



# THERMAL VISION AUSTRALIA

## Inspection services

A.B.N. 86 568 631 384

### REPORT ON THERMAL INSPECTION of the ELECTRICAL FACILITIES At

**"Name of Site"**

**"Address of Site"**

CUSTOMER CODE: "Customer Code"

Prepared for:

**"Who gets the Report"**

**"Inspection Date"**

Prepared By

**Charles Cassar**

Camera Type: FLIR T400

Camera Serial Number: 345001532

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**REPORT SUMMARY**

**1 PLANT INSPECTION PERFORMED**

A summary of all the switchboards and plant equipment scanned during this inspection is detailed in this report:

**2 REQUIRMENTS DURING TESTING**

In order to perform the thermal inspection properly it is required that any panel doors and escutcheon panel's plastic or glass be removed during testing, This is necessary because infrared radiation testing does not pass through the above objects.

Covers will only be removed if safety and integrity of the plants operation is not compromised. Any plant not operating at the time of the Thermal Inspection will be inspected as apart of the whole plant but no thermal observations will be made due to non operation of that plant:

**3 ACTIONS and RISK ANALYSIS**

The following report contains a series of thermograms and digital images of the Plant inspected during the Thermal Inspection which may highlight possible faults with equipment categorized as per the priority risk schedule below.

We would also recommend that you conduct your own Risk Assessment of each observation that we find and report in this document as we only observe / report and recommend the seriousness of faults. You will need to determine the possible impact the observed fault may have on the operation of your plant and prepare your own repair schedule based on your assessment.

**PRIORITY RISK SCHEDULE**

<b>1</b>	Serious fault - Immediate repair is recommended.	<b>2</b>	Not so serious fault - Repair within one week.
<b>3</b>	Fault noted - Should be checked and repaired when convenient.	<b>4</b>	No fault present at time of the inspection. Supplied for information only

**NOTE:**

Refer to priority of temperature ranges as per standard in the technical information section of this document

**4 THERMOGRAM ANALYSIS**

The "Reference" refers to components that are operating at "normal" temperatures. The temperatures in the result table beside the Thermograms are shown as boxes/circles on the image marked as Fault temp: max, Ref, Ir: max, etc. The "Temp Diff" reported, indicates the temperature above the "Reference" temperature.

**5 FOLLOW UP**

We recommend regular Thermal inspections at (12) twelve monthly intervals. This may reduce unscheduled downtime and failures. Will also assist with an effective maintenance program.

Thank you for the opportunity to carry out the Thermal inspection of your plant and we look forward to our mutual association in the future.

*Charles Cassar*

Charles Cassar  
 Thermographer Level 1 Electrician 'A' Class  
 Electrical Contractor



"Customer Code"

**SUMMARY OF OBSERVATIONS:** A detailed analysis of each observation can be found on the page noted

LOCATION	EQUIPMENT	COMPONENT	Priority	Page Number
"Board Location"	"Board Name"	"Component"	1	4
WAREHOUSE	Main Switch Board	HRC Fuse	1	5
"Board Location"	"Board Name"	"Component"	1	6
"Board Location"	"Board Name"	"Component"	4	7

**PLANT INSPECTED:**

LOCATION AT SITE

**NAME OF SITE**

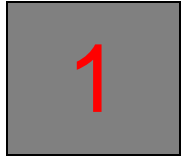
Asset Being Scanned

SAMPLE



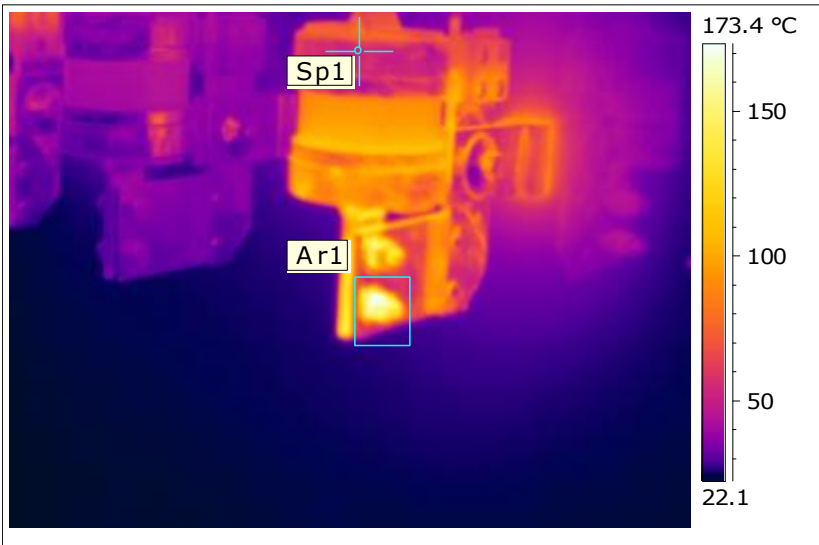
"Customer Code"

