IMO

FireRaptor

Solar Panel Rapid Shutdown Solution

Keeping Solar Safe

FireRaptor

PATENT
PENDING

Solar Panel Rapid Shutdown & Alarm

- Manual Panel Shutdown to 0V Operated from Ground Level
- Automatic Panel Shutdown to 0V at >85°C (185°F) Temperature
- Automatic Panel Shutdown to 0V on External Power Loss
- Hardwire or Mobile Communication Alarm Signalling
- Compliant with NEC 2017
- Suitable for New Installations or Retro-Fit

FireRaptor Overview

The IMO FireRaptor provides three forms of Solar Panel Rapid Shutdown to ZERO VOLTS in case of fire or other emergency:

- **MANUAL EMERGENCY SHUTDOWN**

Manual shutdown is operated via an Emergency Rapid Shutdown Switch utilising a typical “one push” large emergency push button. The switch can be conveniently located anywhere for emergency access and is supplied with a 24VDC power supply to interface with the FireRaptor units.

- **AUTOMATIC EMERGENCY TEMPERATURE SHUTDOWN**

Automatic shutdown occurs via the temperature sensor onboard the FireRaptor detecting an ambient temperature rise in excess of 85°C (185°F). In the event that the temperature exceeds 85°C (185°F) the FireRaptor will act to shut-down the PV panels as follows:-

FRS-01 - Shuts down the panels connected to the individual FireRaptor sensing the temperature rise above 85°C (185°F). The FireRaptor will re-engage the panels if the temperature drops back below 85°C (185°F) provided it does not exceed 92°C (198°F), in which case a manual reset of the Emergency Switch is required.

FRS-02 - Shuts down the entire string in which the individual FireRaptor sensing the temperature rise above 92°C (198°F) is connected. If this occurs a signal is sent to the Emergency Switch and resetting of the Emergency Switch is then required by a professional installer. The Emergency Switch can be configured to provide connection to the building’s central alarm system or notification via mobile commincation (SMS, email etc.).

- **AUTOMATIC EMERGENCY EXTERNAL POWER LOSS SHUTDOWN**

Disconnection of the external AC supply, by whatever means, causes automatic remote operation of the Emergency Rapid Shutdown Switch.

The FireRaptor can be installed without any set-up and with any string inverter as its functionality is completely independent. “Plug & Play” style installation using industry standard connectors is easy, whether fitted to new installs or retro-fitted to existing projects to upgrade fire safety functionality.

