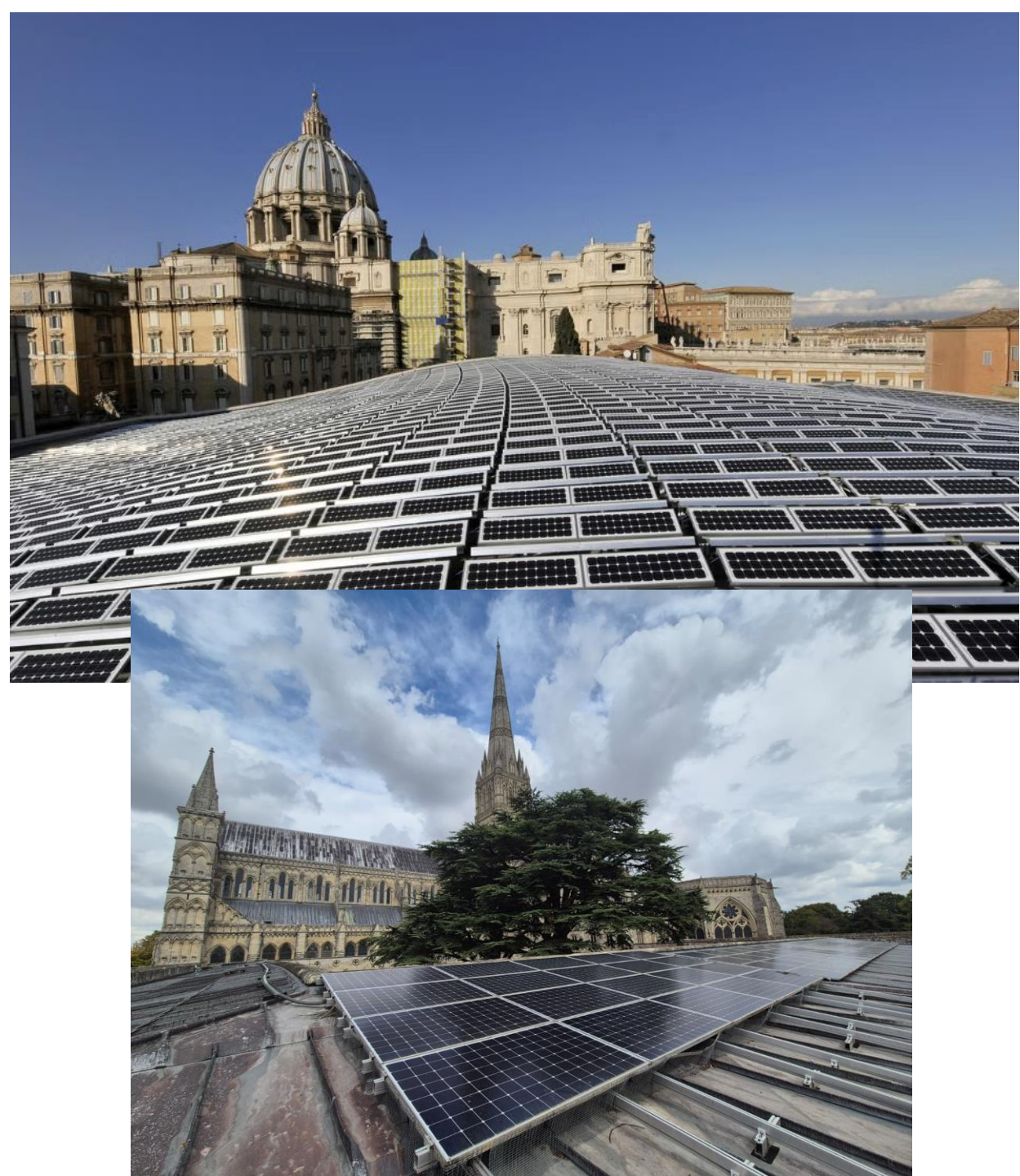


Risk In a PV Installation

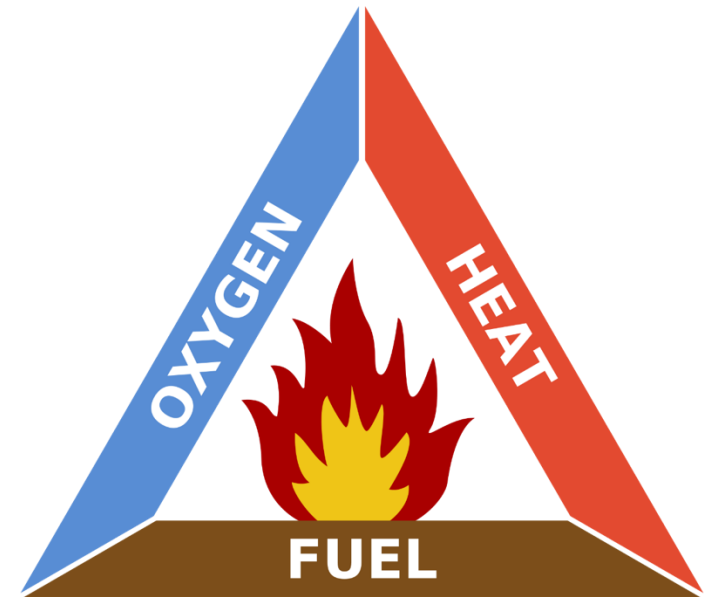
A Thermarestor view



Before any fire, overheating happens first.

Electrical fires typically follow this progression / stages:

1. High-resistance fault
2. Localised heating
3. Pyrolysis / Carbonisation
4. Arcing
5. Ignition
6. Fire



There is no smoke without fire – but remember there is no fire without heat

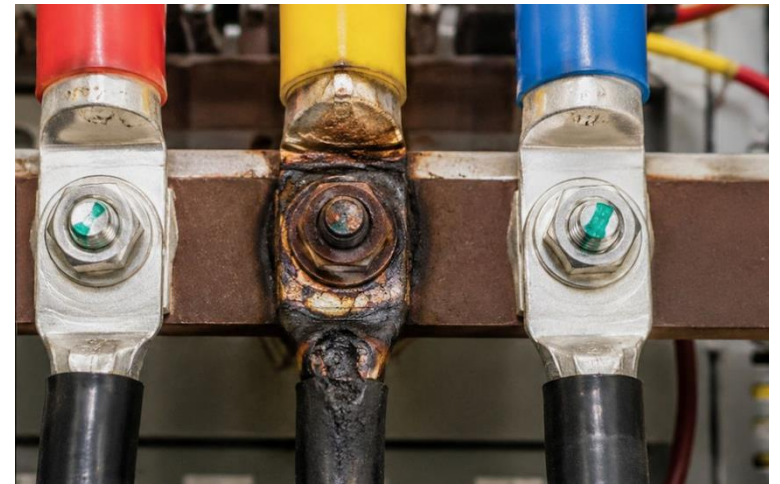
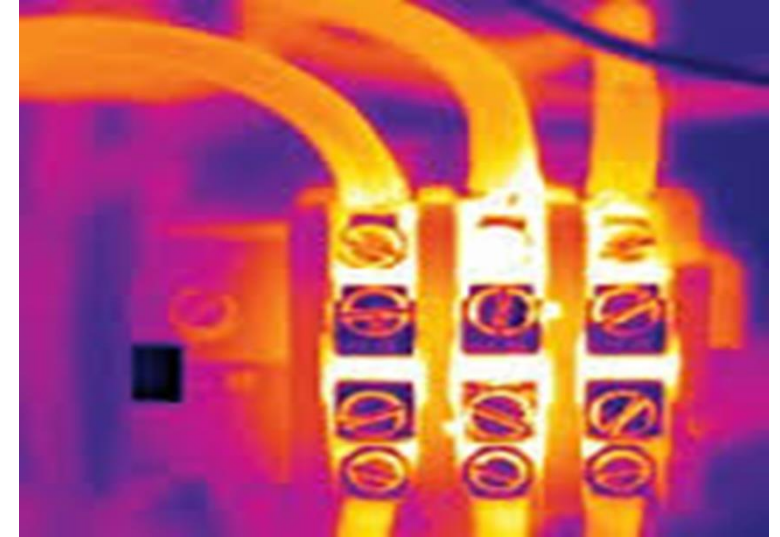
A fire does not require an Arc to be present.