<b>LOCATION</b>	"Board Location"
<b>EQUIPMENT</b>	"Board Name"
<b>COMPONENT</b>	"Component"
<b>OBSERVATION</b>	No Abnormal Thermal Activity Detected



Date: 11/05/2010

Time: 11:40:50 AM



**RESULT TABLE:**

Max Temperature	173.1 °C
Ar1 Max. Temperature	173.1 °C
Sp1 Temperature	54.3 °C

<p><b>Temp. Rise</b> Fault (Ar1 Max) Temp – Ref (Sp1) Temp</p>	<p><b>119</b> °C</p>
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**OBSERVATIONS/RECOMMENDATIONS**

Repair Recommendations  
Maintain 12 Monthly Inspections:

**REPAIRERS COMMENTS**

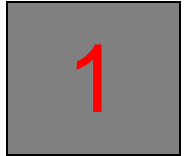
Signed: \_\_\_\_\_

Date: \_\_\_\_\_



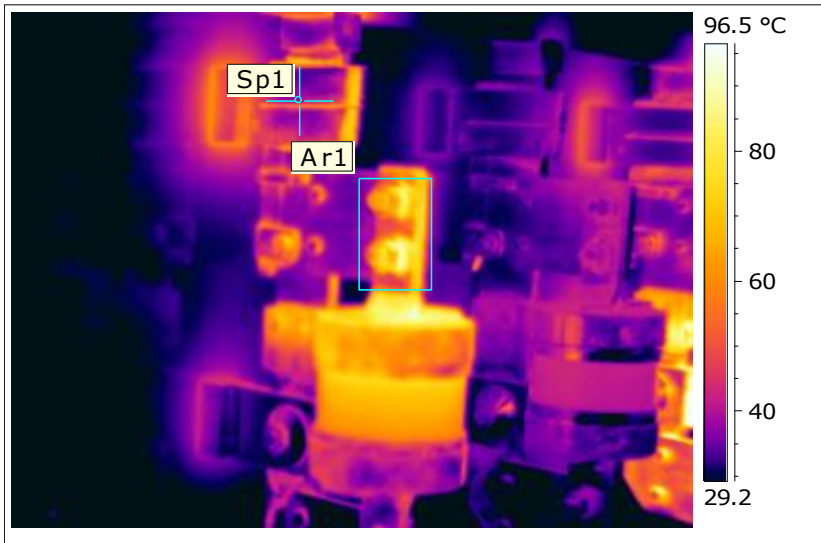
"Customer Code"

<b>LOCATION</b>	WAREHOUSE
<b>EQUIPMENT</b>	Main Switch Board
<b>COMPONENT</b>	HRC Fuse
<b>OBSERVATION</b>	Thermal Activity Detected



Date: 11/05/2010

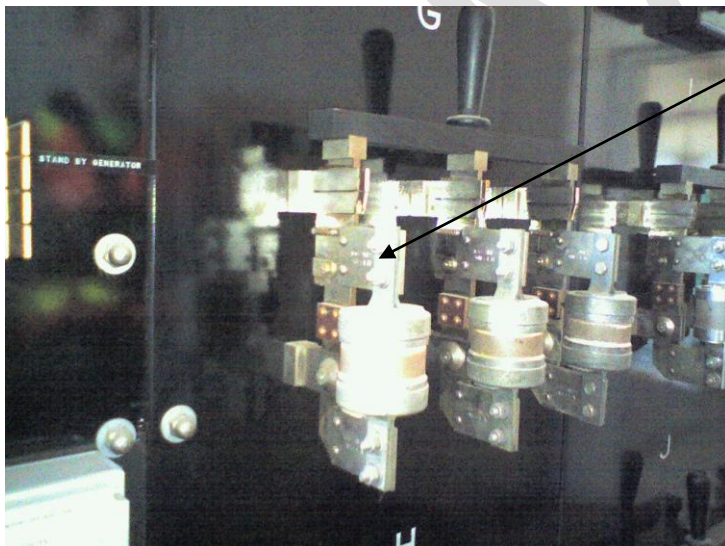
Time: 11:43:13 AM



**RESULT TABLE:**

Max Temperature	111.7 °C
Ar1 Max. Temperature	91.5 °C
Sp1 Temperature	40.8 °C

<b>Temp. Rise</b> Fault (Ar1 Max) Temp – Ref (Sp1) Temp	<b>51 °C</b>
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**OBSERVATIONS/RECOMMENDATIONS**

