

# Ti Thermal Imaging LTD

Unit 8, Weybridge Business Centre, 66 York Road, Weybridge, Surrey, KT13 9DY

Tel: 0845 458 6315 Fax: 0871 9004978 E-mail: info@thermalimaging.co.uk Web: www.thermalimaging.co.uk

## **RISK MANAGEMENT THERMOGRAPHIC INSPECTION FOR:**

**TI THERMAL IMAGING LTD** 

## LOCATION:

## UNIT 8 WEYBRIDGE BUSINESS CENTRE 66 YORK ROAD WEYBRIDGE SURREY KT13 9DY

DATE:

25/08/11

TI JOB NO.

TI - 03



Report generated by Ti Thermal Imaging LTD.

Company Registered in England: 04450573 VAT No. 828 6288 87



tī



#### Introduction to your Ti Thermal Imaging LTD risk management thermographic inspection

This electrical, mechanical and visual thermographic inspection has been carried out using a Flir P-series camera with data input onto a purpose built tablet PC platform for instantaneous results and report generation. A Webmanager houses all data that is permanently accessible over the internet allowing the user to track and monitor problems and their repair status.

This is a guide which should help you to fully understand how the inspection was performed and how the results were achieved

- The framework to this inspection can either be generated onsite during the inspection, building the list during the survey or a list exported to MS Excel can be imported into the tablet PC to provide comprehensive information such as item locations, tag numbers, work orders etc.
- Images are captured of all online items and a record is kept of temperature data to enable a trending programme to begin. Subsequent inspections will see the addition of a new image for each inspection so that temperatures can be monitored.
- Baseline images and anomalous pieces of equipment have been recorded as one of three types of inspection:
  - T/D Electrical This covers transmission, distribution and instrumentation
  - Mechanical This covers all mechanical/moving/rotary equipment
  - Visual This covers all visual findings only
- All component baseline images are taken under normal load conditions.
- Panels have been removed where safe and possible to do so and where covered by the Permit To Work system. In addition load readings have been captured using a clamp meter only where covered by the Permit to Work system and where safe to do so. In some cases load readings have not been taken so these are left as blank intentionally so that the normalised graph will function correctly. If a 0 value is inserted then a fictitious reading will be obtained. An explanation of the Normalization graph is listed later.
- A complete inventory will be built of the equipment giving Test Status at the time of the inspection allowing transparency to the inspection and what occurred with each piece of equipment. These Test Status include:

TBT	To Be Tested	These appear in bold on the thermographers tablet to identify which items are still to be tested
TESTED	TESTED	Marked as Tested once images and faults have been documented
NTLO	Not Tested Locked Out	Selected if the item could not be opened safely
NTNL	Not Tested No Load	Selected if the item was offline at the time of inspection and could not be started
NTNA	Not Tested Not Available	Selected if the item is no longer available
NTNS	Not Tested Not Specified	Selected if an item is found to be unspecified
NTUR	Not Tested Under Repair	Selected if an item is currently under a repair procedure
NSFI	Not Scheduled For Inspection	Selected if an item is not due or needed to be tested
NTTC	Not Tested Time Constraint	Selected if the inspection has not been allocated enough time or access problems have cause it to overrun.







# Ti Thermal Imaging LTD

Unit 8, Weybridge Business Centre, 66 York Road, Weybridge, Surrey, KT13 9DY

Tel: 0845 458 6315 Fax: 0871 9004978 E-mail: info@thermalimaging.co.uk Web: www.thermalimaging.co.uk

Each piece of equipment has been allocated a priority to operation taken from the following non-changeable list:

CTO	Critical To Operation
ETO	Essential to Operation
NON	Non-Essential To Operation
UNC	Unclassified

- Emissivity is the value in which an object emits it's infra-red radiation and is also directly proportional to it's reflectivity. For example if an item had 0.9 emissivity then it's reflectivity would be 0.1. This inspection uses an emissivity set to 0.96 because this value is found to be suitable when assessing the temperatures of most electrical components due to them usually being housed in plastic or rubber which has a similar emissivity value. Emissivity is only changed were absolutely necessary. An example of this would be copper busbar with no electrical tape/labels attached.
- Anomalous components are assessed in one of two ways.
- 1. With the use of Reference components operating under similar conditions: These would include using line/load sides or different phases with similar load patterns to compare an anomalous component with another which has a more normal temperature gradient.
- 2. The use of load correction formulas which results in the following value:
  - Estimated fault component temp at full load (°C) This estimates the temperature that the component would be running at if it was loaded at 100%. This value has been arrived at using a formula correction using anomalous and ambient temperatures, measured and maximum load.
- The value of 75°C has been taken from the British Standard BS7671 (\*.\*). This value is the recommended cable temperatures of between 65-85C at full load.
- Using this value it is possible to use a fault rating system to grade the severity of the fault. The following fault ratings and colour coding have been used:

Fault Ratings	minor	Important	Serious	Critical
Temp above ref temp or above 75°C	0-7	8-15	16-32	33+

- This value of 75°C is also used as a threshold temperature for the captured baseline images. In certain circumstances, this value has either been increased to 100°C or decreased to 50°C. The value has been increased to 100°C where the thermographer deems this a more appropriate value due to an elevated cubicle ambient or where components are tightly arranged together causing uplift in operating temperature. The value has been decreased to 50°C where the thermographer deems this a more appropriate value due to panel covers not being able to be removed and only the surface of the component can be seen and not the actual connections. In certain circumstances where SP2 Reference temperature cannot be suitably obtained, the value has been set from the BS Ref of 75°C as the SP2 reference temp.
- The normalization graph simulates temperature at 0, 50% and 100% load and is designed to assist the prediction of component operating temperature where a reference component has been used. According to Ohms law P=I<sup>2</sup>R but the graph is designed as a quick glance tool to assist in viewing the potential that a problem may become.
- Where anomalous components are found, a knowledge base library is used to house specific statements that ensure synergy between inspections for faults, root causes and recommended remedial actions.
- Formulas:

Normalization Graph	P=I <sup>2</sup> R where P=Power, I=Current, R=Resistance
T load corrected	Let $(Tm - Tamb) = Trise$ ; I meas / I full = LF (Load factor) Then: Tcorr = (((1/ LF)^1.68+(1/ LF)^1.46)/2)*Trise + Tamb



Report generated by Ti Thermal Imaging LTD.





# Ti Thermal Imaging LTD

Unit 8, Weybridge Business Centre, 66 York Road, Weybridge, Surrey, KT13 9DY

Tel: 0845 458 6315 Fax: 0871 9004978 E-mail: info@thermalimaging.co.uk Web: www.thermalimaging.co.uk

#### Report pages:

The combined report contains the following pages:

NB Page numbers have been left in for additional ID purposes. Page numbers run in sequence beginning at #1 for each section but do not run in sequence for the whole combined report.

- 1. Cover Page for TD Electrical: This is a summary report which offers the amount of problems found and their severity grade. It is for a complete site overview.
- 2. List of all open problems: This is the full list of equipment found with problems and includes their locations and tag numbers
- 3. Inspection Inventory: This is a full inventory of equipment inspected, their ID numbers and their test status.
- 4. Documentation pages: These pages include the details of all anomalies found for individual pieces of equipment.
- 5. Cost Benefit Analysis: This lists the possible cost benefits of finding the faults before they have failed and estimates how much cost has been saved by predicting a failure before it happens. These values are deliberately very conservative and loss of production has not been taken into account.

The Webmanager contains all of the above reports and lists problems, cost benefits and baseline trends in easy to source locations. To view your current and previous inspections, please logon to your personal Webmanager using your username and password already supplied. If you do not have this please contact Ti on 0845 4586315.

http://193.228.155.40/inspectrend or www.thermalimaging.co.uk then 'Login to Webmanager' tab

#### Webmanager tutorial snapshot:

Navigate to the area you need using one of the 6 tabs at the top of the screen:

	Overview	Summary listing all problems active or closed with severity grade.
REP'S/ELECTRICIANS ENTER CORRECTIVE WORKORDERS INTO WEBMANAGER HERE	Inspection	Select site and then hit search to reveal historical list of inspections. Select 'more' next to the inspection that you want to see further details of. At the bottom is a 'reports' button that highlights in red, hit this to reveal a list of your reports. Your combined report will be prefixed by 1_ to ensure it the very first report.
	Inventory	Select site and then hit search to reveal a full inventory of surveyed equipment, test status, priority to site operation and last inspected date.
	Problems	Select site and then hit search to reveal a list of all open/closed problems found with severity grade, repair status and date found. Attach a work order here for remedial action and view the problem in its own individual report page.
	Cost Benefit	Select site and then hit search to reveal the savings you have made by having this inspection carried out. Typical ratio is spend £1 and save £4.
	Baseline	Select site and then hit search to reveal baseline trend data for all equipment surveyed. Here you can view individual trend reports for each piece of equipment where the latest IR/DC images are displayed with a historical temperature graph for baseline temp/current insp. Temp and threshold temp.



Report generated by Ti Thermal Imaging LTD.





# **Cover Page for T/D Electrical**

**Executive and Operations summary of problems found** 

Also available on your Webmanager Overview page Please use your login details provided

http://193.228.155.40/inspectrend





Report generated by Ti Thermal Imaging LTD.



#### INFRARED THERMOGRAPHIC INSPECTION OF TRANSMISSION / DISTRIBUTION ELECTRICAL INSPECTION

Page 1

Report Date: 25/08/2011

#### Provided for

#### TI, TI Site 3

#### **Overview:**

The Infrared Electrical Inspection was performed by TI Thermal Imaging, by a certified infrared Thermographer. All of the items inspected are listed in this InspecTrend report. Any anomalies are listed in order of priority based on the component's temperature rise, as measured from a reference component of equal type and load at the time of the inspection. TI Thermal Imaging assumes no liability directly or indirectly as a result of this inspection.

**Current Inspection No: 1089** August 25, 2011 **Prior Inspection No:** Percent of Prior Current Change **Temp Rise** Inspection Inspection Priority 1-Critical 33 - Above 1 = 25%NA NA 2-Serious 16 - 32 1 = 25%NA NA 3-Important 8 - 15 1 = 25%NA NA 4-Minor 1 - 7 1 = 25%NA NA 5-Normal NA 0 0 = 0%NA **Total Tested Problems:** 4 NA NA Number of New Documented Problems: 4 = 100%NA NA Number of Tested re-occuring Problems: 0 = 0%NA NA Number of prior problems which were Not Tested this inspection : NA Number of Total Open Problems 1 Number of prior problems which tested Normal this inspection NA •

I hereby certify the above project was inspected by myself or under my direction and that the enclosed data is the direct result of this inspection. **TI Thermal Imaging** 

Wallace, Richard

Certification Level/No.: ITC Level II

\* Summary of reoccuring problems on following page(s)



# **Cover Page for Visual**

**Executive and Operations summary of problems found** 

Also available on your Webmanager Overview page Please use your login details provided

http://193.228.155.40/inspectrend





Report generated by Ti Thermal Imaging LTD.



