IIRT INSTITUTE OF INFRARED THERMOGRAPHY

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Infrared Thermography Electrical Inspection

10-Year Series Case Study Report (2015 to 2025)

50+ Most Common Equipment Faults found in Preventive Maintenance Thermal Scanning

Includes:

- *Three-Phase, Single-Phase Circuit Breakers*
- *Uninterruptible Power Supply (UPS)*
- *Battery Bank, Capacitor, RCCB*
- *Earth Leakage Relay, Fuse*
- *Busbar Cable Termination*

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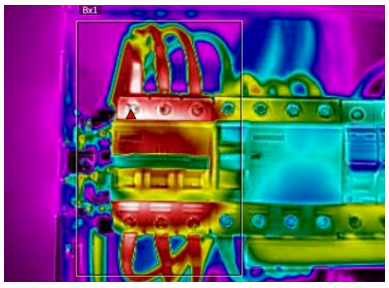
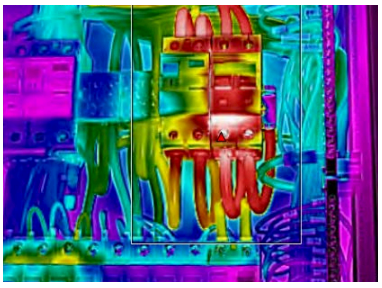
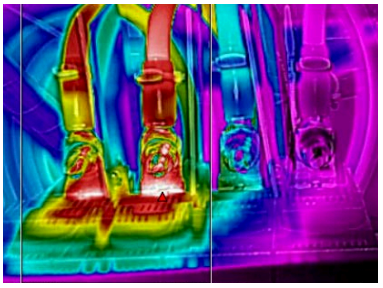

Objectives

This document compiles a 10-year series of infrared electrical inspections conducted between 2015 and 2025, showcasing real case examples from commercial, industrial, and mission-critical facilities. Its purpose is to help thermographers recognise the diverse fault conditions encountered during preventive maintenance thermal scanning.

By reviewing these decade-long field findings, thermographers can strengthen their ability to:

- Identify common electrical fault signatures
- Interpret defects in thermal imagery under live-load conditions
- Understand temperature behaviour, severity trends, and failure progression
- Anticipate potential hazards across different equipment types
- Make more accurate, confident decisions during inspections and reporting

This document is intended as a practical reference guide to support ongoing competency. It does not replace formal thermography certification, which remains essential for safe inspection practices and accurate thermal interpretation.

Overview

- Scope of Equipment Covered: Examples include electrical switchboards, circuit breakers, UPS systems, busbars, cable terminations, and other relevant components.
- Data Interpretation & Documentation: Each case highlights key observations, thermal measurements, severity assessment, and recommended corrective actions, providing practical reference points for evaluating similar defects in the field.
- Intended Users: This guide is designed for trained infrared thermographers and maintenance professionals seeking to improve fault identification skills. It is not a substitute for formal certification but serves as a real-world companion to support ongoing competency and field judgment.

Standards of Reference

All infrared inspections are conducted in compliance with international thermography standards, including:

- ASTM E1934-99A (American Society for Testing and Materials): Standard Guide for Examining Electrical and Mechanical Equipment with Infrared Thermography.
- ASNT SNT-TC-1A (American Society for Nondestructive Testing): Personnel Qualification and Certification in NDT.
- ISO 18436-7: Condition Monitoring & Diagnostics (Requirements for Thermography).
- Singapore Standards 638: Code of Practice for Electrical Installations.

Infrared Thermographer Qualifications

- IIRT infrared thermographers are Level-2 certified or above, and qualified in electrical engineering-based maintenance inspections of live power distribution systems.

Infrared Thermal Imaging Systems

- All infrared thermal cameras used during inspections are calibrated and traceable to accredited laboratory standards.
- All infrared thermal cameras used meet or exceed the following specifications:
    - Detector Resolution: **320 × 240 pixels**
    - Thermal Sensitivity (NETD): **≤ 0.05°C (50 mK) or lower @ 30°C**
    - Spectral Range: **From 8 to 14 µm**
    - Conforms to standard accuracy specifications of **±2 °C or ±2%** of reading, whichever is greater, across the full measurement range.

Thermal Data Interpretation

- Displayed temperature values in thermograms are derived from preset emissivity coefficients assigned to the surface material, or values that closely represent the specific material being analysed.
- All diagnostic interpretations and recommendations are based on the certified thermographer's technical expertise, calibration references, and field experience.

Severity Criteria / Repair Priority

- **Critical** – Immediate repair is required. Conditions identified present an imminent risk of failure, safety hazard, or operational interruption, potentially leading to damage, equipment outage, or electrical tripping.
- **High** – Repairs should be completed within 1 week. Condition warrants prompt corrective action, as continued operation may result in component degradation or failure. Frequent monitoring should also be performed to detect further temperature rise or deterioration.
- **Medium** – Repairs should be completed within 2 weeks. Condition is moderate and not immediately hazardous. Routine monitoring is advised until repairs are completed. Temperature and load trends should be observed to verify condition stability.
- **Low** – Routine monitoring is recommended until the next scheduled infrared inspection or maintenance cycle. No significant thermal anomaly detected, condition observed is within acceptable limits for the component's normal operation.

PRIORITY	ACTION REQUIRED	PVC Cables	Circuit Breakers	Contactors	Exposed Busbar
Critical	**Repair immediately**	> 80°C	> 80°C	> 85°C	> 100°C
High	**Repair within 1 week**	> 80°C	> 81°C	> 85°C	> 100°C
Medium	**Check problem area within 2 weeks**	71°C – 80°C	71°C – 80°C	76°C – 85°C	81°C – 100°C
Low	**Monthly monitoring until next IR scan**	≤ 55°C	≤ 60°C	≤ 65°C	≤ 60°C

General Guidelines for Component Temperature Thresholds:

- **PVC Cables**: Should not exceed 55°C under normal operating operations. Excessive temperatures above this range may indicate overload, poor ventilation, or insulation degradation.
- **Circuit Breakers**: Should not exceed 60°C under normal operations. Excessive temperatures above this range may indicate potential overload, loose terminations, or failing contact mechanisms.
- **Contactors**: Should not exceed 65°C under normal operating operations. Excessive temperatures above this range may indicate coil deterioration, high current draw, or poor contact resistance.
- **Exposed Busbar:** Should not exceed 60°C under normal operating operations. Excessive temperatures above this range may indicate undersized conductors, overload, or poor joint integrity.

  Note: The above guidelines serve as general reference values. Refer to manufacturer specifications or relevant operating manuals for precise allowable temperature limits.

Possible Faults

- **Electrical Installations:** Thermal exceptions are commonly attributed to loose or deteriorated terminations, oxidized or contaminated contact surfaces, short circuits, phase load imbalance, overloading, or improperly installed components.
- **Mechanical/Rotating Equipment:** Thermal exceptions are commonly attributed to frictional heating caused by misalignment, insufficient lubrication, bearing wear, or unbalanced loading conditions.
- **Cable and Joint Terminations:** Thermal exceptions commonly arise from, but are not limited to, the following:
    a. Loose or inadequately torqued screws, bolts, or nuts;
    b. Over-tightened fasteners causing mechanical stress;
    c. Elevated contact resistance due to oxidation or corrosion;
    d. Damaged or improperly crimped terminations;
    e. Reduced or broken conductor strands;
    f. Incomplete conductor-to-terminal contact;
    g. Use of poor-quality or incompatible cable lugs;
    h. Deficient workmanship or improper crimping methods.

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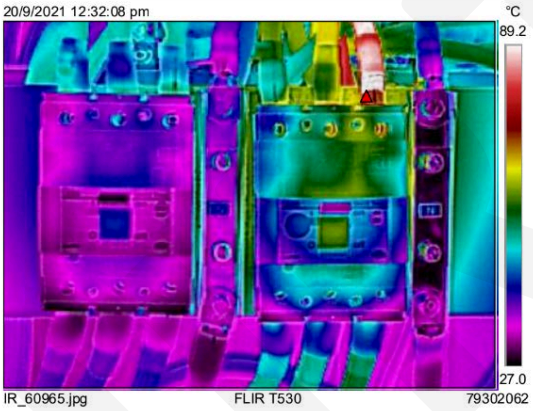
1. THREE-PHASE MOLDED CASE CIRCUIT BREAKER (MCCB)

Detected Issue	Observations	Possible Faults
Severe overheating at circuit breaker terminal	Thermal inspection shows the measured terminal (Bx1) with a critically high temperature of **103.7 °C**, far exceeding surrounding components.	Severely loose termination, heavy oxidation, or dangerously high contact resistance at the terminal.
Isolated heating on one phase	Excessive temperature rise is confined to a single phase, while adjacent terminals remain within normal temperature limits.	Connection-specific fault rather than system overload or balanced high loading.
Extreme temperature rise	The abnormal heating is highly localised and significantly above acceptable operating limits.	Advanced degradation at the terminal interface with high risk of failure or fire if left unrectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Critical	Repair immediately



Measurements		
Bx1	Max	103.7 °C

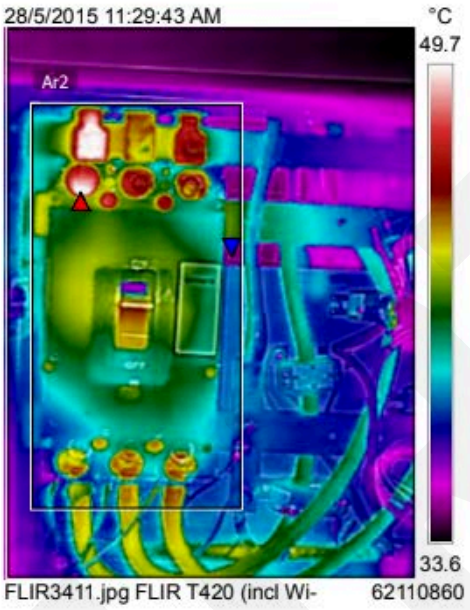
Parameters	
Emissivity	0.95
Refl. temp.	20 °C

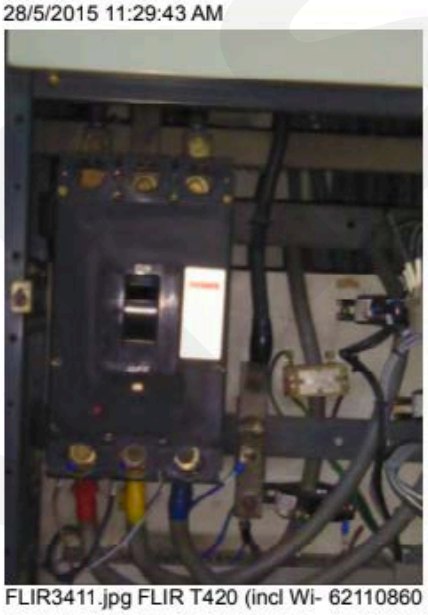
2. THREE-PHASE MOLDED CASE CIRCUIT BREAKER (MCCB)

Detected Issue	Observations	Possible Faults
High temperature at cable lug terminal	Uneven heating across phases, only 1 terminal displays elevated temperature.	Loose termination, oxidation, increased resistance at the joint.
Localised heating	Highlighted cable terminal (Ar2) shows **51.5 °C**.	Uneven loading between phases.
	Noticeably higher than surrounding components.	Connection-specific defect, rather than a system-wide overload.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
High	**Repair within 1 week**





Measurements		°C
Ar1	Max	51.5
Ar2	Max	51.5
	Min	33.9
	Average	37.4

Parameters	
Emissivity	0.95
Refl. temp.	20 °C
Distance	1 m
Atmospheric temp.	20 °C
Ext. optics temp.	20 °C
Ext. optics trans.	1
Relative humidity	50 %

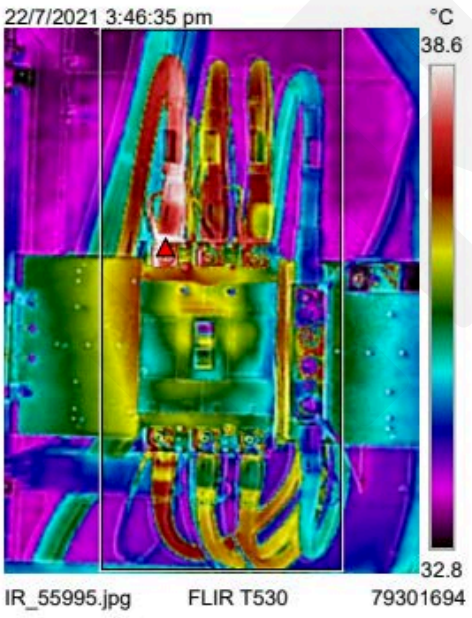
Geolocation	
Compass	NW

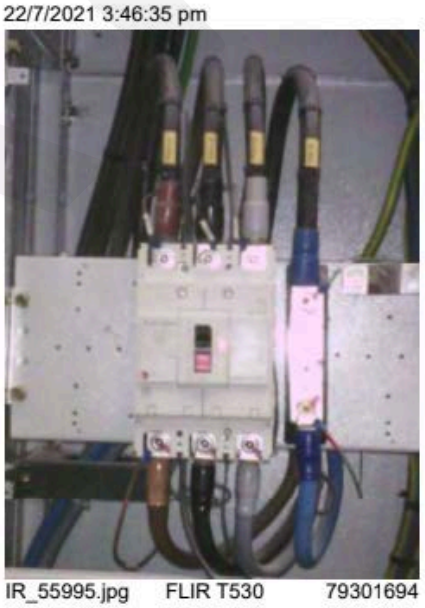
3. THREE-PHASE MOLDED CASE CIRCUIT BREAKER (MCCB)

Detected Issue	Observations	Possible Faults
High temperature at breaker cable lug	Localised temperature rise observed at the top cable termination of the breaker (Bx1). Only one termination displays elevated temperature during operation.	Loose or improperly torqued termination, contact resistance, or early-stage oxidation at the cable lug interface.
Localised heating	Thermal image highlights the affected cable lug with a maximum measured temperature of **40.9 °C**, while adjacent terminations and breaker surfaces remain significantly cooler.	Connection-specific defect rather than phase imbalance or conductor overload.
Temperature higher than surrounding components	Hotspot temperature is noticeably higher compared to nearby reference points, indicating possible abnormal resistive heating at the termination.	Progressive degradation at the connection point, potentially worsening under increased load conditions if not rectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Low	Monthly monitoring until next IR scan





Measurements

Bx1	Max	40.9 °C

Parameters

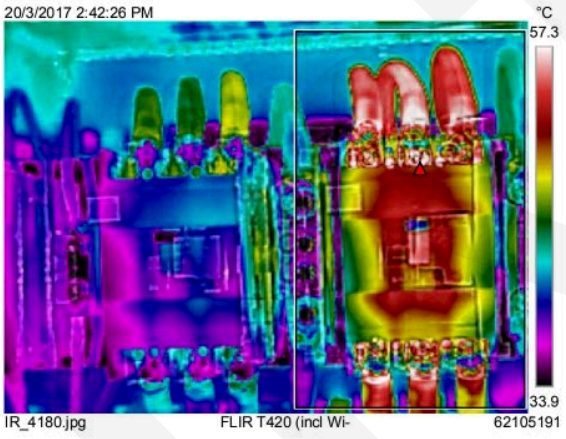
Emissivity	0.95
Refl. temp.	20 °C

4. THREE-PHASE MOLDED CASE CIRCUIT BREAKER (MCCB)

Detected Issue	Observations	Possible Faults
High temperature at incoming cable terminals	Thermal image highlights incoming cable terminals (Bx1) with a peak temperature of **62.0 °C**, significantly higher than surrounding components.	Loose termination, oxidation, or increased contact resistance at the cable termination point.
Uneven heating across phases	Only one set of incoming terminals exhibits elevated temperature, while adjacent phases remain noticeably cooler.	Connection-specific defect or uneven loading rather than a system-wide overload.
Localised temperature rise	Abnormal heating is isolated to the center terminals, indicating a localised issue at that joint or conductor.	Progressive degradation at the affected termination if left unrectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Medium	**Check problem area within 2 weeks**