What does an over heating, High Resistance Connection look like?

What do the effects look like?

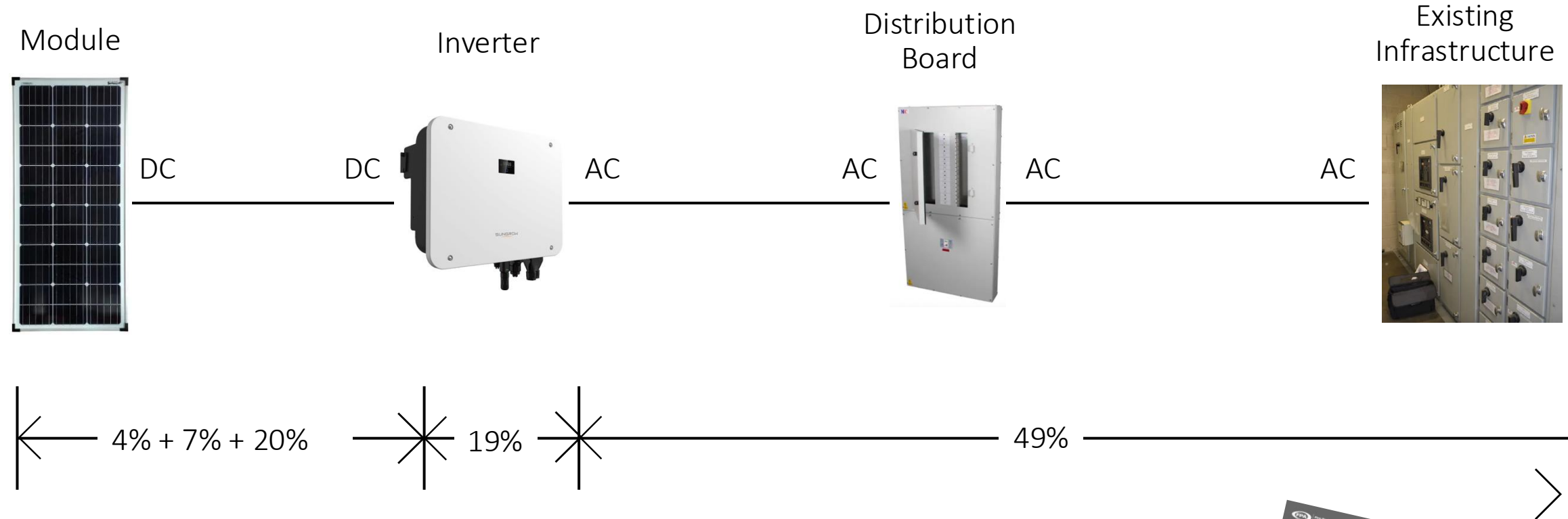
- Incorrectly terminated cables
- Loose terminals – cables cores change shape if subject to thermal stress
- Cables installed with unnecessary physical forces – tight bends close to terminals

This applies to ANY electrical connection



Where are the risks of a fire in a PV System?

Simple Arrangement



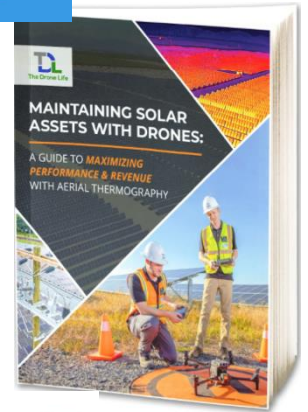
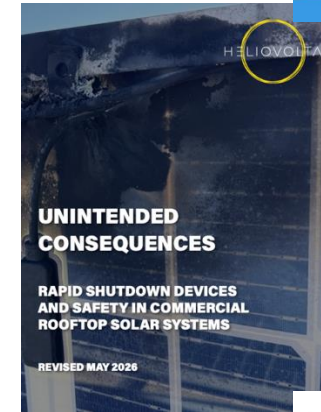
BRE 2017 Study. 'PV components most likely to develop faults that led to a fire incident'



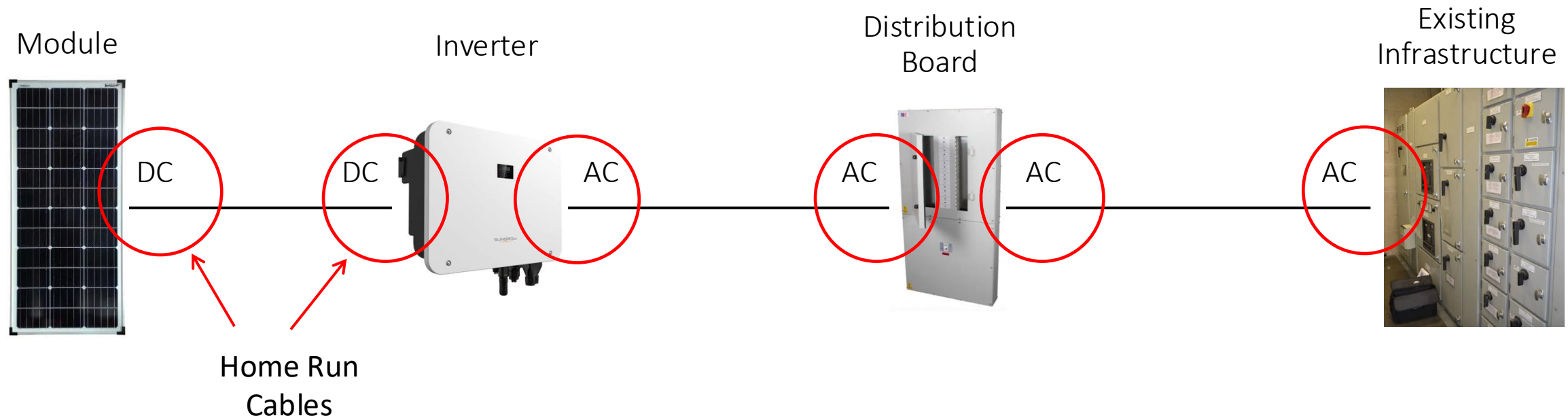
Look at the Data

Since the BRE 2017 Study, there are more reports and studies to build on this information