The FireRaptor meets the current requirements of nec 2017

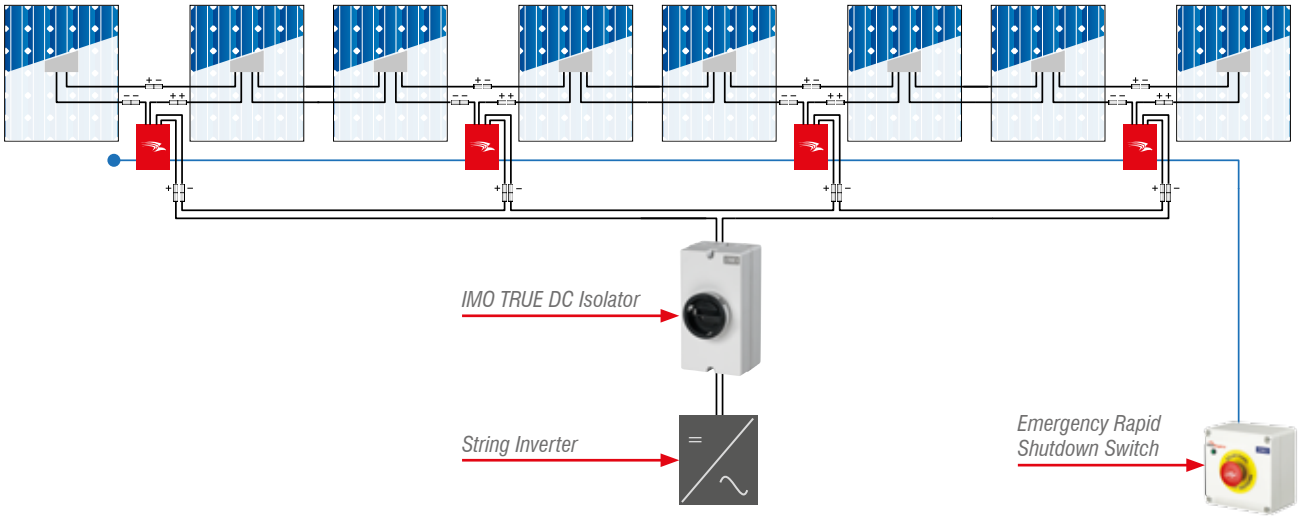
FireRaptor Installation

One FireRaptor will control two solar panels. The diagram below illustrates an example of a 2kW FireRaptor protected installation using eight 250W solar panels and four FRS-01 FireRaptors.

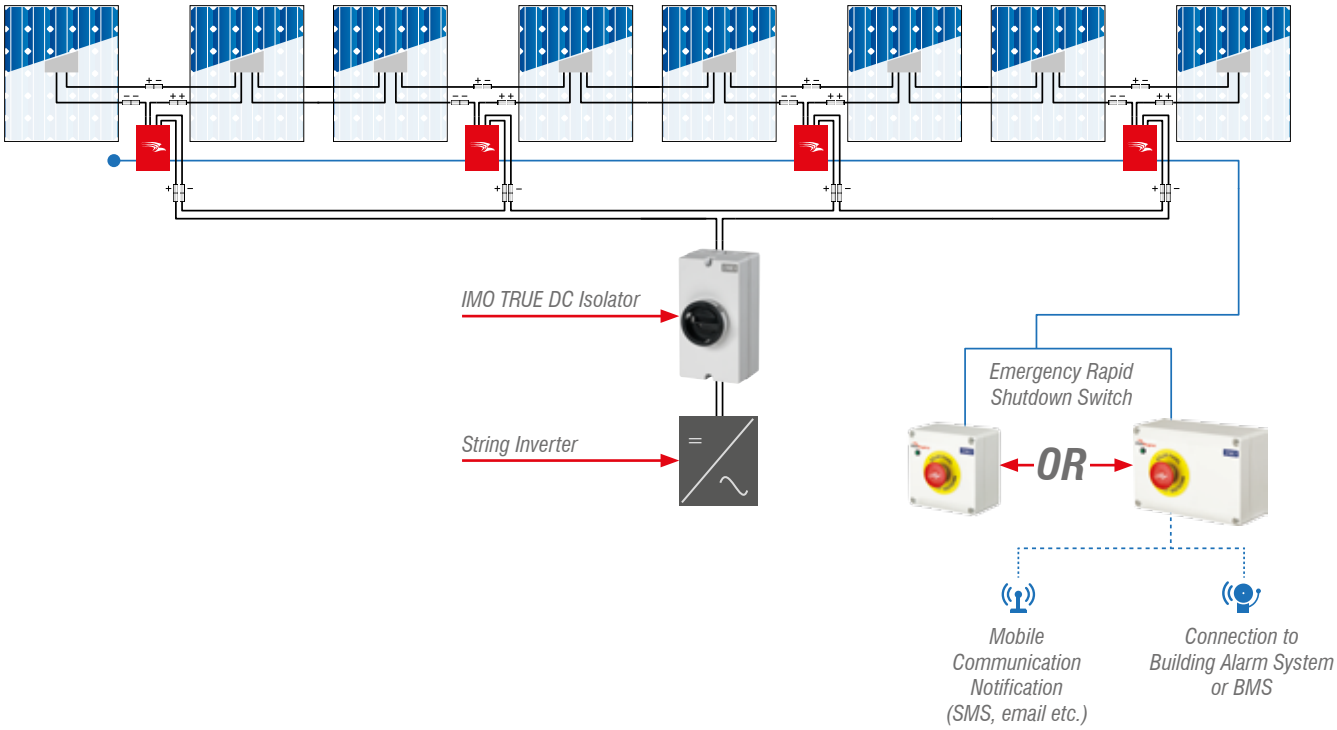
The Emergency Rapid Shutdown Switch can be installed at a convenient ground level location providing easy access during emergencies. Alternatively, multiple switches can be installed in different multi-level building zones.