### INFRARED THERMOGRAPHIC INSPECTION OF VISUAL PROBLEMS

Page 1

#### Provided for

Report Date: 25/08/2011

### TI, TI Site 3

#### **Overview:**

The Infrared Inspection was performed by TI Thermal Imaging, by a certified infrared Thermographer. All of the items inspected are listed in this InspecTrend report. Any anomalies are listed in order of priority based on the component's temperature rise, as measured from a reference component of equal type and load at the time of the inspection. TI Thermal Imaging assumes no liability directly or indirectly as a result of this inspection.

**Current Inspection No:** 1089 August 25, 2011 **Prior Inspection No:** Percent Prior of Current Inspection Change **Temp Rise** Inspection Priority 1-Critical 1 = 50%NA NA 2-Serious 0 = 0%NA NA 1 = 50%3-Important NA NA NA 4-Minor 0 = 0%NA **Total Tested Problems:** 2 NA NA Number of New Documented Problems: 2 = 100% NA NA Number of Tested re-occuring Problems: 0 = 0%NA NA Number of prior problems which were Not Tested this inspection : NA Number of Total Open Problems 1 Number of prior problems which tested Normal this inspection NA

I hereby certify the above project was inspected by myself or under my direction and that the enclosed data is the direct result of this inspection. **TI Thermal Imaging** 

### Wallace. Richard

Certification Level/No.: ITC Level II

\* Summary of reoccuring problems on following page(s)



# **List of Open Problems**

Full list of thermal, mechanical and visual issues found

Also available on your Webmanager Problems page Please use your login details provided

http://193.228.155.40/inspectrend





Report generated by Ti Thermal Imaging LTD.



1	'l Site 3				CTO = ETO =	ation Priority Key = Critical to operate = Essential to ope	tion ration
Rep	oort Date: 25/08/2011					= Non-essential to = Un-Classified	operation
	Prior Inspection No : Irrent Inspection No : 1089	August 25, 2011		Temp	%		
Prob	# Asset ID		Insp#	Rise	Load	<u>Severity</u>	Status
TD 1	DB T41	Equipment: RISER E \ DB T41	1089	12 C	35%	6 3-Important	TESTED
		Component: B phase line side connection indicates higher temperature than expected on 1 Breaker	00A - 3 F	Pole Circuit			
V 1	DBLL15	Equipment: RISER E \ DBLL15 Component: Broken door hinge causing an access and possible security issue	1089			3-Important	TESTED



# **Inspection Inventory Pages** Equipment listing and test status

Also available on your Webmanager Inventory page with Photos Please use your login details provided

http://193.228.155.40/inspectrend





Report generated by Ti Thermal Imaging LTD.



ТΙ

TI Site 3

Inspected By :

Work Order

NI

NI NI

NI

NI

NI

NI

NI NI

Report Date: 25/08/2011

Wallace, Richard

Asset ID

CP2

LV1-1

LV1-1

LV1-2

LV1-3

LV1-4

LV1-5

MCC

MCC

LV2

-

-

GHCP

DB T18-21

**DB T20 R3** 

DB T22-25

DB T12-15

DB T12-15

DBLL15

DB BFCU

DBT32-33

DB NTAC

DB T41

DB 22-25 RYB1-4

RISER E

DBLL15

DBT32-33

DB T41

DB NATIONAL AC

BALFOUR FAN COIL UNITS

-

-

### Current Inspection Inventory Status By Inspection Order

**Test Status Note** 

Other

TBT = To Be Tested TD = T/D Electrical NI = Not Issued SCE = Safety Critical NT/NL = Not Tested/No Load M = Mechanical NT/TC = Not Tested/Time Constraint V = Visual Inspection NT/UR = Not Tested/Under Repair **Operation Priority Key** NT/LO = Not Tested/Locked Out CTO = Critical to operation NT/NA = Not Tested/Not Available Prior Inspection No: ETO = Essential to operation NT/NS = Not Tested/Not Specified Current Inspection No: 1089 NON = Non-essential to operation NSFI = Not Selected for this insp. UNC = Un-Classified **Equipment Description** СТО Tested Test Status Notes Problem # SWITCHROOM СТО TESTED СТО TESTED MAIN LV ROCKWELL ISOLATOR LOADSIDE СТО TESTED СТО ROCKWELL ISOLATOR LINESDIE TESTED СТО TESTED PANEL B LOWER BUSBAR СТО TESTED UPPER BUSBAR СТО TESTED СТО TESTED MAIN INCOMER **BALFOUR PLANTROOM** СТО TESTED MCC СТО TESTED F10 сто TESTED PLANTROOM PANEL СТО TESTED сто TESTED GAS HEATER CONTROL PANEL RISFR A СТО TESTED DB T18-21 сто TESTED DB T20 R3 сто TESTED RISER B сто TESTED DB T22-25 сто TESTED DB 22-25 RYB1-4 сто TESTED DB T12-15 сто TESTED **RYB1-4** СТО TESTED

сто

сто

СТО

СТО

СТО

СТО

TESTED

TESTED

TESTED

TESTED

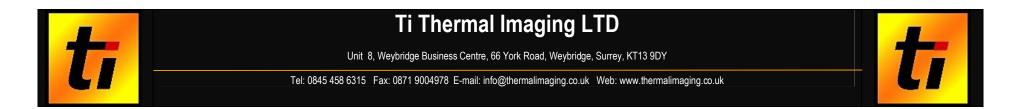
TESTED V1

TESTED TD1

Problem Type Key

Page: 1

**Equipment Test Status Key** 



# **Documentation pages for TD Electrical**

Details of TD electrical problems found

Also available on your Webmanager Problems page Please use your login details provided

http://193.228.155.40/inspectrend





Report generated by Ti Thermal Imaging LTD.

		Client		Asset		Inspection Number	Report Date	Inspection Type
Π	Γ	TI		TI Site 3		1089	25/08/2011	T/D Electrical
Location / Equipment	Information				Normalized G	iraph	Digital Image: DC_05	22.jpg Date: 24/08/2011
Work Order	NOT ISSUED					Problem — Referen		
Equipment ID	DB T41					Problem	ce	
Location	RISER E				140			
Description	DB T41				120 -		en a la la	A CARGE CARGE
Severity	3-Important				100 -			
Anomoly	B phase line side co than expected on 100			emperature	80 -			
Possible Root Cause	Suspected loose/de	teriorated line sic	le connecti	on	60 - 40			
Recommendation	Check, clean and re	-make line side c	onnection(s	s)	20 - 0	50% Load 100% Load	Alm real	
Equipment Informatio	n				Infrared Imag		Date: 2	4/08/2011
Component:	Circuit Breakers						A STATE OF THE STATE	Not a supervision of the supervision
Manufacturer:	Socamec				<ul> <li>N</li> </ul>			40 6 00
Model No:	S100A							40.6 °C
Rated Amps:	100							
Circuit Voltage:	415 Volts							
Measured Loads	Phase	Actual Lo	oads (A)	Load %				
(Load taken if safe and allowed on	B phase line side:	35	5	35.00%			min 23.3 m	iax 42.3
PTW)	B phase load side:	35	5	35.00%				
,								
	Neutral				ALC: NO.		1	
Current Prob No: T/D	Electrical/1				A STATE		40.5 2	5.7
Operation Priority:			Critical to	operation				
	erature - Ar1 Max Temp	erature		42 C				
Reference Temperature				<u>30 C</u>				
Temperature Rise Above Reference   12 C								
				75 C				
British Standard Refere							Martin Parts	
Temperature Information	tion				中 自然是在			
Cubicle ambient:				21 C				
Emissivity:				0.96				A REAL PROPERTY OF
Environment:				Indoors				214
Adjusted Temperature				12 C				21.4
	over reference @ 50% L			24 C				
Estimated Temp Rise o	over reference @ 100%	Load: (See " 2)		98 C				

	C	lient		Asset		Inspection Number	Report Date	Inspection Type
Ti	T	1		TI Site 3		1089	25/08/2011	T/D Electrical
• /								
Location / Equipment	Information				Normalized G	raph	Digital Image: DC_05	532.jpg Date: 24/08/2011
Work Order	1830172					Problem	ce	
Equipment ID	MCC				50000			F10 F11 F12 F
Location	BALFOUR PLANTRO	M			45000 -	<b>\$</b>	in the second	Sand State State State
Description	F10				40000 -			
Severity	1-Critical				35000 -			
Anomoly	Indicates higher temp	erature than exp	bected on 20	0A - Fuse	30000 - 25000 -		STATISTICS IN CONTRACTOR	
Possible Root Cause	Suspected internal pr	oblem			20000 - 15000 - 10000 -		Anos var Bitrini	E E E E E E E E E E E E E E E E E E E
Recommendation	Either replace or inve determine source of te		connections	s to	5000 - 0	50% Load 100% Load	784 6699. 3 AC80	04.500V. ACB0 ACB0 ACB0 ACB0 ACB0 ACB0
Equipment Information	n				Infrared Image	e: IR_0531A.jpg	Date: 2	24/08/2011
Component:	Fuses - Fuse Carriers							
Manufacturer:	Ottermill							1 10 7 00
Model No:	AC80							148.7 °C
Rated Amps:	20							CONTRACTOR OF STREET, S
Circuit Voltage:	500 Volts							
Measured Loads	Phase	Actual Lo	ads (A)	Load %			min 34.5 max 159.3	
(Load taken if safe and allowed on	-:	1		5.00%		and the state of the		
PTW)	-:	1		5.00%				
,								A DESCRIPTION OF A DESC
	Neutral							
Current Prob No: T/D I	Electrical/2					1	23.4	
Operation Priority:			Critical to	operation				32.5
	erature - Ar1 Max Temper	ature		159 C				
Reference Temperature				<u>43 C</u>				
Temperature Rise Abov				116 C				
	mperature British Standar	d Reference		75 C				
British Standard Refere								
Temperature Informat	ion							
Cubicle ambient:				23 C				
Emissivity:				0.96				
Environment:				Indoors				
Adjusted Temperature F				116 C				24.0
	ver reference @ 50% Lo	· · ·		11600 C				
Estimated Temp Rise of	ver reference @ 100% L	oad: (See * 2)		46400 C				