More organizations are focusing on the growing numbers of installations and that the numbers of fires associated with those installations growing at a faster rate



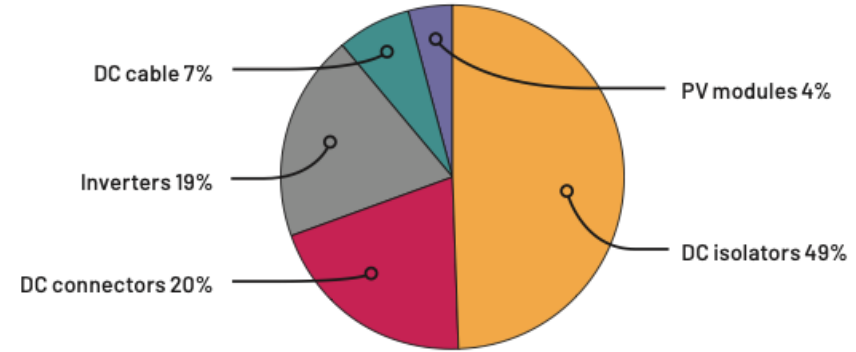
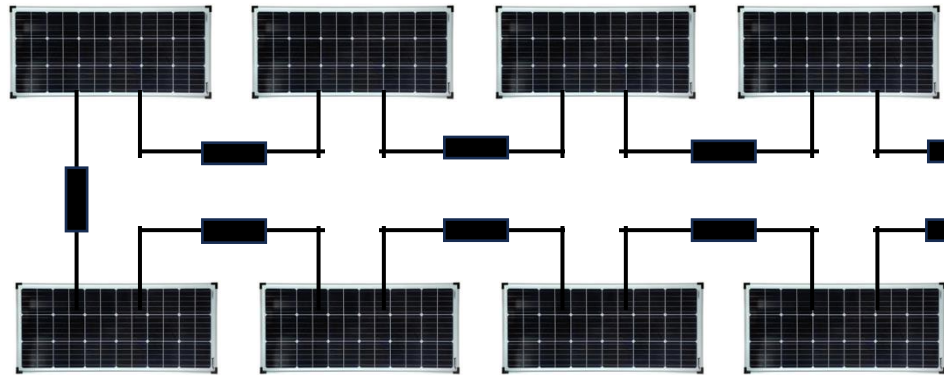
Which Connections are Site Terminated?



