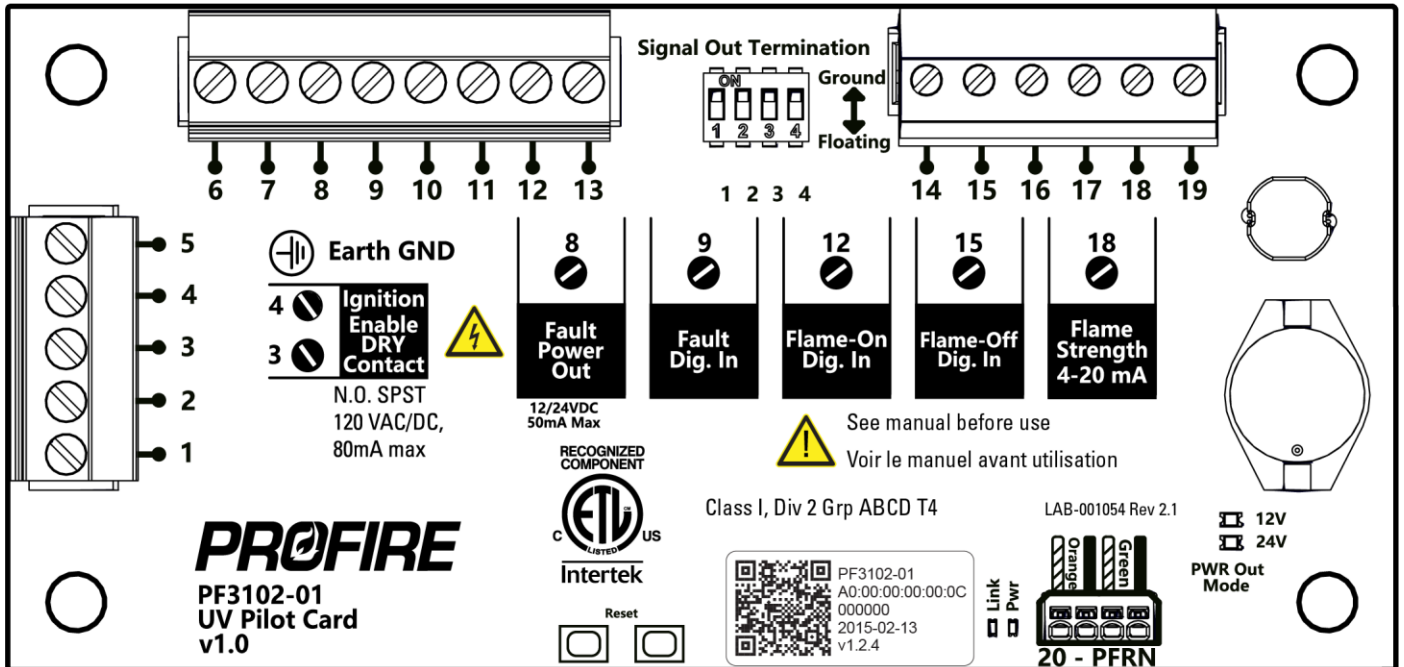


# PROFIRE PF3100 UV Pilot Card

## PF3102-01



The PROFIRE PF3100 UV Pilot Card allows the use of an optical flame detector with the PF3100 system.

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## 1. Introduction

### Functional Description

The PROFIRE PF3100 UV Pilot Card is designed to detect flame via an optical flame detector. It also includes the ability to control an external ignition source via an on-board relay.

The function of this module is to relay UV flame scanner information to the BMS for flame detection purposes. It is intended to be used with a self-checking UV flame scanner (e.g. – Fireye 65UV5).

### Model Types

Model Number	Name	Description
PF3102-01	UV Pilot Card	PCBA (Card) - Circuit Board Assembly with Firmware

## 2. Certifications

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

### UV Pilot Card - Hazardous Location Rating

Certification: Class I, Div 2, Groups A, B, C, D, T4 [CSA C22.2#213:2016 Ed.2]

IEC 61508 SIL2, CSA C22.2#61010-1:2012 Ed.3

UL61010-1:2012 Ed.3+R:29Apr2016

ISA 12.12.01:2016 Ed. 7



The board includes the following symbols:



Caution: possibility of electric shock.



