PELCO OPERATOR'S MANUAL 2007

MAY 2007

INTRODUCTION

Things To Know / General Information

- This operator's manual is intended for the installation of the Pelco Hot Water Boiler and its safe operation.
- Your certified Pelco installer is responsible for all sizing, plumbing and positioning of the Pelco Hot Water Boiler.
- The Pelco Hot Water Boiler must be installed by a certified Pelco installer who has an understanding of an open pressure system.
- Complete the Warranty Registration and return to Pro-Fab Industries Inc. Failure to do so may result in delays in warranty claim resolution.
- The Pelco Hot Water Boiler comes in three sizes. Be sure that you are referring to the correct dimensions for your Pelco when reading this manual.
- The Pelco Hot Water Boiler is an OPEN PRESSURE system. When placing equipment above the boiler, the system should be a complete closed loop with no leaks. With an existing heating system a heat exchanger is recommended. Your qualified installer will advise of the correct size for your installation.
- Once installed, add water treatment. Have the water tested at least once a year using the test bottles supplied.
- A complete installation will have a back up heating system in the event of a failure.
- When shutting down the Pelco Boiler, the circulating pumps must keep operating until the fuel in the combustion chamber is consumed and the chamber is cooled. As long as there is solid fuel burning in the combustion chamber, the water in the boiler will continue to absorb heat. Turning off the circulating pumps will result in the water heating past the boiling point and overflowing the expansion tank.
- In the event of a power failure, the Pelco Hot Water Boiler will shut down. When power resumes the beacon will have a solid red light. If the fire is still hot enough to sustain continued combustion, press the emergency button. If the fire is out, restart the fire and press the emergency button and pull out to reset the computer.
- At the end of the season, do not turn off power to the control panel. Prolonged lack of power may result in computer memory loss.
- Pelco Boilers are not to be plumbed in series. Zone your application when more than one boiler is required in your location.

Fire Out Offset

The intent of the Fire Out Offset is to completely shut down the Pelco in the event that there is no fire in the fire box. This action prevents the fire box to be continually feeding fuel when there is no fire. The programmable logic controller (PLC) will only activate this feature once the high level water temperature limit has been reached. Each time the main power switch is turned on, the PLC is activated to the first time start up mode and will allow the boiler to run with cold water until the water reaches operating temperature. Once the high water temperature limit is reached, the boiler will now be in RUN mode, the PLC will then trigger the Fire Out Offset to monitor the Pelco operation.

Pelco Hot Water Boiler

Congratulations on purchasing a Pelco Hot Water Boiler. The Pelco Hot Water Boiler is designed for domestic, agricultural, commercial, or industrial applications.

The Pelco Hot Water Boiler is professionally designed and engineered.

To get maximum benefit from your new Pelco Hot Water Boiler, please read this owner's manual and follow the instructions carefully.

These operation instructions are for models: PC1020, PC1520 and PC2520.

IMPORTANT: Save this manual for future reference.

Figure 1 - Pelco Hot Water Boiler

Model & Serial Number Information

Locate and record the model number (Fig. 2) and serial number in the space provided.

Model Number: _____

Serial Number: _____

Have this information available when contacting the dealer or company for service, warranty or other information.

Figure 2 - Pelco Serial Number Decal

Certifications

CSA Standard B366.1-M91
Warnock Hersey CAN/CSA B366.1-M91
-Solid Fuel Fired Central Heating Appliances

UL Standard 391 & UL Standard 726

Pro-Fab Industries Inc.
Box 112, Arborg, MB, Canada R0C 0A0
Toll Free: 1-888-933-4440
Telephone: (204) 364-2211
Fax: (204) 364-2472
Email: info@profab.org
Web: www.profab.org

Safety Precautions

SAFETY PRECAUTIONS

- Burn only Pro-Fab approved combustibles in the Pelco Hot Water Boiler.
- Do not use gasoline, naphtha, engine oil, or other flammable liquids directly on fuel combustion chamber.
- Operate the Pelco Hot Water Boiler at atmospheric pressure only. Keep the vent cap loose on the vent opening. Do not seal or clamp down the vent cap.
- Keep area around the Pelco Hot Water Boiler clear of combustibles to avoid fire hazard.
- Ashes must be contained in a non-combustible container with a tight fitting lid.
- If installing the Pelco Hot Water Boiler indoors, please refer to clearances listed in the Material Requirements section, on page 66.
- Fuel storage hopper or bin must be installed with minimum clearances. Please see bin supplier for specifications.
- When inspecting the fire chamber, open the door slowly.
- Be sure to review all safety information in this manual and read all safety decals on the Pelco Hot Water Boiler.
- Control panel doors must be closed when Pelco is in operation.
- Contact your dealer if you have questions.

Safety Alert Symbol

The Safety Alert symbol identifies important safety messages in the manual and on the Pelco Hot Water Boiler. This symbol indicates the possibility of injury or death. Follow all of the instructions in the safety message given. This symbol means “attention,” “be alert,” and “your safety is involved.”

Why is SAFETY important to you? Three big reasons:

1. Accidents disable and kill.
2. Accidents cost.
3. Accidents can be avoided.

Signal Words

Note the use of the signal words: **DANGER, WARNING,** and **CAUTION** with the safety messages. The appropriate signal word has been selected using the following guidelines:

DANGER

DANGER: Indicates an imminently hazardous situation that, if not avoided, WILL result in death or serious injury.

WARNING

WARNING: Indicates a potentially hazardous situation that, if not avoided, COULD result in death or serious injury.

CAUTION

CAUTION: Indicates a potentially hazardous situation that, if not avoided, MAY result in minor or moderate injury, or serves as a reminder to follow appropriate safety practices.

Maintenance Safety

⚠ WARNING

Fire Hazard. Ash and/or residue may ignite outside of the combustion chamber.

- Press Emergency Stop Button
- Use fire extinguisher to contain fire
- Contact your local Fire Department

⚠ WARNING

Fire Hazard. Collect ashes in a non-combustible container with a tight fitting lid. Waste other than ashes should not be placed in the same container.

⚠ WARNING

Do not operate the Pelco Hot Water Boiler without cover plates and guards in their proper positions. Ensure all cover plates and guards are in position and properly secured prior to operating the Pelco Hot Water Boiler.

⚠ DANGER

Electrocution hazard. Disconnect electrical power supply to the Pelco Hot Water Boiler prior to performing any service or maintenance.

⚠ CAUTION

Potential residue accumulation. A small, intense fire in the Pelco Hot Water Boiler is preferable to a large, smoldering fire, which can produce undesirable amounts of residue.

Sizes & Model Specifications

	PC 1020		PC 1520		PC 2520	
Height	10 ft.	3 m	11 ft.	3.4 m	11 ft.	3.4 m
Width	53 1/2 in.	136 cm	61 1/4 in.	156 cm	73 1/4 in.	186 cm
Water Capacity	130 Gal.	492 L	220 Gal.	833 L	350 Gal.	1,325 L
Shipping Weight	3,500 lbs.	1,588 kg	5,000 lbs.	2,268 kg	6,250 lbs.	2,835 kg
Burner Size	20 in.	51 cm	28 1/2 in.	72 cm	36 1/2 in.	93 cm
Maximum Input BTU*	750,000		1,500,000		2,500,000	
Computerized Controls	Included		Included		Included	
Electrical Requirements	220V / 20 amp		220V / 20 amp		220V / 20 amp	
Outlet Fitting Sizes	1 1/2 in.		2 in.		2 1/2 in.	

*BTU numbers indicated are approximate input values based on tests using maximum value fuel. For proper sizing and output BTU values, contact an authorized Pelco installer. (BTU value will vary by fuel type)

Identifying Main Components

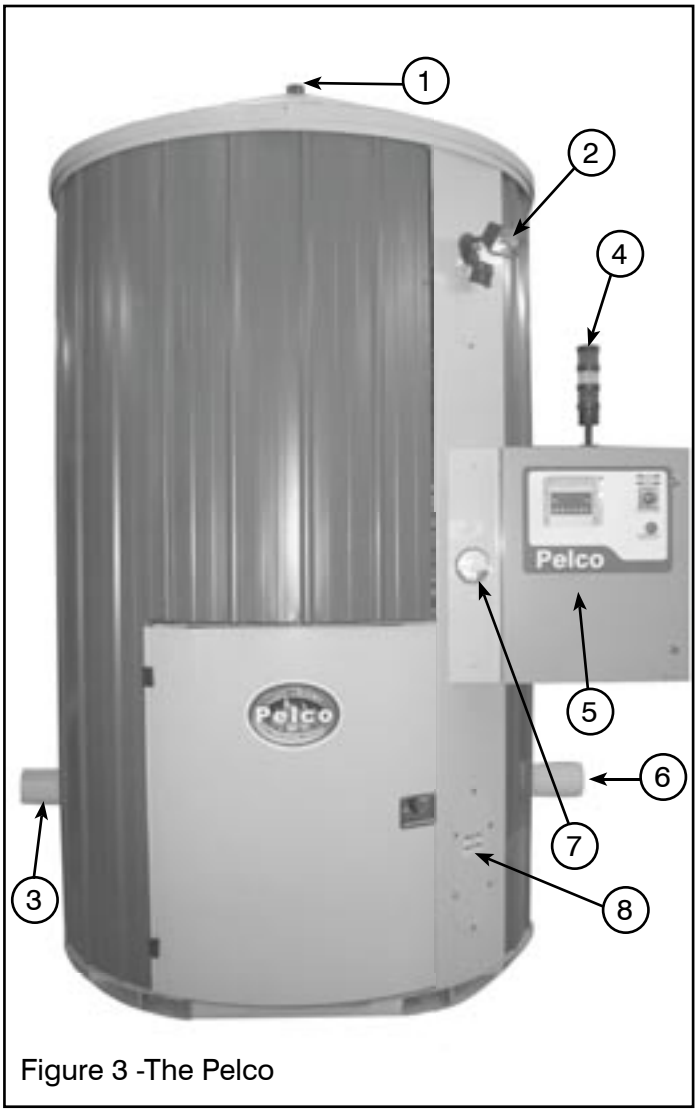


Figure 3 -The Pelco

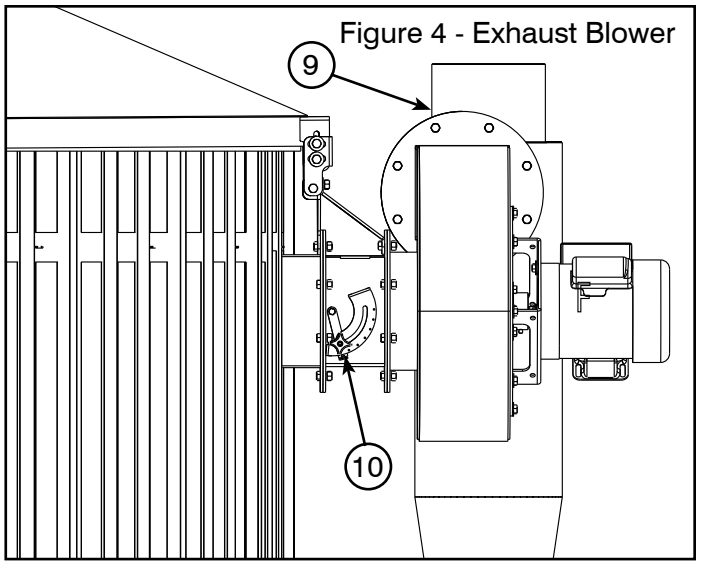


Figure 4 - Exhaust Blower

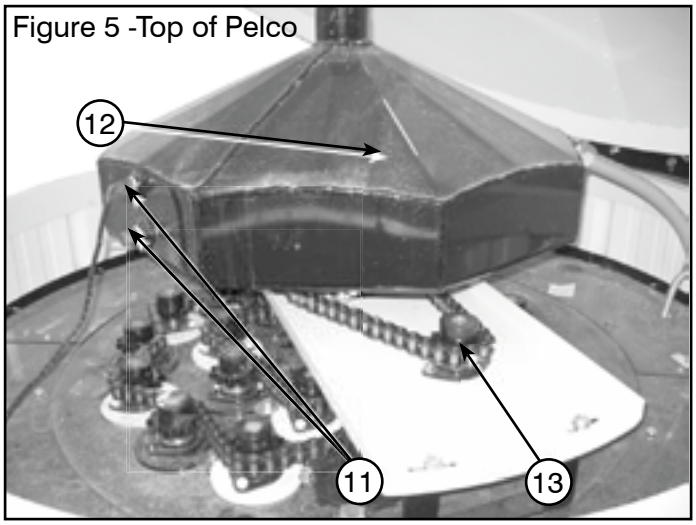


Figure 5 -Top of Pelco

Figure 3 - The Pelco Figure 4 - Exhaust Blower		Figure 5 - Top of Pelco Figure 6 - Combustion Blower
Item No.	Figure Number	Description
1	3	Vent Opening
2	3	Service Box & Light
3	3	Ash Auger
4	3	Beacon
5	3	Control Panel
6	3	Intake Feed Auger
7	3	Magnehelic
8	3	Electrical Service Cover
9	4	Exhaust Blower
10	4	Exhaust Blower Control
11	5	Liquid Level Sensor
12	5	Expansion Tank
13	5	Flue Cleaner Drive
14	6	Combustion Blower Adjuster

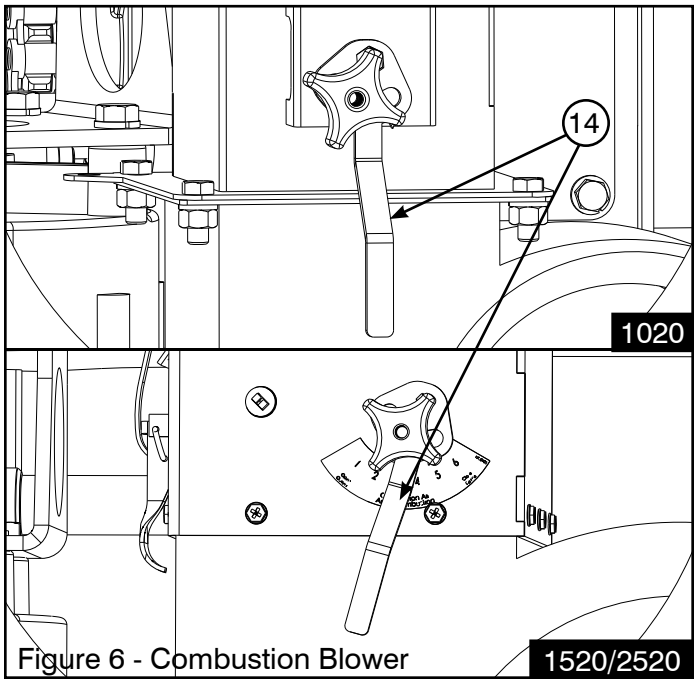
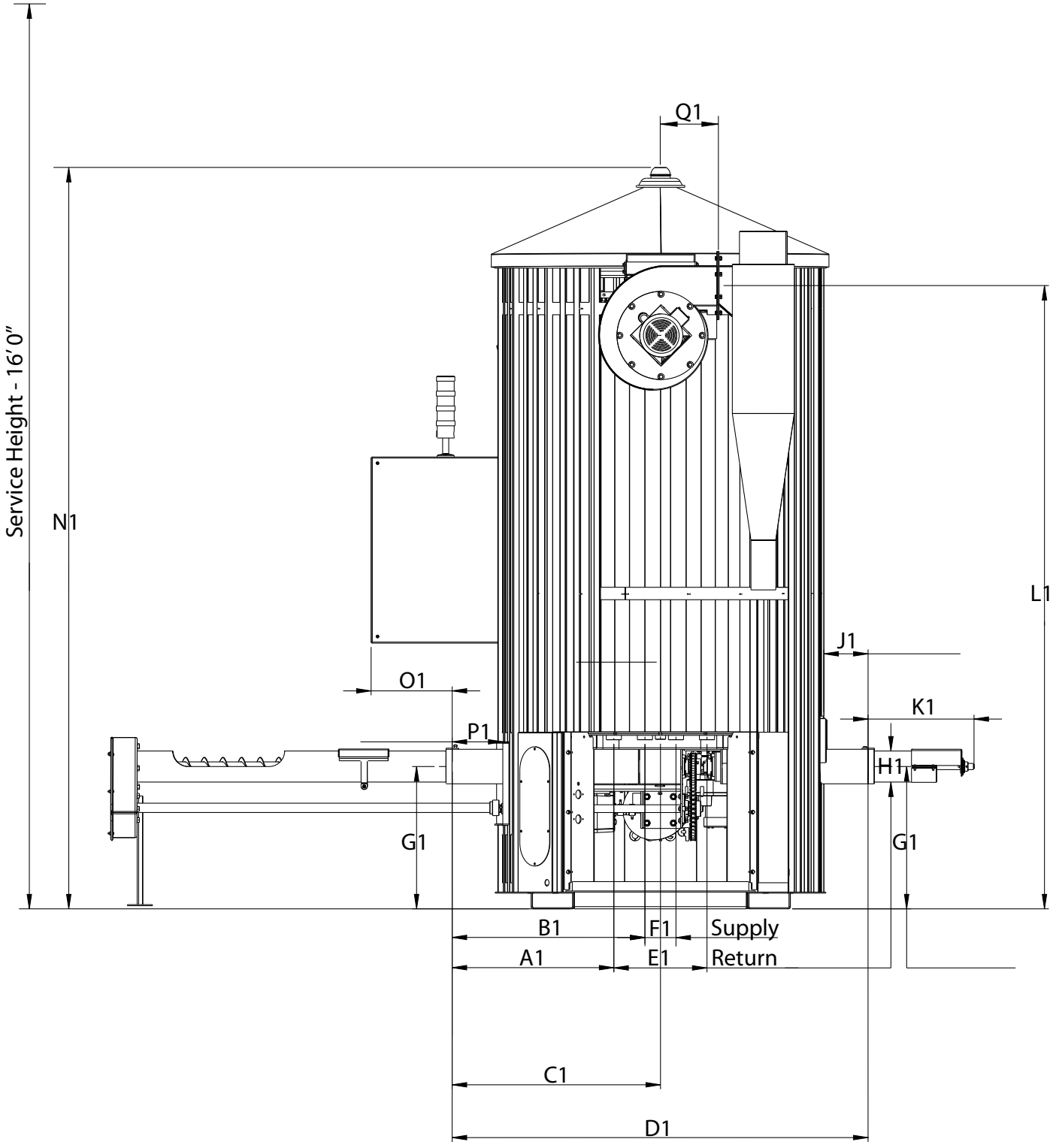


Figure 6 - Combustion Blower

Specifications - Pelco Rear View

Figure 7 - Pelco Rear View
see table on following page

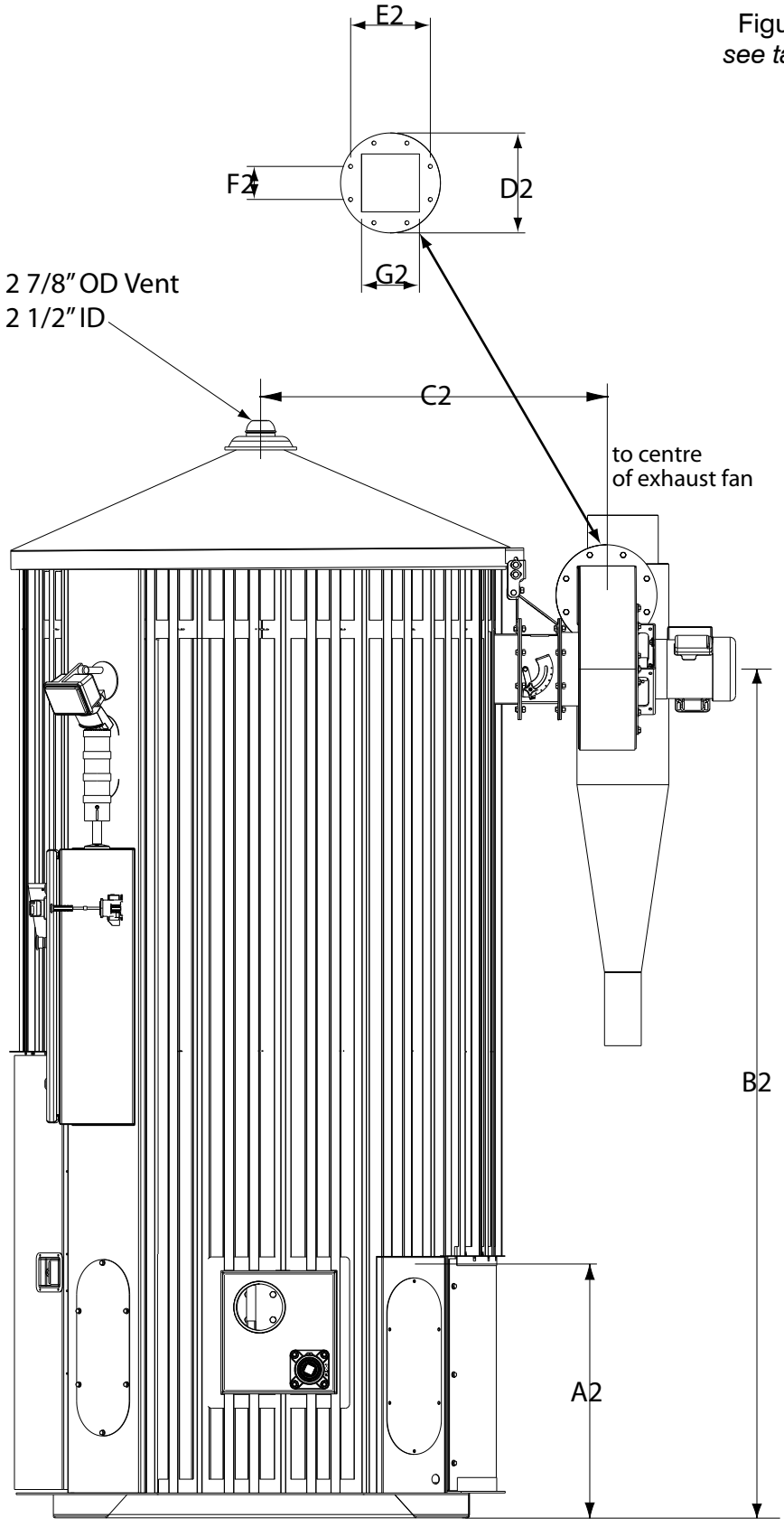


Specifications - Pelco Rear View

Figure 7 - Pelco Rear View [metres(inches)]								
	Detailed Description	1020		1520		2520		
A1	Centre of return (1.5” NPT) to end of feed auger	0.66m	(26.05in)	0.79m	(31.13in)	0.78m	(30.75in)	
B1	Centre of supply (1.5” NPT) to end of feed auger	0.79m	(31.05in)	0.93m	(36.64in)	1.01m	(39.84in)	
C1	Centre of drain (1” NPT) to end of feed auger	0.85m	(33.56in)	1.00m	(39.50in)	1.14m	(44.75in)	
D1	End of feed auger to end of ash auger	1.70m	(66.98in)	1.97m	(77.50in)	2.22m	(87.50in)	
E1	Centre of return (1.5” NPT) to centre of return (1.5” NPT)	0.38m	(15.00in)	0.42m	(16.73in)	0.71m	(27.97in)	
F1	Centre of supply (1.5” NPT) to centre of supply (1.5” NPT)	0.13m	(5.00in)	0.15m	(5.73in)	0.22m	(8.81in)	
G1	Ground to centre of auger	0.58m	(22.93in)	0.58m	(22.96in)	0.58m	(22.96in)	
H1	Outside diameter ash auger	0.13m	(5.00in)	0.13m	(5.00in)	0.13m	(5.00in)	
J1	End of ash auger to siding	0.18m	(7.12in)	0.21m	(8.45in)	0.18m	(7.24in)	
K1	Ash auger length	0.43m	(17.06in)	1.35m	(53.04in)	1.35m	(53.04in)	
L1	Centre of exhaust outlet	2.55m	(100.43in)	0.85m	(33.55in)	0.89m	(35.00in)	
M1	Boiler diameter	1.34m	(52.64in)	1.56m	(61.30in)	1.85m	(73.00in)	
N1	Boiler height	3.03m	(119.46in)	3.37m	(132.50in)	3.37m	(132.50in)	
O1	End of feed auger to end of control panel	0.33m	(13.06in)	0.31m	(12.34in)	0.31m	(12.34in)	
P1	End of feed auger to siding	0.21m	(8.18in)	0.25m	(10.00in)	0.25m	(10.00in)	
Q1	Centre of boiler to face of fan	0.24m	(9.25in)	0.23m	(9.18in)	0.23m	(9.18in)	

Specifications - Pelco Side View

Figure 8 - Pelco Side View
see table on following page



Specifications - Pelco Side View

Figure 8 - Pelco Side View [metres(inches)]				
	Detailed Description	1020	1520	2520
A2	Floor to line hookup	0.69m (27.03in)	0.69m (27.03in)	0.69m (27.03in)
B2	Floor to centre of exhaust	2.53m (99.64in)	2.70m (106.22in)	2.73m (107.36in)
C2	Centre of boiler to centre of exhaust fan	0.96m (37.66in)	1.06m (41.64in)	1.22m (48.00in)
D2	Flange diameter	0.28m (11.00in)	0.28m (11.00in)	0.28m (11.00in)
E2	Centre to centre of mounting holes	0.22m (8.78in)	0.22m (8.78in)	0.22m (8.78in)
F2	Centre to centre of mounting holes	0.09m (3.64in)	0.09m (3.64in)	0.09m (3.64in)
G2	Exhaust hole	0.16m (6.37in)	0.16m (6.37in)	0.16m (6.37in)

Specifications - Pelco Bottom Rear View

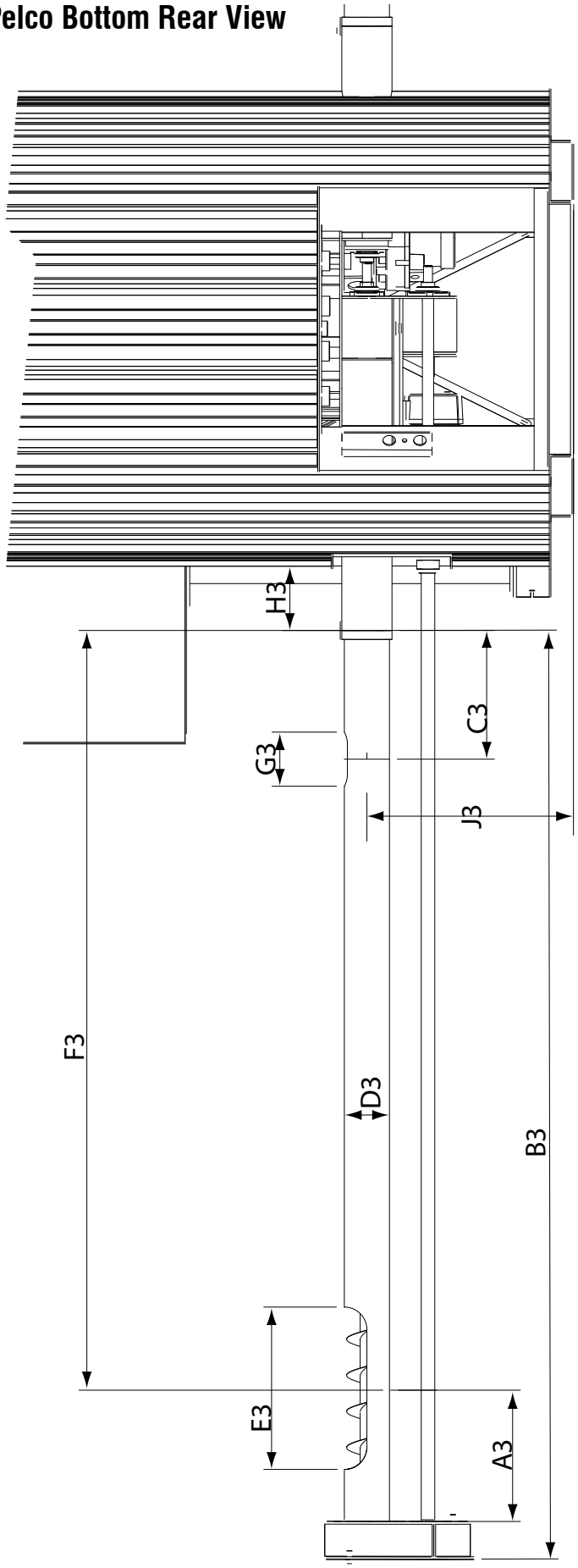
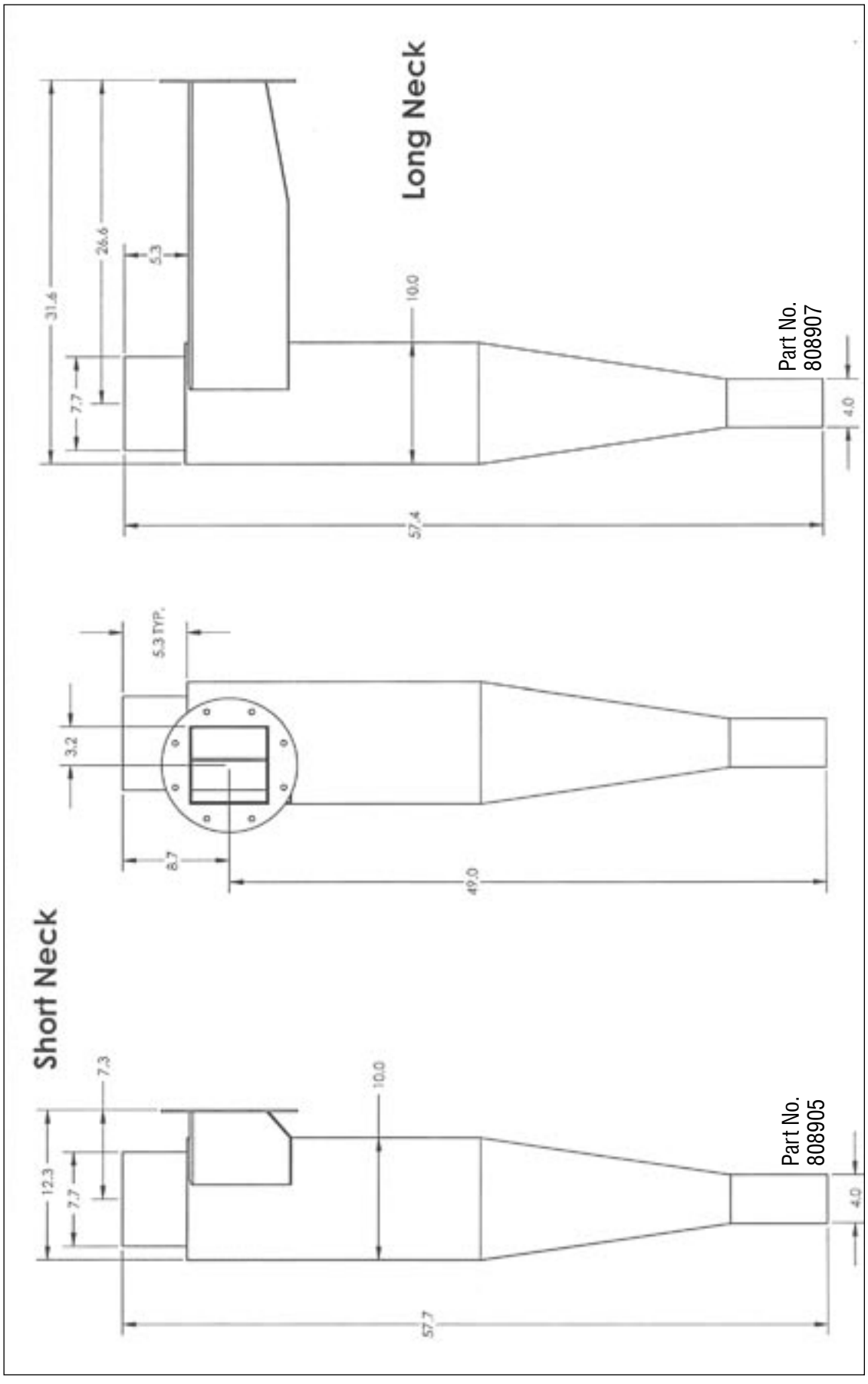


