

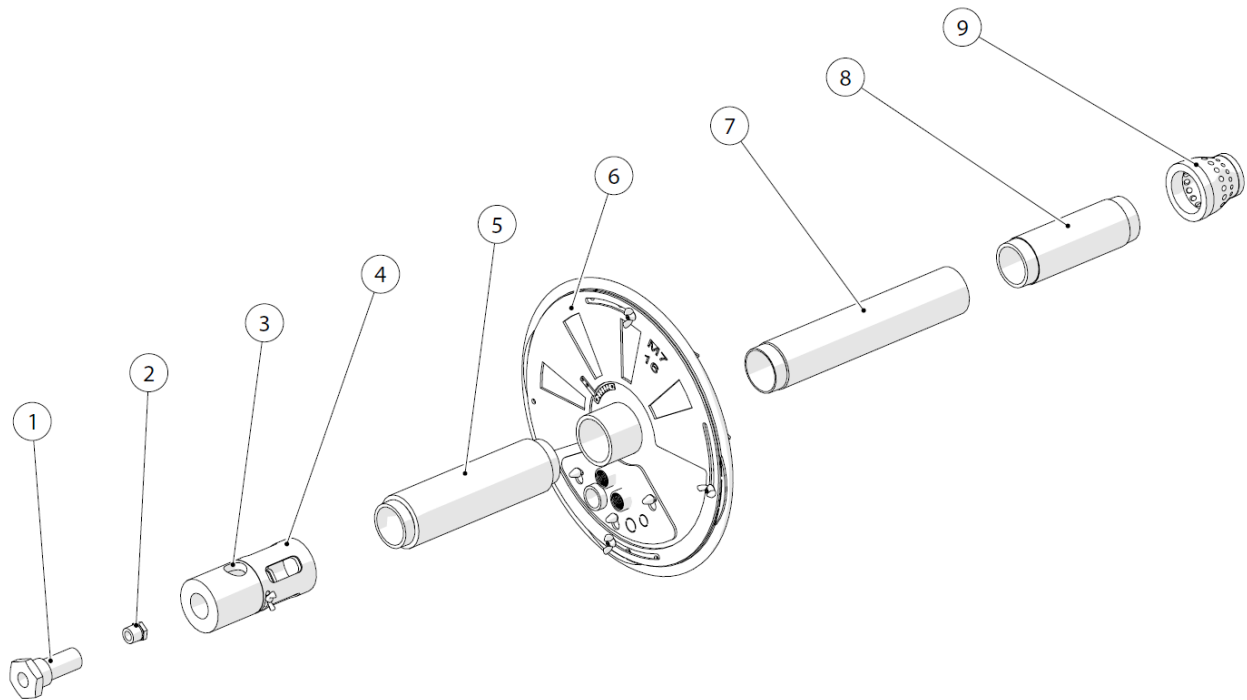
PROFIRE

PF M7™ HIGH-PERFORMANCE BURNER



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AIR PLATE ASSEMBLY



NUMBER	QTY	DESCRIPTION
1	1	Gas Inlet
2	1	Hex Brass Orifice
3	1	1" Flue Gas return Port
4	1	Primary Air Mixer with Adjustable Shutter
5	1	Venturi
6	1	Air Plate Assembly
7	1	2" MNPT x 2" FNPT x 12" Long optional extension (included)
8	1	2" MNPT x 2" MNPT x 6" Long extension (included)
9	1	2" Bell Nozzle

BURNER – MECHANICAL INSTALLATION

1. Verify BTU input needed. This can be done manually with a calculation of the surface area of the firetube, or it may be tagged on the vessel.
2. Ensure Pilot is installed at either the 3 or 9 o'clock position.
3. Drill out main burner brass orifice(s) to satisfy the BTU input of the vessel.
4. Assemble burner as per the assembly image provided.
5. If not implementing the flue gas port, plug port with a 1" NPT plug.
6. Install burner inside the flame arrestor housing.
7. Profire recommends installing a union on the burner piping to allow ease of service.
8. Ensure the tip of the burner nozzle is at least 4" inside the inner liquid vessel wall (where heating of liquid is desired). (See Fig.1)
9. Open the primary and secondary air control to 100%.
10. Install the pilot burner where the pilot tip aligns with the tip of the bell nozzle. (See Fig. 2 & 3)
DO NOT use thread tape on any portion of the burner or pilot as this may affect flame detection. Anti-seize is recommended on the gas inlet and Thredaze on all other connections.

