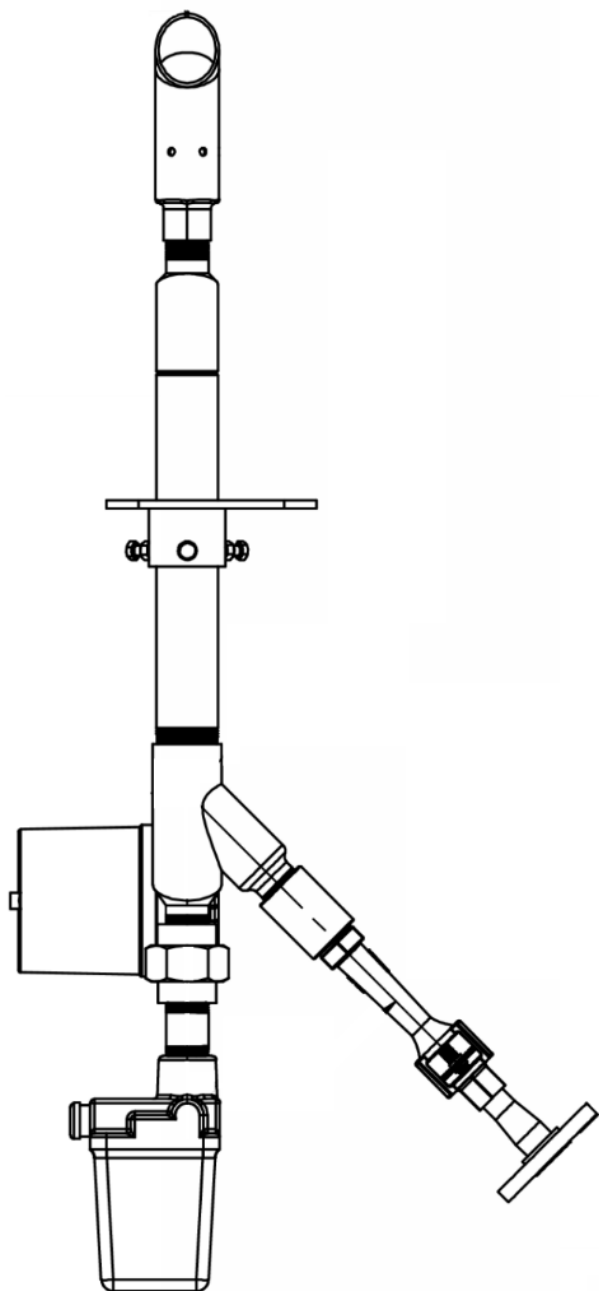


100K Pilot

Installation and Operation Manual

Model	Part Number
100,000BTU/Hr	Z-10003



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1 How to Use This Manual

The following symbols appear throughout Unifire installation and operation manuals.



HAZARD

A specific hazard is brought to the attention of the reader. Failure to observe these instructions may result in injury or other high severity consequence.



CAUTION

Important information that when not followed so may result in premature failure of the product or system malfunction.



INFORMATION

Important details relating to correct function and reliable operation of the product.

2 Limited Product Warranty

- A) Unifire warranty covers the product against defects in workmanship and materials, only if the product is installed and used according to the installation instructions. The warranty is valid for a period of twelve (12) months starting from the date of purchase.
- B) At the sole discretion of Unifire; the liability of Unifire shall be limited to the costs of the parts to be repaired in the defective product or to the exchange of the defective product for a replacement product.
- C) Third party product provided by Unifire as part of an assembly shall be subject to the original manufacturer's standard warranty and, notwithstanding anything to the contrary, Unifire shall have no liability for correcting any defect in the materials and workmanship in such Products. Unifire's only obligation is to make a reasonable commercial effort to assist the Buyer in making a warranty claim as against the manufacturer's standard warranty.
- D) Unifire is not responsible, in contract, tort or strict product liability for any losses, damages, costs, inconveniences and expenses, direct or indirect arising from the use of the product, or from defects in workmanship or materials.
- E) This warranty applies only to those products returned to Unifire during the warranty period.
- F) This warranty does not cover the costs of the parts or labor incurred for the removal and transportation of the defective product, or the reinstallation of the repaired or replaced product.
- G) This warranty does not apply if the product has been damaged due to negligence by person, accident, fire, Act of God, abuse or misuse; or has been damaged by modification, alterations or attachments made subsequent to the purchase which have not been authorized by Unifire; or if the product was not installed in compliance with Unifire instructions and the local codes and standards.