Measurements		°C
Bx1	Max	62.0

Parameters	
Emissivity	0.95
Refl. temp.	20 °C
Distance	1 m
Atmospheric temp.	20 °C
Ext. optics temp.	20 °C
Ext. optics trans.	1
Relative humidity	50 %

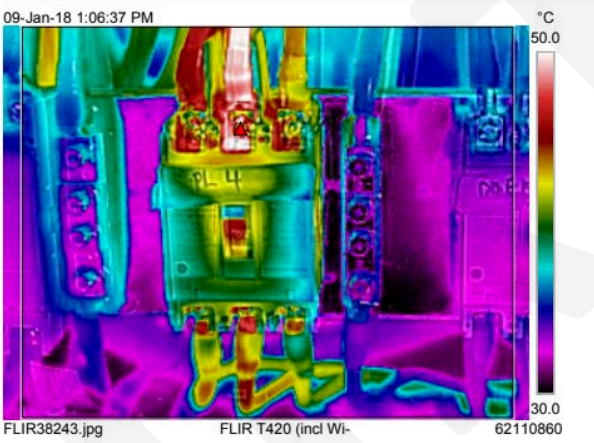
Geolocation	
Compass	5° N

5. THREE-PHASE MOLDED CASE CIRCUIT BREAKER (MCCB)

Detected Issue	Observations	Possible Faults
High temperature at breaker cable lug	Thermal inspection shows a localised hotspot of **55.6 °C** at the top cable termination of the breaker (Bx1).	Loose termination, increased contact resistance, or minor oxidation at the connection point.
Localised heating	Abnormal heating is confined to a single termination point, while adjacent cables and breaker terminals remain significantly cooler.	Connection-specific defect rather than system-wide overload or phase imbalance.
Temperature higher than surrounding components	The affected termination temperature is noticeably higher compared to nearby reference points and adjacent components.	Early-stage degradation at the termination interface if left unrectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Low	Monthly monitoring until next IR scan



Measurements		°C
Bx1	Max	55.6

Parameters	
Emissivity	0.94
Refl. temp.	20 °C

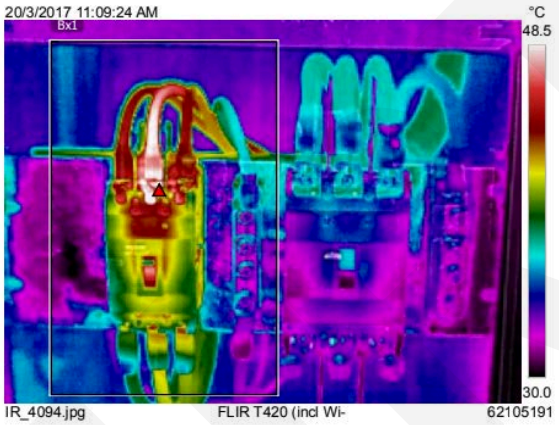
Geolocation	
Compass	281° W

6. THREE-PHASE MOLDED CASE CIRCUIT BREAKER (MCCB)

Detected Issue	Observations	Possible Faults
High temperature at circuit breaker incoming terminal	Thermal inspection shows the incoming terminal (Bx1) with a peak temperature of **57.6 °C**, noticeably higher than surrounding components.	Loose termination, oxidation build-up, or increased contact resistance at the incoming connection point.
Localised heating on a single phase	Only one incoming terminal exhibits significant temperature rise, while adjacent phases remain thermally normal.	Connection-specific defect rather than uniform loading or system-wide overheating.
Temperature higher than surrounding components	The abnormal heating is confined to the highlighted terminal under normal operating conditions.	Early-stage degradation at the termination interface if left uncorrected.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Low	Monthly monitoring until next IR scan



Measurements		°C
Bx1	Max	57.6

Parameters	
Emissivity	0.95
Refl. temp.	20 °C
Distance	1 m
Atmospheric temp.	20 °C
Ext. optics temp.	20 °C
Ext. optics trans.	1
Relative humidity	50 %

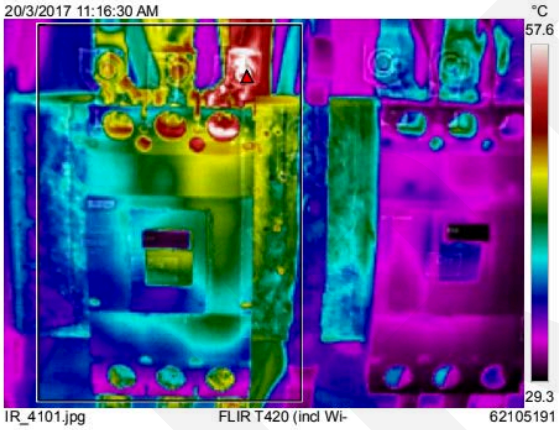
Geolocation	
Compass	19° N

7. THREE-PHASE MOLDED CASE CIRCUIT BREAKER (MCCB)

Detected Issue	Observations	Possible Faults
Elevated temperature at circuit breaker terminal	Thermal inspection shows the highlighted terminal (Bx1) at **64.9 °C**, noticeably higher than surrounding components.	Loose termination, contamination, or increased contact resistance at the circuit breaker terminal connection.
Localised heating on a single phase	Only one terminal exhibits elevated temperature, while adjacent phases remain significantly cooler.	Connection-specific defect rather than uniform load imbalance or system-wide overheating.
Temperature higher than surrounding components	Abnormal heating is isolated to the affected terminal under normal operating conditions.	Progressive deterioration at the terminal interface if left unrectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Medium	**Check problem area within 2 weeks**



Measurements		°C
Bx1	Max	64.9

Parameters	
Emissivity	0.95
Refl. temp.	20 °C
Distance	1 m
Atmospheric temp.	20 °C
Ext. optics temp.	20 °C
Ext. optics trans.	1
Relative humidity	50 %

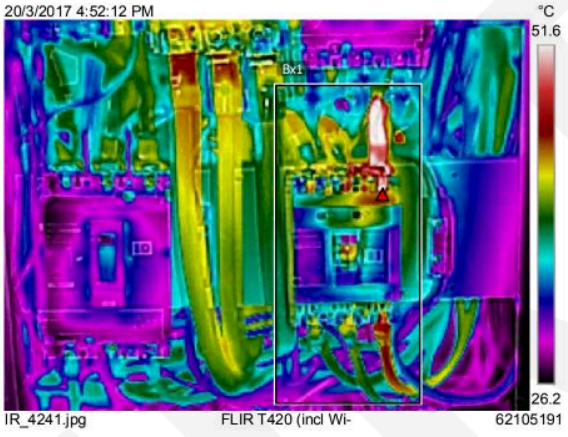
Geolocation	
Compass	14° N

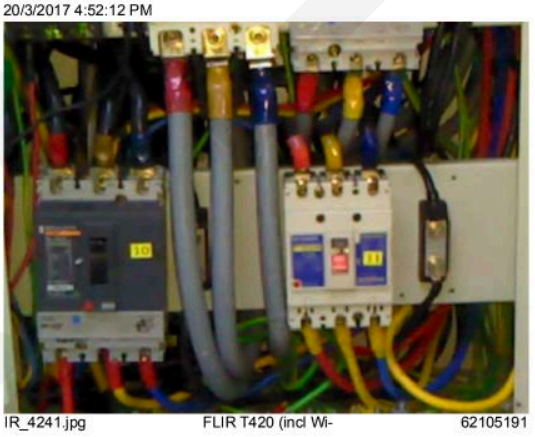
8. THREE-PHASE MOLDED CASE CIRCUIT BREAKER (MCCB)

Detected Issue	Observations	Possible Faults
Elevated temperature at incoming cable terminal	Thermal inspection shows the highlighted terminal (Bx1) at **60.8 °C**, significantly higher than surrounding components	Loose termination, oxidation, or increased contact resistance at the incoming cable connection.
Localised heating on a single phase	Only the identified terminal exhibits elevated temperature, while adjacent phases remain within normal limits.	Connection-specific defect rather than balanced high loading or a system-wide issue
Temperature higher than surrounding components	Abnormal heating is confined to the affected terminal under normal operating conditions.	Progressive thermal deterioration at the terminal interface if not rectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Medium	**Check problem area within 2 weeks**





Measurements		°C
Bx1	Max	60.8

Parameters	
Emissivity	0.95
Refl. temp.	20 °C
Distance	1 m
Atmospheric temp.	20 °C
Ext. optics temp.	20 °C
Ext. optics trans.	1
Relative humidity	50 %

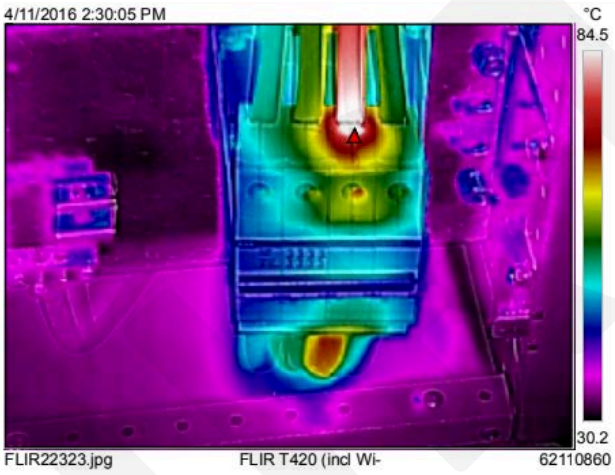
Geolocation	
Compass	1° N

9. THREE-PHASE MINIATURE CIRCUIT BREAKER (MCB)

Detected Issue	Observations	Possible Faults
Severe overheating at incoming cable terminal	Thermal inspection shows the incoming terminal (Bx1) reaching **96.3 °C**, significantly higher than ambient and surrounding components.	Severely loose termination, heavy oxidation, or excessive contact resistance at the incoming cable lug.
Localised heating on a single phase	Only the identified incoming terminal exhibits extreme overheating, while adjacent phases remain within normal thermal limits.	Connection-specific failure rather than balanced load issue or system-wide thermal stress.
Temperature far above surrounding components	Abnormal heating is highly concentrated at the terminal under normal operating conditions.	Imminent risk of thermal damage, insulation breakdown, or terminal failure if left unrectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Critical	Repair immediately



Measurements		°C
Bx1	Max	96.3

Parameters	
Emissivity	0.95
Refl. temp.	20 °C
Distance	1 m
Atmospheric temp.	20 °C
Ext. optics temp.	20 °C
Ext. optics trans.	1
Relative humidity	50 %

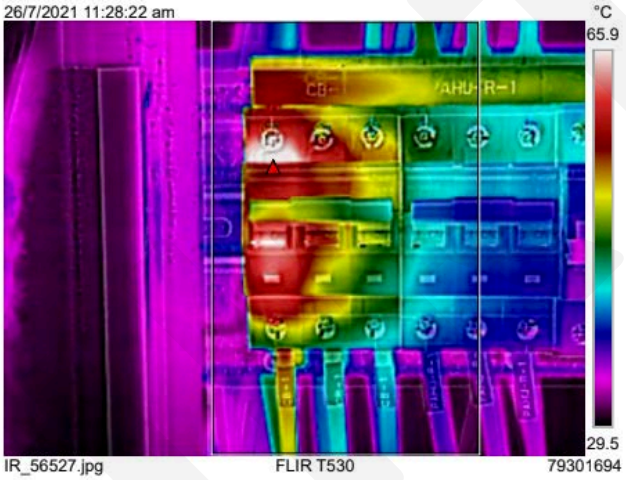
Geolocation	
Compass	229° SW

10. THREE-PHASE MINIATURE CIRCUIT BREAKER (MCB)

Detected Issue	Observations	Possible Faults
High temperature at breaker terminal	Thermal inspection shows a localised hotspot of **75.7 °C** at one breaker pole (Bx1), which is significantly higher than typical operating temperatures.	Loose or improperly torqued connection, high contact resistance, or early-stage deterioration at the breaker terminal.
Uneven heating across poles	Only one breaker pole exhibits elevated temperature, while the remaining poles remain considerably cooler under the same operating conditions.	Connection-specific defect rather than overall breaker overload or uniform phase loading.
Temperature significantly higher than adjacent components	The hotspot temperature is noticeably higher compared to surrounding breaker terminals and reference points, indicating abnormal resistive heating.	Progressive degradation at the terminal interface, potentially leading to insulation damage or failure if left unrectified

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Medium	Check problem area within 2 weeks



Measurements

Bx1	Max	75.7 °C

Parameters

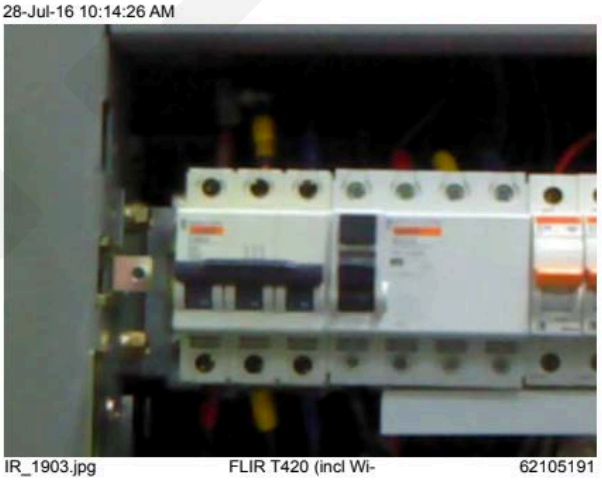
Emissivity	0.95
Refl. temp.	20 °C

11. THREE-PHASE MINIATURE CIRCUIT BREAKER (MCB)

Detected Issue	Observations	Possible Faults
High temperature at breaker terminal	Thermal image shows a localised hotspot of **68.2 °C** at the middle breaker terminal (Bx1).	Loose termination, increased contact resistance, or early-stage oxidation/corrosion at the terminal.
Localised heating	Only the left breaker pole exhibits abnormal heating, while adjacent poles remain significantly cooler.	Connection-related defect or uneven load distribution rather than overall breaker overload
Temperature higher than surrounding components	The affected terminal temperature is noticeably higher than nearby breaker poles and reference points	Progressive degradation at the terminal interface if left unrectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Medium	**Check problem area within 2 weeks**



