Electrical Thermographic Survey

Sample Report

By

Pixel Thermographics Ltd

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Report Details

Customer	
Inspection Site	
Contact Person	
Contact Person Address	
Phone Number	
Email Address	
Thermographer	
Thermographer Certification	ITC Level 2 Certified Thermographer
Survey Equipment	Flir Thermacam SC640 Infrared Camera Reporter 9.2 Software
Inspection Date	

INFORMATION

This sample report has been produced to provide potential clients with evidence of the types of fault we are able to detect using high resolution infrared thermographic equipment.

Typical equipment we can survey includes:

- Switchgear and Switchboards
- Busbar Systems & Tap Off Boxes
- Distribution Boards and Fuse Boards
- Transformers
- High Voltage Systems
- Overhead Power Lines & Substations
- Control Panels
- UPS Systems
- Batteries
- Marshalling Panels & Joint Boxes

The benefits of using Pixel Thermographics Ltd to conduct an electrical thermographic survey include:

- All our surveyors are ITC Level 2 certified professional electrical Thermographers.
- Power is not interrupted during a survey.
- This is a predictive maintenance technique which will make your business more reliable and lessen the risk of fire.
- We are able to detect faults which if left unattended are likely lead to breakdown or risk of fire.
- We provide a clear report which details the suspected cause of the fault, the severity of the problem and the remedial action required to repair.
- We only use high resolution thermal imaging equipment (resolution of 640 x 480 pixels) which allows us to detect faults on smaller components and allows us to keep a safe distance from potential faults.
- Insurance companies provide positive feedback on our service and follow up activities.
- You should be able to get a reduction in your business insurance by having a thermographic survey conducted.

A FLIR Thermacam SC640 was used to capture the thermal data which is recorded within this report. Report has been produced using Flir System Reporter Professional 9.2 Software.

Following completion of a survey we produce a report which will be issued to the client within five working days.

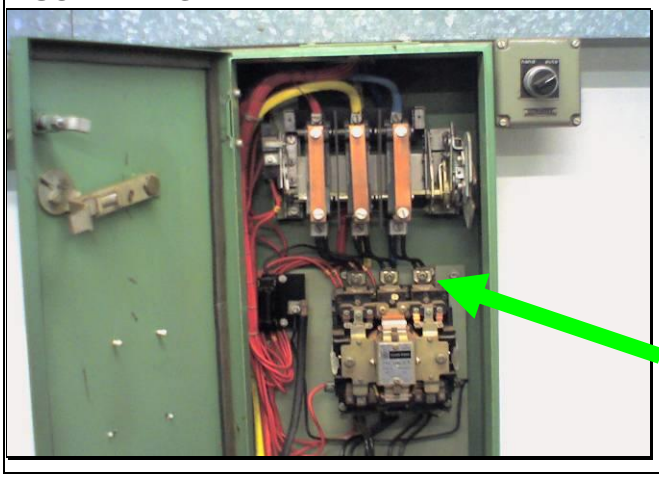
Contact us for a detailed quotation.

SUMMARY OF IMAGES

High risk of equipment failure, loss of production and safety of personnel	**Priority 1**	Urgent attention required
Medium risk of equipment failure, loss of production and safety of personnel	**Priority 2**	Investigation or corrective action is necessary at the earliest opportunity
Low risk of equipment failure, loss of production and safety of personnel	**Priority 3**	Plan repair at next natural outage. Non urgent.
No risk of equipment failure, loss of production and safety of personnel	**Priority 0**	Image included for information only

PIXEL Thermographics	**Thermographic Electrical Inspection Sample Report**	**Inspection Date:**