3 Service Support and Returns

For service and support please contact the Unifire support team using your preferred method below.

Telephone:

+1 604 567 2212

Email:

support@unifire.ca

Returns:

Unifire (A division of CSI Group)
207 – 39012 Discovery Way
Squamish
V8B 0E5
BC
Canada

4 General Product Information

The 100K Pilot Burner is designed for a design heat release of 100,000 BTU/Hr and intended to provide continuous or interrupted ignition of Main burners installed to industrial fired appliances.

A high efficiency mixer provides naturally aspirated premixed fuel air to the pilot burner tip. The fuel air mixture is ignited by an integrated High Energy Ignition (HEI) assembly eccentrically located inside the pilot riser pipe. The HEI assembly ensures reliable ignition throughout the life of the pilot by removing many sources of ignition problems that plague traditional pilots.

The eccentricity of the HEI assembly provides a clear line of sight for optional UV Flame scanner technology. By facilitating the use of higher reliability UV scanner combustion safeguards end-users are able to remove from existing systems the unreliability of traditional ionization rod technology; lowering spurious trip rates and increasing system availability.

5 Specifications and Ratings

Design parameters are listed below, please refer to as built customer drawings and/or datasheets for specific installation settings.

Design Heat Release	100,000 BTU/Hr.
Fuel	Natural Gas
Design Fuel Supply Pressure	10 psig
Turndown ¹	3:1
Air Supply Pressure	Naturally Aspirated
Pilot Mass ²	25 lbs
Power Supply (HEI Ignition)	24VDC, 120VAC, 240VAC
Approvals (24VDC, 120VAC HEI Ignition)	UL Recognized File MH62401 CSA 22.2 #199 ANSI Z21.20

¹ Supply pressure 1psi to 10psi delivers approx. 30,000 to 100,000 BTU/Hr

² Not including flame scanner assembly or mounting bracket

www.unifire.ca

email: support@unifire.ca

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6 Dimensions

Configurable options on the standard pilot are shown (Figure 1); Unifire will work with the end-user during procurement to match the pilot to existing appliances.