Measurements		°C
Bx1	Max	68.2

Parameters	
Emissivity	0.95
Refl. temp.	20 °C

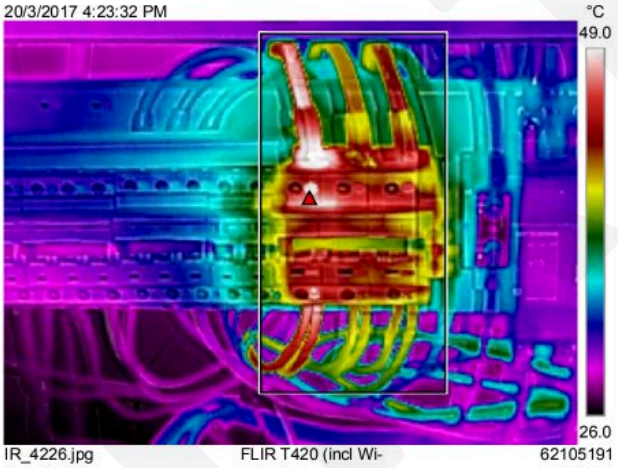
Geolocation	
Compass	169° S

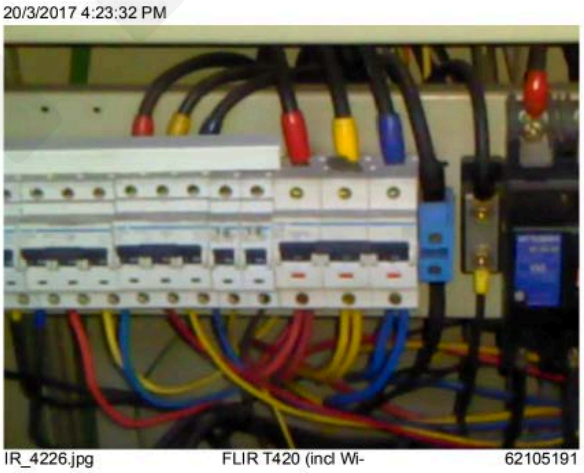
12. THREE-PHASE MINIATURE CIRCUIT BREAKER (MCB)

Detected Issue	Observations	Possible Faults
High temperature at breaker cable termination	Thermal inspection shows a localised hotspot of **56.1 °C** at the top cable lug termination of the breaker (Bx1), which is significantly above normal operating levels.	Loose termination, excessive contact resistance, or early-stage degradation at the connection point.
Localised heating	Heating is concentrated at the top termination only, while the breaker body and other terminations remain significantly cooler.	Connection-specific defect rather than overall breaker overload or uniform phase loading.
Temperature higher than surrounding components	The affected cable lug temperature is noticeably higher compared to adjacent terminations and nearby reference points.	Progressive deterioration at the termination interface if left unrectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Low	Monthly monitoring until next IR scan





Measurements		°C
Bx1	Max	56.1

Parameters	
Emissivity	0.95
Refl. temp.	20 °C
Distance	1 m
Atmospheric temp.	20 °C
Ext. optics temp.	20 °C
Ext. optics trans.	1
Relative humidity	50 %

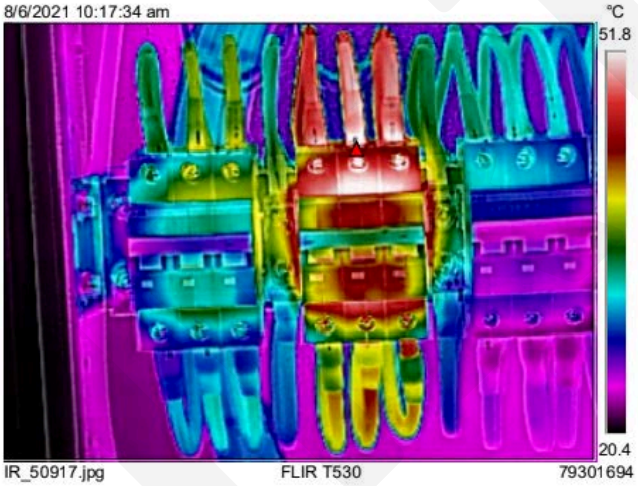
Geolocation	
Compass	358° N

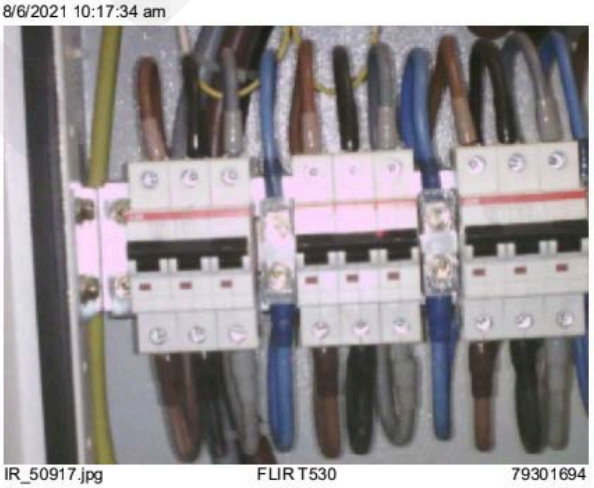
13. THREE-PHASE MINIATURE CIRCUIT BREAKER (MCB)

Detected Issue	Observations	Possible Faults
High temperature at circuit breaker terminal	Thermal inspection shows the measured terminal (Bx1) at **56.7 °C**, which is elevated compared to surrounding terminals and phase conductors.	Loose termination, oxidation, or increased contact resistance at the breaker terminal.
Isolated heating on a single phase	Only one terminal exhibits abnormal heating, while adjacent phase conductors and terminals remain significantly cooler.	Connection-specific defect rather than overall phase imbalance or system-wide overheating.
Temperature higher than surrounding components	The affected terminal temperature is noticeably higher than nearby reference points under normal operation.	Early-stage degradation at the terminal interface, potentially worsening if left unrectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Low	Monthly monitoring until next IR scan





Measurements

Bx1	Max	56.7 °C

Parameters

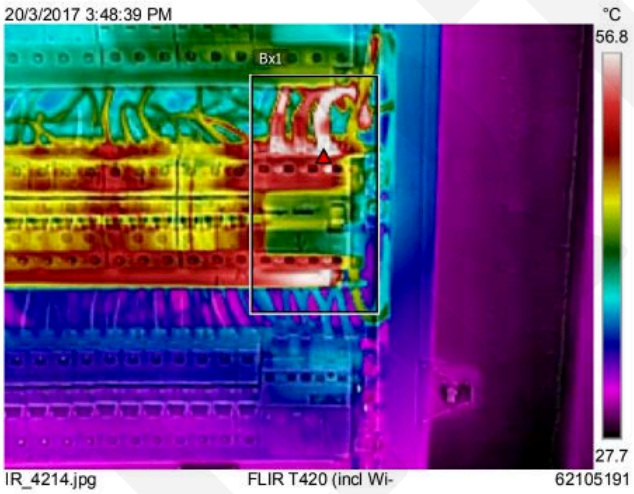
Emissivity	0.95
Refl. temp.	20 °C

14. THREE-PHASE MINIATURE CIRCUIT BREAKER (MCB)

Detected Issue	Observations	Possible Faults
Elevated temperature at terminal connection	Thermal inspection shows the highlighted terminal (Bx1) with a temperature of **67.0 °C**, noticeably higher than surrounding conductors and components.	Loose termination, contamination, or increased contact resistance at the terminal connection.
Localised heating on a single circuit	Only the identified terminal exhibits elevated temperature, while adjacent terminals remain comparatively cooler.	Connection-specific defect rather than uniform high loading or circuit-wide overheating.
Temperature higher than surrounding components	Abnormal heating is isolated to the affected terminal under normal operating conditions.	Progressive deterioration at the terminal interface if left unrectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Medium	**Check problem area within 2 weeks**



Measurements		°C
Bx1	Max	67.0

Parameters	
Emissivity	0.95
Refl. temp.	20 °C
Distance	1 m
Atmospheric temp.	20 °C
Ext. optics temp.	20 °C
Ext. optics trans.	1
Relative humidity	50 %

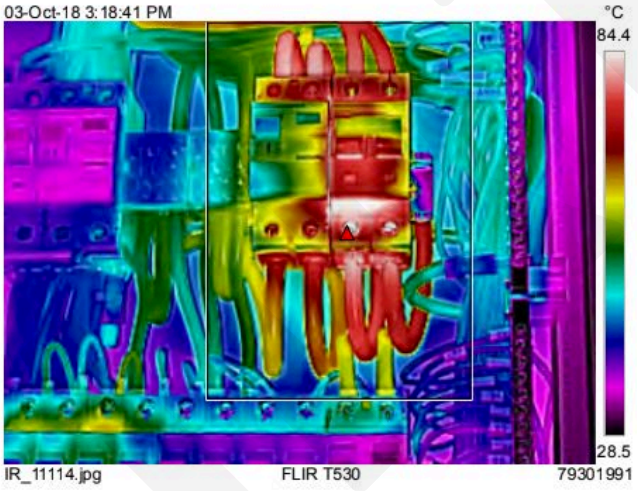
Geolocation	
Compass	170° S

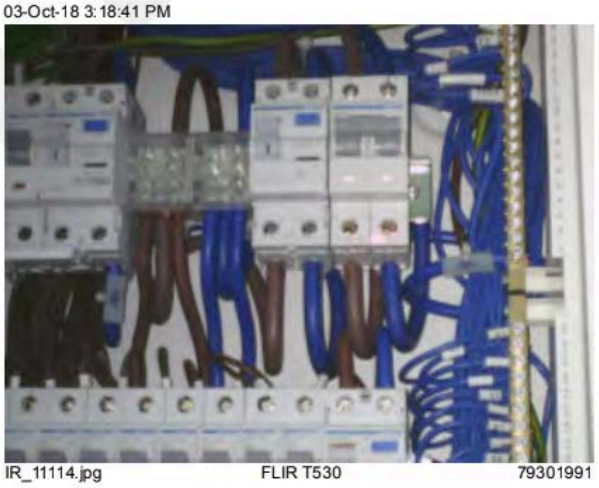
15. SINGLE-PHASE CIRCUIT BREAKER

Detected Issue	Observations	Possible Faults
Severe overheating at terminal connection	Thermal inspection records a hotspot exceeding **101.5 °C** at the terminal connection, significantly higher than surrounding components under normal operating conditions.	Loose contact, oxidised terminals, or severe contact resistance at the breaker terminal or cable lug.
Localised overheating on a single breaker	The thermal signature is concentrated on one breaker, while adjacent breakers operate at substantially lower temperatures.	Overloaded breaker or internally faulty component drawing or passing excessive current.
Extreme temperature rise above normal limits	The magnitude of the temperature rise indicates abnormal operating conditions and elevated fire risk.	Imminent failure of terminal connection or breaker if not immediately addressed.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Critical	Repair immediately





Measurements		°C
Bx1	Max	101.5

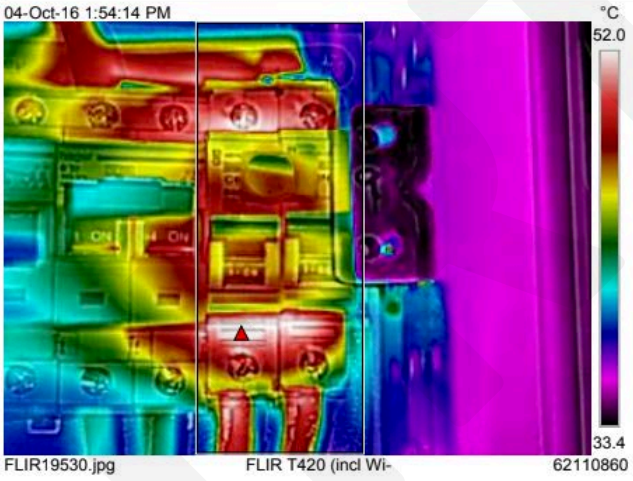
Parameters	
Emissivity	0.95
Refl. temp.	20 °C

16. SINGLE-PHASE CIRCUIT BREAKER

Detected Issue	Observations	Possible Faults
Overheating at breaker terminal	Thermal inspection identifies a hotspot of **53.5 °C** at the breaker terminal, higher than surrounding components under similar operating conditions	Loose or oxidised terminal connection causing increased electrical resistance and heat generation.
Uneven temperature between breakers	Temperature distribution across breakers is uneven, with one breaker exhibiting higher thermal stress compared to others.	Load imbalance on the affected circuit, resulting in higher current draw on one phase.
Localised heating under normal operation	Elevated temperature is concentrated at a specific breaker rather than across the entire assembly.	Progressive degradation of the breaker terminal or conductor if corrective action is not taken.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Medium	**Check problem area within 2 weeks**



Measurements		°C
Bx1	Max	53.5

Parameters	
Emissivity	0.95
Refl. temp.	20 °C

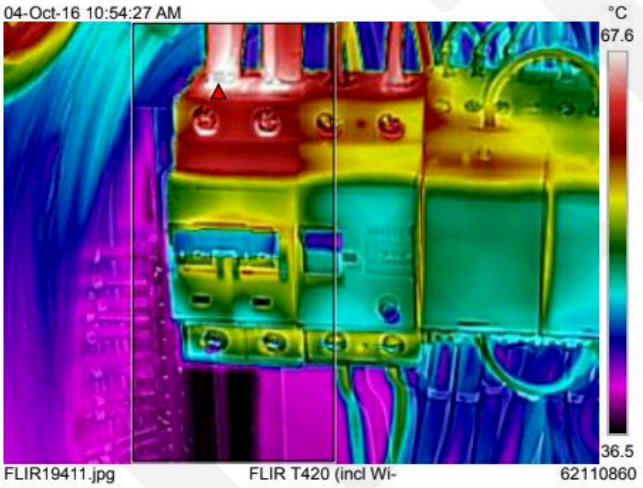
Geolocation	
Compass	57° NE

17. SINGLE-PHASE CIRCUIT BREAKER

Detected Issue	Observations	Possible Faults
Severe overheating at breaker terminal	Thermal inspection shows the left breaker reaching a maximum temperature of **72.6 °C**, significantly higher than adjacent breakers under similar operating conditions.	Loose termination, corrosion, or high contact resistance at the breaker terminal.
Uneven temperature across breakers	The left-most breaker is markedly hotter than surrounding breakers, indicating abnormal thermal behaviour.	Load imbalance or an overloaded breaker carrying excessive current.
Localised high-temperature hotspot	Heating is concentrated at the breaker terminal rather than distributed across the panel.	Accelerated thermal degradation of the breaker or terminal interface if left unaddressed..

