



ANNEXTURE (A)

THERMAL IMAGING FUNDAMENTALS AND METHODOLOGY

1.1 T-SURVEY APPROACH & METHODOLOGY

Infrared Thermography is science of using electronic optical devices to detect and measure radiation and correlating that to surface temperature. Thermal imagers can convert infrared radiation being emitted from the body into electric signals and thus present them visually. The various advantages of Infrared Thermography are as below:

- It is of great significance in preventive service and maintenance, building condition, Production Monitoring, technical diagnostics etc.
- A thermal imager makes anomalies visible, thus making an exact search for errors or fault possible.
- It checks materials and components completely without any damage and exposes problems before malfunction can occur.

1.2 OBJECTIVE OF T-SURVEY

Generally T-Surveys are conducted with the following objectives:

- To identify equipment / connections which requires Thermo-Survey
- To carry out infrared thermal imaging of equipment (electrical, Mechanical) in operation to identify hotspots.

1.3 CLASSIFICATION OF SEVERITY OF THERMAL ANOMALY IN ELECTRICAL UTILITIES

The infrared thermo-grapher may use the following Delta T (temperature difference) criteria to evaluate the temperature severity of an exception. These Delta T criteria are reported as the temperature rise of the exception above the temperature of a defined reference, which is typically the ambient air temperature, a similar component under the same conditions or the maximum allowable temperature of the component.

NETA standards recommend that infrared scans be performed with a minimum of 40% load or at the highest normal load whenever possible. Special care should be given to any discrepancy found on lightly loaded equipment where the load is likely to increase over time.



As per NFPA 70 (B) & NETA Standards, the Risk Category is defined as below:

Alarming : Delta T temperature is more than 15°C.

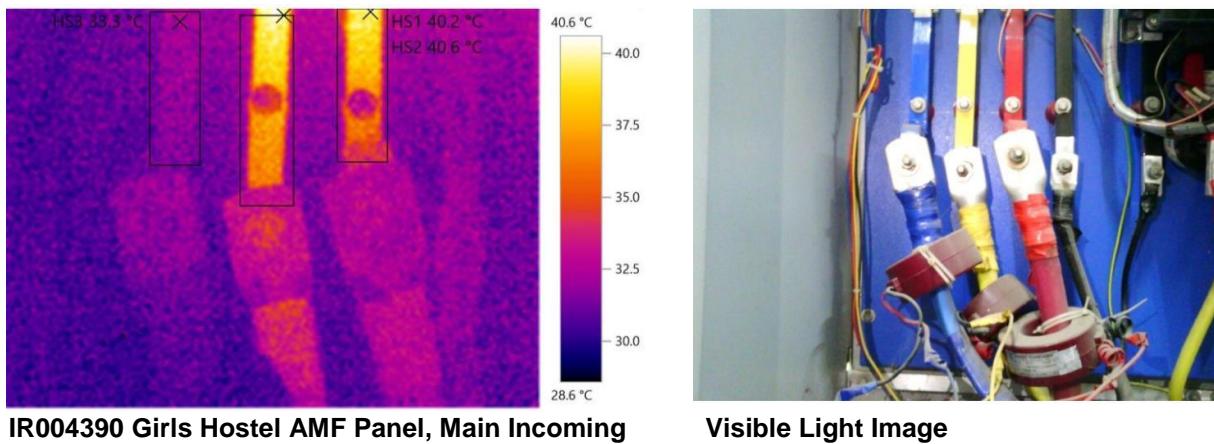
Caution : Delta T temperature is between 4°C to 15°C.

Normal : Delta T temperature is between 1°C and 3°C.

NETA Maintenance Testing Specifications, for electrical equipment

Priority	Delta T between similar components under similar load	Delta T over ambient air temperature	Recommended Action
4	1 to 3 C°	1 to 10 C°	Possible deficiency; warrants investigation
3	4 to 15 C°	11 to 20 C°	Indicates probable deficiency; repair as time permits
2	---	21 to 40 C°	Monitor until corrective measures can be accomplished
1	>15 C°	>40 C°	Major discrepancy; repair immediately

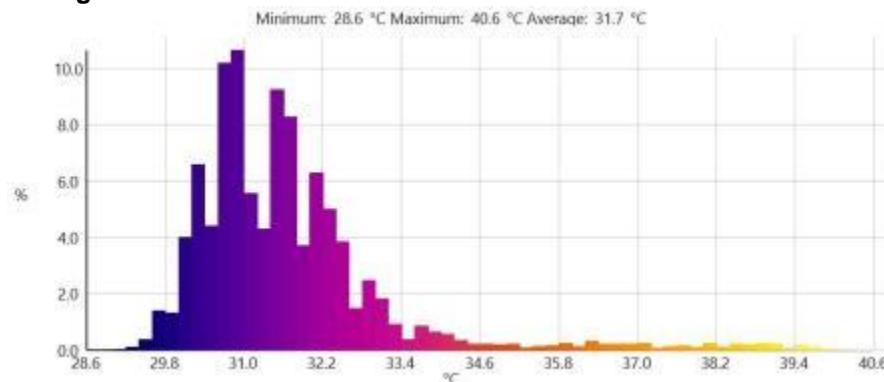
<https://www.atlanticleak.com/wp-content/uploads/2019/08/Standard-for-Infrared-Inspection-of-Electrical-systems-and-Rotating-Equipment.pdf>.



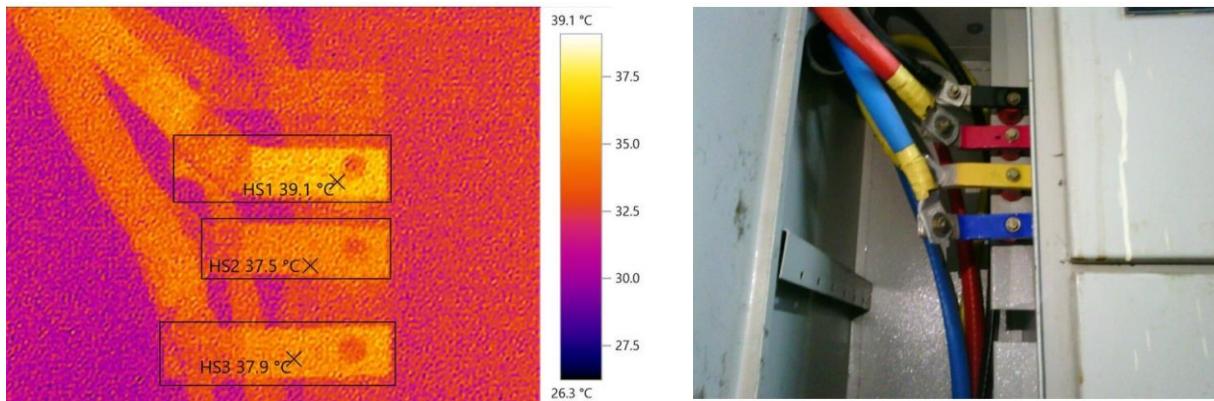
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	40.2	0.95	30.0
Hot spot 2	40.6	0.95	30.0
Hot spot 3	33.3	0.95	30.0

Histogram:



Analysis and Recommended Action	Observation: In the above thermo-gram the temperature difference between HS1 and HS3 (ΔT) is 6.9°C and HS2 and HS3 is 7.3°C. The thermo-gram is classified under Caution . Recommendation: The R and Y phase is experiencing heating due to the maximum load. It is recommended to balance the load across all phases.
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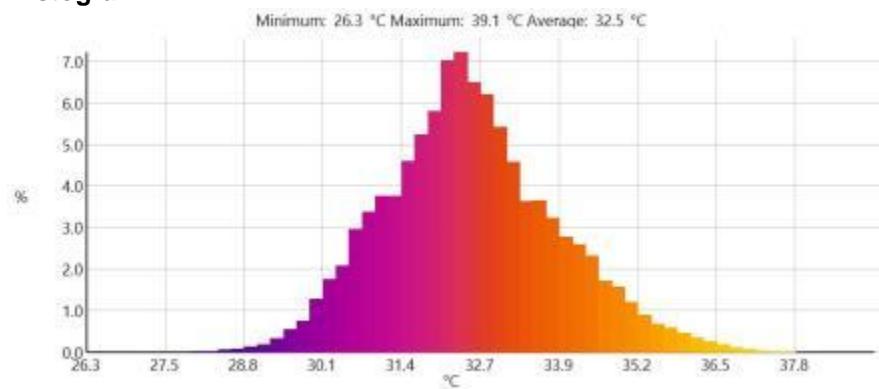
SR004388 JDVC Main Panel, Main Incoming

Visible Light Image

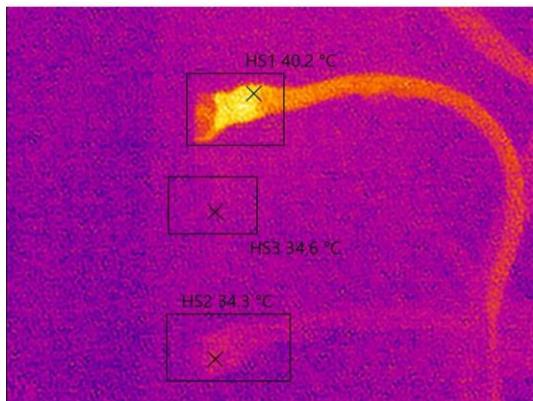
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	39.1	0.95	30.0
Hot spot 2	37.5	0.95	30.0
Hot spot 3	37.9	0.95	30.0

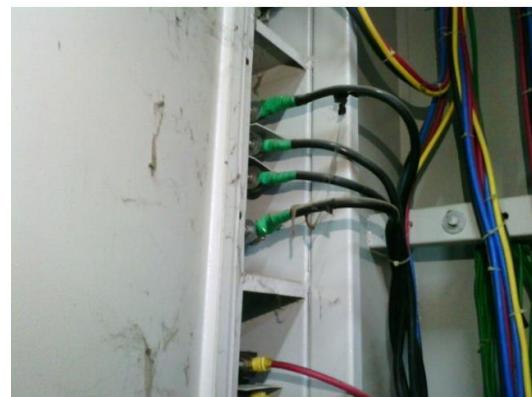
Histogram:



Analysis and Recommended Action	Observation: In the above thermo-gram the temperature difference between HS1 and HS2 (ΔT) is 1.6°C and HS2 and HS3 is 0.4°C. The thermo-gram is classified under Normal .
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SR004389 JDVC Main Panel, First Floor outgoing

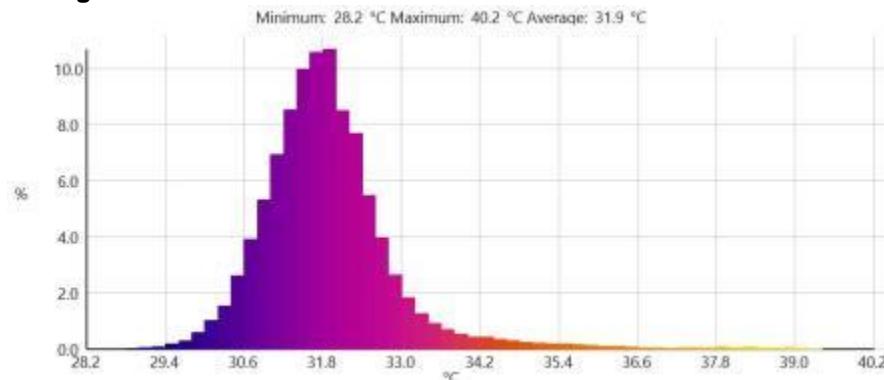


Visible Light Image

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	40.2	0.95	30.0
Hot spot 2	34.3	0.95	30.0
Hot spot 3	34.6	0.95	30.0

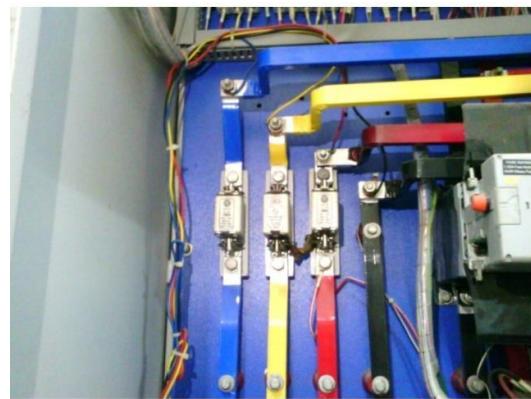
Histogram:



Analysis and Recommended Action	<p>Observation: In the above thermo-gram the temperature difference between HS1 and HS2 (ΔT) is 5.9°C and HS2 and HS3 is 0.3°C. The thermo-gram is classified under Caution.</p> <p>Recommendation: The R phase is experiencing heating due to the maximum load. It is recommended to balance the load across all phases.</p>
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SR004391 Girls Hostel AMF Panel, Fuse outlet

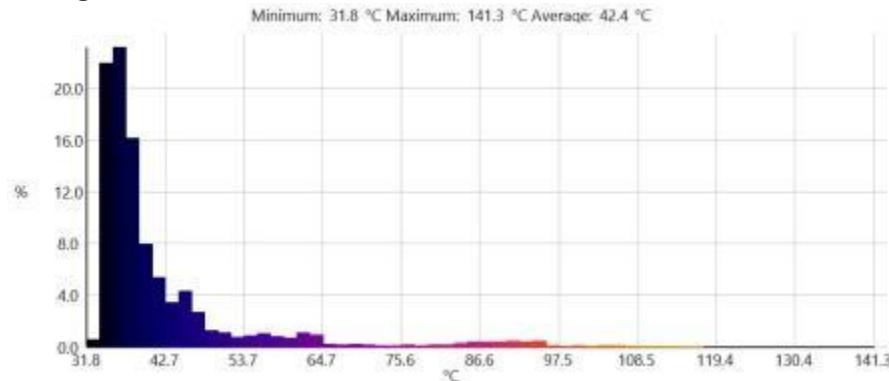


Visible Light Image

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	141.3	0.95	30.0
Hot spot 2	65.8	0.95	30.0
Hot spot 3	37.9	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above thermo-gram the temperature difference between HS1 and HS3 (ΔT) is 103.4°C and HS2 and HS3 is 27.9°C. The thermo-gram is classified under Alarming.</p> <p>Recommendation: The R phase is experiencing heating due to the maximum load. It is recommended to balance the load across all phases and retighten the connection of R phase.</p>
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SR004392 Girls Hostel AMF Panel, Fuse outlet

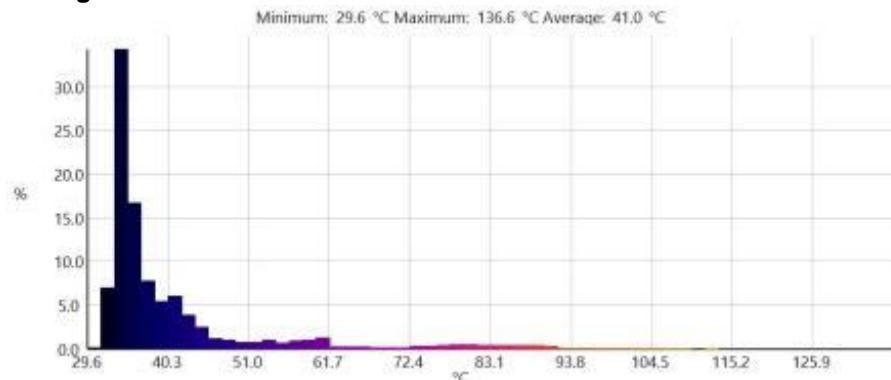


Visible Light Image

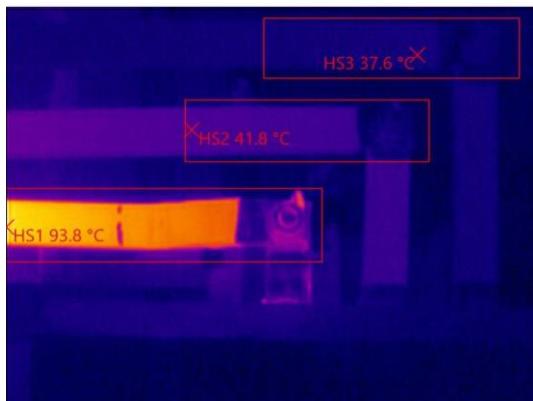
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	136.6	0.95	30.0
Hot spot 2	60.3	0.95	30.0
Hot spot 3	42.5	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above thermo-gram the temperature difference between HS1 and HS3 (ΔT) is 94.1°C and HS2 and HS3 is 17.8°C. The thermo-gram is classified under Alarming.</p> <p>Recommendation: The R phase is experiencing heating due to the maximum load. It is recommended to balance the load across all phases. and retighten the connection of R phase.</p>
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SR004393 Girls Hostel AMF Panel, Change Over
MCCB Inlet