These are the connections that Thermarestor can reduce the risk for

Module and DC cable Risks

Factory Assembled DC Cable MC4 Connections



Site assembled "Home Run" cables to inverter

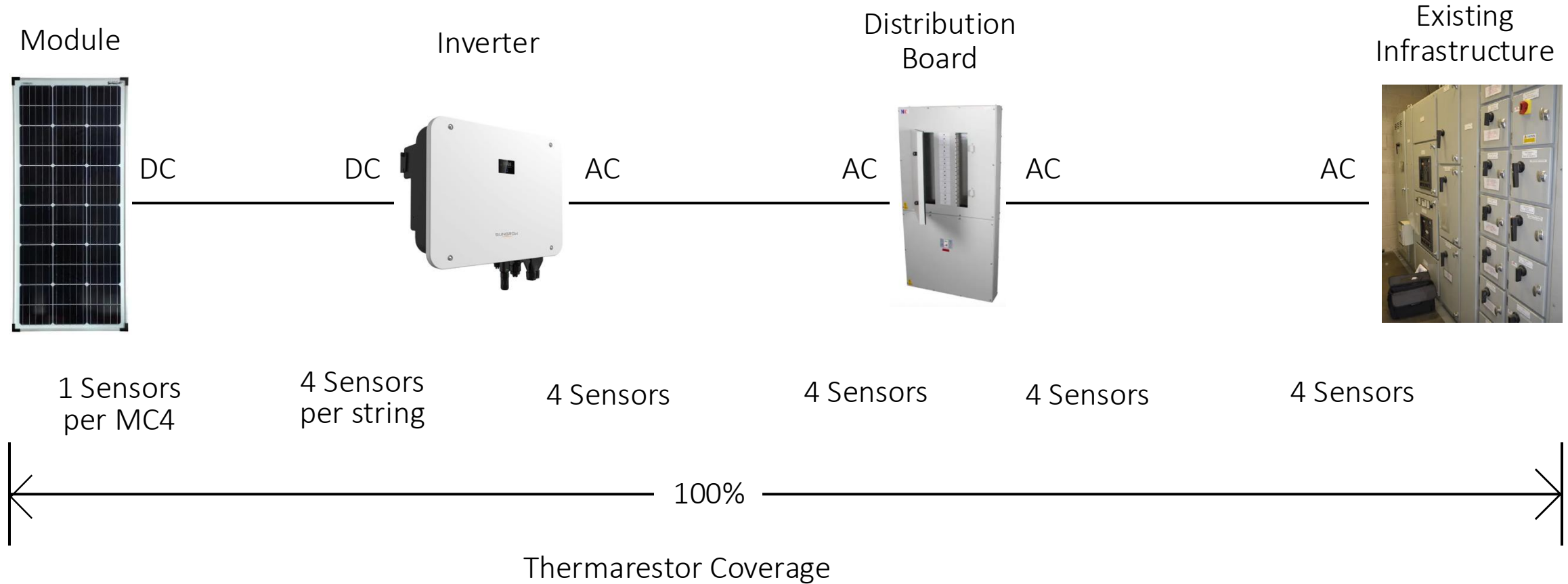


Inverter

4% Modules + 7% DC cable + 20% MC4 Connectors

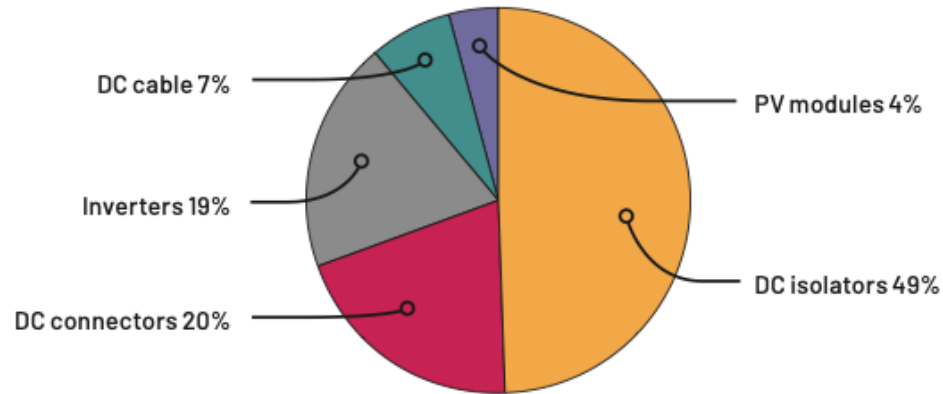
Risk v Protection

Simple Arrangement

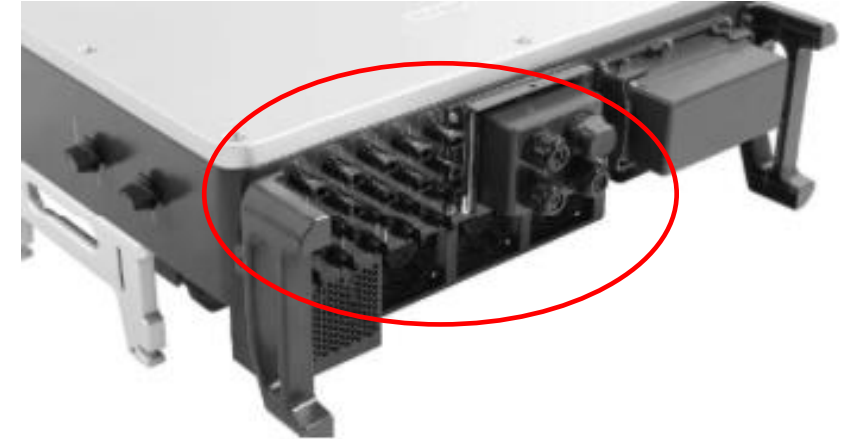


Inverter Risks – 19%

At the connections



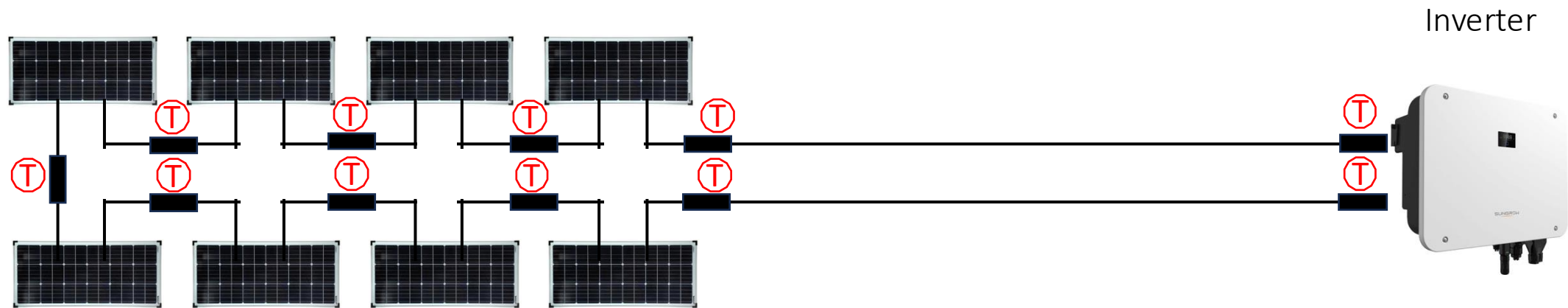
Site terminated DC MC4 connections



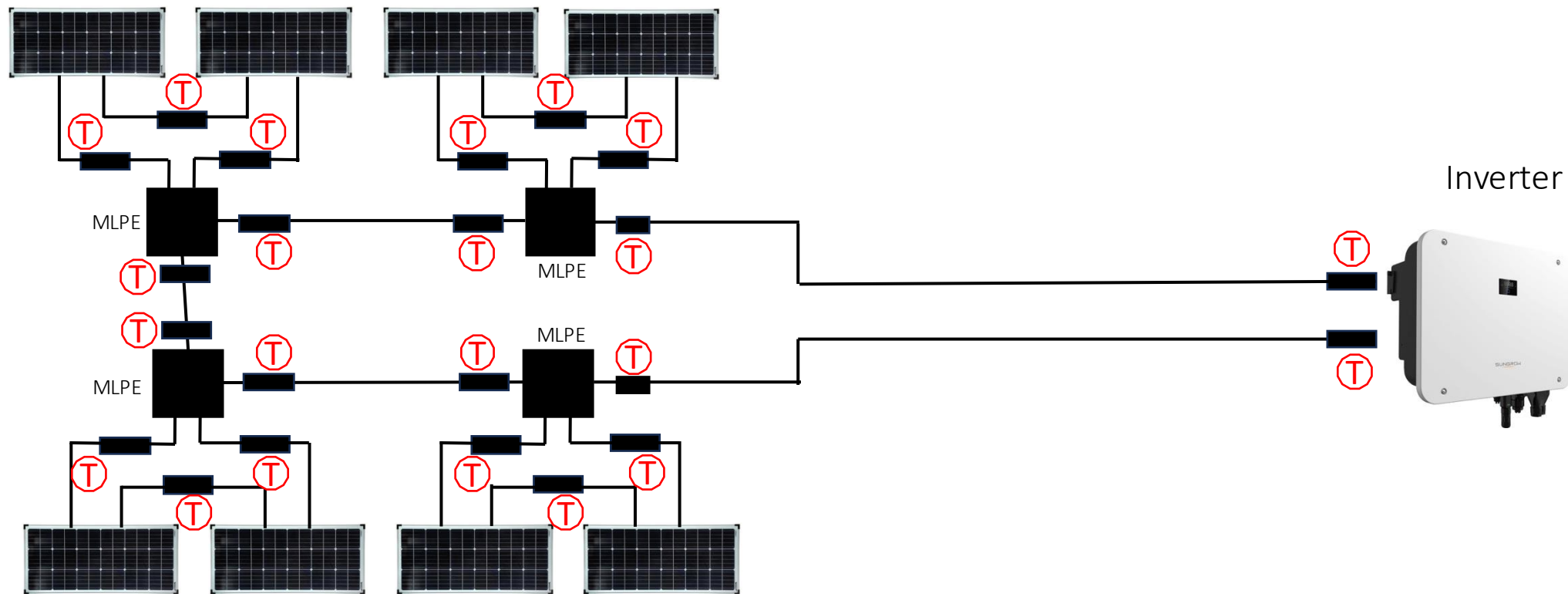
Site terminated AC connections in accessible chamber



What 100% Thermarestor Risk Coverage Looks Like For Modules , Connectors and DC Cabling – Simple Connection



What 100% Thermarestor Risk Coverage Looks Like For Modules , Connectors and DC Cabling – With Module Level Power Electronics (MLPE)



When does the 100% protection mean more than the cost?

When the repair costs and loss of cultural buildings far outweigh the protection system cost

Clandon Park, Guildford, Surrey - National Trust repair cost £150M

Notre Dame, Paris – repair cost - €846M



Clandon Park, Surrey, UK. 2015



Notre Dame Cathedral, Paris. 2019

What is Thermarestor and how can it make a difference?

Our unique and patented **thermal sensor** that sits on electrical connection points and activates at $\approx 80^{\circ}\text{C} (\pm 5^{\circ}\text{C})$ — well before ignition, letting someone know, turning a potential fire into a simple maintenance event.