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
High	**Repair within 1 week**



Measurements		°C
Bx1	Max	72.6

Parameters	
Emissivity	0.95
Refl. temp.	20 °C

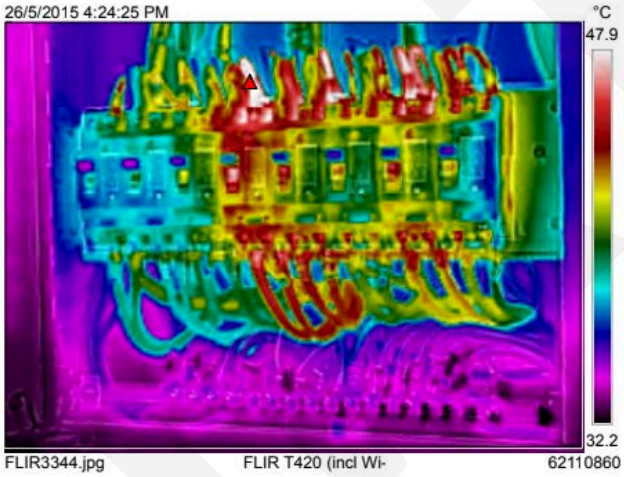
Geolocation	
Compass	331° NW

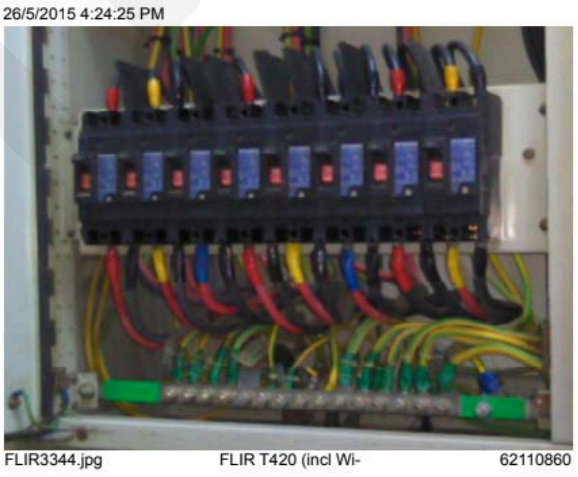
18. SINGLE-PHASE CIRCUIT BREAKER

Detected Issue	Observations	Possible Faults
Localised heating at breaker terminal	Thermal inspection shows one breaker terminal reaching a maximum temperature of **55.3 °C**, noticeably higher than surrounding terminals under similar operating conditions.	Loose connection, oxidation, or high contact resistance at the affected breaker terminal.
Uneven thermal distribution across breakers	Several breakers exhibit varying temperatures, indicating non-uniform thermal behaviour across the breaker row.	Load imbalance where certain circuits are drawing significantly higher current than others.
Isolated elevated temperature under normal operation	Elevated temperature is localised to specific breaker terminals rather than uniformly across the panel.	Progressive thermal deterioration of breaker terminals or conductors if left unrectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Medium	**Check problem area within 2 weeks**





Measurements		°C
Ar1	Max	55.3

Parameters	
Emissivity	0.95
Refl. temp.	20 °C

Geolocation	
Compass	S

19. SINGLE-PHASE CIRCUIT BREAKER

Detected Issue	Observations	Possible Faults
Elevated temperature at circuit breaker module	Thermal inspection shows the highlighted breaker module (Bx1) with a peak of **51.3 °C**.	Loose termination, worn internal contacts, or increased contact resistance within the breaker or its connection points.
Heating isolated to a single breaker	Only the identified breaker exhibits elevated temperature, while neighbouring breakers remain comparatively cooler.	Breaker-specific or connection-specific defect rather than evenly distributed load across circuits.
Early-stage thermal stress	The observed temperature rise is moderate but localised, indicating abnormal resistance or current flow at an early stage.	Progressive deterioration of breaker contacts or terminals if not monitored and addressed.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Low	Monthly monitoring until next IR scan

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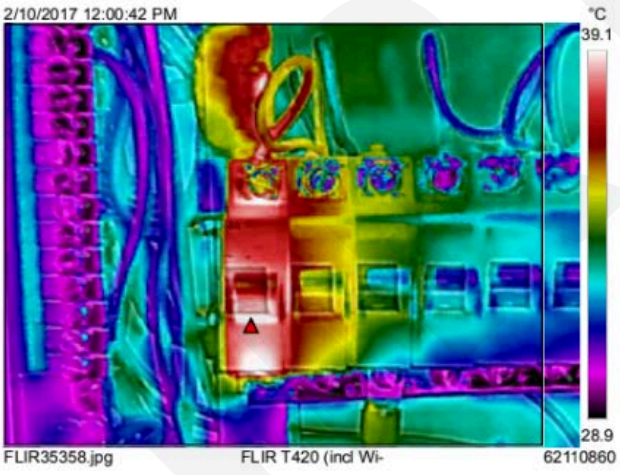
20. SINGLE-PHASE CIRCUIT BREAKER

Detected Issue	Observations	Possible Faults
Slightly elevated temperature at terminal / breaker connection	Thermal inspection shows a maximum temperature of **40.2 °C** at the highlighted connection, marginally higher than surrounding components under similar operating conditions.	Minor contact resistance due to early-stage loosening, light oxidation, or normal load concentration at the connection point.
Localised heating at a single point	Elevated temperature is confined to one connection area, while adjacent terminals and breakers remain comparatively cooler.	Connection-specific condition rather than uniform loading or system-wide thermal stress.
Early indication of electrical stress	Although the absolute temperature is low, the localised hotspot indicates a developing resistance point.	Gradual contact degradation if left unchecked over extended operating periods.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Low	Monthly monitoring until next IR scan



Measurements		°C
Bx1	Max	40.2

Parameters	
Emissivity	0.95
Refl. temp.	20 °C
Distance	1 m
Atmospheric temp.	20 °C
Ext. optics temp.	20 °C
Ext. optics trans.	1
Relative humidity	50 %

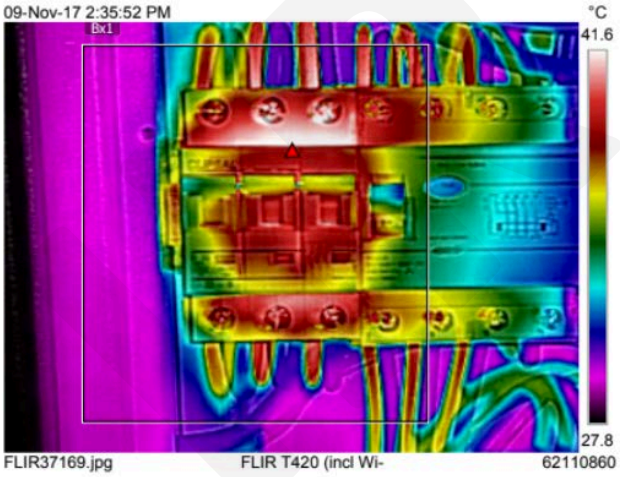
Geolocation	
Compass	270° W

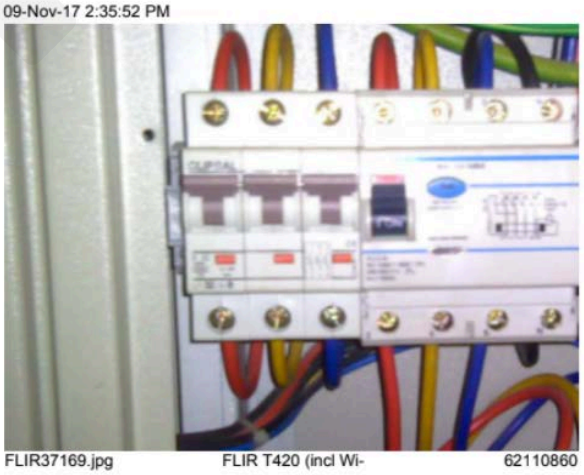
21. SINGLE-PHASE CIRCUIT BREAKER

Detected Issue	Observations	Possible Faults
Elevated temperature at breaker terminal assembly	Thermal inspection shows the highlighted breaker terminal area reaching a maximum temperature of **42.5 °C**, slightly higher than surrounding terminals under similar operating conditions.	Minor contact resistance due to early-stage loosening, light oxidation, or normal load concentration at the breaker terminals.
Localised heating at a single breaker module	Elevated temperature is confined to one breaker module, while adjacent breakers remain comparatively cooler.	Connection-specific condition rather than evenly distributed loading across the breaker row.
Early indication of thermal stress	Although the absolute temperature remains moderate, the localised hotspot suggests developing resistance at the affected terminal interface..	Progressive contact degradation or insulation ageing if not monitored over time.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Low	Monthly monitoring until next IR scan





Measurements		°C
Bx1	Max	42.5

Parameters	
Emissivity	0.94
Refl. temp.	20 °C

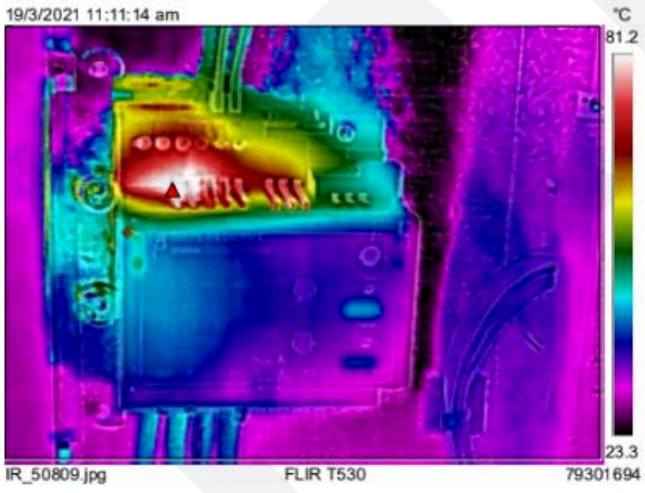
Geolocation	
Compass	335° NW

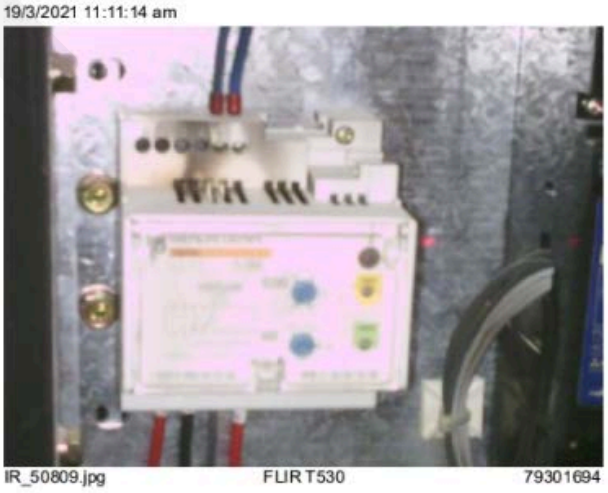
22. EARTH LEAKAGE RELAY (ELR)

Detected Issue	Observations	Possible Faults
Severe overheating at terminal strip	Thermal inspection shows a hotspot exceeding **101.4 °C** at the terminal strip connection area, significantly higher than surrounding components under normal operating conditions.	Loose wiring, oxidised contact surfaces, or internal arcing resulting in excessive contact resistance and heat buildup.
Localised overheating on a specific line	Only one section of the terminal strip exhibits excessive heating, while adjacent connections remain comparatively cool.	Line-specific overcurrent condition or defective contact point rather than system-wide loading.
Extreme temperature rise beyond safe limits	Recorded temperatures are above recognised safe operating thresholds for terminal strips and associated insulation materials.	Imminent insulation melting, terminal burnout, or electrical fire if not urgently rectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Critical	Repair immediately





Measurements

Bx1	Max	101.4 °C

Parameters

Emissivity	0.95
Refl. temp.	20 °C

23. EARTH LEAKAGE RELAY (ELR)

Detected Issue	Observations	Possible Faults
Severe overheating at earth leakage relay	Thermal inspection identifies a concentrated hotspot exceeding **100.3 °C** at the earth leakage relay, significantly higher than surrounding components.	Loose internal or external connections, internal relay failure, or excessive current flow through the relay or associated terminal block.
Isolated heat buildup at control component	Adjacent components remain significantly cooler, indicating the overheating is confined to a single control device.	Faulty, misconfigured, or internally stressed relay element rather than a system-wide loading issue.
Extreme temperature rise above safe operating limits	The magnitude of temperature rise indicates abnormal operating conditions and elevated fire risk.	Imminent thermal breakdown, insulation failure, or electrical fire if not immediately rectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Critical	Repair immediately

Measurements		°C
Bx1	Max	100.3

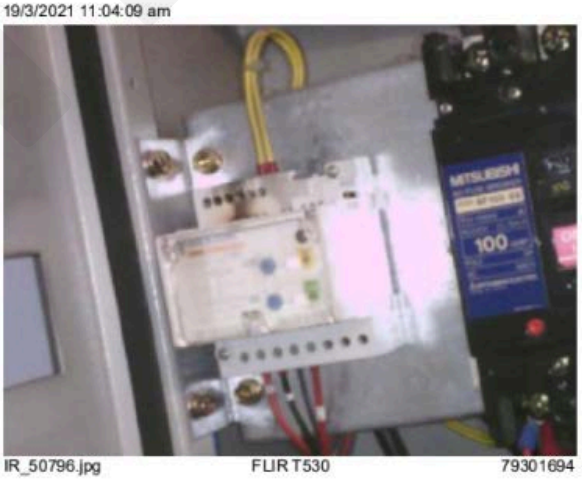
Parameters	
Emissivity	0.95
Refl. temp.	20 °C

24. EARTH LEAKAGE RELAY (ELR)

Detected Issue	Observations	Possible Faults
Severe overheating at terminal point	Thermal inspection identifies a hotspot near the top terminal with temperatures approaching **98.9 °C**, significantly higher than surrounding areas under normal operating conditions.	Loose terminal screw, corroded contact surface, or excessive current resulting in high contact resistance and heat buildup.
Localised fault within electrical distribution component	Excessive heat is confined to a small region of the device, while adjacent areas remain comparatively cooler.	Component-level defect such as a failing terminal block, damaged contact interface, or worn relay mechanism.
Extreme temperature rise beyond safe operating limits	Recorded temperatures significantly exceed recognised safe limits for electrical components.	Accelerated thermal degradation, insulation breakdown, component failure, or electrical fire if not promptly addressed..

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Critical	Repair immediately



Measurements		
Bx1	Max	98.9 °C

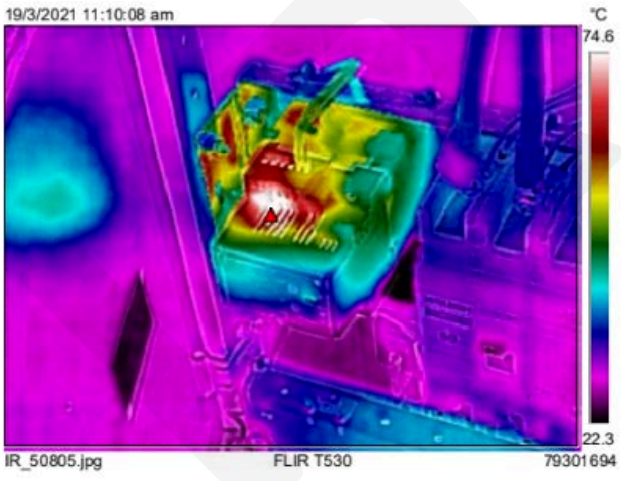
Parameters	
Emissivity	0.95
Refl. temp.	20 °C

25. EARTH LEAKAGE RELAY (ELR)

Detected Issue	Observations	Possible Faults
Severe overheating at upper terminal connection	Thermal inspection identifies a hotspot near the upper cable entry with a measured temperature of **160.4 °C**, significantly higher than surrounding component surfaces under normal operating conditions.	Loose terminal tightening, oxidised contact surface, or severe contact resistance at the cable termination point.
Uneven temperature distribution on the component	The remainder of the component remains comparatively cooler, indicating the overheating is highly localised rather than uniform across the device.	Terminal-level fault or single-phase overload rather than general component overheating.
Extreme thermal stress beyond safe operating limits	The recorded temperature exceeds recognised safe limits for electrical terminals and insulation materials.	Imminent insulation failure, component damage, terminal meltdown, or electrical fire if not immediately addressed.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Critical	Repair immediately