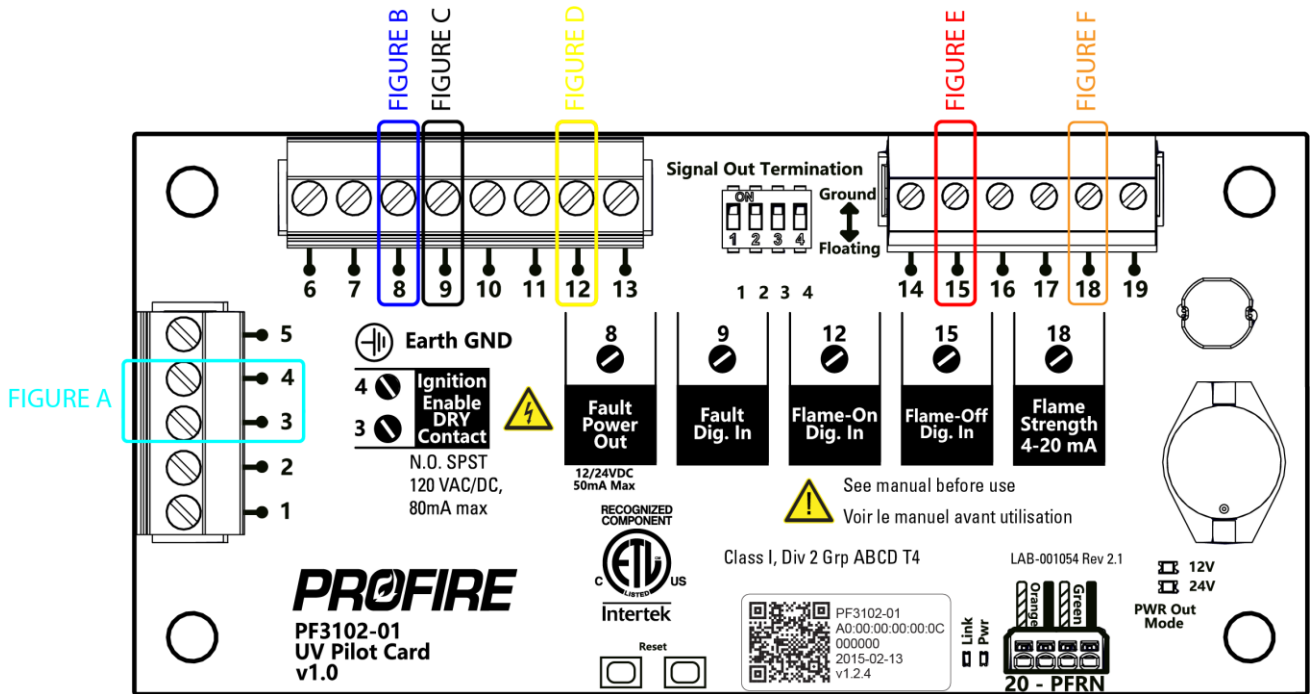
Caution: documentation must be consulted in all cases where this symbol is marked.

## 3. Card Information

### Card Specifications

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

### Card Diagram



### Terminal Specifications

PIN			I/O	Description
Name	No.	Fig.		
Ignition Enable (N.O. Dry Contact)	3-4	A	O	Dry Output - 120 VAC/VDC, 80mA Max
Fault Power Out	8	B	O	Power Output - 112/24 VDC, 50mA Max
Fault Digital In	9	C	I/O	Digital Input 30 VDC, 25mA Max
Flame On Digital In	12	D	I/O	Digital Input 30 VDC, 25mA Max
Flame Off Digital In	15	E	I/O	Digital Input 30 VDC, 25mA Max
Flame Strength 4-20mA	18	F	N/A	4-20mA - 30 VDC, 25mA
PFRN	20	-	I	Power Input/Network Port - 36VDC, 1A Max

*Please note: digital inputs indicated as 30 VDC are rated with a 12/24 VDC limit.*

## Terminal Descriptions

### Ignition Output (Figure A)

Ignition enable is a normally open (NO) contact that closes when the ignition sequence has begun. It will then open when the ignition sequence ends (whether due to a timeout or an alarm). It was designed to drive an igniter via an external relay.

### Fault Power Out (Figure B)

This is the power output to the fault contact.

### Fault Digital In (Figure C)

The fault input is used as an interlock for flame detection. The external contact must always be energized – if this contact becomes de-energized, an alarm will trip in the PF3100.

### Flame-On Digital In (Figure D)

The flame-on signal receives information on flame presence. If the external contact is closed and is opposite in polarity to flame-off, the system will detect this as flame present. If the contact is open and is in the same state as flame-off the system will alarm. If the contact is open and the opposite state of flame-off, the system interprets that as no-flame.

### Flame-Off Digital In (Figure E)

The flame-off signal receives information regarding flame absence. If this contact is open and is opposite in polarity to flame-on, the system will detect this as flame present. If the contact is closed and is in the opposite state of flame-on, the system interprets that as no-flame.