VISUAL IMAGE



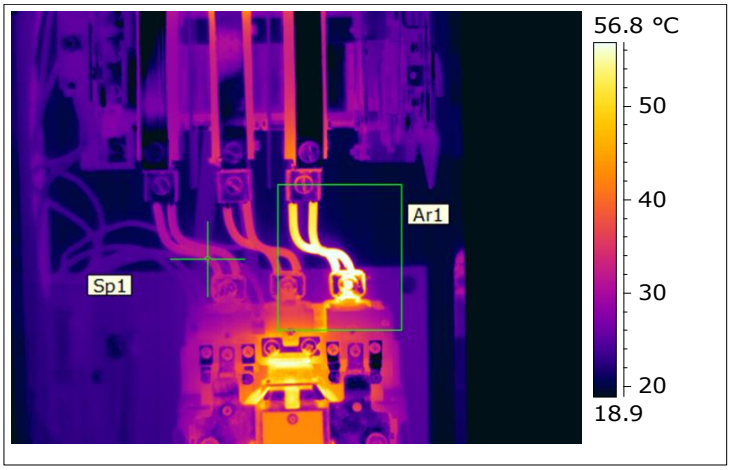
EQUIPMENT INFORMATION

Location	Block 157 Pump House
Equipment	157 Pump Set 3
Type	Contactor

RATING OF EQUIPMENT

Phase	Measured Current (Amps)
Red	43
Yellow	42
Blue	43

THERMAL IMAGE



RADIOMETRIC DATA

Object Parameters	Value
Atmospheric Temperature	11.7 °C
Sp1 Temperature	31.0 °C
Ar1 Max. Temperature	67.0 °C
Emissivity	0.94
Object Distance	1.5 m
Reflected Apparent Temperature	12.9 °C
Image File name	Contactor.jpg

Difference Ar1 - Sp1	36.0 **°C**
Fault Rating	**Priority 1**

ANALYSIS & OBSERVATIONS

Elevated temperature noted on incoming feed to contactor from isolator.

Current measurements were taken and 43 Amps was measured across each phase indicating that load is not the cause of the temperature rise.

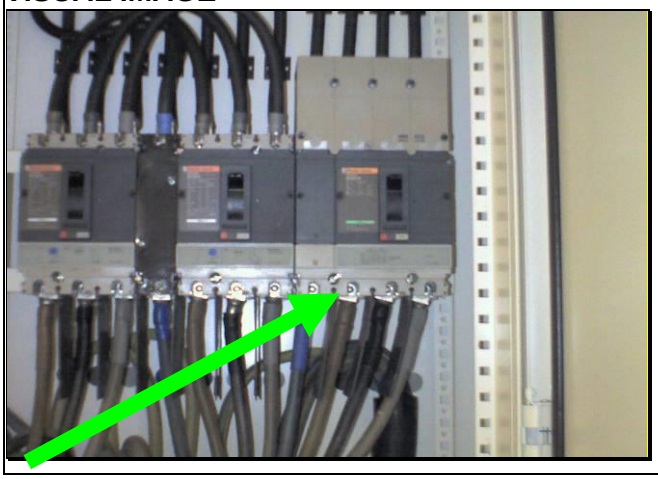
Likely cause of the rise is a poor or high resistance connection.

Recommendation is to inspect, clean and remake off this connection

Repaired by: ....…… Date:

Comment:……..

VISUAL IMAGE



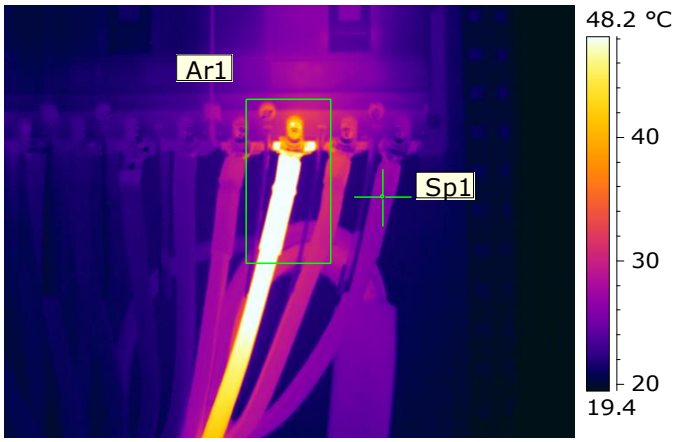
EQUIPMENT INFORMATION

Location	Old Wing - Main UPS Room
Equipment	UPS Input / Output Panel
Type	Connection From Breaker

RATING OF EQUIPMENT

Phase	Measured Current (Amps)
Phase 1	40 A
Phase 2	41 A
Phase 3	41 A

THERMAL IMAGE



RADIOMETRIC DATA

Object Parameters	Value
Atmospheric Temperature	21.0 °C
Sp1 Temperature	25.8 °C
Ar1 Max. Temperature	58.4 °C
Emissivity	0.95
Object Distance	1.5 m
Reflected Apparent Temperature	21.0 °C
Image File name	IR_10238.jpg

Difference Ar1 - Sp1	32.6 **°C**
Fault Rating	**Priority 2**

ANALYSIS & OBSERVATIONS

Elevated temperature noted on phase 1 (brown) outgoing connection from the breaker.