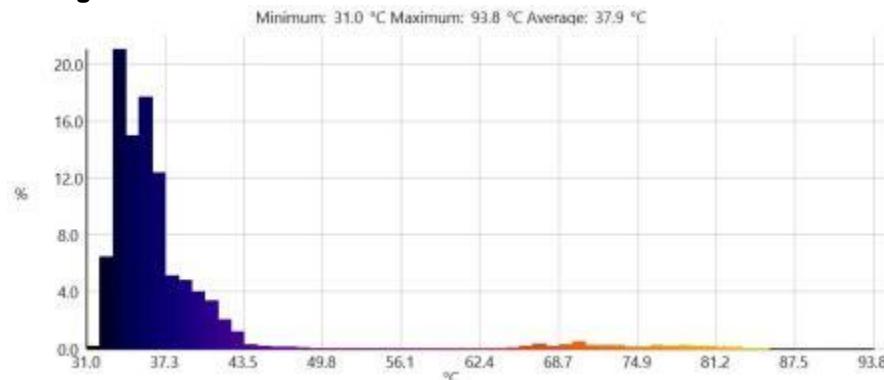


Visible Light Image

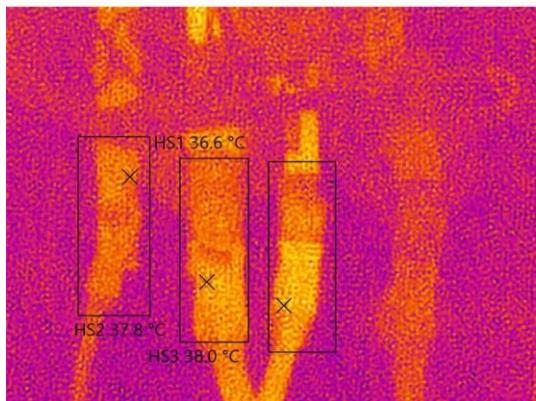
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	93.8	0.95	30.0
Hot spot 2	41.8	0.95	30.0
Hot spot 3	37.6	0.95	30.0

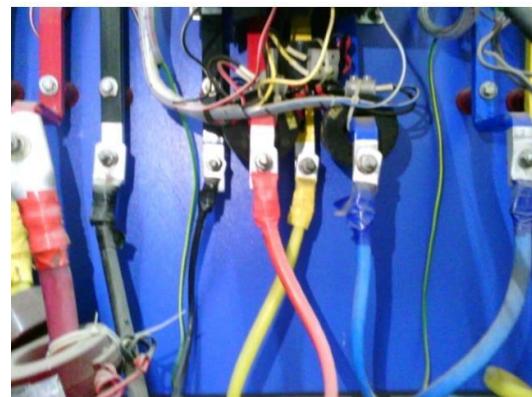
Histogram:



Analysis and Recommended Action	<p>Observation: In the above thermo-gram the temperature difference between HS1 and HS3 (ΔT) is 56.2°C and HS2 and HS3 is 4.2°C. The thermo-gram is classified under Alarming.</p> <p>Recommendation: The R phase is experiencing heating due to the maximum load. It is recommended to balance the load across all phases. and retighten the connection of R phase.</p>
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SR004394 Girls Hostel AMF Panel, Change over
MCCB Outlet

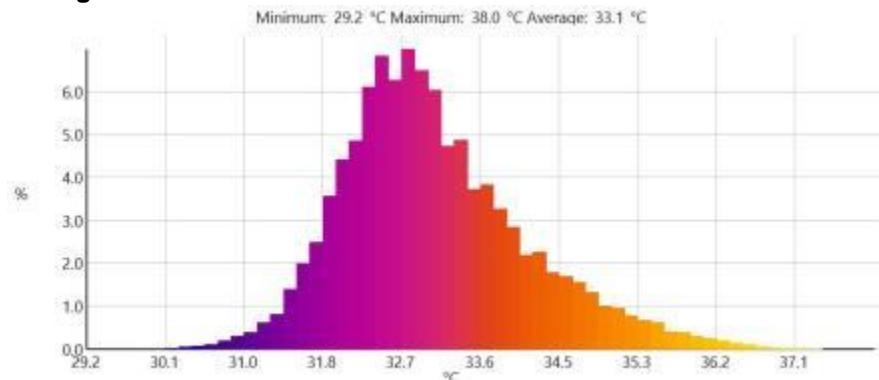


Visible Light Image

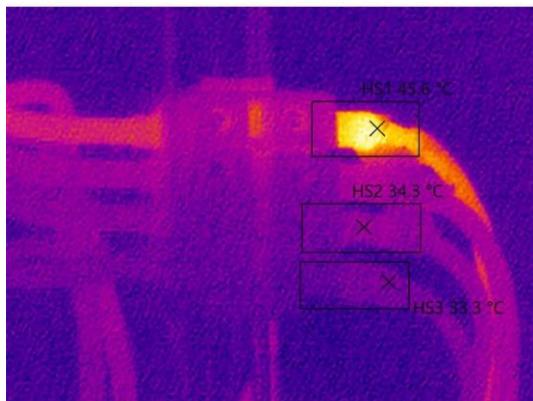
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	36.6	0.95	30.0
Hot spot 2	37.8	0.95	30.0
Hot spot 3	38.0	0.95	30.0

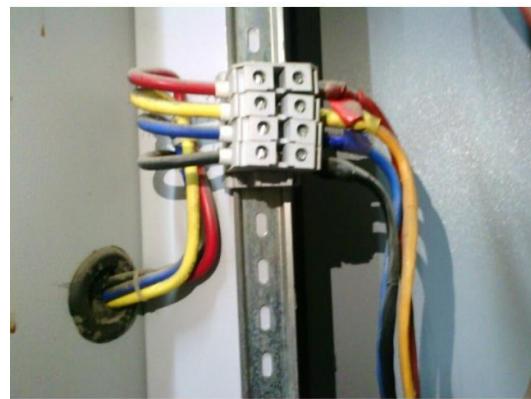
Histogram:



Analysis and Recommended Action	Observation: In the above thermo-gram the temperature difference between HS1 and HS2 (ΔT) is 1.2°C and HS1 and HS3 is 1.4°C. The thermo-gram is classified under Normal .
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SR004395 Girls Hostel AMF Panel, VIth Floor outgoing

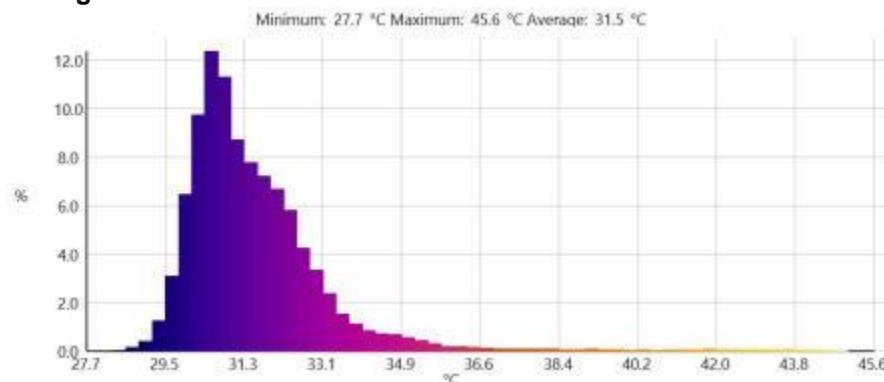


Visible Light Image

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	45.6	0.95	30.0
Hot spot 2	34.3	0.95	30.0
Hot spot 3	33.3	0.95	30.0

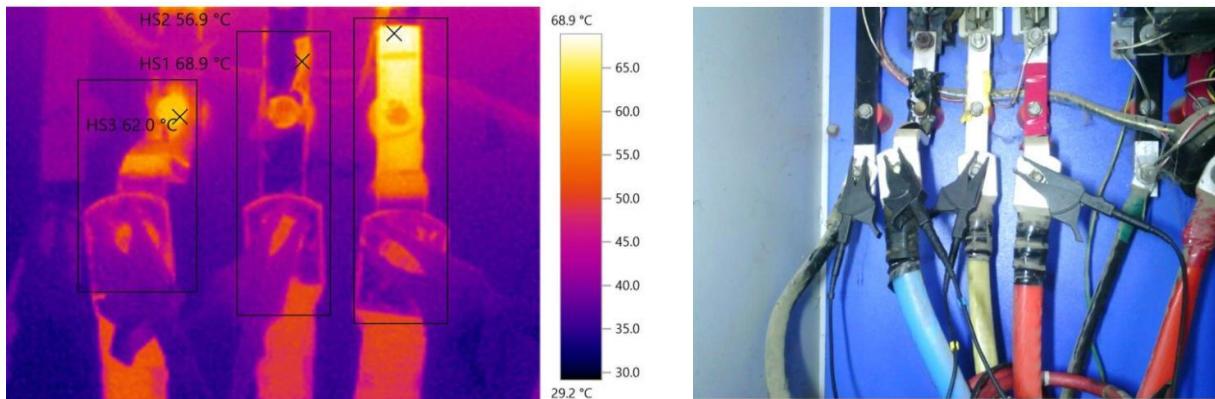
Histogram:



Analysis and Recommended Action

Observation: In the above thermo-gram the temperature difference between HS1 and HS3 (ΔT) is 12.3°C and HS2 and HS3 is 1.0°C . The thermo-gram is classified under **Caution**.

Recommendation: The R phase is experiencing heating due to the maximum load and retighten the connection of R phase. It is also recommended to re-crimp the R phase.



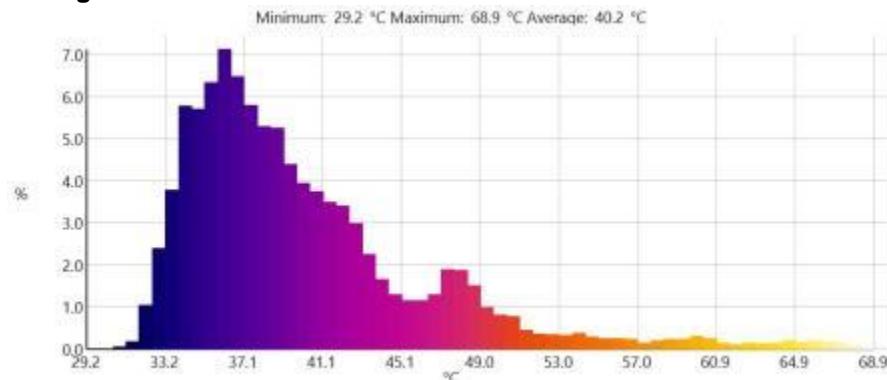
SR004541 DG Change over Panel, Main Incoming from Transformer

Visible Light Image

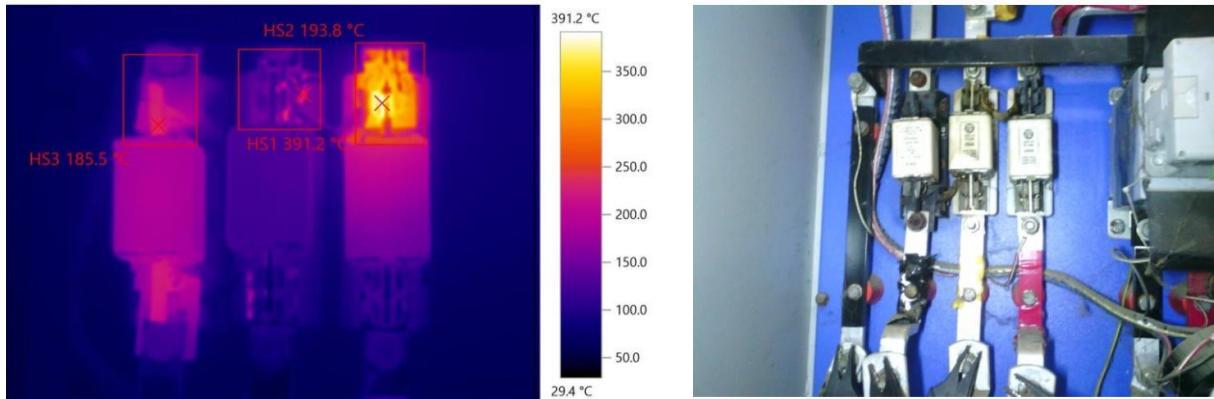
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	68.9	0.95	30.0
Hot spot 2	56.9	0.95	30.0
Hot spot 3	62.0	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above thermo-gram the temperature difference between HS1 and HS2 (ΔT) is 12.0°C and HS2 and HS3 is 5.1°C. The thermo-gram is classified under Caution.</p> <p>Recommendation: The R and B phase is experiencing heating due to the maximum load. It is recommended to balance the load across all phase and retighten the connection of R and B phase.</p>
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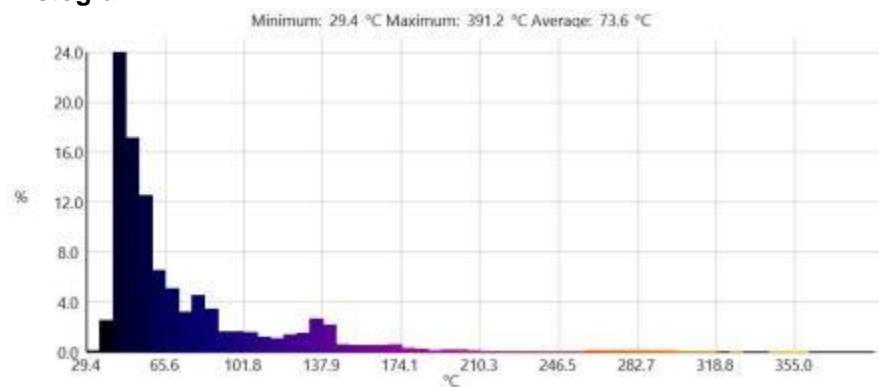
SR004542 DG Change over Panel, Fuse Inlet

Visible Light Image

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	391.2	0.95	30.0
Hot spot 2	193.8	0.95	30.0
Hot spot 3	185.5	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above thermo-gram the temperature difference between HS1 and HS3 (ΔT) is 205.7°C and HS2 and HS3 is 8.3°C. The thermo-gram is classified under Alarming.</p> <p>Recommendation: The R and B phase is experiencing heating due to the maximum load. It is recommended to balance the load across all phase and retighten the connection of R and B phase.</p>
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SR004544 DG Change over Panel, Fuse Outlet