Measurements

Bx1	Max	160.4 °C

Parameters

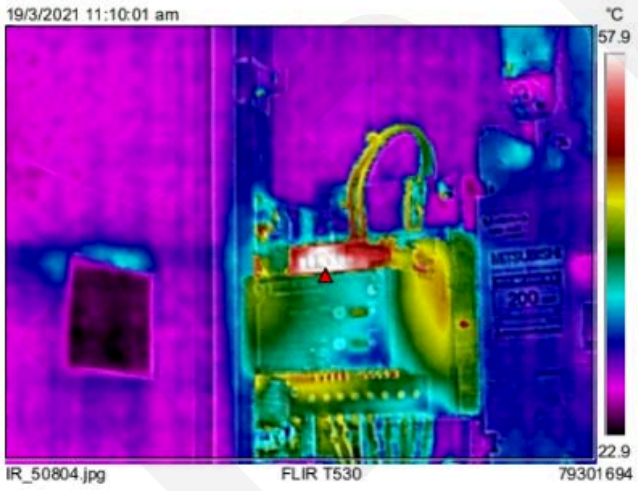
Emissivity	0.95
Refl. temp.	20 °C

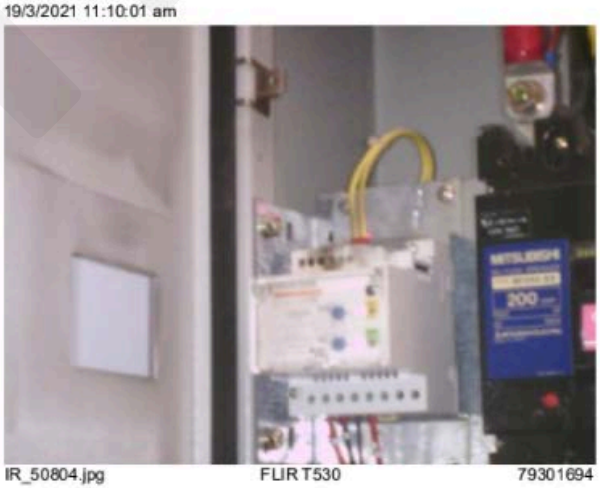
26. EARTH LEAKAGE RELAY (ELR)

Detected Issue	Observations	Possible Faults
Localised overheating at top terminal	Thermal inspection highlights a concentrated hotspot at the top terminal, with a measured temperature of approximately **72.9 °C**, noticeably higher than surrounding areas under normal operating conditions.	Loose or degraded terminal connection causing increased contact resistance and localised heat buildup.
Uneven heat distribution across component	Only one terminal exhibits elevated temperature while the remainder of the component remains comparatively cooler.	Terminal-level fault, poor termination, or single-phase overload rather than uniform component overheating.
Elevated thermal stress above normal operating range	Sustained operation at this temperature level increases stress on insulation and internal component materials.	Progressive insulation degradation, mechanical fatigue, or component failure if left unrectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
High	**Repair within 1 week**





Measurements

Bx1	Max	72.9 °C

Parameters

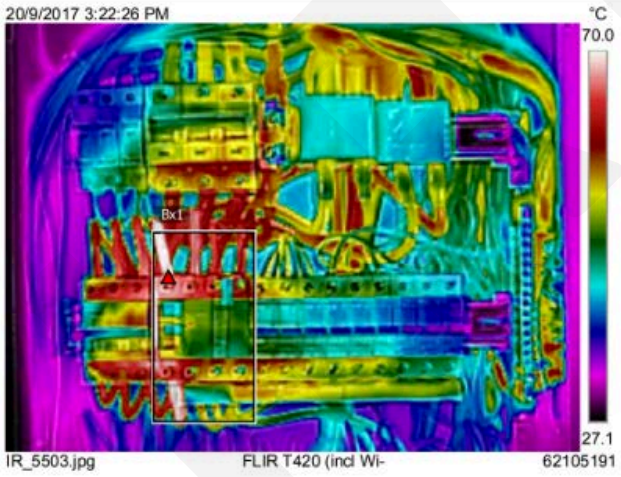
Emissivity	0.95
Refl. temp.	20 °C

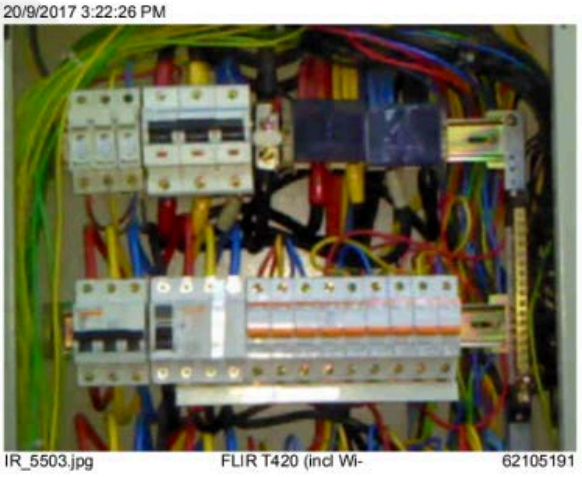
27. RESIDUAL CURRENT CIRCUIT BREAKER (RCCB)

Detected Issue	Observations	Possible Faults
Severe overheating at terminal block	Thermal inspection identifies a concentrated hotspot at the terminal block with a recorded temperature of **78.1 °C**, noticeably higher than surrounding terminals under normal operating conditions.	Loose terminal screws, poor contact quality, or oxidised terminal surfaces resulting in increased contact resistance and heat buildup.
Uneven thermal distribution across terminal block	Only a specific section of the terminal block exhibits significantly elevated temperature, while adjacent terminals remain comparatively cooler.	Localised load imbalance or heavily loaded circuit concentrated at a single connection point rather than uniform loading.
Elevated thermal stress with risk of progressive damage	Sustained operation at this temperature level exceeds typical design margins for terminal blocks and insulation materials.	Progressive insulation degradation, material fatigue, or eventual terminal block failure if not addressed promptly.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
High	Repair within 1 week





Measurements		°C
Bx1	Max	78.1

Parameters	
Emissivity	0.95
Refl. temp.	20 °C
Distance	1 m
Atmospheric temp.	20 °C
Ext. optics temp.	20 °C
Ext. optics trans.	1
Relative humidity	50 %

Geolocation	
Compass	173° S

28. RESIDUAL CURRENT CIRCUIT BREAKER (RCCB)

Detected Issue	Observations	Possible Faults
Overheating at DIN rail terminal	Thermal inspection identifies a localised hotspot at the DIN rail terminal, with temperatures reaching approximately **67 °C**, higher than surrounding components under similar operating conditions.	Loose or deteriorated terminal connection causing increased contact resistance and localised heat buildup around the screw terminal area.
Uneven thermal distribution within distribution row	Elevated temperature is confined to one section of the distribution row, while adjacent breakers and terminals remain comparatively cooler.	Load imbalance on an individual circuit or connection-specific fault rather than system-wide overheating.
Elevated thermal stress above normal operating range	Prolonged operation at this temperature level may accelerate wear on insulation and terminal components.	Progressive insulation degradation, terminal fatigue, or eventual component failure if not rectified.

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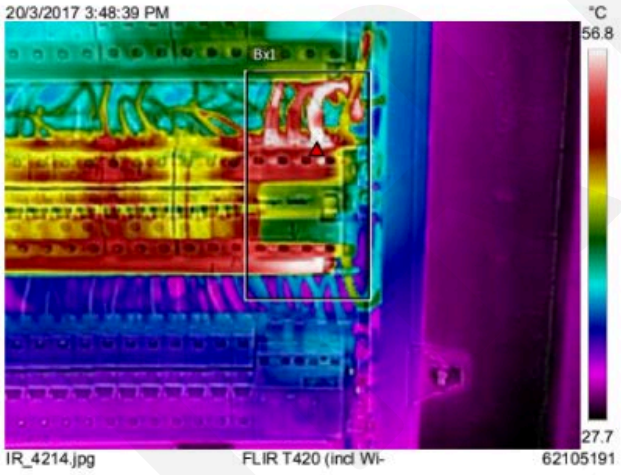
Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Medium	**Check problem area within 2 weeks**



Measurements		°C
Bx1	Max	67.0

Parameters	
Emissivity	0.95
Refl. temp.	20 °C
Distance	1 m
Atmospheric temp.	20 °C
Ext. optics temp.	20 °C
Ext. optics trans.	1
Relative humidity	50 %

Geolocation	
Compass	170° S

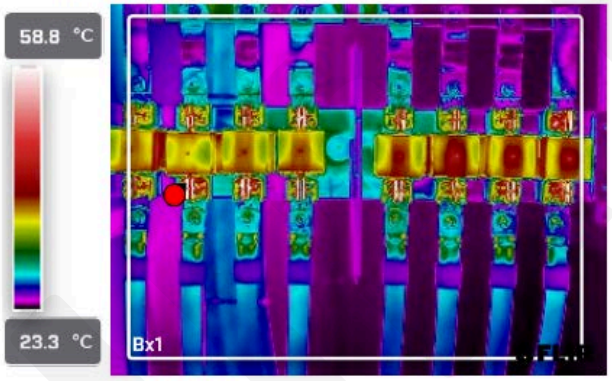
29. FUSE CABLE

Detected Issue	Observations	Possible Faults
Elevated temperature at cable termination point	Thermal inspection shows the highlighted termination (Bx1) reaching **72.4 °C**, significantly higher than adjacent terminations.	Loose termination, oxidation, or increased contact resistance at the cable–busbar interface.
Localised heating on a single connection	Only the identified termination exhibits elevated temperature, while neighbouring connections remain relatively uniform and cooler.	Connection-specific defect rather than balanced loading or system-wide thermal stress.
Elevated thermal stress above normal operating range	Sustained operation at this temperature level increases thermal stress on the termination and surrounding insulation materials.	Progressive deterioration of the cable lug, busbar interface, or insulation if not rectified.

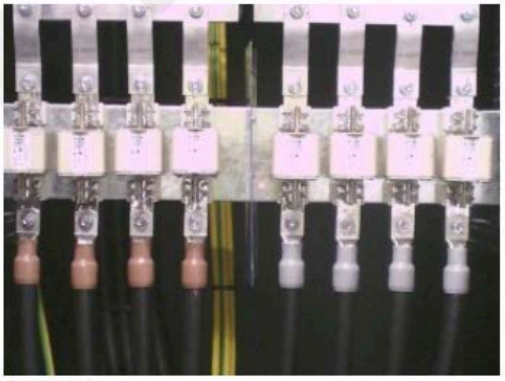
Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
High	Repair within 1 week

22/8/2024 2:32:10 pm



IR_77077.jpg



79301991

Parameters	
Emissivity	0.95
Distance	1.86 m
Reflected temp.	29.0 °C
Atmospheric temp.	25.0 °C
Relative humidity	50.0%
Ext. optics temp.	20.0 °C
Ext. optics trans.	1.00

File information	
File name	IR_77077.jpg
File size	361 KB
Width	320
Height	240
Minimum temp.	23.1 °C
Maximum temp.	72.4 °C

Camera information	
Camera model	FLIR T530
Lens	FOL18
Camera serial	79301991
Filter	
Range max.	120.0 °C
Range min.	-20.0 °C
Field of view	23.50

Measurements	
Bx1	
Max	72.4 °C

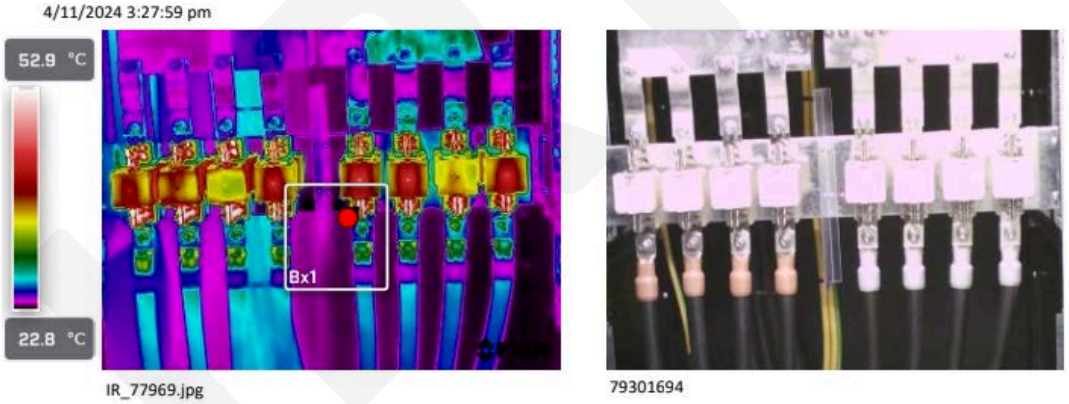
Geolocation	
Coordinates	
Compass degrees	

30. FUSE CABLE

Detected Issue	Observations	Possible Faults
Overheating at terminal joints	Thermal inspection shows terminal joints reaching a maximum temperature of **55.7 °C**, higher than surrounding conductors under similar operating conditions.	Loose or oxidised terminal connections causing increased electrical resistance and localised heat generation.
Temperature disparity across phases	Uneven temperature distribution is observed between phases, with certain terminals operating at higher temperatures than others.	Phase load imbalance or uneven current distribution stressing individual terminals and components.
Measurement condition – elevated reflected temperature setting		Potential minor measurement uncertainty; however, observed thermal pattern remains valid for identifying relative anomalies.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Medium	Check problem area within 2 weeks



Parameters	
Emissivity	0.95
Distance	1.98 m
Reflected temp.	30.0 °C
Atmospheric temp.	20.0 °C
Relative humidity	50.0%
Ext. optics temp.	20.0 °C
Ext. optics trans.	1.00

File information	
File name	IR_77969.jpg
File size	340 KB
Width	320
Height	240
Minimum temp.	22.7 °C
Maximum temp.	66.1 °C

Camera information	
Camera model	FLIR T530
Lens	FOL18
Camera serial	79301694
Filter	
Range max.	120.0 °C
Range min.	-20.0 °C
Field of view	23.50

Measurements	
Bx1	
Max	55.7 °C

Geolocation	
Coordinates	
Compass degrees	

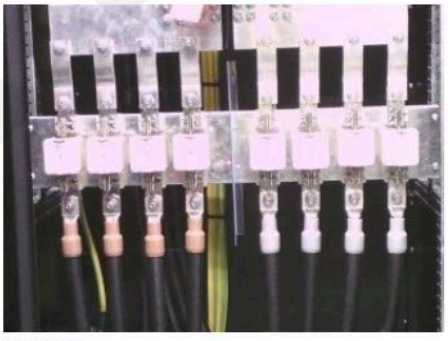
31. FUSE CABLE

Detected Issue	Observations	Possible Faults
Elevated temperature at cable lug / terminal connections	Thermal inspection shows multiple adjacent cable lugs reaching a maximum temperature of **71.3 °C**, noticeably higher than surrounding conductors and background temperatures under normal operating conditions.	Loose termination, oxidation at lug–terminal interfaces, or increased contact resistance at the connection points.
Localised heating across specific terminals	Elevated temperatures are concentrated on selected terminal connections, while other neighbouring lugs remain comparatively cooler.	Connection-specific defects or uneven load sharing rather than uniform loading across all phases.
Elevated thermal stress above normal operating range	Sustained operation at this temperature level exceeds typical thermal margins for cable lugs and insulation materials.	Progressive contact degradation, insulation ageing, or eventual termination failure if not rectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
High	**Repair within 1 week**

IR_77933.jpg



79301694

Parameters	
Emissivity	0.95
Distance	2.16 m
Reflected temp.	30.0 °C
Atmospheric temp.	20.0 °C
Relative humidity	50.0%
Ext. optics temp.	20.0 °C
Ext. optics trans.	1.00