The temperature varied considerably during the course of the survey and the Thermographer witnessed temperatures up to 70°C shortly before this image was recorded.

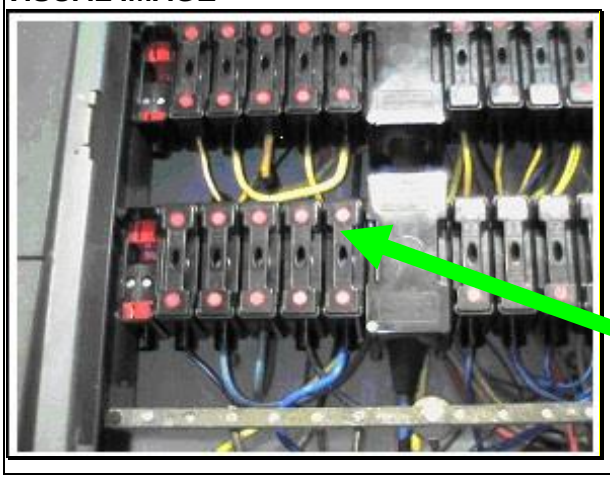
The likely cause of this rise in temperature is a poor or loose connection to the breaker.

Recommendation is to isolate, disconnect, clean and remake off this connection.

Repaired by: ...…… Date:

Comment:……..

VISUAL IMAGE



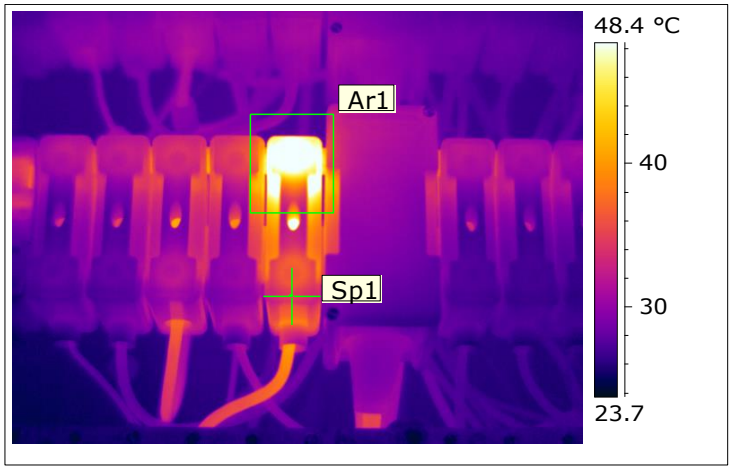
EQUIPMENT INFORMATION

Location	Main Switchroom 2
Equipment	Fuseboard A-1-4-6
Type	Fuse Blue 6

RATING OF EQUIPMENT

Phase	Measured Current (Amps)
Red	23
Yellow	16
Blue	31

THERMAL IMAGE



RADIOMETRIC DATA

Object Parameters	Value
Atmospheric Temperature	23.2 °C
Sp1 Temperature	34.7 °C
Ar1 Max. Temperature	56.7 °C
Emissivity	0.95
Object Distance	1.5 m
Reflected Apparent Temperature	25.0 °C
Image File name	IR_0033.jpg

Difference Ar1 - Sp1	22.0 **°C**
Fault Rating	**Priority 2**

ANALYSIS & OBSERVATIONS

Raised temperature noted on in-feed side of fuse carrier.

Temperature imbalance such as this would not be expected across a fuse and indicates an internal problem.

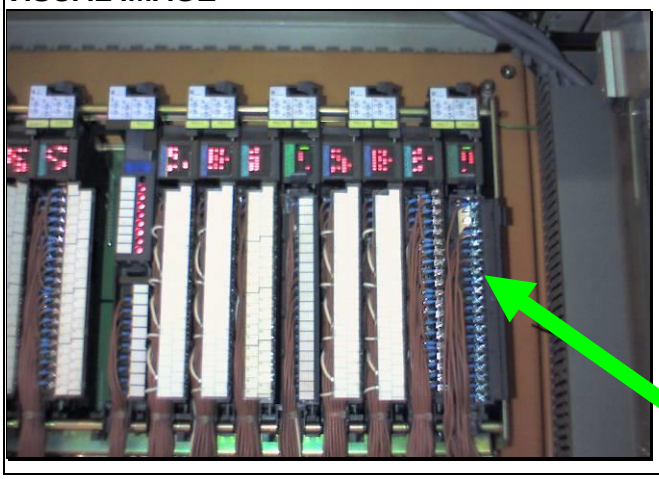
Possible source of temperature rise includes poor connection, loose fuse fixing, or high resistance blade connections.