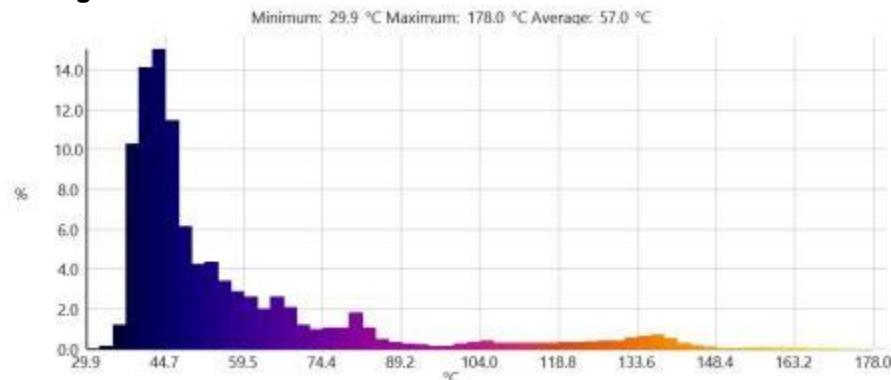


Visible Light Image

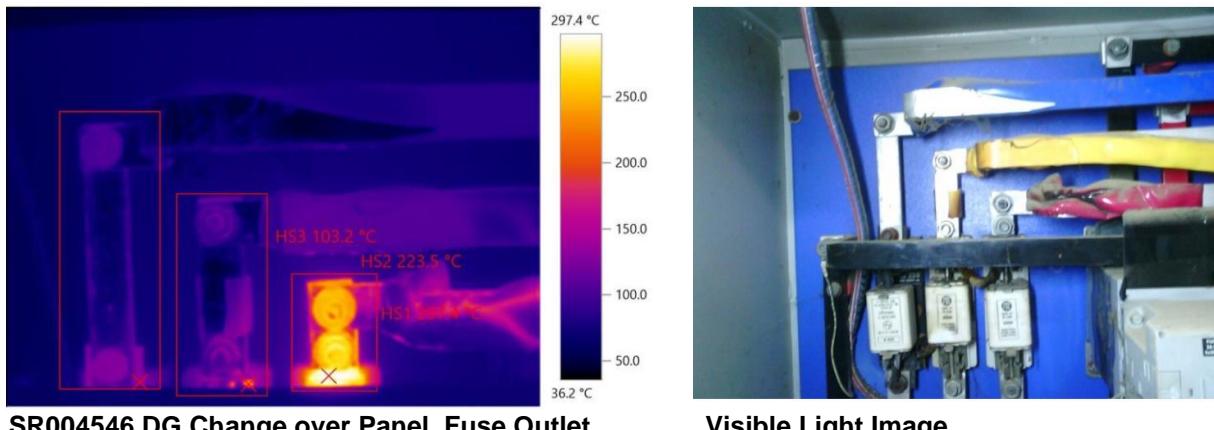
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	178.0	0.95	30.0
Hot spot 2	130.3	0.95	30.0
Hot spot 3	96.7	0.95	30.0

Histogram:



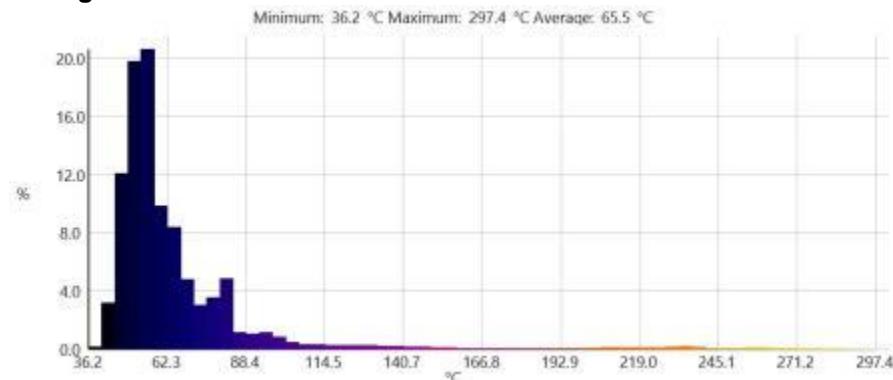
Analysis and Recommended Action	<p>Observation: In the above thermo-gram the temperature difference between HS1 and HS3 (ΔT) is 81.3°C and HS2 and HS3 is 33.6°C. The thermo-gram is classified under Alarming.</p> <p>Recommendation: The R and B phase is experiencing heating due to the maximum load. It is recommended to balance the load across all phases and retighten the connection of R and B phase.</p>
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Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	297.4	0.95	30.0
Hot spot 2	223.5	0.95	30.0
Hot spot 3	103.2	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above thermo-gram the temperature difference between HS1 and HS3 (ΔT) is 194.2°C and HS2 and HS3 is 120.3°C. The thermo-gram is classified under Alarming.</p> <p>Recommendation: The R and B phase is experiencing heating due to the maximum load. It is recommended to balance the load across all phases and retighten the connection of R and B phase.</p>
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SR004547 DG Change over Panel, MCCB Change Over

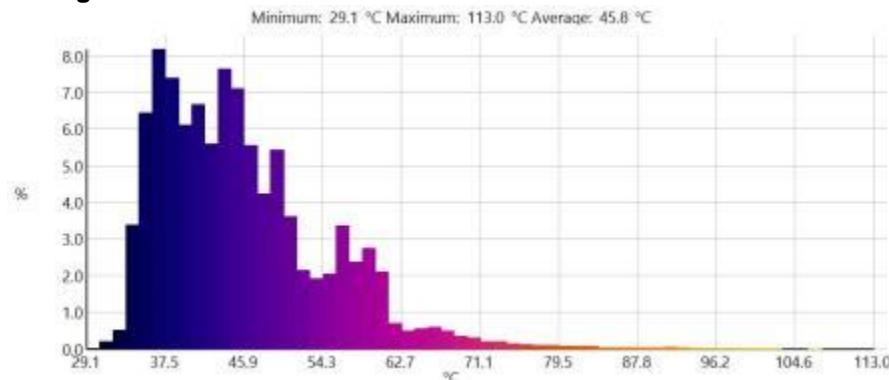


Visible Light Image

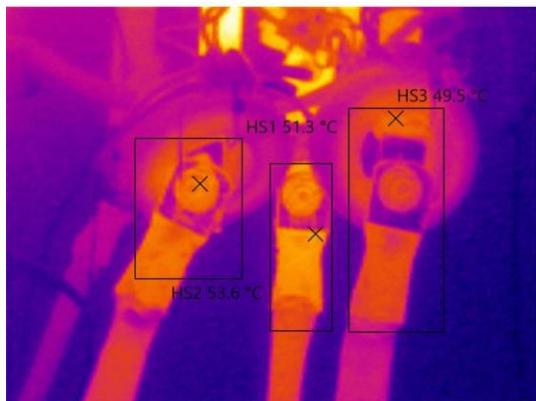
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	113.0	0.95	30.0
Hot spot 2	71.7	0.95	30.0
Hot spot 3	57.5	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above thermo-gram the temperature difference between HS1 and HS3 (ΔT) is 55.5°C and HS2 and HS3 is 14.2°C. The thermo-gram is classified under Alarming.</p> <p>Recommendation: The R phase is experiencing heating due to the maximum load. It is recommended to balance the load across all phases and retighten the connection of R phase.</p>
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SR004549 DG Change over Panel, MCCB Change Over outgoing to Admin Main Panel

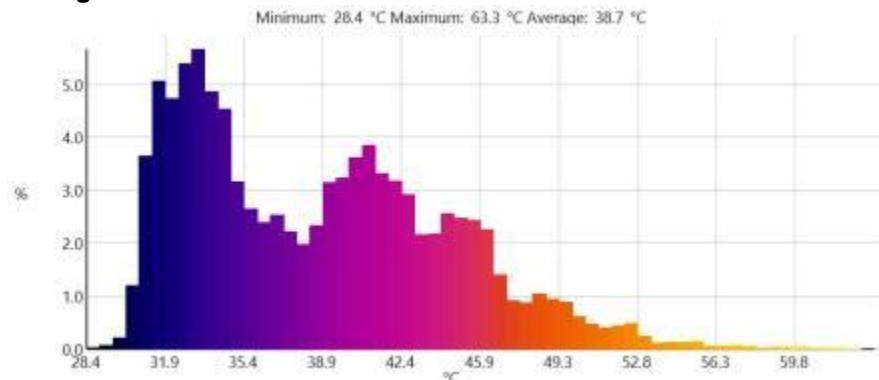


Visible Light Image

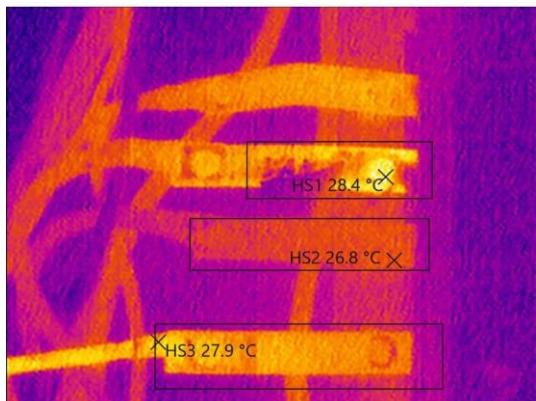
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	51.3	0.95	30.0
Hot spot 2	53.6	0.95	30.0
Hot spot 3	49.5	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above thermo-gram the temperature difference between HS1 and HS3 (ΔT) is 1.8°C and HS2 and HS3 is 4.1°C. The thermo-gram is classified under Caution.</p> <p>Recommendation: It is recommended to balance the load across all phases and retighten the connection of all phases.</p>
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SR004550 Admin GF Sub Main Panel-3, Main Incoming

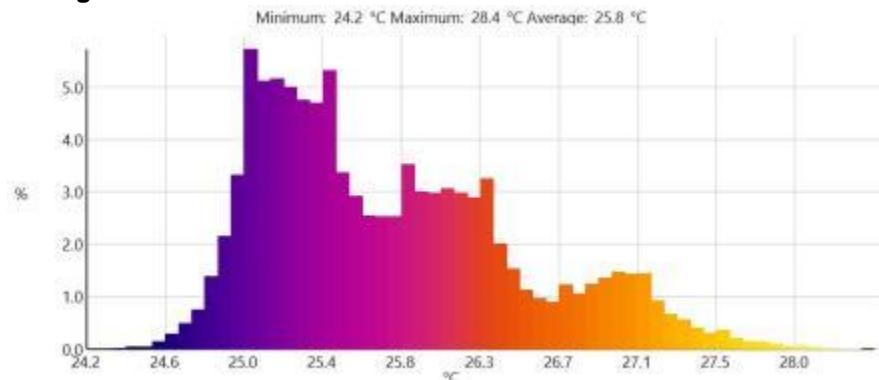


Visible Light Image

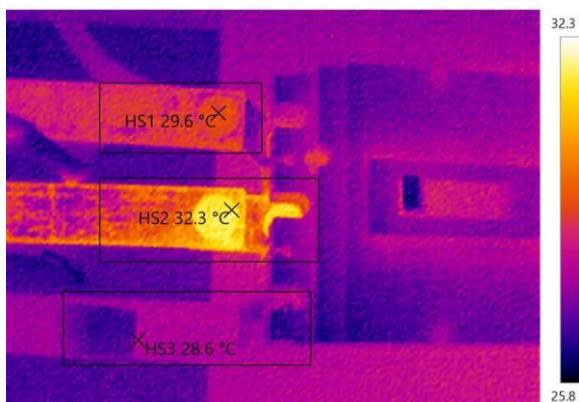
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	28.4	0.95	30.0
Hot spot 2	26.8	0.95	30.0
Hot spot 3	27.9	0.95	30.0

Histogram:



Analysis and Recommended Action	Observation: In the above thermo-gram the temperature difference between HS1 and HS2 (ΔT) is 1.6°C and HS2 and HS3 is 1.1°C. The thermo-gram is classified under Normal .
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SR004551 Admin GF Sub Main Panel-3, Main Incoming MCB Inlet

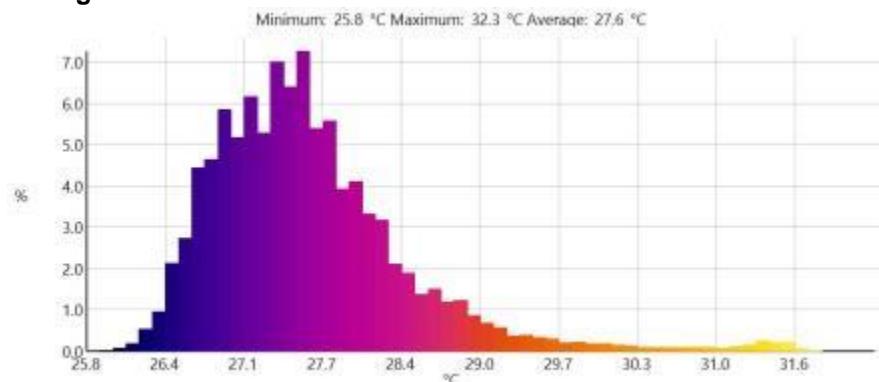


Visible Light Image

Picture markings:

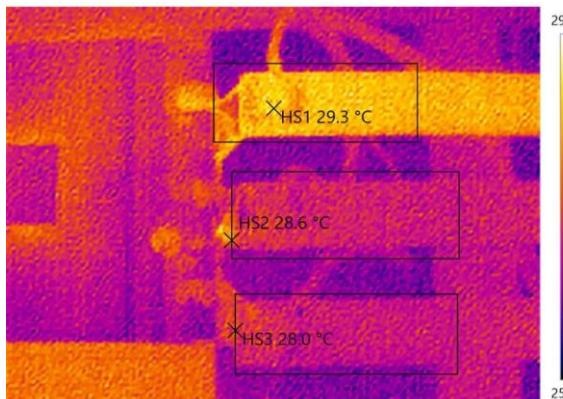
Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	29.6	0.95	30.0
Hot spot 2	32.3	0.95	30.0
Hot spot 3	28.6	0.95	30.0

Histogram:



Analysis and Recommended Action

Observation: In the above thermo-gram the temperature difference between HS1 and HS3 (ΔT) is 1.0°C and HS2 and HS3 is 3.7°C. The thermo-gram is classified under **Normal**.



