

How Thermarestor protects a PV installation

RC62: Recommendations for fire safety with PV panel installations

The Joint Code of Practice for fire safety with photovoltaic panel installations, with focus on commercial rooftop mounted systems

Devastating effects of fire at Solar Farms

Fire on solar farms are rarely reported publicly.

Business confidence and financial penalties impact these decisions.



Where do fires occur in a PV installation?

Switchgear equates 68% of the fire incidents recorded.

And the DC connectors equates to 20%.

A2.2.3 An analogous UK study, undertaken in 2017 by the BRE and submitted to Government, investigated the PV components most likely to develop faults that led to a fire incident. Their results, based on investigation of 46 incidents, are shown in Figure A2.2.2.

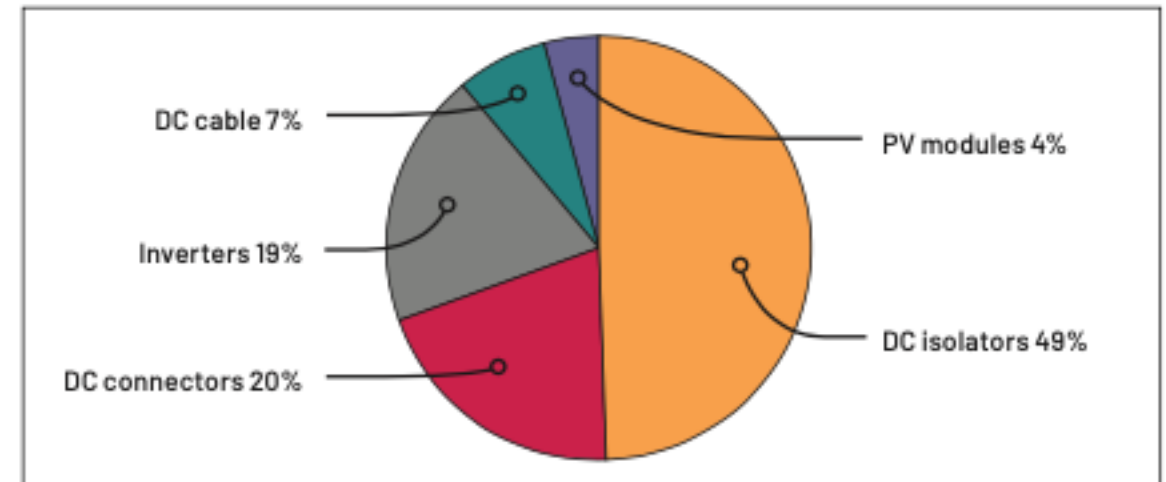


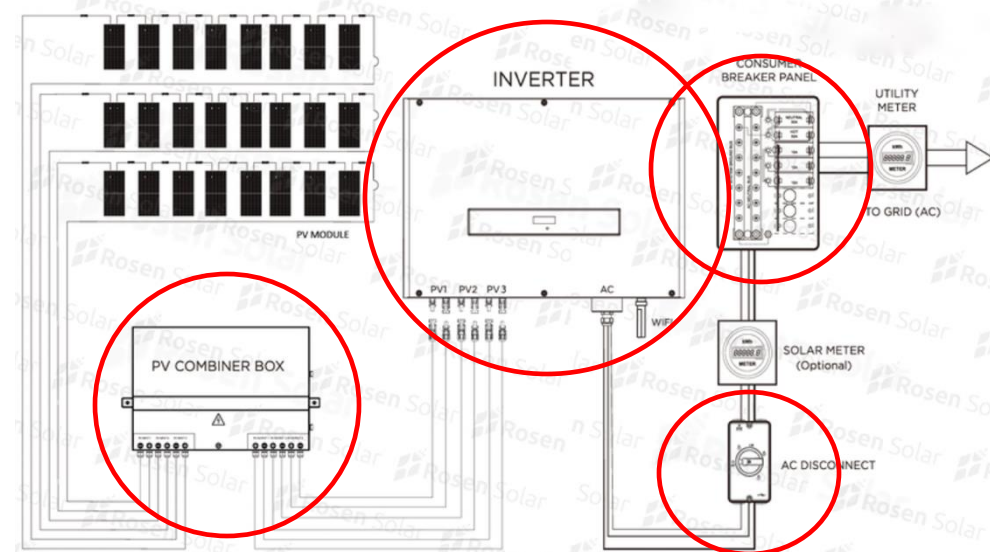
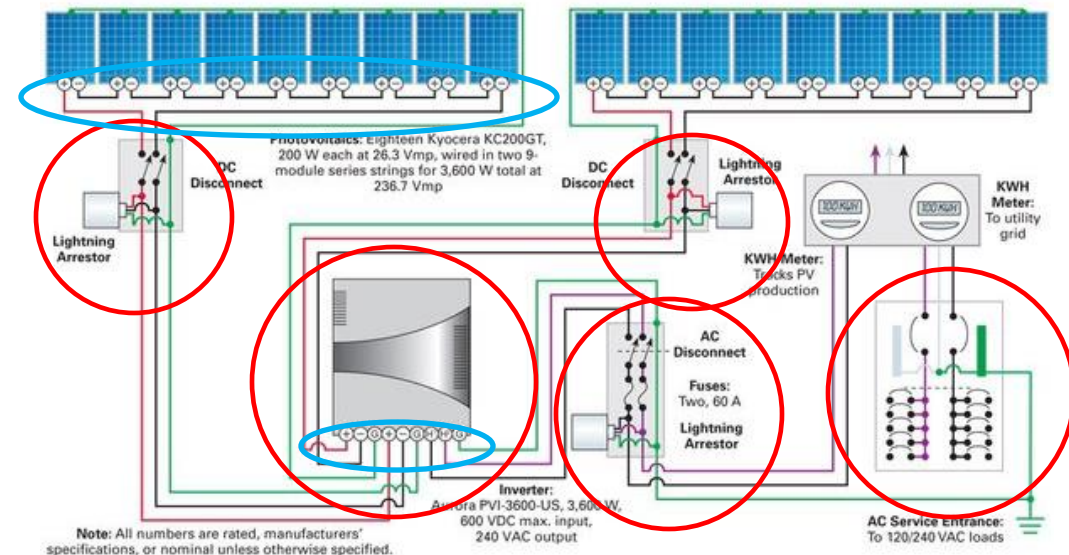
Figure A2.2.2 PV system component faults as causes of fire (Source: P100874-1004 Issue 2.5 Fire and Solar PV Systems – Investigations and Evidence)

Protect the important elements of the installation

No matter the ultimate system design there will be field installed connections between the panel strings, an inverter and AC output. These are potential locations for resistive joints where heat can occur.

