

IMO

# **FireRaptor**

Solar Panel Rapid Shutdown Solution



PATENT  
PENDING

MADE IN  
EUROPE

Keeping Solar Safe

## Solar Panel Rapid Shutdown & Alarm

- Manual Panel Shutdown to 0V Operated from Ground Level
- Automatic Panel Shutdown to 0V at  $>85^{\circ}\text{C}$  ( $185^{\circ}\text{F}$ ) Temperature
- Automatic Panel Shutdown to 0V on External Power Loss
- Hardwire or Mobile Communication Alarm Signalling
- Compliant with NEC 2014 & NEC 2017
- Suitable for New Installations or Retro-Fit



## FireRaptor Overview

The IMO FireRaptor shuts down DC supply at panel level to ZERO VOLTS in case of emergency. Shut-down is initiated in three ways - Manual Operation, External Power Loss or Temperature Rise Trigger as follows:

### • MANUAL OPERATION

Manual shutdown is initiated within less than 1 second of operation by pressing the emergency pushbutton on the Emergency Rapid Shutdown Switch (Part no FRS-ESWx). The Emergency Switch can be conveniently located at ground level for easy access or multiple switches can be installed in different multi-level building zones.

### • EXTERNAL POWER LOSS

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

### • TEMPERATURE RISE TRIGGER

Automatic shutdown occurs if the temperature sensor onboard the FireRaptor detects an ambient temperature rise above  $85^{\circ}\text{C}$  ( $185^{\circ}\text{F}$ ). The two FireRaptor versions available shutdown in different ways.

The **FRS-01** shuts down only the panel(s) connected to it upon sensing an ambient temperature rise above  $85^{\circ}\text{C}$  ( $185^{\circ}\text{F}$ ). Provided the temperature does not exceed  $92^{\circ}\text{C}$  ( $198^{\circ}\text{F}$ ), the unit will re-engage the panel(s) if the temperature drops back below  $85^{\circ}\text{C}$  ( $185^{\circ}\text{F}$ ), otherwise a manual reset of the Emergency Switch is required.

The **FRS-02** shuts down the entire string connected to it upon sensing an ambient temperature rise above  $92^{\circ}\text{C}$  ( $198^{\circ}\text{F}$ ) and resetting of the Emergency Switch by a professional installer is then required. The shut-down signal can be configured to provide connection to the building's central alarm system or notification via mobile communication (SMS, email etc.).



