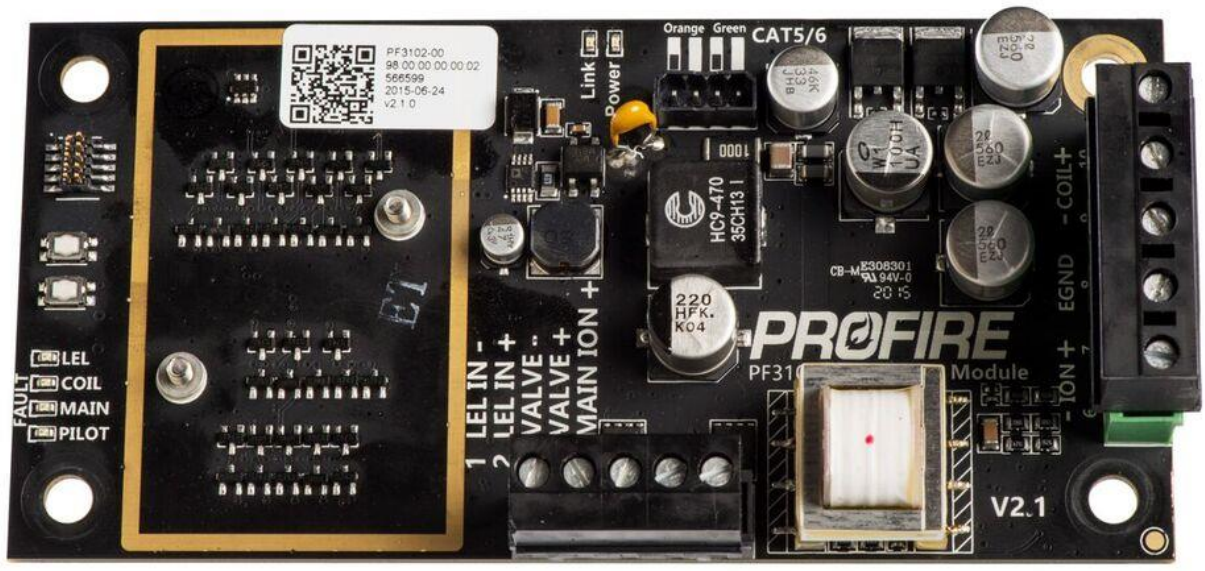
PROFIRE PF3100 Ion Pilot Card

PF3102-00



The PROFIRE PF3100 Ion Pilot card is an igniter and uses ionization to detect flame.

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1. Introduction

Functional Description

The PROFIRE PF3100 Ion Pilot card is used to generate a spark to ignite a pilot burner and to detect the flame of both a pilot and main burner. This card is powered through the PFRN network via a controller or network card (a BMS controller card, or a Network card).

Model Types

Model Number	Name	Description
PF3102-00A	Ion Pilot Card - Zone 1	Aluminum enclosure.

2. Certifications

PROFIRE strives to ensure that certifications are updated as quickly as they become available for all of our products.

Ion Pilot Card - Hazardous Location Rating

Certification: Class I, Div 1, Grp BCD; T6, IP66, Type 4
IEC 61508 SIL 2, CSA 22.2 No. 60730-2-5, UL 60730-2-5.

The board includes the following symbols:

 Caution: possibility of electric shock.