The inverse flame-off and flame-on contacts are implemented to achieve a high degree of safety assurance. This allows the system to read two inputs to determine flame status and to detect any shorts between the lines.

### Flame Strength 4-20mA (Figure F)

This is a 4-20mA signal input that represents flame quality.

### PFRN

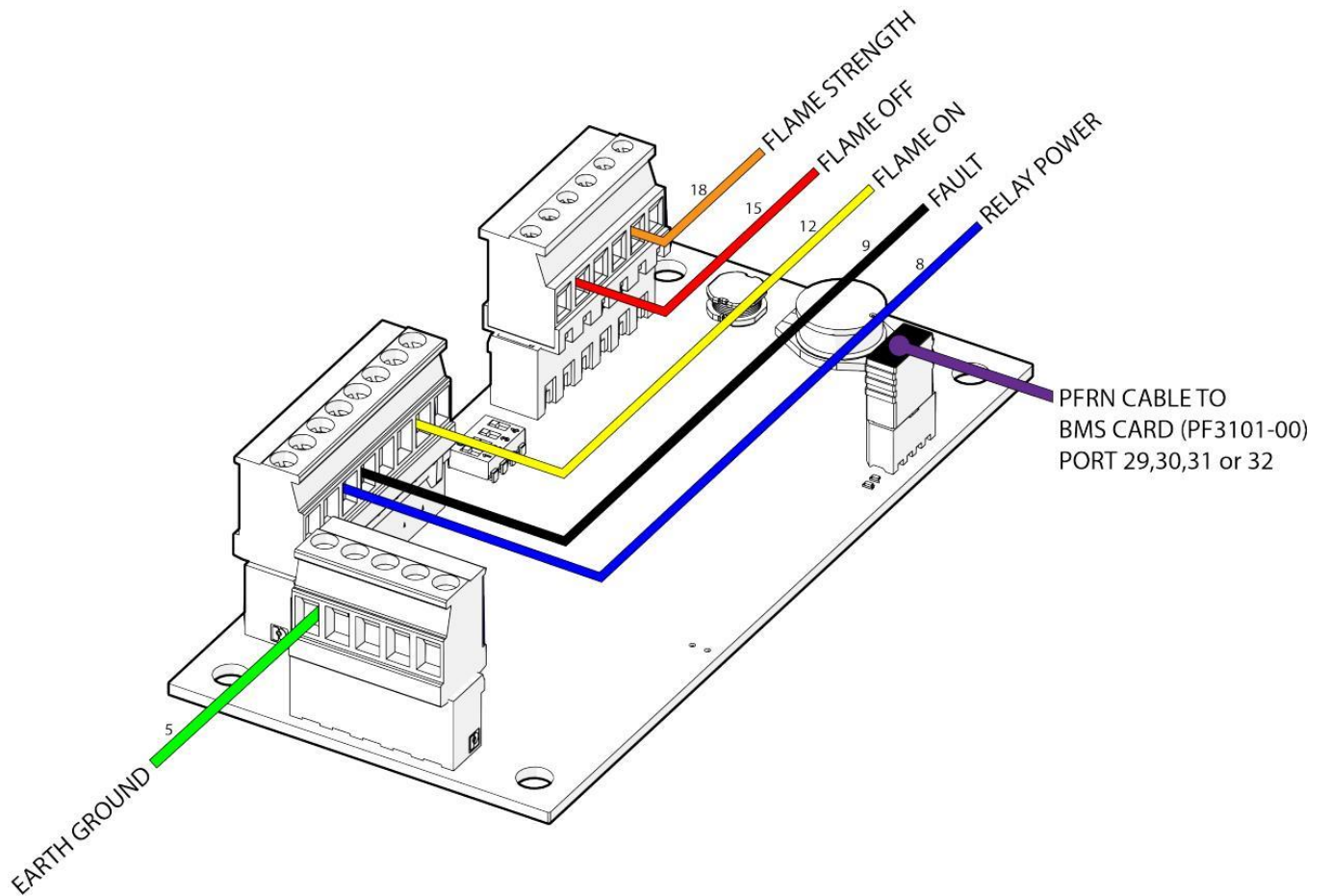
The PFRN port is used to connect the network cable. It is rated 36V, 1A.

### Reset Switches

These switches are not intended for use in normal operations.

## 4. Wiring Diagram

The diagram below indicates how the UV card is connected to the BMS module.