Recommendation is to inspect, check fuse carrier blades for signs of pitting or heat damage, replace the fuse, re-tighten the fuse fixings and re-tighten all connections.

Repaired by: ...…… Date:

Comment:……..

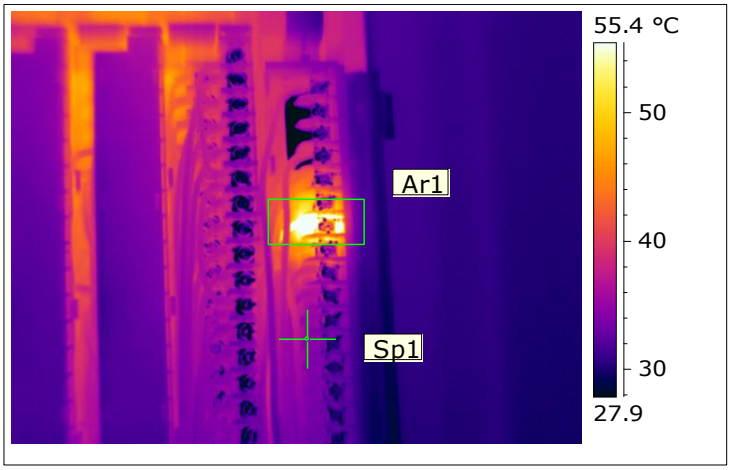
VISUAL IMAGE



EQUIPMENT INFORMATION

Location	Line 7 PLC Section
Equipment	AB PLC Digital Output Rack
Type	Terminal No. 7

THERMAL IMAGE



RADIOMETRIC DATA

Object Parameters	Value
Atmospheric Temperature	21.5 °C
Sp1 Temperature	34.3 °C
Ar1 Max. Temperature	71.8 °C
Emissivity	0.95
Object Distance	1.5 m
Reflected Apparent Temperature	21.5 °C
Image File name	IR_2007-08-07_0026.jpg

Difference Ar1 - Sp1	37.5 **°C**
Fault Rating	**Priority 1**

ANALYSIS & OBSERVATIONS

Temperature increase on terminal No.7.

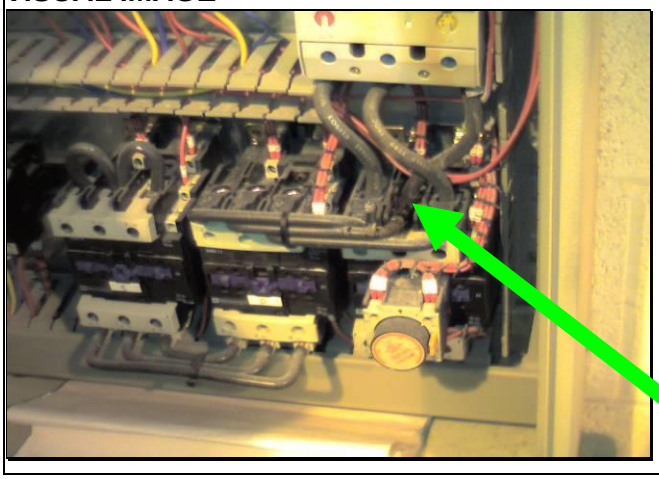
Likely cause of heat rise is a loose connection to the PLC module.

Recommendation is to tighten up the terminal screw on the device.

Repaired by: ...…… Date:

Comment:……..

VISUAL IMAGE



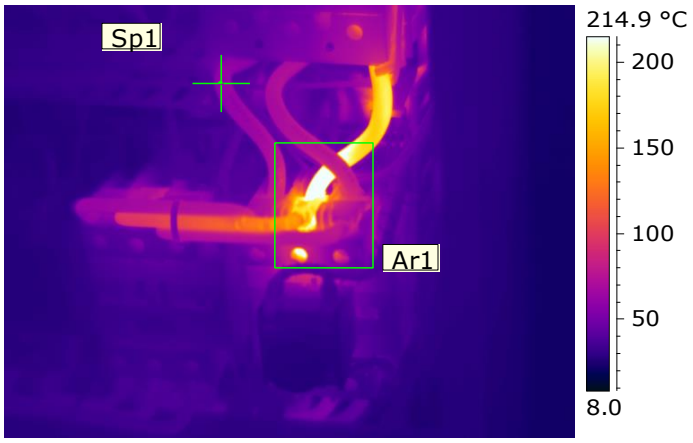
EQUIPMENT INFORMATION

Location	Sanitex Roller Machine
Equipment	Main Control Panel
Type	Overload Incoming Phase 3