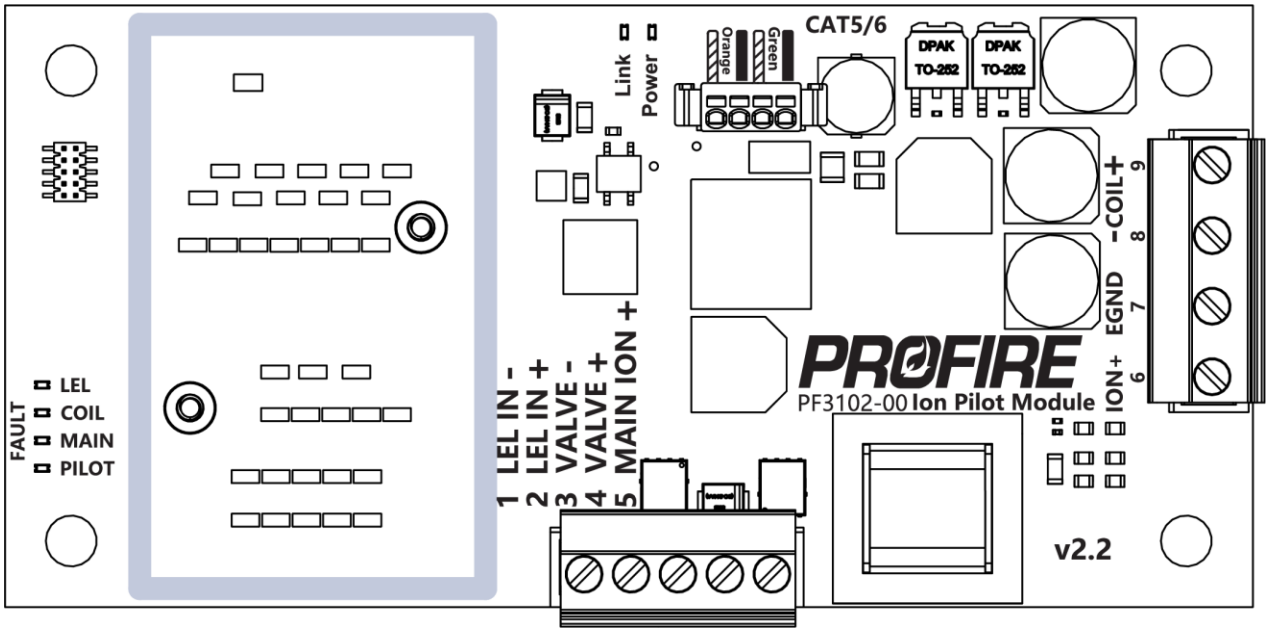
 Caution: documentation must be consulted in all cases where this symbol is marked.

3. Card Information

Card Specifications

The ambient temperature rating for the Ion Pilot Card is -40°C (-40°F) to +60°C (+140°F).

Card Diagram



Terminal Specifications

Terminal Number	Terminal Name	Expected Connections	Input/Output	Safety Rated	Electrical Ratings	
					Voltage	Current
1	LEL In -	*Connect to an external LEL sensor (4-20mA or dry).*	*Digital/4-20mA Input*	*Yes*	0-15 VDC	25mA
2	LEL In +		*12/24VDC Power Output*	*Yes*	12 VDC	50mA
3	Valve -	*Connect to Pilot Valve terminal . Do NOT connect to ground.*	*Powered Output*	*Yes*	0-12 VDC	1A
4	Valve +	*Connect to Pilot Valve terminal 1.*	*Powered Output*	*Yes*		
5	Main Ion +	*Connect to main flame rod.*	*Flame Ionization Input*	*Yes*	200 VAC	10mA
6	Ion +	*For a dual rod configuration: connect to the pilot flame rod. For a single rod configuration, connect to the Ion + terminal of the coil (red wire).*	*Flame Ionization Input*	*Yes*	200VAC	10mA
7	EGND	*Earth Ground and Enclosure Ground*	*Ground*	*N/A*	*N/A*	*N/A*
8	Coil -	*Connect to the primary winding of the ignition coil (black wire).*	*Coil Drive Output*	*Yes*	*N/A*	*N/A*
9	Coil +	*Connect to the primary winding of the ignition coil (white wire).*	*Coil Drive Output*	*Yes*	14 VDC	360mA

Terminal Descriptions

Main Ion, Pilot Ion

Connect each of these inputs to a Kanthal flame rod placed directly in the pilot/main flame. The pilot and main nozzles must be grounded for the flame detection to function properly. These inputs are protected from high voltage, and can be connected in series with the high voltage terminals of an external ignition coil; this allows a single flame rod to be used for both pilot ignition and pilot flame detection. A 65 VAC (voltage AC) signal is applied to the flame rod. The source impedance is very high, so there is no danger of sparking during detection.

Coil

Connect the primary terminal of the ignition coil to these terminals. A 12V pulsed DC signal is applied by the card to the coil. This output is protected by a 250mA thermal fuse.