RECOMMENDATION

In order to achieve safety as well as the maximum efficiency of the burner and appliance, Profire strongly recommends startup and commissioning is completed by a qualified and experienced burner technician. Please contact a Profire Expert at 855.776.3473 to schedule a technician.

ORIFICE SIZING

The table below represents the recommended Pressure and Orifice Ranges for the PF M7 2" Burner which is based on Specific Gravity of 0.60 (Natural Gas).

Table values are to be used as guidelines, always reference orifice sizing charts when selecting burner and orifice size.

Orifice Sizing Chart for BTU/hr

Orifice Size in inches	8 PSI	10 PSI	12 PSI	14 PSI	15 PSI
11/64	668,000	747,000	817,000	876,000	882,000
3/16	795,000	889,000	972,000	1,042,000	1,049,000
13/64	933,000	1,043,000	1,140,000	1,223,000	1,231,000
7/32	1,083,000	1,211,000	1,324,000	1,420,000	1,429,000
15/64	1,241,000	1,388,000	1,517,000	1,628,000	1,638,000
1/4	1,414,000	1,581,000	1,728,000	1,854,000	1,866,000
17/64	1,596,000	1,784,000	1,950,000	2,092,000	2,105,000

BURNER STARTUP / COMMISSIONING

1. Close the main burner ball valve but leave the pilot ball valve open.
2. Initiate the start sequence on the BMS.
3. Verify visually that a strong pilot flame is present and that it will allow positive light off of the main burner.
4. Set pilot pressure to between 3-5 psi.
5. With the pilot running, slowly open the main ball valve to full fire.
6. Set the primary air control to produce a clean-burning flame.
7. Verify that flame is centered in firetube, and no flame impingement is happening.
8. Close up arrestor.
9. Set primary and secondary air control for maximum efficiency. (This must be done while taking flue gas readings with a combustion analyzer).
10. Test all fuel train and BMS shutdowns.
11. Profire recommends conducting a combustion report to ensure maximum efficiency.

MAINTENANCE

1. **Inspect Ignition Rod for Cleanliness** – Inspect the ignition rod and ground return path for corrosion and sooty deposits. Clean them, if necessary, to ensure good conductivity for the spark to jump across. An excessively dirty ignition rod or nozzle can result in a spark occurring in the enclosure instead of at the ignition rod.
2. **Inspect the Spark Gap** – Inspect the ignition rod and ground return path for proper spark gap size. Spark gap size should be $\frac{1}{4}$ to $\frac{5}{16}$ " from the tip of the nozzle. The ignition rod should be at the 12 o'clock position directly over the pilot nozzle hole.
3. **Inspect Fire Tube for Cleanliness** – Ensure the fire tube is free of any debris.
4. **Burner and Pilot Orifice** – Inspect the pilot and burner orifice for wear, debris, or clogging. If the orifice cannot be cleaned it should be replaced.

NOTE: This document does NOT cover the assembly and installation of the pilot burner.