RATING OF EQUIPMENT

Phase	Measured Current (Amps)
Red	67
Yellow	73
Blue	79

THERMAL IMAGE



RADIOMETRIC DATA

Object Parameters	Value
Atmospheric Temperature	21.0 °C
Sp1 Temperature	60.9 °C
Ar1 Max. Temperature	273.6 °C
Emissivity	0.95
Object Distance	1.5 m
Reflected Apparent Temperature	21.0 °C
Image File name	IR_2630.jpg

Difference Ar1 - Sp1	212.7 **°C**
Fault Rating	**Priority 1**

ANALYSIS & OBSERVATIONS

Dangerously high temperatures noted on incoming phase 2 connection to main overload unit.

Visible heat damage also noted at the time of the survey.

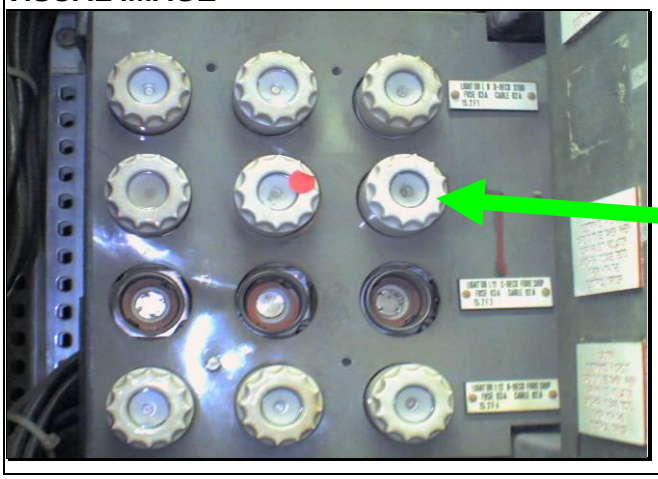
The unit manager and operator were both made aware of this fault immediately and the decision was made to isolate this equipment until a repair could be carried out.

Recommendation is to replace the overload, the contactor and the 3 feed cables which have all suffered heat damage as a result of this fault.

Repaired by: ....…… Date:

Comment:……..

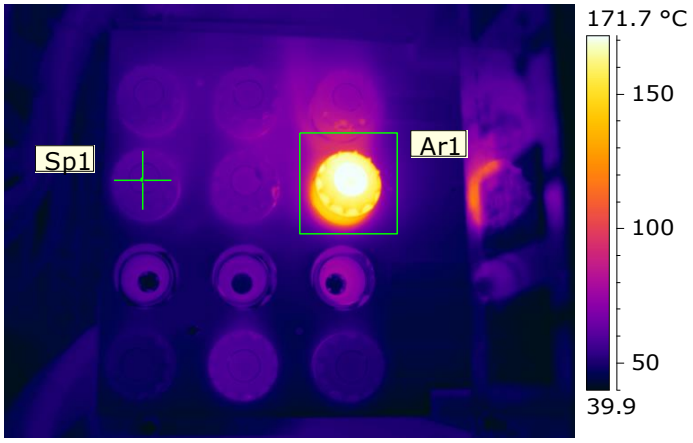
VISUAL IMAGE



EQUIPMENT INFORMATION

Location	Main Control Room
Equipment	Main Switchboard (Aft)
Type	Panel 15 - Bottle Fuse - Lighting Board L11 Phase 3

THERMAL IMAGE



RADIOMETRIC DATA

Object Parameters	Value
Atmospheric Temperature	25.0 °C
Sp1 Temperature	58.9 °C
Ar1 Max. Temperature	193.8 °C
Emissivity	0.95
Object Distance	1.5 m
Reflected Apparent Temperature	25.0 °C
Image File name	IR_6727.jpg

Difference Ar1 - Sp1	134.9 **°C**
Fault Rating	**Priority 1**

ANALYSIS & OBSERVATIONS

Significantly elevated surface temperatures noted on bottle fuse carrier.