SR004552 Admin GF Sub Main Panel-3, Main Incoming MCB Outlet

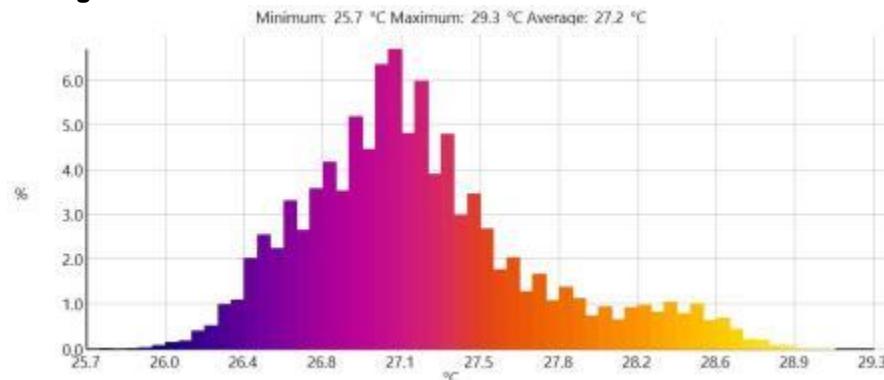


Visible Light Image

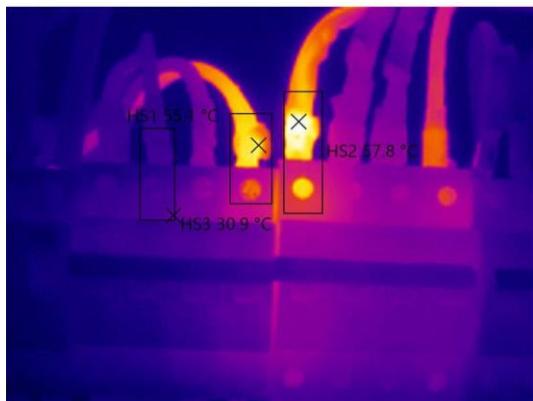
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	29.3	0.95	30.0
Hot spot 2	28.6	0.95	30.0
Hot spot 3	28.0	0.95	30.0

Histogram:



Analysis and Recommended Action	Observation: In the above thermo-gram the temperature difference between HS1 and HS3 (ΔT) is 1.3°C and HS2 and HS3 is 0.6°C. The thermo-gram is classified under Normal .
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SR004553 Admin GF Sub Main Panel-3,
Distribution Panel MCB-2 and 3

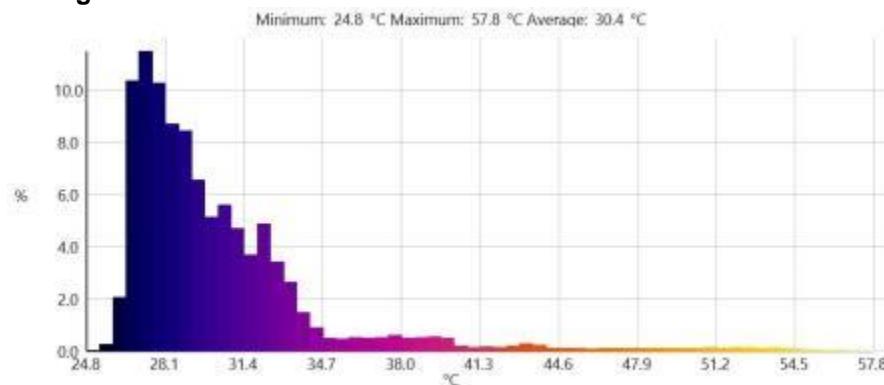


Visible Light Image

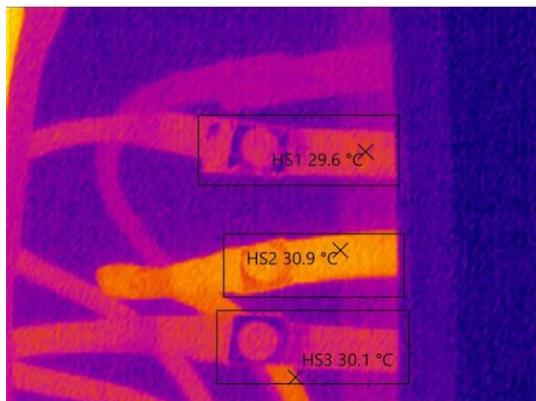
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	55.1	0.95	30.0
Hot spot 2	57.8	0.95	30.0
Hot spot 3	30.9	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above thermo-gram the temperature difference between HS1 and HS3 (ΔT) is 24.2°C and HS2 and HS3 is 26.9°C. The thermo-gram is classified under Alarming.</p> <p>Recommendation: The R and neutral phase is experiencing heating due to the maximum load. Heating was observed on the R and neutral phase. It is recommended to retighten the connection of R and neutral phase. and re-crimp the R and neutral phase.</p>
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SR004554 Admin GF Sub Main Panel-4, Main Incoming

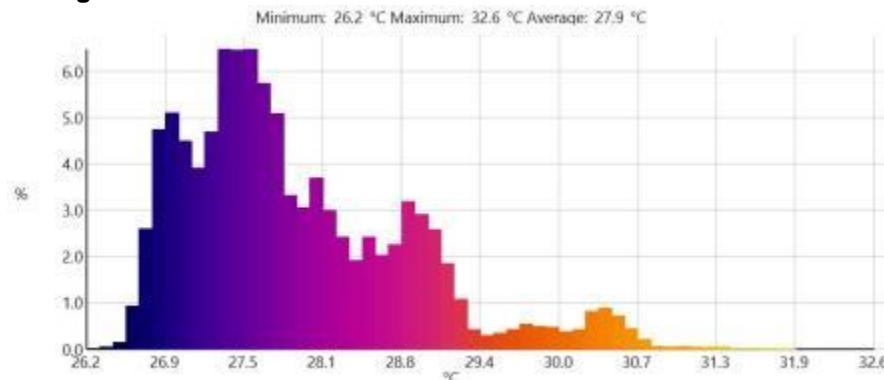


Visible Light Image

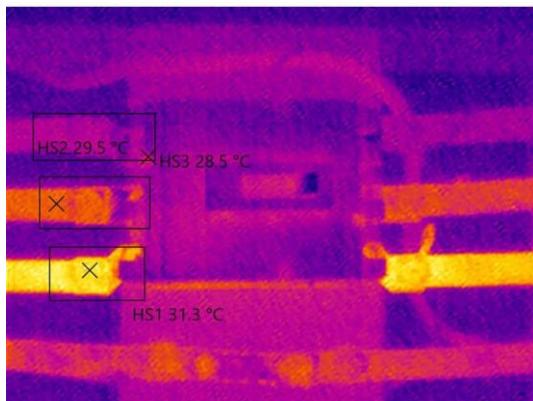
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	29.6	0.95	30.0
Hot spot 2	30.9	0.95	30.0
Hot spot 3	30.1	0.95	30.0

Histogram:



Analysis and Recommended Action	Observation: In the above thermo-gram the temperature difference between HS1 and HS2 (ΔT) is 1.3°C and HS1 and HS3 is 0.5°C. The thermo-gram is classified under Normal .
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SR004555 Admin GF Sub Main Panel-4, Main Incoming MCB Inlet

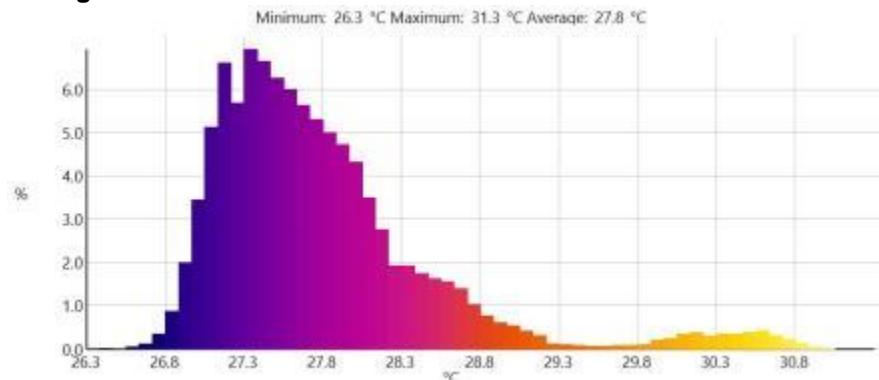


Visible Light Image

Picture markings:

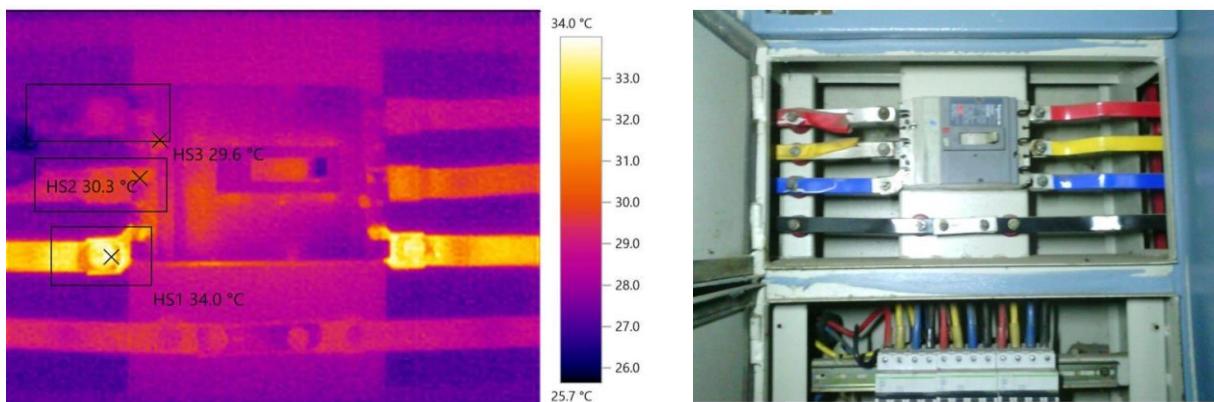
Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	31.3	0.95	30.0
Hot spot 2	29.5	0.95	30.0
Hot spot 3	28.5	0.95	30.0

Histogram:



Analysis and Recommended Action

Observation: In the above thermo-gram the temperature difference between HS1 and HS3 (ΔT) is 2.8°C and HS2 and HS3 is 1.0°C. The thermo-gram is classified under **Normal**.



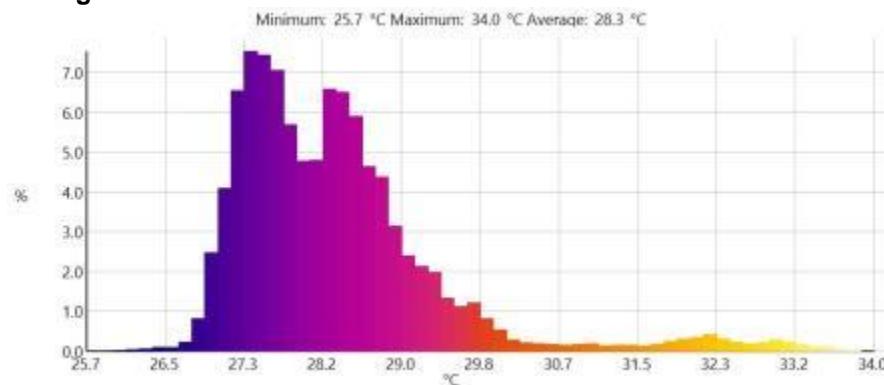
SR004556 Admin GF Sub Main Panel-4, Feeder-1F3
Auditorium MCB

Visible Light Image

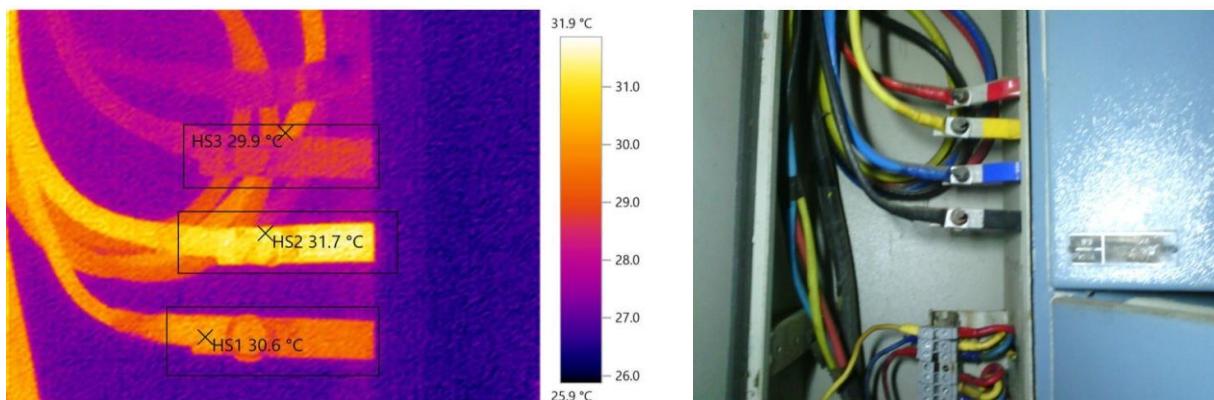
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	34.0	0.95	30.0
Hot spot 2	30.3	0.95	30.0
Hot spot 3	29.6	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above thermo-gram the temperature difference between HS1 and HS3 (ΔT) is 4.4°C and HS2 and HS3 is 0.7°C. The thermo-gram is classified under Caution.</p> <p>Recommendation: The B phase is experiencing heating due to the maximum load. It is recommended to balance the load across all phases and retighten the connection of B phase.</p>
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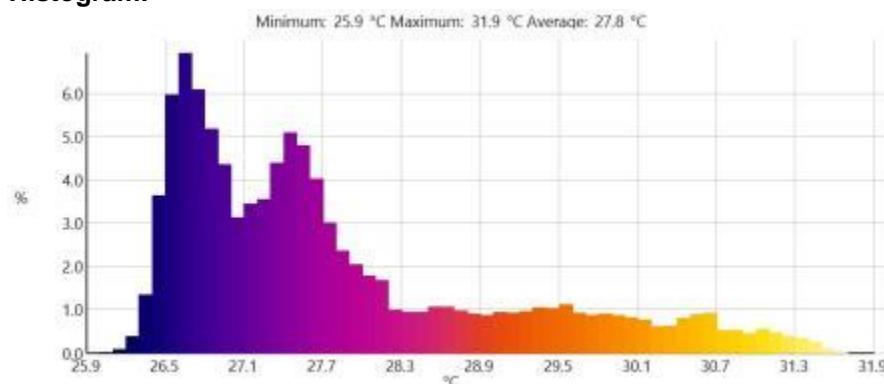
SR004557 Admin GF Sub Main Panel-4, Feeder-1F3
Auditorium Outgoing

Visible Light Image

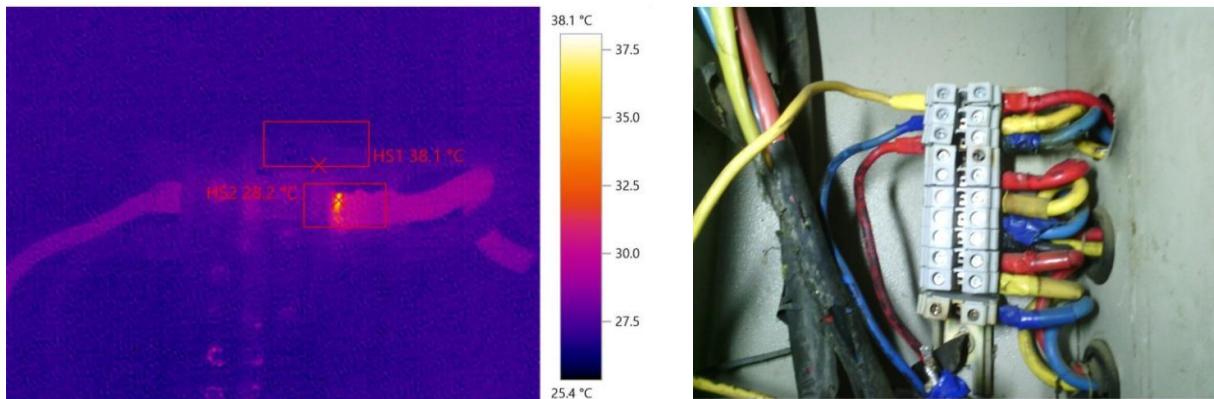
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	30.6	0.95	30.0
Hot spot 2	31.7	0.95	30.0
Hot spot 3	29.9	0.95	30.0

Histogram:



Analysis and Recommended Action	Observation: In the above thermo-gram the temperature difference between HS1 and HS3 (ΔT) is 0.7°C and HS2 and HS3 is 1.8°C. The thermo-gram is classified under Normal .
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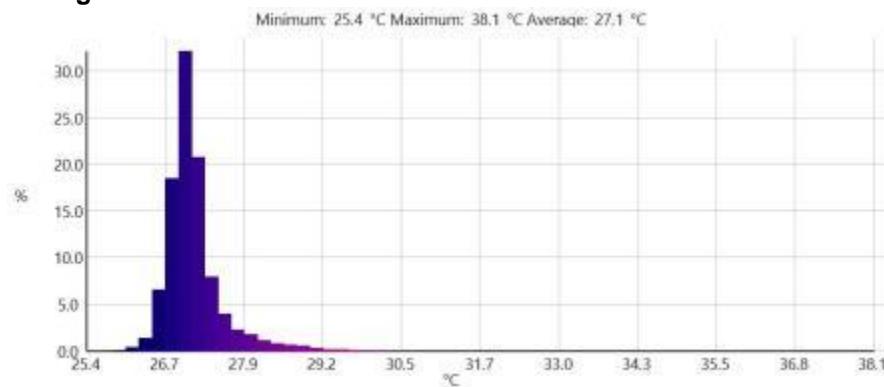
SR004558 Admin GF Sub Main Panel-4, Feeder-1F4
Distribution Panel