		Client	Asset		Inspection Number	Report Date	Inspection Type
Ti		TI	TI Site 3		1089	25/08/2011	T/D Electrical
Location / Equipment I	nformation			Normalized G	iraph	Digital Image: DC_05	66.jpg Date: 24/08/2011
Work Order	NOT ISSUED				Problem — Referen		
Equipment ID	DB T12-15						
Location	RISER B			90			
Description	RYB1-4			80 -			
Severity	4-Minor			70 -			
Anomoly	A phase line side c than expected on 10	onnection indicates highe	er temperature er	60 - 50 -			
Possible Root Cause	Suspected loose/d	eteriorated line side conn	ection	40 - 30 - 20 -			
Recommendation	Check, clean and r	e-make line side connecti	on(s)	10 - 0	50% Load 100% Load		deneradi
Equipment Information	ו			Infrared Imag		Date: 2	4/08/2011
Component:	Circuit Breakers			的情况。	and the second second	The second se	AND
Manufacturer:	Socamec						21 0 00
Model No:	S100A						31.8 °C
Rated Amps:	100						
Circuit Voltage:	400 Volts						
Measured Loads	Phase	Actual Loads (A)	) Load %				The Prove of the
(Load taken if safe and allowed on	A phase line side:	31	31.00%				19 P 20 P 20 20 20 20 20 20 20 20 20 20 20 20 20
PTW)	A phase load side:	31	31.00%			(s) a	Ø 🔍
	Neutral						
Current Prob No: T/D E	Electrical/3						
Operation Priority:		Critica	al to operation				
Max Component Tempe	erature - Ar1 Max Tem	perature	31 C			Canada	
Reference Temperature			<u>26 C</u>			1.7 21.2	
Temperature Rise Abov			5 C	No. R. R.			
Maximum allowable Ter		dard Reference	75 C				
British Standard Referen	nce - BS7671			用等性。	min 19	9.3 max 32.0	
Temperature Informat	ion						
Cubicle ambient:			19 C			ALC: NO DE LA COMPANY	
Emissivity:			0.96	建築 经公司			
Environment:			Indoors				
Adjusted Temperature F			5 C	A Participation of the second			18.7
Estimated Temp Rise ov			13 C				
Estimated Temp Rise ov	ver reference @ 100%	6 Load: (See * 2)	52 C				

Location / Equipment Information       Digital Image: DC.0556.jg       Date: 2408201         Equipment ID       DB T20 R3       Digital Image: DC.0556.jg       Date: 2408201         Location       HSERA       Description       DB T20 R3       Digital Image: DC.0556.jg       Date: 2408201         Severity       2-Serious       Anomoly       Location Inflicates higher temperature than expected on 32A - 1 Pole Mini Circuit Breaker       Digital Image: DC.0556.jg       Date: 2408201         Possible Root Cause       Suspected loose/deteriorated load side connection       Digital Image: DC.0556.jg       Date: 2408201         Equipment Information       Check, clean and remake load side connection(s)       Date: 2408201       Date: 2408201         Equipment Information       Concontint       Mini Circuit Breakers       Date: 15       Date: 15         Manufacturer:       Socarme       Model No:       Actual Loads (A)       Load 5%         Indeed Noi       A23       Environment       Mini Size Market       Date: 15       Market         Model No:       A23       Circuit Voltage: 400 Volts       Date: 15       Market       Date: 15       Market         Model No:       Normalized Framerature - A1 Max Temperature - 15       Gate: 17       Gate: 17       Gate: 17       Gate: 17       Gate: 17       Gate: 17       G			Client	Asset		Inspection Number	Report Date	Inspection Type
Work Order       1830173         Equipment ID       DB T20 R3         Location       RISER A         Description       DB T20 R3         Severity       2-Serious         Anomoly       Load side connection indicates higher temperature than expected to 32A - 1 Pole Mini Circuit Breaker         Possible Root Cause       Suspected loose/deteriorated load side connection         Recommendation       Check, clean and remake load side connection(s)         Equipment Information       Mini Circuit Breakers         Manufacturer:       Socame commendation         Model No:       A225         Rated Anpse:       32         Circuit Voitage:       40         Vitod taken if able cont Temperature       15         Model No:       Nation         Prob       Time Standard Reference         Temperature Rise Above Reference       17         Chicks and allowed on Provide       21         Temperature Rise Above Reference       17         Temperature Rise Above Reference       17         Temperature Rise Above Reference       17         <	Ti	ſ	ТІ	TI Site 3		1089	25/08/2011	T/D Electrical
Equipment ID       DB T20 R3         Location       RISER A         Description       DB T20 R3         Severity       2-Serious         Anomoly       Load side connection indicates higher temperature than expected on 32A - 1 Pole Mini Circuit Breaker         Possible Root Cause       Suspected loose/detriorated load side connection         Recommendation       Check, clean and remake load side connection(s)         Equipment Information       Check, clean and remake load side connection(s)         Manufacturer:       Socamec         Model No:       A323         Circuit Voltage:       400 Volts         Measured Loads       hasse         Load side:       15       46.88%, load side:         PTW)       Detextral       40.88%, load side:         Current Prob No: TOP Elevtrical4       Corponent:       Gorparature Rise Above Reference         PTW)       Neutral       15         Current Prob No: TOP Northy:       Critical to operation Rise Above Reference       75 C         Maximum allowable Temperature PRinds Prometature       21 C         Current Prob Northy:       0.96         Environment:       116 docs:         Chied antenit:       21 C         Cheinsburky:       0.96         Envinon	Location / Equipment I	Information			Normalized G	iraph	Digital Image: DC_05	56.jpg Date: 24/08/2011
Equipment ID       DB 120 R3         Location       RisER A         Description       DB 720 R3         Sworthy       2-Serious         Anomoly       Load side connection indicates higher temperature than expected on 32A - 1 Pole Mini Circuit Breaker         Possible Root Cause       Suspected loose/deteriorated load side connection(s)         Equipment Information       Check, clean and remake load side connection(s)         Equipment Information       Component:         Mini Circuit Breakers       Mini Circuit Breakers         Manufacturer:       Socamec         Model No:       A22S         Rated Amps:       32         Circuit Voltage:       400 Volts         Mesured Looks Phase       Actual Loads (A)       Lead %         Maint allowed No:       15       46.88%         PTW)       Line side:       15       46.88%         PTW)       Line side:       15       46.88%         Operation Priority:       Maximum allowed Reference       75 C         British Standard Reference       75 C       75 C         British Standard Reference:       80 C       15 C         Gritish Standard Reference:       75 C       75 C         British Standard Reference:       71 C       <	Work Order	1830173				Drohlom Deferrer		1 S.
Location       NISER A         Description       DB 720 R3         Severity       2-Serious         Anomoly       Location indicates higher temperature than expected on 32.4 1 Pole Mini Circuit Breaker         Possible Root Cause       Suspected lose/detriorated load side connection         Recommendation       Check, clean and remake load side connection(s)         Equipment Information       Check, clean and remake load side connection(s)         Manufacturer:       Socarnee         Model No:       A 223         Circuit Voltage:       400 Volts         Heasured Loads       Actual Loads (A)       Load %         Load side:       15       46.88%         PTW)       Line side:       15       46.88%         Distin Standard Reference       75 C       Circuit Neise Above Reference       75 C         Temperature Rise Above Reference       75 C       Erwisting:       0.96         Erwisting:       0.96       Indoors C       0.96       0.96	Equipment ID	DB T20 R3				Problem — Referen	ce	and the second s
everity       2-Serious         Anomoly       Load side connection indicates higher temperature than expected loose/deteriorated load side connection         Possible Root Cause       Suspected loose/deteriorated load side connection(s)         Equipment Information       Check, clean and remake load side connection(s)         Equipment Information       Infared Image: IR_0605A;pg         Component:       Mini Circuit Breakers         Manufacturer:       Socamec         Model No:       A32S         Rated Amps:       32         Circuit Voltage:       40 Volts         Measured Loads ide:       15         Load side:       15         Maximum allowable Temperature British Standard Reference       17 c         Maximum allowable Temperature British Standard Reference:       17 c         Maximum allowable Temperature       21 c         Childs Ambient:       21 c         Environment:       Indoces         Adjusted Temperature Rise above reference:       17 c	Location	RISER A			120			
Anomoly       Load side connection Indicates higher temperature than expected on 32A - 1 Pole Mini Circuit Breaker         Possible Root Cause       Suspected load side connection         Recommendation       Check, clean and remake load side connection(s)         Equipment Information       Check, clean and remake load side connection(s)         Manufacturer:       Socame         Model No:       A32S         Carcuit Voltage:       400 Volts         Meated Amps:       32         Circuit Voltage:       400 Volts         Neutral       Ins side:         Is ad side:       15       46.88%         Intered Imperature Rise Above Reference       17 C         Pamperature Rise Above Reference       17 C         Entirest Standard Reference - B37671       71 C         Temperature Rise Above Reference:       17 C         Adjustad Temperature Rise above reference:       17 C         Adjustad Temperature Rise above reference:       17 C	Description	DB T20 R3			100 -	× 1		
Anometry       Exact and connection market for a back of the adverted that experiment to that experiment to that experiment to the adverted or s2A - 1 Pole Mini Circuit Breaker         Recommendation       Check, clean and remake load side connection(s)         Equipment Information       Information         Component:       Mini Circuit Breakers         Manufacturer:       Socame         Model No:       A325         Rated Amps:       32         Circuit Voltage:       40 Volts         Messaved Loads       15       46.88%         Line side:       15       46.88%         Vind lawed on Privi):       Neutral       45.9         Maximum allowable Temperature       17 C         Maximum allowable Temperature       17 C         Chrish Standard Reference       17 C         Maximum allowable Temperature       17 C         Chrish Standard Reference:       17 C         Environment:       0.068         Environment:       0.069         Environment:       0.069         Environment:       17 C         Adjusted Temperature Rise above reference:       17 C         Environment:       0.069         Environment:       16         Adjusted Temperature Rise above reference:	Severity	2-Serious						
Recommendation Check, clean and remake load side connection(s)   Equipment Information   Component:   Mini Circuit Breakers   Manufacturer:   Socamec   Model Nc:   A328   Circuit Voltage:   400 Volts   Measured Loads   (Load taken if safe   and allowed   PTW)   Line side:   15   46.88%   Neutral   Operation Priotity:   Circuit Voltage:   PTW)   Circuit Note Reference   PTW)   Circuit Notage:   Circuit Notage:   Neutral   Component:   Socamece   Neutral   Circuit Notage:   Neutral   Circuit Notage:   Neutral   Circuit Notage:   Neutral   Circuit Notage:   Circuit Notage:   Neutral   Circuit Notage:   Maxic Component:   Circuit Notage:   Circuit Notage:   Notaria   Circuit Notage:   Maxic Component Temperature - Art Max Temperature   Gride ambient:   Circuit Notage:   Circuit Notage:   Circuit Congeneration:   Circuit Congeneration:   Circuit Congeneration:   Circuit Notage:   Circuit Notage:   Circuit Notage:   Circuit Notage:   Circuit Notage:   Circuit Notage:   Circuit Notage: <	Anomoly							
Recommendation Check, clean and remake load side connection(s)   Equipment Information   Equipment Information   Component:   Mini Circuit Breakers   Manufacturor:   Socamec   Model No:   A325   Rated Amps:   32   Circuit Voltage:   400 Volts   Cond skine if safe   Ine side:   15   46.88%   Volta   Voltadie:   15   46.88%   Voltadie:   15   46.88%   Voltadie:   15   46.88%   Voltadie:   15   46.88%   Voltadie:   15   46.88%   Voltadie:   Operation Priority:   Current Prob No: T/D Electrical/4   Operation Priority:   Circuit Voltage:   Operation Priority:   Cubicle ambient:   Cubicle ambient:   Cubicle ambient:   Cubicle ambient:   Cubicle ambient:   Cubicle ambient: <td>Possible Root Cause</td> <td>Suspected loose/de</td> <td>eteriorated load side</td> <td>connection</td> <td>40</td> <td></td> <td>1 Aga</td> <td></td>	Possible Root Cause	Suspected loose/de	eteriorated load side	connection	40		1 Aga	
Equipment Information         Infrared Image:         IR_0555A.jpg         Date:         24/08/2011           Component:         Mini Circuit Breakers         Socamec         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9         45.9 <t< td=""><td>Recommendation</td><td>Check, clean and re</td><td>make load side con</td><td>nection(s)</td><td></td><td>50% Load 100% Load</td><td></td><td></td></t<>	Recommendation	Check, clean and re	make load side con	nection(s)		50% Load 100% Load		
Manufacturer:       Socamec         Model No:       A32S         Rated Amps:       32         Circuit Voltage:       400 Volts         Measured Loads (Load taken if safe and allowed on PTW)       Phase       Actual Loads (A)       Load %         Line side:       15       46.88%       46.88%         Neutral	Equipment Information	า			Infrared Imag		Date: 2	4/08/2011
Model No:       A328         Rated Amps:       32         Circuit Voltage:       400 Volts         Measured Loads (Load taken if safe and allowed on PTW)       Phase       Actual Loads (A)       Load %         Line side:       15       46.88%         Line side:       15       46.88%         Neutral	Component:	Mini Circuit Breake	rs					A STATISTICS
Rated Amps:       32         Circuit Voltage:       400 Volts         Measured Loads       Phase       Actual Loads (A)       Load %         (Load taken if safe and allowed on PTW)       Phase       Actual Loads (A)       Load %         Measured Loads       Phase       Actual Loads (A)       Load %         Load side:       15       46.88%       Line side:       15       46.88%         Line side:       15       46.88%       Line side:       15       46.88%         Operation Priority:       Critical to operation       Max Component Temperature - Ar1 Max Temperature       47 C         Reference Temperature or SP2 Temperature       30 C       30.1       30.1       30.1         Temperature Rise Above Reference       75 C       75 C       75 C       76 C         British Standard Reference - BS7671       T       76 C       76 C       76 C         Cubicle ambient:       21 C       9.06       9.06       9.06       9.06       9.06       9.06       9.06       9.06       9.06       9.06       9.06       9.06       9.06       9.06       9.06       9.06       9.06       9.06       9.06       9.06       9.06       9.06       9.06       9.06       9.06       9	Manufacturer:	Socamec						45 0.00
Circuit Voltage:       400 Volts         Measured Loads (Load taken if safe and allowed on PTW)       Phase       Actual Loads (A)       Load %         Line side:       15       46.88%         Line side:       15       46.88%         Neutral	Model No:	A32S						45.9 °C
Measured Loads (Load taken if safe and allowed on PTW)       Phase       Actual Loads (A)       Load %         Load side:       15       46.88%         Line side:       15       46.88%         Neutral	Rated Amps:	32					the second second second	THE COLUMN
Load taken if safe and allowed on PTW)       Load side:       15       46.88%         Line side:       15       46.88%         Neutral       Neutral       10         Operation Priority:       Critical to operation Max Component Temperature - Ar1 Max Temperature       47 C         Reference Temperature or SP2 Temperature       30 C         Temperature Rise Above Reference       17 C         Maximum allowable Temperature British Standard Reference       75 C         British Standard Reference - BS7671	Circuit Voltage:	400 Volts			a print a second		Contraction of the second	
and allowed on PTW)       Image: Image		Phase	Actual Load	ds (A) Load %	States and			
PTW)         Line side:         15         46.88%           Neutral         Image: Im		Load side:	15	46.88%			State of the second	
Neutral   Operation Priority:   Operation Priority:   Operation Priority:   Critical to operation   Max Component Temperature - Ar1 Max Temperature   47 C   Reference Temperature or SP2 Temperature   30 C   Temperature Rise Above Reference   17 C   Maximum allowable Temperature British Standard Reference   575 C   British Standard Reference - BS7671   Cubicle ambient:   1ndoors   Adjusted Temperature Rise above reference:   17 C		Line side:	15	46.88%	and the second second		Anna -	
Current Prob No: T/D Electrical/4         Operation Priority:       Critical to operation         Max Component Temperature - Ar1 Max Temperature       47 C         Reference Temperature or SP2 Temperature       30 C         Temperature Rise Above Reference       17 C         Maximum allowable Temperature British Standard Reference       75 C         British Standard Reference - BS7671       0         Cubicle ambient:       21 C         Emissivity:       0.96         Environment:       Indoors         Adjusted Temperature Rise above reference:       17 C	,	N. 6 1					min 32.9 max 46.6	
Operation Priority:Critical to operationMax Component Temperature - Ar1 Max Temperature47 CReference Temperature or SP2 Temperature30 CTemperature Rise Above Reference17 CMaximum allowable Temperature British Standard Reference75 CBritish Standard Reference - BS7671							45.9	
Max Component Temperature - Ar1 Max Temperature       47 C         Reference Temperature or SP2 Temperature       30 C         Temperature Rise Above Reference       17 C         Maximum allowable Temperature British Standard Reference       75 C         British Standard Reference - BS7671       0         Cubicle ambient:       21 C         Emissivity:       0.96         Environment:       Indoors         Adjusted Temperature Rise above reference:       17 C		Electrical/4	l l		A AND A			
Reference Temperature or SP2 Temperature       30 C         Temperature Rise Above Reference       17 C         Maximum allowable Temperature British Standard Reference       75 C         British Standard Reference - BS7671       71 C         Cubicle ambient:       21 C         Emissivity:       0.96         Environment:       Indoors         Adjusted Temperature Rise above reference:       17 C				-		30.1		
Temperature Rise Above Reference       17 C         Maximum allowable Temperature British Standard Reference       75 C         British Standard Reference - BS7671       1         Cubicle ambient:         Cubicle ambient:       21 C         Environment:       0.96         Environment:       Indoors         Adjusted Temperature Rise above reference:       17 C			erature				ROCC	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Maximum allowable Temperature British Standard Reference       75 C         British Standard Reference - BS7671       0         Temperature Information         Cubicle ambient:       21 C         Emissivity:       0.96         Environment:       Indoors         Adjusted Temperature Rise above reference:       17 C							1 martin	
British Standard Reference - BS7671         Temperature Information         Cubicle ambient:       21 C         Emissivity:       0.96         Environment:       Indoors         Adjusted Temperature Rise above reference:       17 C								
Temperature Information         Cubicle ambient:       21 C         Emissivity:       0.96         Environment:       Indoors         Adjusted Temperature Rise above reference:       17 C			ard Reference	75 C			· · · · · · · · · · · · · · · · · · ·	
Cubicle ambient:       21 C         Emissivity:       0.96         Environment:       Indoors         Adjusted Temperature Rise above reference:       17 C								States States
Emissivity:       0.96         Environment:       Indoors         Adjusted Temperature Rise above reference:       17 C				24.0				
Environment:     Indoors       Adjusted Temperature Rise above reference:     17 C					相然有了一些	and the state of the		
Adjusted Temperature Rise above reference: 17 C	,				· 二次 王王子			Statement and the statement
		Rise above reference:						24.6
			oad: (See * 1)	17 C				24.0
Estimated Temp Rise over reference @ 100% Load: (See * 2) 77 C					5061747			