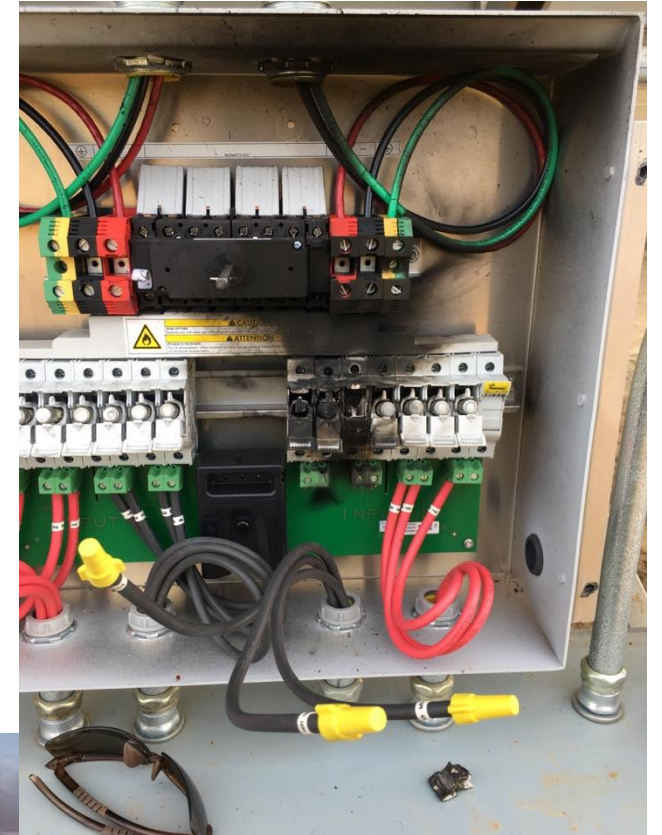
89% of the problems – red circles

7% of the problems – blue circles



Effects of fires in the switchgear

The fires cause physical and economic damage.



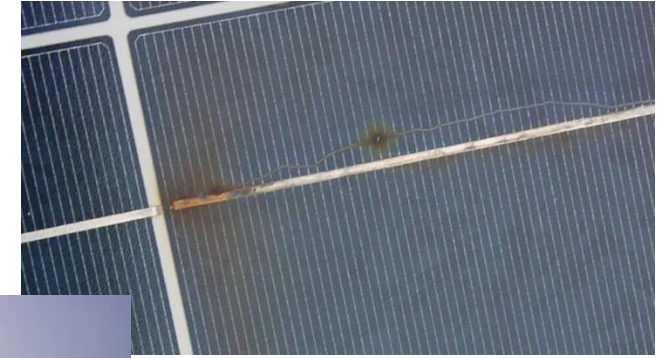
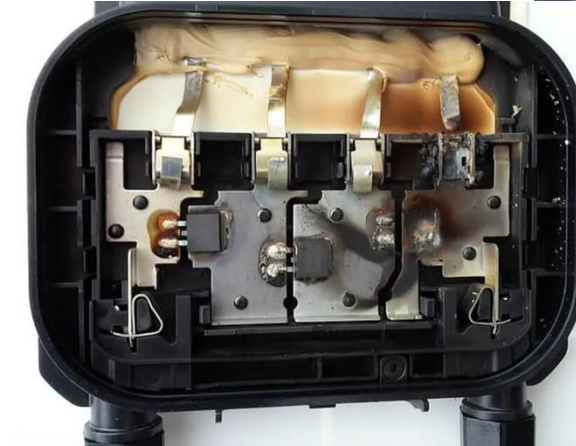
Effects of fires in the DC Cable connectors

These failures equates to 4% of the fire incidents recorded.



Panel and Panel Connection failures

These failures equates to only 4% of the fire incidents recorded.



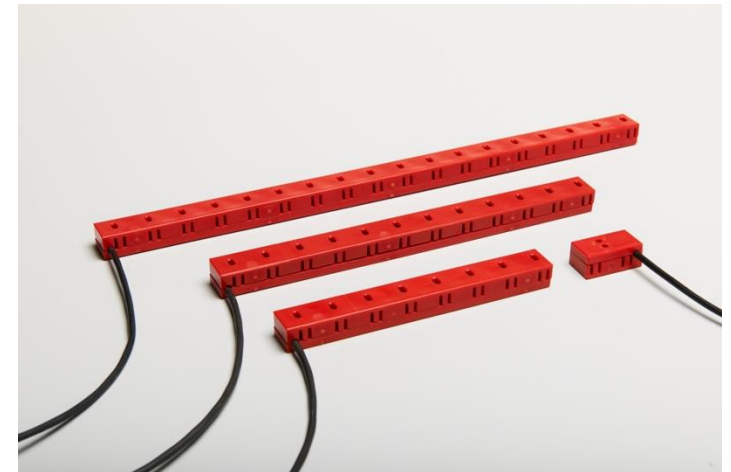
Thermarestor

Thermarestor gives early warning of a Thermal Event. It gives building owners and custodians time to investigate the situation BEFORE a fire occurs.