Figure 9 - Pelco Bottom Rear View
see table on following page

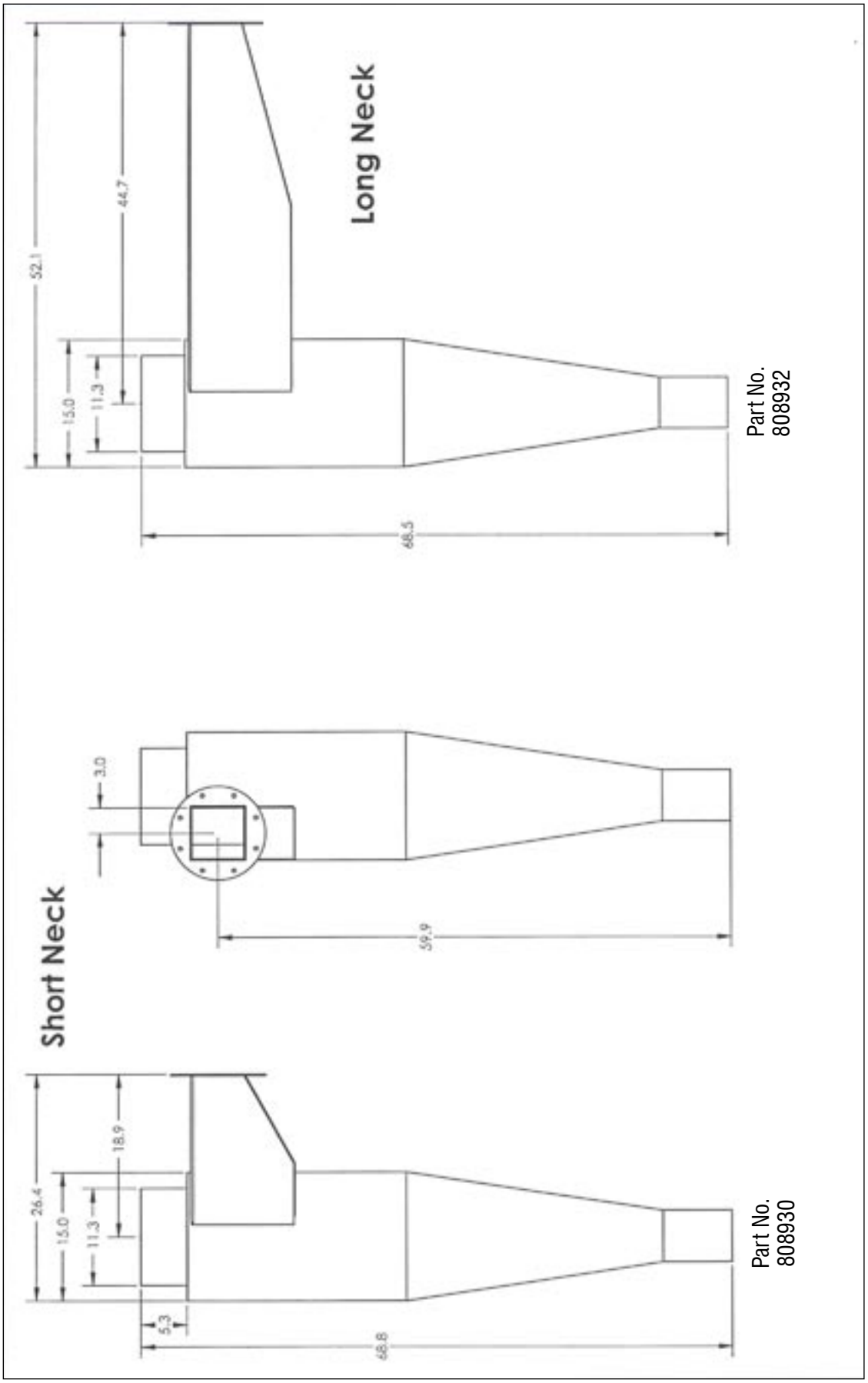
Specifications - Pelco Bottom Rear View

Figure 9 - Pelco Bottom Rear View [metres(inches)]				
	Detailed Description	1020	1520	2520
A3	Bearing mount to centre of feed auger intake hole	0.37m (14.55in)	0.37m (14.55in)	0.37m (14.55in)
B3	Total length of auger extension	2.61m (102.95in)	2.61m (102.95in)	2.61m (102.95in)
C3	Boiler to centre of sight glass	0.36m (14.27in)	0.36m (14.27in)	0.36m (14.27in)
D3	Outside diameter	0.13m (5.00in)	0.13m (5.00in)	0.13m (5.00in)
E3	Auger intake hole	0.46m (18.00in)	0.46m (18.00in)	0.46m (18.00in)
F3	End of feed auger to centre of intake hole (3ft)	0.91m (36.00in)	0.91m (36.00in)	0.91m (36.00in)
F3	End of feed auger to centre of intake hole (5ft)	1.52m (60.00in)	1.52m (60.00in)	1.52m (60.00in)
F3	End of feed auger to centre of intake hole (7ft)	2.13m (84.00in)	2.13m (84.00in)	2.13m (84.00in)
F3	End of feed auger to centre of intake hole (9ft)	2.74m (108.00in)	2.74m (108.00in)	2.74m (108.00in)
F3	End of feed auger to centre of intake hole (11ft)	3.35m (132.00in)	3.35m (132.00in)	3.35m (132.00in)
G3	Sight glass opening	0.15m (6.00in)	0.15m (6.00in)	0.15m (6.00in)
H3	Siding to end of feed auger tube	0.18m (7.15in)	0.22m (8.85in)	0.18m (7.15in)
J3	Floor to centre of feed auger tube	0.58m (22.90in)	0.58m (22.90in)	0.58m (22.90in)

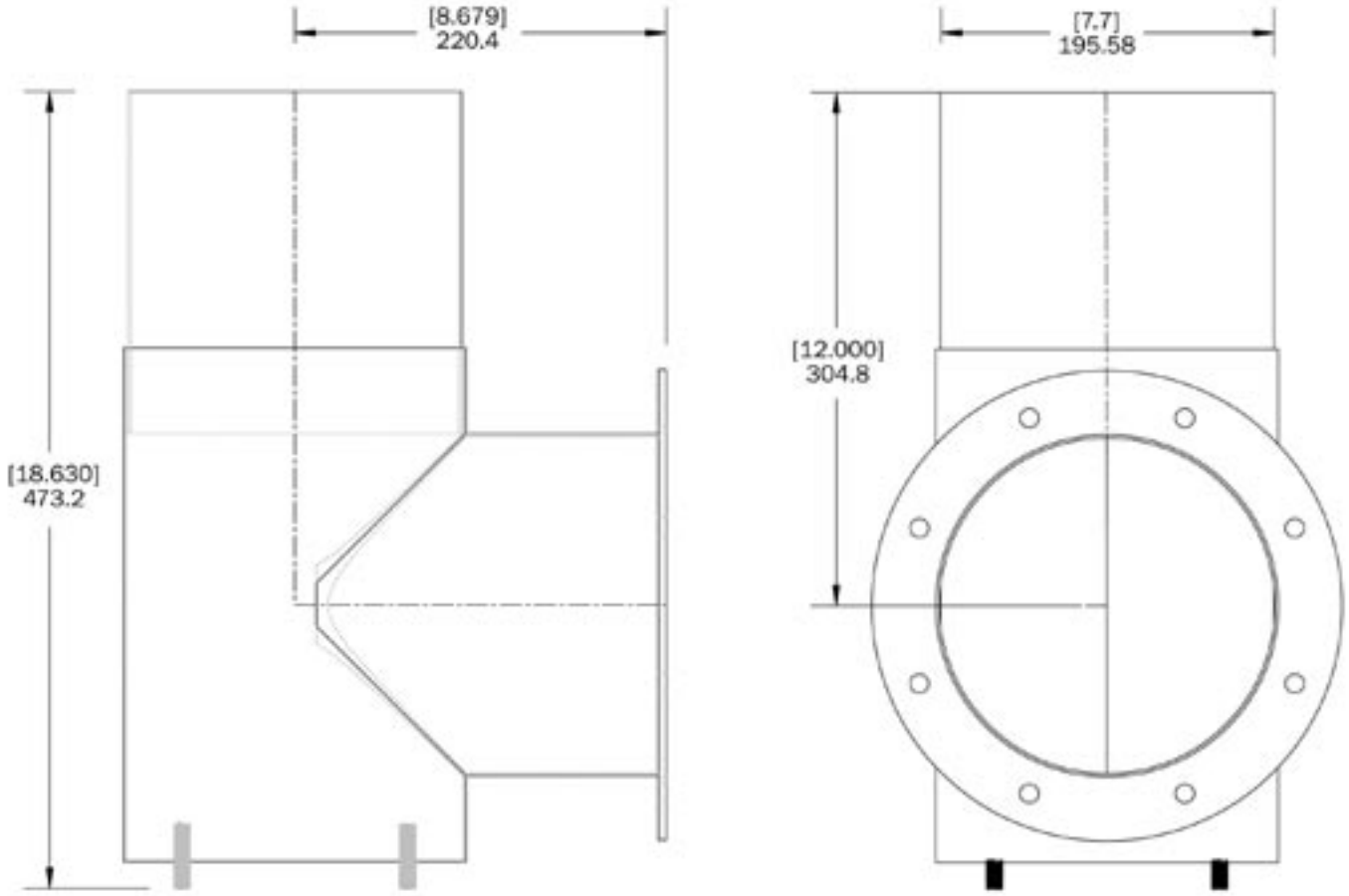
Options - Cyclones



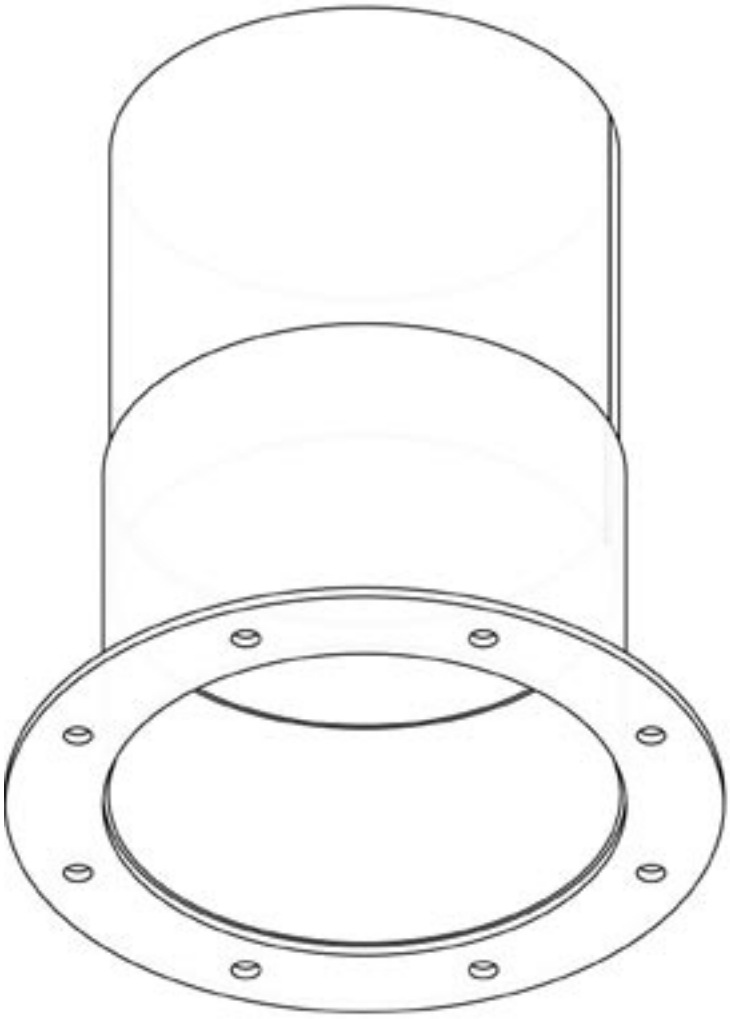
Options - Cyclones

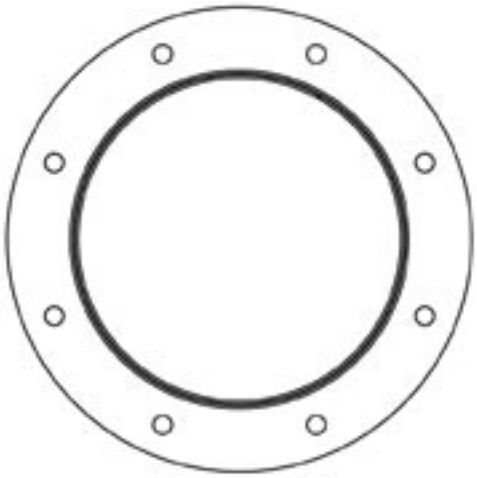


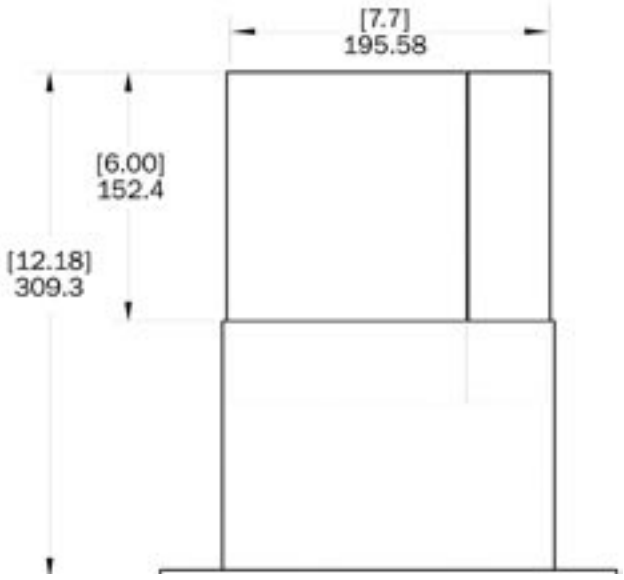
Options - Chimney Tee



Options - Straight Chimney Tube







Site Preparation - Foundation

The Pelco Hot Water Boiler (1, Fig. 11) should be installed on a concrete pad (2, Fig. 11) large enough to fit both the Pelco Hot Water Boiler and the fuel hopper (3, Fig. 11). The pad should be constructed to provide stability between the hopper and the Pelco Hot Water Boiler to prevent the intake feed auger from binding. The thickness of the pad will vary, according to the size of the fuel hopper and ground conditions.

For installation on a concrete pad of your hopper bottom bin, please see your bin supplier for specifications.

Provide an opening (4, Fig. 11) in the pad to allow water line and electrical wire installation.

Minimum spacing from control box to bin is 6 inches.

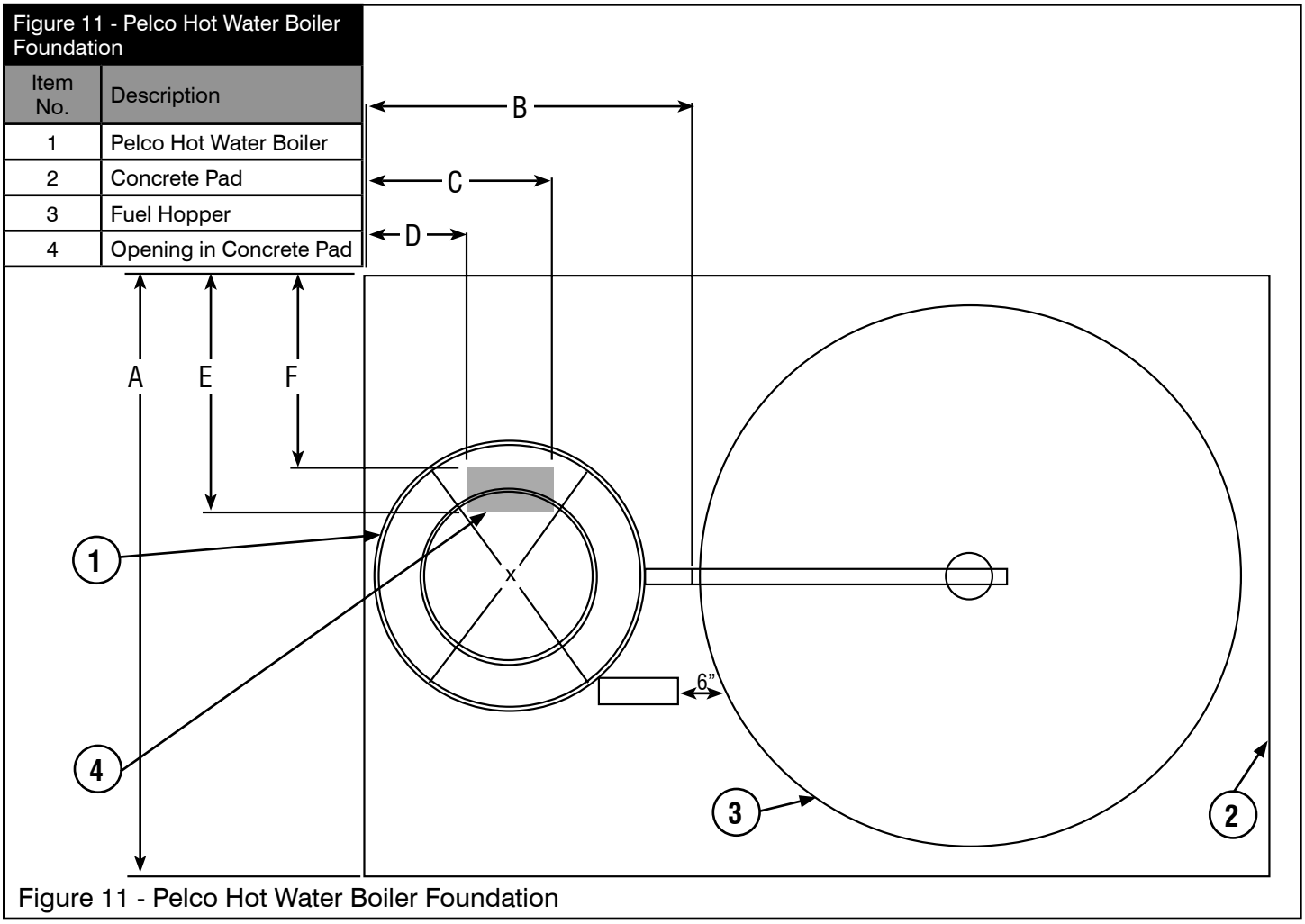
The following information is to be used for estimating purposes only. Before construction, the owner must check with their local authority to take soil conditions into consideration and concrete psi recommendations.

General rules for Fuel Bins up to 40 tons capacity:
- Gravel Base
- 8” Thick Concrete Pad
- 1/2” Re-Bar at 18” Centers

General rules for Fuel Bins up to 60 tons capacity:
- Gravel Base
- 10” Thick Concrete Pad
- 1/2” Re-Bar at 18” Centers

Figure 11 - Pelco Hot Water Boiler Foundation

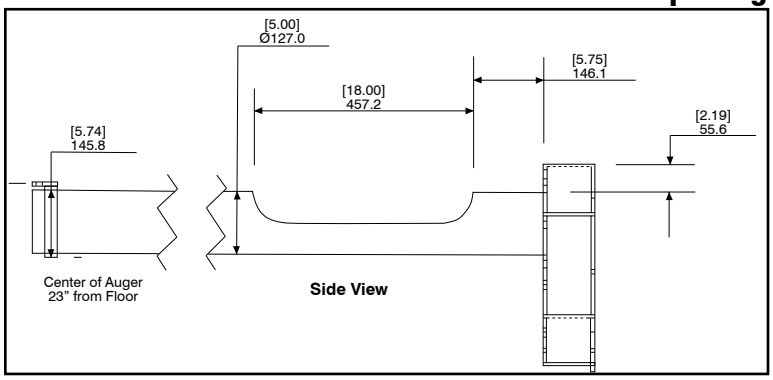
Item No.	Description
1	Pelco Hot Water Boiler
2	Concrete Pad
3	Fuel Hopper
4	Opening in Concrete Pad



Concrete Pad Dimensions metres (inches)

PC1020	A	B	C	D	E	F
12 Ft Bin	4.22m (166in)	1.93m (76in)	1.32m (52in)	0.66m (26in)	1.88m (74in)	1.68m (66in)
14 Ft Bin	4.83m (190in)	1.93m (76in)	1.32m (52in)	0.66m (26in)	2.18m (86in)	1.98m (78in)
PC1520	**A**	**B**	**C**	**D**	**E**	**F**
12 Ft Bin	4.22m (166in)	1.83m (72in)	1.45m (57in)	0.69m (27in)	1.83m (72in)	1.52m (60in)
14 Ft Bin	4.83m (190in)	1.83m (72in)	1.45m (57in)	0.69m (27in)	2.13m (84in)	1.83m (72in)
PC2520	**A**	**B**	**C**	**D**	**E**	**F**
12 Ft Bin	4.22m (166in)	1.93m (76in)	1.32m (52in)	0.71m (28in)	1.65m (65in)	1.35m (53in)
14 Ft Bin	4.83m (190in)	1.93m (76in)	1.32m (52in)	0.71m (28in)	1.80m (71in)	1.50m (59in)

Intake Opening



Pelco Hot Water Boiler Placement

1. Place the Pelco Hot Water Boiler above the water line openings in the concrete pad.
2. Adjust positioning of the Pelco Hot Water Boiler to properly align the feed auger tube both horizontally and vertically between the fuel hopper and the Pelco Hot Water Boiler.

Water Lines

Connect the Pelco Hot Water Boiler to the supply and return water lines.

1. Install shut off valves (1, Fig. 12) on all lines to prevent loss of water during maintenance.

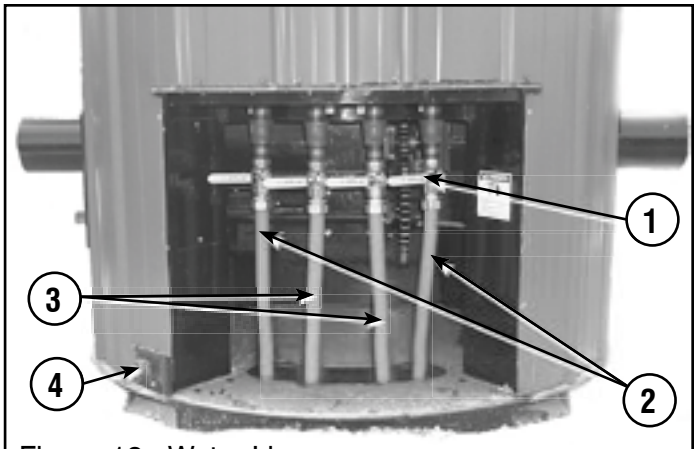


Figure 12 - Water Lines

2. Connect the water lines. The two outside fittings (2, Fig. 12) are returns, and the two middle fittings (3, Fig. 12) are supply outlets.

3. If the system is overfilled with water there is an overflow valve (4, Fig. 12) that the water will drain through.

Figure 12 - Water Lines	
Item No.	Description
1	Shut Off Valves
2	Return Lines
3	Supply Lines
4	Overflow Outlet

IMPORTANT: To ensure maximum performance of your Pelco Hot Water Boiler please consult a qualified engineer/installer.

Feed Auger Installation

1. Slide the feed auger tube (1, Fig. 13) through fuel hopper discharge boot (2, Fig. 13).
2. Secure the feed auger tube (1, Fig. 14) on the Pelco Hot Water Boiler (2, Fig. 14) with a ⅜" x ½" hex bolt (3, Fig. 14).
3. Slide the auger shaft (1, Fig. 15) into the auger tube.
4. Insert the auger bearing (2, Fig. 15) into the bearing housing (3, Fig. 15) and slide onto the end of the auger shaft. Secure the bearing housing to mounting plate (4, Fig. 15) with four 7/16" x 1½" hex bolts.
5. Slide the auger sprocket (5, Fig. 15) over the end of the auger shaft. Insert key (6, Fig. 15) into keyway. Tighten set screws on auger sprocket hub.
6. Slide the drive shaft (7, Fig. 15) through the opening in the mounting plate. Assemble the bearing and bearing housing (8, Fig. 15) and slide over the end of the drive shaft. Secure the bearing housing to the mounting plate with four 7/16" x 1½" hex bolts.
7. Slide the drive sprocket (9, Fig. 15) over the end of the drive shaft. Insert key (10, Fig. 15) into keyway. Tighten set screws on drive sprocket hub.
8. Place the chain (11, Fig. 15) on the sprockets. Tighten the chain by loosening the drive bearing housing mounting bolts and pulling down on the drive shaft. Once the chain is properly adjusted, tighten the bolts.
9. Replace the chain drive cover (12, Fig. 15).

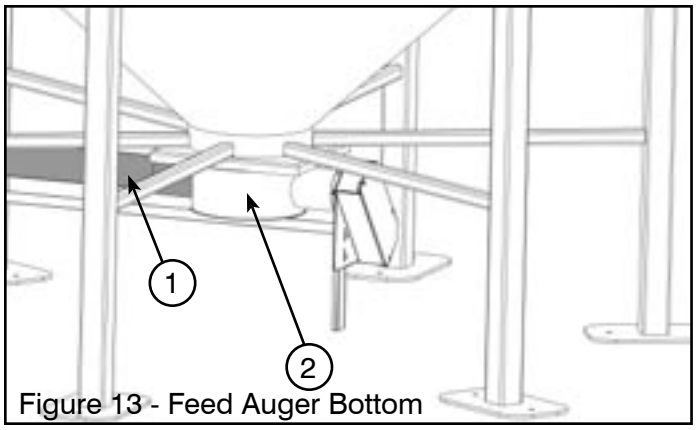


Figure 13 - Feed Auger Bottom

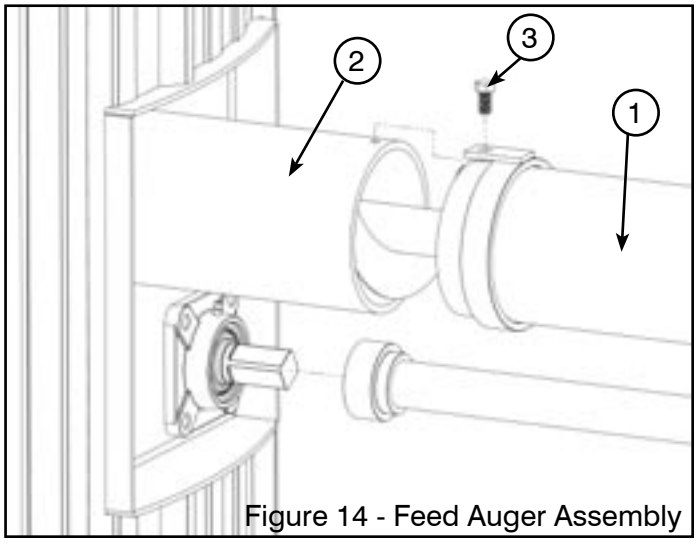


Figure 14 - Feed Auger Assembly

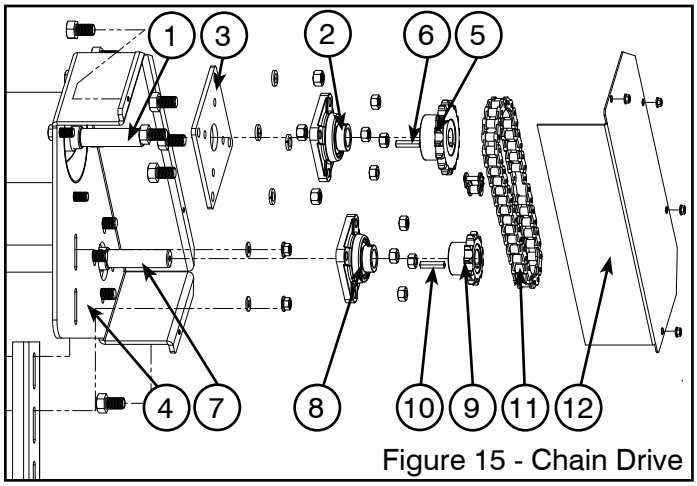


Figure 15 - Chain Drive

IMPORTANT: The Pelco Hot Water Boiler must be aligned properly, both horizontally and vertically, to prevent the feed auger flighting from binding in the tube.