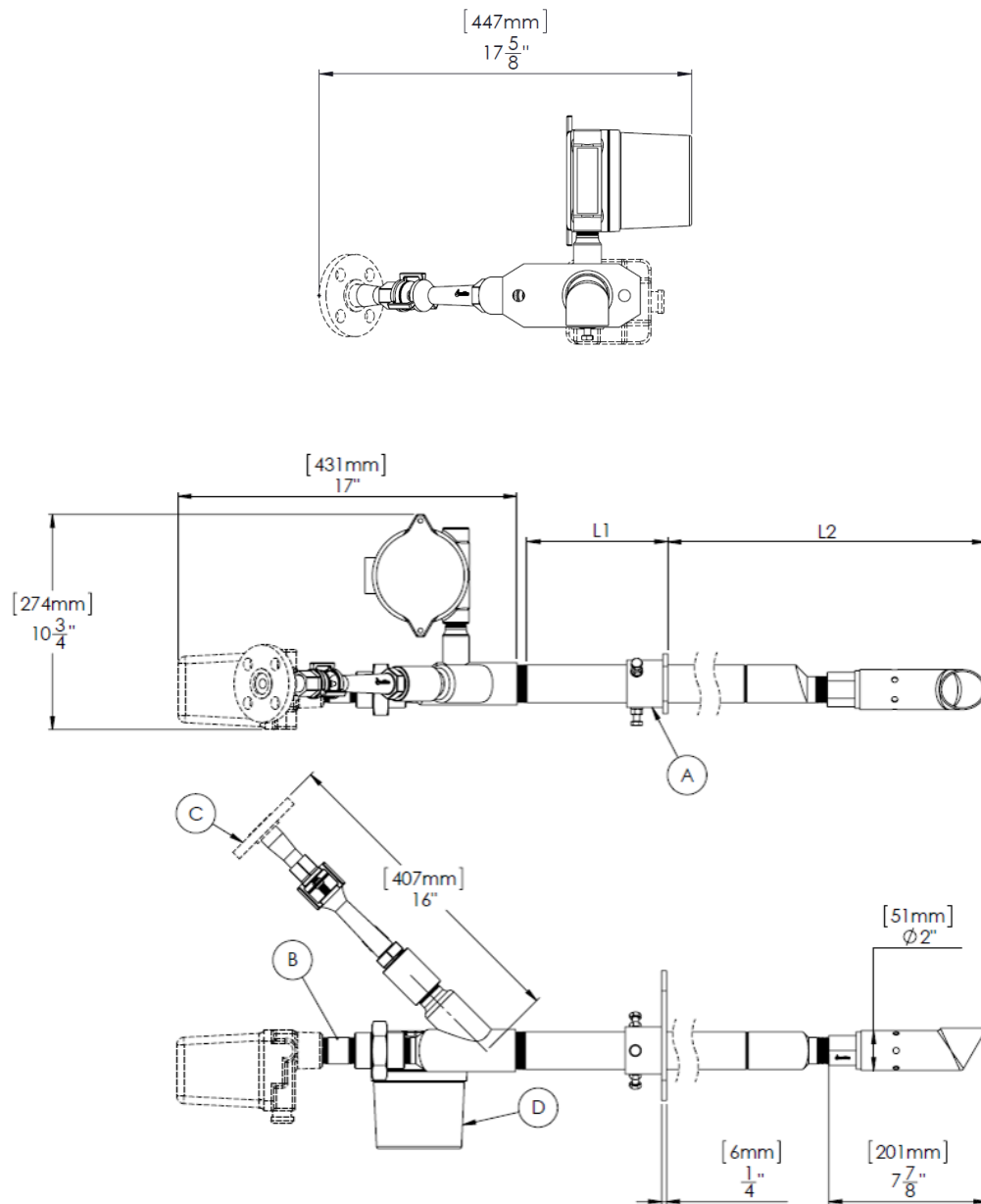


Figure 1 - Dimensions

1. Riser Pipe Length [Figure 1 L2] and positioning of the mounting flange [Figure 1 L1] are specific to end users appliance.
2. Mounting flange [Figure 1 A] is specific to the end users appliance, a 2" entry for the pilot is a minimum requirement.
3. 1" FNPT connection [Figure 1 B] is provided as standard for connection to leading vendor UV flame scanners.
4. Mixer mount [Figure 1 C] to fuel supply line is specific to end users appliance.
5. HEI Ignition [Figure 1 D] is available in 24VDC, 120VAC and 240VAC variants.