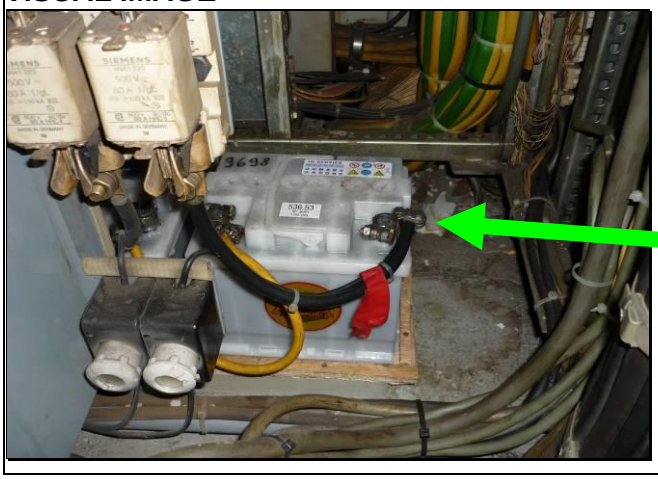
Likely causes of heat rise include dirty or pitted conductive surface, loose or poorly fitted fuse carrier or poor outgoing connection at rear.

Recommendation is to remove the carrier, replace the fuse, check all surfaces are clean and re-install the carrier ensuring it is tight and secure.

Repaired by: ....…… Date:

Comment:……..

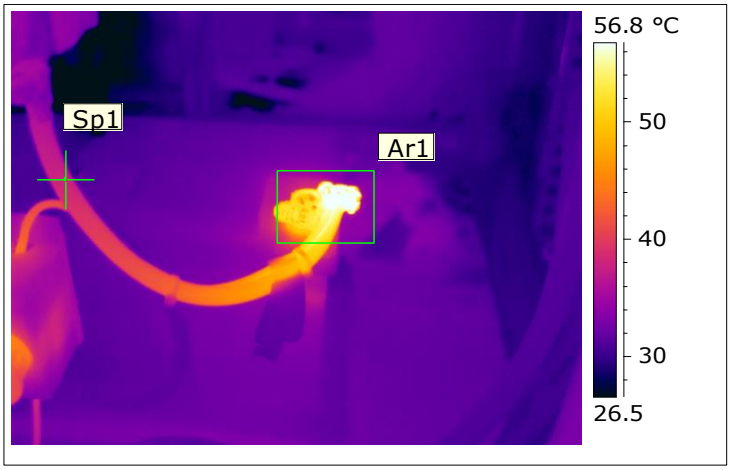
VISUAL IMAGE



EQUIPMENT INFORMATION

Location	Main Control Room
Equipment	Main Switchboard (Central)
Type	24V Simos Alarms Negative Battery Connection

THERMAL IMAGE



RADIOMETRIC DATA

Object Parameters	Value
Atmospheric Temperature	25.0 °C
Sp1 Temperature	37.9 °C
Ar1 Max. Temperature	61.3 °C
Emissivity	0.95
Object Distance	1.5 m
Reflected Apparent Temperature	25.0 °C
Image File name	IR_6733.jpg

Difference Ar1 - Sp1	23.5 **°C**
Fault Rating	**Priority 2**

ANALYSIS & OBSERVATIONS

Elevated temperature noted on battery negative connection.

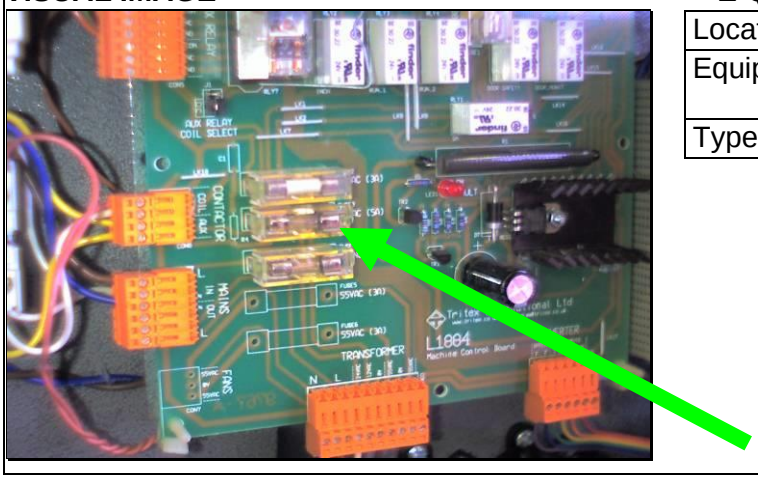
Likely cause of heat rise is a poor or loose connection.