Thermarestor is a passive device that activates when a heat rise of above 80degC (+/- 5degC) is detected.

MultiPoint and Single point sensors protect wiring connections.

A pre-ignition solution is better than putting out a fire.



Thermarestor Applications - Switchgear

Thermarestor sensors can be installed in any type of switchgear, in either the DC or AC elements of the systems

Thermarestor can be installed in new installations and as a retrofit item for existing installations.

Thermarestor can be installed in small scale domestic to every element of a large-scale Commercial PV Farm



Thermarestor Applications - Connectors

Thermarestor sensors can be installed on any of the DC connectors, - field wiring or at the inverters

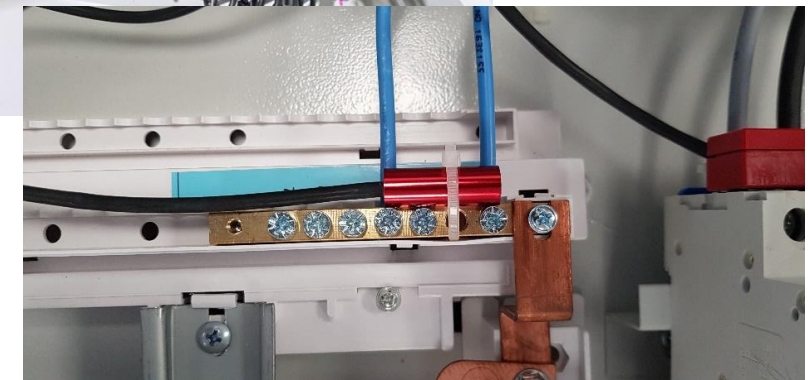
Again, Thermarestor can be installed in new installations and as a retrofit item for existing installations.



Thermarestor Installed

Thermarestor sensors can be installed in any type of switchgear, in either the DC or AC elements of the systems

Thermarestor can be installed in new installations and as a retrofit item for existing installations.



Signaling / Reporting

Thermarestor sensors are wired to a communicator, installed locally.

Each communicator is fitted with a SIM card for 2G / 4G autonomous communication

The communicator is battery operated.