Repair Recommendations:

Maintain 12 Monthly Inspections:

**REPAIRERS COMMENTS**

Signed: \_\_\_\_\_

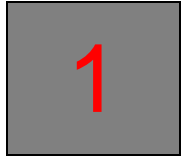
Date: \_\_\_\_\_





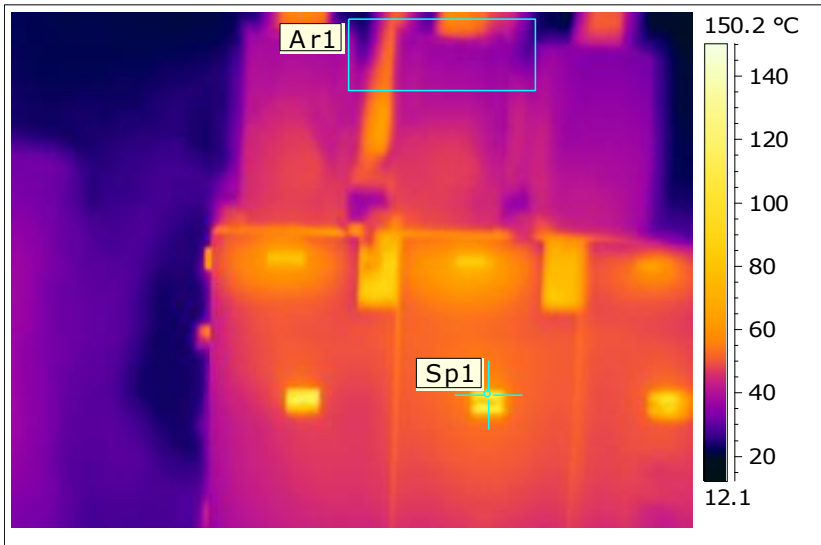
"Customer Code"

<b>LOCATION</b>	"Board Location"
<b>EQUIPMENT</b>	"Board Name"
<b>COMPONENT</b>	"Component"
<b>OBSERVATION</b>	No Abnormal Thermal Activity Detected



Date: 30/04/2010

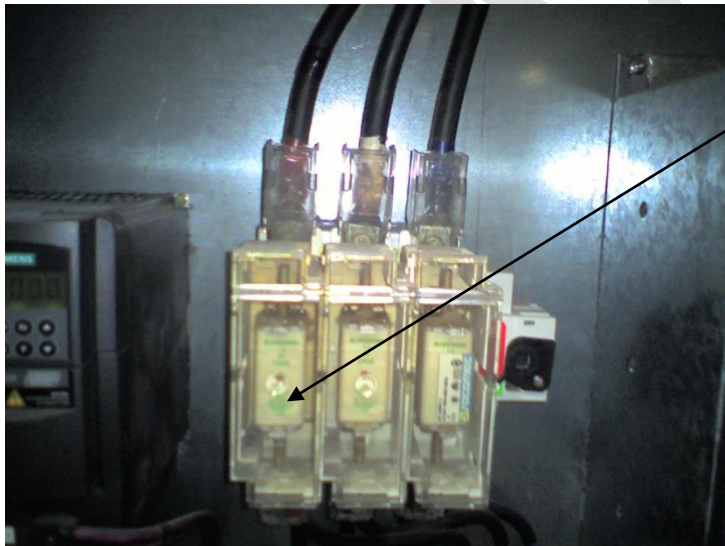
Time: 9:41:09 AM



**RESULT TABLE:**

Max Temperature	117.7 °C
Ar1 Max. Temperature	57.5 °C
Sp1 Temperature	111.0 °C

<b>Temp. Rise</b> Fault (Ar1 Max) Temp – Ref (Sp1) Temp	<b>-53</b> °C
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**OBSERVATIONS/RECOMMENDATIONS**

Repair recommendations:

Maintain 12 Monthly Inspections:

**REPAIRERS COMMENTS**

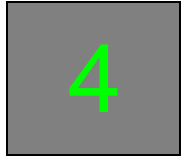
Signed: \_\_\_\_\_

Date: \_\_\_\_\_



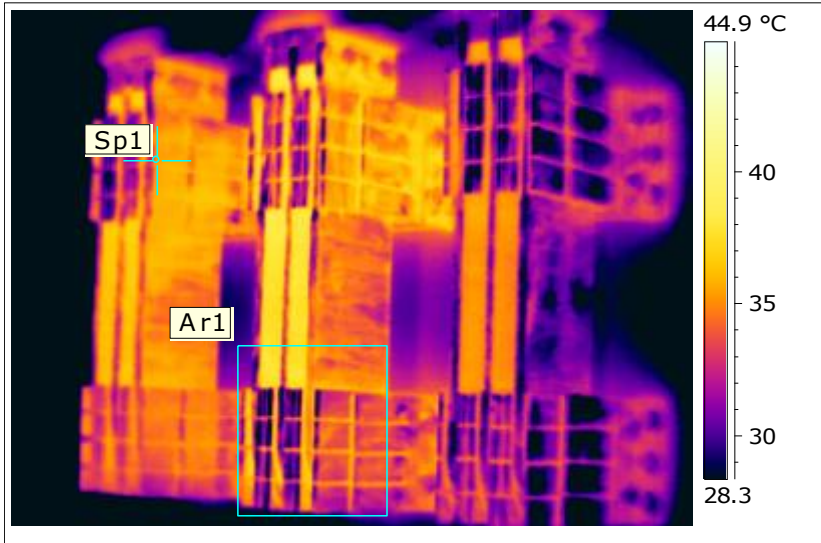
"Customer Code"

<b>LOCATION</b>	"Board Location"
<b>EQUIPMENT</b>	"Board Name"
<b>COMPONENT</b>	"Component"
<b>OBSERVATION</b>	No Abnormal Thermal Activity Detected



Date: 11/05/2010

Time: 11:45:31 AM



**RESULT TABLE:**

Max Temperature	38.4 °C
Ar1 Max. Temperature	38.1 °C
Sp1 Temperature	35.5 °C

<b>Temp. Rise</b> Fault (Ar1 Max) Temp – Ref (Sp1) Temp	<b>3 °C</b>
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**OBSERVATIONS/RECOMMENDATIONS**

The temperatures recorded in the Results Table above are the maximum and a reference temperature detected on this equipment: This would be considered to be normal operating temperature and no further action will be necessary:

Maintain 12 Monthly Inspections:



## TECHNICAL INFORMATION

The temperature observations that are detailed in this report can be referenced to the Australian standards "Limiting Temperatures" information, which may assist you in your risk a

analysis of each observation, further information can be found in the Australian standards AS 3000 and AS 3008

### PRIORITIES RISK SCHEDULE INFORMATION

The priorities as specified in the priority schedule below are based on the above mentioned standards, The temperature difference as stated below is the difference in temperature between the operating reference temperature and the maximum fault temperature recorded.

The above temperature difference can exist in an electrical installation between phases, across switches, contactors and other components

Other factors that can effect a temperature difference are the loading and application of an electrical circuit.

<u>Priority</u>	<u>Temp Diff</u>	<u>Suggested Action</u>
1	>30°C	Serious Problem identified, should be corrected as soon as possible, could fail at any time, check adjacent components for damage.
2	20°C - 30°C	Not so serious problem should be corrected with in 1-2 weeks it could fail at any time resulting to breakdown, check adjacent components for damage.
3	20°C - 10°C	Minor problem, should be checked and repaired when convenient or during routine maintenance should be reinspected during next inspection to determine trends.
4	<10°C	No problem found. Reinspect in 12 months.

### CONCLUSION

The following general assumptions can be made.

1. Where fuses are hot at one end it can be assumed that a problem exists with the contacts and/or connections.
2. Where fuses are hot overall check the fuse size and load should be checked for correct rating.
3. A high temperature on both sides of a components suggests faulty contacts/connections and/or out of balance load. Testing will confirm/eliminate the balance as a problem.
4. Where contactor terminals are hot and the screws are tight, the problem may exist internally with in the contactor.
5. Generally overloads run cooler than the contactor coil. If the overload is hotter the loads and sizing should be checked.