Recommendation is to inspect, clean and re-tighten this connection.

Repaired by: ...…… Date:

Comment:……..

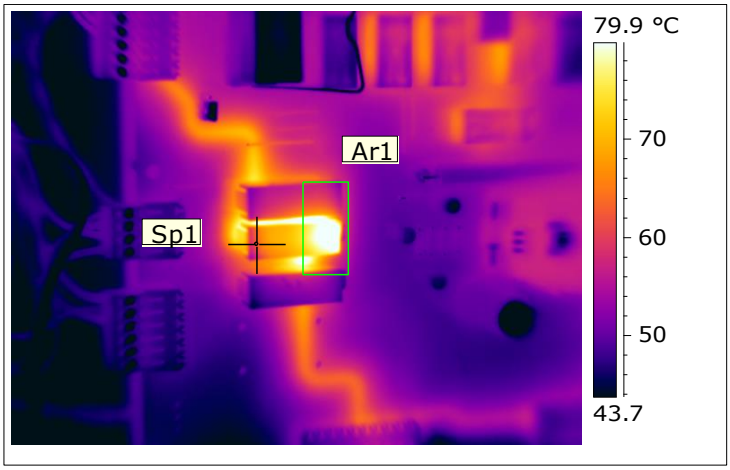
VISUAL IMAGE



E Q U I P M E N T I N F O R M A T I O N

Location	Machine Room
Equipment	Sewing Machine F6 Control Panel
Type	PCB Mounted Fuse Carrier

THERMAL IMAGE



RADIOMETRIC DATA

Object Parameters	Value
Atmospheric Temperature	21.0 °C
Sp1 Temperature	61.9 °C
Ar1 Max. Temperature	94.3 °C
Emissivity	0.95
Object Distance	1.5 m
Reflected Apparent Temperature	21.0 °C
Image File name	IR_1400.jpg

Difference Ar1 - Sp1	32.4 **°C**
Fault Rating	**Priority 2**

ANALYSIS & OBSERVATIONS

Elevated temperature noted on end of fuse carrier on machine PCB unit.

Temperature differential across a fuse carrier would not be expected and indicates an internal issue.

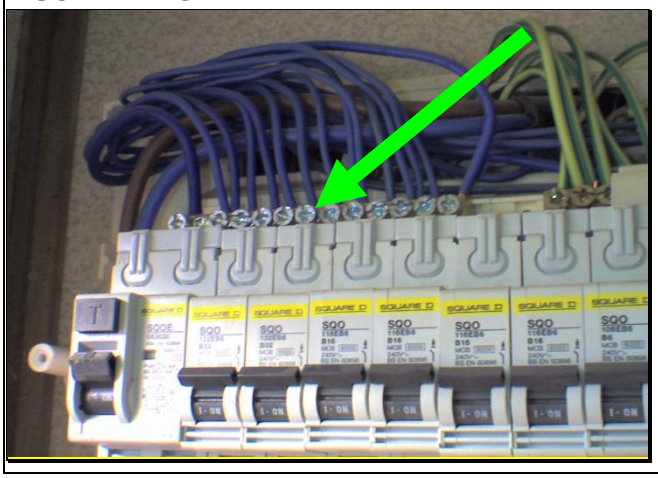
Discussion with machine operator highlighted that the machine stops intermittently and this fault could well be the cause of this.

Recommendation is to replace the fuse carrier and fuse.

Repaired by: ....…… Date:

Comment:……..