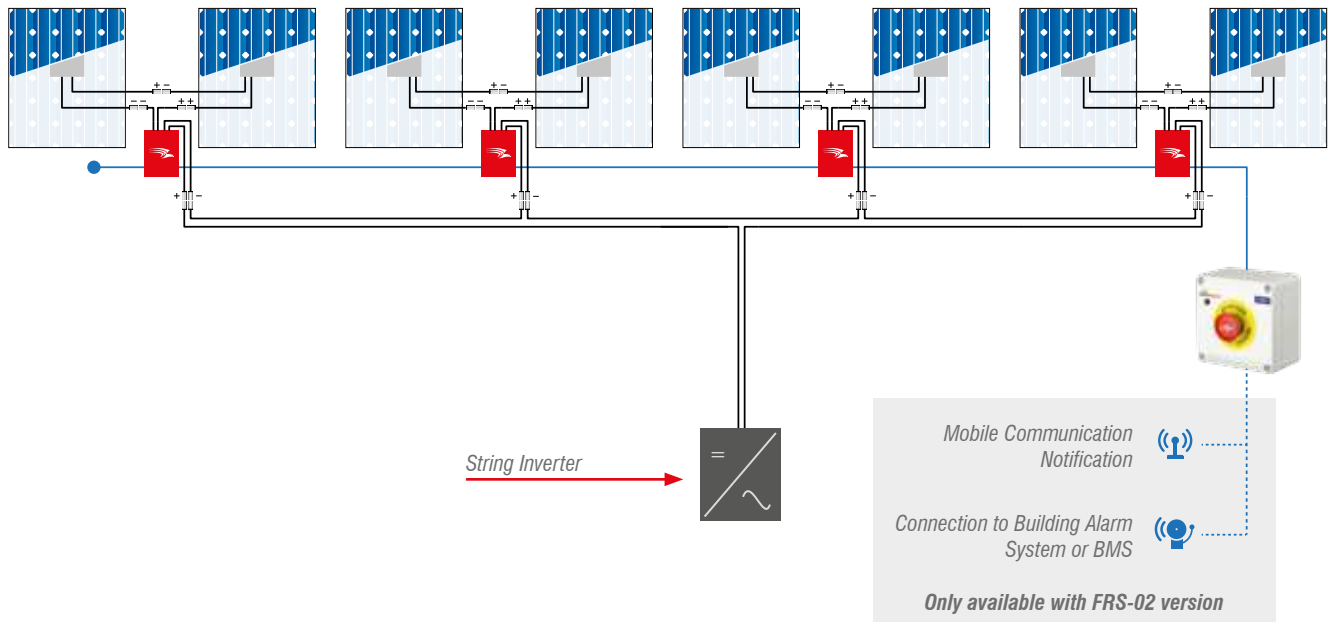
## Inverter Compatibility

The FireRaptor operates in the same way as an isolator/disconnect switch but is located at solar panel level. Like an isolator/disconnect, the FireRaptor is compatible with all string inverters and does not affect their operation or performance in any way.

## FireRaptor Installation

The FireRaptor is easy to install, requires no set-up and is suitable for both new and retro-fit installations. It is designed to shutdown two panels or it can be mounted in single panel configuration if preferred. The diagram below shows a typical two-panel installation.

The FireRaptor is manufactured using original MC4 connectors on the DC cables ensuring high quality integration and compatibility. The Emergency Switch control cable is fitted with Tyco SuperSeal connectors ensuring quick and easy (plug & play) installation.



**Note:** If two panel installation is used in accordance with NEC 2017, each panel must be <40V.

## 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



## Emergency Shutdown Switches

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

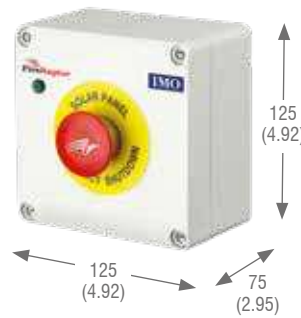
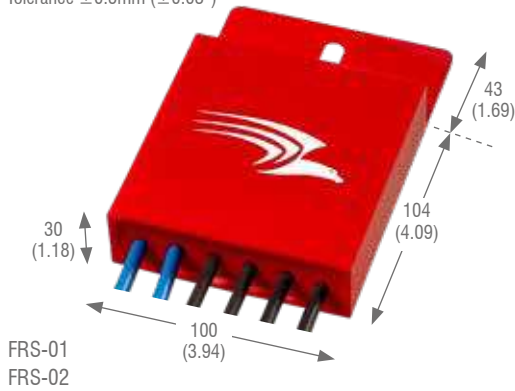
Emergency Shutdown Cable	2x1mm <sup>2</sup> cable + Tyco SuperSeal 2-pole plug/connector (male/female)
DC Power Supply*	24VDC suitable for up to 20 FireRaptor units (40 panels)
Maximum System Input Power	700W (350W per panel)
Maximum System Input Voltage	150V (75V per panel)
Maximum System Input Current	12A
Maximum Isolation Voltage	1500V
Input Protection	Over voltage & transient voltage suppression
Maximum System Output Current	12A (99.5% efficiency)
Breakdown Voltage	1500VAC for 1 minute
Maximum System Output Voltage	150V (75V per panel)
Output Protection	Over voltage, over current & transient voltage suppression
Max. Input Short Circuit Current	15A
Operating Temperature	-30°C to +95°C
Ambient Operating Temperature	-30°C to +55°C
IP Class Protection	> IP68 (designed to comply with NEMA 4X)
PV Casing	Flame retardant ABS - UL94-V0
Weight (without cables)	400g
Panel Cable Length	120mm
String & Signal Cable Length	1800mm
Standard Compliance	EN 61000, EN 61646, EN 61215, IEC 62716 draft C (NH <sub>3</sub> resistant), VDE-AR-E 2100-712, BS 7671-712, UL 1741
PV Connectors	Multi contact MC4