Ash Auger

NOTE: The Pelco Hot Water Boiler comes standard with a 1.22 m (4 ft) ash auger extension.

1. Insert the ash auger shaft (1, Fig. 16) into the ash auger discharge tube (4, Fig. 13) ensuring the square hub is on the square shaft.
2. Slide the ash auger extension tube (2, Fig. 16) over the auger extension shaft and flighting.
3. Secure the ash auger extension tube to the discharge auger tube with a 3/8" x 1/2" hex bolt (3, Fig. 16).
4. Bolt together piece number 1 and 2 (1, 2, Fig. 17) with four 1/4" x 1" bolts (3, Fig. 17).
5. Slide the bolted part 1 and 2 onto the ash auger tube (4, Fig. 17).
6. Slide the flange (5, Fig. 17) onto the ash auger shaft (8, Fig. 17), then slide the bearing (6, Fig. 17) followed by the second flange (7, Fig. 17). Fasten with two 5/16" carriage bolts (9, Fig. 17).
7. Tighten the locking collar (10, Fig. 17) onto the bearing.

IMPORTANT: Bolt thread length must not exceed 12.7 mm (1/2 in) to prevent collapsing of the tube and binding auger flighting.

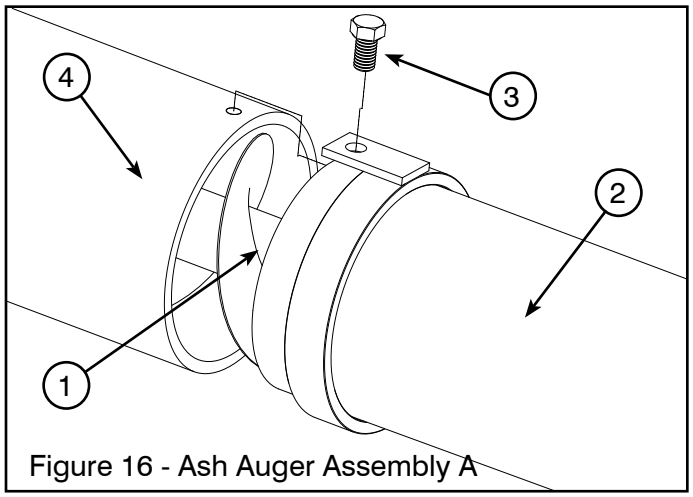


Figure 16 - Ash Auger Assembly A

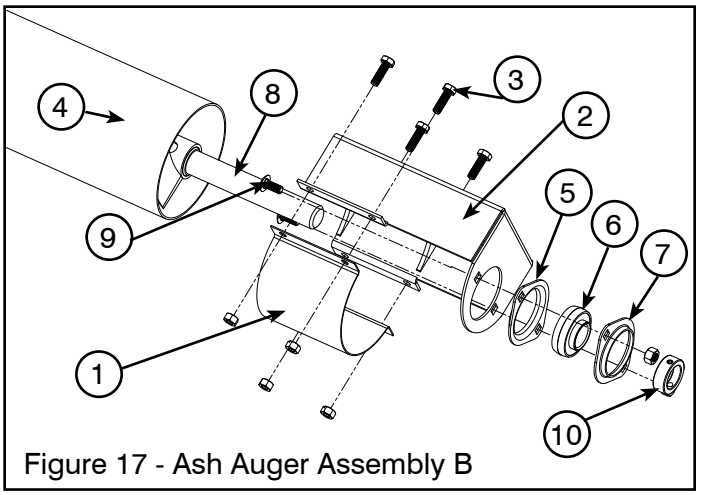


Figure 17 - Ash Auger Assembly B

Filling the System with Water

1. To fill the Pelco Hot Water Boiler with water from inside the building being heated, install a "T" in the return or supply line with a valve and boiler fill/drain fitting (Fig. 18).
2. Attach a water supply hose.
3. Isolate the Pelco Hot Water Boiler by closing off the supply and return valves at the back of the Pelco Hot Water Boiler.
4. Turn on the water to pressurize the line system.
5. Inspect all lines and connectors for leaks.


Figure 18 - Fill/Drain Fitting

⚠ CAUTION

Do not pressurize the Pelco Hot Water Boiler.

6. After checking for leaks, open the supply valve at the Pelco Hot Water Boiler and let water enter the Pelco Hot Water Boiler water jacket for 2 minutes, then close.

Filling the System with Water con't

7. Now open the return valve at the Pelco Hot Water Boiler and let water run for 2 minutes, then close.

NOTE: Alternating between lines will assure that most of the air is bled from the system.

8. Repeat the above procedure 3 to 4 times during filling of the Pelco Hot Water Boiler.

NOTE: Electrical power supply must be "on" for green beacon to illuminate.

9. When the Pelco Hot Water Boiler is full, the green beacon light will illuminate. Shut off the water supply valve.

IMPORTANT:

- **Use only clean, filtered water in the Pelco Hot Water Boiler. Add water treatment to prevent corrosion. (Supplied with the Pelco Hot Water Boiler.)**
- **Add boiler glycol to the water chamber to prevent freezing of the Pelco Hot Water Boiler and the pump, if the unit shuts down due to a power failure or other cause.**
- **Use an environmentally-friendly, propylene glycol, low toxicity, non petroleum based boiler glycol designed for use in hot water boiler systems, available from your Pelco Hot Water Boiler Dealer.**

Clinker Stick

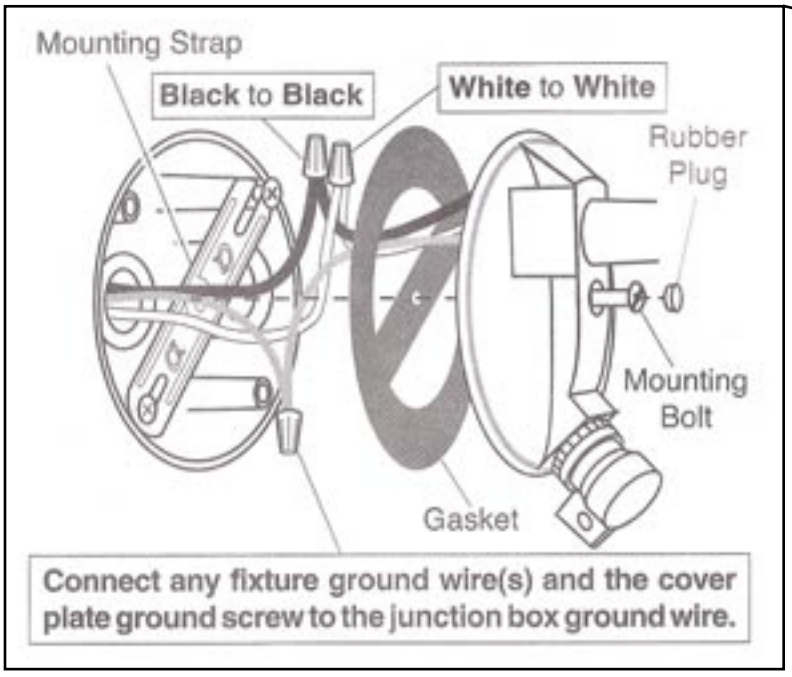
Prop Rod

Expansion Tank

Gasket or high temp silicone must be installed to prevent leakage.

Light

Install as per instructions included with light fixture.



Startup Instructions

IMPORTANT: Read the Control Panel information and become familiar with the controls prior to starting the Pelco Hot Water Boiler.

NOTE: The message display will now start to scroll through a series of codes, to where it will display the Main Window.

After the Pelco Hot Water Boiler has been properly installed, connections tightened properly, and water reservoir and system are filled to the proper level, your Pelco Hot Water Boiler is ready to start.

1. Turn emergency switch to OFF.
2. Turn main disconnect switch to ON.
3. Pull the emergency switch to ON. The Pelco Hot Water Boiler will start and the green light on the beacon will illuminate.

   The following components should be operating as follows:

   Exhaust Blower - running steady.

   Combustion Blower - running steady.

   Ash Ring Drive - running according to settings on the Electronic Digital Display panel.

   Feeder Drive - running according to settings on the Electronic Digital Display panel.

   Using the Electronic Digital Display adjust fuel input rate to 99% until the burner is covered.
4. Using the Electronic Digital Display adjust the fuel rate down to 1%.
5. Light the fire. (See the following instructions to start the fire.)

   a) Coal:

   - To start a fire with coal you will need: a one gallon tin can, wood pellets and fire starter fluid.
   - Fill the tin can full with wood pellets and pour fire starter fluid over the wood pellets. Let the wood pellets soak for a few minutes before placing them on the burner.
   - Start the Pelco Hot Water Boiler before putting the wood pellets in the fire chamber. Select manual feed on the main window of the control panel to bring the coal up to the burner. Once there is an even layer of coal covering the burner rings, stop feeding the coal and pour the pellets into the centre of the burner.
   - With the combustion blower still off, light the fire using a small propane torch. Once the wood pellets are burning, the Pelco Hot Water Boiler can be turned on ensuring the combustion air control is completely closed and the fuel feed rate is at 1%.
   - Slowly turn up the combustion air until the fire starts to burn rapidly. Once you can see that the coal is burning, the fuel feed rate can be increased to feed more coal.
   - At this time the fire should be burning on its own and ready for final adjustments depending on your heat load.

   b) Corn:

   - To start a fire with corn you will need: a one gallon tin can, wood pellets and fire starter fluid.
   - Fill up the tin can with wood pellets and pour fire starter fluid over the wood pellets. Let the pellets soak for a few minutes before proceeding.

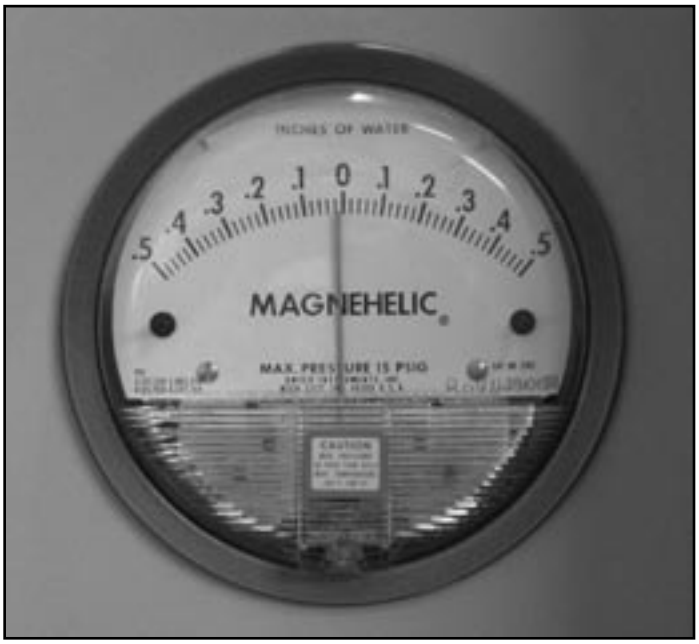
Startup Instructions Continued

- Before putting the wood pellets into the burner ensure the Pelco Hot Water Boiler is ON and select manual feed on the main window of the control panel to bring the corn up to the burner.
- When you have about two pounds of corn in the centre of the burner, stop feeding the corn and pour the pellets into the centre of the burner over the corn.
- With the combustion blower off, light the fire using a small propane torch. Once the wood pellets are nicely burning you can then turn on the Pelco Hot Water Boiler ensuring the combustion air control is completely closed and the fuel feed rate is at 1%.
- Slowly turn up the combustion air until the fire starts to burn rapidly. Once the corn is starting to burn the fuel feed rate can be turned up to bring in more corn.
- At this time the fire should be burning on its own and ready for final adjustments depending on the heat load.

6. Adjust the Combustion Blower air control as required.
7. Once the fire is lit, turn the Fuel Input Rate to approximately 30%.
8. After the fuel is burning evenly all around the burner, readjust the Combustion Blower air control, and the Fuel Input Rate to ensure proper burning.
9. Check the ash auger to make sure that no unburned fuel or live embers are feeding into the ash auger.

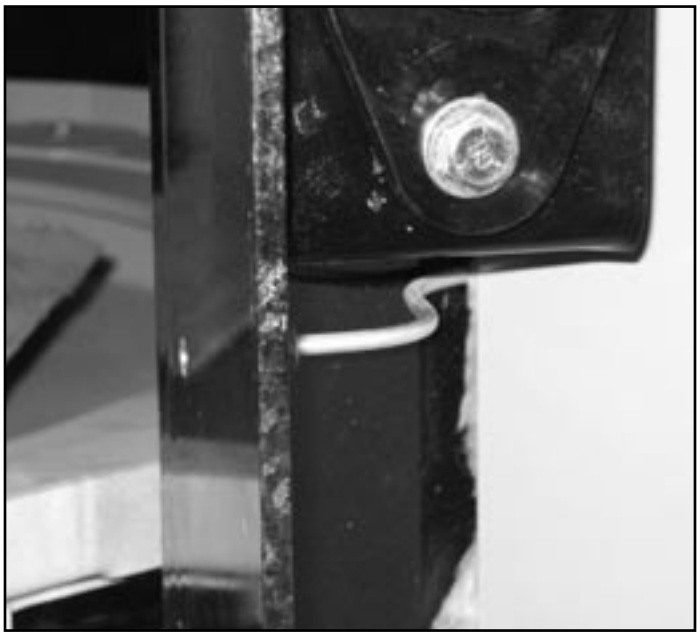
Magnehelic

Normal over fire operating draft would be -0.1”wc to -0.2” wc. This will ensure having the correct draft for combustion of most alternative fuels. This will also ensure a max level of heat transfer from fire box to boiler (always confirm this range at operating temperatures).



Tube

For proper operation of your Pelco Boiler ensure that the tube opening is clear of foreign material. Use a wire or pipe cleaner to clear.



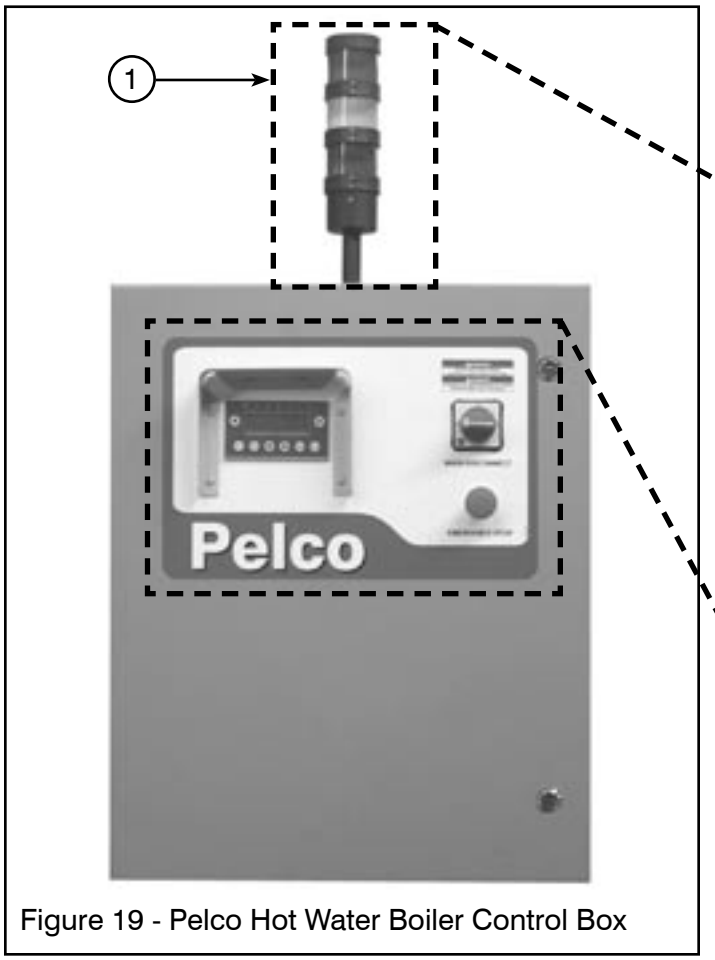


Figure 19 - Pelco Hot Water Boiler Control Box

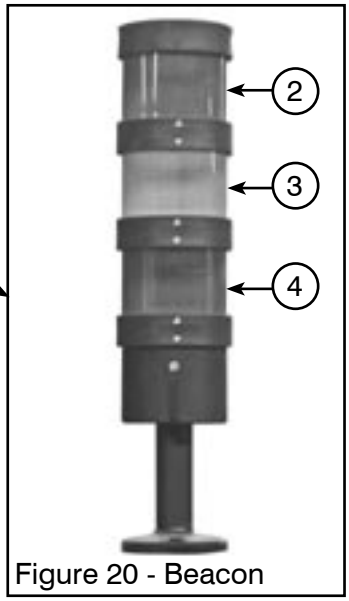


Figure 20 - Beacon

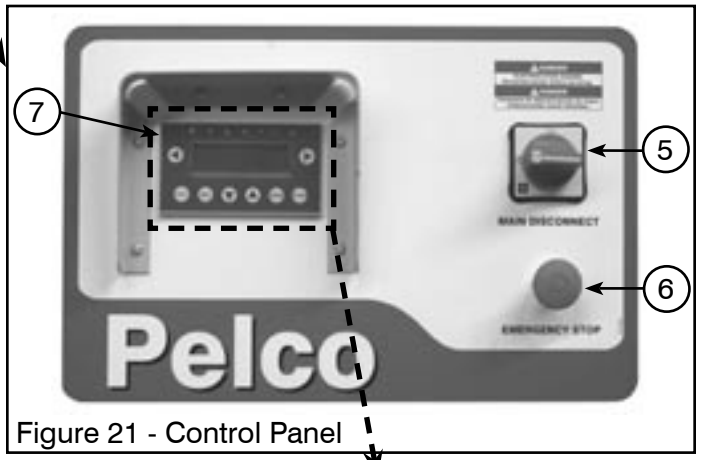


Figure 21 - Control Panel

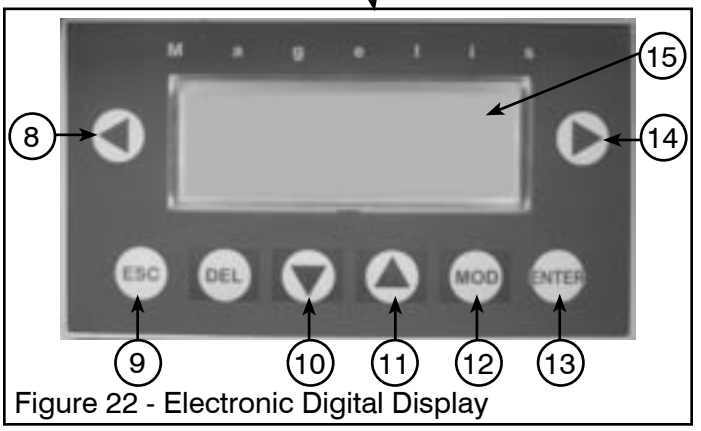


Figure 22 - Electronic Digital Display

Figure 19 - Pelco Hot Water Boiler Control Box Figure 20 - Beacon Figure 21 - Control Panel Figure 22 - Electronic Digital Display		
Item No.	Figure Number	Description
1	19	Beacon
2	20	Red Light
3	20	Amber Light
4	20	Green Light
5	21	Main Disconnect Switch
6	21	Emergency ON / OFF Switch
7	21	Electronic Digital Display
8	22	Left Arrow
9	22	Escape Button
10	22	Down Arrow
11	22	Up Arrow
12	22	Mode Button
13	22	Enter Button
14	22	Right Arrow
15	22	Electronic Display Window

Operation - Control Panel Functions

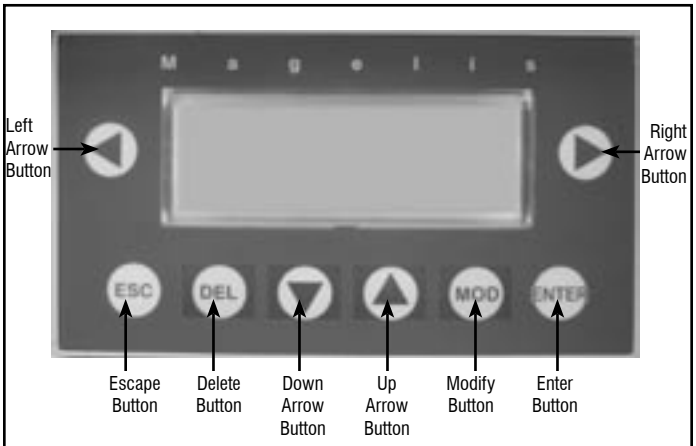


Figure 23 - Electronic Digital Display Main Window Display

In case of an alarm:

If there is only one alarm, the electronic digital display will indicate "1/1." If there are two alarms, the display will indicate the message with "1/2." To scroll between messages use the ◀ or ▶ buttons to read the next message which will indicate the message with "2/2" on the side.

	◀	Main Window	
▼ or	▲	Select	Manual Feed Manual Clean 1 Manual Clean 2
	MOD	Hold to operate motor	
	ESC	To return to main window	
▼ and	▲	Settings	
	▼	To select	Fuel input rate Water high limit Fire out offset Temp diff. Flue clean Heat dissipation Ash ring On Ash ring Off
	MOD	To select change	
▼ or	▲	Increase or decrease settings	
	ENTER	To save selected settings	
Repeat other selections if desired			
	ESC	To return to main window	

NOTE: To return to the main window, press the ESC "ESC" button.

Operation - Electronic Digital Display Settings

Factory Settings	Label	Allowable Values	Description
50%	Feed Input Rate	0–100%	Percentage of feed motor speed.
180°F	Water High Limit	150°F–180°F	Maximum temperature that the boiler will get to.
40°F	Fire Out Offset	20°F–100°F	Variance setting to shut down unit if temperature drops
6°F	Temp. Diff.	2°F–9°F	Running operating variance.
10hrs 59mins	Heat Dissipation	0–20hrs 0–59mins	Time set for the unit to operate the heat dissipater circuit.
2	Flue Clean	2–48	Number of times in a 24 hour period that the flue augers operate.
1 min	Ash Ring On	1–100min	Ash ring on time.
1 min	Ash Ring Off	1–100min	Ash ring off time.
	Program V X.X		Program Version

Operation - Beacon Messages

Beacon	Alarm Display	Functions of the Pelco	Solution
Red Solid	Water level low	Unit shuts down	Need to fill water
	Fire out	Unit shuts down	Start/Restart fire
	Water overheated	Unit shuts down	Wait for cool down
Red Solid Green Solid	Ash auger overheated	Unit has shut down	Wait for cool down
Green Solid	Breaker tripped	Unit will not run	Reset breaker
Amber Solid Green Solid	Add water	Unit will continue to run	Need to fill water
	Flue Cleaning	Unit shuts down during cleanout	Wait for completion
	Flue cleanout breaker is tripped.	Flue cleanout motors will shut down. Rest of boiler will continue to run.	Reset breaker

Operation - Alarm Messages

Alarm	Meaning	Result	Cause	Action
Fire Out	No fire in the fire box	Boiler will shut down.	Out of fuel. Improper fuel feed rate.	Determine why the fire has gone out, rectify and restart fire.
Water Overheated	Boiler too hot	Boiler will shut down but will turn back on when it cools.	Water temp. has surpassed190 degrees.	Let boiler cool down. Determine why boiler overheated. May want to reduce high temp setting.
Ash Auger Overheated	Unburnt fuel entering the ash auger	Boiler will shut down.	Unburnt fuel spilling over into ash ring.	Reduce fuel feed rate. Adjust combustion air.
Breaker Tripped	Electrical motor over heated (except flue augers)	Only that portion of the boiler will shut down.	Overheated motor. Motor jammed.	Determine if drive system has a blockage. Remove and let motor cool down. Reset breaker.
Cleanout Tripped	Electrical motor over heated	Only the flue auger will not operate.	Flue augers jammed.	Check chain, remove jam and reset breaker.
Add Water	Water level at a dangerously low level	Boiler will shut down.	Low level switch.	Add water.
Flue Clean in Progress	Warning	Boiler shuts down while the flues are cleaned.	Normal operation.	No action required.
Water Full	Warning	When filling the boiler for the first time and high level switch is activated.	Normal operation.	No action required.
Water Level Low	Warning	No change.	Upper float switch was activated because of water level.	Fill with water until amber light goes out.
Heat Dissipation	Warning	Timing on heat dissipation has activated the circuit.	No fire in combustion chamber for a given period of time.	Non required. Normal operation.

Combustion Blower Settings

1. Set combustion blower adjuster (1, Fig. 24) to the centre position, initially.
2. Refer to Standard Operation Procedure, Page 62.

IMPORTANT: Too little air will result in the incomplete combustion of fuel. Too much air may result in unburned fuel or "clinkers" and may produce excessive smoke.

Exhaust Blower Settings

IMPORTANT: Contact your dealer for suggested settings.

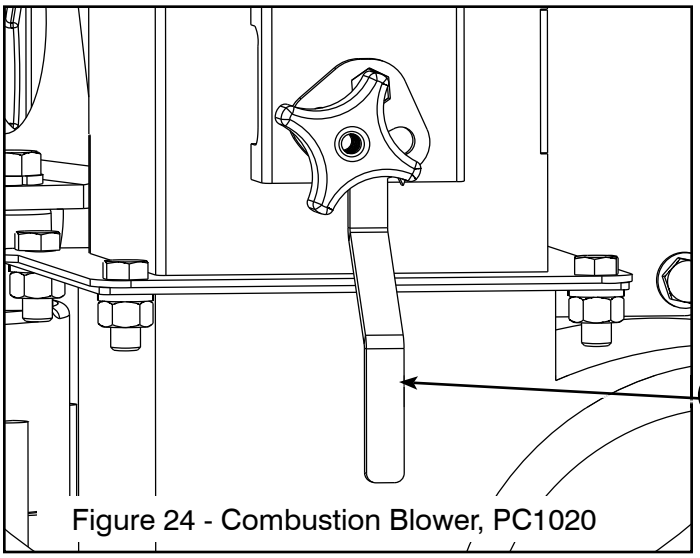


Figure 24 - Combustion Blower, PC1020

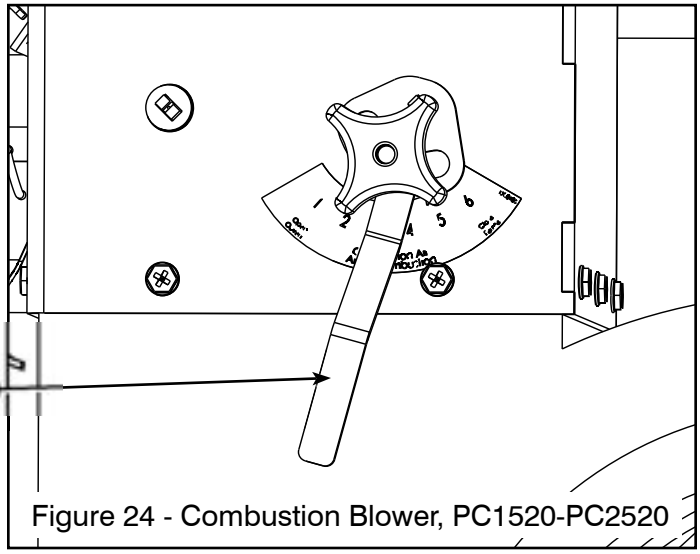


Figure 24 - Combustion Blower, PC1520-PC2520

The exhaust blower controls the emissions and efficiency of the Pelco Hot Water Boiler. Proper exhaust blower adjustments will result in a slightly negative pressure in the fire box.