7 Installation

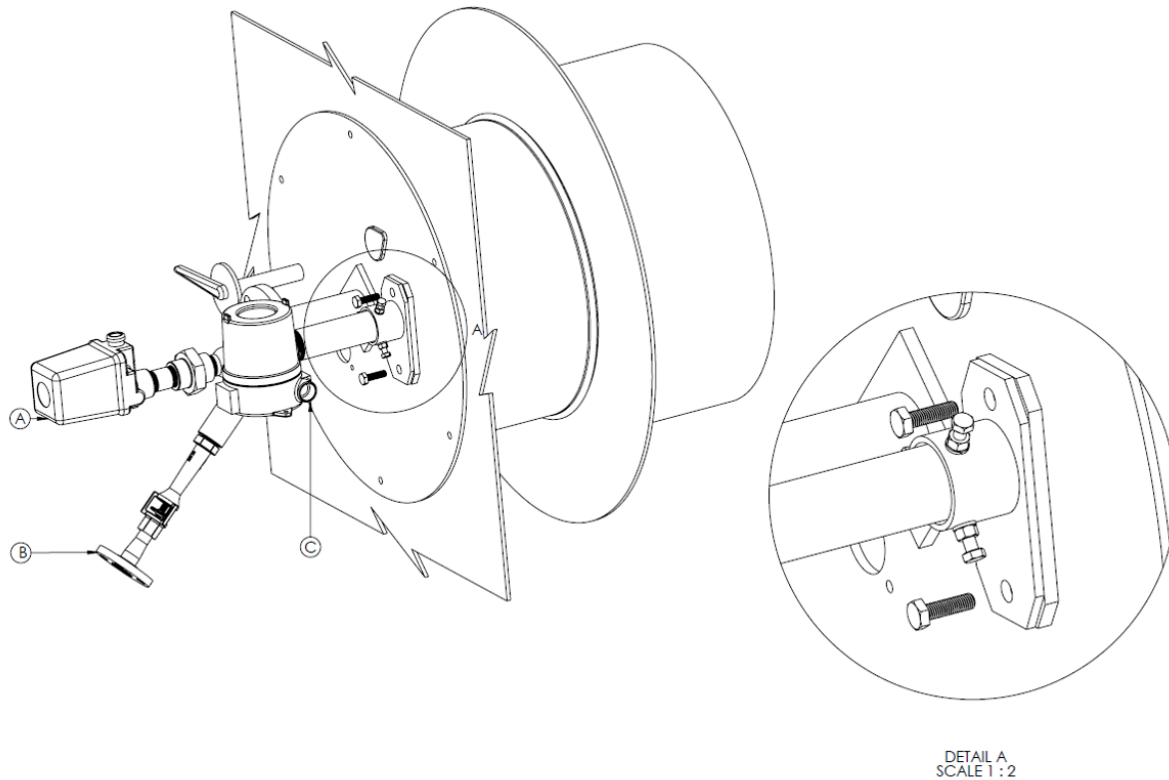


Figure 2 - Installation

1. Connect Power supply to High Energy Igniter.

Power supply connection to the high energy ignition assembly is easiest, prior to installation of the pilot in the appliance.

Remove the $\frac{3}{4}$ " plug [Figure 2 C] from the explosion proof enclosure and pass field wiring through an approved explosion proof connection, routing individual wires to the top of the enclosure.



ENSURE POWER IS DE-ENERGIZED WHEN CONNECTING THE HIGH ENERGY IGNITION DEVICE. THE IGNITION MODULE (PHE) IS ALWAYS ON WHEN POWER IS SUPPLIED AND WILL PRODUCE SPARKS IMMEDIATELY UPON SUPPLY OF POWER.

For AC igniters connect Ground, Live and Neutral to the terminals as marked on the top cover of the igniter. Similarly, for DC igniters connect +ve and -ve supply wires to marked terminals.

2. **Install and mount to appliance.**

Pilot burners are easily clamped to the firebox of the appliance using the mounting bracket [Figure 2 Detail A] specified during procurement.

3. **Connect Flame Safeguard to BMS.**

Flame safeguards (UV Scanners) [Figure 2 A], if specified by the end user, are pre-installed and verified to reliably detect the presence of a flame prior to shipping. Field installation shall only require that the flame scanner cable assembly is connected to the controlling Burner Management System (BMS) per the manufacturer's instructions.

4. **Connect Gas Supply to Mixer.**

During test firing the field gas supply will be connected to the pilot mixer [Figure 2 B]. See section 8.

8 Test Firing

It is recommended to follow the procedure below during site install and commissioning.

1. Inhibit Gas Flow to the Pilot.

- It is recommended to verify ignition by following the steps below, prior to introducing the gas supply.

2. Energize High Energy Igniter.

- Energize the power supply to the high energy igniter from the controlling PLC.
- When powered, the red LED shall illuminate and be visible through the window of the explosion proof housing.
- If the LED is not illuminated, verify 24VDC or 120VAC supply across the PHE Terminals. If the LED will not illuminate with power supplied, contact Unifire support.

