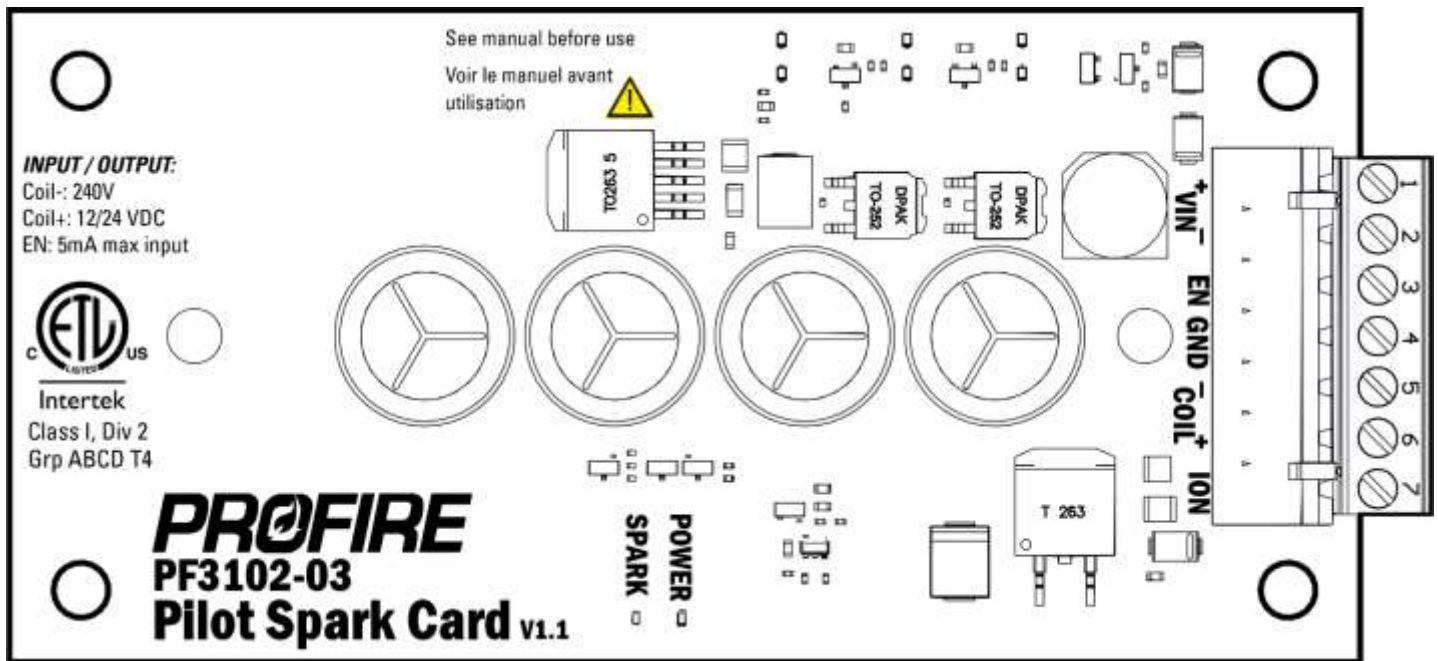


PROFIRE PF3100 Pilot Spark Card

PF3102-03



The PROFIRE PF3100 Pilot Spark Card is designed to work as an igniter, and should be used with either an Ion Pilot or UV card.

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1. Introduction

Functional Description

The PF3100 Pilot Spark Card is designed to work with an external ignition coil as an ignition source. A digital logic signal passed to the card enables it to ignite. This signal will typically be provided by the spark enable outputs on the UV Pilot Card. This card does not have firmware; it is a hardware-controlled device only.

Model Types

Model Number	Name	Description
PF3102-03	Pilot Spark Card	PCBA (Card) Circuit Board Assembly

2. Certifications

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

Spark 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 symbol:



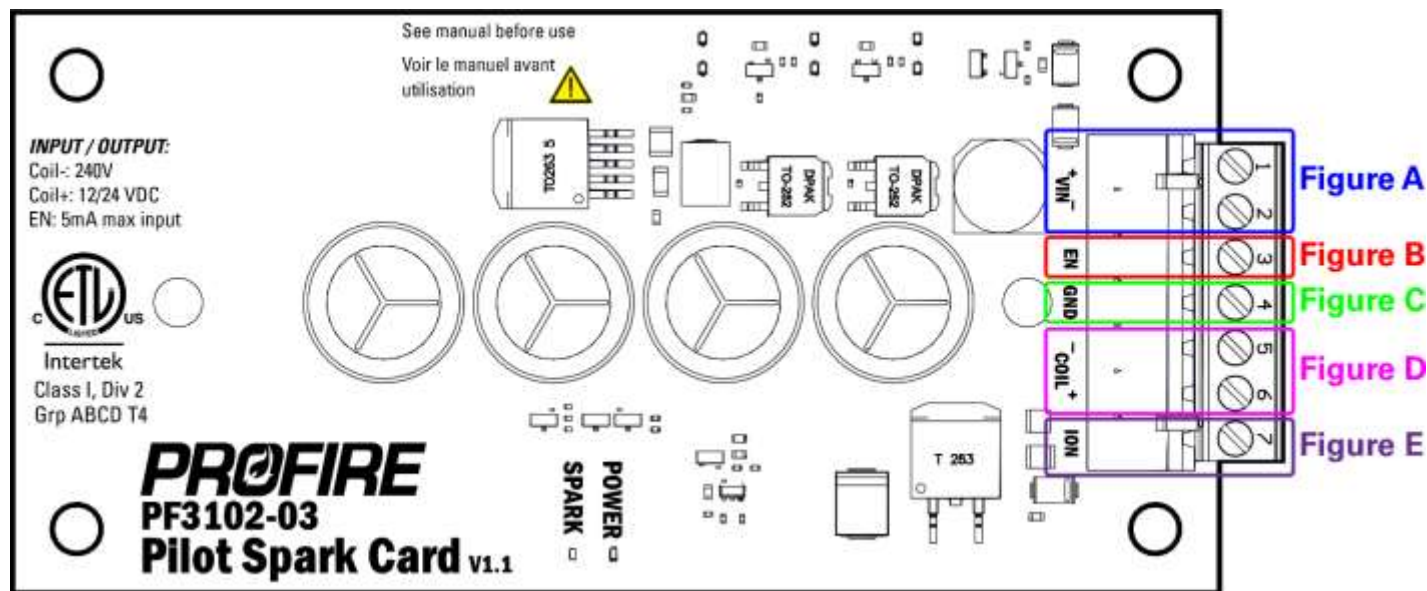
Caution: documentation must be consulted in all cases where this symbol is marked.

3. Card Information

Card Specifications

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

Card Diagram



Terminal Specifications

Name	PIN		I/O	Safety Rated	Description
	No.	Fig.			
VIN	1-2	A	I	No	Power Input - 12/24 VDC, 2A Max
EN	3	B	I	Yes	Signal Input - 12/24 VDC, 5mA Max input
GND	4	C	N/A	No	Earth Ground
Coil -	5	D	I	Yes	Coil Return- 240VAC/0.1A DC AVG, 2A peak, 5% duty. The switching frequency of this terminal is 42.5 Hz.
Coil +	6	D	O	Yes	Coil Output - 12/24 VDC, 2A Max
Ion	7	E	N/A	No	Coil Ground

Terminal Descriptions

Power

This card requires either a 12VDC or 24VDC input supplied from a power supply with a minimum of 2A available. The card should be fused according to local codes, and wire gauge selected.

The main power path has an internal PTC that will trip at 2.2A, however this is not sufficient for fusing the card.

External Coil

The Pilot Spark Card is designed to work with PROFIRE XFR ignition coils. Other coils may be used if they match the switching criteria and current capabilities of the spark board. For technical timing information, please contact a PROFIRE representative.

Ignition Enable

A single input is used to control the enable. The board does not have any BMS logic of its own, therefore it is expected to be used with a safety certified BMS system when required.

In other general-purpose applications (e.g. – as a flare stack ignitor) the device may be wired to spark continuously or be controlled by a PLC or manually by an operator.

Status Indication

Two status LEDs are on the device. The power LED is on when the board has power at the VIN contacts. The spark LED is ON when coil+ has power and the system is sparking.

Coil + Terminal

The coil + terminal has large bulk capacitance to supply instantaneous current for switching the coil. A 2.2A trip (1-amp hold) PTC protects the card (transistors and traces) in the case of a sustained output short to ground.