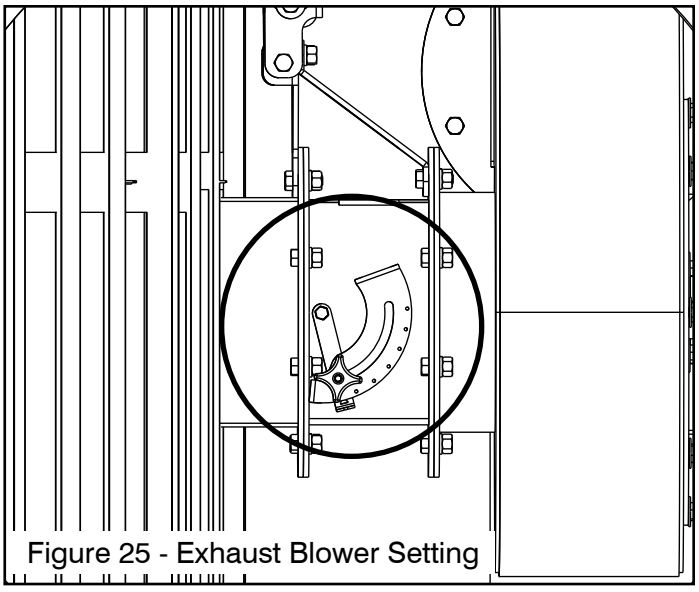


Figure 25 - Exhaust Blower Setting

Your Pelco is designed to burn various types of solid fuel. Understanding that solid fuel does require maintenance and your particular type of fuel will assist in the peck operation of your Pelco. The removal of clinkers is considered normal. It is best to pay attention to the moisture content, fines and quality of the fuel.

Factory Tested and Approved Fuels:

Coal: There are typically four types of coal. Anthracite, Bituminous, Sub-bituminous, and Lignite. Anthracite and Bituminous coal IS NOT recommended and the use of such coal will void any warranty claims. Sub-bituminous and Lignite coals are approved and recommended. Normal BTU values of Sub-bituminous and Lignite coal ranges from 7000 to 9500 BTU per pound. Desired size is - 1" x ½" stocker coal with an ash content of 5 to 8% and a moisture content of 20% or less. Clinker build up can be minimal depending of the moisture content and foreign matter mixed in with the coal such as clay.

Wood Pellets: l/4 " diameter pellets burns well. 3/8" diameter pellets are preferred. Premium wood pellets as per the Pellet Fuels Institute are recommended. Premium grade spruce with 2% ash and 3% fines is considered good quality grades. Pellets made from bark and generally dark pellets are considered subject as to their quality. Normal BTU value for wood pellets is considered to 8,000 BTU per pound. Clinker build up is generally not considered to be a problem with wood pellets but can be troublesome with poor quality pellets.

Corn: Corn has many variables that are out of the control of the producer. For best performance use a corn that has low wax content. Cracked corn will produce large quantities of clinker and in most cases will not sustain a burn. Maximum moisture content must be 15% or less. Normal BTU value range for corn is 6500 to 7500 BTU per pound. Corn is subject to large clinker buildup. It is normal for the clinker to have to be removed at least twice a day.

Agricultural residue: As the blends, moisture content and sizes are so varied, it is recommended that you consult your qualified Pelco dealer for assistance in choosing and using agricultural residue.

Routine Maintenance - During Heating Season

Daily:

1. Inspect combustion chamber to ensure proper fuel feeding. Adjust fuel feed rate, if necessary.
2. Inspect combustion chamber for presence of accumulation of non-combusted fuel, “clinkers.”
3. Inspect water level in reservoir. Add water, if necessary.

⚠ WARNING

Extreme heat source. Open access doors and covers carefully when inspecting combustion chamber.

Monthly:

1. Clean chimney and exhaust blower to remove accumulated ash and other residue.
2. Inspect vent opening for blockage. Remove blockage if present.
3. Ensure vent cap is in place and maintains a loose fit.
4. Lubricate flue cleaning auger drive.

⚠ WARNING

Combustion chamber pressurization. The Pelco Hot Water Boiler is designed to be operated at atmospheric pressure. Ensure that vent cap is in place with a loose fit to prevent pressurization.

Routine Maintenance - End of Heating Season

1. Disconnect the electrical power supply.
2. To minimize corrosion, thoroughly clean chimney, exhaust blower and fire chamber to remove any residue or ash accumulation.
3. Inspect the door gasket for leaks. Ensure an air tight fit. Replace the gasket if necessary.
4. Check to make sure there is no moisture in the fire chamber.
5. Lubricate the fire chamber and exhaust system with diesel fuel or motor oil to prevent corrosion.
6. Cover and seal the chimney to prevent any rain or moisture from entering the fire chamber while not in use.
7. Ensure water reservoir is full during the non-heating season to prevent corrosion inside the water jacket.
8. Upon receipt of water test results adjust as recommended. If you are adding rust inhibitor, operate the water circulating pump for 24 hours after adding rust inhibitor to ensure proper mixing of the rust inhibitor with the water.
9. Draw a water sample once a year and forward to a certified test lab. Contact your dealer for details.
10. Do not turn the power off to the control panel to prevent the possible loss of computer information.

NOTE: Water properly treated with WT 41 should have a pH balance of 10, nitrite level of 850 – 900 ppm. If the pH or nitrite level is low, add more WT 41.

NOTE: Water should have conductivity less than 4000 mmhos. If the conductivity is too high, drain one half of the water in the unit and replace with fresh water.

IMPORTANT: Failing to use an approved rust inhibitor in accordance with the operators’ instructions will void your warranty. Contact your dealer for supplies.

Routine Maintenance - Yearly (Once each year, or every 2,000 hours)

1. Clean, check, and lubricate your Pelco Hot Water Boiler. (Lockout power by shutting off and tagging the breaker, or disconnect power. Water pumps may be left on.)
2. Grease (as per illustrations) with High Temperature Grease:

   a) Motor/Drive Chamber Bearings in the bottom of the Pelco

   Three bearings are located at the bottom of the Pelco Hot Water Boiler under the fire chamber (Fig. 27). The forth bearing is located by the feed auger (Fig. 26) on the outside of the Pelco Hot Water Boiler.

   b) Bushing on the Ash Ring Drive

   Every Pelco Hot Water Boiler has one bushing with front access under the fire chamber (Fig. 28).

   c) Bearings on the Cleanout Driveshaft

   The PC1020 has one bearing on the cleanout driveshaft (Fig. 29) located at the top left of the Pelco Hot Water Boiler, under the lid.

   The PC1520 and PC2520 have two cleanout driveshaft bearings (Fig. 30, 31) located at the top of the Pelco Hot Water Boiler, under the lid.

3. Check Oil (SAE 15W40 Motor Oil)

   a) Gearboxes in the Motor/Drive Chamber in the bottom of the Pelco

   The PC1020 has two gearboxes located in the bottom (Fig. 32) of the Pelco Hot Water Boiler on the right and left sides.

   The PC1520 and PC2520 have three gearboxes. The first two are located on the bottom (Fig. 32) of the Pelco Hot Water Boiler on the left and right sides. The third gearbox is located under the fire chamber (Fig. 33) attached to the ash ring.

4. Lubricate with Chain Lube

   a) Flue Cleanout Auger Drive Chains

   The Flue Cleanout Auger Drive Chains are located on the top (Fig. 34) of the Pelco Hot Water Boiler under the lid.

5. Remove burner plates and clean out any accumulated ash.

Routine Maintenance - Yearly (Once each year, or every 2,000 hours)

Figure 26

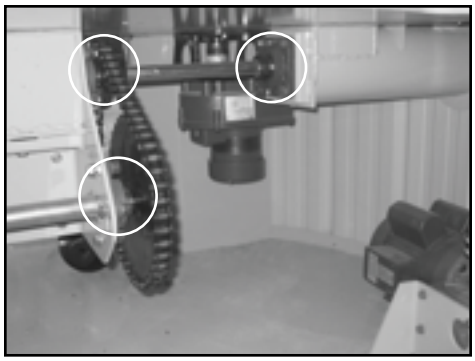


Figure 27

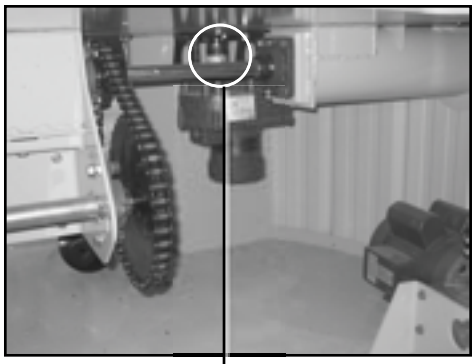


Figure 28

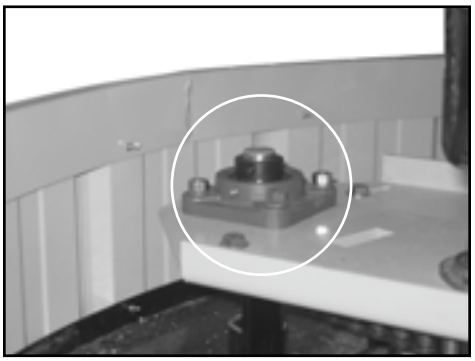


Figure 29

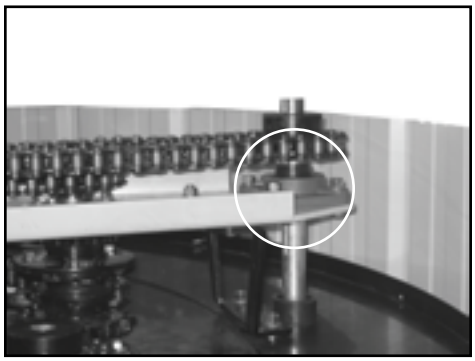
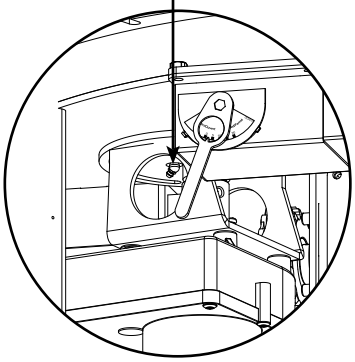


Figure 30



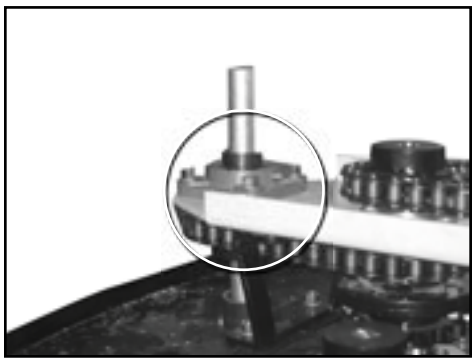


Figure 31

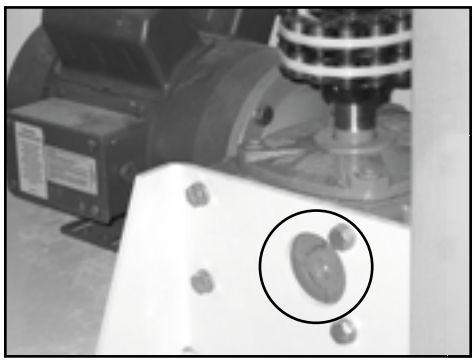


Figure 32

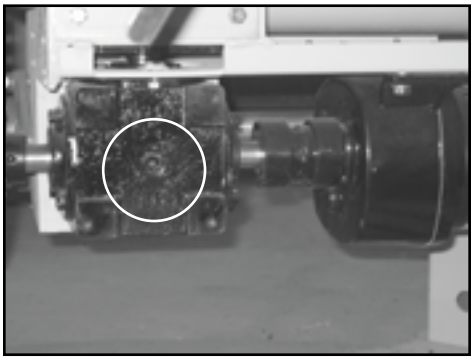


Figure 33

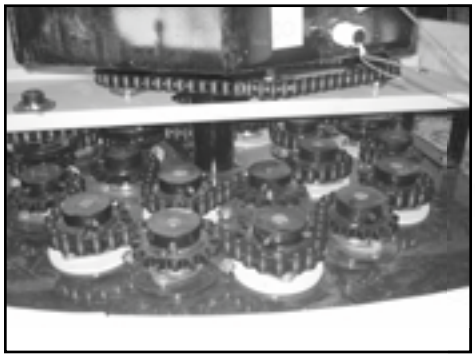


Figure 34

Heat Dissipation

There is an electrical outlet on the Pelco Hot Water Boiler where either a pump or a fan can be connected which will cut in at a preset time; this is called the “heat dissipation” connection.

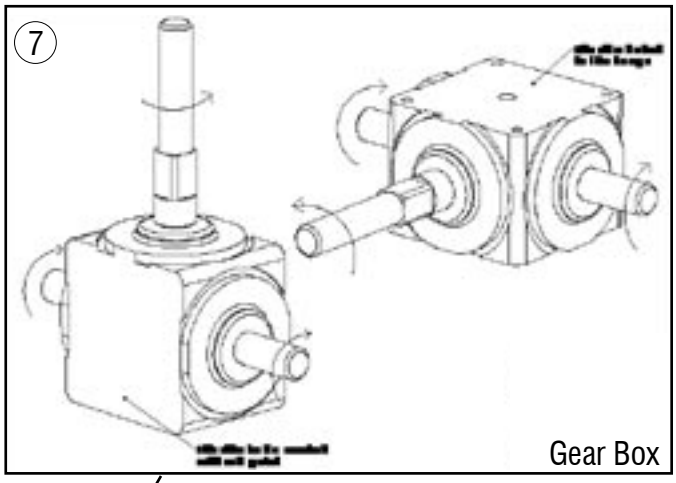
The control panel can be set so that when the Pelco Hot Water Boiler is on hold fire (temperature has reached its max setting), the heat dissipation will get rid of the heat (through a heat exchange system, supplied by the customer, in the building or right beside the Pelco Hot Water Boiler) so that the Pelco Hot Water Boiler will cut in to keep the fire from going out. This eliminates the unit from sitting idle and the fire from going out.

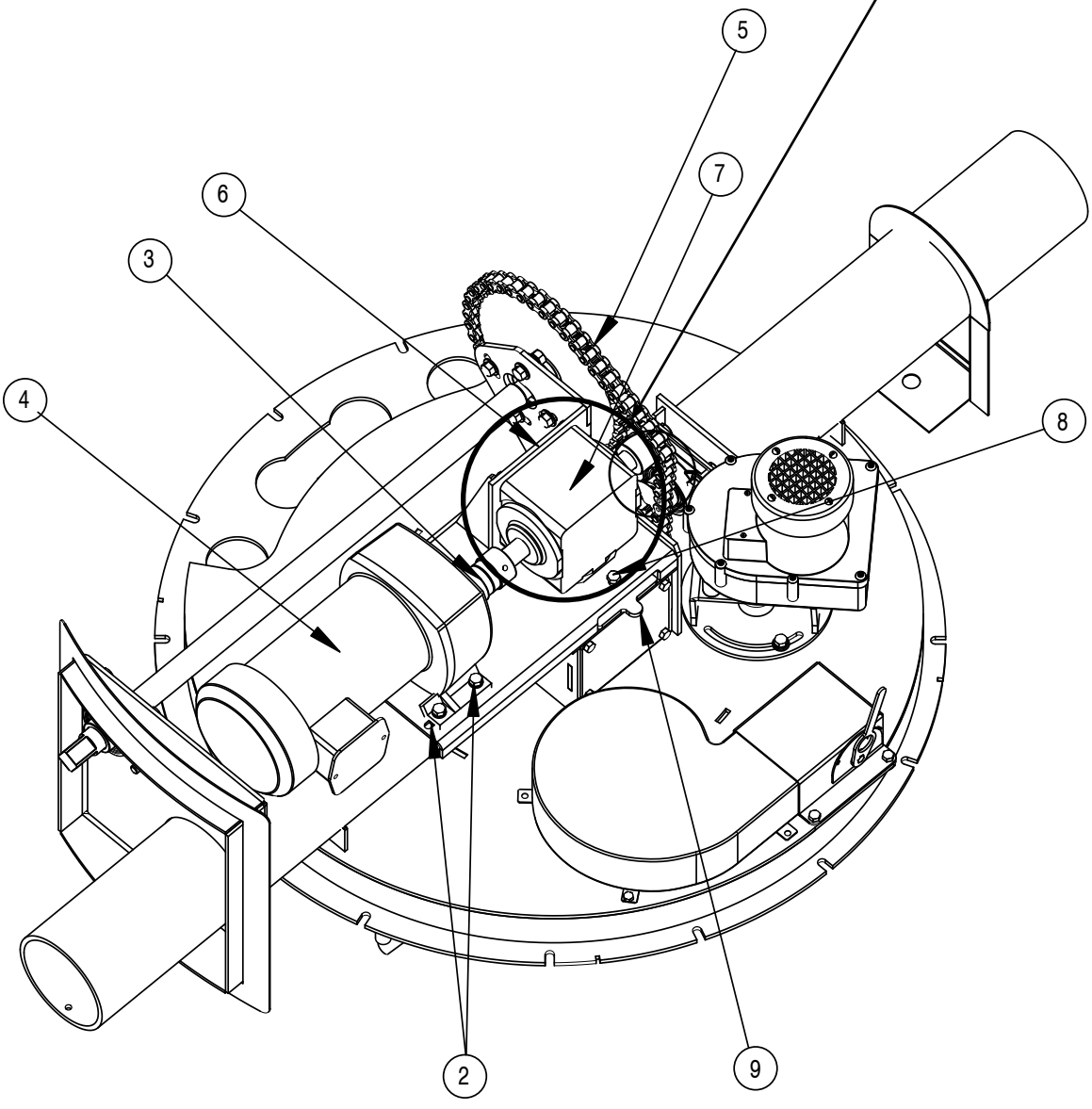
The heat dissipation connection is accessed through the back panel. The connection is found on the left side with a label directly below (Fig. 36).

Figure 36 - Heat Dissipation

Replacement of Oil Seal (802471)

1. Remove vertical feed auger.
2. Loosen (do not remove) main drive motor mounting bolts (4 bolts)
3. Loosen both coupler set screws. (2 screws)
4. Slide motor all the way back.
5. Find and remove drive chain connecting link.
6. Remove gear box mounting bolts. (4 bolts)
7. Lower gear box.
8. Loosen bolts on holder seal. (2 bolts)
9. Pull holder seal out.
10. Replace seal. (802471)
11. Assemble in reverse order.



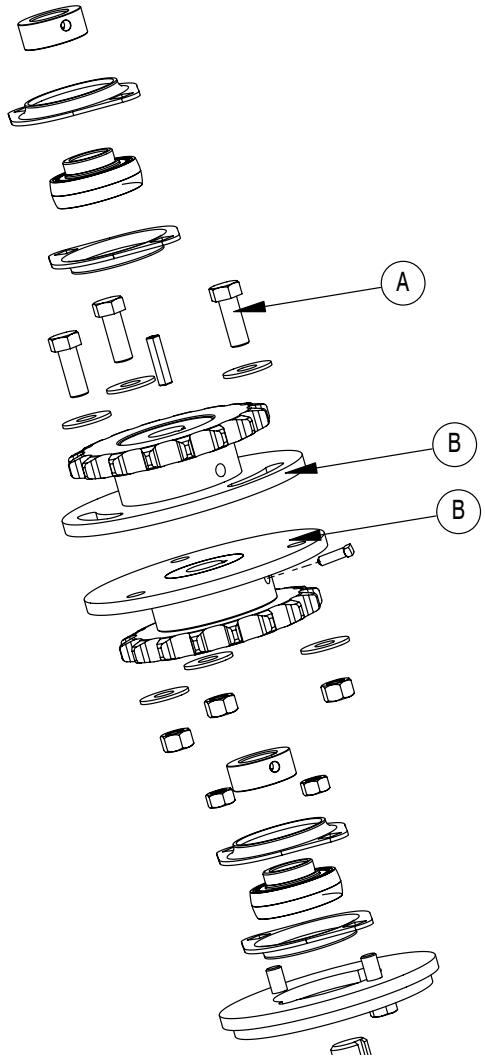


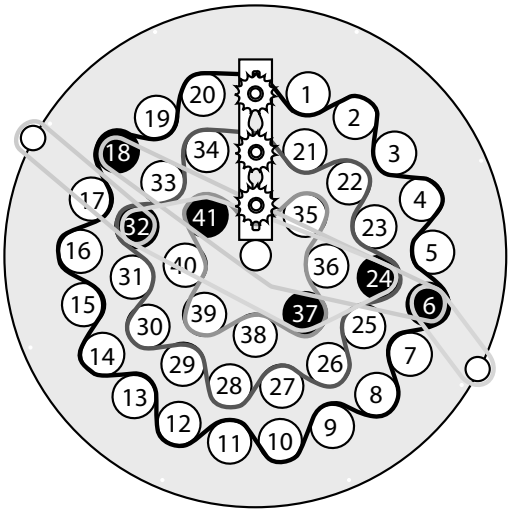
Aligning Drive Chain Synchronizers

Synchronizing Drive Chains

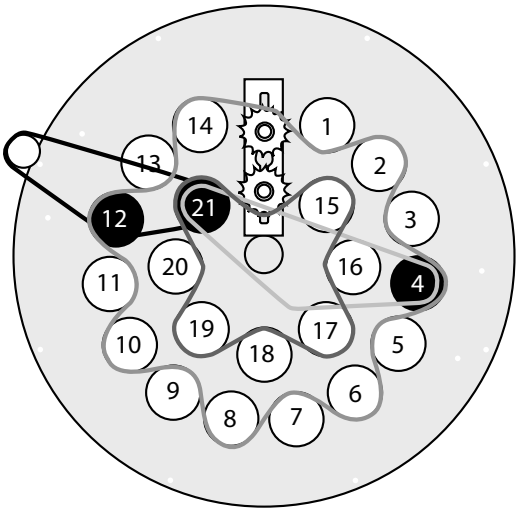
During routine operation and maintenance, the flue clean drive chains may become misaligned. Indication of misaligned flue auger drive chains is rough operation or the chain disengaging from the sprocket. Alignment procedure is as follows:

1. Identify chain and synchronizer sprockets to be aligned. (see page 3.33)
2. Loosen three bolts (A) on each synchronizer sprocket.
3. Loosen idler sprockets (C) to relax the chain (B).
4. Tighten idler sprockets (C) to place tension on the chain.
5. Tighten three bolts (A) on each synchronizer sprocket (B).
6. If alignment can not be achieved, you may have to relax the chain and move a synchronizer sprocket one tooth.
7. Repeat from step 2.
8. If necessary, all chain drives may have to be realigned independently.
9. Lubricate all chains with a high temperature chain lube.

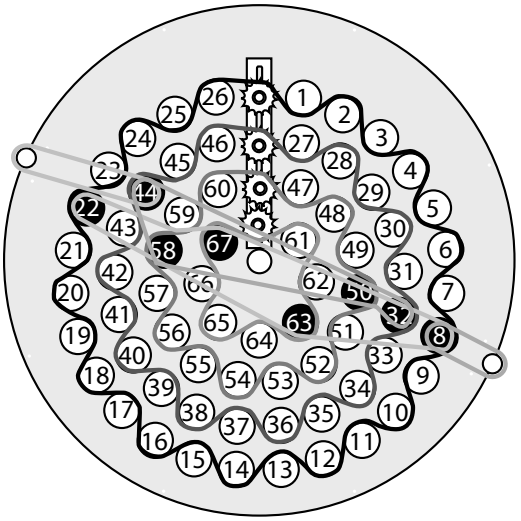




PC1520 — Synchronizers
6/8, 24/32, 37/41



PC1020 — Synchronizers
12/4, 21



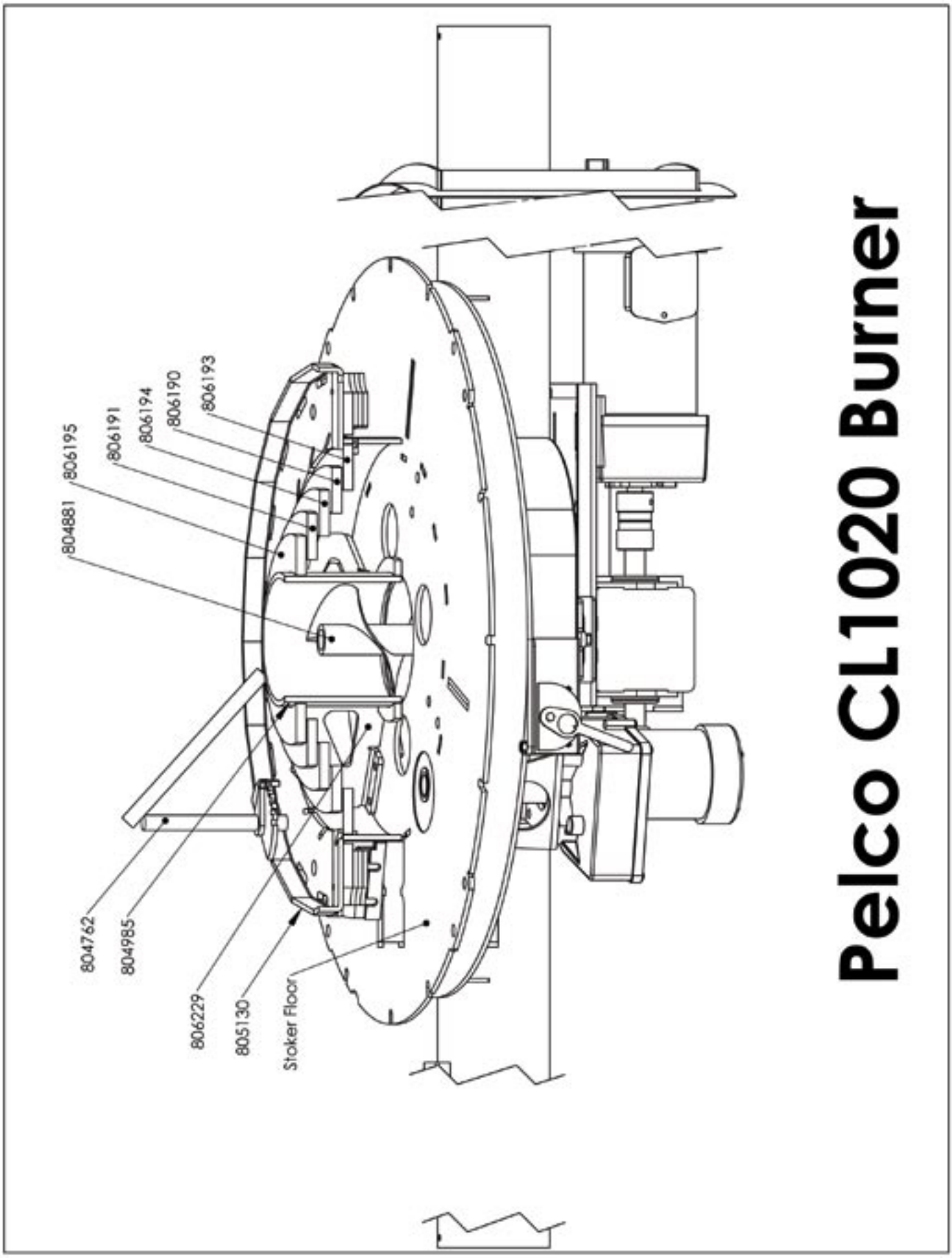
PC2520 — Synchronizers
8/22, 32/44, 50/58, 63/67

Burners

Installation Instructions for the Pelco CL1020 Burner (807467)

Part Number	Description	Quantity
806229	Burner Support	4
804985	Tube Burner	1
804221	Feed Auger	1
806190	Burner Ring	1
806194	Burner Ring	1
806191	Burner Ring	1
806195	Burner Ring	1
Bolts	3/8 x 1	8
Washers	3/8	8
804762	Stir Fingers	2
Silicone		

1. Locate 2 burner supports (806229), over pre-drilled and tapped holes in the stoker floor.
2. Insert bolts through holes in burner support and into pre-drilled holes but do not tighten. Leave loose.
3. On the flange of the burner tube (804985), apply bead of silicone.
4. Place burner tube over coal auger hole and under notches of burner supports. Silicone will make seal between flange of burner tube and stoker floor.
5. Locate and bolt the last 2 burner supports (806229).
6. Tighten all 8 bolts.
7. Install burner rings on burner supports in the following order: 806190, 806194, 806191, and 806195.
8. Install stir fingers (804762). Do not install fingers pointing directly to the center. The stir fingers should be located so that they sweep the coals. If stir fingers are too close to the burner, they may lift the ash ring and allow contaminants to enter the air chamber.