# **Documentation pages for Visual findings**

Details of Visual problems found

Also available on your Webmanager Problems page Please use your login details provided

http://193.228.155.40/inspectrend





Report generated by Ti Thermal Imaging LTD.



TI Site 3

ΤI

## **Visual Problem Documentation**

Location/Equipment Information Asset ID: DBLL15 RISER E DBLL15

#### Work Order#: NOT ISSUED

Current Prob No: Visual/1						
Is Chronic:	No					
Operation Priority:	Critical to operation					
Repair Priority:	3-Important					

 InspectionNo: 1089

 Report Date: 25/08/2011

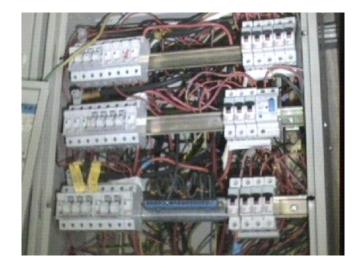
 Classification: 25/08/2011

 Observations: 8 lectrical

 Observations: 9 hysical damage

 What is the Cause: 9 hysical damage

 Recommendations: 8 Repair or replace



File:	Date:	Time:
File: DC_0506.jpg	Date:	Time:
	Technician: Certification Level/No.:	Wallace, Richard ITC Level II

### IR IMAGE IS NOT NECESSARY

Page 1



#### TI TI

TI Site 3

## **Visual Problem Documentation**

Location/Equipment Information

Asset ID: -

BALFOUR PLANTROOM

Work Order#: 1830178

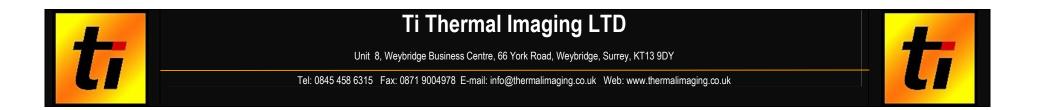
Current Prob No: Vis	sual/2
Is Chronic:	No
Operation Priority:	Critical to operation
Repair Priority:	1-Critical

InspectionNo: Report Date:	1089 25/08/2011
Classification:	Electrical
Observations:	Insect infestation causing an unsafe working environment and access restriction
What is the Cau	se: Insect nest by access door
Recommendatio	ns: Insect repellant procedure required



File:	Date:	Time:	
File: DC_4276.jpg	Date: 06/08/2009	Time: 12:34 PM	
	Technician: Certification Level/No.:	Wallace, Richard ITC Level II	

IR IMAGE IS NOT NECESSARY



# **Benchmark Baseline Trending**

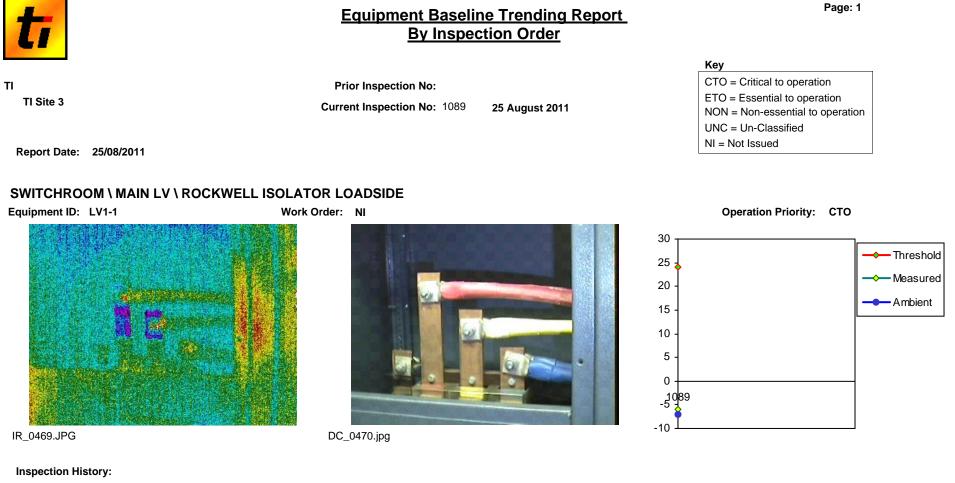
## Full list of equipment baseline trends is also available on your Webmanager Please use your login details provided

http://193.228.155.40/inspectrend





Report generated by Ti Thermal Imaging LTD.