LEL In

This input can be connected to an optional LEL (Lower Explosive Limit) sensor to detect explosive gas concentrations in the burner housing. The input can be configured in software to be disabled, to require an LEL switch, or to require an LEL 4-20mA transmitter. The system will not start if the contact is open, or if the

4-20mA LEL input is above the trip point. It also has Aux In capability and can be used for thermocouple flame detection.

Valve

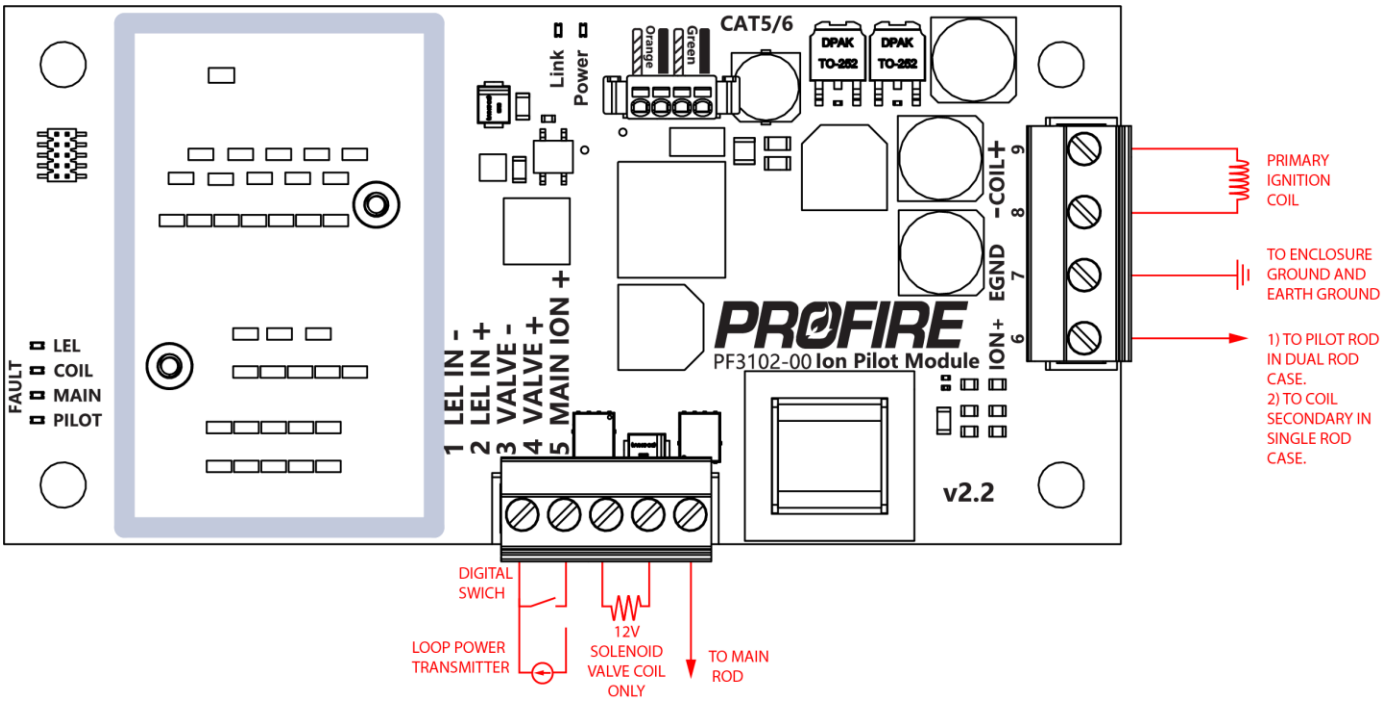
Solenoid valves must be connected between the positive and negative terminals. The negative terminal is NOT directly connected to ground. This output is driven by 12V and will only work with 12V solenoid valves.

EGND

This terminal must be connected to the same earth ground as the pilot and main burner assemblies. Modules come pre-wired with a connection to the enclosure ground lug, which must be connected to earth ground.