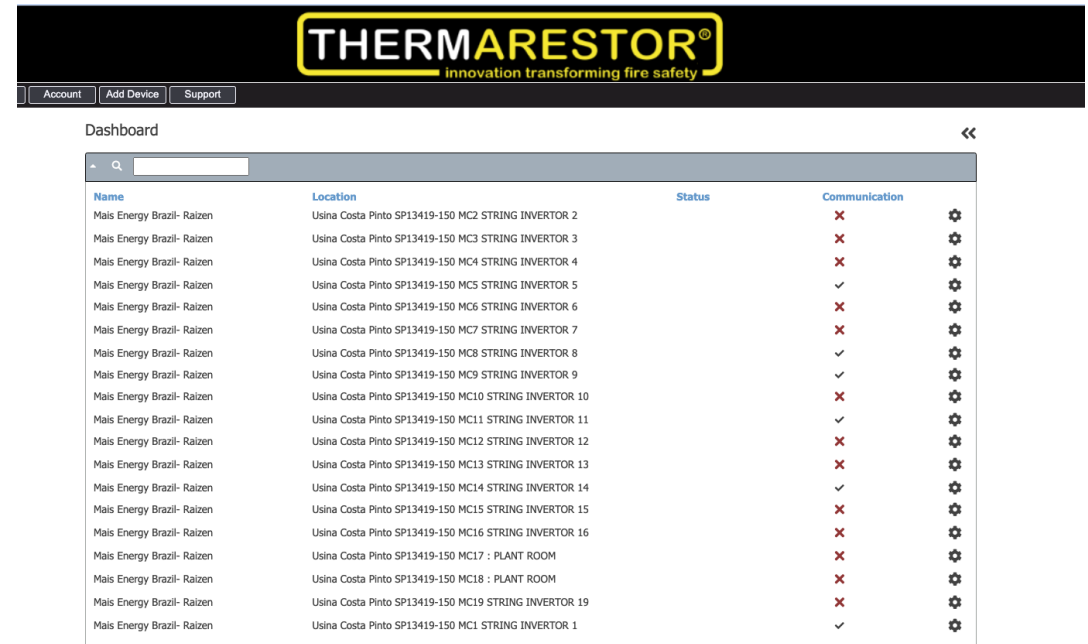
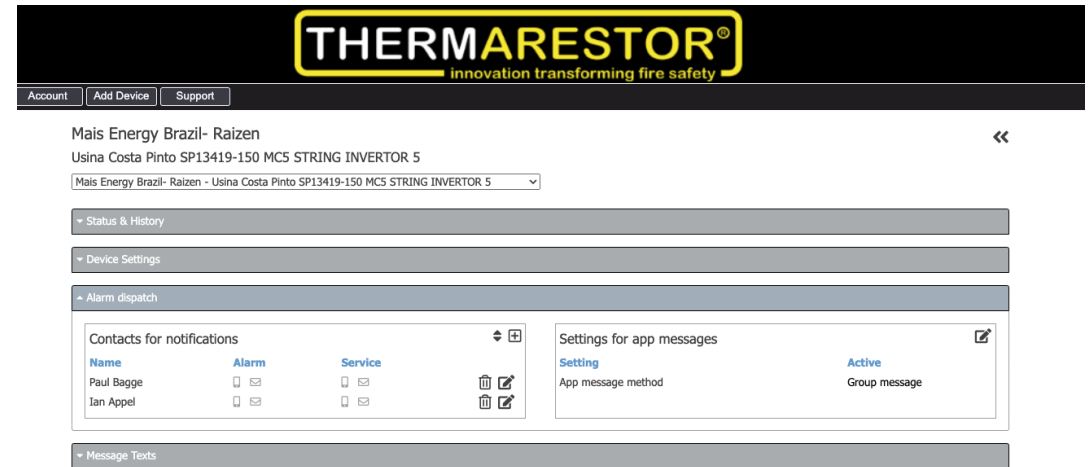
Signaling / reporting – Cloud Platform

Each Thermarestor communicator is partnered with our cloud-based portal.

The portal issues a notification of activation to personnel designated by the team via a Mobile Phone App, SMS message or email.

The portal allows maintenance staff to review the status of the devices and communicators.

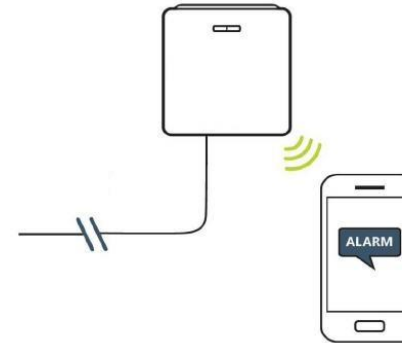
It allows an operators to control and monitor the notifications issued for effective maintenance management.



Signaling / reporting – Phone App

The Mobile Phone App receives alarms and service messages by push notification.

The Mobile Phone App allows maintenance staff to react and confirm acceptance of the action to investigate.



MEB-Raizen-El Santo
Invertor 1 REF DCBI
2024-01-29 15:04



**HIGH
TEMPERATURE
ALERT-**
Thermarestor
activation.
Maintenance
required



Confirmed by Jason Tomkins
(15:05)

12:16 82%



CONFIRM

Salisbury Cathedral (UK)
Salisbury SP1 2EJ
2024-04-24 12:37



**ATTENTION
REQUIRED:Thermaresto
r Board DBCT2**



CONFIRM

ME (BR) ENEL
Rio De Janerio RJ 20220-297
2024-03-05 12:48



**Thermarestor Alarm
DIST Board 1**

Confirmed by Ian Appel (12:48)