What It Looks Like

Three unique, patented sensor types:

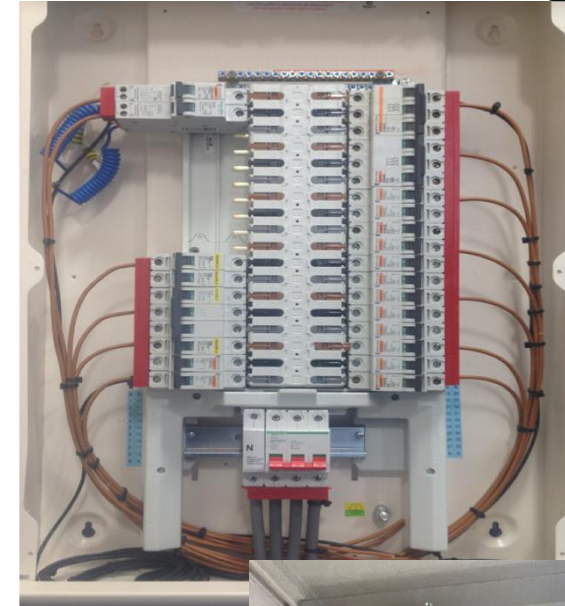
- **SinglePoint (T1150/T1155)** — monitors one connection.
- **MultiPoint (T1102–T1118)** — protects multiple terminals / connections.



Why It's Protection

- Detects thermal faults before fire.
- Reduces downtime & claims.
- Protects switchgear & PV assets.

Suitable for Retrofit or new installations. Only requirement is access to connections and isolation of system during install

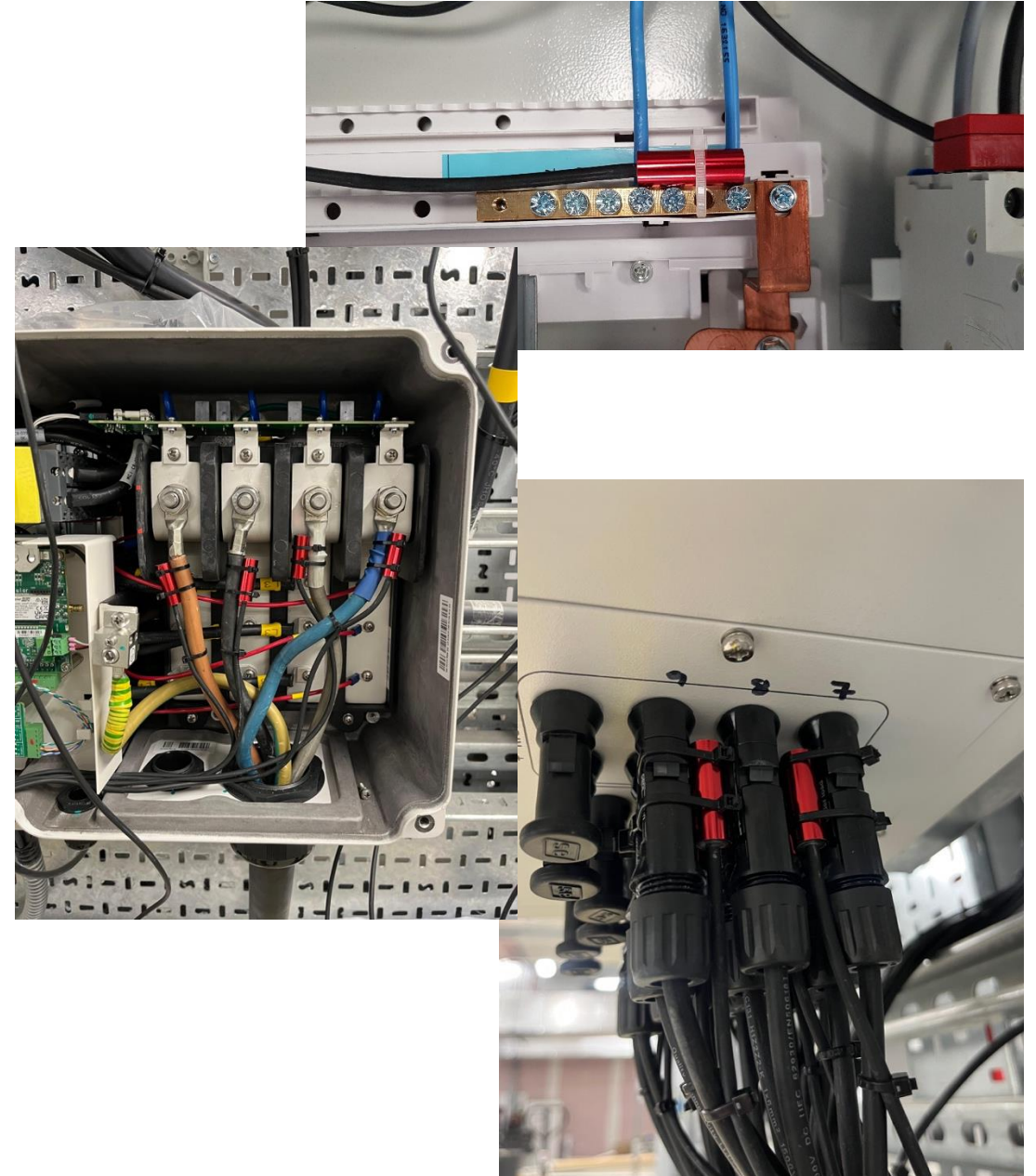


Where It Is Installed

Mounted directly on cable terminals:

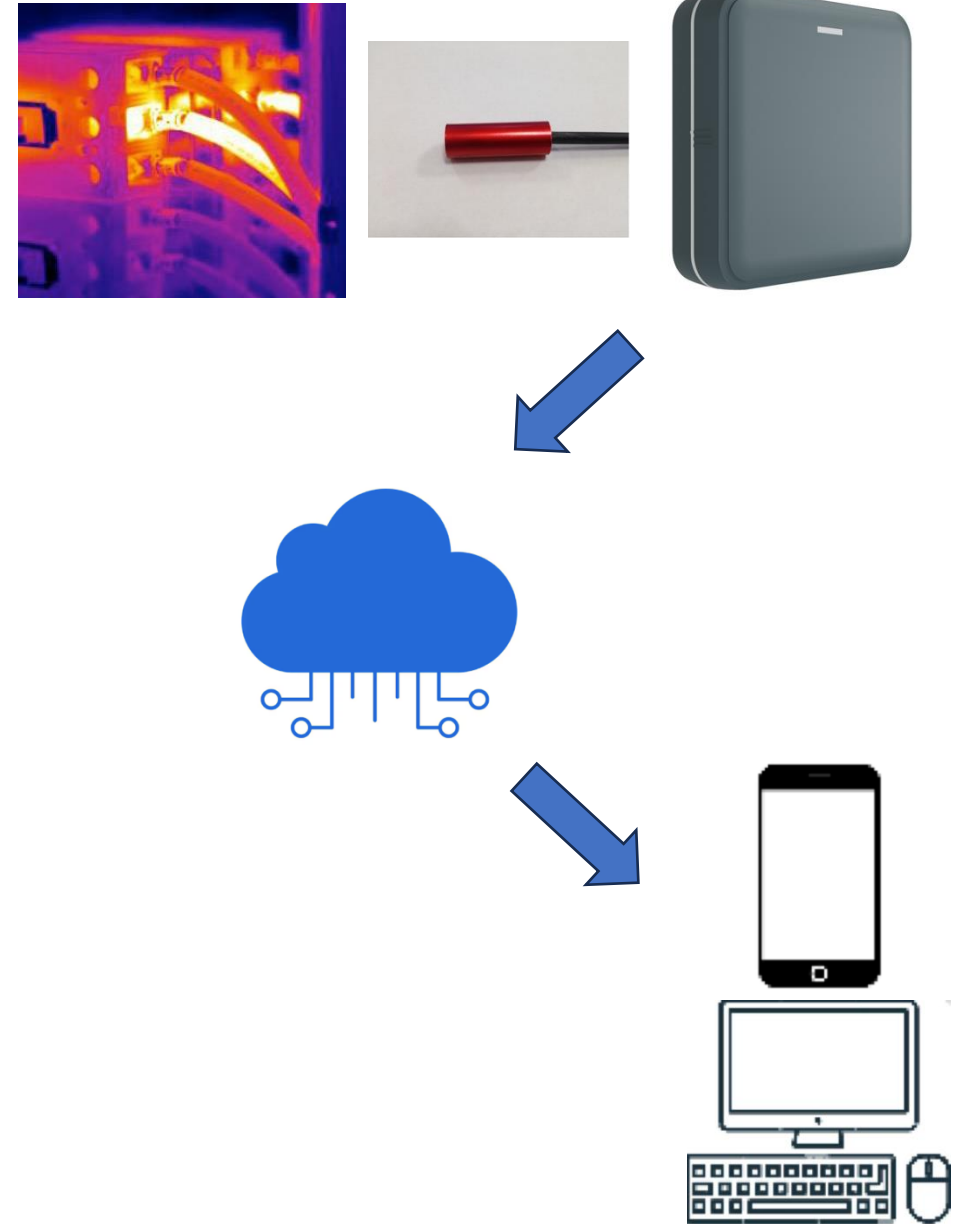
- Switchgear & distribution boards
- String inverter terminals
- DC isolators & MC4 connectors

Permanently monitoring for adverse temperatures



How the Thermarestor® System Works

1. Connection overheats.
2. Sensor detects adverse temperature on equipment above safe design levels
3. Sends message to Thermarestor cloud monitoring portal
4. Cloud portal distributes warning calls, messages and email to nominated maintenance teams and stake-holders.
Maintains audit trail records for later review.



How Alerts Are Raised

- Cloud Portal: live status & history
- Call, SMS, email to nominated personnel
- Phone app – push notification
- Unlimited contacts
- Unlimited access
- Unlimited recorded events

The screenshot shows the Thermarestor Cloud Portal interface. At the top is a navigation bar with links for Dashboard, Contacts, Account, Add Device, and Support. Below this is a 'Dashboard' section with a table of devices. The table has columns for Name, Location, Status, and Communication. The devices listed are all 'Salisbury Cathedral SP1 2EJ' with various locations like 'LIBRARY STAIRS - Library HBD', 'TOWER DB CT1', 'EIGHT DOORS DBD2 + SPED', 'TOWER - Zip Joint Boxes', and 'TOWER-RC Dinner Panel + RC Relay Panel + Main Switch'. All devices show a status of 'OK' and 'Communication' as 'OK'.

Below the dashboard, there's a section for 'Salisbury Cathedral SP1 2EJ' and 'TOWER DB CT1'. This section shows a 'Status & History' tab. The 'Status' section displays real-time data: Updated on 2/16/2026 (3:28 PM), SW version 2.15B, Battery status (full), External Power Off, Network strength -87 dB, Provider 'VODAFONE UK', Synchronised Yes, and Communication Yes. The 'History' section shows a list of events with columns for Date, Time, and Event. The events are all 'Keep-alive message' sent at 3:28 PM on various dates from 1/19/2026 to 2/16/2026.

At the bottom, there are expandable sections for 'Device Settings', 'Alarm dispatch', and 'Message Texts'.

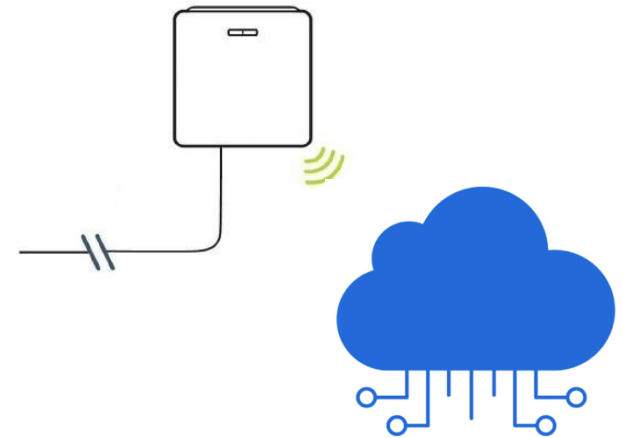
This screenshot shows a desktop alert notification. The header reads 'MEB-Raizen-EI Santo' and 'Invertor 1 REF DCBI'. The date and time are '2024-01-29' and '15:04'. The main body of the alert is a red box with a white triangle icon containing an exclamation mark, followed by the text 'HIGH TEMPERATURE ALERT- Thermarestor activation. Maintenance required'. At the bottom, it says 'Confirmed by Jason Tomkins (15:05)'.

This screenshot shows a mobile phone app interface. At the top, there's a status bar with the time '13:16' and signal indicators. Below that is a 'CONFIRM' button. The app displays a list of alerts for 'Salisbury Cathedral (UK)'. The first alert is for 'Salisbury SP1 2EJ' on '2024-04-24' at '12:37'. It shows a red triangle icon with an exclamation mark and the text 'ATTENTION REQUIRED: Thermarestor Board DBCT2'. Below this is another 'CONFIRM' button. The second alert is for 'ME (BR) ENEL' on '2024-03-05' at '12:48'. It shows a red triangle icon with an exclamation mark and the text 'Thermarestor Alarm DIST Board 1'. Below this is a 'Confirmed by Ian Appel (12:48)' button. The third alert is for 'Salisbury Cathedral (UK)' on '2024-02-23' at '14:42'. It shows a red triangle icon with an exclamation mark and the text 'ATTENTION REQUIRED: Thermarestor Board DBCT2'. Below this is a 'Confirmed by Ian Appel (14:44)' button.