4. Wiring Diagram

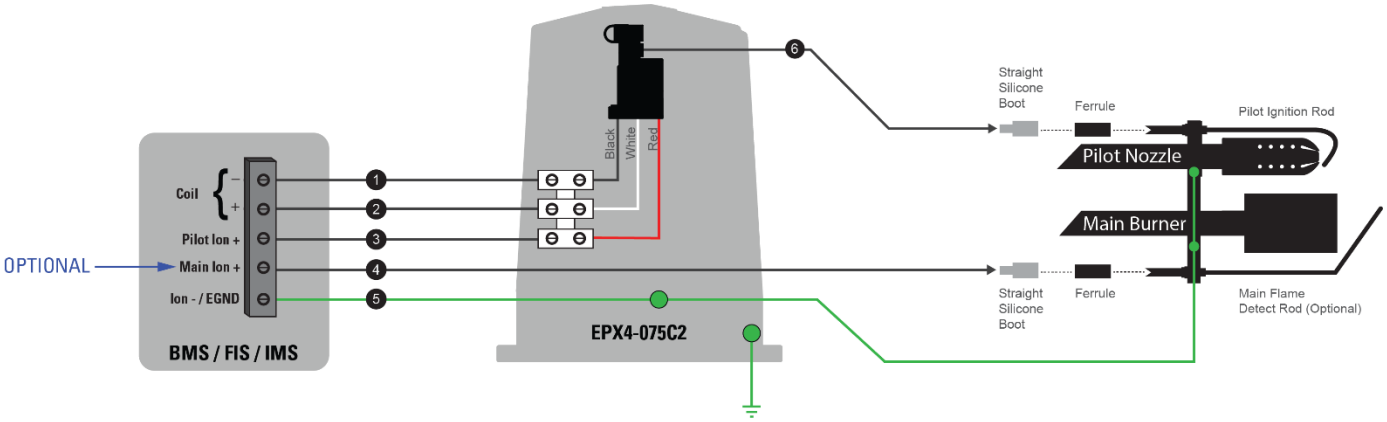
General Wiring Diagram



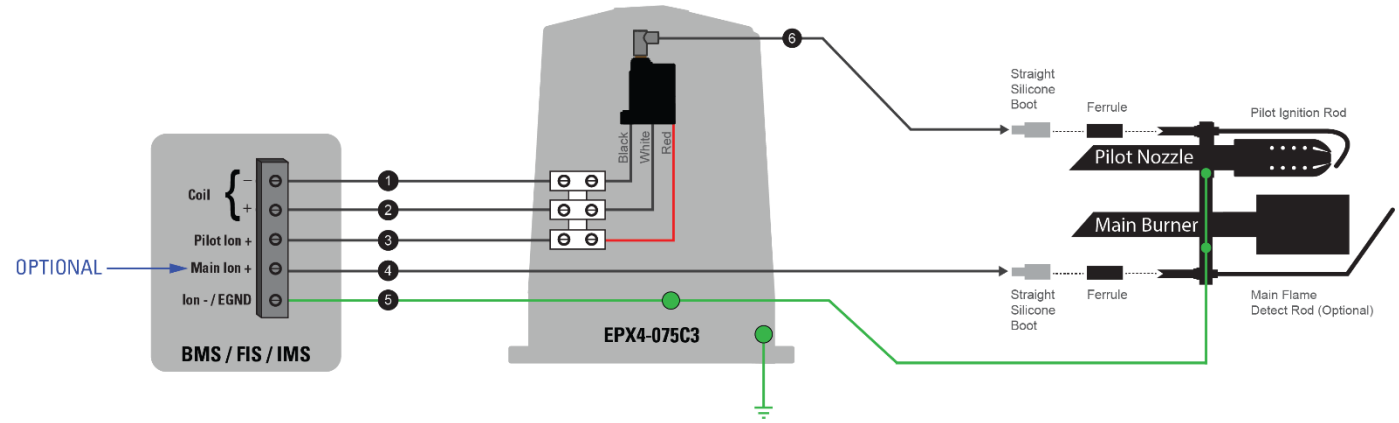
Single Rod Pilot Wiring

The single rod pilot configuration is used for a single rod for flame detection and pilot detection.