Pelco CL1020 Burner
804762
804985
806229
805130
Stoker Floor
804881
806195
806191
806194
806190
806193

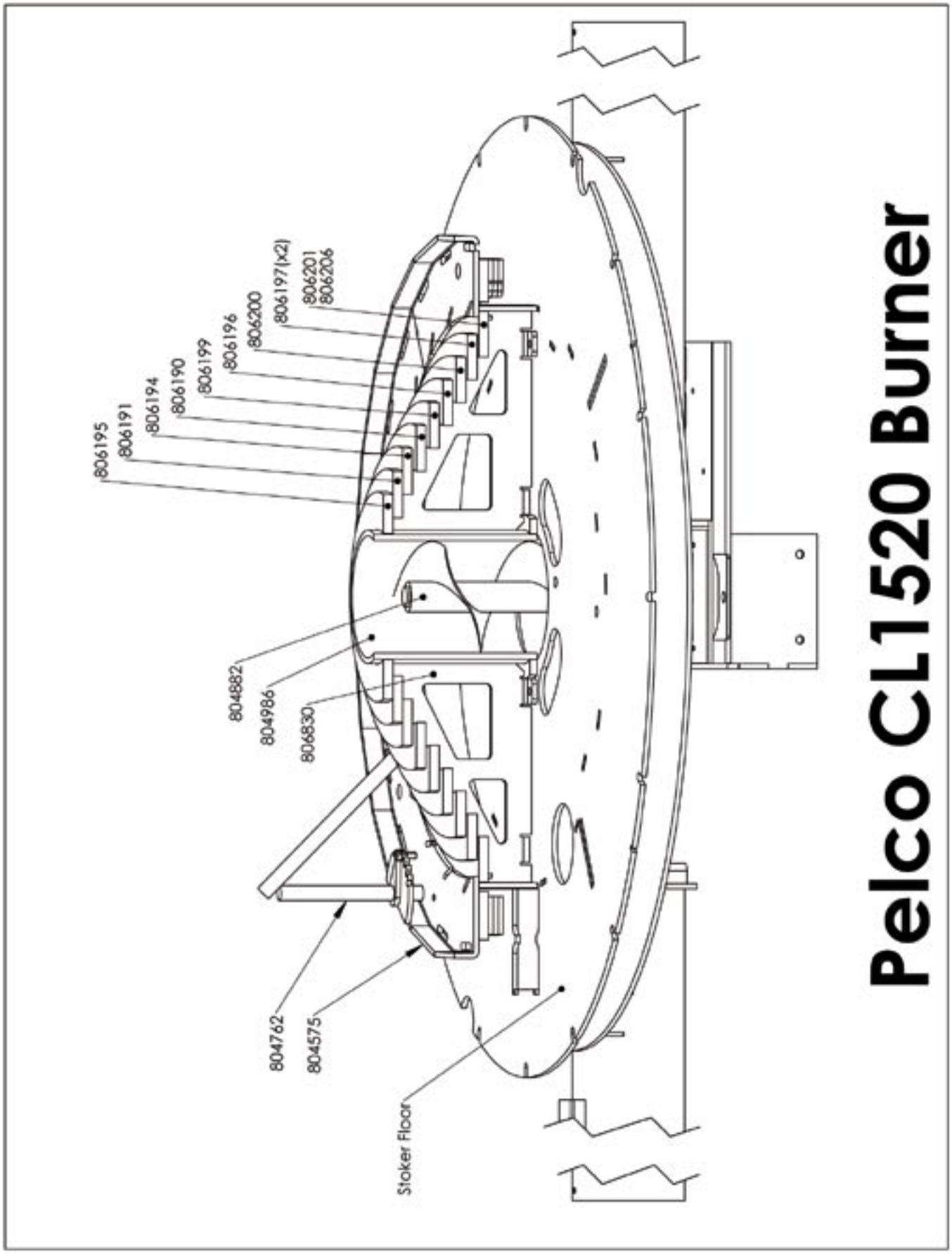
Burners

Installation Instructions for the Pelco CL1520 burner (807466)

Part Number	Description	Quantity
804986	Burner Support	4
804986	Tube Burner	1
804882	Feed Auger	1
806197	Burner Ring	2 pieces
806200	Burner Ring	1
806196	Burner Ring	1
806199	Burner Ring	1
806190	Burner Ring	1
806194	Burner Ring	1
806191	Burner Ring	1
806195	Burner Ring	1
Bolts	3/8 x 1	8
Washers	3/8	8
804762	Stir Fingers	2
Silicone		

1. Locate 2 x burner supports (806830), over pre-drilled and tapped holes in the stoker floor.
2. Insert bolts through holes in burner support and into pre-drilled holes but do not tighten. Leave loose.
3. On the flange of the burner tube (804986), apply bead of silicone.
4. Place burner tube over coal auger hole and under notches of burner supports. Silicone will make seal between flange of burner tube and stoker floor.
5. Locate and bolt the last 2 burner supports (806830).
6. Tighten all 8 bolts.
7. Install burner rings on burner supports in the following order: 806197, 8066200, 806196, 806199, 806190, 806194, 806194 and 806195.
8. Install stir fingers (804762). Do not install fingers pointing directly to the center. The stir fingers should be located so that they sweep the coals. If stir fingers are too close to the burner, they may lift the ash ring and allow contaminants into the air chamber.

Burners


Pelco CL1520 Burner
806195
806191
806194
806190
806199
806196
806200
806197(x2)
806201
806206
804882
804986
806830
804762
804575
Stoker Floor

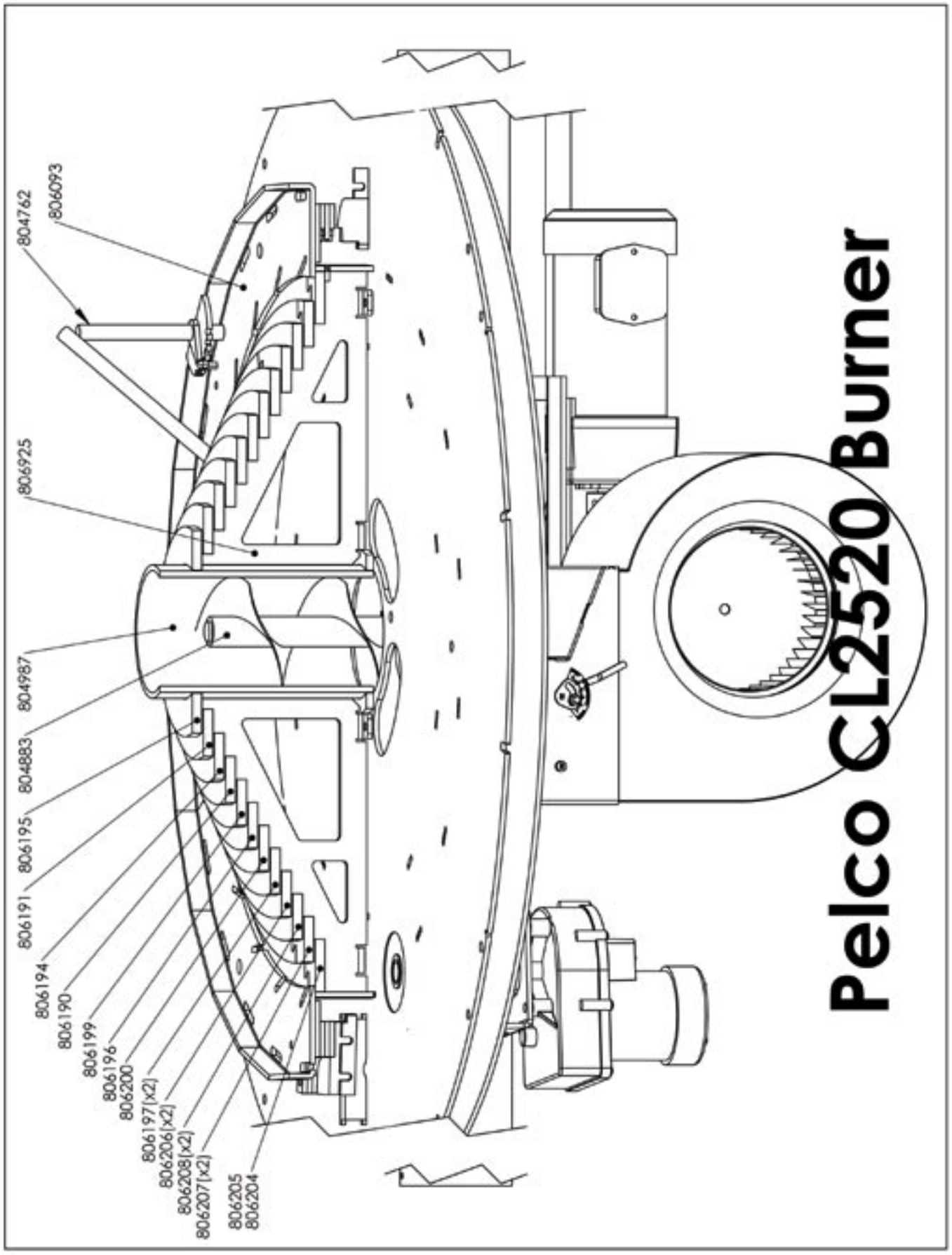
Burners

Installation instructions for the Pelco CL2520 burner (807468)

Part Number	Description	Quantity
806925	Burner Support	4
804987	Tube Burner	1
804883	Feed Auger	1
806207	Burner Ring	2 pieces
806208	Burner Ring	2 pieces
806206	Burner Ring	2 pieces
806197	Burner Ring	2 pieces
806200	Burner Ring	1
806196	Burner Ring	1
806199	Burner Ring	1
806190	Burner Ring	1
806194	Burner Ring	1
806191	Burner Ring	1
806195	Burner Ring	1
Bolts	3/8” x 1	8
Washers	3/8”	8
804762	Stir Fingers	2
Silicone		

1. Locate 2 x burner supports (806925), over pre-drilled and tapped holes in the stoker floor.
2. Insert bolts through holes in burner support and into pre-drilled holes but do not tighten. Leave loose.
3. On the flange of the burner tube (804987), apply bead of silicone.
4. Place burner tube over coal auger hole and under notches of burner supports. Silicone will make seal between flange of burner tube and stoker floor.
5. Locate and bolt the last 2 burner supports (806925).
6. Tighten all 8 bolts.
7. Install burner rings on burner supports in the following order: 806205, 806204, 806207, 806208, 806206, 806197, 8066200, 806196, 806199, 806190, 806194, 806194 and 806195.
8. Install stir fingers (804762). Do not install fingers pointing directly to the center. The stir fingers should be located so that they sweep the coals. If stir fingers are too close to the burner, they may lift the ash ring and allow contaminants into the air chamber.

Burners


Pelco CL2520 Burner
804762
806093
806925
804987
804883
806195
806191
806194
806190
806199
806196
806200
806197(x2)
806206(x2)
806208(x2)
806207(x2)
806205
806204

Burners

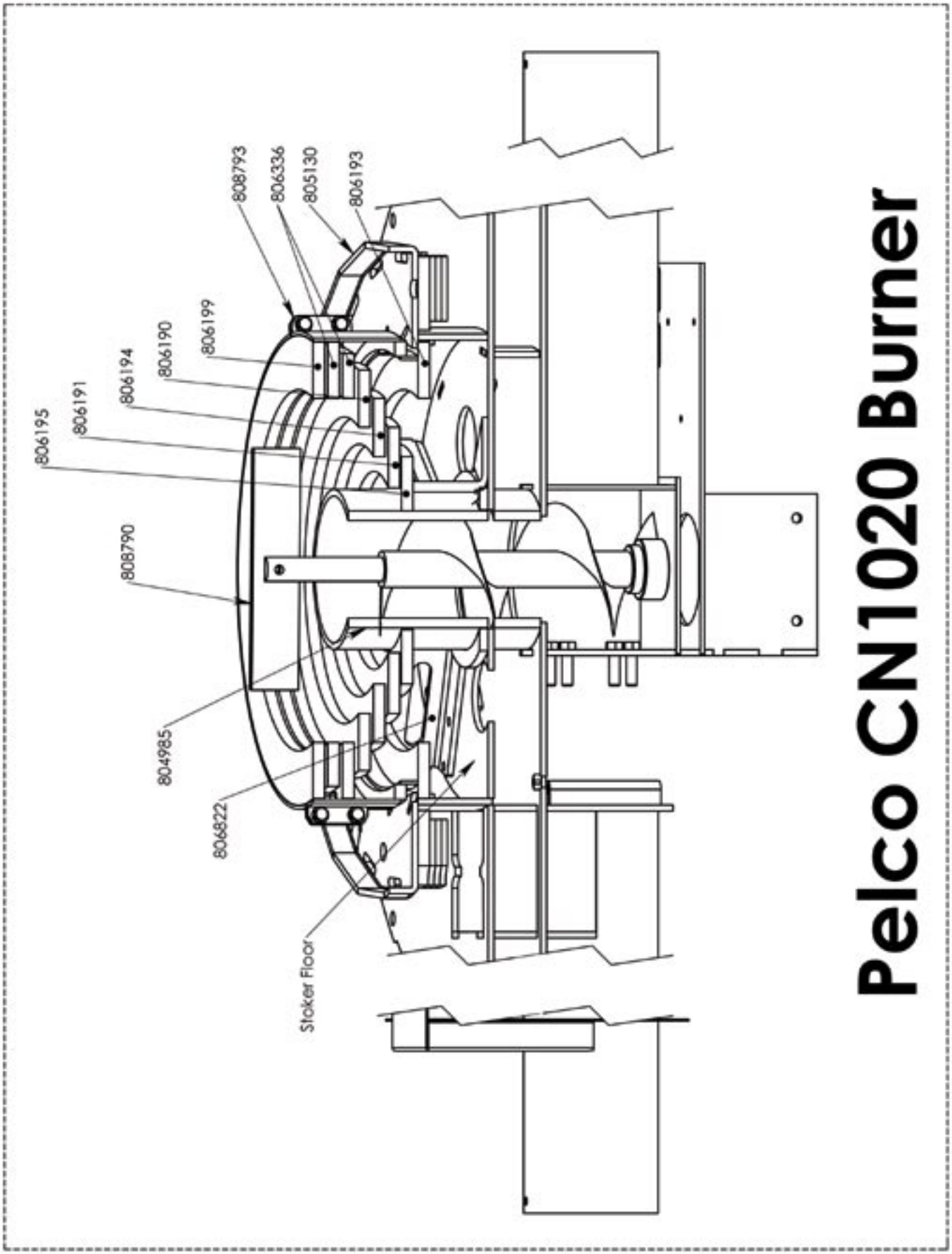
Installation Instructions for the Pelco CN1020 Burner (808338)

Part Number	Description	Quantity	Part Number	Description	Quantity
806822	Burner Support	4	806199	Burner Ring	1
804985	Tube Burner	1	Bolts	3/8” x 1”	8
808790	Feed Auger Assembly	1*	Washers	3/8”	8
806195	Burner Ring	1	808793	Air Band	2
806191	Burner Ring	1	Bolts	3/8” x 1 1/4”	4
806194	Burner Ring	1	Lock Washers	3/8”	4
806190	Burner Ring	1	Nuts	3/8”	4
806336	Burner Ring	1	Silicone		

* Includes auger, scraper, 3/8” x 1 1/4” bolt, washer and nut.

1. Locate 2 burner supports (806822), over pre-drilled and tapped holes in the stoker floor.
2. Insert bolts through holes in burner support and into pre-drilled holes but do not tighten. Leave loose.
3. On the flange of the burner tube (804985), apply bead of silicone.
4. Place burner tube over coal auger hole and under notches of burner supports. Silicone will make seal between flange of burner tube and stoker floor.
5. Locate and bolt the last 2 burner supports (806822).
6. Tighten all 8 bolts
7. Place the two air bands (808793) together with the flanges facing each other over the installed support plates. Insert bolts, apply washer and nut. Only start nut on bolt. Leave loose at this time.
8. Apply silicone around complete perimeter of base of air band and up the two vertical joints.
9. Starting with the smallest burner ring, place the burner rings on the burner supports in the following order (806195, 806191, 806194, 806190).
10. Burner ring (806336) has notches cut out on the perimeter. This is to allow for air to pass through. Alternate the notches when placing the second ring in position. Both rings have knobs welded on one side. The knobs must be facing up when installed.
11. Final ring (806199) is now installed on the top of the stack.
12. Tighten bolts on the air band.
13. Attach scraper to vertical auger with 3/8 x 1 ¼ bolt, washer and nut.
14. Locate and install auger assembly ensuring that it is fully engaged over square drive shaft.

Burners


Pelco CN1020 Burner
808793
806336
805130
806193
806199
806190
806194
806191
806195
808790
804985
806822
Stoker Floor

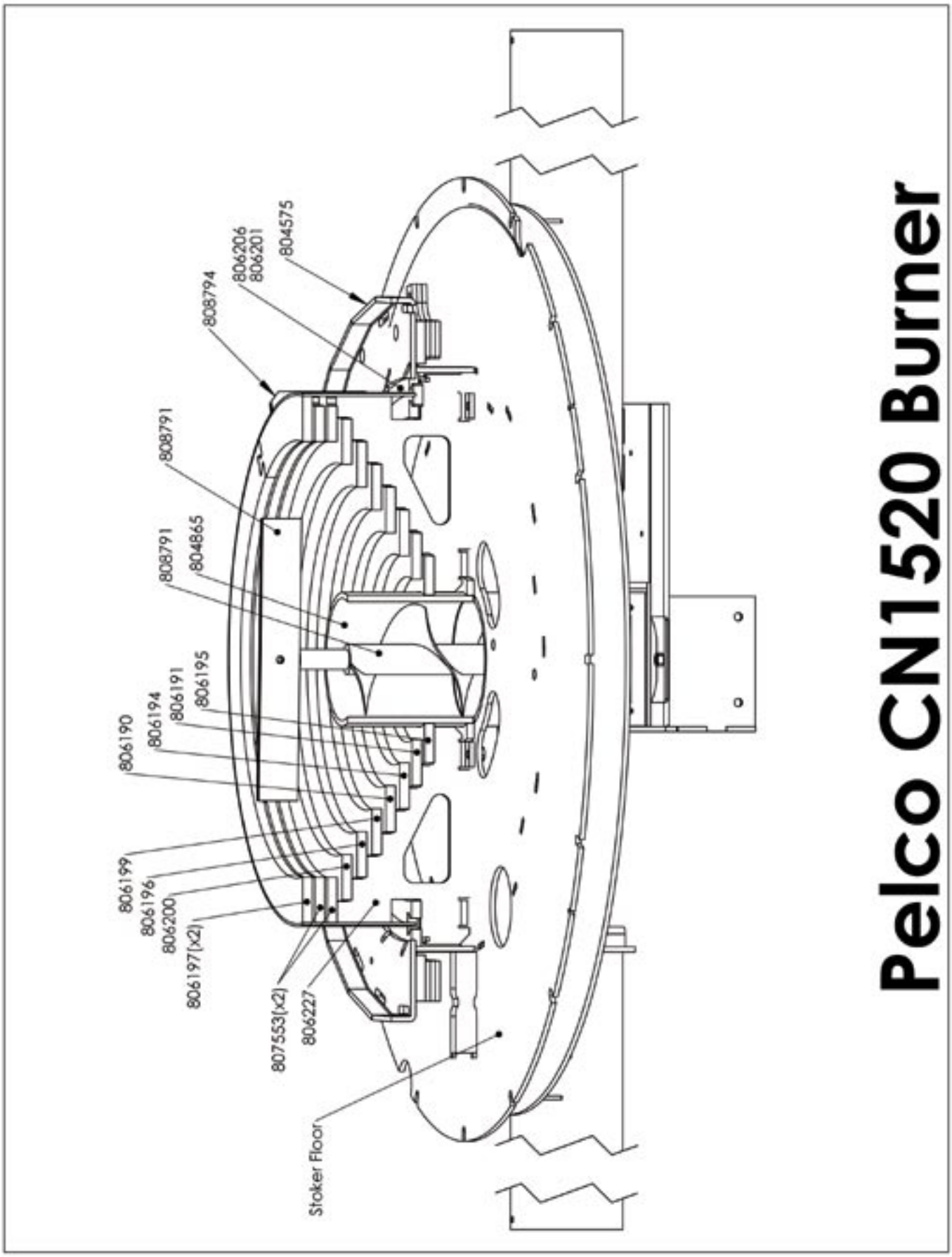
Burners

Installation instructions for the Pelco CN1520 burner (807551)

Part Number	Description	Quantity	Part Number	Description	Quantity
806227	Burner Support	4	806553	Burner Ring	2 pieces (two sets)
804865	Tube Burner	1	806197	Burner Ring	2 pieces
808791	Feed Auger Assembly	1*	Bolts	3/8 x 1	8
806195	Burner Ring	1	Washers	3/8	8
806191	Burner Ring	1	808794	Air Band	2
806194	Burner Ring	1	Bolts	3/8 x 1 1/4	6
806190	Burner Ring	1	Lock Washers	3/8	6
806199	Burner Ring	1	Nuts	3/8	6
806196	Burner Ring	1	Silicone		
806200	Burner Ring	1 (see #7)			

* Includes auger, scraper, 3/8” x 1 1/4” bolt, washer and nut.

1. Locate 2 burner supports (806227), over pre-drilled and tapped holes in the stoker floor.
2. Insert bolts through holes in burner support and into pre-drilled holes but do not tighten. Leave loose.
3. On the flange of the burner tube (804865), apply bead of silicone.
4. Place burner tube over coal auger hole and under notches of burner supports. Silicone will make seal between flange of burner tube and stoker floor.
5. Locate and bolt the last 2 burner supports (806227).
6. Tighten all 8 bolts.
7. Place burner ring (806200) in fire box for future installation.
8. Place the two air bands (808794) together with the flanges facing each other over the installed burner supports. Insert bolts, apply washer and nut. Only start nut on bolt. Leave loose at this time.
9. Apply silicone around complete perimeter of base of air band and up the two vertical joints.
10. Starting with the smallest burner ring, place the burner rings on the burner supports in the following order (806195, 806191, 806194, 806190, 806199, 806196, 806200).
11. Burner ring (806336) has notches cut out on the perimeter. This is to allow for air to pass through. Alternate the notches when placing the second ring in position. Both rings have knobs welded on one side. The knobs must be facing up when installed.
12. Final ring (806199) is now installed on the top of the stack.
13. Tighten bolts on the air band.
14. Attach scraper to vertical auger with 3/8 x 1 ¼ bolt, washer and nut.
15. Locate and install auger assembly ensuring that it is fully engaged over square drive shaft.


Pelco CN1520 Burner
804575
806206
806201
808794
808791
808791
804865
806195
806191
806194
806190
806199
806196
806200
806197(x2)
807553(x2)
806227
Stoker Floor

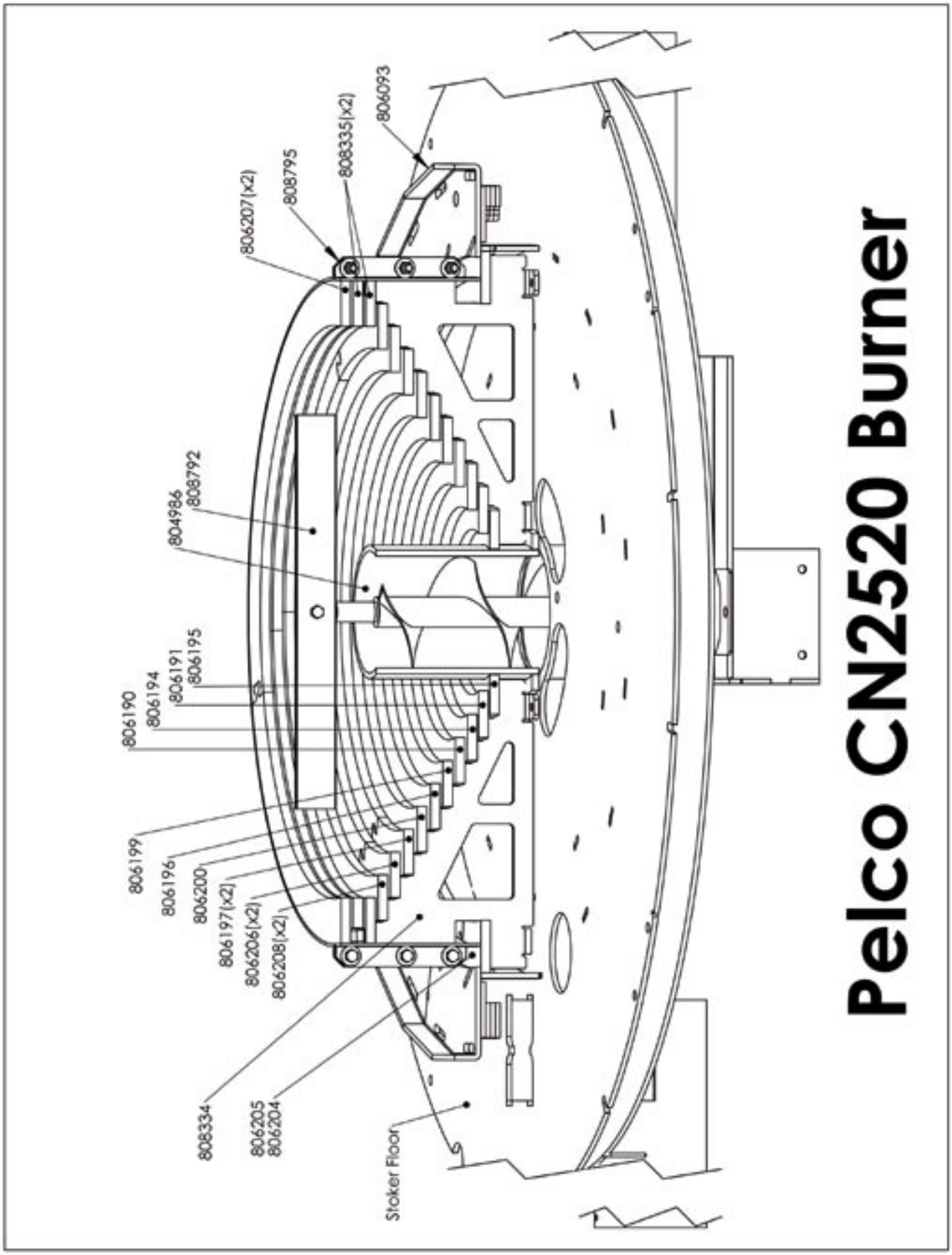
Burners

Installation instructions for the Pelco CN2520 burner (808337)

Part Number	Description	Quantity	Part Number	Description	Quantity
808334	Burner Support	4	806208	Burner Ring	2 pieces
804986	Tube Burner	1	806335	Burner Ring	2 pieces (two sets)
808792	Feed Auger Assembly	1*	806207	Burner Ring	1
806195	Burner Ring	1	Bolts	3/8" x 1"	8
806191	Burner Ring	1	Washers	3/8"	8
806194	Burner Ring	1	808795	Air Band	2
806190	Burner Ring	1	Bolts	3/8" x 1 ¼"	6
806199	Burner Ring	1	Lock Washers	3/8"	6
806196	Burner Ring	1	Nuts	3/8"	6
806200	Burner Ring	1	Silicone		
806206	Burner Ring	2 pieces			

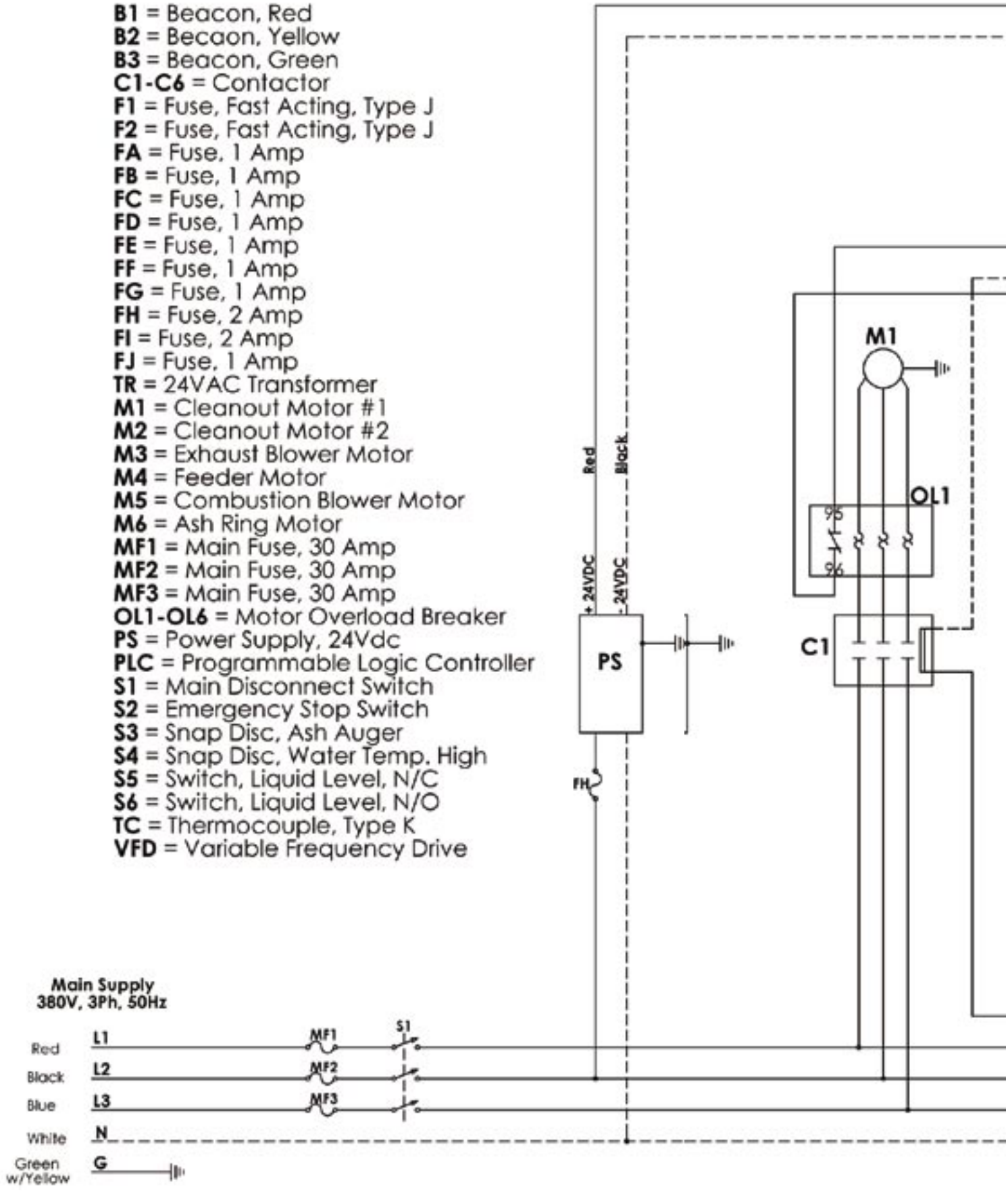
*Includes auger, scraper, 3/8" x 1 ¼" bolt, washer and nut.