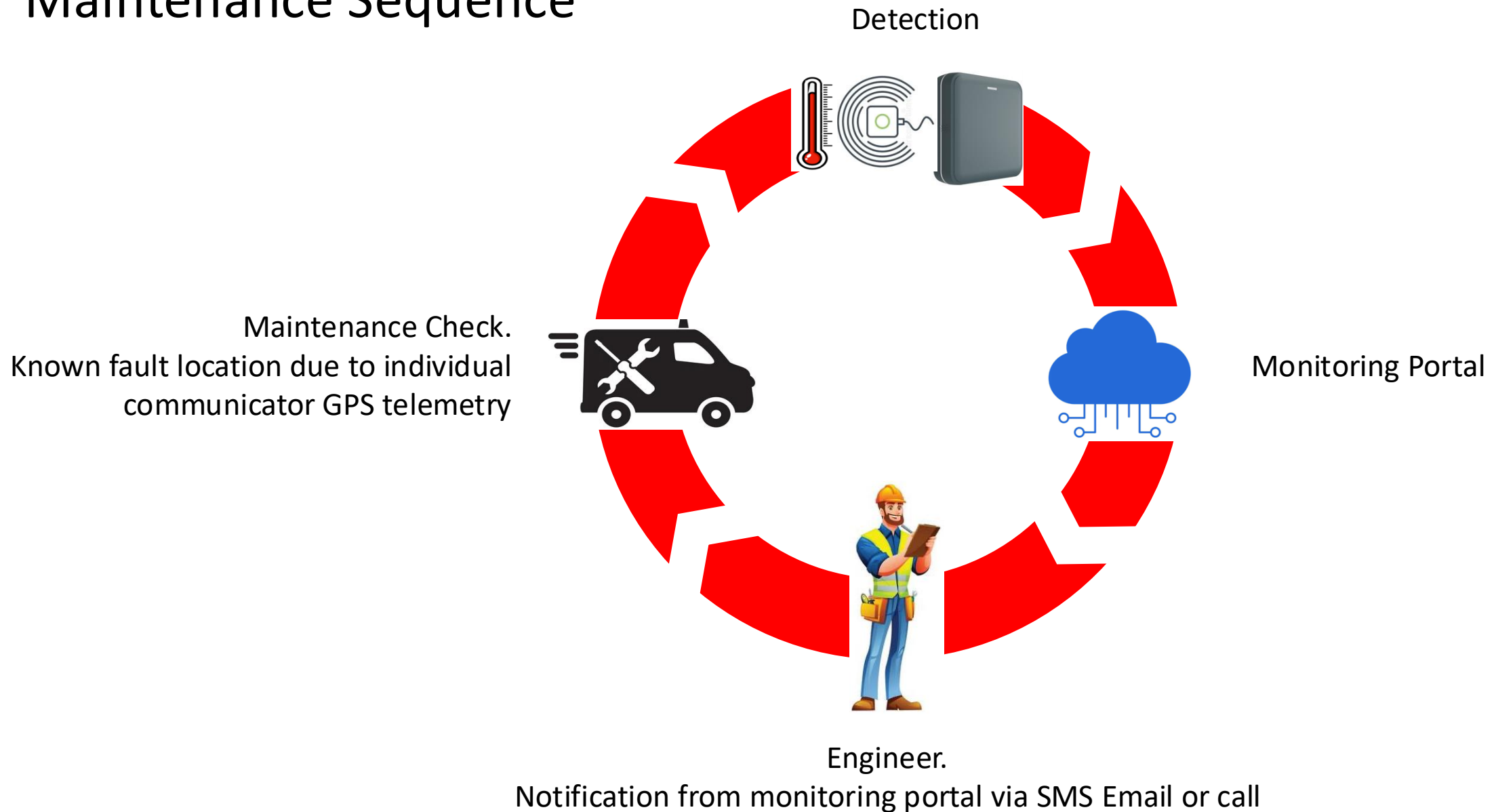
How the signals are communicated

The link between the sensors and the cloud monitoring portal

- Self Contained GPS unit
- Battery operated – 18 month life
- No power supply required