Older Model with Gen 2 Coil



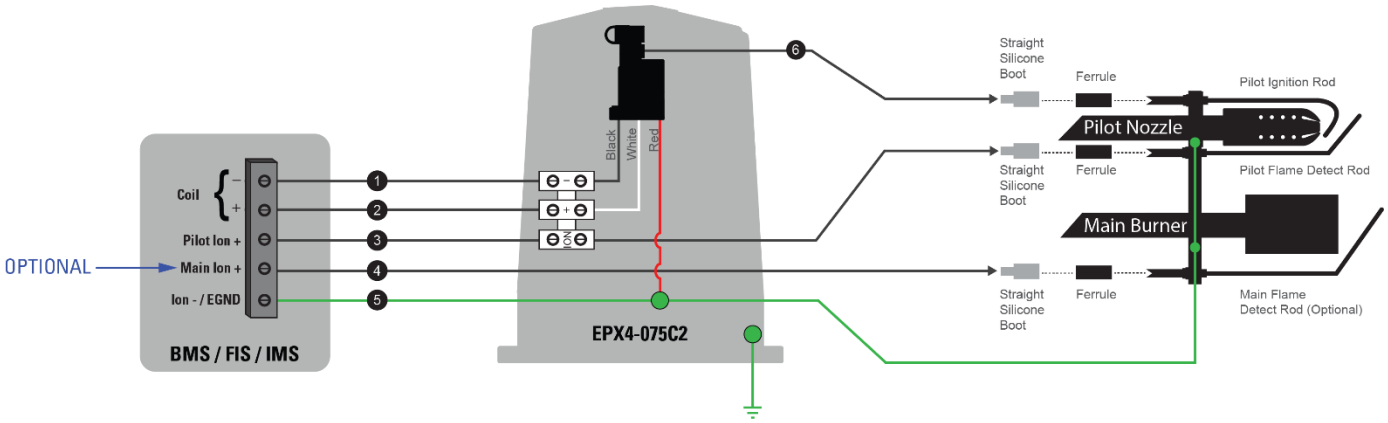
Newer Model with Gen 3 Coil



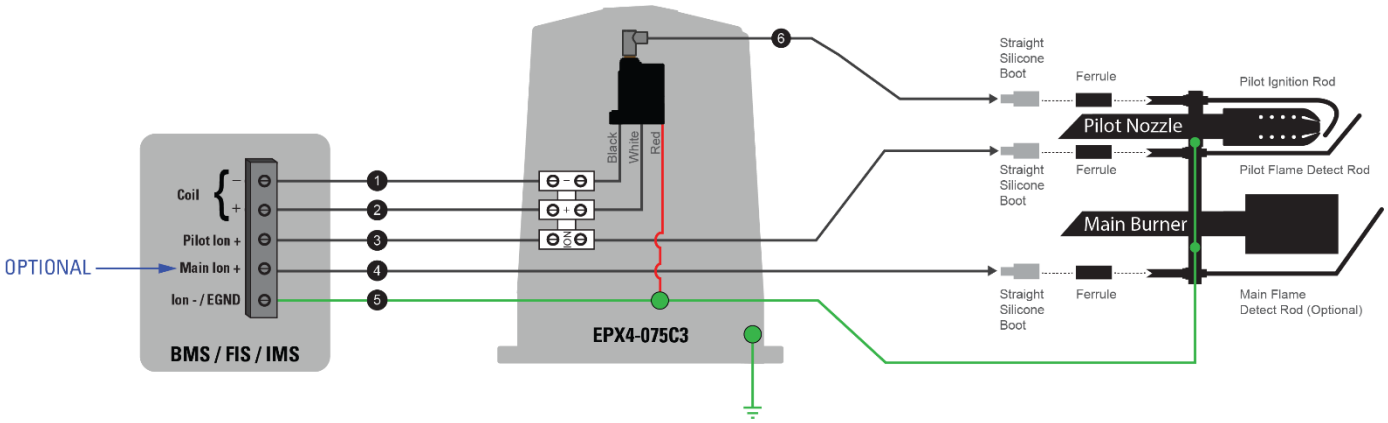
Dual Rod Pilot Wiring

Dual rod configuration is used when two separate rods for pilot ignition and flame detection are used.