Note that some PLC's may run self-check diagnostics that result in a faint intermittent glow of the PHE LED when powered off. This should not be confused with the fully illuminated energized state of the igniter.

3. Verify that sparking commences at the Igniter Probe.

- Sparking should commence immediately upon supply of power at approximately 2 / 3 Hz for 30 seconds, pause then repeat. (24V variants for 40 seconds).
- A snapping/ticking sound should be heard inside the Riser Pipe.
- If a spark fails to generate de-energize the power supply and allow the unit to discharge for 30 seconds before checking wiring.
- Check for continuity between the riser pipe and igniter "G" terminal. If no continuity there is likely a "bad" ground.
- Check for at least 1 MΩ resistance between IGN and G terminals of the high energy igniter. Shorting G and IGN terminals will prevent sparking at the ignition tip.
- If wiring appears OK but there is still no audible ignition snap/tick carefully remove the UV scanner (if supplied) and look up the riser pipe. The spark should be visible.



ENSURE THE GAS SUPPLY REMAINS INHIBITED / BLOCKED IN AS THE PILOT MAY BACKFIRE DOWN THE RISER TUBE.

- If no spark is detected contact Unifire service for further support.

4. If the Igniter Probe successfully sparks, switch the power off.

5. Connect fuel supply to the Pilot Mixer (1/2" FNPT).

- For testing firing it is recommended to use a temporary supply (e.g. propane bottle).

- Connect the propane bottle to the pilot mixer.
6. **Open the valve on the propane.**
 7. **Energize the High Energy Igniter.**
 - Verify Sparking.
 - Pilot should ignite immediately, flame shall be visible through the appliance viewport.
 8. **If the Pilot successfully lights.**
 - Pilot flame may appear to lift off of the pilot tip during sparking and initial combustion (this is normal).
 - De-energize the power supply to the high energy igniter, pilot flame shall latch on to the pilot tip and remain stable.
 - Verify that the flame safeguard is “seeing” the flame. Refer to manufacturer’s instructions for verification method.
 9. **Close the valve on the propane.**
 - The Pilot shall go out.
 - Verify that the flame safeguard (if supplied) detects the loss of flame and de-energizes the status output.
 10. **If the Pilot fails to light.**
 - If no flame is visible, verify that there is sufficient fuel pressure (see specifications & ratings).
 - If fuel pressure is OK, verify that the mixer orifice is not clogged inhibiting fuel flow to the mixer.



DO NOT DRILL OUT THE ORIFICE OR USE A DRILL BIT TO CLEAR A BLOCKAGE, THIS COULD NEGATIVELY IMPACT THE ORIFICE SIZING AND PERFORMANCE OF THE PILOT BURNER.

- Remove mounting flanges and nipples (if installed) from the rear of the pilot mixer. This will expose the orifice which may be cleared by inserting a thin wire through the orifice.
 - Alternatively, using a ¼” Hex key remove the orifice and immerse in a solvent to clean out debris. Note, the mixer wheel will also separate from the orifice during removal.
 - If blockage cannot be cleared contact Unifire sales for replacement.
- If fuel flow is OK, verify that mixer plate is dialed out such that sufficient air flow is available to the venturi.

- Verify that the mixer arms are not bent and that the mixer and orifice appear centralized on the fuel flow means. Any deviation from center may negatively affect the pilot fuel/air mixture flow. Replacement mixer assemblies are available from Unifire sales.
- Verify no other obstructions are present in the mixer or upstream valves (ice, dirt etc).

The pilot burner has now been test fired. If successful the field fuel supply can be connected to the mixer and pilot can be put into operation. Any apparent issues with combustion stability should be directed to the Unifire support team for resolution.

9 Serviceable Components

The following parts (Figure 3) are available for field replacement by contacting the Unifire sales team.