Disconnection of the external AC supply, by whatever means, causes automatic remote operation of the Emergency Rapid Shutdown Switch.

FRS-01 Emergency Rapid Shutdown



FRS-02 Emergency Rapid Shutdown with Fire Monitoring & Integration Options



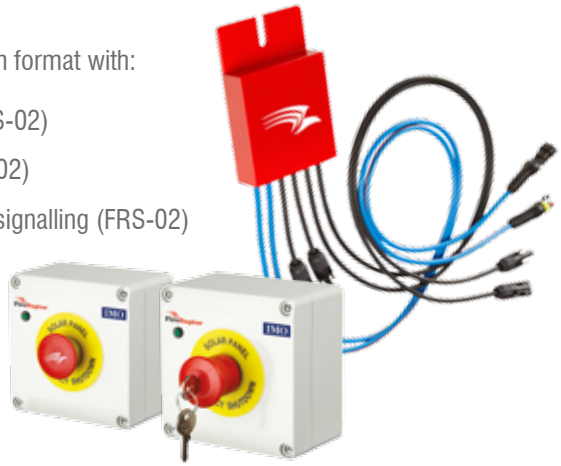
Emergency Shutdown Switch

The Emergency Shutdown Switch for both the FRS-01 and the FRS-02 is supplied with a 24VDC power supply suitable for up to 40 panel operation. It is available with either a “twist-to-release”pushbutton or keylock pushbutton, both with LED indicator to signal FireRaptor supply status (ON indicates the supply is live).

For larger installations, the Emergency Shutdown Switch is available in custom format with:

- Larger power supply options for increased number of panels (FRS-01 & FRS-02)
- Multi connection terminals for increased number of strings (FRS-01 & FRS-02)
- Temperature monitoring unit with hardwire or mobile communication alarm signalling (FRS-02)

Contact IMO for further information on any of these options.



Technical Specification

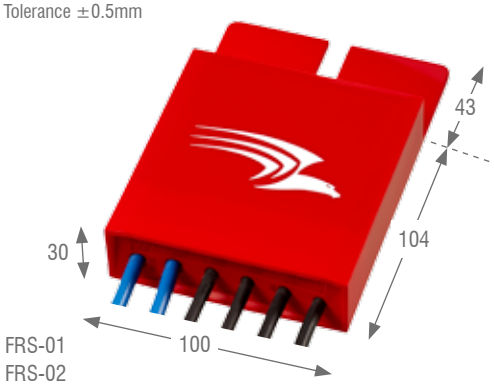
Shutdown Control Cable	2x1mm² cable + Tyco SuperSeal 2-pole connector
Panel & String Cable	4mm² DC rated cable + MC4 type connector
DC Power Supply	24VDC suitable for up to 20 FireRaptor units (40 panels) - Input 90-264VAC
Maximum Input Power	700W (350W per panel)
Maximum Input Voltage	150V (75V per panel)
Maximum Input Current	12A
Maximum System Voltage	1500V
Input Protection	Over voltage & transient voltage supression
Maximum Output Current	12A (99.5% efficiency)
Dielectric Strength	1500VAC for 1 minute
Maximum Output Voltage	150V (75V per panel)
Output Protection	Over voltage, over current & transient voltage suppression
Ambient Operating Temperature	-30°C (-22°F) to +95°C (203°F)
IP Class Protection	FireRaptor - IP68 (designed to comply with NEMA 4X), Emergency Switch - IP66 (designed to comply with NEMA 3R)
Casing	FireRaptor - Flame retardant Polycarbonate - UL94-V0, Emergency Switch - Flame retardant ABS - UL94-HB
Weight (without cables)	300g (10.6oz.)
Panel Cable Length	120mm (4 11/16”)
String & Control Cable Length	1800mm (70 7/8”)
Standard Compliance	EN61000, EN61646, EN61215, IEC 62716 draft C (NH_3 resistant), VDE-AR-E 2100-712, BS7671-712