Inspection No	Date Inspected	Test Status	Measured Temp	Threshold Temp	Ambient Temp Status Note	Customer Notes
25/08/2011		ESTED	-6 C	24 C	-7 C	



### Equipment Baseline Trending Report By Inspection Order

ТΙ TI Site 3 **Prior Inspection No:** 

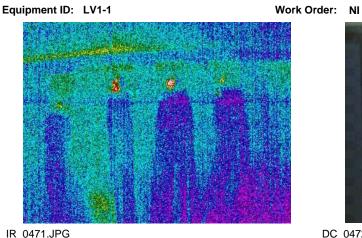
Current Inspection No: 1089

25 August 2011

Key CTO = Critical to operation ETO = Essential to operation NON = Non-essential to operation UNC = Un-Classified NI = Not Issued

Report Date: 25/08/2011

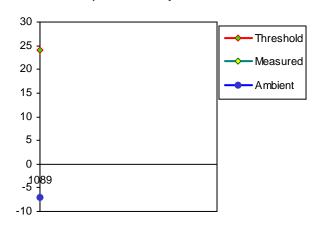
#### SWITCHROOM \ MAIN LV \ ROCKWELL ISOLATOR LINESDIE





DC\_0472.jpg

**Operation Priority: CTO** 

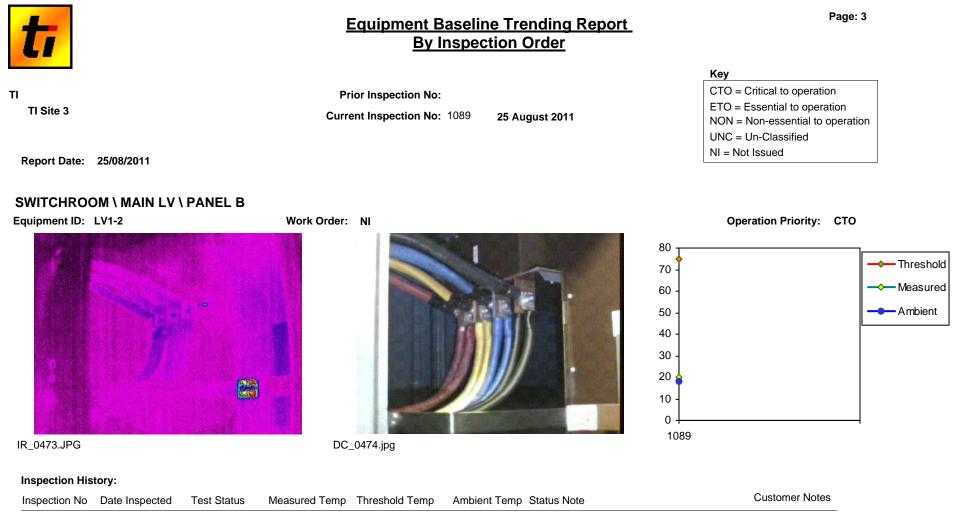


#### Inspection History:

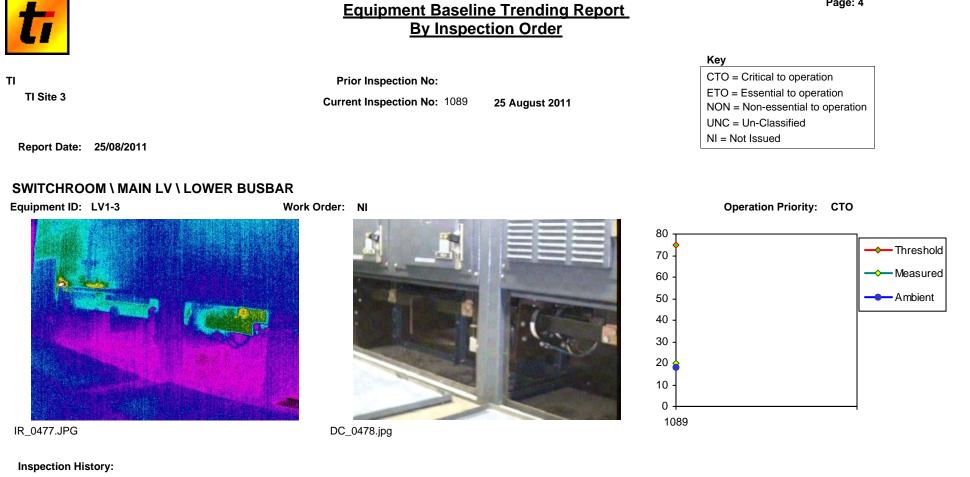
Inspection No	Date Inspected	Test Status	Measured Temp	Threshold Temp	Ambient Temp Status Note	Customer Notes
25/08/2011		ESTED	-7 C	24 C	-7 C	

This report was generated by InspecTrend and this inspection was performed by: TI Thermal Imaging

Page: 2



25/08/2011 ESTED 20 C 75 C 18 C



Page: 4

Inspection No	Date Inspected	Test Status	Measured Temp	Threshold Temp	Ambient Temp Status Note	Customer Notes
25/08/2011		ESTED	20 C	75 C	18 C	



10 -0 -1089

**Customer Notes** 

This report was generated by InspecTrend and this inspection was performed by: TI Thermal Imaging

Ambient Temp Status Note

19 C

DC\_0480.jpg

75 C

Measured Temp Threshold Temp

21 C

IR 0479.JPG

25/08/2011

Inspection History:

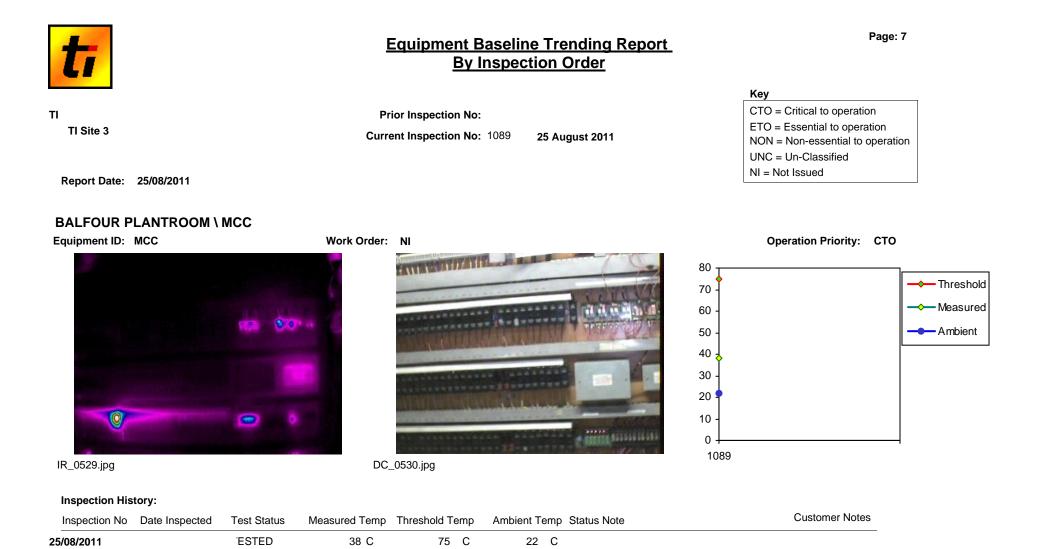
Inspection No Date Inspected

Test Status

ESTED



25/08/2011	ESTED	20 C	75 C	32 C





#### BALFOUR PLANTROOM \ MCC \ F10

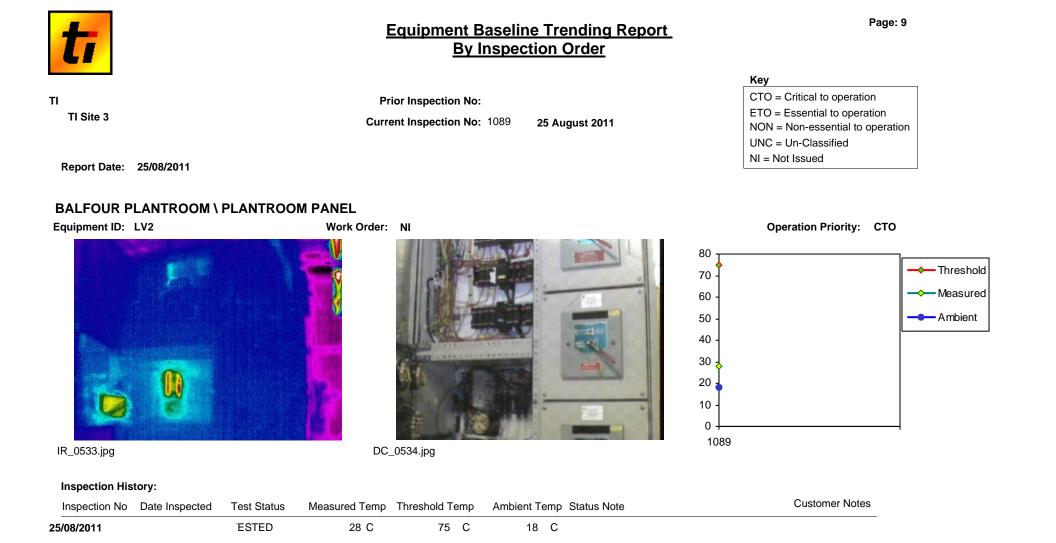
Equipment ID: MCC

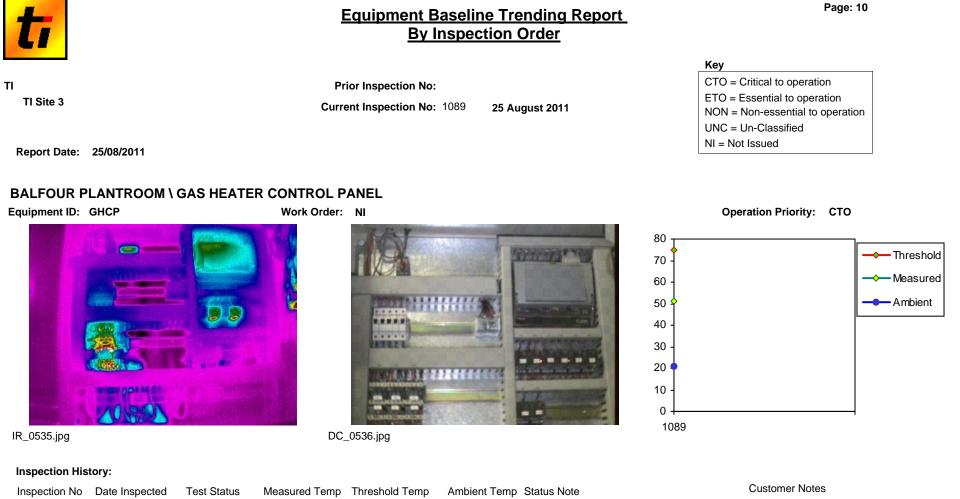
Work Order: NI



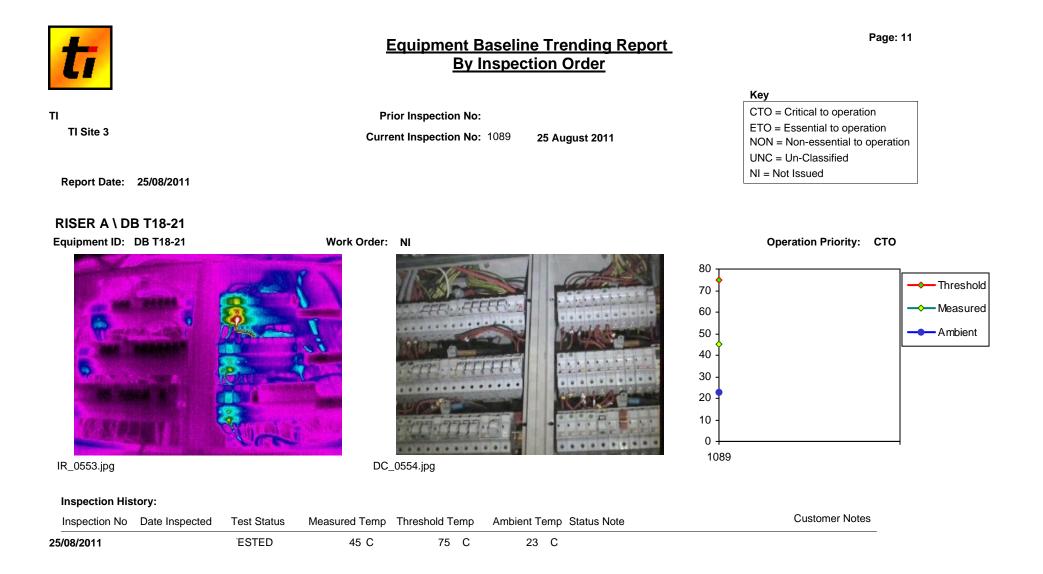


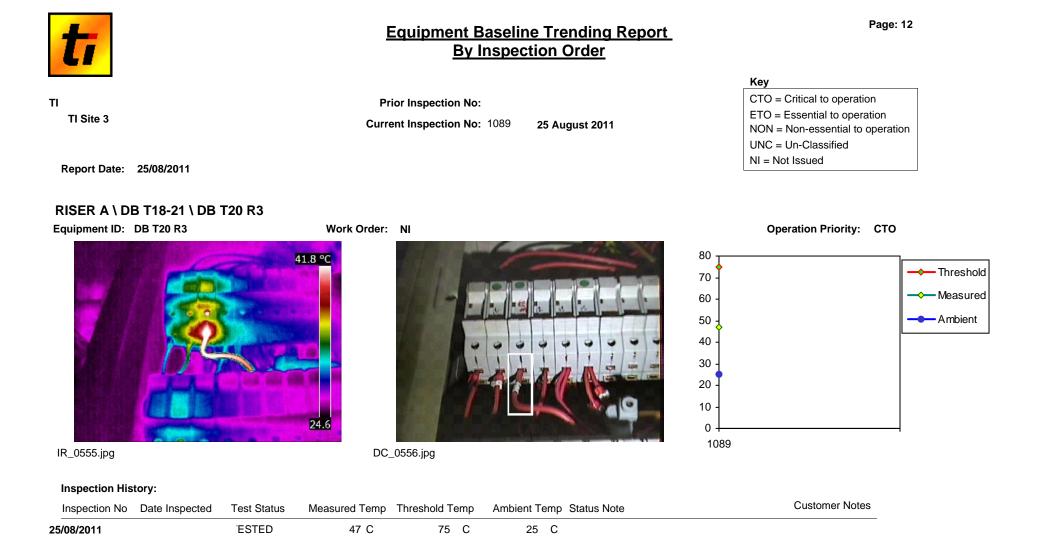
25/08/2011 ESTED 159 C 75 C 23 C

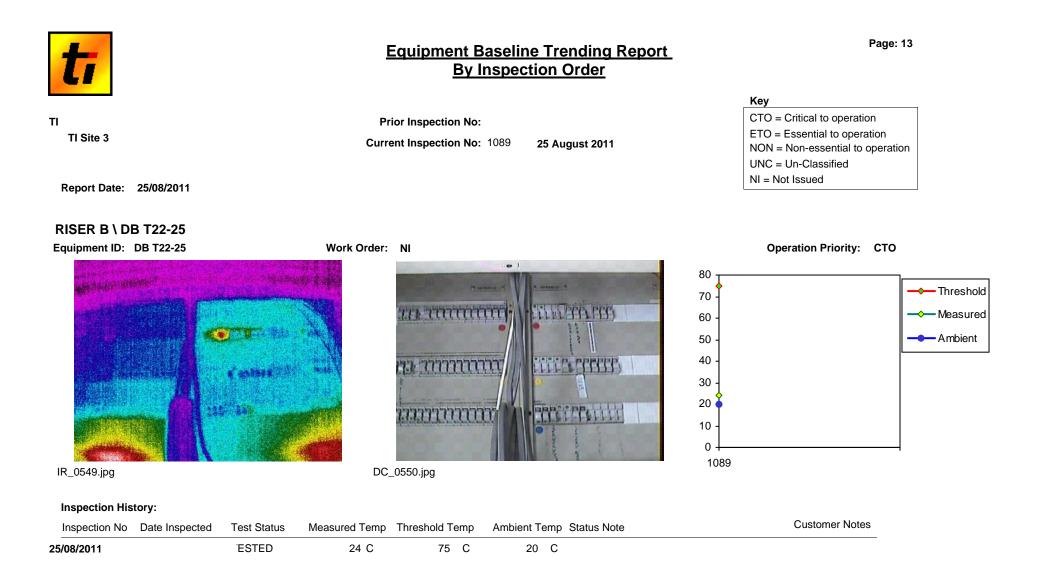


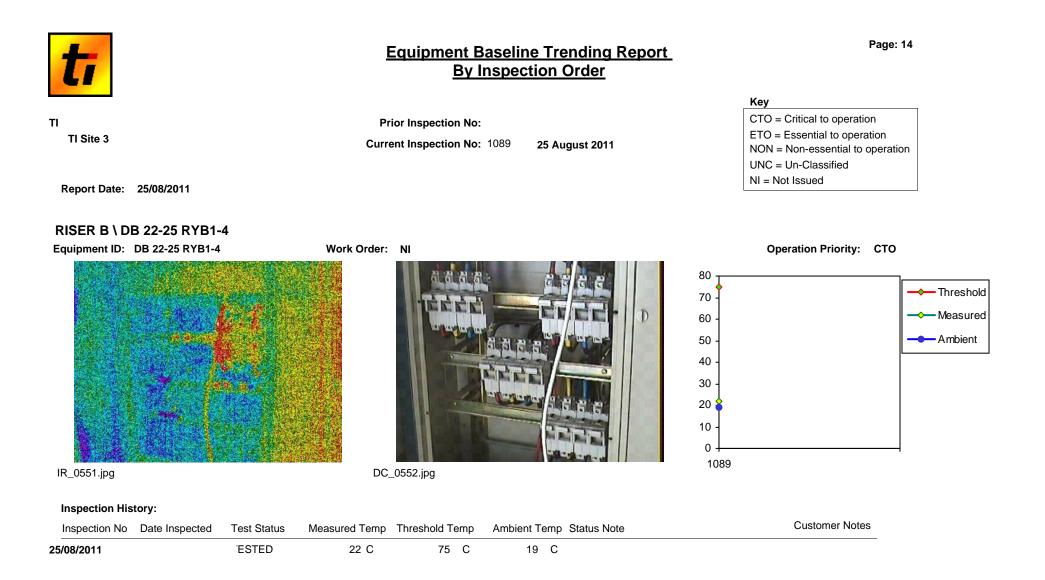


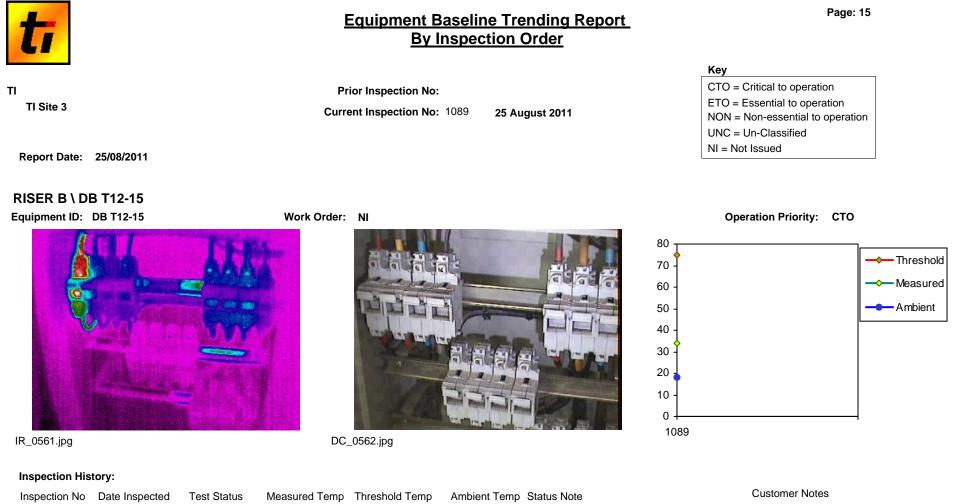
25/08/2011 ESTED 51 C 75 C 21 C



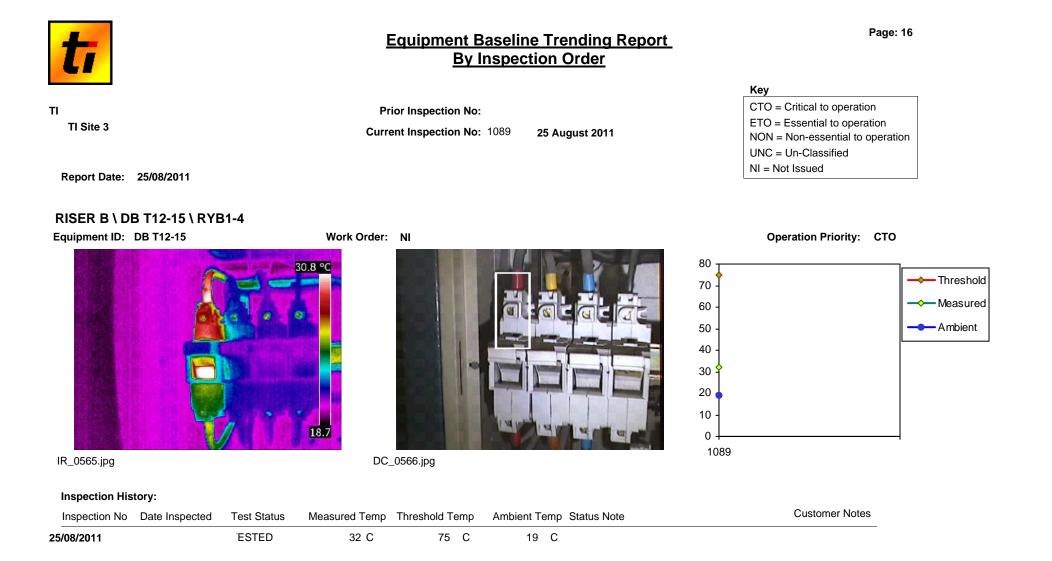


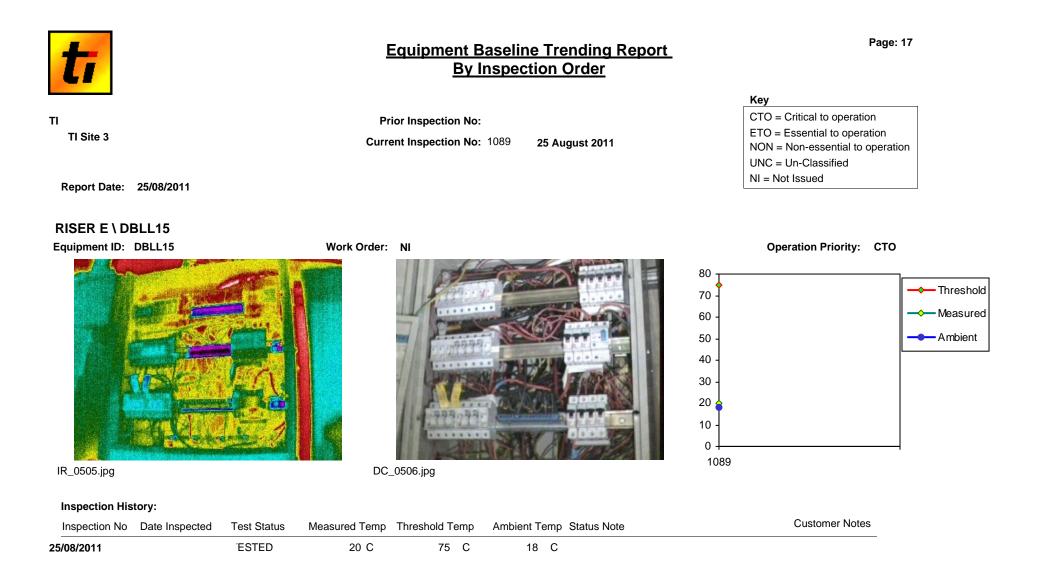






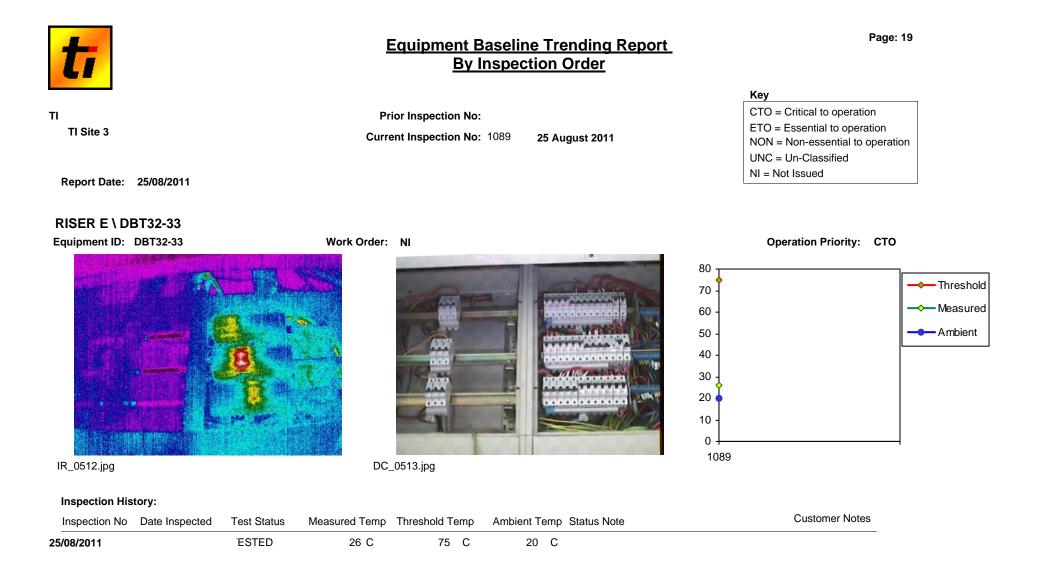
25/08/2011	ESTED	34 C	75 C	18 C
25/00/2011	LOILD	54 0	15 0	10 0



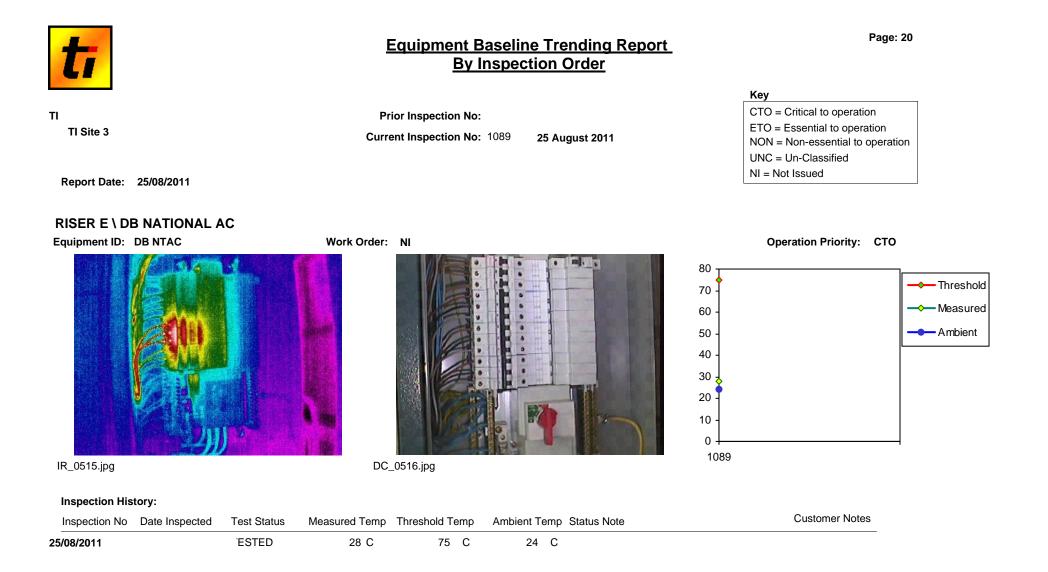


This report was generated by InspecTrend and this inspection was performed by: TI Thermal Imaging

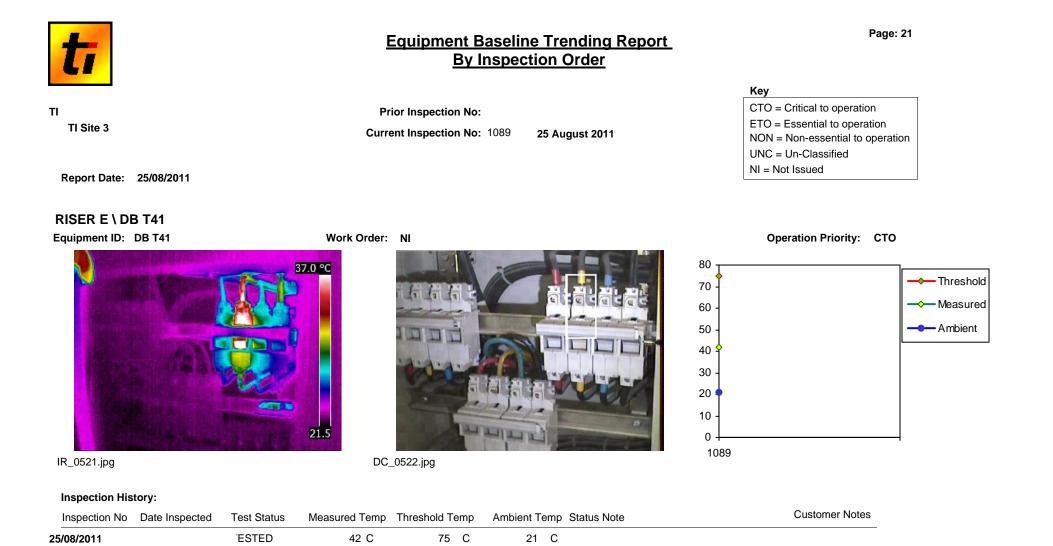




This report was generated by InspecTrend and this inspection was performed by: TI Thermal Imaging



This report was generated by InspecTrend and this inspection was performed by: TI Thermal Imaging





# **Work Order Documentation pages**

Fax or Email back Corrective Work Orders

Also available on your Webmanager Problems page Please use your login details provided

http://193.228.155.40/inspectrend





Report generated by Ti Thermal Imaging LTD.

Company Registered in England: 04450573 VAT No. 828 6288 87



Page: 1

### **Documentation/Work Order** T/D Electrical: Please add **Corrective Work Order**

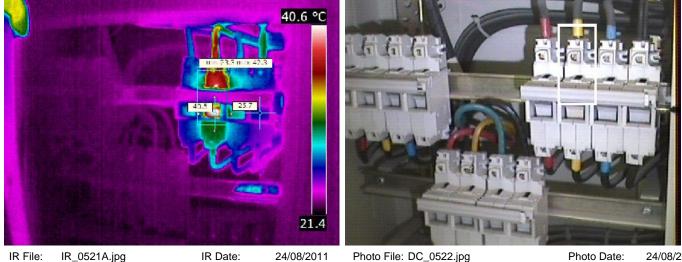