Visible Light Image

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	38.1	0.95	30.0
Hot spot 2	28.2	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above thermo-gram the temperature difference between HS1 and HS2 (ΔT) is 9.9°C. The thermo-gram is classified under Caution.</p> <p>Recommendation: Heating was observed on the R phase. It is recommended to retighten the connection of R phase. It is recommended to re-crimp the R phase.</p>
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SR004559 Admin GF Sub Main Panel-4, Feeder-1F4
Distribution Panel

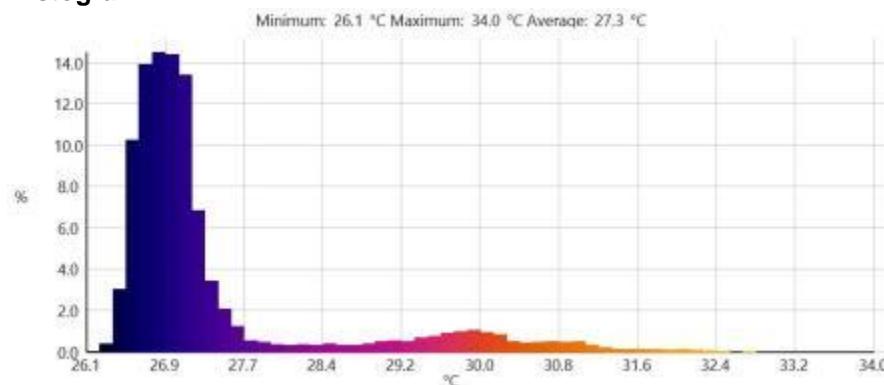


Visible Light Image

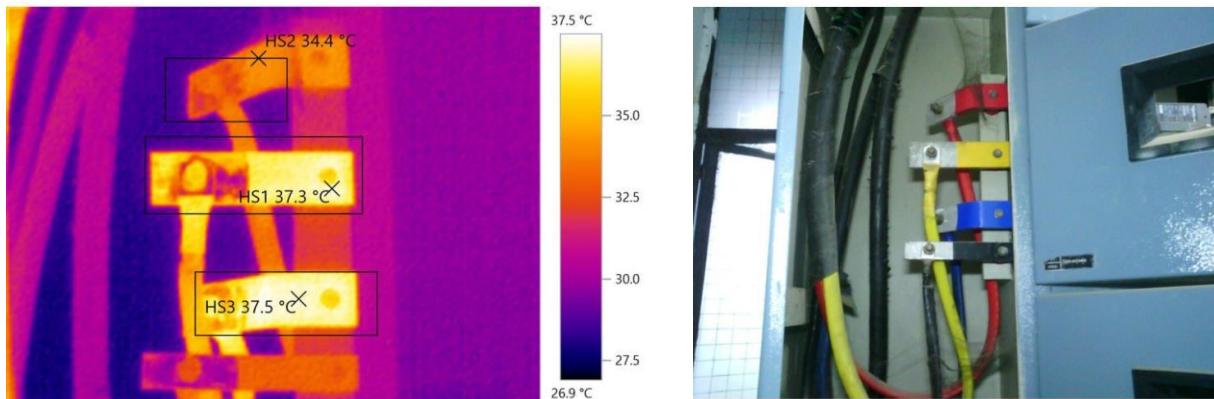
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	34.0	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above picture marking the running temperature is 34.0°C. The thermograph is classified under Caution.</p> <p>Recommendation: Heating was observed on the Neutral phase. It is recommended to retighten the connection of Neutral phase with thimble and also recommended to re-crimp the Neutral phase.</p>
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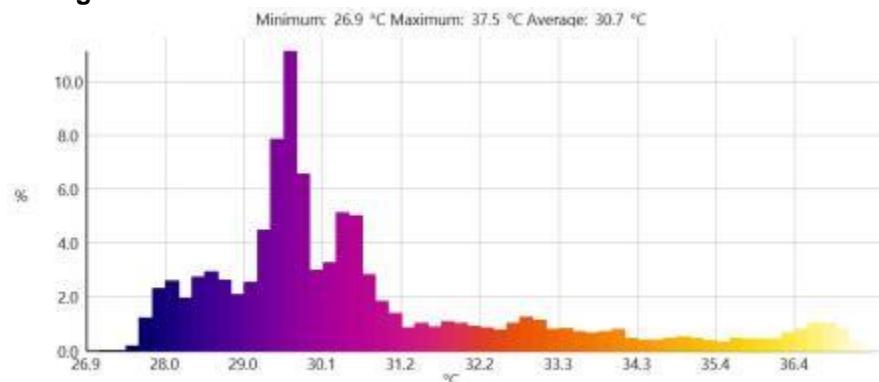
SR004560 Admin Building Main Panel, Main Incoming from DG Changeover Panel

Visible Light Image

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	37.3	0.95	30.0
Hot spot 2	34.4	0.95	30.0
Hot spot 3	37.5	0.95	30.0

Histogram:



Analysis and Recommended Action	Observation: In the above picture marking the temperature difference between HS1 and HS2 (ΔT) is 2.9°C and HS2 and HS3 (ΔT) is 3.1°C. The thermograph is classified under Normal .
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SR004561 Admin Building Main Panel, Feeder-1F1
Main Incoming MCCB

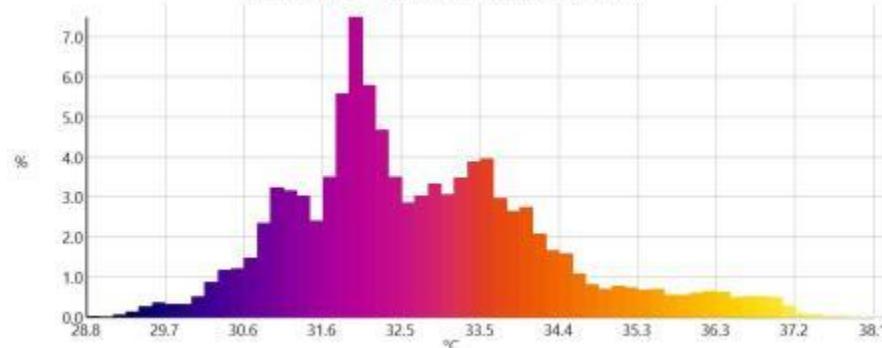
Visible Light Image

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	38.1	0.95	30.0
Hot spot 2	37.3	0.95	30.0
Hot spot 3	35.1	0.95	30.0

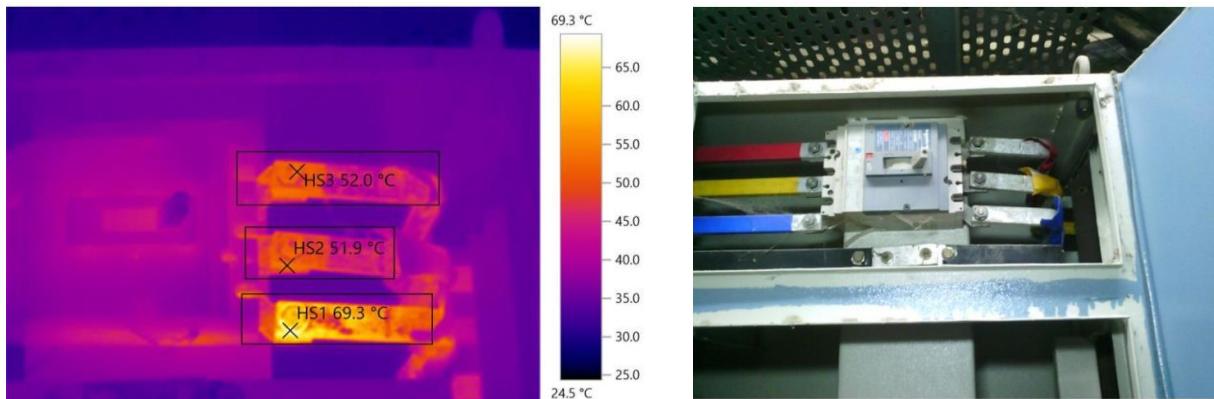
Histogram:

Minimum: 28.8 °C Maximum: 38.1 °C Average: 32.7 °C



Analysis and Recommended Action

Observation: In the above picture marking the temperature difference between HS1 and HS3 (ΔT) is 3.0°C and HS2 and HS3 (ΔT) is 2.2°C. The thermograph is classified under **Normal**.



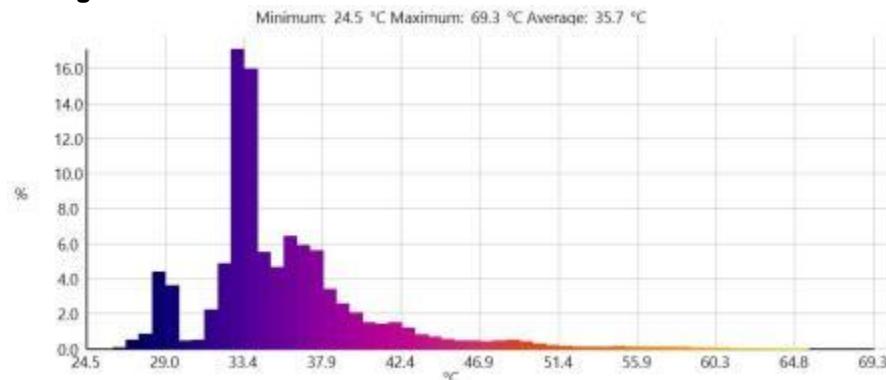
SR004562 Admin Building Main Panel, AMF Supply

Visible Light Image

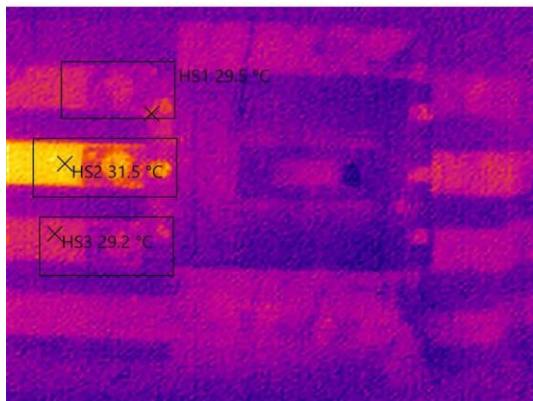
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	69.3	0.95	30.0
Hot spot 2	51.9	0.95	30.0
Hot spot 3	52.0	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above picture marking the temperature difference between HS1 and HS2 (ΔT) is 17.4°C and HS2 and HS3 (ΔT) is 0.1°C. The thermograph is classified under Alarming.</p> <p>Recommendation: The B phase is experiencing heating due to the maximum load. It is recommended to balance the load across all phases and retighten the connection of B phase.</p>
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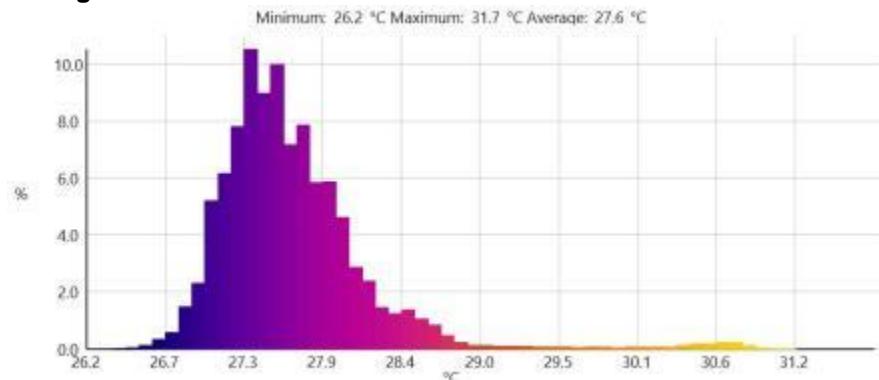
SR004563 Admin Building Main Panel, Feeder-2F6
Class Room

Visible Light Image

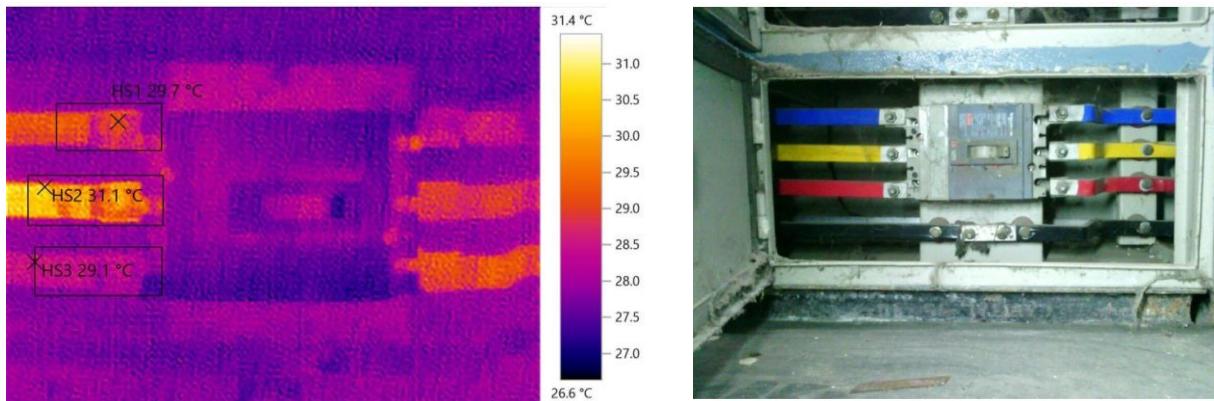
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	29.5	0.95	30.0
Hot spot 2	31.5	0.95	30.0
Hot spot 3	29.2	0.95	30.0

Histogram:



Analysis and Recommended Action	Observation: In the above picture marking the temperature difference between HS1 and HS3 (ΔT) is 0.3°C and HS2 and HS3 (ΔT) is 2.3°C. The thermograph is classified under Normal .
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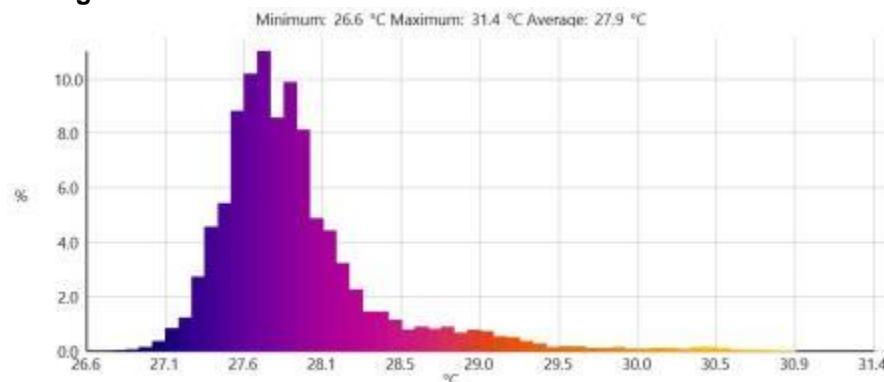
SR004564 Admin Building Main Panel, Feeder-2F7
Spare-1

Visible Light Image

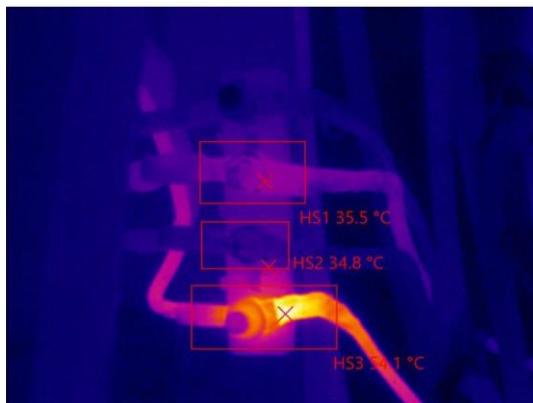
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	29.7	0.95	30.0
Hot spot 2	31.1	0.95	30.0
Hot spot 3	29.1	0.95	30.0

Histogram:



Analysis and Recommended Action	Observation: In the above picture marking the temperature difference between HS1 and HS3 (ΔT) is 0.6°C and HS2 and HS3 (ΔT) is 2.1°C. The thermograph is classified under Normal .
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SR004565 Admin Building Main Panel, Feeder-2F3
Auditorium

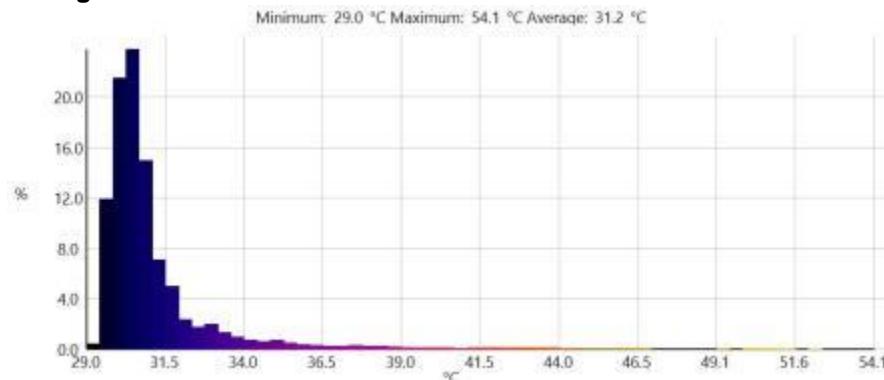


Visible Light Image

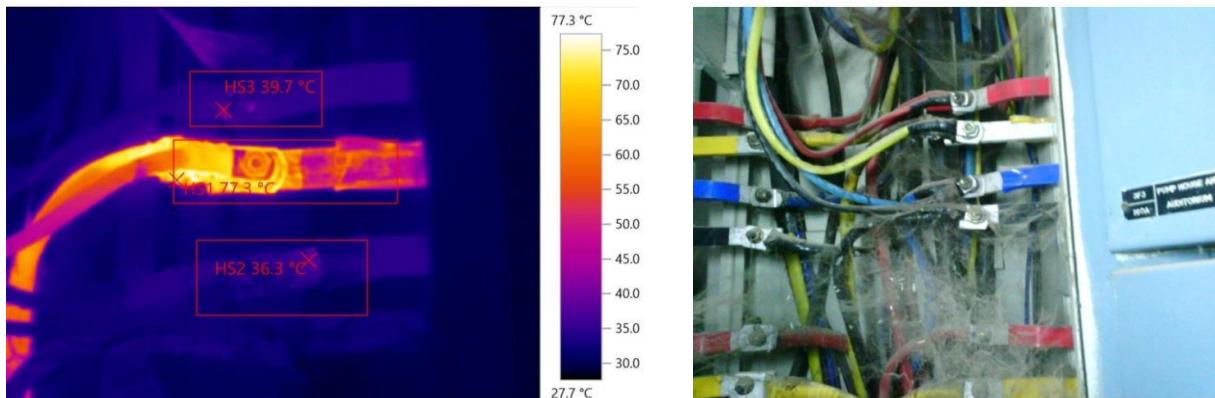
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	35.5	0.95	30.0
Hot spot 2	34.8	0.95	30.0
Hot spot 3	54.1	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above picture marking the temperature difference between HS1 and HS2 (ΔT) is 0.7°C and HS2 and HS3 (ΔT) is 19.3°C. The thermograph is classified under Alarming.</p> <p>Recommendation: The Neutral phase is experiencing heating due to the maximum load. It is recommended to balance the load across all phases. It is recommended to retighten the connection of Neutral phase.</p>
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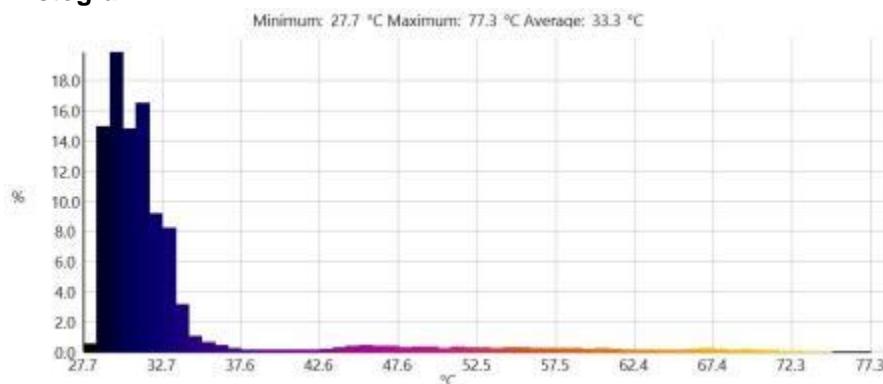
SR004566 Admin Building Main Panel, Feeder-3F3
Pump house outgoing

Visible Light Image

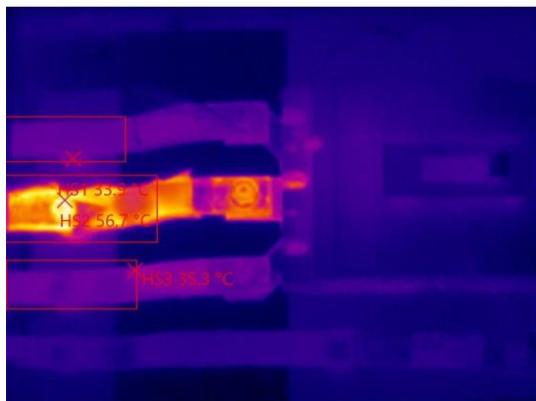
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	77.3	0.95	30.0
Hot spot 2	36.3	0.95	30.0
Hot spot 3	39.7	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above picture marking the temperature difference between HS1 and HS2 (ΔT) is 41.0°C and HS2 and HS3 (ΔT) is 3.4°C. The thermograph is classified under Alarming.</p> <p>Recommendation: The Y phase is experiencing heating due to the maximum load. It is recommended to balance the load across all phases and retighten the connection of Y phase.</p>
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SR004568 Admin Building Main Panel, Feeder-3F3
Pump house MCCB Outlet

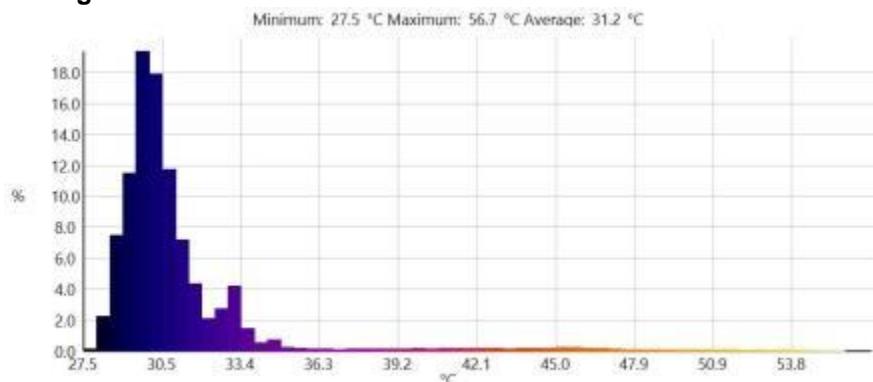


Visible Light Image

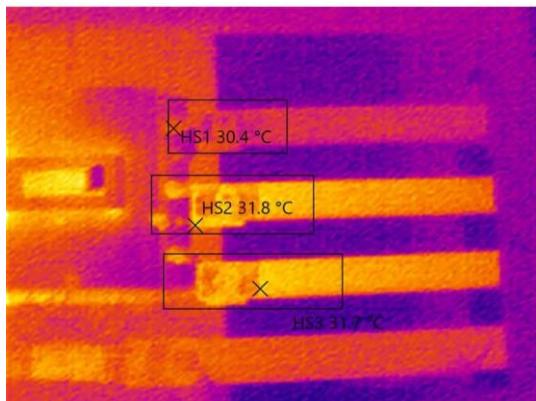
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	33.9	0.95	30.0
Hot spot 2	56.7	0.95	30.0
Hot spot 3	35.3	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above picture marking the temperature difference between HS1 and HS2 (ΔT) is 22.8°C and HS1 and HS3 (ΔT) is 1.4°C. The thermograph is classified under Alarming.</p> <p>Recommendation: The Y phase is experiencing heating due to the maximum load. It is recommended to balance the load across all phases and retighten the connection of Y phase.</p>
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SR004569 Admin Building Main Panel, Feeder-3F3
Pump house MCCB Inlet

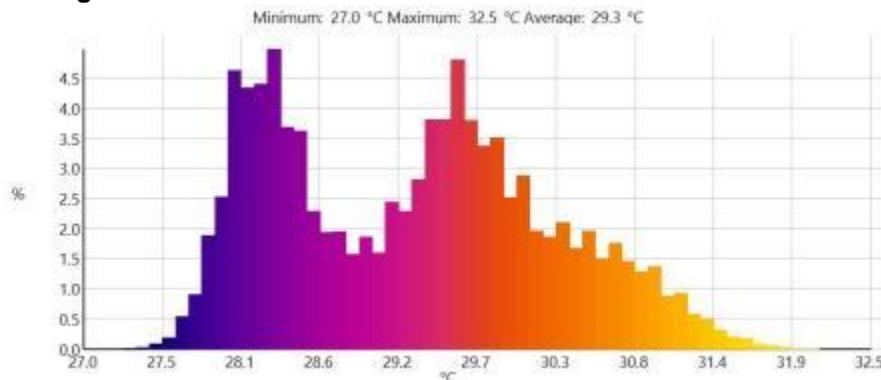


Visible Light Image

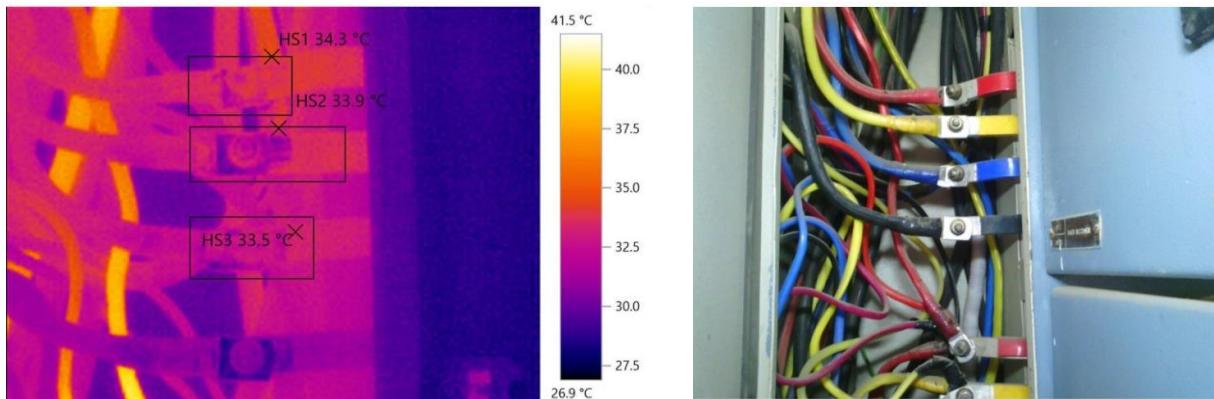
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	30.4	0.95	30.0
Hot spot 2	31.8	0.95	30.0
Hot spot 3	31.7	0.95	30.0

Histogram:



Analysis and Recommended Action	Observation: In the above picture marking the temperature difference between HS1 and HS2 (ΔT) is 1.4°C and HS1 and HS3 (ΔT) is 1.3°C. The thermograph is classified under Normal .
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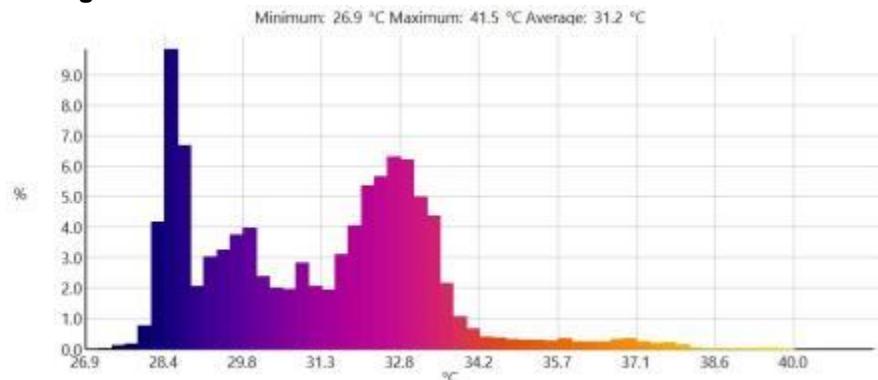
SR004570 Canteen Sub Main Panel-2, Main Incoming

Visible Light Image

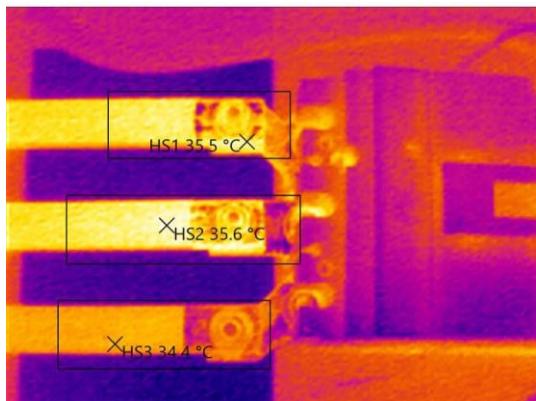
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	34.3	0.95	30.0
Hot spot 2	33.9	0.95	30.0
Hot spot 3	33.5	0.95	30.0

Histogram:



Analysis and Recommended Action	Observation: In the above picture marking the temperature difference between HS1 and HS3 (ΔT) is 0.8°C and HS2 and HS3 (ΔT) is 0.4°C. The thermograph is classified under Normal .
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SR004571 Canteen Sub Main Panel-2, Main Incoming MCCB Inlet

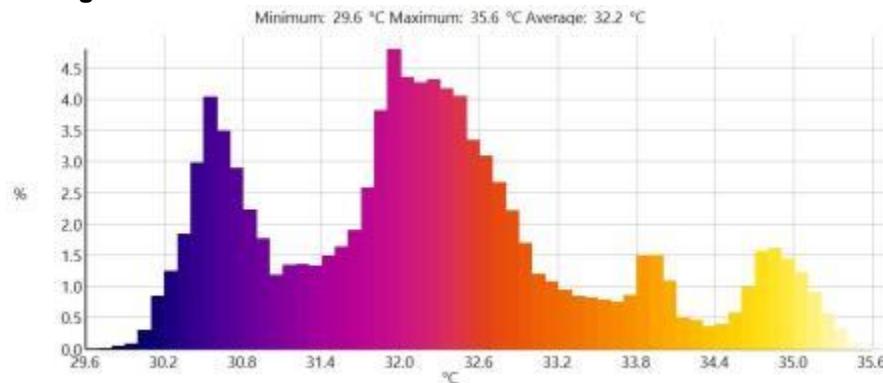


Visible Light Image

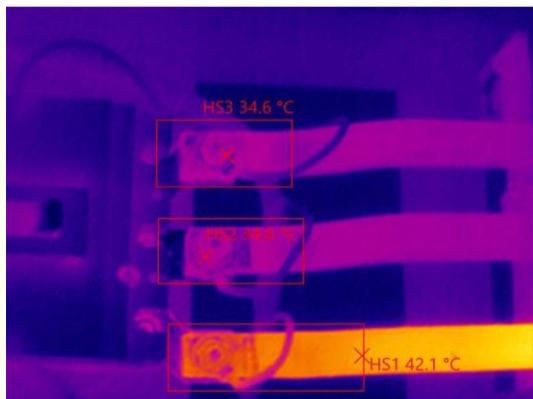
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	35.5	0.95	30.0
Hot spot 2	35.6	0.95	30.0
Hot spot 3	34.4	0.95	30.0

Histogram:



Analysis and Recommended Action	Observation: In the above picture marking the temperature difference between HS1 and HS3 (ΔT) is 1.1°C and HS2 and HS3 (ΔT) is 1.2°C. The thermograph is classified under Normal .
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SR004572 Canteen Sub Main Panel-2, Main Incoming MCCB Outlet

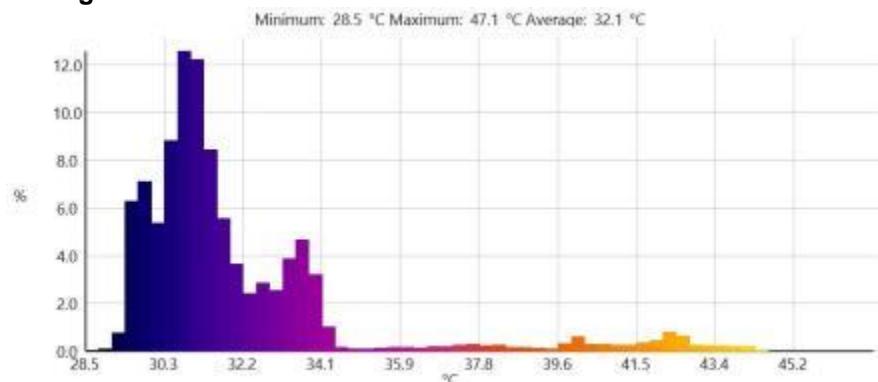


Visible Light Image

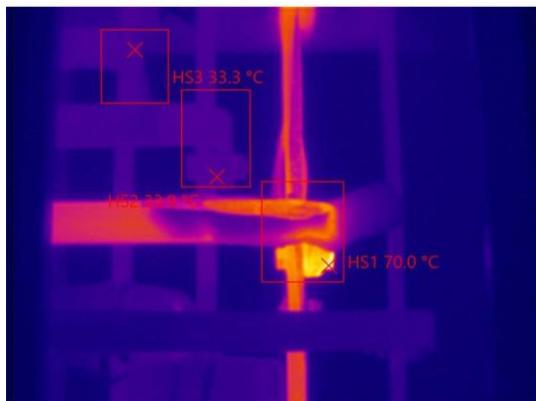
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	42.1	0.95	30.0
Hot spot 2	34.6	0.95	30.0
Hot spot 3	34.6	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above picture marking the temperature difference between HS1 and HS3 (ΔT) is 7.5°C and HS2 and HS3 (ΔT) is 0.0°C. The thermograph is classified under Caution.</p> <p>Recommendation: Heating was observed on the B phase. It is recommended to retighten the connection of B phase.</p>
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SR004573 Canteen Sub Main Panel-2, Feeder-1F2
Connected Bus bar

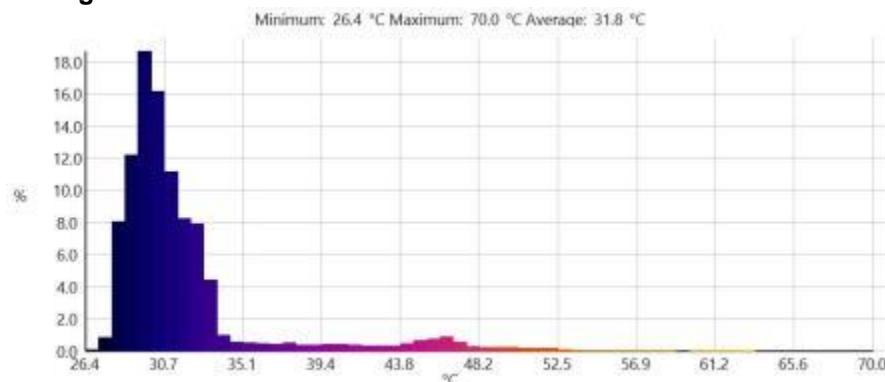


Visible Light Image

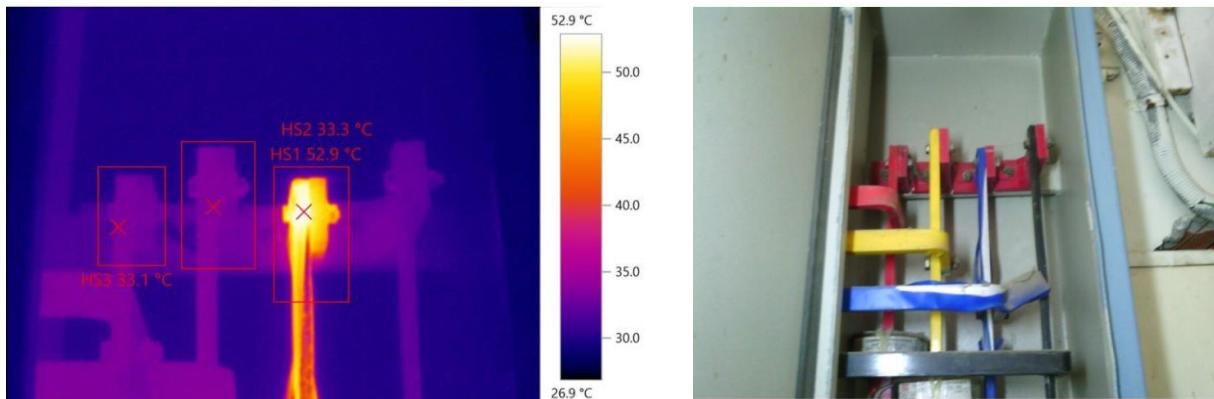
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	70.0	0.95	30.0
Hot spot 2	33.9	0.95	30.0
Hot spot 3	33.3	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above picture marking the temperature difference between HS1 and HS3 (ΔT) is 36.7°C and HS2 and HS3 (ΔT) is 0.6°C. The thermograph is classified under Alarming.</p> <p>Recommendation: Heating was observed on the B phase bus bar. It is recommended to retighten the connection of B phase bus bar.</p>
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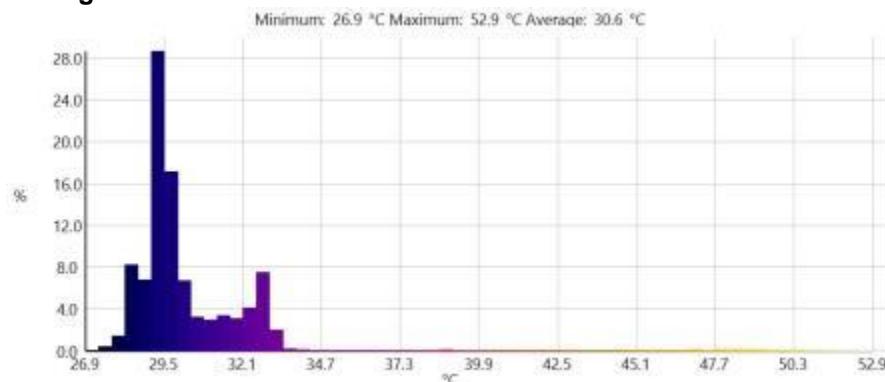
SR004574 Canteen Sub Main Panel-2, Feeder-1F2
Connected Bus bar

Visible Light Image

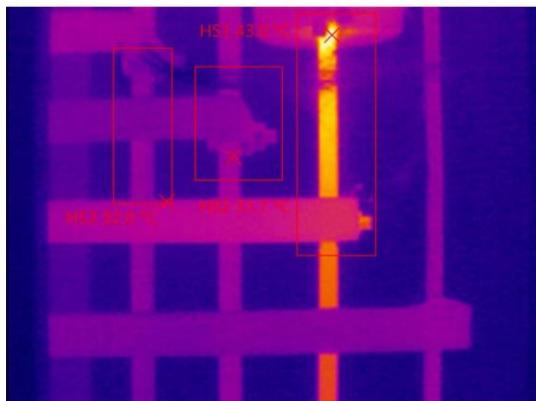
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	52.9	0.95	30.0
Hot spot 2	33.3	0.95	30.0
Hot spot 3	33.1	0.95	30.0

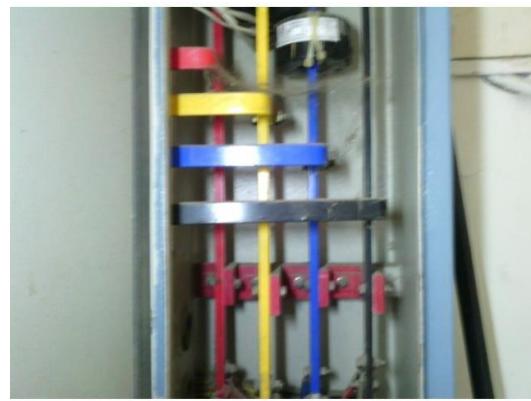
Histogram:



Analysis and Recommended Action	<p>Observation: In the above picture marking the temperature difference between HS1 and HS3 (ΔT) is 19.8°C and HS2 and HS3 (ΔT) is 0.2°C. The thermograph is classified under Alarming.</p> <p>Recommendation: Heating was observed on the B phase bus bar. It is recommended to retighten the connection of B phase bus bar.</p>
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SR004575 Canteen Sub Main Panel-2, Feeder-1F2
Connected Busbar

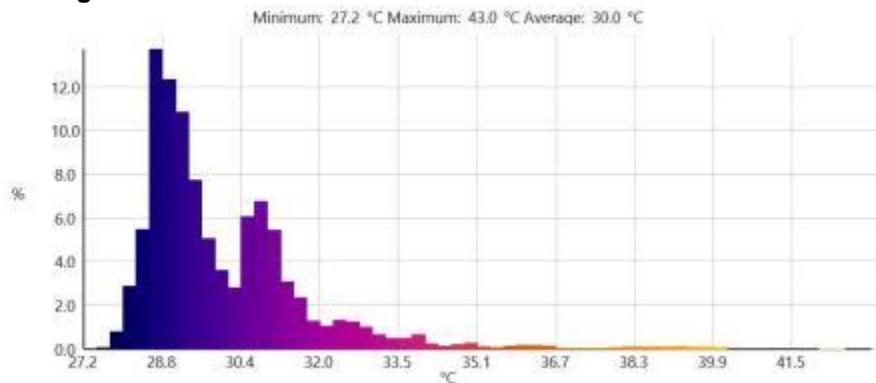


Visible Light Image

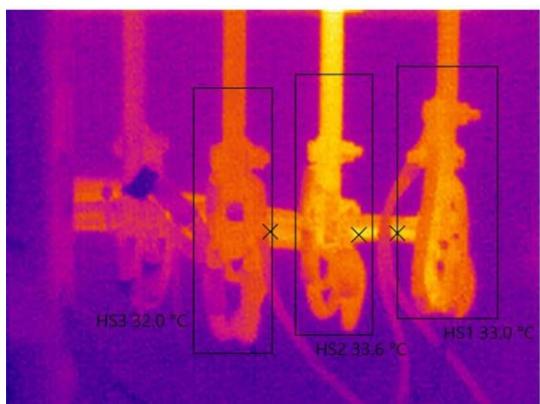
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	43.0	0.95	30.0
Hot spot 2	31.7	0.95	30.0
Hot spot 3	32.0	0.95	30.0

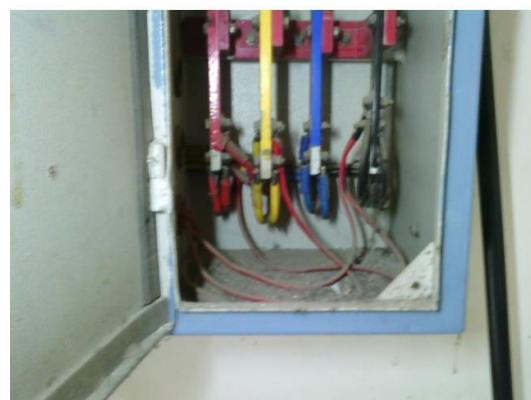
Histogram:



Analysis and Recommended Action	<p>Observation: In the above picture marking the temperature difference between HS1 and HS2 (ΔT) is 11.3°C and HS2 and HS3 (ΔT) is 0.3°C. The thermograph is classified under Caution.</p> <p>Recommendation: Heating was observed on the B phase. It is recommended to retighten the connection of B phase.</p>
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SR004576 Canteen Sub Main Panel-2, Feeder-1F2
Connected Bus bar

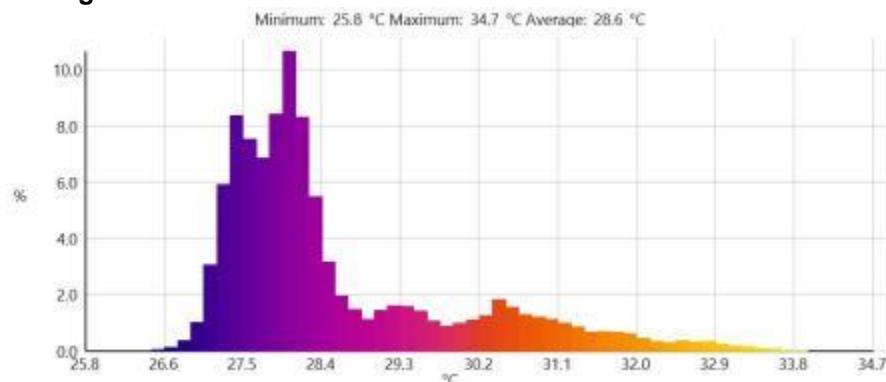


Visible Light Image

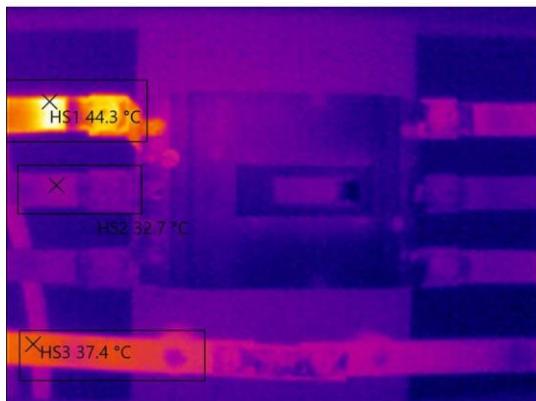
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	33.0	0.95	30.0
Hot spot 2	33.6	0.95	30.0
Hot spot 3	32.0	0.95	30.0

Histogram:



Analysis and Recommended Action	Observation: In the above picture marking the temperature difference between HS1 and HS3 (ΔT) is 1.0°C and HS2 and HS3 (ΔT) is 1.6°C. The thermograph is classified under Normal .
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**SR004577 Canteen Sub Main Panel-2, Feeder-1F3
New office, Lab 1 and 2 Server room connected
MCB inlet**