Ordering Information

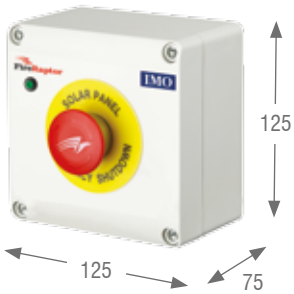
Part Number	Description
FRS-01	FireRaptor Rapid Shutdown Unit - suitable for connection to two solar panels
FRS-02	FireRaptor Monitored Rapid Shutdown Unit - suitable for connection to two solar panels
FRS-ESW1	Emergency Rapid Shutdown Switch IP66 (for FRS-01) - includes 24VDC power supply
FRS-ESW1-K	Emergency Rapid Shutdown Switch IP66 (for FRS-01) with Key Lock - includes 24VDC power supply
FRS-ESW2	Emergency Rapid Shutdown Switch IP66 (for FRS-02) - includes 24VDC power supply
FRS-ESW2-K	Emergency Rapid Shutdown Switch IP66 (for FRS-02) with Key Lock - includes 24VDC power supply
FRS-SIGCAB1.8-F	1.8m (70”) Signal Cable terminated at one end with Tyco female connector for use at end of PV String

Dimensions (mm)

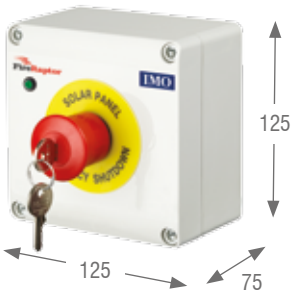
Tolerance ±0.5mm



FRS-01
FRS-02



FRS-ESW1
FRS-ESW2

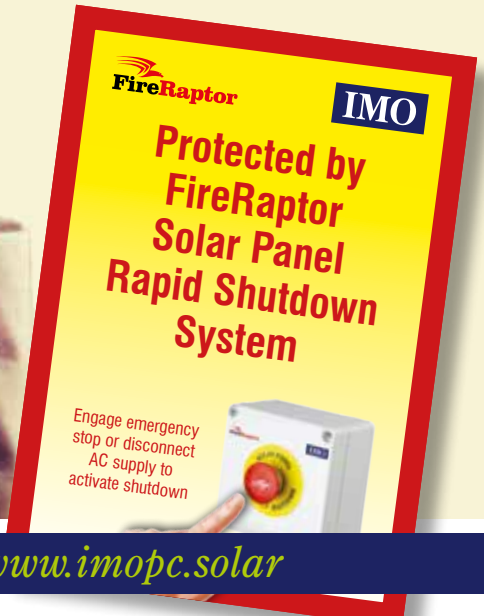


FRS-ESW1-K
FRS-ESW2-K

COMPLETE SAFETY
LOW COST
PEACE OF MIND

The Ultimate Emergency Solar Panel Rapid Shutdown Solution

The FireRaptor from IMO is an innovative solar panel rapid shutdown solution which takes your safety seriously. Offering three ways to shut down your solar panels to ZERO volts and a TWENTY YEAR WARRANTY, the FireRaptor is the most efficient solution, easy to install and operate, fully compliant with NEC2017 and now available with temperature monitoring and hardwire or mobile communication alarm signalling (SMS, email etc.).



Keeping Solar Safe *www.imopc.solar*

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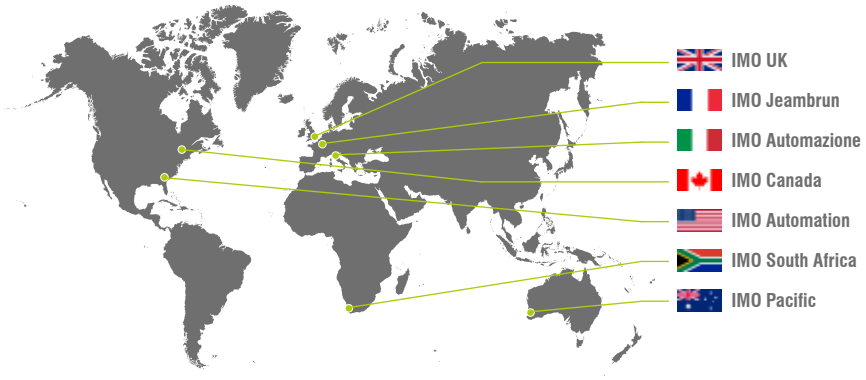

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