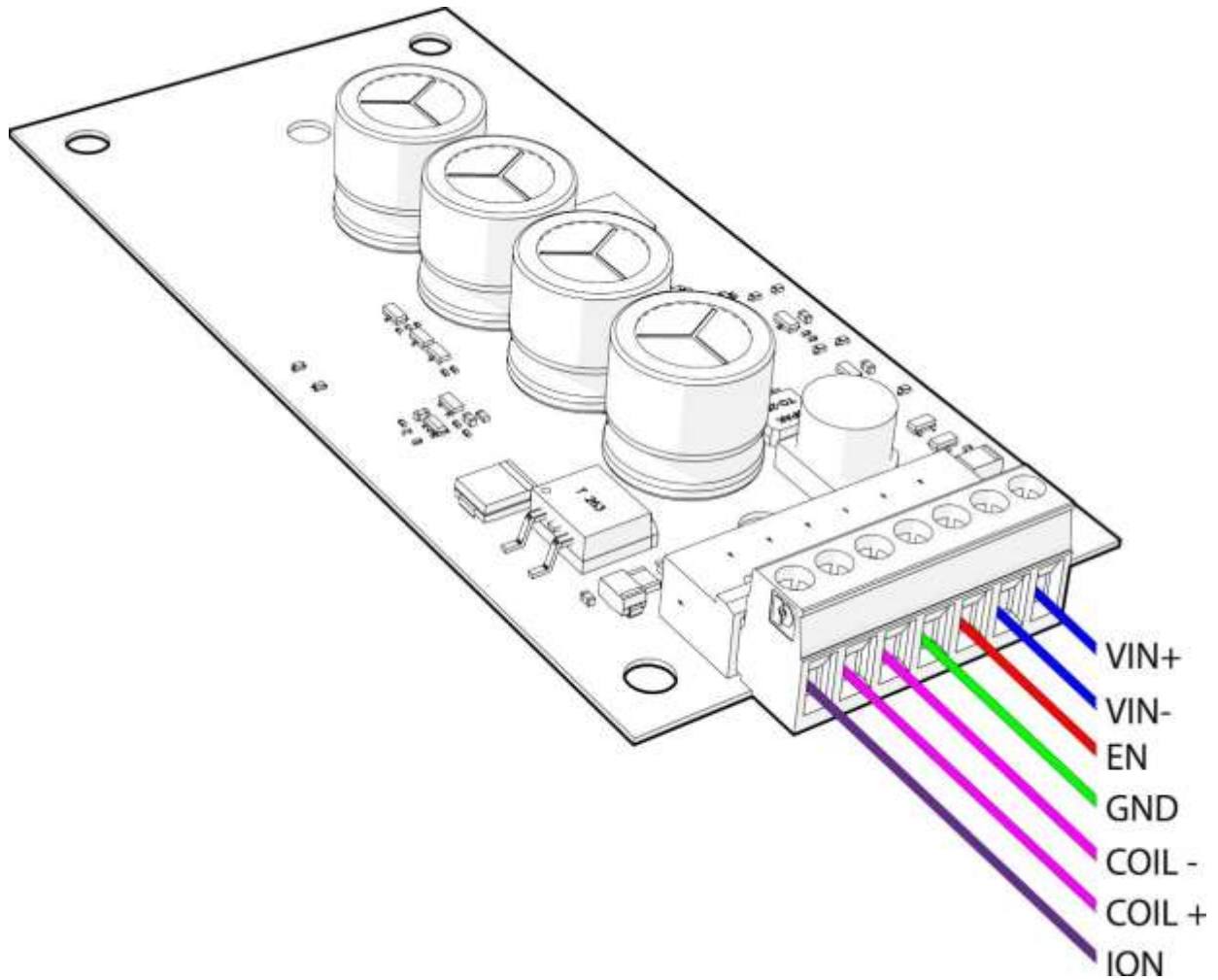
Coil- Terminal

The switching is controlled by a PWM IC set to a static frequency and duty cycle. When coil - is grounded, current flows through the ignition coil from coil +. When coil – goes high impedance, the ignition coil inductance increases the secondary coil voltage up to 40kV if the XFR coil is utilized.

Reset Switches

These switches are not intended for use in normal operations.