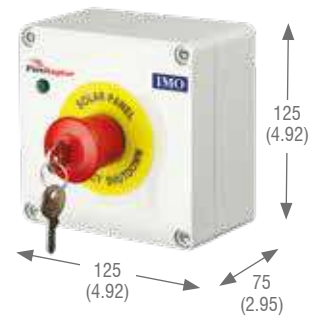


## Dimensions mm (inches)

Tolerance  $\pm 0.5\text{mm}$  ( $\pm 0.03''$ )



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 NEC2014 & NEC2017 and is also now available with temperature monitoring and hardwire or mobile communication alarm signalling (SMS, email etc.).

**FireRaptor**

**IMO**

**Protected by  
FireRaptor  
Solar Panel  
Rapid Shutdown  
System**

Engage emergency  
stop or disconnect  
AC supply to  
activate shutdown



Keeping Solar Safe



[www.imopc.com](http://www.imopc.com)

## IMO Worldwide Offices

### IMO Precision Controls Limited

The Interchange  
Frobisher Way  
Hatfield, Herts AL10 9TG  
United Kingdom

Tel: 01707 414 444  
Fax: 01707 414 445  
Email: imo@imopc.com  
Web: www.imopc.com

### IMO Jeambrun Automation SAS

5, Rue Alfred De Musset  
94100  
Saint-Maur-Des-Fosses  
France

Tel: 0800 912 712 (n° gratuit)  
Fax: 0145 134 737  
Email: imo-fr@imopc.com  
Web: www.imojeambrun.fr

### IMO Automazione

Via Belfiore 10,  
50144 Firenze (FI)  
Italia

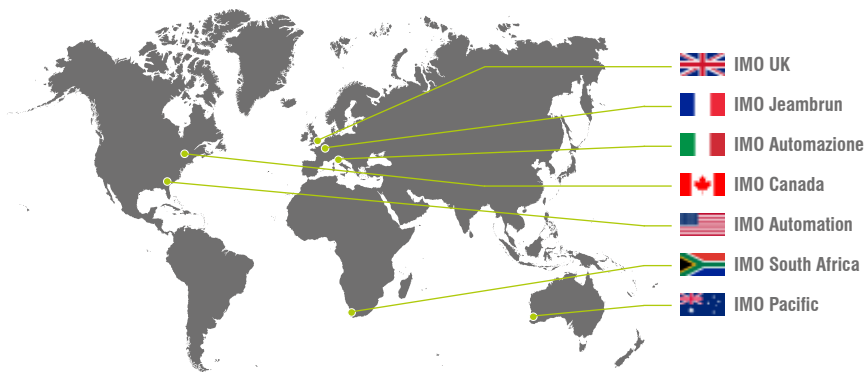
Tel: 800 930 872 (toll free)  
Fax: 8000 452 6445  
Email: imo-it@imopc.com  
Web: www.imopc.it

### IMO Canada

Suite 608  
1B-701 Rossland Road East,  
Whitby, Ontario L1N 9K3  
Canada

Tel: 905 799 9237

Email: sales-na@imopc.com  
Web: www.imopc.com



### IMO Automation LLC

Steeplechase Industrial Park  
Suite E, 5845 Steeplechase Blvd  
Cumming, GA 30040  
USA

Tel: 404 476 8810

Email: sales-na@imopc.com  
Web: www.imoautomation.com

### IMO South Africa (Pty) Ltd

Unit 12A, Longclaw Drive  
Montague Gardens  
Cape Town 7441  
South Africa

Tel: 021 551 1787  
Fax: 021 555 0676  
Email: info@imopc.co.za  
Web: www.imopc.co.za

### IMO Pacific Pty Ltd

Unit 9, Dillington Pass  
Landsdale  
Perth WA 6065  
Australia

Tel: 1300 34 21 31  
Fax: 08 9303 9908  
Email: sales@imopacific.com.au  
Web: www.imopacific.com.au