Salisbury Cathedral (UK)
Salisbury SP1 2EJ
2024-02-23 14:42

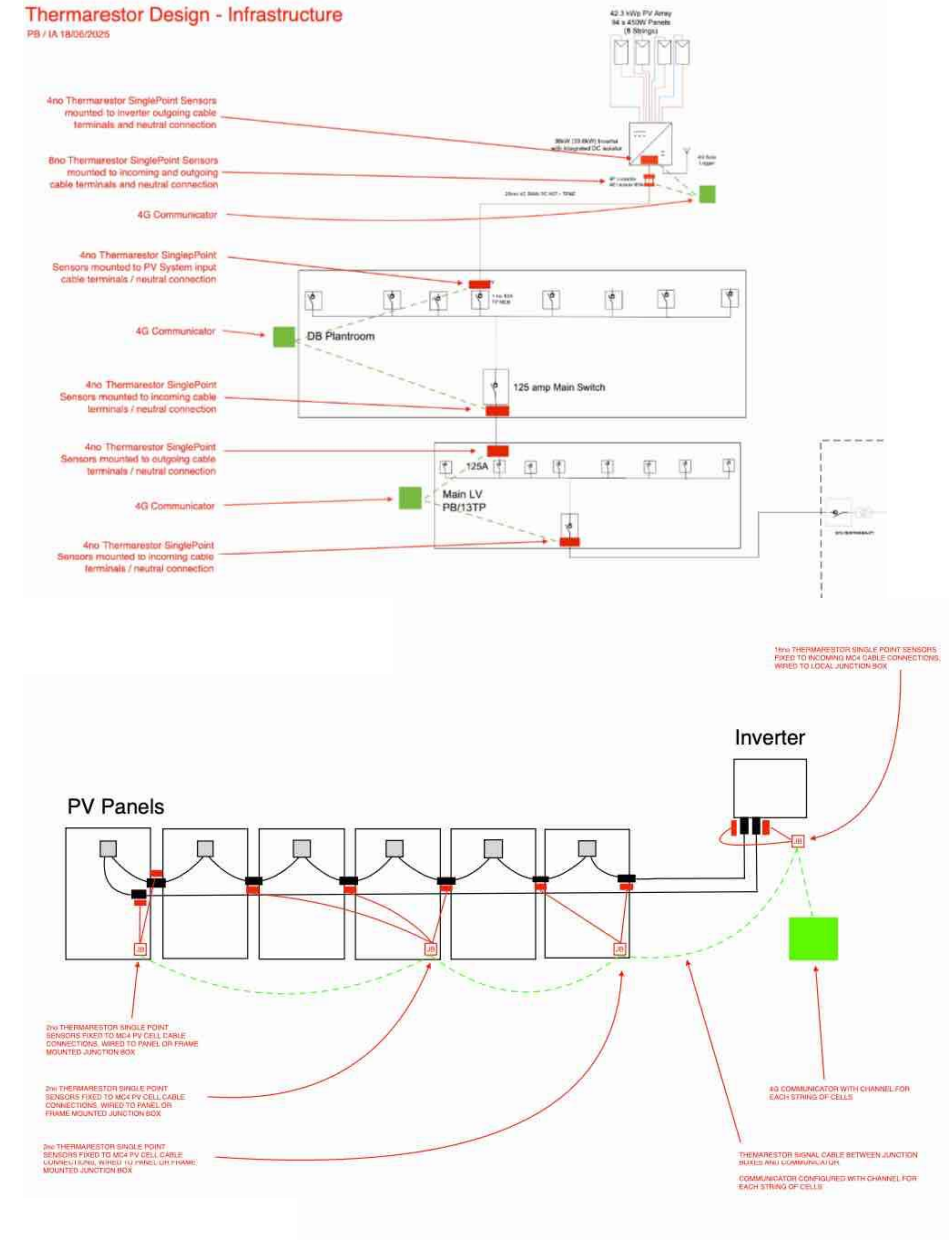


**ATTENTION
REQUIRED:Thermaresto
r Board DBCT2**

Confirmed by Ian Appel (14:44)