1. Locate 2 burner supports (808334), over pre-drilled and tapped holes in the stoker floor.
2. Insert bolts through holes in burner support and into pre-drilled holes but do not tighten. Leave loose.
3. On the flange of the burner tube (804986), apply bead of silicone.
4. Place burner tube over coal auger hole and under notches of burner support. Silicone will make seal between flange of burner tube and stoker floor.
5. Locate and bolt the last 2 burner supports (808334).
6. Tighten all 8 bolts.
7. Place the two air bands (808795) together with the flanges facing each other over the installed burner supports. Insert bolts, apply washer and nut. Only start nut on bolt. Leave loose at this time.
8. Apply silicone around complete perimeter of base of air band and up the two vertical joints.
9. Starting with the smallest burner ring, place the burner rings on the burner supports in the following order (806195, 806191, 806194, 806190, 806199, 806196, 806200, 806206, 806208).
10. Burner ring (808335) has notches cut out on the perimeter. This is to allow for air to pass through. Alternate the notches when placing the second ring in position. Both rings have knobs welded on one side. The knobs must be facing up when installed.
11. Final ring (806199) is now installed on the top of the stack.
12. Tighten bolts on the air band.
13. Attach scraper to vertical auger with 3/8 x 1 ¼ bolt, washer and nut.
14. Locate and install auger assembly ensuring that it is fully engaged over square drive shaft.

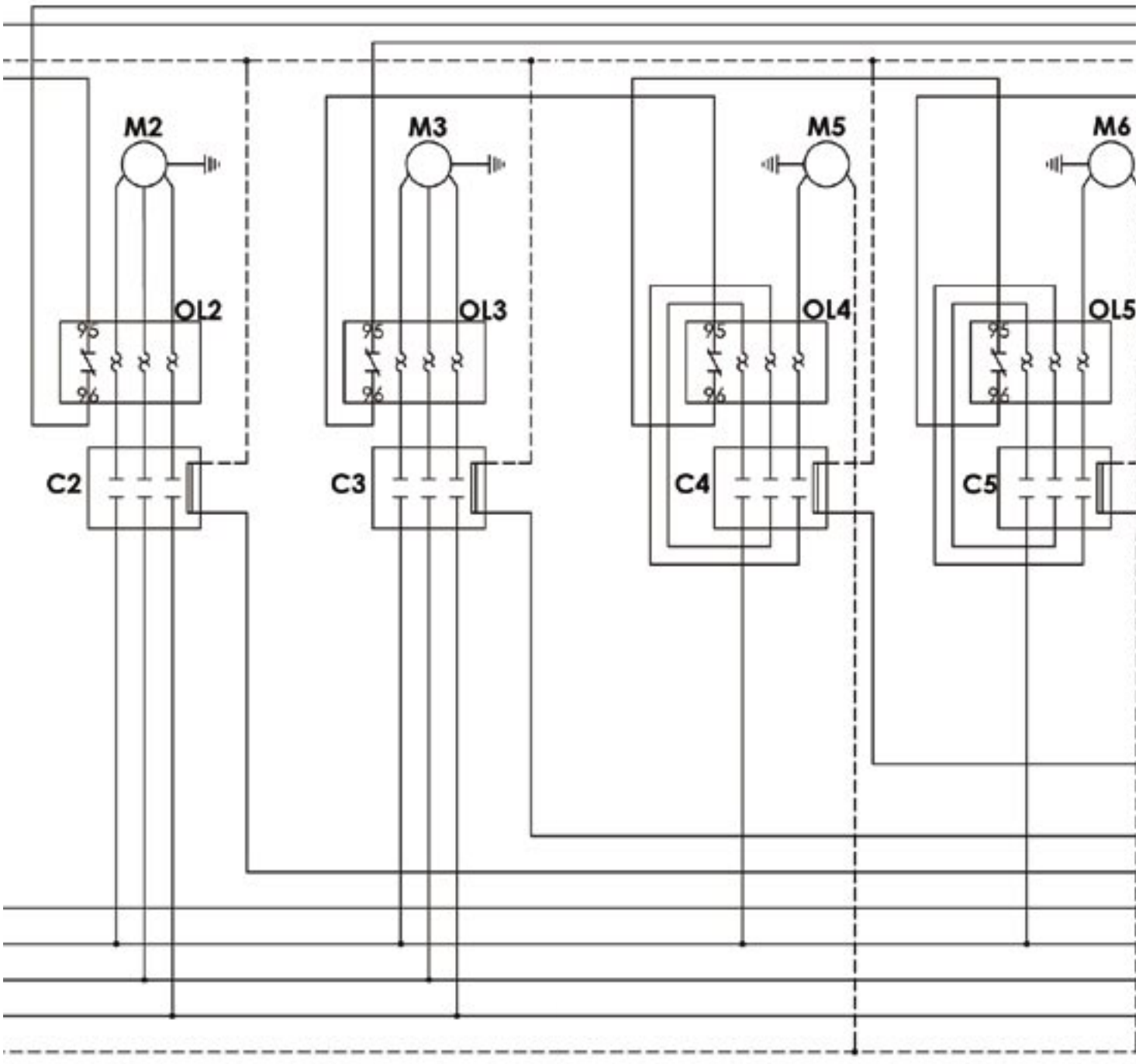

Pelco CN2520 Burner
806093
808335(x2)
808795
806207(x2)
808792
804986
806195
806191
806194
806190
806199
806196
806200
806197(x2)
806206(x2)
806208(x2)
808334
806205
806204
Stoker Floor

Wiring Diagram

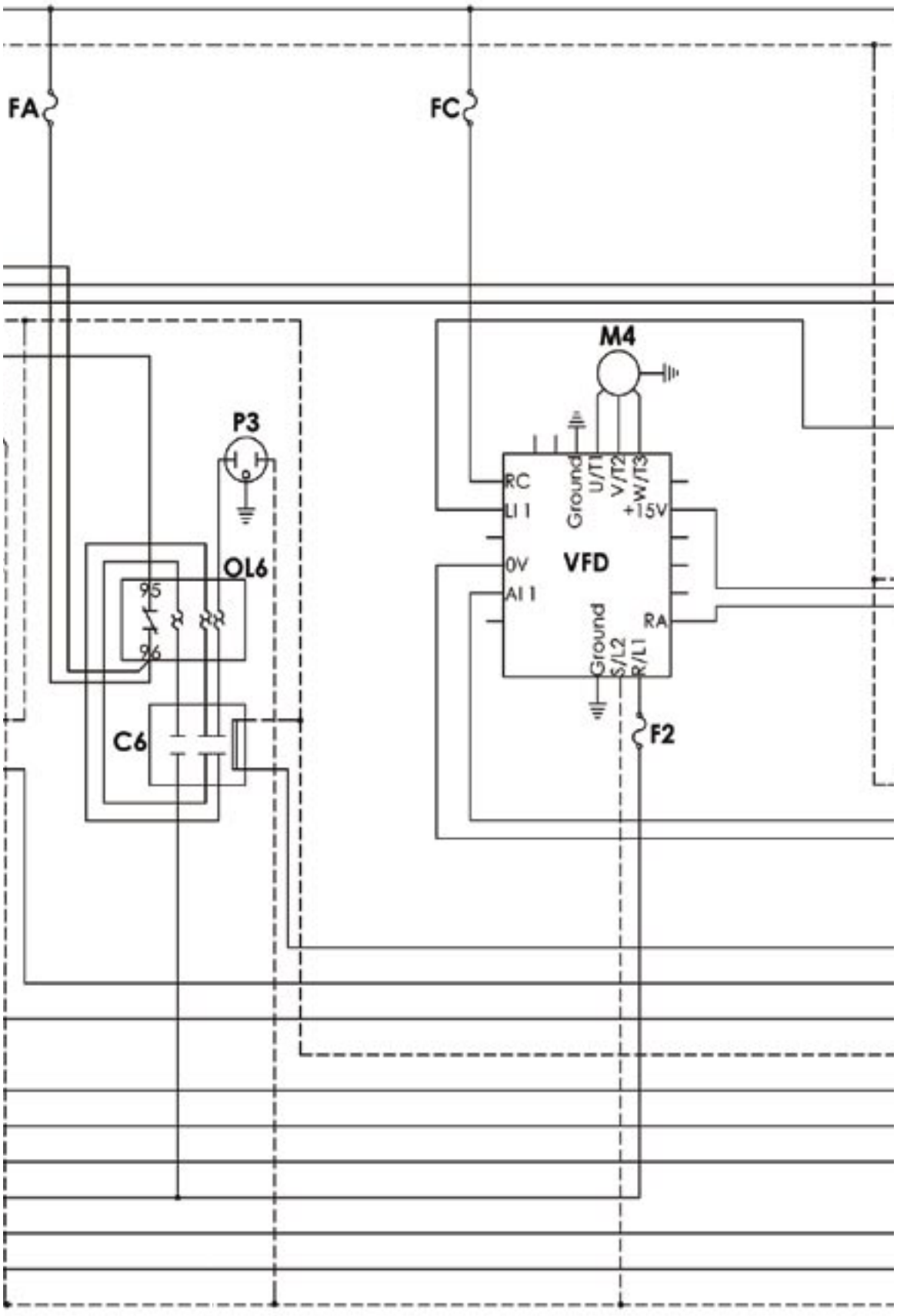
B1 = Beacon, Red
B2 = Becaon, Yellow
B3 = Beacon, Green
C1-C6 = Contactor
F1 = Fuse, Fast Acting, Type J
F2 = Fuse, Fast Acting, Type J
FA = Fuse, 1 Amp
FB = Fuse, 1 Amp
FC = Fuse, 1 Amp
FD = Fuse, 1 Amp
FE = Fuse, 1 Amp
FF = Fuse, 1 Amp
FG = Fuse, 1 Amp
FH = Fuse, 2 Amp
FI = Fuse, 2 Amp
FJ = Fuse, 1 Amp
TR = 24VAC Transformer
M1 = Cleanout Motor #1
M2 = Cleanout Motor #2
M3 = Exhaust Blower Motor
M4 = Feeder Motor
M5 = Combustion Blower Motor
M6 = Ash Ring Motor
MF1 = Main Fuse, 30 Amp
MF2 = Main Fuse, 30 Amp
MF3 = Main Fuse, 30 Amp
OL1-OL6 = Motor Overload Breaker
PS = Power Supply, 24Vdc
PLC = Programmable Logic Controller
S1 = Main Disconnect Switch
S2 = Emergency Stop Switch
S3 = Snap Disc, Ash Auger
S4 = Snap Disc, Water Temp. High
S5 = Switch, Liquid Level, N/C
S6 = Switch, Liquid Level, N/O
TC = Thermocouple, Type K
VFD = Variable Frequency Drive



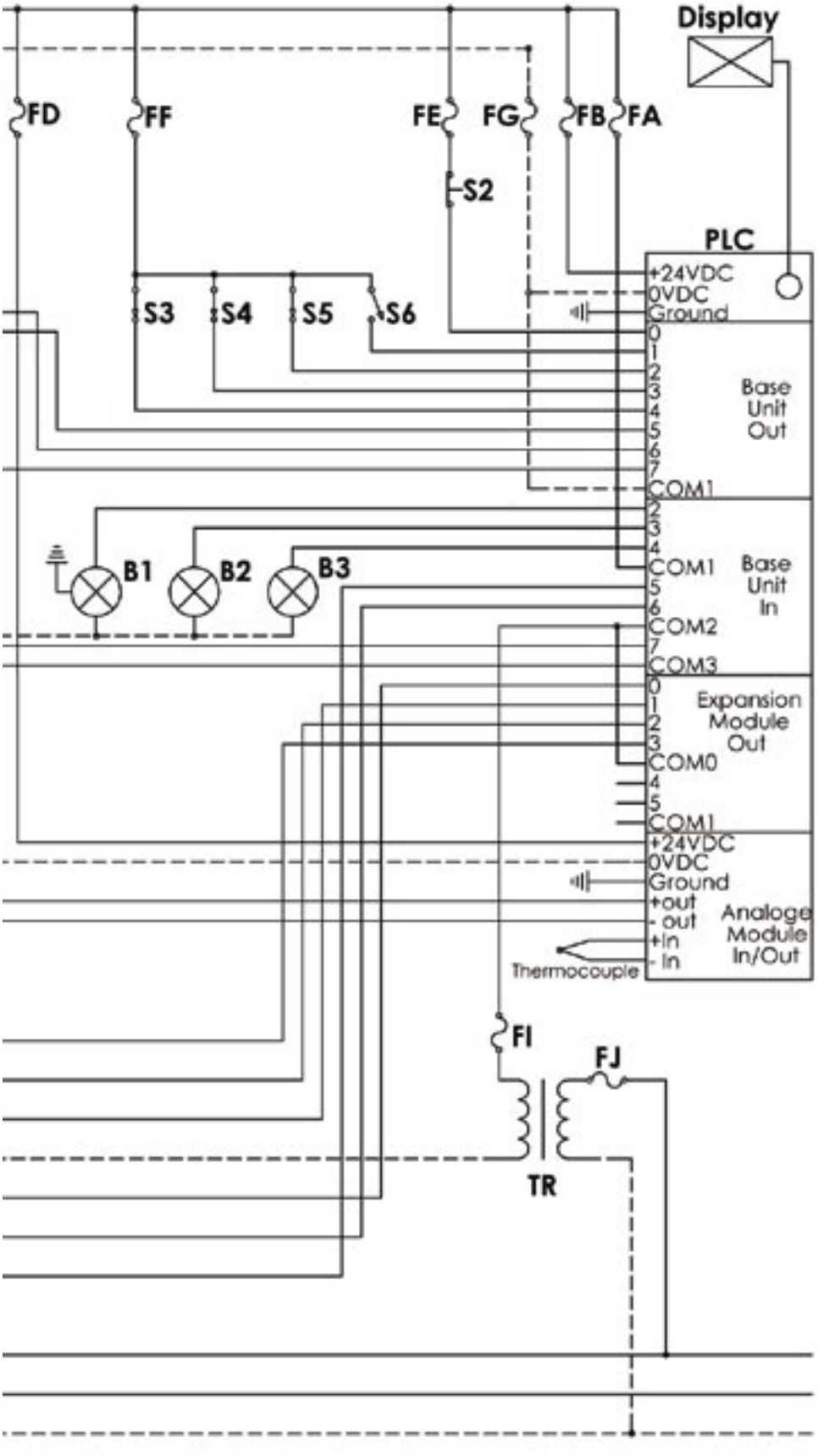
Wiring Diagram



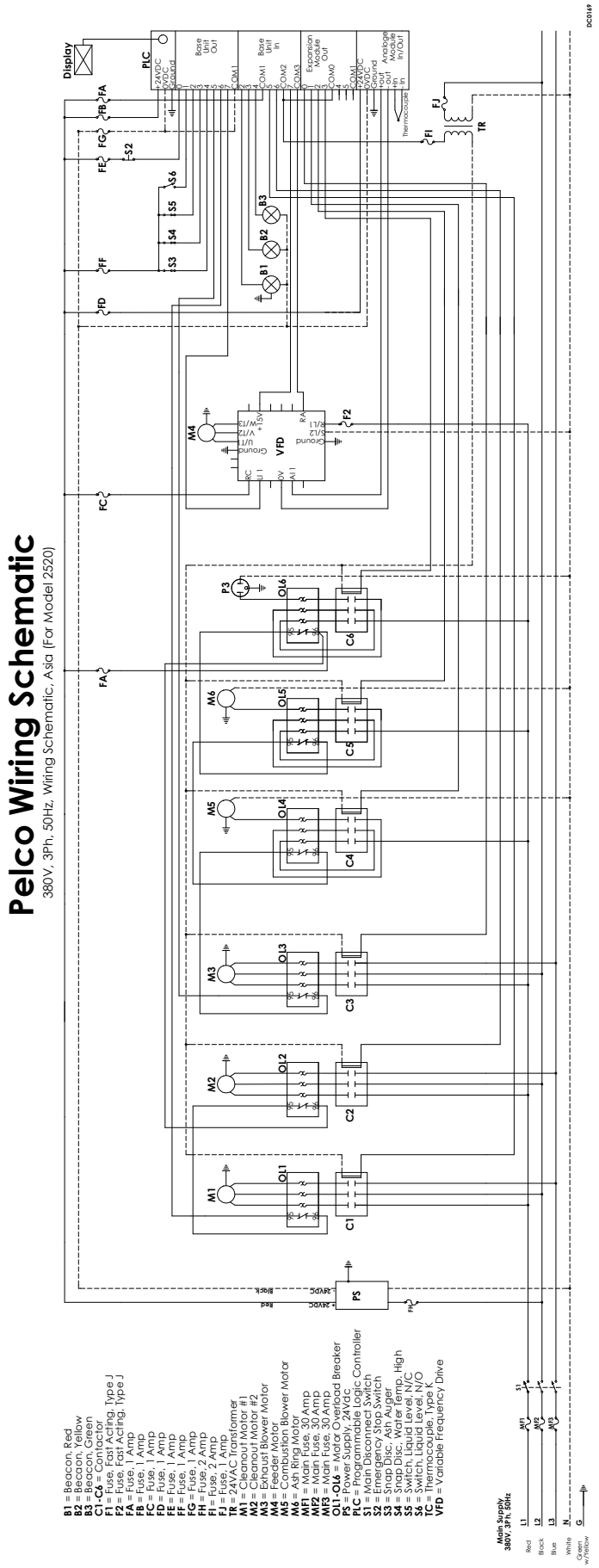
Wiring Diagram



Wiring Diagram



Wiring Diagram



How to Replace the Electronic Digital Display

1. Turn Main Power off.
2. Open the control box door.
3. Remove Display Communication Cable (Fig. 2).
4. Press until a click is heard and remove both display holders.
5. Remove the display from the front surface of the door.

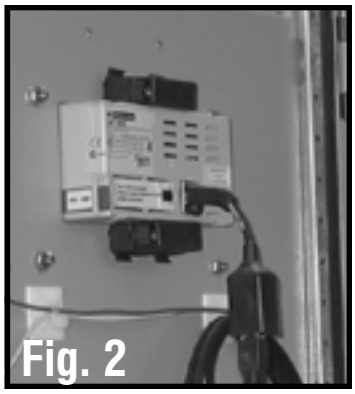


Fig. 2

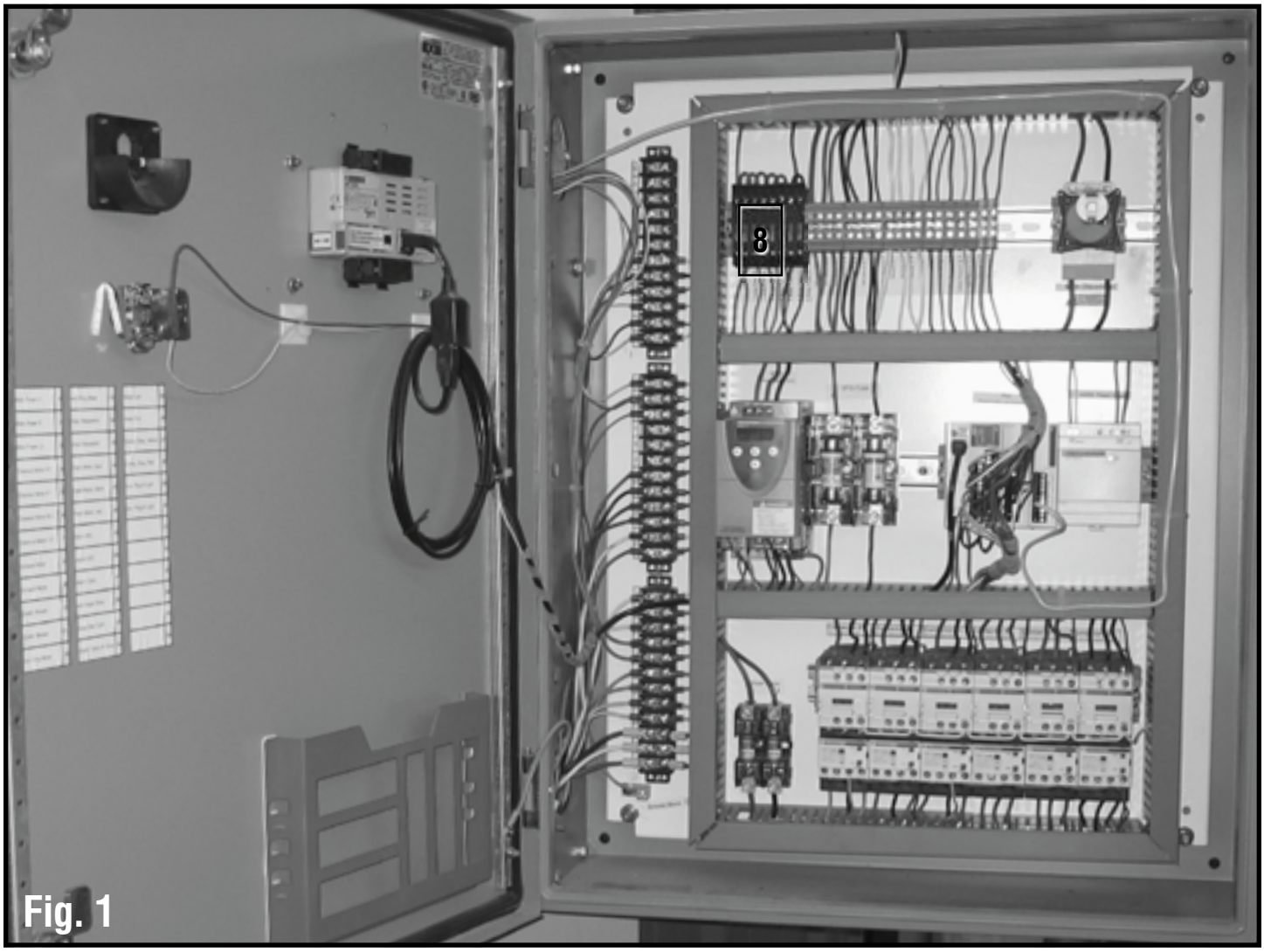


Fig. 1

How to Replace a Beacon Bulb

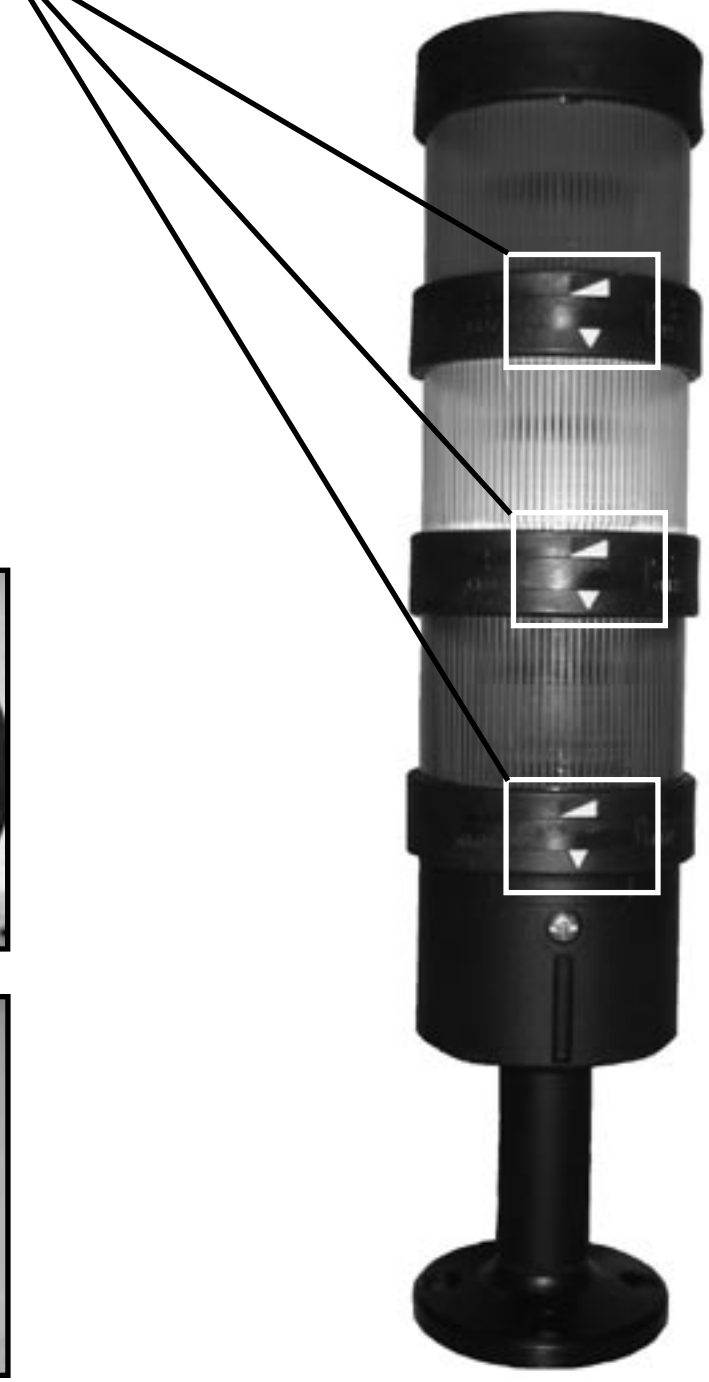

Fig. 1


Fig. 2


Fig. 3


Fig. 4

1. Twist ring counter clockwise (Fig. 1).
2. Lift up beacon stack (Fig. 2).
3. Twist bulb counter clockwise (Fig. 3).
4. Pull bulb out (Fig. 4).
5. Put new bulb in place, push down and twist clockwise (Fig. 3).
6. Place beacon stack in position.
7. Twist/lock ring clockwise.

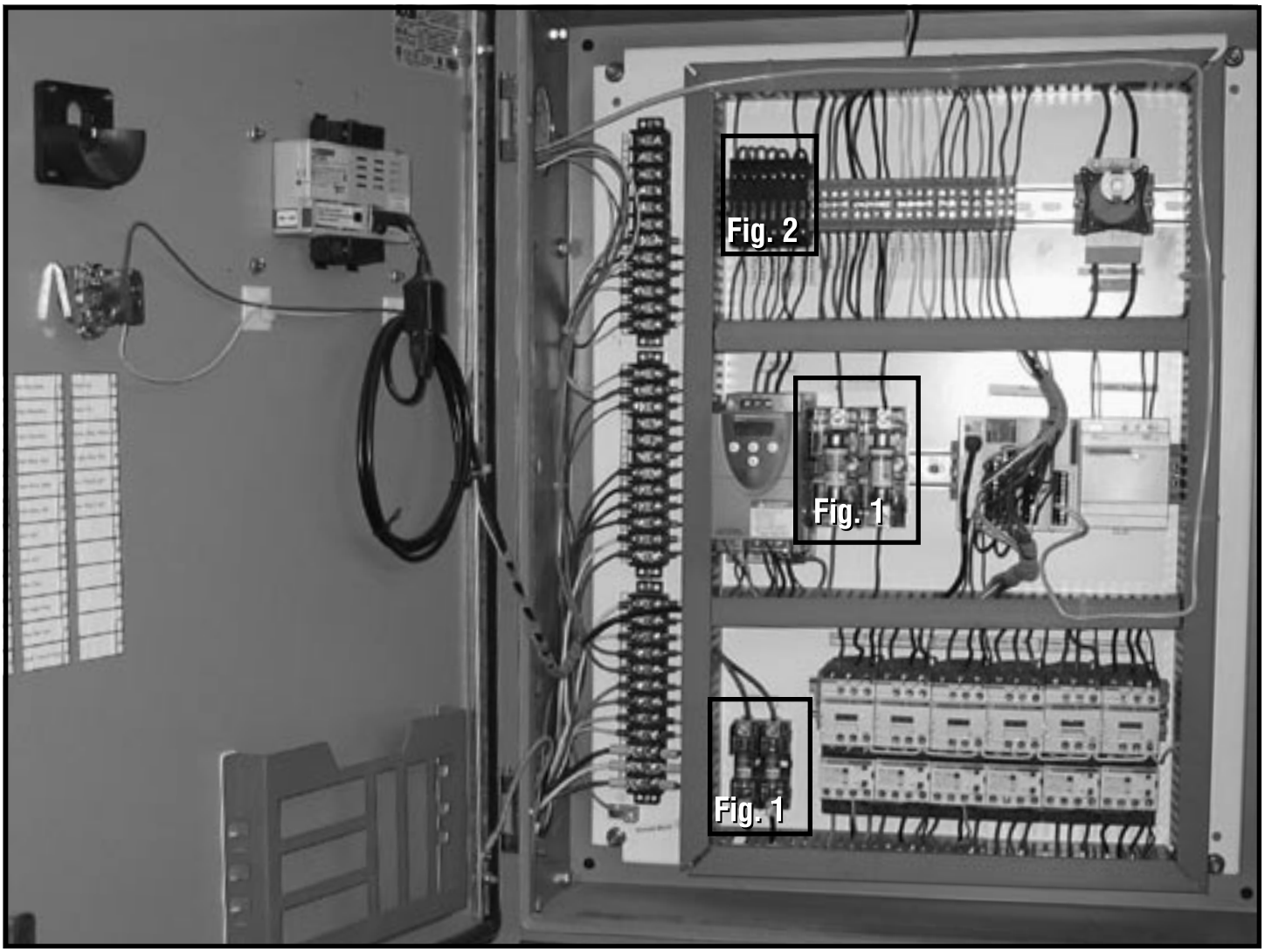


How to Replace a Fuse

1. Turn power off and open control box.
2. To replace main fuses, use a flat screwdriver to gently pry out the fuse (Fig. 1).
3. To replace 1 Amp fuses, lift tab outward (Fig. 2). The fuse is located behind the tab.