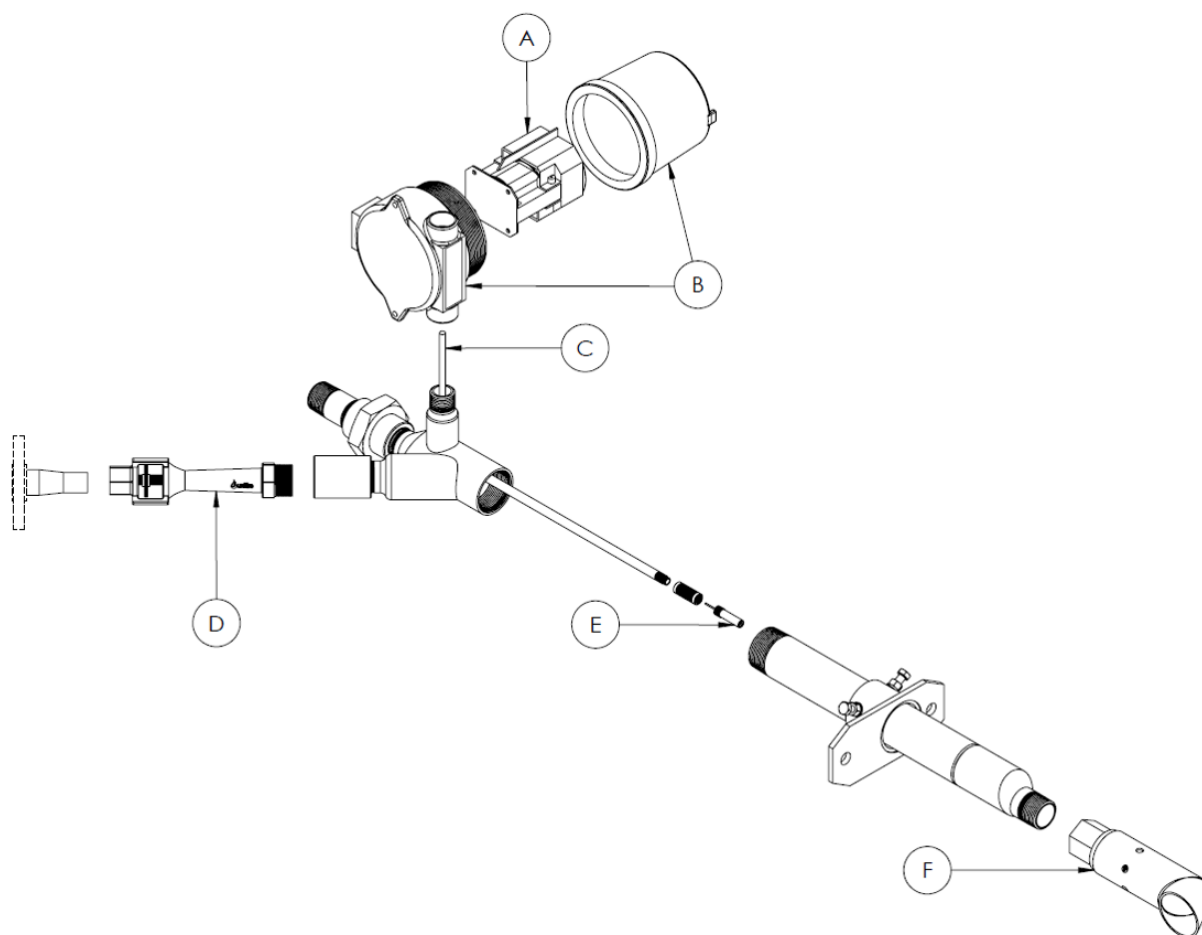


Figure 3 – Serviceable Components

Part Number	Description
A P-10000001(24V) P-10000002(120VAC) P-10000003(240VAC)	High Energy Ignition Module
B C-10000020-00	Killark Custom Explosion Proof Enclosure
C C-10000016-00	High Voltage Ignition Cable
D C-10000031-00 MIXER-00000775	Pilot Mixer 1" 1in Cast Pilot Mixer Orifice
E P-10000000-01	High Voltage Ignition Tip (Adaptor C-10000018-00)
F C-10000055-01	Pilot Burner Tip

* Ignition tip and cable assemblies are available pre-assembled for your specific pilot (Part# Y-10001-00).

[End of Manual]