File information	
File name	IR_77933.jpg
File size	342 KB
Width	320
Height	240
Minimum temp.	23.0 °C
Maximum temp.	71.3 °C

Camera information	
Camera model	FLIR T530
Lens	FOL18
Camera serial	79301694
Filter	
Range max.	120.0 °C
Range min.	-20.0 °C
Field of view	23.50

Measurements	
Bx1	
Max	71.3 °C

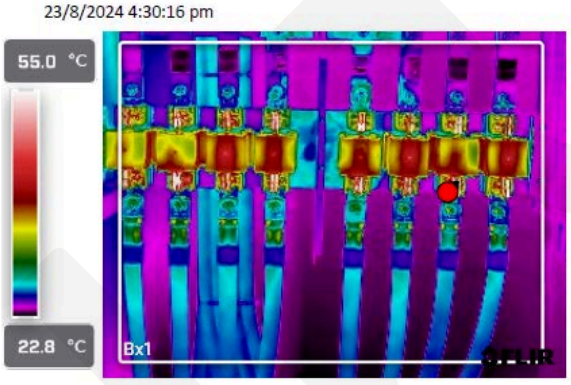
Geolocation	
Coordinates	
Compass degrees	

32. FUSE CABLE

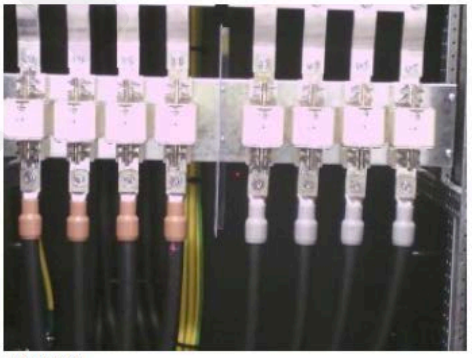
Detected Issue	Observations	Possible Faults
Elevated temperature at cable lug / terminal connections	Thermal inspection shows the highlighted cable lug area reaching a maximum temperature of **65.5 °C**, higher than surrounding conductors under normal operating conditions.	Loose termination, oxidation at the lug–terminal interface, or increased contact resistance at the connection point.
Localised heating on selected terminals	Elevated temperature is concentrated on specific cable lugs, while adjacent connections remain comparatively cooler.	Connection-specific defect or uneven load sharing rather than uniform loading across all phases.
Moderate thermal stress above normal operating range	Sustained operation at this temperature level exceeds typical baseline temperatures for cable lugs and insulation materials.	Progressive contact degradation or insulation ageing if not rectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Medium	Check problem area within 2 weeks



IR_77119.jpg



79301991

Parameters	
Emissivity	0.95
Distance	2.58 m
Reflected temp.	29.0 °C
Atmospheric temp.	25.0 °C
Relative humidity	50.0%
Ext. optics temp.	20.0 °C
Ext. optics trans.	1.00

File information	
File name	IR_77119.jpg
File size	354 KB
Width	320
Height	240
Minimum temp.	21.7 °C
Maximum temp.	66.5 °C

Camera information	
Camera model	FLIR T530
Lens	FOL18
Camera serial	79301991
Filter	
Range max.	120.0 °C
Range min.	-20.0 °C
Field of view	23.50

Measurements	
Bx1	
Max	66.5 °C

Geolocation	
Coordinates	
Compass degrees	

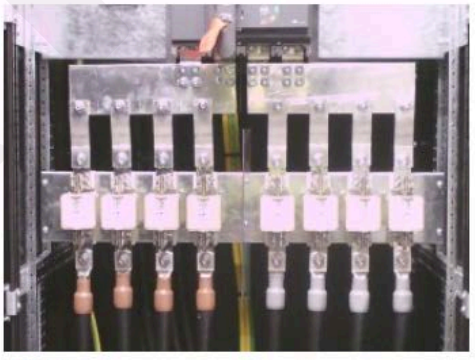
33. FUSE CABLE

Detected Issue	Observations	Possible Faults
Elevated temperature at cable lug / terminal connections	Thermal inspection shows the highlighted cable lug area reaching a maximum temperature of **65.7 °C**, higher than surrounding conductors under normal operating conditions	Loose termination, oxidation at the lug–terminal interface, or increased contact resistance at the connection point.
Localised heating on selected terminals	Elevated temperature is concentrated on specific cable lugs, while adjacent connections remain comparatively cooler.	Connection-specific defect or uneven load sharing rather than uniform loading across all phases.
Moderate thermal stress above normal operating range	Sustained operation at this temperature level exceeds typical baseline temperatures for cable lugs and insulation materials.	Progressive contact degradation or insulation ageing if not rectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Medium	Check problem area within 2 weeks

IR_77478.jpg



79301991

Parameters	
Emissivity	0.95
Distance	2.33 m
Reflected temp.	29.0 °C
Atmospheric temp.	25.0 °C
Relative humidity	50.0%
Ext. optics temp.	20.0 °C
Ext. optics trans.	1.00

File information	
File name	IR_77478.jpg
File size	363 KB
Width	320
Height	240
Minimum temp.	22.6 °C
Maximum temp.	65.7 °C

Camera information	
Camera model	FLIR T530
Lens	FOL18
Camera serial	79301991
Filter	
Range max.	120.0 °C
Range min.	-20.0 °C
Field of view	23.50

Measurements	
Bx1	
Max	65.7 °C

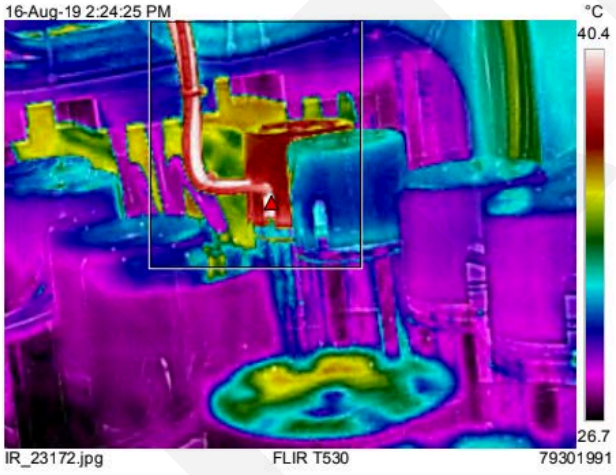
Geolocation	
Coordinates	
Compass degrees	

34. CAPACITOR

Detected Issue	Observations	Possible Faults
Localised overheating at component terminal	Thermal inspection identifies a small hotspot at the top-right of the component, with a measured temperature of **43.5 °C**, slightly higher than surrounding areas under normal operating conditions.	Minor contact resistance due to loose tightening, early-stage oxidation, or degraded terminal contact surface.
Uneven heating pattern among components	One component operates at a higher temperature than adjacent components, while the rest of the system remains comparatively uniform.	Localised internal connection issue or uneven load distribution rather than system-wide thermal stress.
Early indication of electrical stress	Although the absolute temperature is moderate, the localised hotspot suggests abnormal current flow or resistance at a specific point.	Progressive deterioration of the terminal or internal connection if not monitored or corrected.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Low	Monthly monitoring until next IR scan



Measurements		°C
Bx1	Max	43.5

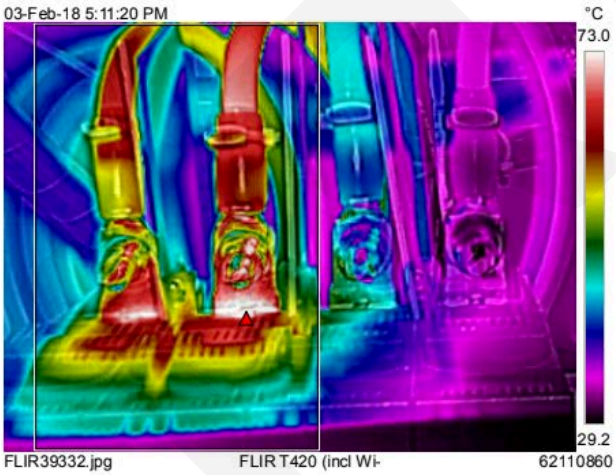
Parameters	
Emissivity	0.95
Refl. temp.	20 °C

35. BUSBAR CABLE TERMINATION

Detected Issue	Observations	Possible Faults
High temperature at cable lug terminal	Thermal inspection shows the brown-phase cable lug reaching **80.8 °C**, significantly higher than the adjacent black and grey phase connections under similar operating conditions.	Loose termination, oxidation, or corrosion at the cable lug resulting in increased contact resistance.
Localised overheating on a single phase	Only the brown-phase connection exhibits elevated temperature, while neighbouring phases remain comparatively cooler.	Loose termination, oxidation, or corrosion at the cable lug resulting in increased contact resistance.
Elevated thermal stress at contact interface	Sustained operation at this temperature places increased stress on the lug and insulation materials.	Progressive contact surface degradation, loss of terminal tension, insulation damage, or potential arcing if not addressed.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
High	Repair within 1 week



Measurements		°C
Bx1	Max	80.8

Parameters	
Emissivity	0.94
Refl. temp.	20 °C

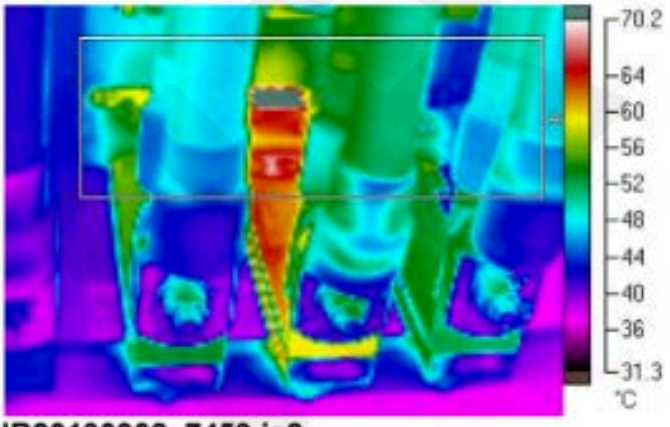
Geolocation	
Compass	355° N

36. BUSBAR CABLE TERMINATION

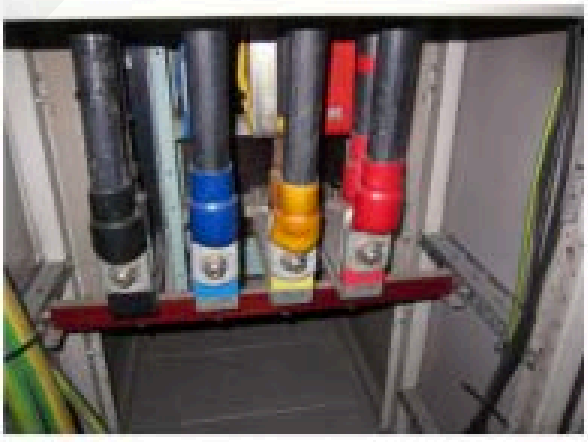
Detected Issue	Observations	Possible Faults
Localised overheating at cable termination	Thermal inspection shows one cable lug operating at a significantly higher temperature than adjacent terminations, with recorded values near **79.3°C** under normal operating conditions.	Loose termination, oxidation, or inadequate contact pressure at the cable lug interface.
Phase-specific overheating	Only one phase conductor exhibits abnormal temperature rise, while other phases remain comparatively cooler.	Phase imbalance or disproportionate current flow through the affected phase rather than system-wide overheating.
Elevated thermal stress with risk of progressive deterioration	Sustained operation at this temperature level increases thermal stress on insulation and contact surfaces, particularly in a mission-critical environment.	Accelerated insulation ageing, contact fatigue, or eventual electrical failure if not rectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
High	**Repair within 1 week**



IR20130902_7459.is2
9/2/2013 9:22:09 PM



Main Image Markers

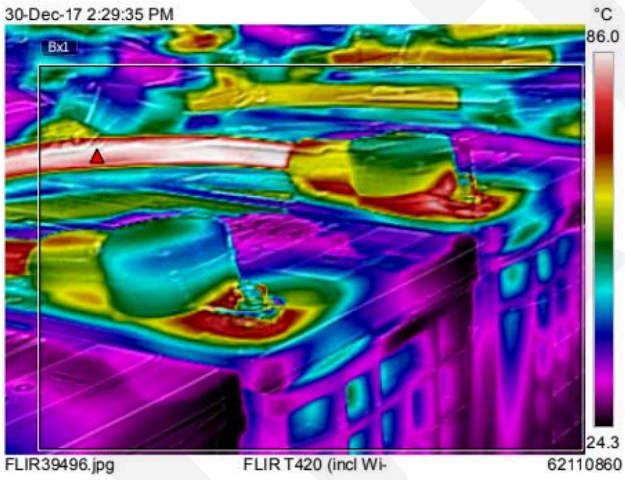
Name	Avg	Min	Max
A1	50.3°C	40.8°C	79.3°C

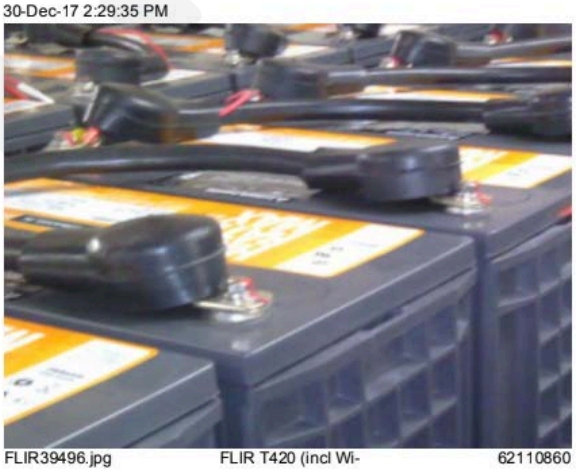
37. UPS INTERLINK BATTERY CABLE

Detected Issue	Observations	Possible Faults
Severe overheating at battery terminal connection	Thermal inspection shows the highlighted battery terminal (Bx1) reaching **87.0 °C**, far exceeding surrounding battery temperatures.	Severely loose termination, corrosion, or excessive contact resistance at the battery post.
Localised heating isolated to a single terminal	Only one battery terminal exhibits this level of overheating, while adjacent terminals remain thermally normal.	Connection-specific failure rather than uniform loading across the battery bank.
High thermal stress with accelerated degradation risk	Sustained operation at this temperature level imposes significant stress on terminal materials and insulation.	Accelerated degradation, terminal damage, or potential battery failure if not urgently addressed.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
High	**Repair within 1 week**





Measurements		°C
Bx1	Max	87.0

Parameters	
Emissivity	0.94
Refl. temp.	20 °C

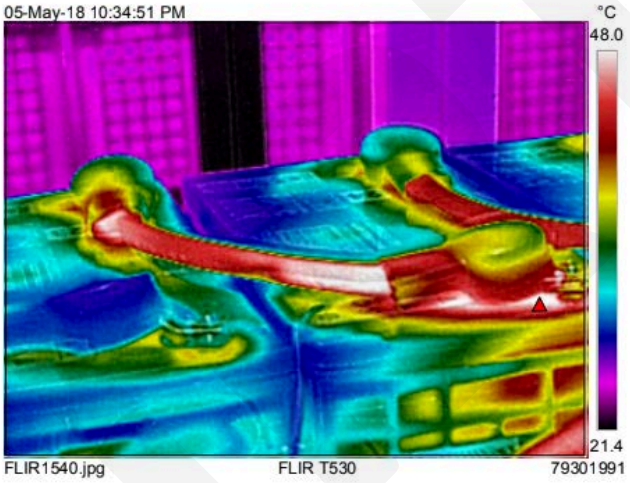
Geolocation	
Compass	69° E

38. UPS INTERLINK BATTERY CABLE

Detected Issue	Observations	Possible Faults
Elevated temperature at battery interlink cable	Thermal inspection shows the highlighted interconnection cable (Bx1) reaching **50.3 °C**, noticeably higher than surrounding battery surfaces.	Loose terminal connection, corrosion buildup, or increased contact resistance along the battery interlink cable.
Localised heating at a single connection point	Only one section of the interlink cable exhibits elevated temperature, while adjacent connections remain comparatively cooler.	Connection-specific defect rather than uniform high current draw across the battery bank.
Early-stage thermal stress at cable termination	The abnormal temperature rise is confined to the affected termination, indicating developing thermal stress.	Progressive contact degradation or insulation ageing if not rectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Medium	**Check problem area within 2 weeks**