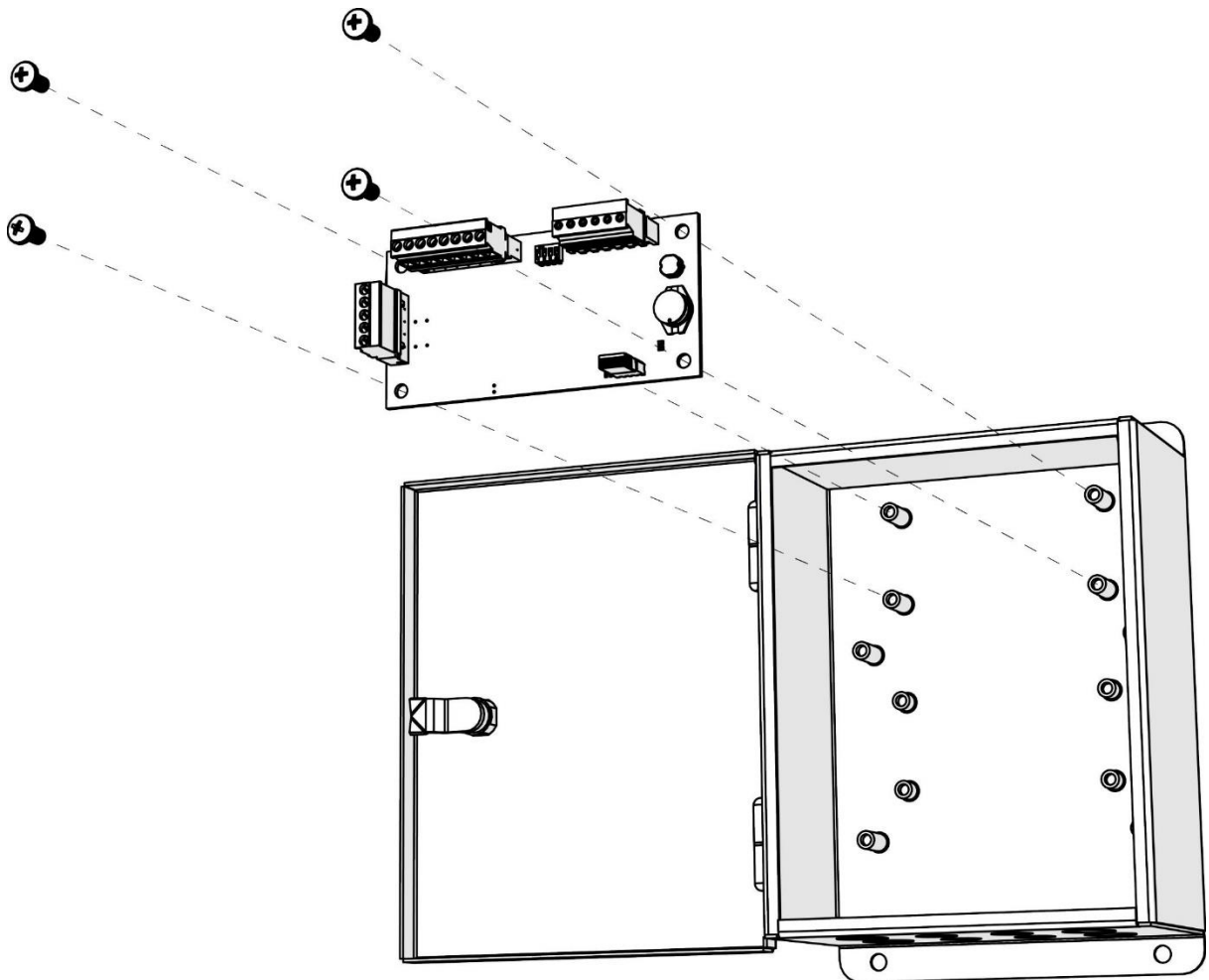
## Wiring Specifications

12-30 AWG can be used for all connections. The PFRN cable must be CAT5 or better. External fuses must be installed according to the local code. Wire gauge size must also be selected in accordance with local codes.