Older Model with Gen 2 Coil



Newer Model with Gen 3 Coil



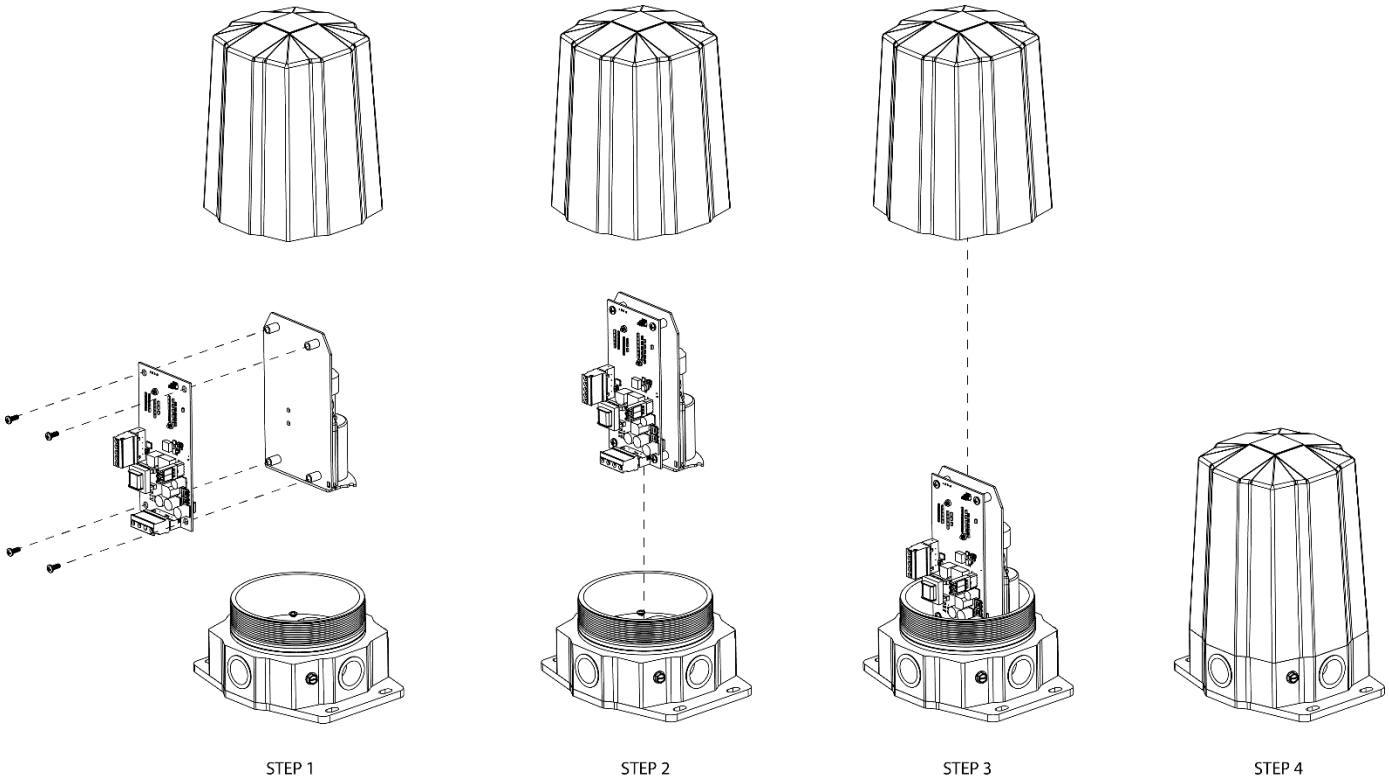
Wiring Specifications

Wire Location	Connection Description	Wire Type and Minimum Gauge	Maximum Length
5	Board to Main Flame Detect Rod	7mm (0.25 inches) ignition wire	Wire should be limited to 3 meters (10 ft).
6	Board to Pilot Flame Detect (Dual Rod Pilot only)	7mm (0.25 inches) ignition wire	Wire should be limited to 3 meters (10 ft).
7	Board to Burner	14 AWG	Wire should be limited to 3 meters (10 ft).
10	Coil to Pilot Ignition Rod	7mm (0.25 inches) ignition wire	Wire should be limited to 3 meters (10 ft).

5. Mounting Instructions

Mounting the Card in the Enclosure

1. Install four (4) #10-32 screws through the Ion Pilot card (as indicated in the image below) and attach them to the upper set of enclosure stand-offs. Please note the board orientation.
2. Torque to 26 in*lb.