Work Order #: NOT ISSUED

Corrective Work Order #:

PLEASE ADD CORRECTIVE WORK ORDER ABOVE

InspectionNo: 1089 **Report Date:** 25/08/2011 1089-1 Current Prob No: T/D Electrical/1

Location/Equip	oment Information	Load Test Results		
Asset ID: Barcode:	DB T41 NI	Component Rated Load: B phase line side:	100 35	amps amps
Location:	RISER E DB T41	B phase load side:	35	amps amps
		Thermal Information		
Component: Problem:	<b>Circuit Breakers</b> B phase line side connection indicates	Operation Priority:Critical to operationRepair Priority:3-ImportantAmbient:21 CEnviroment:IndoorsComponent Temperature On B phase line si	42	с
	higher temperature than expected on 100A - 3 Pole Circuit Breaker	B phase load side Reference Temperature: Temperature Rise Above Reference: ANSI/EEE/NEMA Max Allowable Temp @ 100% Load: Est Temp Rise over reference @ 50% Load: Est Temp Rise over reference @ 100% Load:		C C
Manufacturer: Model No: Circuit Voltage:	Socamec S100A 415 Volts			12 C 75 C 24 98



IR File:	IR_0521A.jpg	
----------	--------------	--

IR Date:

Photo File: DC\_0522.jpg

Photo Date: 24/08/2011

Repair Information Consequences of Failure:	PLEASE FAX BACK AFTER REPAIR TO: 0871 900 4978 OR INFO@THERMALIMAGING.CO.UK	Loss to Proc	duction ☐ No  ✔ Unknown
Loss of DB T41	Repair Date:		Repaired By:
Parts Req. Before Failure:	Root Cause:		
Parts Req. After Failure:	Repair Procedure:		
Repair Recommendation:	Repair Action:		
Check, clean and re-make line si	ide connection(s)		