## 5. Mounting Instructions

### Mounting the Card in the Enclosure

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



## 6. Enclosure Specifications

The UV Pilot card can be mounted in a fire-proof enclosure that is safe for the area of operation (e.g. – hazardous/non-hazardous.) The UIX, CTX, and AUX enclosures described below are examples:

Specifications	Enclosure Type		
	UIX	CTX	AUX
Dimensions	Height 30.9cm (12.15 inches) Width 23.4cm (9.23 inches) Depth 13.4cm (5.28 inches)	Height 30.9cm (12.15 inches) Width 23.4cm (9.23 inches) Depth 13.4cm (5.28 inches)	Height 30.9cm (12.15 inches) Width 23.4cm (9.23 inches) Depth 13.4cm (5.28 inches)
Hazloc Rating	Class I Div 2, IP66	Class I Div 2, IP66	Class I Div 2, IP66
Mounting	Channel Bar or Direct Mount	Channel Bar or Direct Mount	Channel Bar or Direct Mount
Enclosure Construction	Poly Painted Steel	Poly Painted Steel	Poly Painted Steel
Operating Temperature	-40°C (-40°F) to 60°C (140°F)	-40°C (-40°F) to 60°C (140°F)	-40°C (-40°F) to 60°C (140°F)
Storage Temperature	-40°C (-40°F) to 60°C (140°F)	-40°C (-40°F) to 60°C (140°F)	-40°C (-40°F) to 60°C (140°F)

## 7. Instructions for Use

The UV Pilot card is designed to be used with a certified BMS controller as part of the PF3100 platform. The only connection to the BMS is the PFRN. External power is not required for the board. Configuration of the card settings are performed on the PF3100 User Interface.

- The only flame scanner that is currently compatible with the PROFIRE UV Pilot card is the Fireye 65UV5 (PROFIRE Part Number – UVS100AAZ). Other scanners may be used, provided that they satisfy the Fault, Flame On, and Flame Off input requirements. The installer must ensure that all flame scanner instructions and safety requirements are fulfilled.
- All DIP switches must be set to ground (GND).

### Operation

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

### Operating Modes

The UV Pilot card is able to operate in four (4) different modes: Flame Detected, No Flame Detected, Fault, and Ignition.

#### Flame Detected

The flame scanner signals that it senses flame.

#### No Flame Detected

The flame scanner signals that it does not sense flame.

#### Fault

The flame scanner signals that it has an internal or external fault.



## Ignition

The UV Pilot card will close the ignition during a BMS ignition sequence. This may be connected to an ignition source such as the PROFIRE Pilot Spark card.

## 8. Preventative Maintenance & Inspection

In order to ensure that this product 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).
- Ensure 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. The board may be tested for correct operation in a safe environment as follows:
  - Confirm that all UV cards are communicating with the system.
  - Disconnect the PFRN connection from the UV card. Confirm that the BMS indicated it has lost communication with it.
  - Start the system and confirm that the ignition contact closes during the ignition cycle.
  - Stop the system and confirm that the ignition contact opens.
  - Check that the Fault Out power is within tolerance of the flame scanner.
  - De-energize the Fault Digital In contact (open it). Confirm that the system faults.
  - Energize the Fault Digital In contact (close it). Confirm that the system clears the fault code.
  - Set both Flame On Digital In and Flame Off Digital In to Open. The system should alarm.
  - Set both Flame On Digital In and Flame Off Digital In to Closed. The system should alarm.
  - Set Flame On Digital In to Closed and Flame Off Digital In to Open. The system should detect flame.
  - Set Flame On Digital In to Open and Flame Off Digital In to Closed. The system should not detect flame.
  - Perform the flame scanner inspection and test instructions for the equipment. (These can be obtained from the manufacturer of the UV scanner being used. If this is not known, please contact a PROFIRE representative for assistance).

### **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).

Ensure that the UV detector is cleaned properly according to the manufacturer's instructions.

### **Replacement Parts**

Please contact PROFIRE should any replacement parts be required.

## **9. Important Safety Information**

Before installing the PF3100 UV 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, 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.

### Other Warnings

- The operator must only use a certified and compatible UV detector (e.g. – Fireye 65UV5) with the UV pilot card.
- To determine compatibility, the UV detector must have a de-energize-to-trip fault contact, as well as dual flame contacts (flame on/off).
- Bypassing or modifying the flame detection circuitry is extremely dangerous and can lead to injury or death.
- Equipment must be housed inside a fire-proof enclosure that is suitable for the environment and can only be accessed with the use of a tool.
- Evaluation for the UV Pilot Card as part of the system assembly is required after final installation.
- Equipment **MUST** be installed with a PF3100 controller.

## 10. PROFIRE Contact Information

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

### U.S.

1.801.796.5127  
321 South, 1250 West Suite 1  
Lindon, UT  
84042, USA

[solutions@profireenergy.com](mailto:solutions@profireenergy.com)

### CANADA

1.780.960.5278  
Box 3313, Bay 12, 55 Alberta Ave  
Spruce Grove, AB  
T7X 3A6, Canada

[solutions@profireenergy.com](mailto:solutions@profireenergy.com)

<http://www.profireenergy.com/>