Measurements		°C
Bx1	Max	50.3

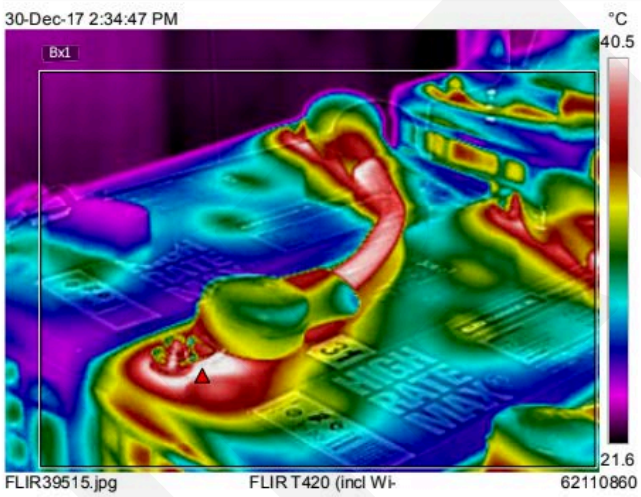
Parameters	
Emissivity	0.95
Refl. temp.	20 °C

39. UPS INTERLINK BATTERY CABLE

Detected Issue	Observations	Possible Faults
Elevated temperature at battery terminal connection	Thermal inspection shows the highlighted battery terminal (Bx1) reaching **44.0 °C**, higher than the surrounding battery.	Loose terminal connection, early-stage oxidation, or increased contact resistance at the battery post.
Localised heating at a single terminal	Only the identified battery terminal exhibits elevated temperature, while adjacent terminals and interlink cables remain comparatively cooler.	Connection-specific defect rather than uniform current loading across the battery system.
Early indication of thermal stress	The temperature rise is moderate but clearly localised, indicating abnormal resistance at the affected terminal.	Progressive contact degradation or insulation ageing if left unaddressed.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Low	Monthly monitoring until next IR scan



Measurements		°C
Bx1	Max	44.0

Parameters	
Emissivity	0.94
Refl. temp.	20 °C

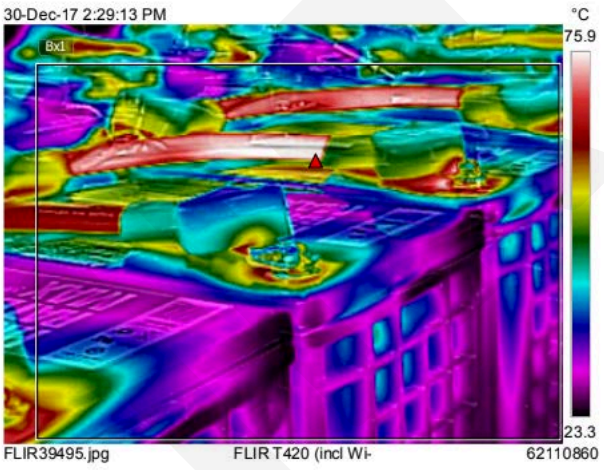
Geolocation	
Compass	271° W

40. UPS INTERLINK BATTERY CABLE

Detected Issue	Observations	Possible Faults
Elevated temperature at battery terminal connection	Thermal inspection shows the highlighted battery terminal (Bx1) reaching **77.0 °C**, significantly higher than the surrounding battery.	Loose terminal connection, corrosion buildup, or increased contact resistance at the battery post.
Localised heating at a single terminal	Only the identified battery terminal exhibits elevated temperature, while adjacent terminals remain within normal thermal limits.	Connection-specific defect rather than uniform current loading across the battery bank.
Elevated thermal stress with risk of progressive deterioration	Sustained operation at this temperature level exceeds typical design margins for battery terminals and insulation materials.	Progressive contact degradation, insulation ageing, or potential terminal failure if not addressed.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
High	Repair within 1 week



Measurements		°C
Bx1	Max	77.0

Parameters	
Emissivity	0.94
Refl. temp.	20 °C

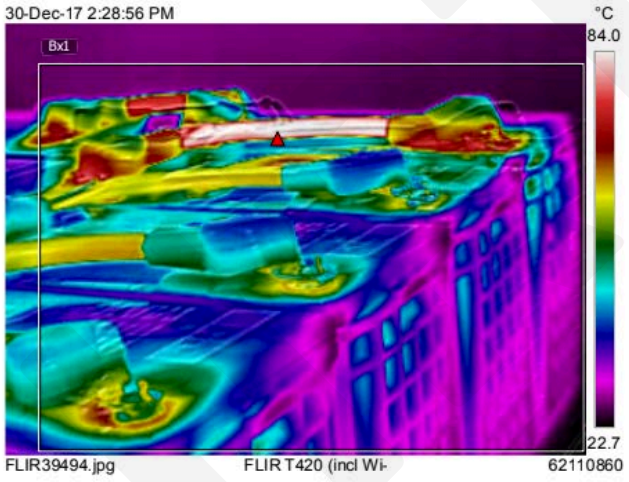
Geolocation	
Compass	55° NE

41. UPS INTERLINK BATTERY CABLE

Detected Issue	Observations	Possible Faults
Severe overheating at battery terminal connection	Thermal inspection shows the highlighted battery terminal (Bx1) reaching **85.2 °C**, substantially higher than surrounding battery temperatures.	Severely loose termination, corrosion buildup, or excessive contact resistance at the battery post.
Localised heating isolated to a single terminal	Only the identified battery terminal exhibits this elevated temperature, while adjacent terminals remain within normal thermal limits.	Connection-specific defect rather than uniform loading across the battery bank.
High thermal stress with accelerated degradation risk	Sustained operation at this temperature level imposes significant stress on terminal materials and insulation.	Accelerated contact degradation, thermal damage, or potential battery system failure if not promptly rectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
High	**Repair within 1 week**



Measurements		°C
Bx1	Max	85.2

Parameters	
Emissivity	0.94
Refl. temp.	20 °C

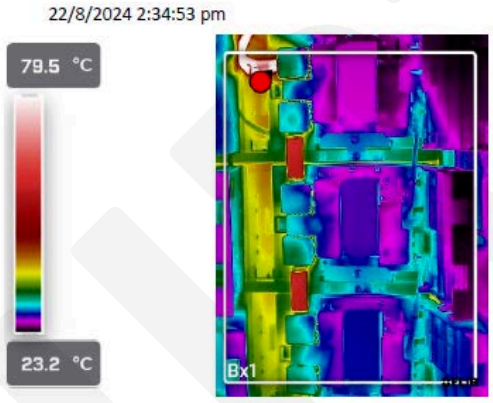
Geolocation	
Compass	57° NE

42. UPS BATTERY TERMINAL

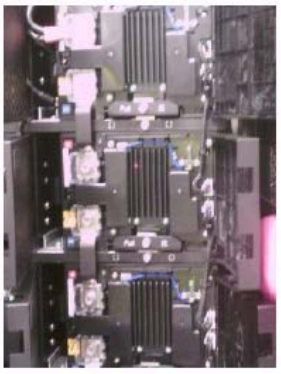
Detected Issue	Observations	Possible Faults
Severe overheating at panel terminal / breaker assembly	Thermal inspection identifies a concentrated hotspot (Bx1) with a recorded maximum temperature of **90.5 °C**, substantially higher than surrounding components under normal operating conditions..	Loose termination, oxidised contact surfaces, or excessive contact resistance within the breaker or terminal assembly.
Localised heating confined to a single module	Elevated temperature is isolated to one breaker/module, while adjacent modules and connections remain comparatively cooler.	Connection-specific defect rather than evenly distributed loading across the panel.
Very high thermal stress approaching critical limits	Sustained operation near this temperature places extreme stress on terminal materials and insulation systems.	Rapid contact degradation, insulation damage, or imminent breaker or panel failure if not rectified promptly.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
High	Repair within 1 week



IR_77086.jpg



79301991

Parameters	
Emissivity	0.95
Distance	1.14 m
Reflected temp.	29.0 °C
Atmospheric temp.	25.0 °C
Relative humidity	50.0%
Ext. optics temp.	20.0 °C
Ext. optics trans.	1.00

File information	
File name	IR_77086.jpg
File size	373 KB
Width	240
Height	320
Minimum temp.	23.2 °C
Maximum temp.	90.5 °C

Camera information	
Camera model	FLIR T530
Lens	FOL18
Camera serial	79301991
Filter	
Range max.	120.0 °C
Range min.	-20.0 °C
Field of view	23.50

Measurements	
Bx1	
Max	90.5 °C

Geolocation	
Coordinates	
Compass degrees	

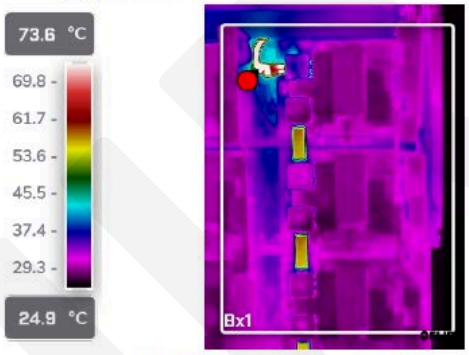
43. UPS BATTERY TERMINAL

Detected Issue	Observations	Possible Faults
Severe overheating at panel terminal / breaker assembly	Thermal inspection identifies a concentrated hotspot (Bx1) with a recorded maximum temperature of **84.2 °C**, significantly higher than surrounding components under normal operating conditions.	Loose termination, oxidised contact surfaces, or increased contact resistance within the breaker or terminal assembly.
Localised heating confined to a single module	Elevated temperature is isolated to one section of the panel, while adjacent modules and connections remain comparatively cooler.	Connection-specific defect rather than evenly distributed loading across the panel.
High thermal stress exceeding normal operating limits	Sustained operation at this temperature level places excessive stress on terminal materials and insulation.	Accelerated contact degradation, insulation damage, or eventual breaker or panel failure if not addressed promptly.

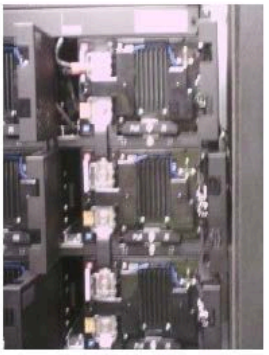
Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
High	Repair within 1 week

28/10/2024 6:03:12 pm



IR_77827.jpg



79301694

Parameters	
Emissivity	0.95
Distance	1.35 m
Reflected temp.	30.0 °C
Atmospheric temp.	20.0 °C
Relative humidity	50.0%
Ext. optics temp.	20.0 °C
Ext. optics trans.	1.00

File information	
File name	IR_77827.jpg
File size	325 KB
Width	240
Height	320
Minimum temp.	24.8 °C
Maximum temp.	84.2 °C

Camera information	
Camera model	FLIR T530
Lens	FOL18
Camera serial	79301694
Filter	
Range max.	120.0 °C
Range min.	-20.0 °C
Field of view	23.50

Measurements	
Bx1	
Max	84.2 °C

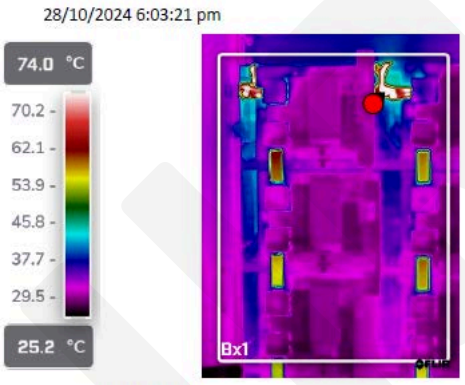
Geolocation	
Coordinates	
Compass degrees	

44. UPS BATTERY TERMINAL

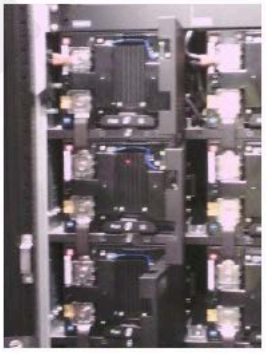
Detected Issue	Observations	Possible Faults
Severe overheating at panel terminal / breaker assembly	Thermal inspection identifies a concentrated hotspot (Bx1) with a recorded maximum temperature of **83.2 °C**, significantly higher than surrounding components under normal operating conditions.	Loose termination, oxidised contact surfaces, or increased contact resistance within the breaker or terminal assembly.
Localised heating confined to a single module	Elevated temperature is isolated to one section of the panel, while adjacent modules and connections remain comparatively cooler.	Connection-specific defect rather than evenly distributed loading across the panel.
High thermal stress exceeding normal operating limits	Sustained operation at this temperature level places excessive stress on terminal materials and insulation.	Accelerated contact degradation, insulation damage, or eventual breaker or panel failure if not addressed promptly.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
High	Repair within 1 week



IR_77829.jpg



79301694

Parameters	
Emissivity	0.95
Distance	1.38 m
Reflected temp.	30.0 °C
Atmospheric temp.	20.0 °C
Relative humidity	50.0%
Ext. optics temp.	20.0 °C
Ext. optics trans.	1.00

File information	
File name	IR_77829.jpg
File size	337 KB
Width	240
Height	320
Minimum temp.	25.0 °C
Maximum temp.	83.2 °C

Camera information	
Camera model	FLIR T530
Lens	FOL18
Camera serial	79301694
Filter	
Range max.	120.0 °C
Range min.	-20.0 °C
Field of view	23.50

Measurements	
Bx1	
Max	83.2 °C

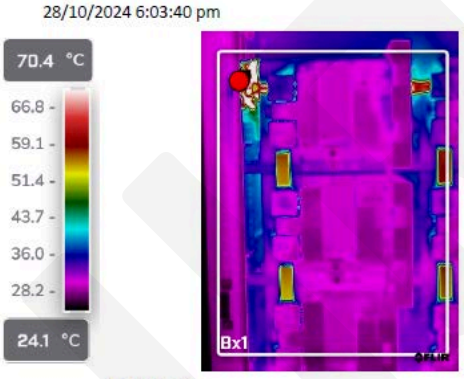
Geolocation	
Coordinates	
Compass degrees	