#### Documentation/Work Order T/D Electrical: Please add Corrective Work Order

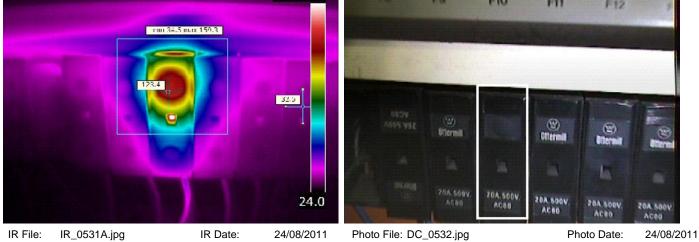
Work Order #: 1830172

Corrective Work Order #:

PLEASE ADD CORRECTIVE WORK ORDER ABOVE

InspectionNo: 1089 Report Date: 25/08/2011 1089-2 Current Prob No: T/D Electrical/2

Location/Equip	oment Information	Load Test Results		
Asset ID: Barcode:	MCC NI	Component Rated Load: -:	20 1	amps amps
Location:	BALFOUR PLANTROOM MCC F10	-:	1	amps amps
		Thermal Information		
Component:	Fuses - Fuse Carriers	Operation Priority:Critical to operationRepair Priority:1-CriticalAmbient:23 CEnviroment:Indoors		
Problem:	Indicates higher temperature than expected on 20A - Fuse	Component Temperature On -: - Reference Temperature:	159 <u>43</u>	-
Manufacturer: Model No:	Ottermill AC80	Temperature Rise Above Reference: ANSI/EEE/NEMA Max Allowable Temp @ 100% Load: Est Temp Rise over reference @ 50% Load:	116 75 11600	-
Circuit Voltage:	500 Volts	Est Temp Rise over reference @ 100% Load:	46400	



PLEASE FAX BACK ARepair Information0871 900 4Consequences of Failure:INFO@THERMALI	1978 OR	Loss to Pro	duction	Unknown
Loss of F10	Repair Date:		Repaired By:	
Parts Req. Before Failure:	Root Cause:			
Parts Req. After Failure:	Repair Procedure:			
Repair Recommendation:	Repair Action:			
Either replace or investigate internal connections to determine source of temp anomaly				

Page: 2

This inspection & report was performed & generated by: TI Thermal Imaging



InspectionNo: 1089 Report Date: 25/08/2011

### Documentation/Work Order T/D Electrical: Please add Corrective Work Order

Work Order #: NOT ISSUED

Corrective Work Order #:

PLEASE ADD CORRECTIVE WORK ORDER ABOVE

1089-3 Current Prob No: T/D Electrical/3

B T12-15 I	Component Rated Load: A phase line side:	100 31	amps amps	
ISER B DB T12-15 RYB1-4	A phase load side:	31	amps amps	
	Thermal Information			
ircuit Breakers	Operation Priority:       Critical to operation         Repair Priority:       4-Minor	·	·	
phase line side connection indicates igher temperature than expected on 100A - Pole Circuit Breaker	Component Temperature On A phase line si A phase load side Reference Temperature:	31 <u>26</u>	С	
ocamec 100A 00 Volts	ANSI/EEE/NEMA Max Allowable Temp @ 100% Load Est Temp Rise over reference @ 50% Load:			
i i	ISER B DB T12-15 RYB1-4 ircuit Breakers phase line side connection indicates gher temperature than expected on 100A - Pole Circuit Breaker ocamec 100A	ISER B DB T12-15 RYB1-4  Thermal Information Operation Priority: Critical to operation Repair Priority: Critical to operation Repair Priority: 4-Minor Ambient: 19 C Enviroment: Indoors Component Temperature On A phase line si A phase load side Reference Temperature: Temperature Rise Above Reference: ANSI/EEE/NEMA Max Allowable Temp @ 100% Load: Est Temp Rise over reference @ 50% Load:	ISER B       A phase load side:       31         Interval       Information       Operation Priority:       Critical to operation         Repair Priority:       4-Minor       Ambient:       19 C       Enviroment: Indoors         Component Temperature On A phase line si       31       A phase load side Reference Temperature:       26         Temperature Rise Above Reference:       5       ANSI/EEE/NEMA Max Allowable Temp @ 100% Load:       75         Est Temp Rise over reference @ 50% Load:       13	





IR File: IR\_0565A.jpg

IR Date: 24/08/2011

Photo File: DC\_0566.jpg

Photo Date: 24/08/2011

Repair Information Consequences of Failure:	PLEASE FAX BACK AFTER REPAIR 0871 900 4978 OR INFO@THERMALIMAGING.CO.U	☐ Yes
Loss of RYB1-4	Repair Date:	Repaired By:
Parts Req. Before Failure:	Root Cause:	
Parts Req. After Failure:	Repair Proced	dure:
Repair Recommendation: Check, clean and re-make line s	Repair Action:	:



InspectionNo:

**Report Date:** 

1089

25/08/2011

Documentation/Work Order T/D Electrical: Please add Corrective Work Order

Work Order #: 1830173

Corrective Work Order #:

PLEASE ADD CORRECTIVE WORK ORDER ABOVE

1089-4 Current Prob No: T/D Electrical/4

Location/Equip	ment Information	Load Test Results			
Asset ID: Barcode:	DB T20 R3 NI	Component Rated Load: Load side:	32 15	amps amps	
Location:	RISER A DB T18-21 DB T20 R3	Line side:	15	amps amps	
Component: Problem:	Mini Circuit Breakers Load side connection indicates higher temperature than expected on 32A - 1 Pole Mini Circuit Breaker	Thermal Information         Operation Priority:       Critical to operation         Repair Priority:       2-Serious         Ambient:       21 C       Enviroment: Indoors         Component Temperature On Load side:       Line side Reference Temperature:         Temperature Rise Above Reference:	47 <u>30</u> 17	C	
Manufacturer: Model No: Circuit Voltage:	Socamec A32S 400 Volts	Temperature Rise Above Reference: ANSI/EEE/NEMA Max Allowable Temp @ 100% Load: Est Temp Rise over reference @ 50% Load: Est Temp Rise over reference @ 100% Load:		17 C 75 C 19 77	





IR File:	IR_0555A.jpg	
----------	--------------	--

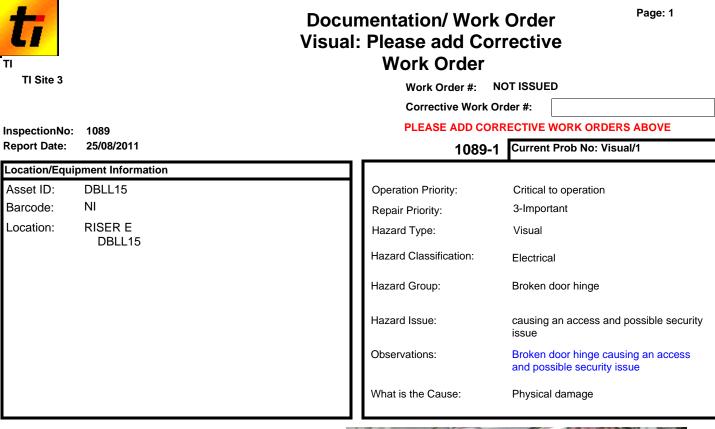
IR Date: 24/08/2011

Photo File: DC\_0556.jpg

Photo Date: 24/08/2011

PLEASE FAX BACK AFTER REPAIR TO: 0871 900 4978 OR INFO@THERMALIMAGING.CO.UK	Loss to Proc	duction	✓ Unknown
Repair Date:		Repaired By:	
Root Cause:			
Repair Procedure:			
de connection(s)			
	0871 900 4978 OR         INFO@THERMALIMAGING.CO.UK         Repair Date:         Root Cause:         Repair Procedure:         Repair Action:	0871 900 4978 OR       Yes         INFO@THERMALIMAGING.CO.UK       Repair Date:         Root Cause:          Repair Procedure:          Repair Action:	0871 900 4978 OR       Yes       No         INFO@THERMALIMAGING.CO.UK       Repair Date:       Repaired By         Root Cause:       Repair Procedure:       Repair Procedure:         Repair Action:       Repair Action:       Repaired By

This inspection & report was performed & generated by: TI Thermal Imaging





# NECESSARY

PHOTO IMAGE IS NOT

Photo File:	Photo Date:	Photo File:	DC_0506.jpg	Photo Date:
Repair Information Consequences of Failure:	PLEASE FAX BACK AN 0871 900 49 INFO@THERMALIN	78 OR AGING.CO. Repair Date:	L	.oss to Production         Yes       No         ✔       Unknown         Repaired By:
		Root Cause:		
Parts Req. Before Failure:				
. <u>.</u>		Repair	Repair or re	place
Parts Req. After Failure:		Procedure:		
		Repair Notes:		
Repair Recommendation:				
Repair or replace				

TI TI Site 3 InspectionNo: Report Date:	1089 25/08/2011	Documentation/ Work Order       Page: 2         Visual: Please add Corrective       Work Order         Work Order #:       1830178         Corrective Work Order #:       PLEASE ADD CORRECTIVE WORK ORDERS ABOVE			
	oment Information		1089-2	Current Prob No: Visual/2	
Asset ID: Barcode: Location:	- NI BALFOUR PLANTROOM		Operation Priority: Repair Priority: Hazard Type: Hazard Classification: Hazard Group: Hazard Issue: Observations: What is the Cause:	Critical to operation 1-Critical Visual Electrical Insect infestation causing an unsafe working environment and access restriction Insect infestation causing an unsafe working environment and access restriction Insect nest by access door	



## PHOTO IMAGE IS NOT NECESSARY

Photo File:	Photo Date:	Photo File:	DC_4276.jp	g	Photo Date:	06/08/2009
Repair Information Consequences of Failure:	PLEASE FAX BACH 0871 900 INFO@THERMA	0 4978 OR		Loss to Productio	No 🗸	Unknown
		Root Cause:				
Parts Req. Before Failure:						
		Repair				
Parts Req. After Failure:		Procedure:				
		Repair Notes:				
Repair Recommendation:						
Insect repellant procedure requi	red					



## Ti Thermal Imaging LTD

Unit 8, Weybridge Business Centre, 66 York Road, Weybridge, Surrey, KT13 9DY

Tel: 0845 458 6315 Fax: 0871 9004978 E-mail: info@thermalimaging.co.uk Web: www.thermalimaging.co.uk

## **Client Work Appraisal**

We are continually trying to improve our service and ensure that all our inspections are carried out to the highest standards. Please use the form below to add your comments, anonymously if you prefer and send back to us at the address above or:

Email: <u>info@thermalimaging.co.uk</u> Fax: +44 870 9004971

TI Job Number: (Optional)	Excellent	Good	Mediocre	Poor	Comments
Office:					
Response time to enquiry					
Content of information sent on enquiry					
Telephone and email manner					
Price					
Value					
Engineer:					
Time keeping					
Appearance					
Code of conduct					
Subject knowledge					
Method of work					
Engineer flexibility					
Inspection Specification:					
Equipment and software					
Report content					
Report delivery time					
Report retrieval					
Other Comments:					



Report generated by Ti Thermal Imaging LTD.



tī

Company Registered in England: 04450573 VAT No. 828 6288 87