4. Wiring Diagram



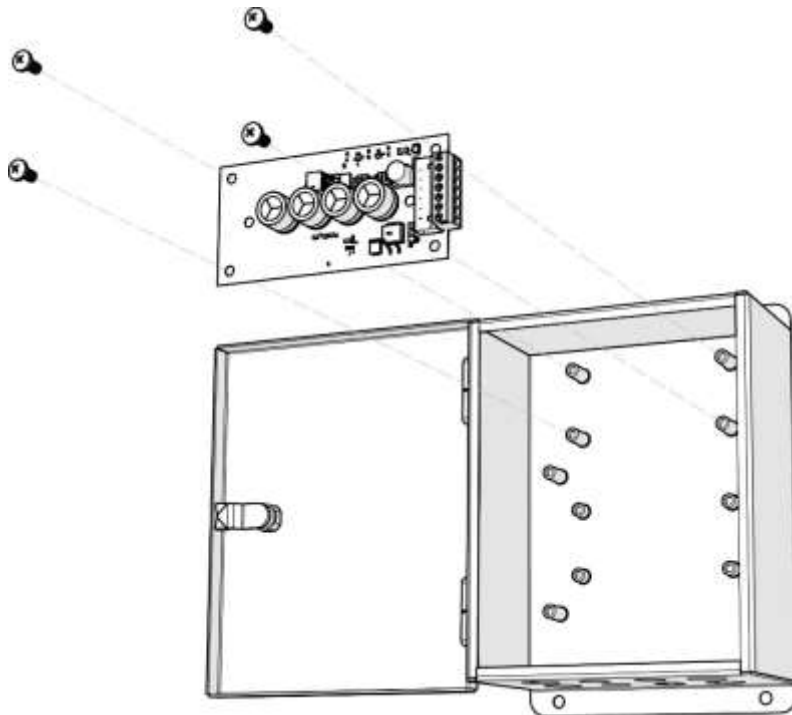
Wiring Specifications

12-30 AWG can be used for all connections. 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 Pilot Spark 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 Pilot Spark 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 EPX enclosures described below are examples:

Specifications	Enclosure Type		
	EPX	CTX	UIX
Dimensions	Height 21.6cm (8.53 inches) Width 16.8cm (6.62 inches) Depth 13.6cm (5.36 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 1, GRP BCD, IP66, Type 4X	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	-50°C (-58°F) to 135°C (275°F)	-40°C (-40°F) to 60°C (140°F)	-40°C (-40°F) to 60°C (140°F)
Storage Temperature	-50°C (-58°F) to 135°C (275°F)	-40°C (-40°F) to 60°C (140°F)	-40°C (-40°F) to 60°C (140°F)

7. Instructions for Use

The Pilot Spark card is designed to be used with a certified BMS controller as part of the PF3100 platform. The Spark card is most commonly controlled by the UV Flame Card.

- Connect the Pilot Spark card to the UV Flame card as indicated by the wiring diagram in Section 4 above.
- Maximum run length is 50 feet.
- Recommended run length of 30 feet or less.
- The Pilot Spark card can also operate with a 12VDC supply, except with a reduced run length of 3 meters (10 feet).
- Power supply must be capable of a minimum of 2A output.
- Spark gap is recommended to be between 1/8” to 1/4” dependent on run length.
- Can use with 24VDC battery bank for solar applications
- Can use in continuous sparking operation or ON/OFF control with external signal.
- The Pilot Spark Card is intended for use with Profire XFR coil.

Operation

Operating controls and their uses are described in Terminal Descriptions above.

Operating Modes

The Pilot Spark card can operate in two (2) modes: Spark Enabled and Spark Disabled. When the board does not have power, the system will not spark.

Spark Enabled

When the board is powered and the enable pin is high, the board will power the coil to spark.

Spark Disabled

When the board is powered and the enabled pin is low, the board will disable the coil and will not spark.

8. Preventative Maintenance & Inspection

In order to ensure that this product works correctly and efficiently, the following routine maintenance and inspection procedures should be followed:

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

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

The terminal block connector can be replaced and is available to order from a PROFIRE representative. Please see PROFIRE Contact Information below for details.

9. Important Safety Information

Before installing the PF3100 Pilot Spark 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

- A commissioning procedure should be followed in order to ensure that the board is operating correctly. When in a non-hazardous environment, power up the Pilot Spark card and verify that the “enable” input successfully initiates sparking when the input is high and stops sparking when the input is low.
- Check the spark gap for the igniter. Optimally it should have a spark gap around 1/4”.
- 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 Pilot Spark 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:

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