6. Enclosure Specifications

The Ion Pilot card is mounted in the EPX enclosure

Specifications	EPX Enclosure
Dimensions	*Top Width 11.7cm (4.61 inches)* *Base Width 16.8cm (6.63 inches)* *Height 21.7cm (8.53 inches)* *Depth 13.3cm (5.25 inches)*
Hazloc Rating	*Class I, Div 1, GRP BCD, Type 4x; Class I, Zone 1, Aex d IIB + H2 T6 Gb; Ex db IIB + H2 T6 Gb, IECEx*
Mounting	*Channel Bar or Direct Mount*
Enclosure Construction	*Aluminum*
Operating Temperature	*-40°C (-40°F) to 60°C (140°F)*
Storage Temperature	*-40°C (-40°F) to 60°C (140°F)*

7. Instructions for Use

The Ion Pilot card is designed to be used with the PF3101-00 BMS controller card as part of the PF3100 platform.

Operation

Operating controls and their uses are described under “Terminal Descriptions” above.

8. Preventative Maintenance & Inspection

In order to ensure that the Ion Pilot card works correctly and efficiently, the following maintenance and inspection procedures should be followed:

- Ensure that all wires are connected correctly.
- Minimize copper wire exposure.
- Check for corrosion and ensure that no wires are frayed or worn, and all insulation is intact.
- Confirm no moisture or condensation is apparent on the board or in the enclosure.
- Ensure that the board does not show any sign of mechanical damage (e.g. – damage from an impact such as dropping an item).
- Check that the board does not show any sign of electrical damage (components should not be burnt or damaged in any way).
- Confirm that the temperature of the board is within ambient temperature operating limits.
- Check that the enclosure is secured and that the device is not subject to excessive vibration.
- Routine inspections of all equipment should be performed. If any abnormality is found, corrective actions should be taken. If the abnormality cannot be corrected, contact PROFIRE.
- A qualified technician should perform any tests necessary to confirm that the equipment is still in a safe condition.
    - Ensure power LED is lit (blue)

- Ensure link LED is lit (green)
- Disconnect ignition wire from coil and measure from ignition wire to EGND to ensure there is no continuity.
- With the ignition wire disconnected, measure from ION+ to EGND in volts AC. A functional board will have a measurement between 17-38 VAC.
- Plug the ignition wire back into the coil and repeat the prior test. This test should show the same readings as before. If not, there is a short between the ignition wire or rod and EGND.

Cleaning

If the card becomes dirty it can be cleaned with compressed air. Do NOT use solvents, cleaners, or liquids to clean the board. Caution must be exercised when cleaning the board in order to prevent damage from ESD (electrostatic discharge).

Replacement Parts

Please contact PROFIRE should any replacement parts be required.

9. Important Safety Information

Before installing the PF3100 Ion Pilot card, please review the list of warnings below. Product use in a manner not specified by PROFIRE is not recommended. Failure to observe the following warnings may result in death, electrocution, property damage, product damage, product damage, government fines, or malfunction of the product itself.

WARNING: Explosion Hazard

- Do not disconnect while circuit is live unless area is known to be non-hazardous or equivalent.
- Substitution of components may impair suitability for specified zones.
- Do not service unless the area is known to be non-hazardous.
- Do not open when energized.
- Installation and use must conform to the directions in this guide.
- System must be properly connected to earth-ground for effective operation of flame detection circuitry.

Installation Warnings

- Ensure that the PF3100 enclosures are securely closed each time after opening the enclosure. This protects the internal circuitry from moisture damage and other environmental concerns. Moisture damage is not covered by the product warranty.
- Do not connect wires or handle the device when powered.
- Properly fuse the board according to local codes.
- Do not disassemble or modify the board in any way. The board is not field repairable and must be sent back to PROFIRE for replacement if damaged.
- Check the spark gap for the igniter. Optimally it should have a spark gap around 1/4”.

- There is a high potential for electric shock due to the high voltages of the ignition coil. The Coil + and Coil – terminals, as well as the Ion+ and the secondary of the ignition coil all pose this risk.

10. PROFIRE Contact Information

If you have any concerns or questions about this product, please contact PROFIRE as follows:

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