Maintenance Sequence



Testing and Certification

Fully tested, certified & Verified

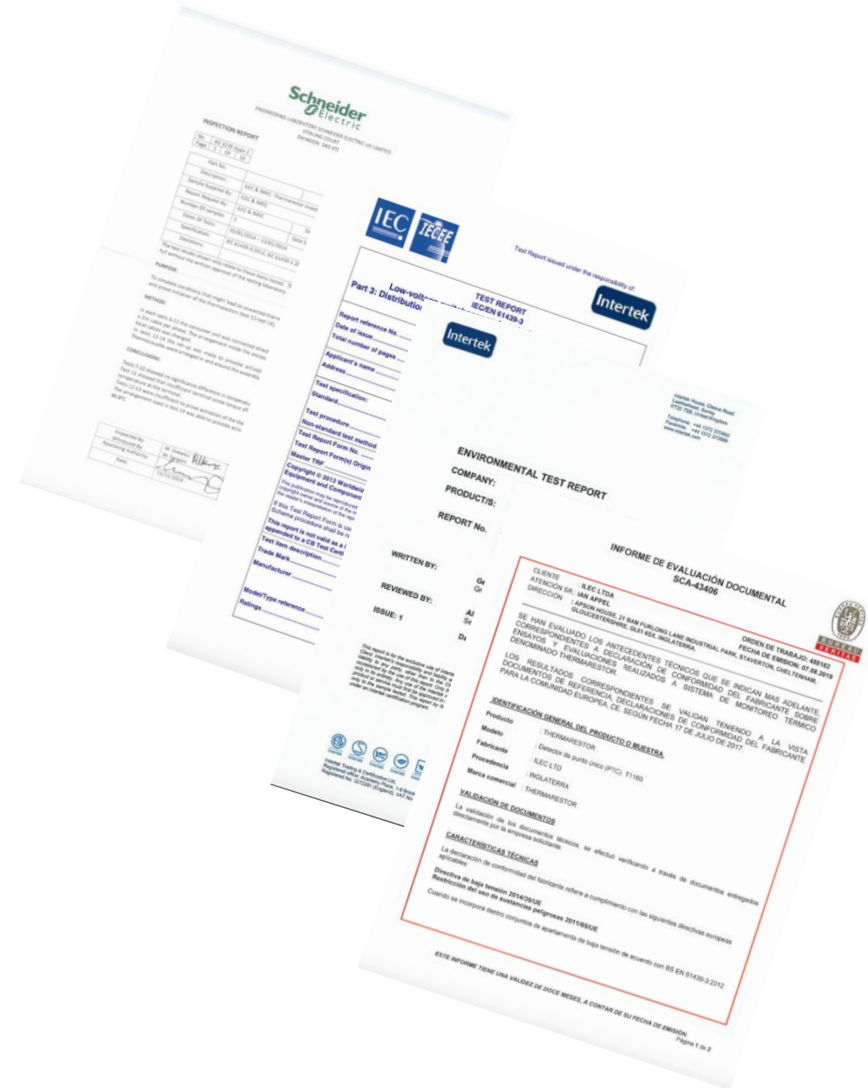
UK Trading standards

Schneider Electric Company

Intertek

Bureau Veritas

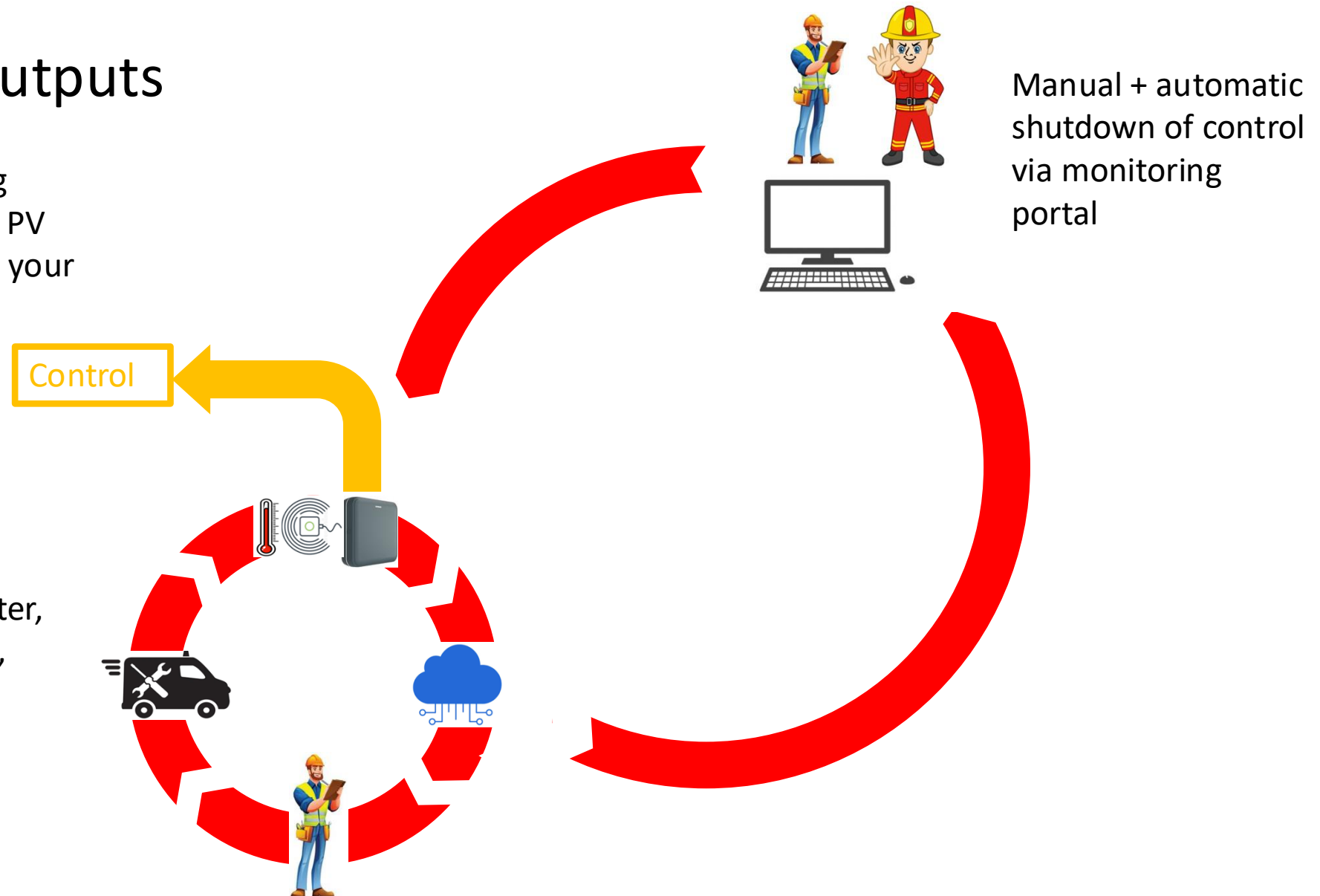
TUV-SUD



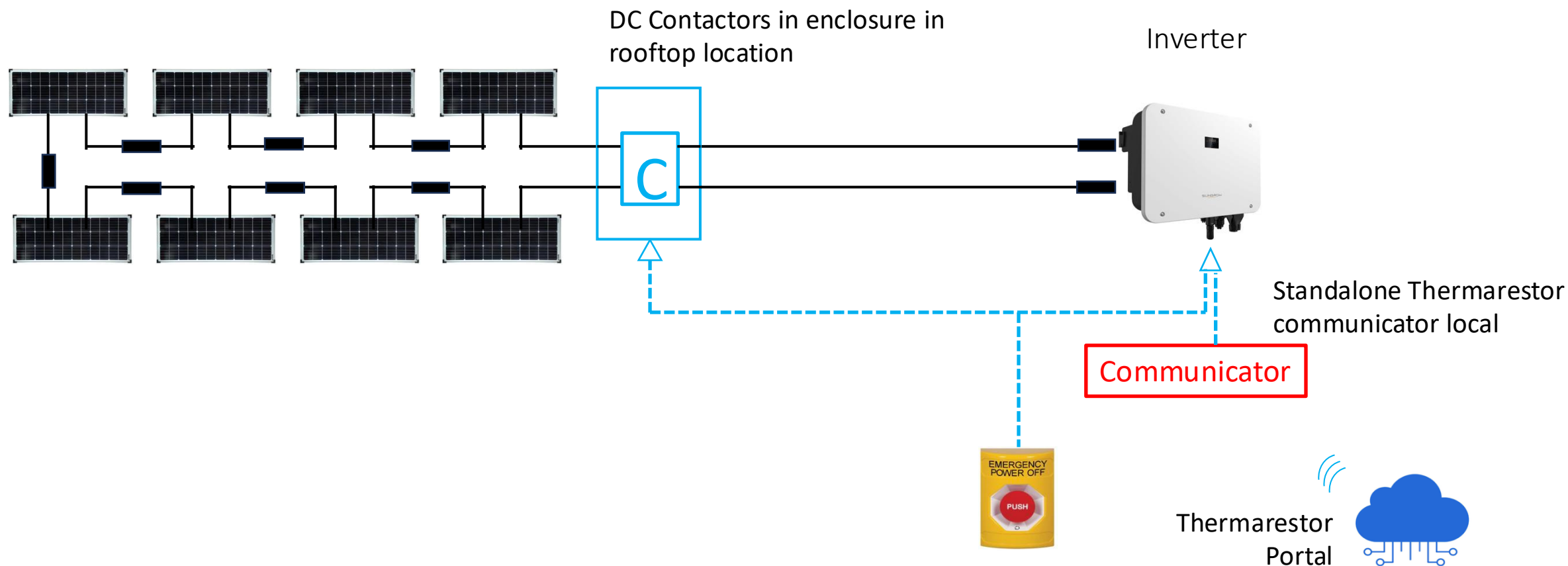
Remote Control Outputs

- Shut down Roof level DC wiring
- Shut down Inverter for rooftop PV
- Individually, remote control for your assets on a farm

Allows remote shut down of inverter, following temperature alert signal, providing essential time for intervention.



Install DC contactors in IP rated enclosures local to the modules – Control



Install DC contactors in IP rated enclosures local to the modules – Control and Protection