Fig. 1


Fig. 2



How to Replace a Programmable Logic Controller (PLC)

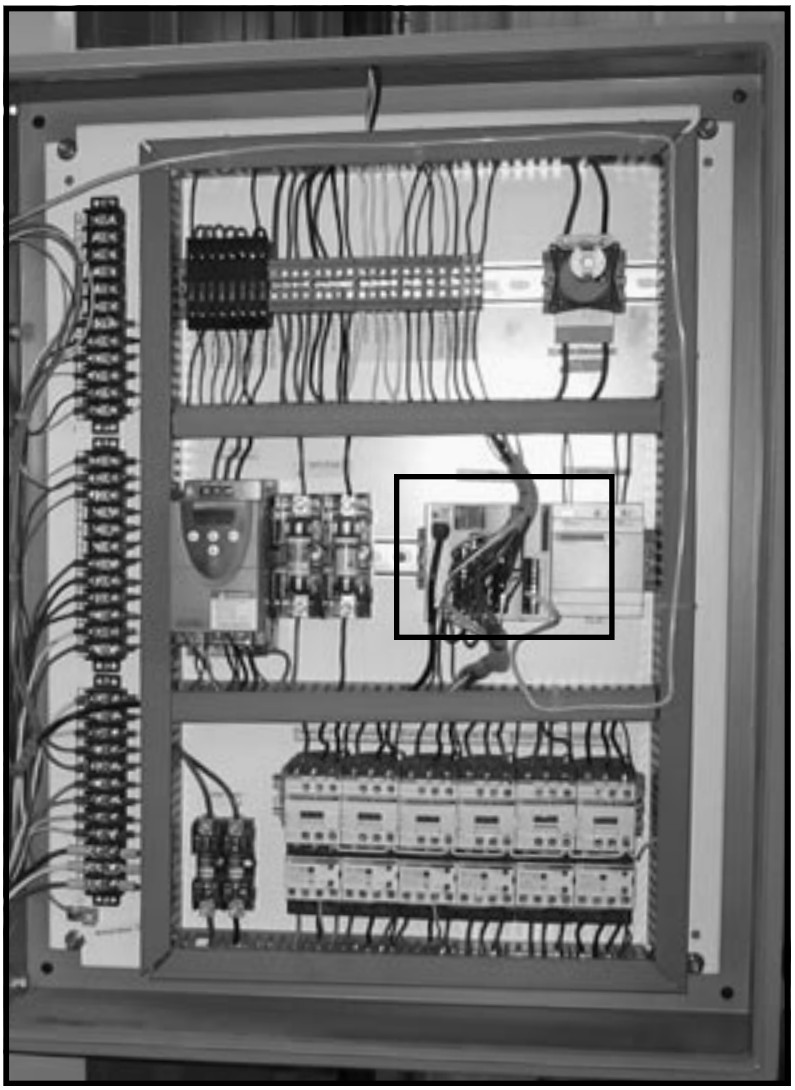

Fig. 1

1. Take all wires off (Fig. 1).
2. Pull down the three tabs located on the bottom of the PLC (Fig. 2).
3. Pull bottom of PLC toward you and pull up (Fig. 3).
4. Install new PLC (Fig. 3 & Fig. 4).
5. Push three tabs up on bottom of PLC.
6. Install wires (Fig. 1).


Fig. 2


Fig. 3


Fig. 4



How to Replace a Contactor and Overload

1. Disconnect Main Power before replacing contactor.
2. Take off all wires connected to the contactor.
3. To remove, pull contactor down (Fig. 3) then pull the bottom out (Fig. 4).
4. To install, hook top over din rail (Fig. 4), click into place by pushing the bottom of the contactor in (Fig. 3).
5. Reinstall wires.
6. This is a picture of the contactors with the overloads already mounted on the bottom (Fig. 1).
7. Overload settings (Fig. 2).
8. Contactor (Fig. 5).
9. Lift lid to adjust overload (Fig. 2).

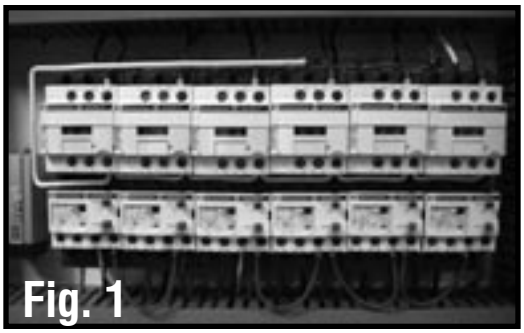


Fig. 1

Fig. 2

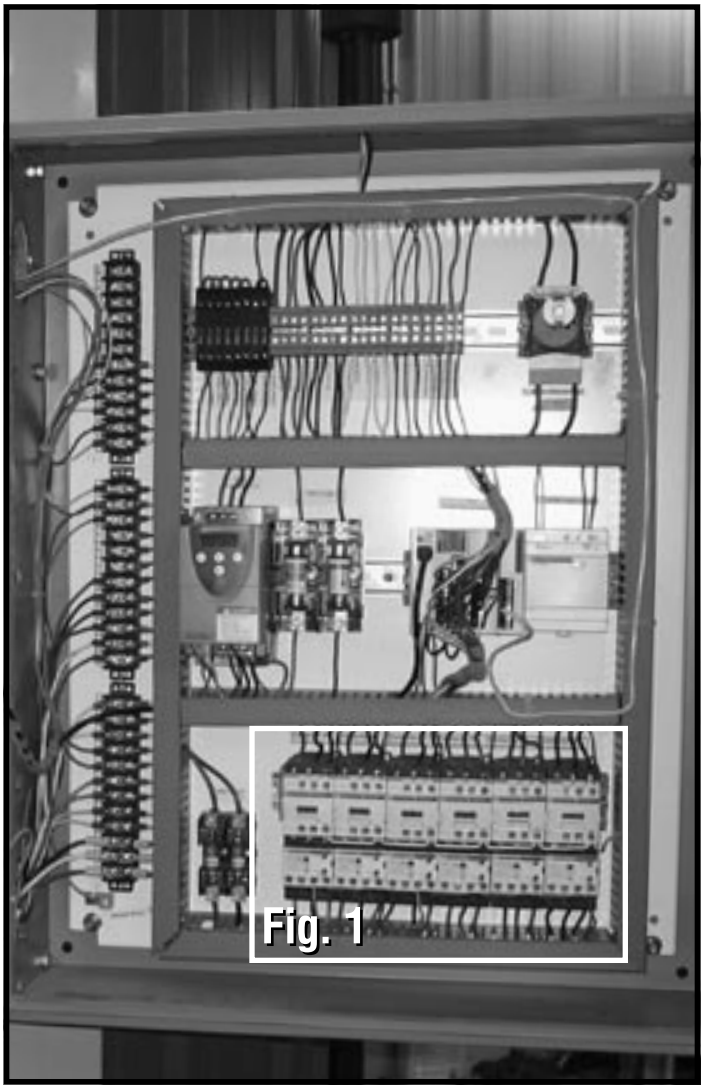


Fig. 1


Fig. 3


Fig. 4

Fig. 5

How to Install an Optional Alarm System

For customers who wish to connect their own alarm system, the Pelco Boiler is prewired to the following configuration.

Terminal 19 is closed when no alarm (red beacon) is on.
Terminal 20 is open when no alarm (red beacon) is on.
Terminal 21 is the common for terminal 19 & 20.

Terminals 19 through 21 accept the following Voltages:
24 volt DC, 2A (must be fused properly)
120 volt AC, 2A (must be fused properly)

For 120VAC, 2A, close to operate, Alarm requirement:

1. Install 120VAC, 2A power from a 120V power source to terminal #21, Figure 1.
2. Install wire from terminal #20, Figure 1, to users' alarm system.

For 120VAC, 2A, open to operate, Alarm requirement:

1. Install 120VAC, 2A power from a 120V power source to terminal #21 (fig 1)
2. Install wire from terminal #19, Figure 1, to users' alarm system.

For 24VDC, 2A, close to operate, Alarm requirement:

1. Install +24VDC, 2A from a 24VDC power source to terminal #21, Figure 1.
2. Install wire from terminal #20, Figure 1, to users' alarm system.

For 24VDC, 2A, open to operate, Alarm requirement:

1. Install +24VAC, 2A from a 24VDC power source to terminal #21, Figure 1.
2. Install wire from terminal #19, Figure 1, to users' alarm system.

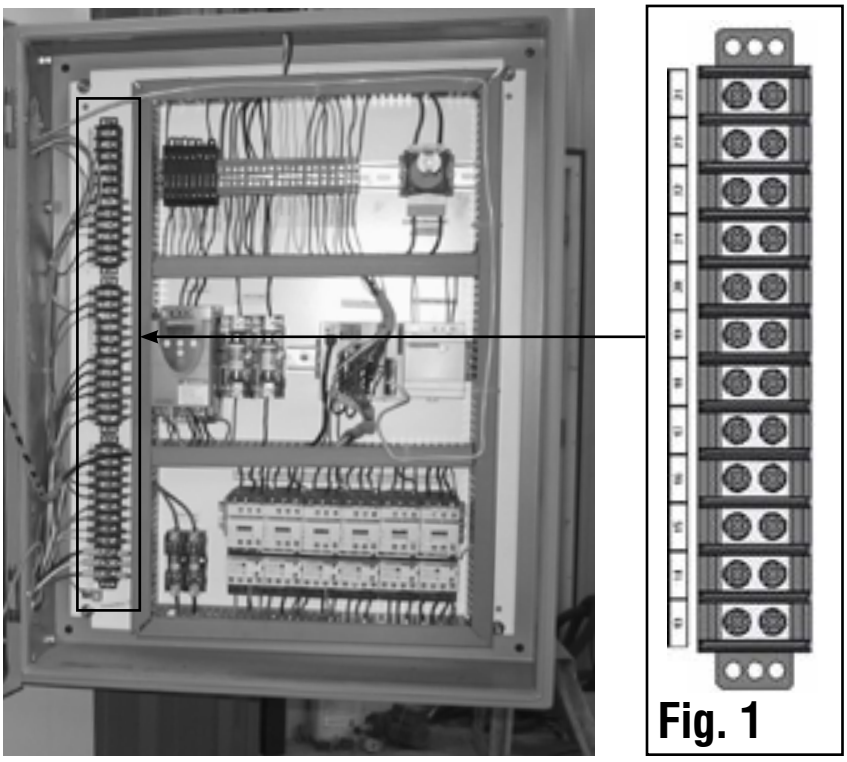


Fig. 1

How to Replace a Snap Disc

1. 190 degree Snap Disc is located behind the "Service Cover B" (Fig. 1).
2. 250°F Snap Disc is located behind the cover "Service Cover A" (Fig. 2).
3. To replace the Snap Disc, disconnect the wires and slide it out of the holder.

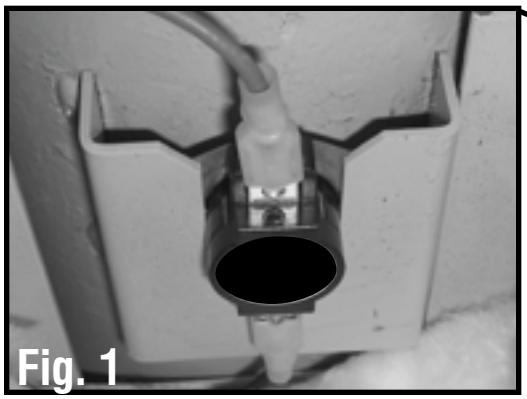


Fig. 1

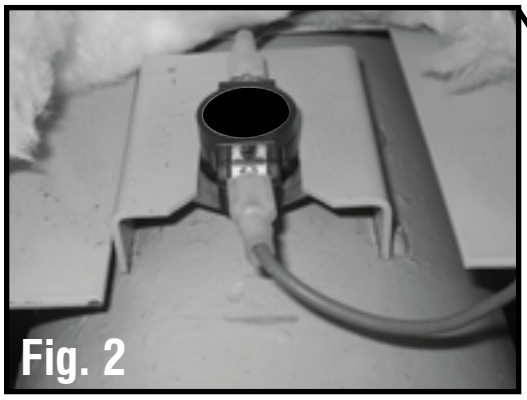
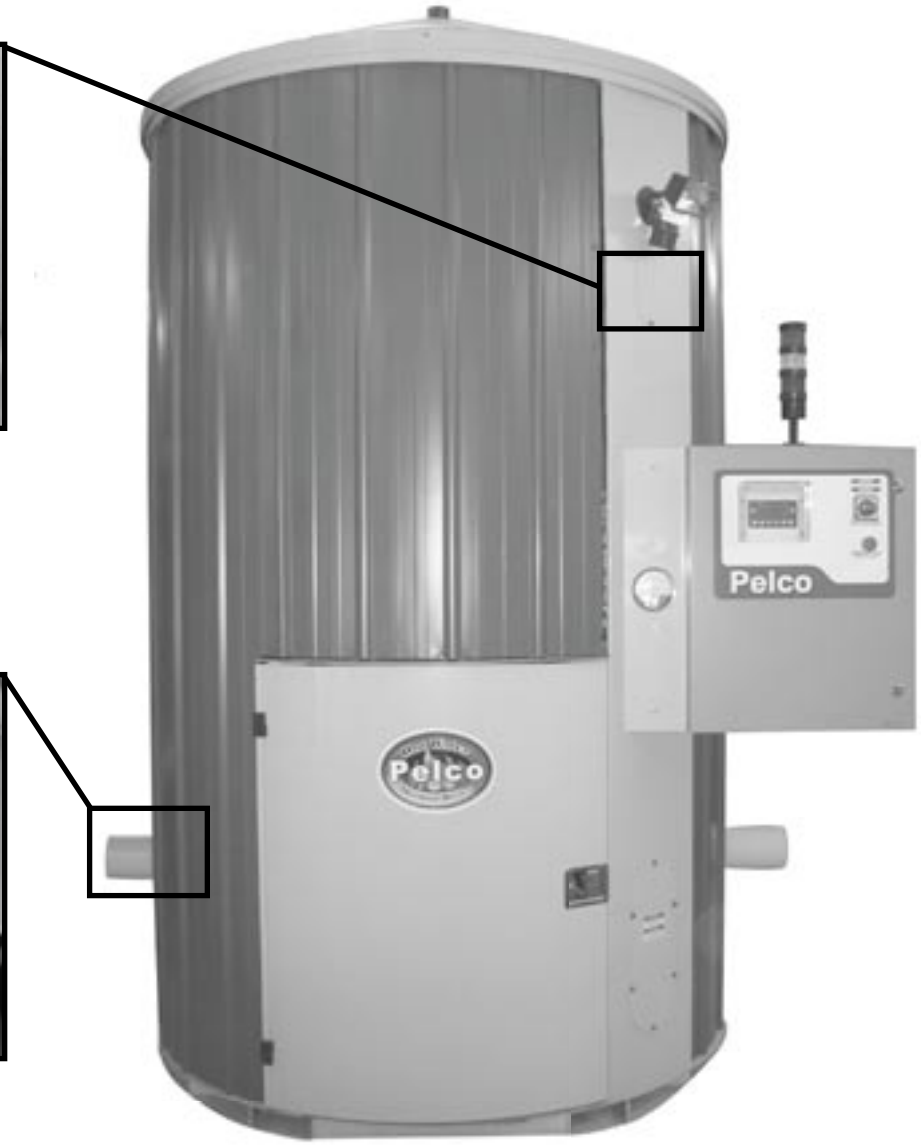


Fig. 2



Pelco Pressure Drop and GPM Requirements

Note: Installing the pump close to the boiler, on the supply side, will keep it from cavitating.

Description	PC 1020	PC 1520	PC 2520
Maximum recommended gpm through the Pelco (both sides)	50 gpm	100 gpm	200 gpm
Recommended gpm through the Pelco per loop (side)*	25 gpm	50 gpm	100 gpm
Total pressure drop through the Pelco in foot of head**	7.359 ft.	7.5 ft.	7.5 ft.
Maximum temperature difference (ΔT) per loop (side)*	20˚F	20˚F	20˚F
Minimum flow rate	10 gpm	15 gpm	25 gpm

*There are 2 hook-ups on all Pelco models for supply and return. Refer to specifications on pages 7-14 for connection sizes and placement.

**Foot of Head based on maximum recorded flow rate.

NOTE: Have your heat load requirements (gpm) calculated by a qualified plumbing specialist.

NOTE: Water properly treated with WT 41 should have a pH balance of 10, nitrite level of 850 – 900 ppm. If the pH or nitrite level is low, add more WT 41.

Standard Operation Procedure

1. For best results make all adjustments with the boiler burning at operating temperature.
2. Set the exhaust damper wide open. Normal chimney height is 10 feet or less. If the chimney exceeds 10 feet, draft will have to be taken into account in order to properly complete this operation.
3. Adjust the combustion air so the fire box has a slight negative pressure. This can be done three ways. Method one is by opening the combustion air damper until smoke starts coming out of the ash or feed auger, then turn back the combustion air damper until the smoke stops. Method two is to place a plastic bag over the end of the ash auger. Adjust the combustion air damper until the bag is gently pulled in. Method three is to use a vacuum gage. With a vacuum gage, the negative pressure in the fire box should read 0.1 to 0.2 inches of water. To use a vacuum gage remove one of the bolts holding the inside plate on the fire box door and place the vacuum gage hose into the bolt hole for testing.
4. Once the proper pressure has been established within the firebox we can now adjust the feed rate. To do this turn the feed rate up progressively, waiting a few minutes between each advancement, until smoke is visible coming out of the exhaust. Turn back the fuel feed until the smoke disappears. When the fuel feed is increased the extra heat may change the pressure within the fire box thus resulting in re-adjustment of the fire box pressure again as described in the above paragraph.
5. Adjustments to the combustion air and the feed rate may have to be made several times to ensure the Pelco is operating at its best.
6. Please note that when burning corn, it is important that the burner is not over fed fuel. Overfeeding of fuel will result in excess emissions causing the flue augers to become plugged. A specific sign of overfeeding will be smoke rising from the chimney. A good burn will have no smoke. It is good practice to manually run the flue clean system weekly to test the operation of the cleaning system and ensure that the drives are functioning properly.
7. If the boiler is burning continuously at its maximum rate, the flue clean drive bearings, and especially the chains, must be kept well lubricated. Failure to keep the flue cleaning drive lubricated could shorten the life of the flue drive assembly.

1. On the main drive gear box, there is a service cover which allows access to the bottom of the vertical feed auger. This access door allows service to the vertical feed auger as well it gives admission to allow the removal of foreign objects such as rocks that stop the fuel feed.
2. Reset buttons can be found on the cleanout motors. They are located on the side of the electrical connection box.
3. Test to ensure the float switches are making a connection. When the boiler is not operating because of low or no water indicator and we have manually measured the water level and found it to be satisfactory, we can test if the float switches are operating correctly. In the control panel, remove wires from terminals 25, 24, 23. Jumper terminals 25 and 24. This will give the same signal to the PLC as if the water in the expansion tank is at its operating level.
4. All motors are protected by overload relays in the control panel. Each relay is factory set to operate under normal conditions. The factory uses 220V 3 phase. Some installations use 220V 1 phase. If a motor continues to trip the overload relay, it is acceptable to increase the amperage of the overload relays.
5. When the flue auger system fails to work, we can check if the motors are operational and the flue augers are seized by removing the cable tie strap on the double chain. Reset the overload, as per above, and run the circuit.
6. Each boiler is shipped with a water sample bottle. Read the instructions and test once a year.
7. The beacon lights are LED bulbs. In the event that the bulb malfunctions, the circuit becomes a dead short and will give incorrect readings to the PLC and shut the boiler down.
8. In the event the source power is interrupted, the boiler electronic system will automatically shut down. In each case, the boiler must be restarted.
9. In the event the internal heater inside the control box shorts out, the boiler electronic system will shut down.
10. Prior to 2005, we could not vary the fire out offset. If the heat recovery is too slow, then the boiler will shut down, thinking that the fire has gone out and the boiler does not want to continue feeding fuel.
11. When installing augers with a square socket, always ensure that the socket fits completely over the square shaft.
12. If the main drive is not operating check the main drive gear box. Take note of the chain driving the feed auger. If the chain is loose then the vertical feed auger is jammed. Remove inspection plate and remove obstruction. If the chain is tight then the horizontal feed auger is jammed. Remove obstruction.
13. If the ash ring is lifting, then the drive is not adjusted correctly or the ash auger is not engaged and the ash is building up under the ring. Ensure the ash auger is operating. Adjust pinion drive and slack on the ash ring.
14. If the ash ring is not turning, check for above and then determine if the coupler is secured tightly to the shaft and pinion.

Frequently Asked Questions

Q. What is a clinker?

A. A clinker is a mass of fused stony matter formed in a furnace, usually from the impurities in the fuel.

Q. Do I have to remove the clinker or will the ash auger take it out?

A. Yes the clinker usually has to be removed. If clinkers are soft, they will be broken up by the ash ring but usually they are hard and must be removed manually.

Q. How often do I have to remove the clinker?

A. Depends on the fuel. Coal can burn for days before a clinker is formed. Corn will form a clinker rapidly and twice a day is not unusual. Most wood pellets seldom have clinkers. Clinkers in the Pelco are totally dependent on the quality of the fuel. Some of the factors that effect coal is the amount of overburden, clay or any foreign matter delivered with the fuel. It is important that after receiving a fresh load of fuel that the Pelco be inspected at minimum of once a day for clinker buildup. Once a confidence level is reached then the frequency of the inspections can be reduced. We recommend that daily inspection always be carried out.

Q. Can I install several Pelco boilers in series?

A. No. The Pelco computer operates by understanding the water temperature in the boiler itself. By having two or more boilers in series would only confuse each computer on all boilers in the series.

Q. We had a minor power failure and my Pelco shut down. Is this normal?

A. Yes. Any interruption in the power supply will shut the boiler down. This is to prevent excess fuel being fed into the boiler when there is no combustion in the event of an extended power failure and the fire has gone out.

Q. My Pelco continued to feed fuel after a power failure and was restarted. Why?

A. In order for the computer in the boiler to set itself for normal operation, the high temperature limit must first be met. After a fire out, bring the water temperature up to its maximum before leaving it to run on its own.

Q. We had a lighting storm in our area causing a power surge. The Pelco has since not been able to function. What happened?

A. In the case of a power surge the problem of returning the Pelco to normal operation can be corrected by checking the one amp. fuses, “F” or “G”. In some cases, the LED in the beacon may of malfunctioned. An LED will cause a dead short when not operating. Replacement of the LED and fuse is then necessary.

Q. Our Pelco shut down and a warning “Ash auger overheated” was displayed. What happened?

A. Hot coals or ash was exiting the firebox. The cause of this is usually overfeeding. Reduce your fuel feed rate and allow the fuel to completely turn to ash prior to it being swept from the burner.

Q. The water temperature will continue to rise higher then the set value on the display even after the Pelco shuts down.

A. With solid fuel, there is residue in the fire box which will take some time to burn and the fire box to start to cool down. This is normal.

Q. The Pelco operates but the fuel and ash augers do not operate. What may be wrong?

A. If foreign objects such as rocks, or misplaced wrenches enter the fuel feed auger, they usually get trapped in the gear box below the vertical auger. Remove the four bolts holding the inspection plate and remove the object. The use of a pipe wrench to reverse the gear box may be necessary to loosen the object.

Q. I have a large installation and the water overflows the expansion tank. Can I add an auxiliary expansion tank?

A. The expansion tank on the Pelco is designed for the boiler and a short water loop. It is preferred that if the system is designed where there is a large amount of water that a heat exchanger be installed so that the Pelco operates with a minimum of water. But if necessary the Pelco can be fitted with an expansion tank. Please consult your qualified dealer. It is important to remember that the Pelco is an open pressure system boiler and proper care must be taken when introducing expansion tanks into the system. It is not recommended to pull the excess water from the vent tube.

Frequently Asked Questions Con't

Q. Why can I not raise the water temperature beyond 180 F?

A. The Pelco boiler is an open pressure system. Open pressure systems are only allowed to operate to a maximum of 180F.

Q. My Pelco has been operating normally and now the PLC is repeatedly turning on and off. What do I check for?

A. First check the main 30 amp power fuses. If one of the main power fuses is blown due to a possible power serge, the PLC with have intermittent power going to it.

Q. I have just replaced my exhaust blower motor and my main power supply circuit breakers trip. What could be the problem?

A. All motors except for the combustion blower motor is designed to be wired for 220V. Ensure that the wiring configuration is followed.

Q. My heat dissipation circuit is always on. How do I correct this?

A. A common reason for the heat dissipation circuit to always be on is that one of the settings on the display is at "0". The computer will not function properly if any of the settings are at "0". A value other than "0" must be in all settings.

Q. If I use antifreeze in my system, do I still have to add water treatment?

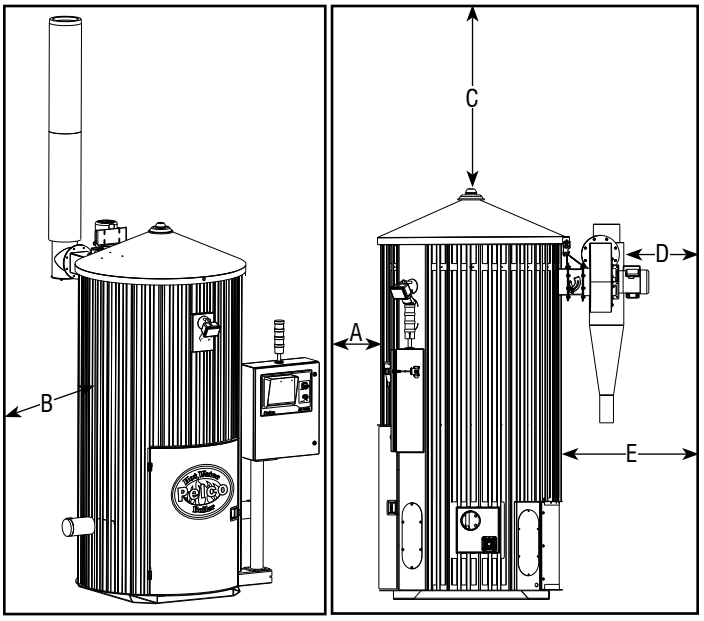
A. Yes. You must follow the instructions for water treatment no matter.

Safe Use Requirements - Indoor Installation

The Pelco Hot Water Boiler must be installed on a noncombustible concrete pad.

There must be a minimum clearance between the Pelco Hot Water Boiler and any combustible material as follows:

	Description	Min. Indoor Clearance
A	Front of Pelco Hot Water Boiler	1219 mm (48 in)
B	Sides of Pelco Hot Water Boiler	152 mm (6 in)
C	Above Pelco Hot Water Boiler	965 mm (38in)
D	From Chimney	457 mm (18 in)
E	Rear of Pelco (from rear siding)	1321 mm (52 in)



Install your Pelco Hot Water Boiler in a location that minimizes the effect the exhaust will have on residences, other buildings or neighbours' property. Consider the direction exhaust will travel with prevailing winds.

The Pelco Hot Water Boiler is certified for indoor (see drawing) and outdoor installation.

Consider insurance policy before installing your Pelco Hot Water Boiler to confirm that it will conform to the installation.

A water treatment must be added to the system at installation to prevent corrosion. Use only the water treatment approved by Pro-Fab Industries Inc. Put the water treatment and boiler glycol in the system after it has warmed and is circulating hot water so as to avoid loss.

NOTE: If height of chimney is too high this can affect the draft.

IMPORTANT: The Pelco Hot Water Boiler must be installed by a certified Pelco installer.

⚠ WARNING

A spark arrester must be installed if your Pelco Hot Water Boiler is used in a high fire risk area.

Installation of the Pelco Hot Water Boiler must be in accordance with building and fire codes. Check these regulations carefully. The Pelco Hot Water Boiler operates at atmospheric pressure and does not require a pressure vessel or Boiler certification. It is not recommended to install more than one Boiler in one circuit.

Pelco Hot Water Boiler Elevation - Outdoor Installation

Optimum Elevation

Install a water circulating pump (1, Fig. 36) in the hot water supply line (2, Fig. 36) several meters below the water level (3, Fig. 36) in the Pelco Hot Water Boiler (4, Fig. 36) to minimize pump cavitation.

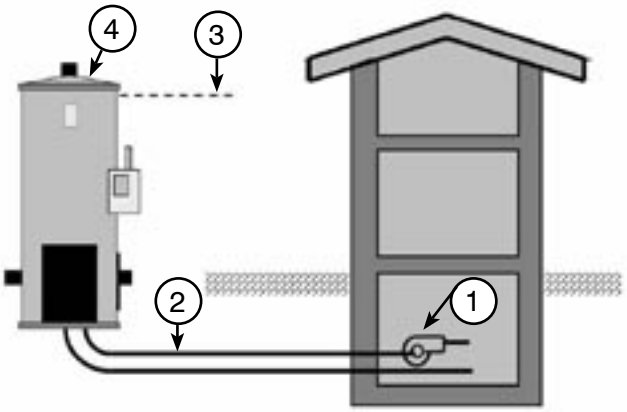


Figure 36 - Optimum Elevation Installation

Low Elevation

If the water level (1, Fig. 37) is less than 600 mm (2 ft) above the level at which the hot water supply enters the building, then the pump (2, Fig. 37) must be installed in the hot water supply line (3, Fig. 37) at the Pelco Hot Water Boiler (4, Fig. 37).