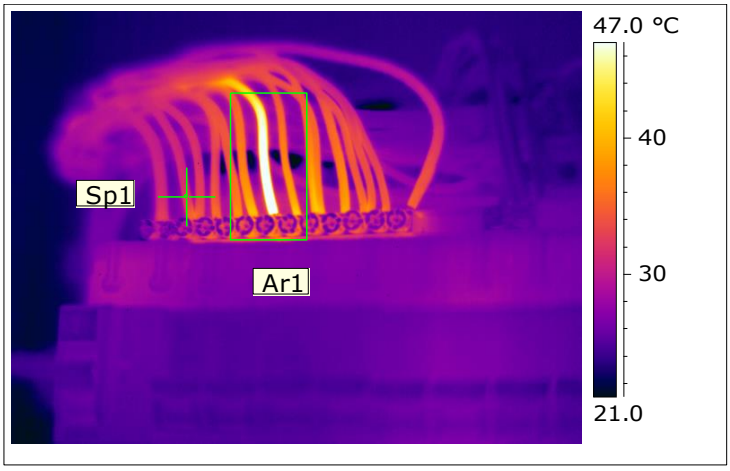
VISUAL IMAGE



EQUIPMENT INFORMATION

Location	Main Office
Equipment	Distribution Board
Type	Neutral Connection

THERMAL IMAGE



RADIOMETRIC DATA

Object Parameters	Value
Atmospheric Temperature	20.0 °C
Sp1 Temperature	32.7 °C
Ar1 Max. Temperature	55.9 °C
Emissivity	0.95
Object Distance	1.5 m
Reflected Apparent Temperature	20.0 °C
Image File name	IR_4062.jpg

Difference Ar1 - Sp1	23.3 **°C**
Fault Rating	**Priority 2**

ANALYSIS & OBSERVATIONS

Elevated temperature noted on neutral connection on distribution board.

Likely cause of heat rise is a poor or loose connection.

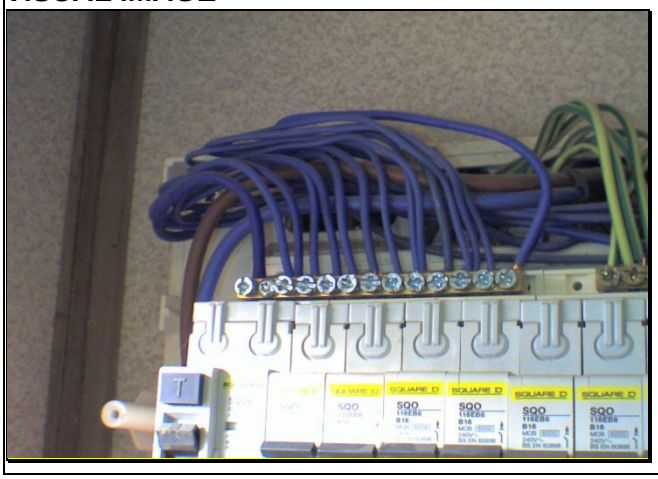
Recommendation is to inspect, clean and remake off this connection.

Note: Repair work was carried out at the time of the survey. See next page for analysis following completion of the repair.

Repaired by: ....…… Date:

Comment:……..

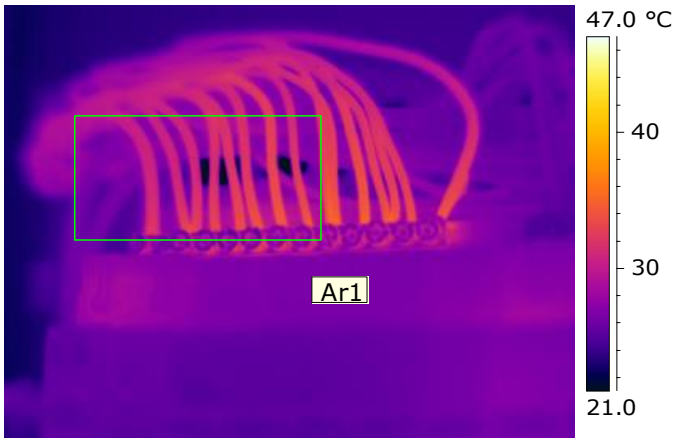
VISUAL IMAGE



EQUIPMENT INFORMATION

Location	Main Office
Equipment	Distribution Board
Type	Neutral Connection - RESOLVED

THERMAL IMAGE



RADIOMETRIC DATA

Object Parameters	Value
Atmospheric Temperature	20.0 °C
Ar1 Max. Temperature	34.6 °C
Emissivity	0.95
Object Distance	1.5 m
Reflected Apparent Temperature	20.0 °C
Image File name	IR_4064.jpg

Difference Ar1 - Sp1	0.0 **°C**
Fault Rating	**Priority 0.0**

ANALYSIS & OBSERVATIONS

Note: See previous page for analysis of fault prior to repair being carried out.

The thermal image shows that following the repair, the temperatures have returned to normal and the fault has disappeared.

No further work required.

The following plant and panels were inspected during the survey:

A full inventory of inspected panels, systems or items would appear on this and subsequent pages.