FIGURE 1

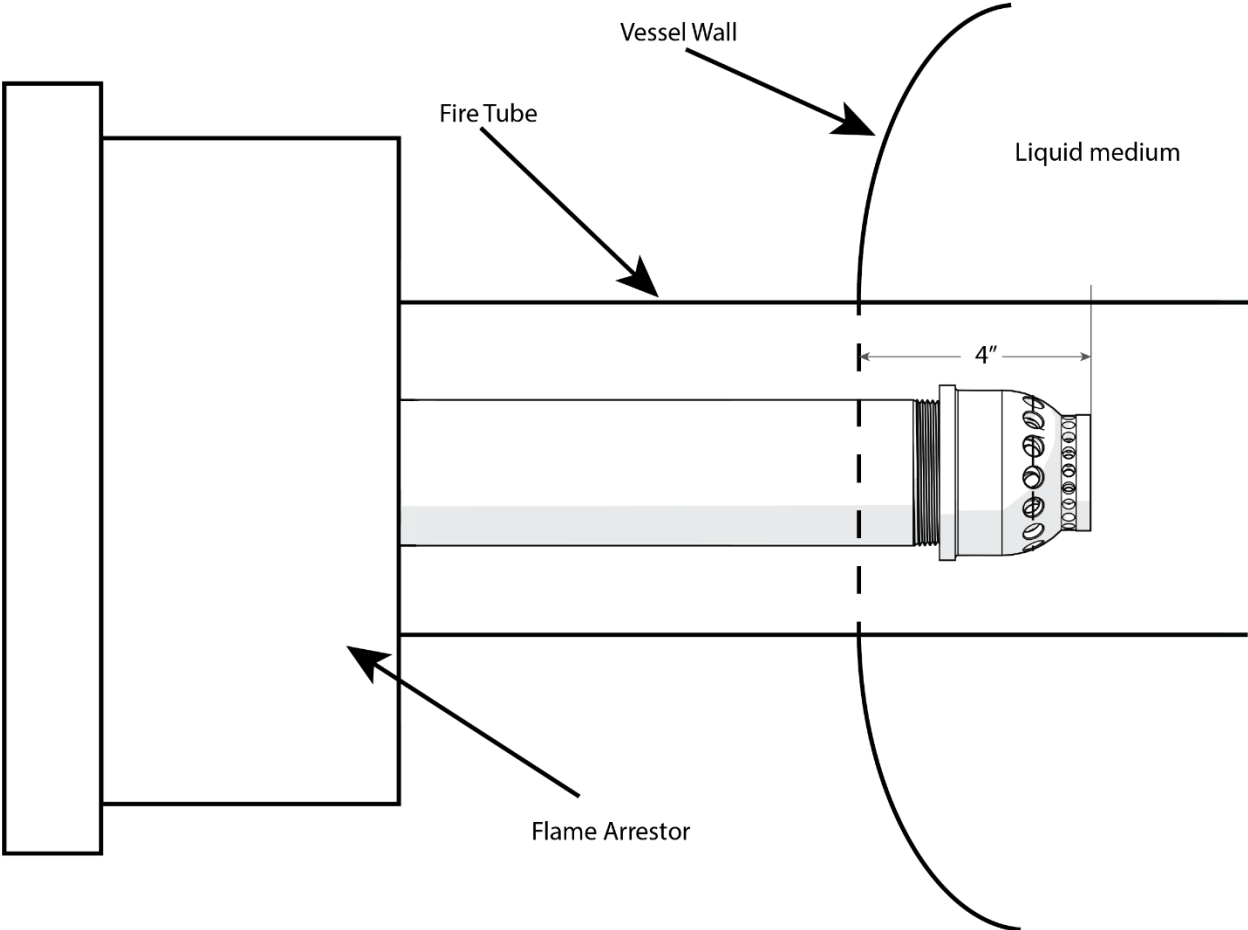


FIGURE 2

Top View of Pilot Alignment

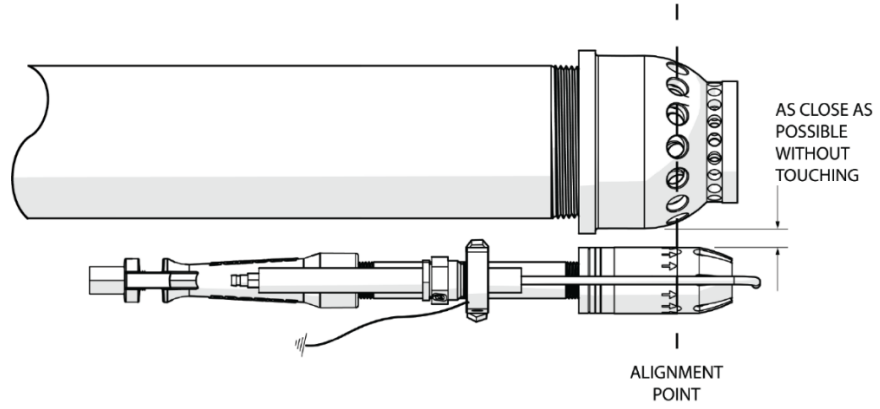
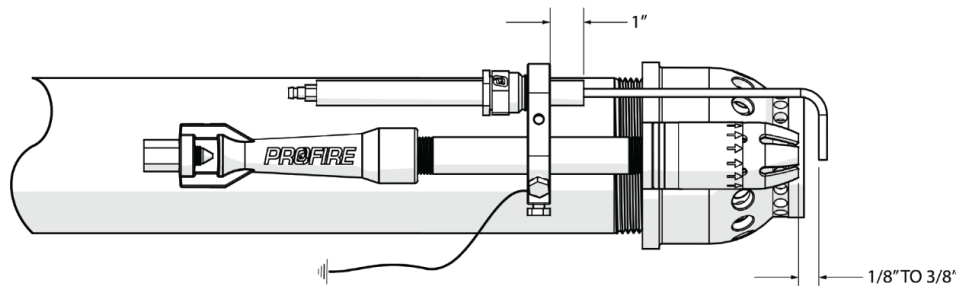


FIGURE 3

Side View Pilot Alignment



QUESTIONS?

If you have any concerns or questions about the PF M7™ High Performance Air Plate, please contact us or visit us at profireenergy.com.

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