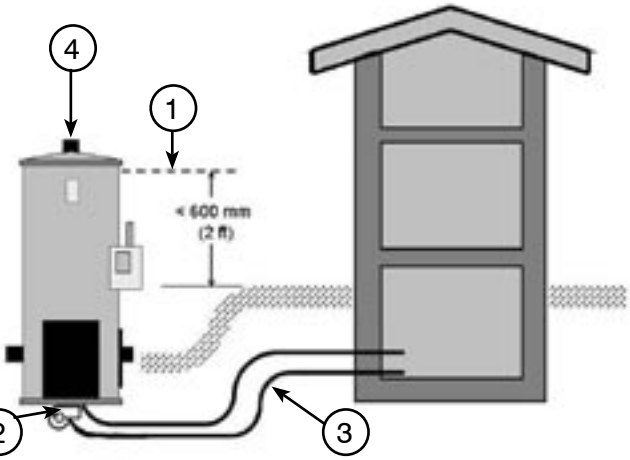


Figure 37 - Low Elevation Installation

Uneven Ground

The pump may be installed inside the building as long as it is at least 900 mm (3 ft) below the water line (1, Fig. 38) and is not above the highest point of the hot water supply line (3,4, Fig. 38).

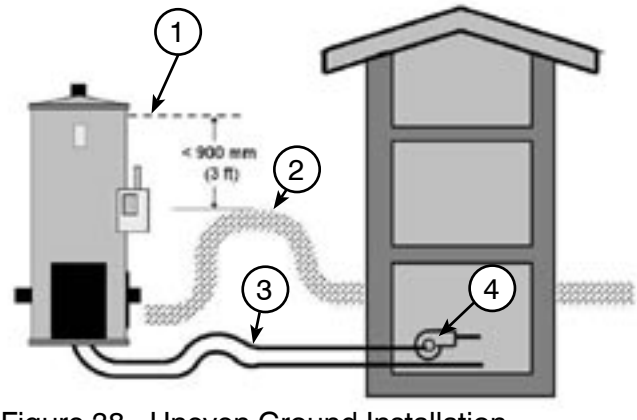


Figure 38 - Uneven Ground Installation

Figure 36 - Optimum Elevation Installation	
Item No.	Description
1	Circulating Pump
2	Hot Water Supply Line
3	Water Level
4	Pelco Hot Water Boiler

Figure 37 - Low Elevation Installation	
Item No.	Description
1	Water Level
2	Circulating Pump
3	Hot Water Supply Line
4	Pelco Hot Water Boiler

Figure 38 - Uneven Ground Installation	
Item No.	Description
1	Water Level
2	Highest Point of Ground
3	Hot Water Supply Line
4	Pelco Hot Water Boiler

Example Residential Installations

The following drawings should help you in establishing a list of materials required for a typical installation. All materials should be available from your Pelco Hot Water Boiler dealer.

The installation drawings in this manual are shown as examples only. We recommend that you engage a plumbing and heating professional to insure that your installation will serve your needs and conform to local and national codes.

IMPORTANT: Pro-Fab Industries Inc. does not warranty the Pelco Hot Water Boiler or accessories if there is evidence of damage caused by faulty installation.

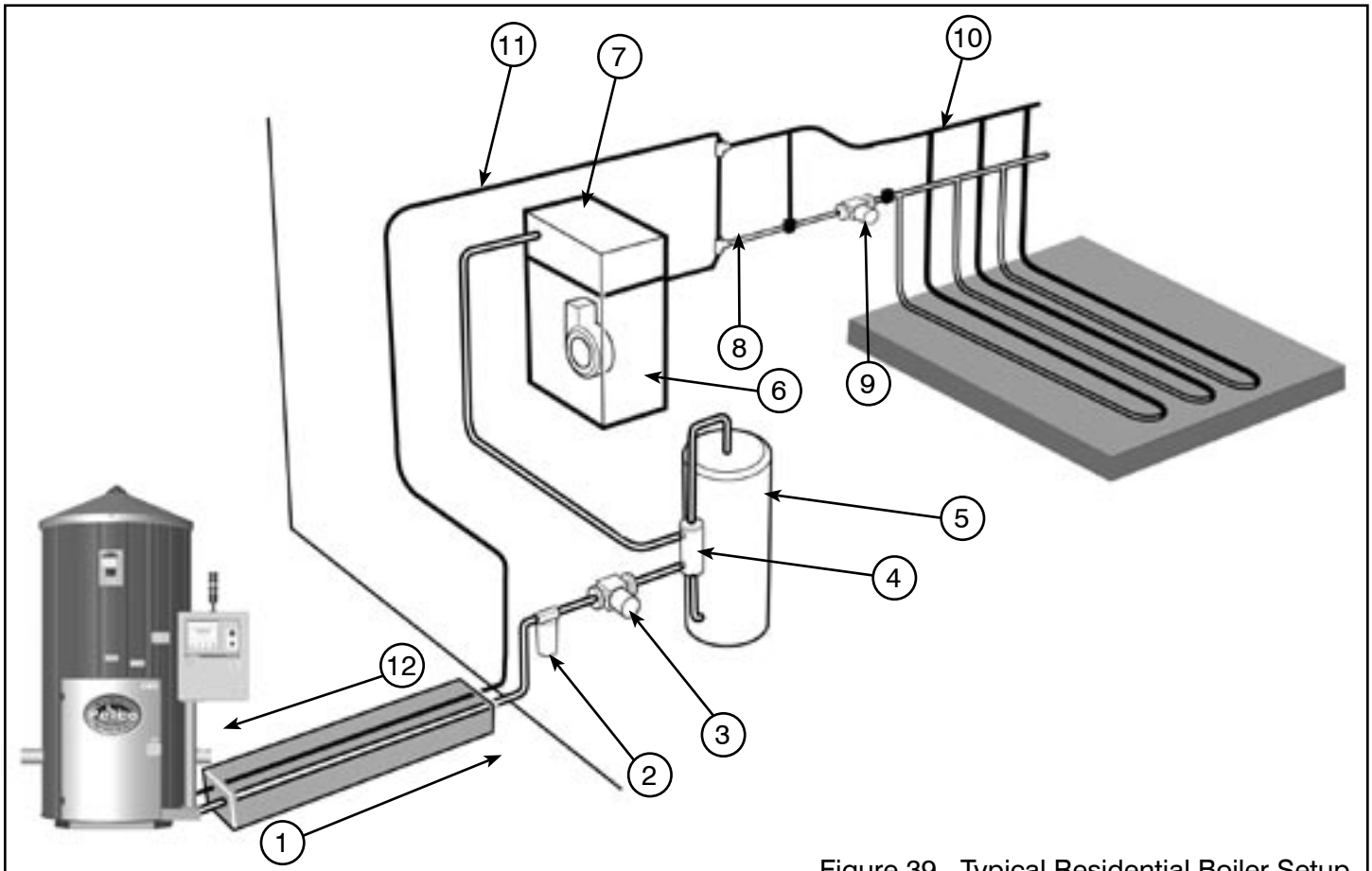


Figure 39 - Typical Residential Boiler Setup

Figure 39 - Typical Residential Boiler Setup					
No.	Description	No.	Description	No.	Description
1	Insulated Supply Line	5	Hot Water Tank	9	Circulating Pump
2	Filter (optional)	6	Furnace (existing)	10	Heating Piles (under floor)
3	Pump	7	Heat Exchanger	11	Return Line
4	Side Arm Heat Exchanger	8	Mixing Valve	12	Insulated Return Line

Existing Heating System

1. Install the heat exchange radiator (1, Fig. 40) in the hot air plenum of the forced air furnace, taking care to seal joints and holes.
2. Install the circulating pump (2, Fig. 40) on the supply line.

IMPORTANT: Ensure that the pump is oriented horizontally.

3. After installing the heat exchanger with the forced air system, check to ensure that the air flow is as specified by the manufacturer of the existing heating system.

IMPORTANT: The fan should accommodate the addition of the heat exchanger.

4. Adjust the pulleys on the motor and blower to obtain proper air flow rate for belt driven hot air fan.
5. Adjust the motor speed on variable speed fans to obtain the correct air flow.
6. Install a second thermostat to allow the blower to operate separately from the Pelco Hot Water Boiler.
7. Set the existing thermostat several degrees lower than the new thermostat. This will allow the existing furnace system to operate normally, should the Pelco Hot Water Boiler run out of fuel.
8. A bleeder valve (3, Fig. 40) installed in the return line allows filling and draining of the system.

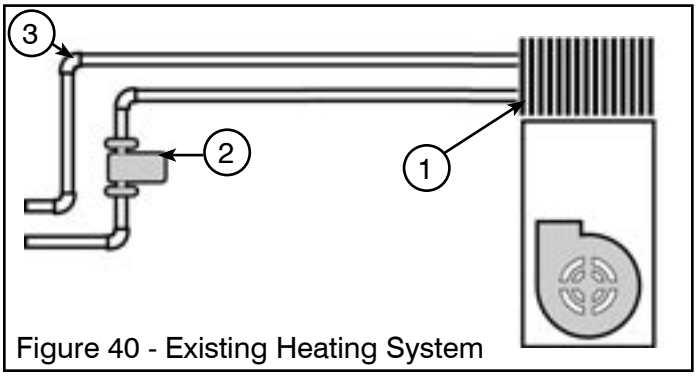


Figure 40 - Existing Heating System

Figure 40 - Existing Heating System	
Item No.	Description
1	Exchange Radiator
2	Circulating Pump
3	Bleeder Valve

IMPORTANT: Have a qualified electrician verify the installation. Any modification to your existing forced air heating system must be made in accordance with the manufacturer's specifications and performed by qualified, licensed personnel in accordance with local codes.

Under Floor Heat

1. Use a 25 volt thermostat with relay to control the circulating pump (1, Fig. 41) for under floor piping (2, Fig. 41).
2. Each zone can be manually adjusted with the ball valves (3, Fig. 41) on the supply header line (4, Fig. 41).
3. Adjust the mixing valve (5, Fig. 41) for water temperature between 43°- 49°C (110°- 120°F) for concrete floor installations.

Figure 41 - Under Floor Heat	
Item No.	Description
1	Circulating Pump
2	Under Floor Piping
3	Ball Valves
4	Supply Header Line
5	Mixing Valve

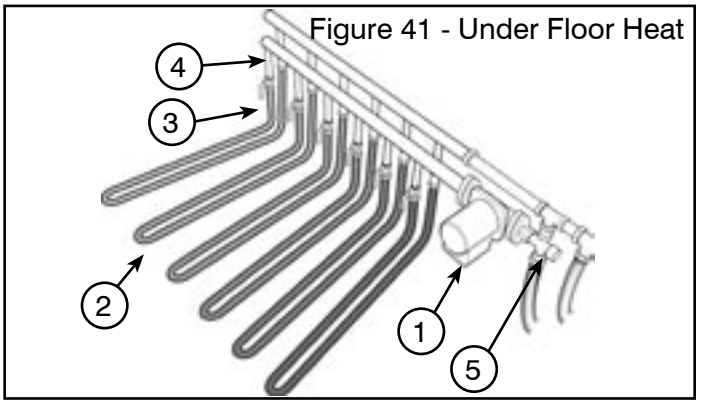


Figure 41 - Under Floor Heat

Side Arm Heat Exchanger

Heated water from the Pelco Hot Water Boiler is introduced to the hot water tank through the side arm heat exchanger (1, Fig. 42).

Figure 42 - Side Arm Heat Exchanger Setup	
Item No.	Description
1	Side Arm Heat Exchanger
2	Hot Water Tank

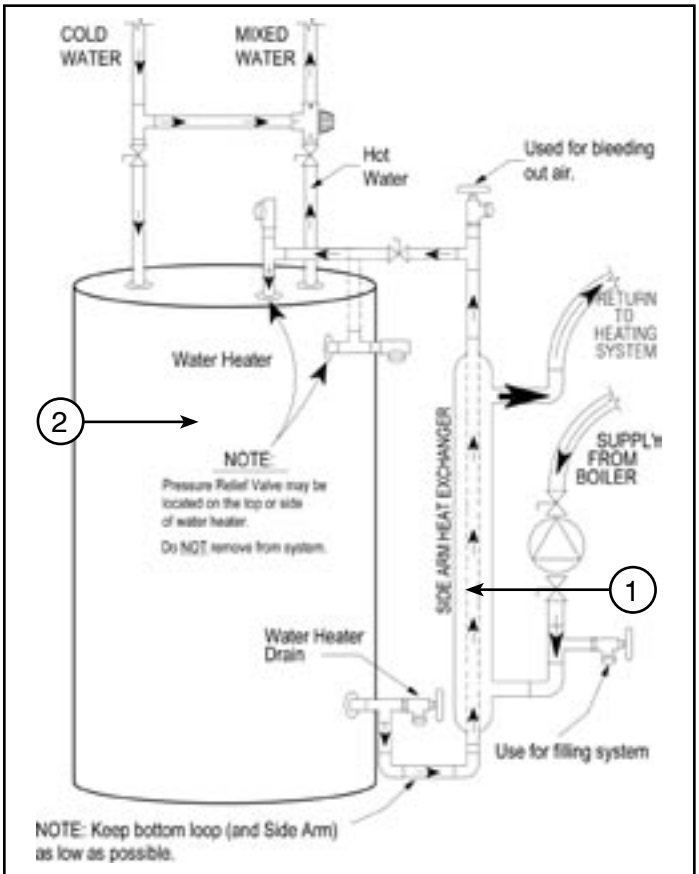


Figure 42 - Side Arm Heat Exchanger Setup

Installing the Pelco Hot Water Boiler with Existing Indoor Furnace (Plate Water to Water Heat Exchanger)

Figure 43 - Installation with Existing Indoor Furnace

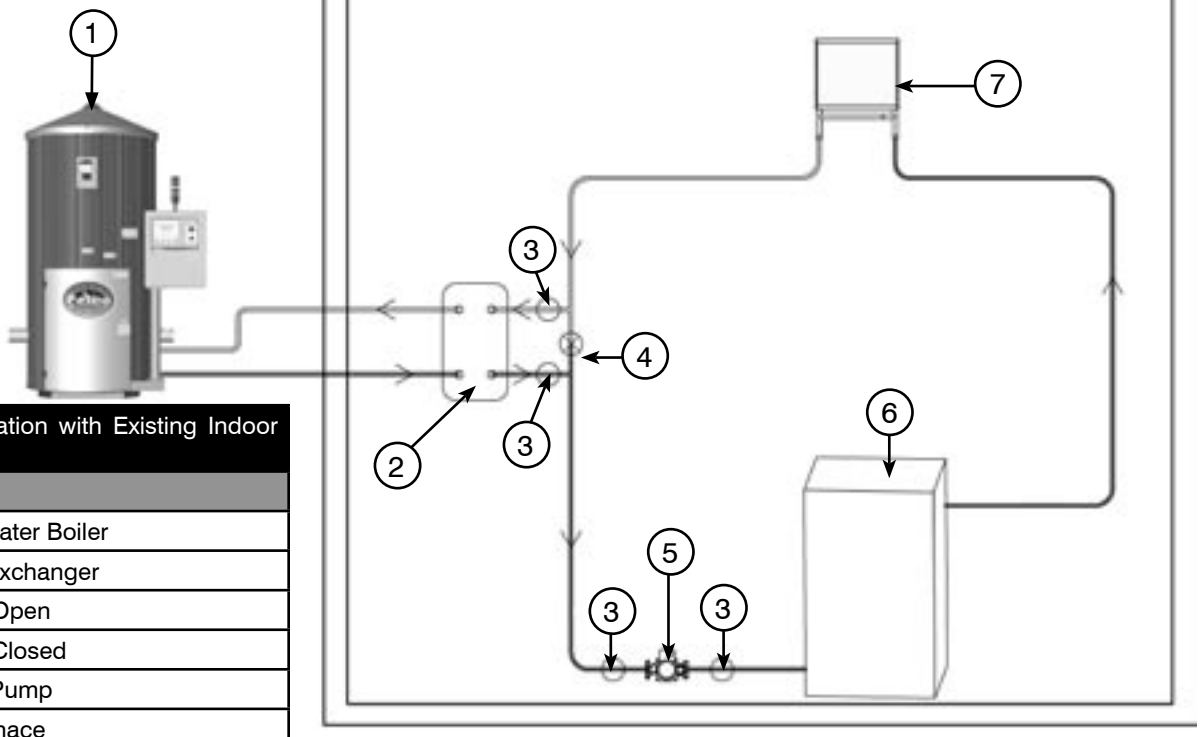


Figure 43 - Installation with Existing Indoor Furnace	
No.	Description
1	Pelco Hot Water Boiler
2	Plate Heat Exchanger
3	Ball Valve - Open
4	Ball Valve - Closed
5	Circulating Pump
6	Existing Furnace
7	Existing Water/Air Heating Coil

Baseboard Distribution

Figure 44 - Baseboard Distribution	
No.	Description
1	24 V Transformer
2	Thermostat
3	3-way Zone Valve
4	Baseboard Unit
5	Outdoor Pelco Hot Water Boiler Circulation Pump
6	From Outdoor Pelco Hot Water Boiler
7	Return to Outdoor Pelco Hot Water Boiler

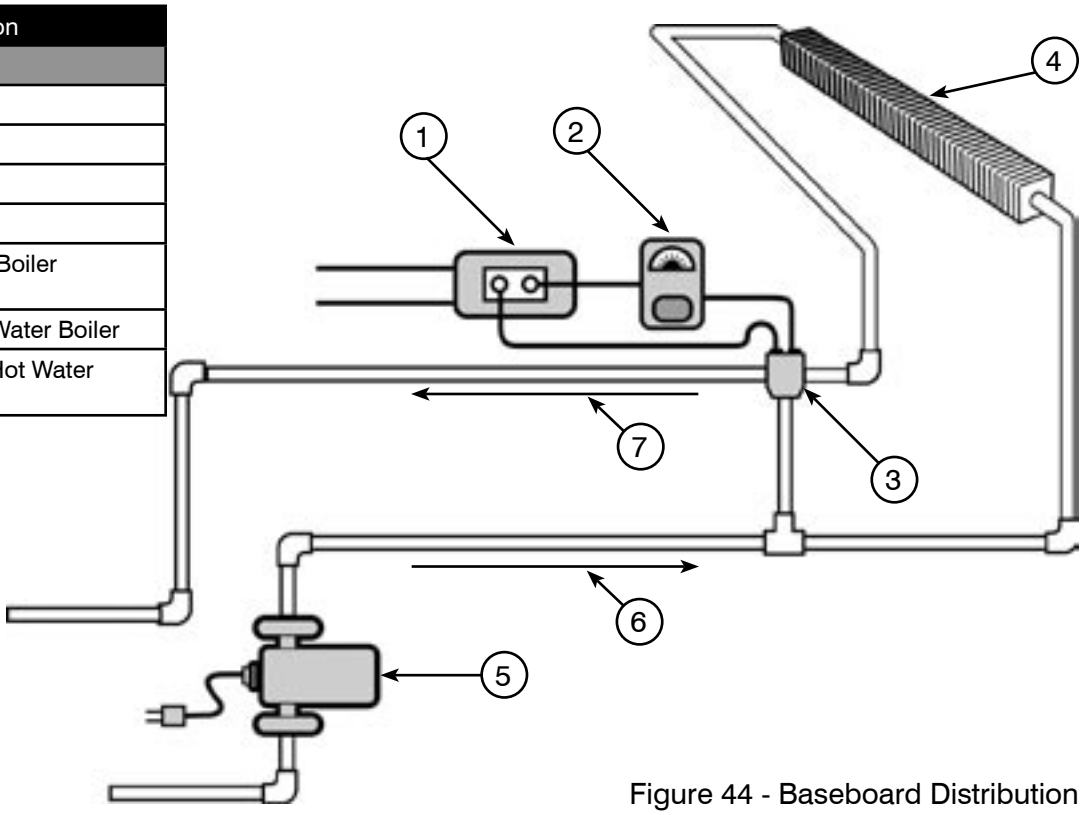


Figure 44 - Baseboard Distribution

Pool and Spa Hookup

Figure 45 - Pool and Spa Hookup	
No.	Description
1	From Pelco Hot Water Boiler
2	Bypass Valve
3	Pool Heater
4	To Pelco Hot Water Boiler
5	Immersion Control
6	To Pool or Spa
7	Black Wire
8	Black Wire - 110 v
9	White Wire - 110 v
10	Transformer
11	From Pool or Spa

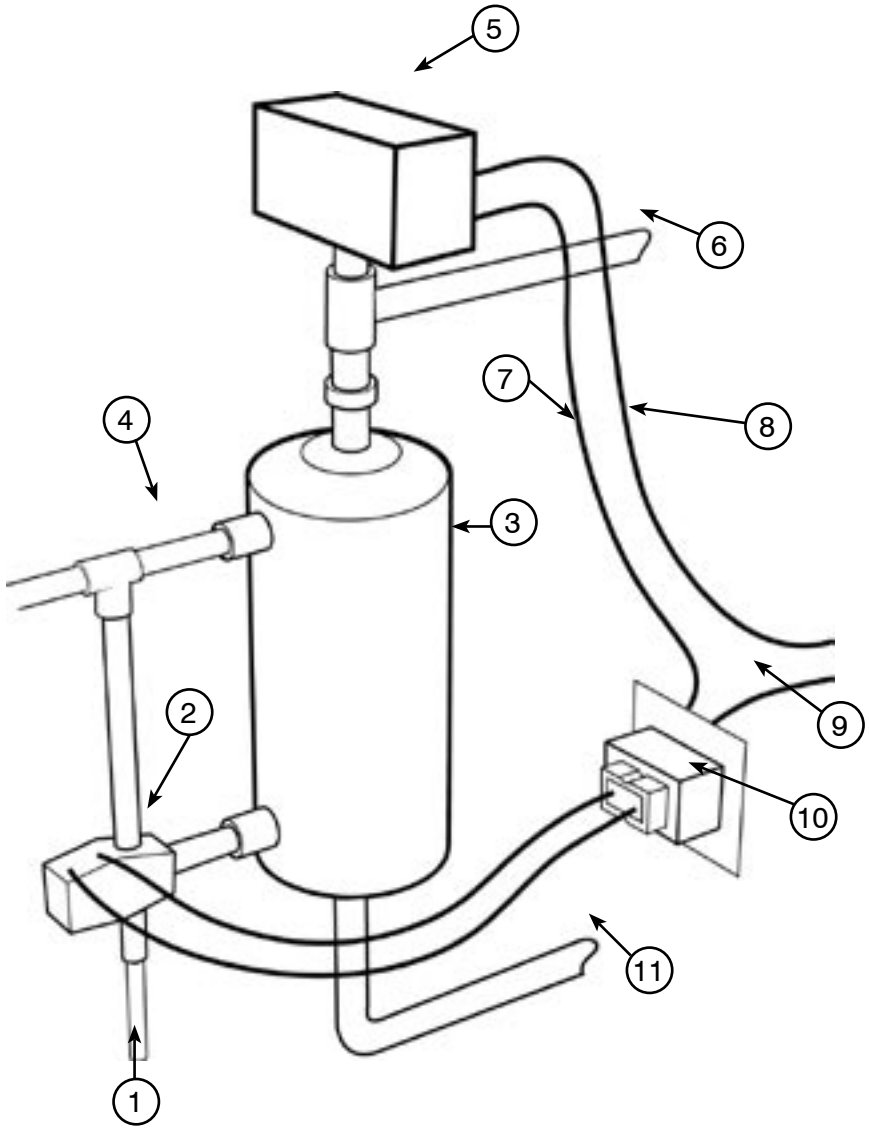


Figure 45 - Pool and Spa Hookup

Trench Details for Supply and Return Water Lines

1) The water lines (1, Fig. 46) must be insulated to minimize heat loss.

2) Contact an authorized Pelco dealer for underground water line insulation.

3) Dig a trench, 610 mm (24 in) deep and 305 mm (12 in) wide, and as level as possible to avoid damage to the water lines. Dig the trench at least 914 mm (36 in) deep under driveways.

4) The water lines should be rated and approved for use with high temperature water and boiler glycol. Size of the waterlines depends upon the distance of the line and volume of heat required.

IMPORTANT: Check with a qualified heating professional to determine the necessary line size to meet the requirements of your specific application.

5) Clearly identify each water line as supply and return lines.

6) Install a power cable (minimum 10/3 AWG) (2, Fig. 46) approved for underground installation.

- Pelco Hot Water Boiler “Optional Alarm” needs room in the trench for cables and a telephone line.

- Pelco Hot Water Boiler “Optional Remote Display” needs room in the trench for cables.

IMPORTANT: Obtain required electrical permit and confirm electrical code requirements prior to installation.

NOTE: Consider adding room for an alarm system in the trenching.

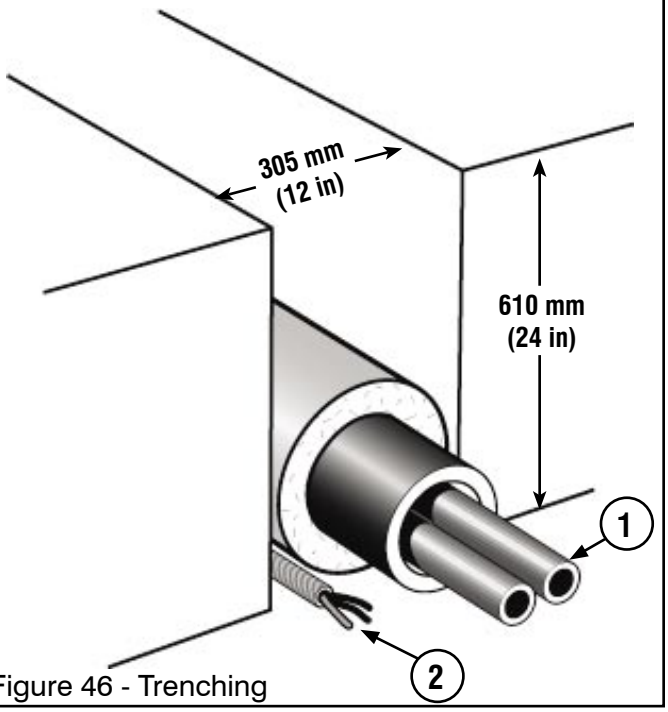


Figure 46 - Trenching

Figure 46 - Trenching	
Item No.	Description
1	Water Lines
2	Power Cable

DANGER

Electrocution hazard. Trench should not be dug in low lying area with standing water.

Notes:

PELCO HOT WATER BOILER
LIMITED WARRANTY

The Warranty registration form and a copy of the original bill of sale must be signed by the Customer and the Dealer and sent to Pro-Fab Industries Inc. within 30 days of purchase in order to initiate this warranty.

The Pelco Outdoor Hot Water Boiler ("Pelco") Operator's Manual contains instructions for the installation and operation of the Pelco. Warranty is void if instructions in the Operator's Manual have not been followed as written.

Pro-Fab Industries Inc. warrants the Pelco to be free from defects in workmanship and parts manufactured by Pro-Fab Industries Inc. This warranty is provided only to the original purchaser. Pro-Fab Industries Inc. has the option, at their sole discretion of repairing or replacing any defective parts.

The Warranty for the firebox, flues, and water jacket is pro-rated over 6 years. In Year 1 and 2 the warranty is 100%. In year 3 the warranty is 75% of the costs of parts and labour and this percentage reduces in year 4 to 50%, in year 5 to 20% and in year 6 to 10%.

All moving parts (including augers, sprockets, chain, ash ring, burner, bearings etc.) have a 1 year warranty. The stir finger, as described in the Operator's Manual carries, no warranty.

Any parts not manufactured by Pro-Fab Industries Inc., including all electrical components carry their own manufacturers' warranty, generally one year. The Customer is responsible for all labour costs necessary to replace these parts.

The Warranty does not include normal wear of moving components. This Pelco warranty is void if the Pelco is operated using combustibles that are not approved for use in the Owner's Manual. Pro-Fab Industries Inc. does not warrant any damage caused by negligence.

Pro-Fab Industries Inc. is not responsible for replacement of plumbing antifreeze, or the shipping costs of the Pelco.

Pro-Fab Industries Inc. is not liable for any losses, damage, loss of life, injury to persons or property or loss of revenue which may occur from the operation of the Pelco.

The Customer assumes all responsibilities for the care, operation and maintenance of the Pelco.

Failure to maintain the coolant as described in the Owner's Manual will void this Warranty. The Customer must keep records of the water samples tested by a certified laboratory confirming that the water has been maintained to a pH balance of 10, a nitrite level of 850 – 900 ppm, and a conductivity of less than 4000 mmhos.

Pro-Fab Industries Inc. reserves the right to make changes or improvements in the design, materials, or specifications of the Pelco or Pelco parts at any time without notice and is not liable or obligated to retrofit existing Pelcos.

There are no other warranties, either expressed or implied by Pro-Fab Industries Inc. or its authorized dealers.

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