



# FireRaptor

Solar Panel Rapid Shutdown Solution

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Keeping Solar Safe



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## 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.).



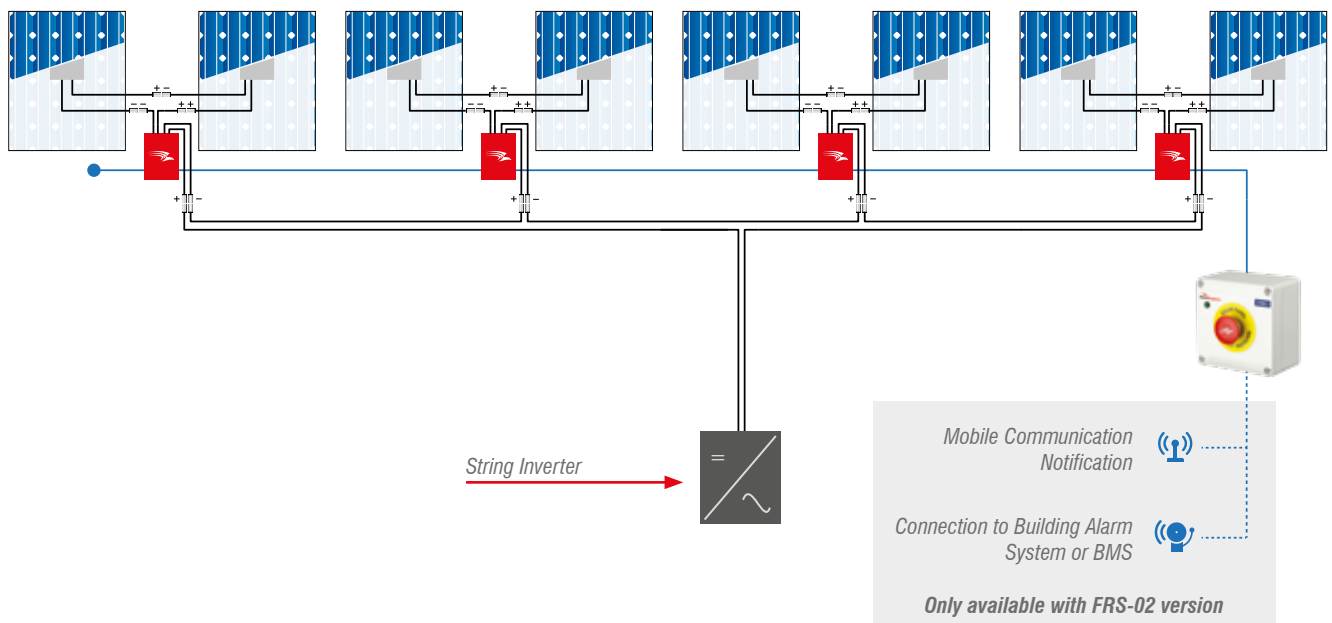
## Inverter Compatibility

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.



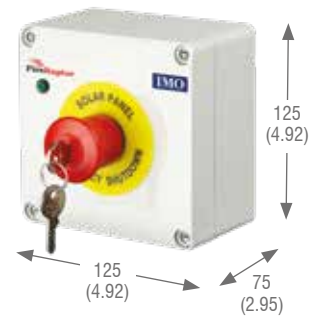
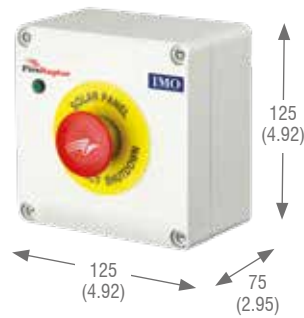
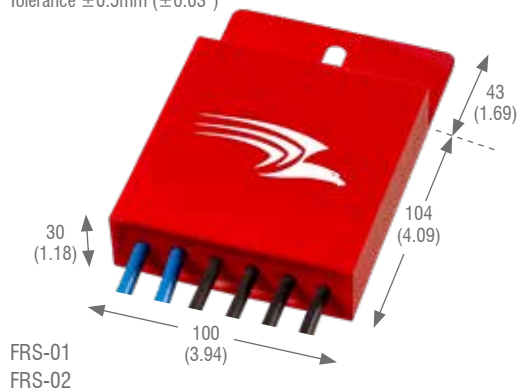
## Technical Specification

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



**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



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

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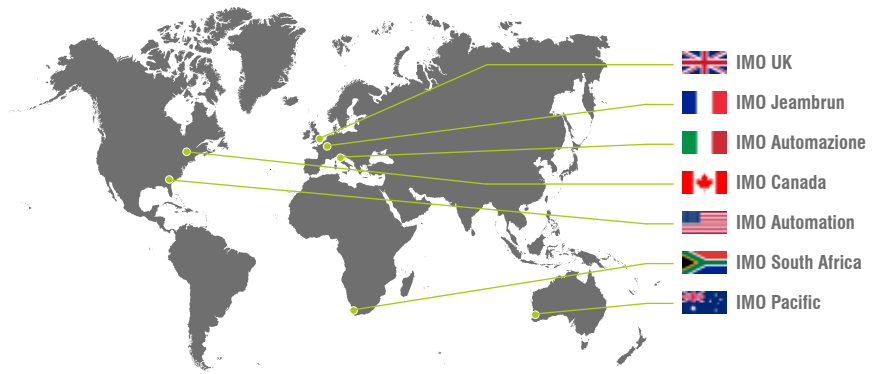
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