45. UPS BATTERY TERMINAL

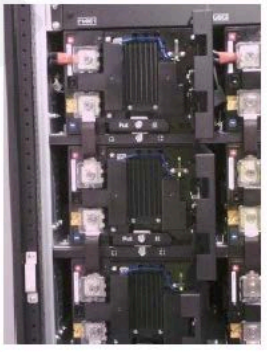
Detected Issue	Observations	Possible Faults
Severe overheating at panel terminal / breaker assembly	Thermal inspection identifies a localised hotspot (Bx1) with a recorded maximum temperature of **80.5 °C**, significantly higher than surrounding components under normal operating conditions.	Loose termination, oxidised contact surfaces, or increased contact resistance within the breaker or associated terminal connections..
Localised heating confined to a single module	Elevated temperature is isolated to one breaker/module, while adjacent modules and terminals remain comparatively cooler.	Connection-specific defect rather than evenly distributed loading across the panel.
High thermal stress exceeding normal operating limits	Sustained operation at this temperature level places excessive thermal stress on terminal materials and insulation.	Accelerated contact degradation, insulation damage, or eventual breaker or panel failure if not addressed.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
High	Repair within 1 week



IR_77833.jpg



79301694

Parameters	
Emissivity	0.95
Distance	1.26 m
Reflected temp.	30.0 °C
Atmospheric temp.	20.0 °C
Relative humidity	50.0%
Ext. optics temp.	20.0 °C
Ext. optics trans.	1.00

File information	
File name	IR_77833.jpg
File size	338 KB
Width	240
Height	320
Minimum temp.	24.0 °C
Maximum temp.	80.5 °C

Camera information	
Camera model	FLIR T530
Lens	FOL18
Camera serial	79301694
Filter	
Range max.	120.0 °C
Range min.	-20.0 °C
Field of view	23.50

Measurements	
Bx1	
Max	80.5 °C

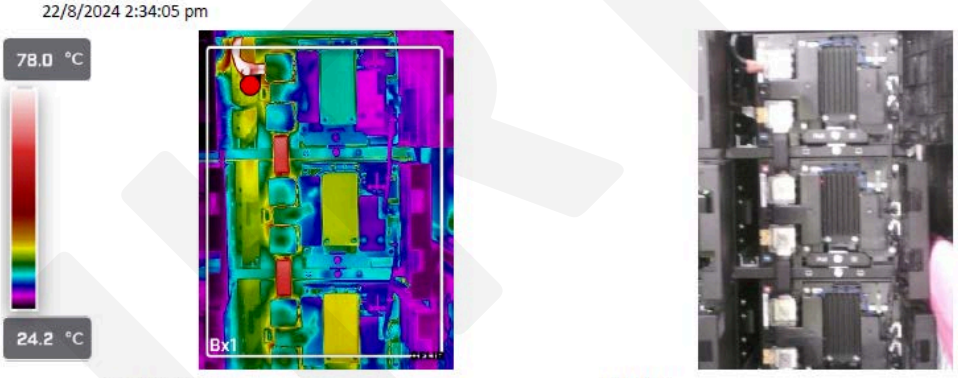
Geolocation	
Coordinates	
Compass degrees	

46. UPS BATTERY TERMINAL

Detected Issue	Observations	Possible Faults
Severe overheating at panel terminal / breaker assembly	Thermal inspection identifies a concentrated hotspot (Bx1) with a recorded maximum temperature of **87.7 °C**, significantly higher than surrounding components under normal operating conditions.	Loose termination, oxidised contact surfaces, or excessive contact resistance within the breaker or terminal assembly.
Localised heating confined to a single module	Elevated temperature is isolated to one breaker/module, while adjacent modules and connections remain comparatively cooler.	Connection-specific defect rather than evenly distributed loading across the panel.
High thermal stress with accelerated degradation risk	Sustained operation at this temperature level imposes substantial stress on terminal materials and insulation systems.	Accelerated contact degradation, insulation damage, or potential breaker or panel failure if not rectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
High	Repair within 1 week



IR_77082.jpg

79301991

Parameters	
Emissivity	0.95
Distance	1.17 m
Reflected temp.	29.0 °C
Atmospheric temp.	25.0 °C
Relative humidity	50.0%
Ext. optics temp.	20.0 °C
Ext. optics trans.	1.00

File information	
File name	IR_77082.jpg
File size	373 KB
Width	240
Height	320
Minimum temp.	23.7 °C
Maximum temp.	87.7 °C

Camera information	
Camera model	FLIR T530
Lens	FOL18
Camera serial	79301991
Filter	
Range max.	120.0 °C
Range min.	-20.0 °C
Field of view	23.50

Measurements	
Bx1	
Max	87.7 °C

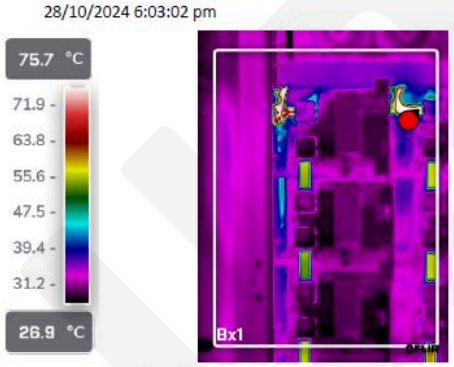
Geolocation	
Coordinates	
Compass degrees	

47. UPS BATTERY TERMINAL

Detected Issue	Observations	Possible Faults
Severe overheating at panel terminal / breaker assembly	Thermal inspection identifies a concentrated hotspot (Bx1) with a recorded maximum temperature of **88.7 °C**, significantly higher than surrounding components operating under similar conditions.	Loose termination, oxidised contact surfaces, or excessive contact resistance within the breaker or terminal assembly.
Localised heating confined to a single module	Elevated temperature is isolated to one breaker/module, while adjacent modules and terminals remain comparatively cooler.	Connection-specific defect rather than evenly distributed load across the panel.
High thermal stress approaching critical limits	Sustained operation at this temperature level places severe stress on terminal materials and insulation systems.	Accelerated contact degradation, insulation damage, or imminent breaker or panel failure if not rectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
High	Repair within 1 week



IR_77825.jpg

79301694

Parameters	
Emissivity	0.95
Distance	1.55 m
Reflected temp.	30.0 °C
Atmospheric temp.	20.0 °C
Relative humidity	50.0%
Ext. optics temp.	20.0 °C
Ext. optics trans.	1.00

File information	
File name	IR_77825.jpg
File size	301 KB
Width	240
Height	320
Minimum temp.	25.6 °C
Maximum temp.	88.7 °C

Camera information	
Camera model	FLIR T530
Lens	FOL18
Camera serial	79301694
Filter	
Range max.	120.0 °C
Range min.	-20.0 °C
Field of view	23.50

Measurements	
Bx1	
Max	88.7 °C

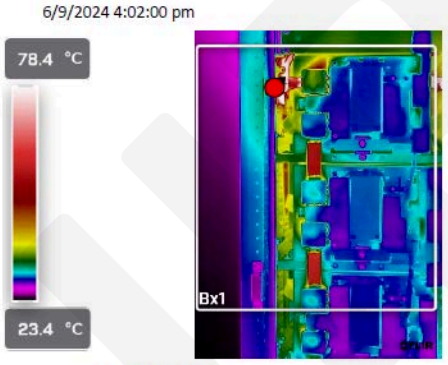
Geolocation	
Coordinates	
Compass degrees	

48. UPS BATTERY TERMINAL

Detected Issue	Observations	Possible Faults
Severe overheating at panel terminal / breaker assembly	Thermal inspection identifies a concentrated hotspot (Bx1) with a recorded maximum temperature of **88.4 °C**, significantly higher than surrounding components operating under similar conditions.	Loose termination, oxidised contact surfaces, or excessive contact resistance within the breaker or terminal assembly.
Localised heating confined to a single module	Elevated temperature is isolated to one breaker/module, while adjacent modules and terminals remain comparatively cooler.	Connection-specific defect rather than evenly distributed load across the panel.
High thermal stress approaching critical limits	Sustained operation at this temperature level imposes severe thermal stress on terminal materials and insulation systems.	Accelerated contact degradation, insulation damage, or imminent breaker or panel failure if not rectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
High	Repair within 1 week



IR_77493.jpg

79301991

Parameters	
Emissivity	0.95
Distance	1.26 m
Reflected temp.	29.0 °C
Atmospheric temp.	25.0 °C
Relative humidity	50.0%
Ext. optics temp.	20.0 °C
Ext. optics trans.	1.00

File information	
File name	IR_77493.jpg
File size	326 KB
Width	240
Height	320
Minimum temp.	23.0 °C
Maximum temp.	88.4 °C

Camera information	
Camera model	FLIR T530
Lens	FOL18
Camera serial	79301991
Filter	
Range max.	120.0 °C
Range min.	-20.0 °C
Field of view	23.50

Measurements	
Bx1	
Max	88.4 °C

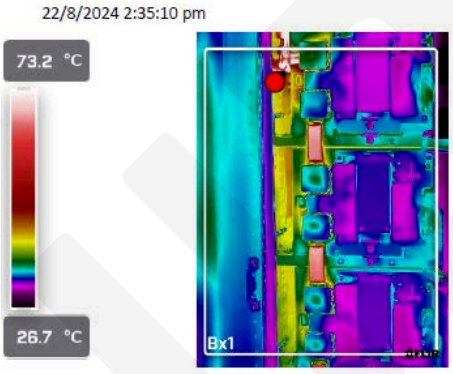
Geolocation	
Coordinates	
Compass degrees	

49. UPS BATTERY TERMINAL

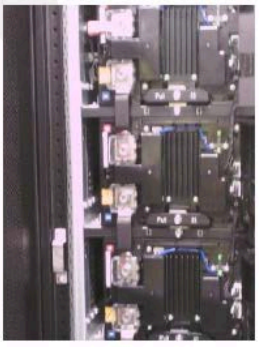
Detected Issue	Observations	Possible Faults
Severe overheating at panel terminal / breaker assembly	Thermal inspection identifies a concentrated hotspot (Bx1) with a recorded maximum temperature of **87.9 °C**, significantly higher than surrounding components operating under similar conditions.	Loose termination, oxidised contact surfaces, or excessive contact resistance within the breaker or terminal assembly.
Localised heating confined to a single module	Elevated temperature is isolated to one breaker/module, while adjacent modules and terminals remain comparatively cooler.	Connection-specific defect rather than evenly distributed loading across the panel.
High thermal stress approaching critical limits	Sustained operation at this temperature level places severe thermal stress on terminal materials and insulation systems.	Accelerated contact degradation, insulation damage, or imminent breaker or panel failure if not rectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
High	Repair within 1 week



IR_77088.jpg



79301991

Parameters	
Emissivity	0.95
Distance	1.15 m
Reflected temp.	29.0 °C
Atmospheric temp.	25.0 °C
Relative humidity	50.0%
Ext. optics temp.	20.0 °C
Ext. optics trans.	1.00

File information	
File name	IR_77088.jpg
File size	387 KB
Width	240
Height	320
Minimum temp.	26.5 °C
Maximum temp.	87.9 °C

Camera information	
Camera model	FLIR T530
Lens	FOL18
Camera serial	79301991
Filter	
Range max.	120.0 °C
Range min.	-20.0 °C
Field of view	23.50

Measurements	
Bx1	
Max	87.9 °C

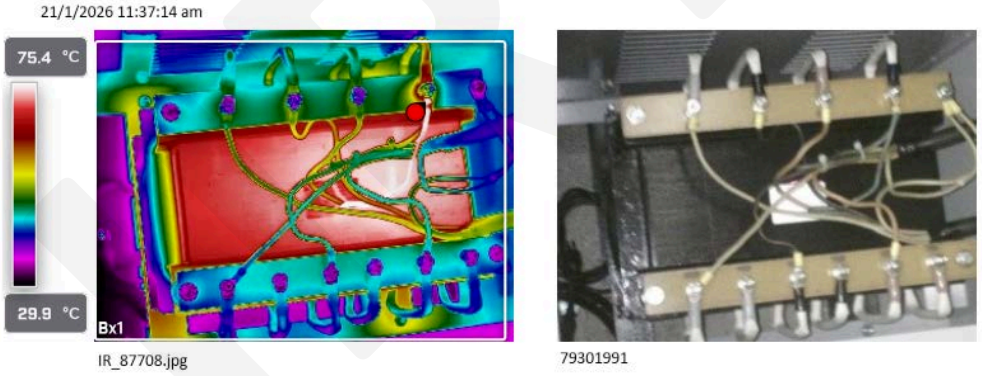
Geolocation	
Coordinates	
Compass degrees	

50. NEUTRAL CONDUCTOR

Detected Issue	Observations	Possible Faults
Severe overheating at neutral conductor / terminal	Thermal inspection identifies a concentrated hotspot along the neutral connection (Bx1), with a recorded maximum temperature of **79.6 °C**, significantly higher than surrounding conductors and terminations under normal operating conditions.	Loose or degraded neutral termination, high contact resistance, or undersized / overstressed neutral conductor.
Localised heating isolated to neutral path	Elevated temperature is confined primarily to the neutral conductor and its termination, while phase conductors appear comparatively cooler.	Neutral imbalance due to harmonic currents, shared neutral overload, or poor neutral connection rather than phase-side loading issues.
High thermal stress with neutral fault implications	Sustained operation at this temperature level places excessive thermal stress on the neutral connection and associated insulation.	Accelerated insulation degradation, neutral conductor damage, voltage instability, or downstream equipment malfunction if not rectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
High	**Repair within 1 week**



IR_87708.jpg

79301991

Parameters	
Emissivity	0.95
Distance	1.01 m
Reflected temp.	20.0 °C
Atmospheric temp.	20.0 °C
Relative humidity	70.0%
Ext. optics temp.	20.0 °C
Ext. optics trans.	1.00

File information	
File name	IR_87708.jpg
File size	343 KB
Width	320
Height	240
Minimum temp.	28.3 °C
Maximum temp.	79.6 °C

Camera information	
Camera model	FLIR T530
Lens	FOL18
Camera serial	79301991
Filter	
Range max.	120.0 °C
Range min.	-20.0 °C
Field of view	23.50

Measurements	
Bx1	
Max	79.6 °C

Geolocation	
Coordinates	
Compass degrees	

51. NEUTRAL CONDUCTOR

Detected Issue	Observations	Possible Faults
Elevated temperature at terminal / busbar connection	Thermal inspection shows a localised hotspot at the highlighted connection (Bx1) with a recorded maximum temperature of **67.5 °C**, higher than surrounding components under similar operating conditions.	Loose termination, oxidation, or increased contact resistance at the terminal or busbar connection point.
Localised heating confined to a single connection	Elevated temperature is isolated to one connection area, while adjacent terminals and conductors remain comparatively cooler.	Connection-specific defect rather than uniform load distribution across the assembly.
Elevated thermal stress above normal operating range	Sustained operation at this temperature level increases thermal stress on conductors and insulation materials.	Progressive contact degradation, insulation ageing, or eventual connection failure if not rectified.

Severity Criteria & Recommended Corrective Actions

PRIORITY	ACTION REQUIRED
Medium	Check Problem Area Within 2 Weeks

IR_86923.jpg

79301694

Parameters	
Emissivity	0.95
Distance	0.67 m
Reflected temp.	20.0 °C
Atmospheric temp.	30.0 °C
Relative humidity	50.0%
Ext. optics temp.	20.0 °C
Ext. optics trans.	1.00

File information	
File name	IR_86923.jpg
File size	311 KB
Width	320
Height	240
Minimum temp.	27.9 °C
Maximum temp.	67.5 °C

Camera information	
Camera model	FLIR T530
Lens	FOL18
Camera serial	79301694
Filter	
Range max.	120.0 °C
Range min.	-20.0 °C
Field of view	23.50

Measurements	
Bx1	
Max	67.5 °C
Min	28.0 °C

Geolocation	
Coordinates	
Compass degrees	

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