Thermarestor Design

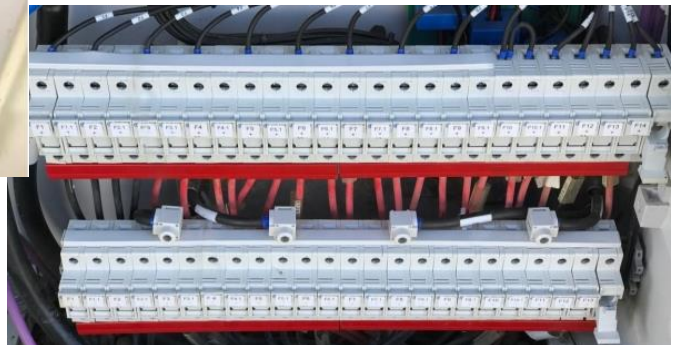
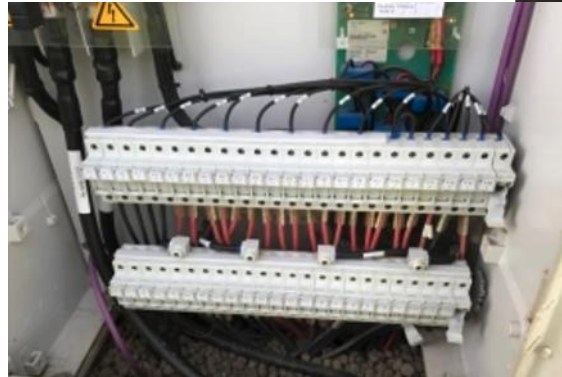
The Thermarestor creates a design for each installation which details where the sensors are to be placed by the installation team



Case Studies - UK

Wymeswold, Leicestershire England, is a 34.4MW installation completed in 2013 on the site of a WW2 Bomber training airfield

Thermarestor upgraded existing switchgear after a fire.

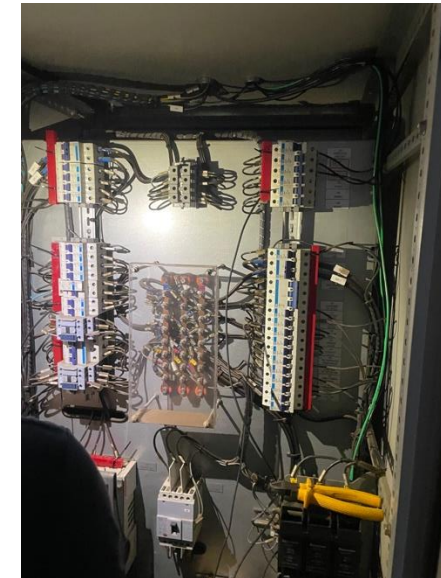


Case Studies - Brazil

Brazil has a a very quickly expanding Commercial Solar sector that recognize that protection of the infrastructure is essential to protect revenue streams

Thermarestor has installed SingleSensors, MultiSensors and Communicators in a new PV installation outside Sau Paulo, linked to the latest Portal to allow the operator to monitor the system in real-time

Sensors were installed in the QGBT (Low Voltage General Switchboards), SCADA communicator, sun tracking controller and String Inverter boxes



Thermarestor's Unique Selling Points

1. British Patented Design.
2. Pre-ignition solution is better than putting out a fire. Turns an emergency into simple maintenance.
3. Cost effective – less than 1 % of the build cost.
4. Sensor warranty for lifetime of Solar plant.
5. Complete and independent system.
6. Communicator / portal gives notifications to unlimited users.
7. Remote monitoring – by Mobile Phone App & portal gives real time reporting 24/7
8. The portal gives recordable incident & maintenance logs