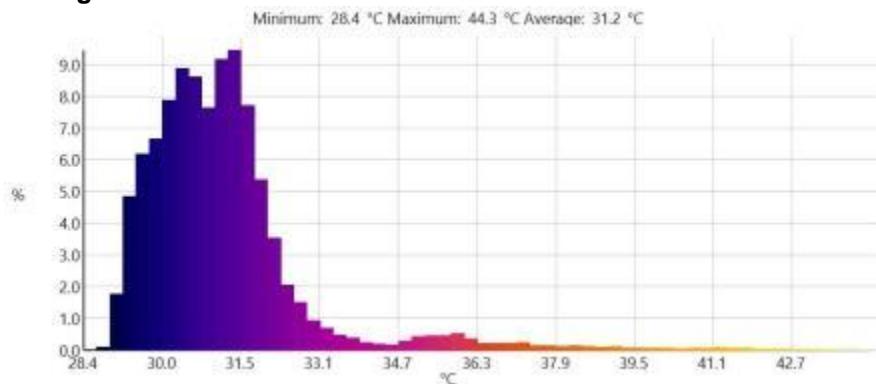


Visible Light Image

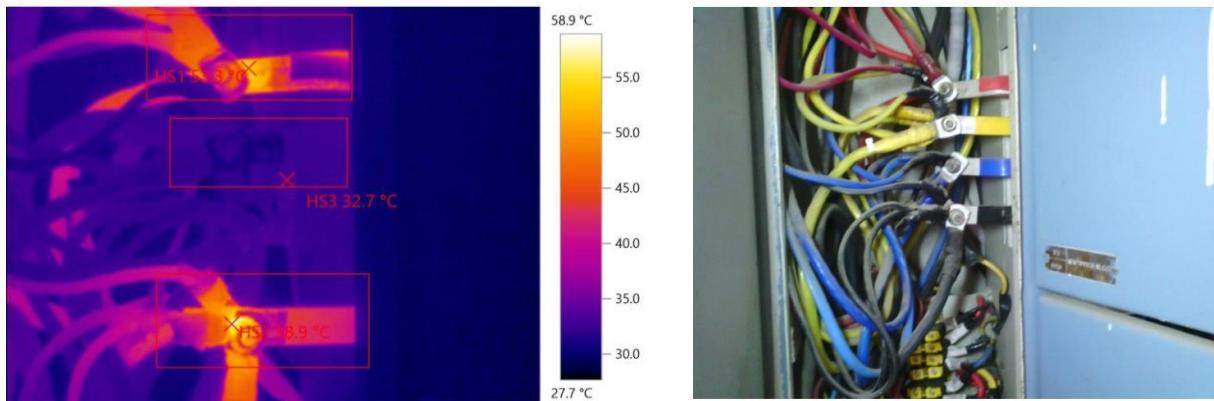
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	44.3	0.95	30.0
Hot spot 2	32.7	0.95	30.0
Hot spot 3	37.4	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above picture marking the temperature difference between HS1 and HS2 (ΔT) is 11.6°C and HS2 and HS3 (ΔT) is 4.7°C. The thermograph is classified under Caution.</p> <p>Recommendation: The R and Neutral phase is experiencing heating due to the maximum load. It is recommended to balance the load across all phases and retighten the connection of R and Neutral phase.</p>
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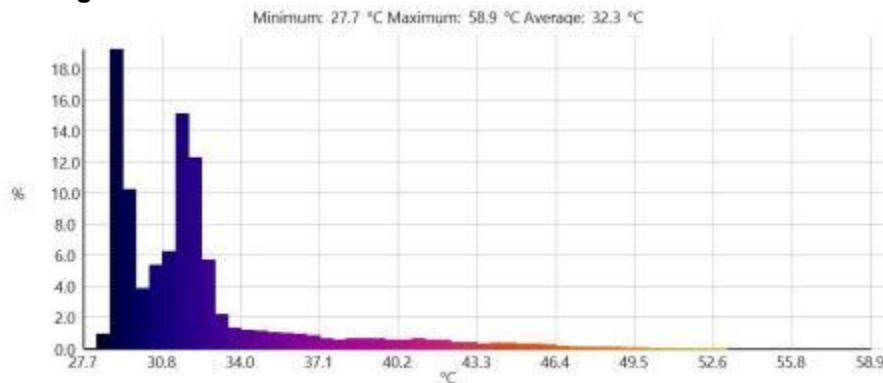
SR004578 Canteen Sub Main Panel-2, Feeder-1F3
New office, Lab 1 and 2 Server room Outgoing

Visible Light Image

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	53.3	0.95	30.0
Hot spot 2	58.9	0.95	30.0
Hot spot 3	32.7	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above picture marking the temperature difference between HS1 and HS3 (ΔT) is 20.6°C and HS2 and HS3 (ΔT) is 26.2°C. The thermograph is classified under Alarming.</p> <p>Recommendation: The R and Neutral phase is experiencing heating due to the maximum load. It is recommended to balance the load across all phases and retighten the connection of R and Neutral phase.</p>
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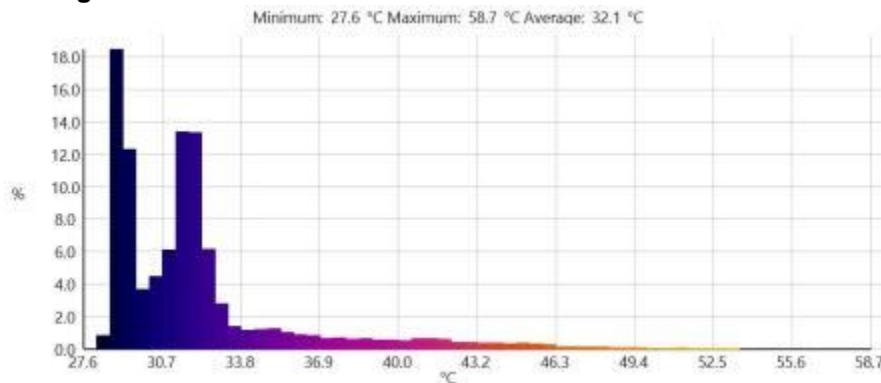
SR004579 Canteen Sub Main Panel-2, Feeder-1F3
New office, Lab 1 and 2 Server room Outgoing

Visible Light Image

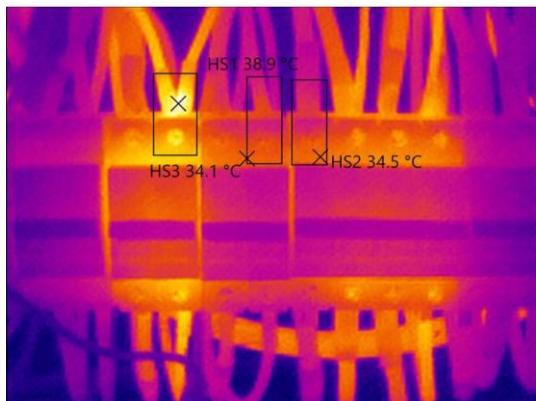
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	58.7	0.95	30.0
Hot spot 2	53.6	0.95	30.0
Hot spot 3	32.7	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above picture marking the temperature difference between HS1 and HS3 (ΔT) is 26.0°C and HS2 and HS3 (ΔT) is 20.9°C. The thermograph is classified under Alarming.</p> <p>Recommendation: The R and Neutral phase is experiencing heating due to the maximum load. It is recommended to balance the load across all phases and retighten the connection of R and Neutral phase.</p>
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SR004580 Canteen Sub Main Panel-2, Feeder-1F4
Distribution Panel

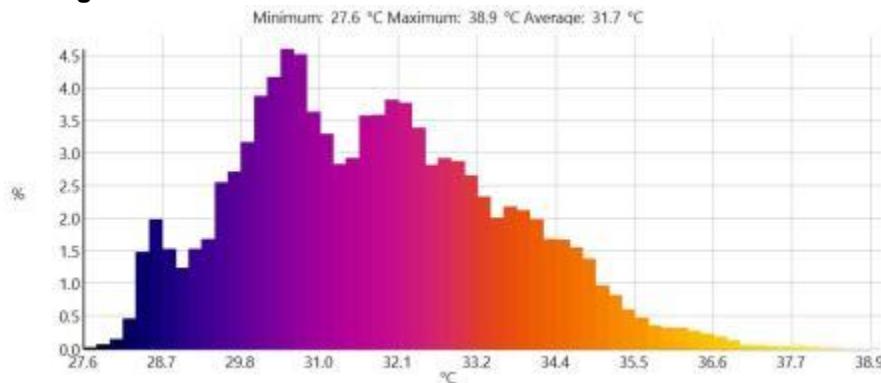


Visible Light Image

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	38.9	0.95	30.0
Hot spot 2	34.5	0.95	30.0
Hot spot 3	34.1	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above picture marking the temperature difference between HS1 and HS3 (ΔT) is 4.8°C and HS2 and HS3 (ΔT) is 0.4°C. The thermograph is classified under Caution.</p> <p>Recommendation: Heating was observed on the Neutral phase. It is recommended to retighten the connection of Neutral phase. It is recommended to re-crimp the Neutral phase.</p>
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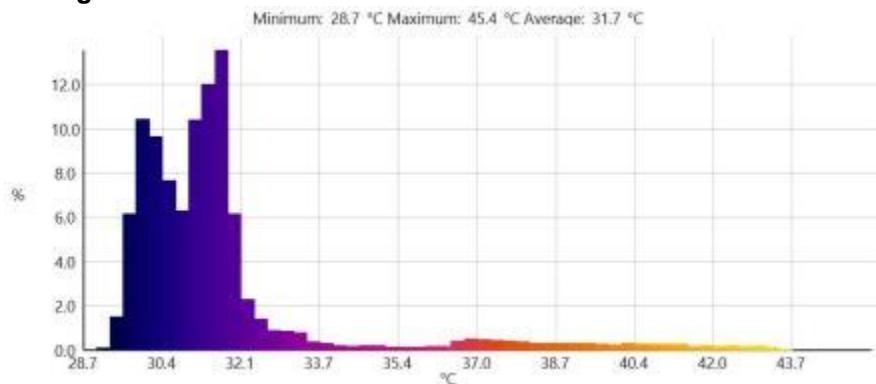
**SR004581 Canteen Sub Main Panel-2, Feeder-1F3
new office, Lab 1 and 2 Server room connected
MCB Outlet**

Visible Light Image

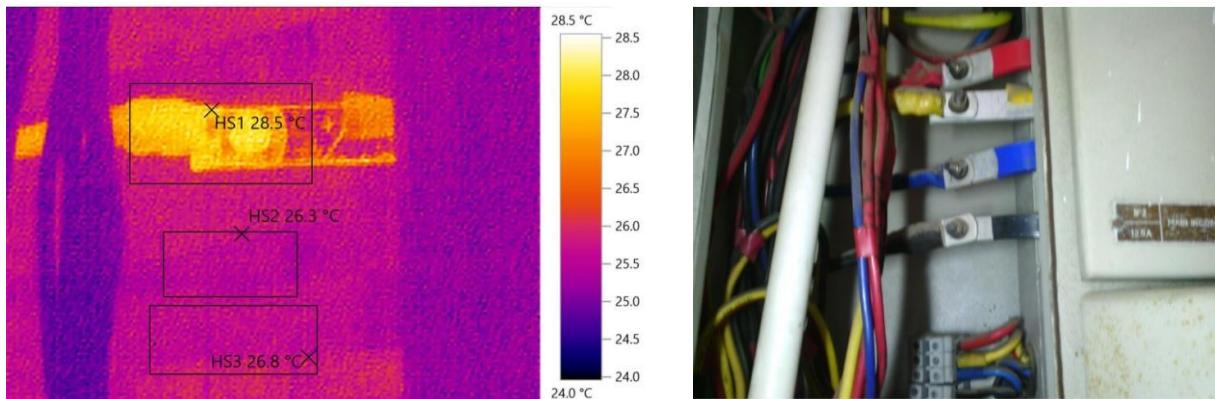
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	43.6	0.95	30.0
Hot spot 2	33.1	0.95	30.0
Hot spot 3	31.8	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above picture marking the temperature difference between HS1 and HS3 (ΔT) is 11.8°C and HS2 and HS3 (ΔT) is 1.3°C. The thermograph is classified under Caution.</p> <p>Recommendation: The R phase is experiencing heating due to the maximum load. It is recommended to balance the load across all phases. It is also recommended to retighten the connection of R phase.</p>
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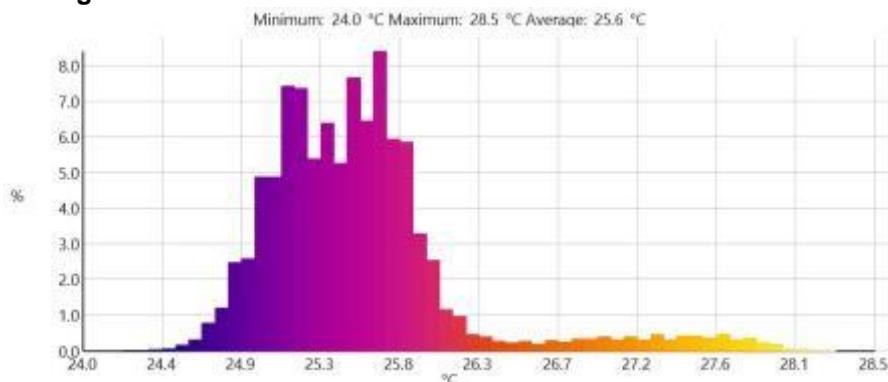
SR004585 First Floor Sub Main Panel-7, Feeder-1F2 Main Incoming

Visible Light Image

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	28.5	0.95	30.0
Hot spot 2	26.3	0.95	30.0
Hot spot 3	26.8	0.95	30.0

Histogram:



Analysis and Recommended Action	Observation: In the above picture marking the temperature difference between HS1 and HS2 (ΔT) is 2.2°C and HS2 and HS3 (ΔT) is 0.5°C. The thermograph is classified under Normal .
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SR004586 First Floor Sub Main Panel-7, Feeder-1F2 Main Incoming MCCB

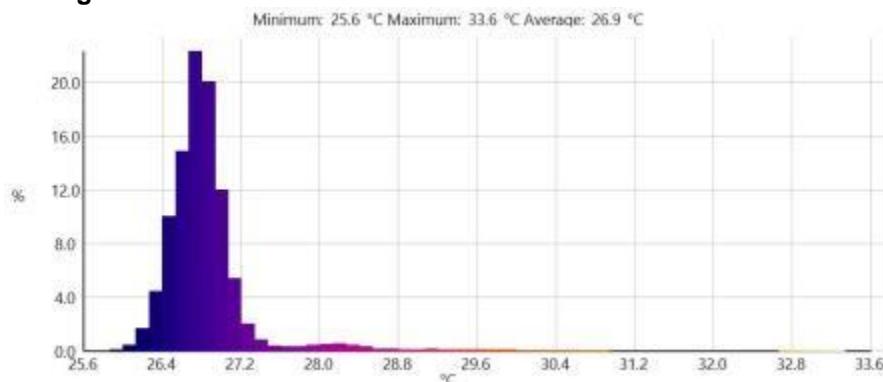


Visible Light Image

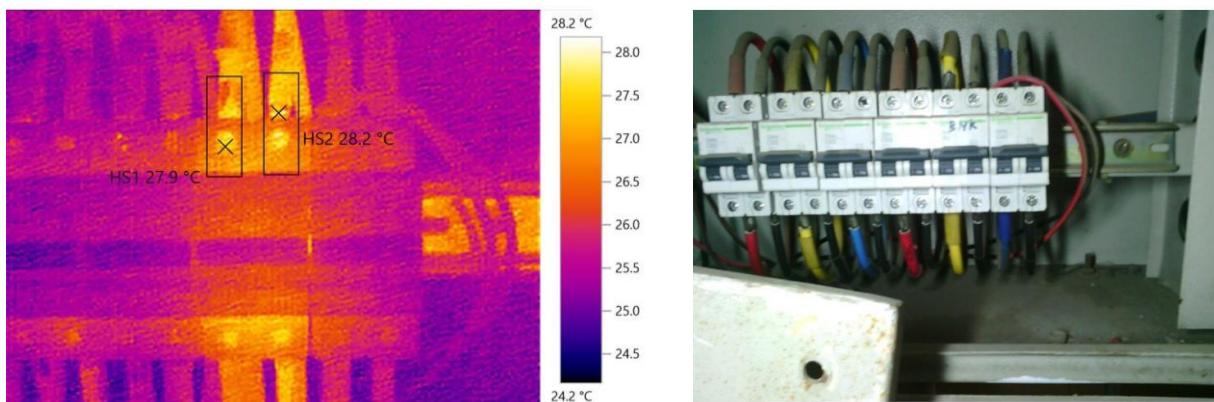
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	27.4	0.95	30.0
Hot spot 2	33.6	0.95	30.0
Hot spot 3	27.6	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above picture marking the temperature difference between HS1 and HS2 (ΔT) is 6.2°C and HS1 and HS3 (ΔT) is 0.2°C. The thermograph is classified under Caution.</p> <p>Recommendation: The Y phase is experiencing heating due to the maximum load. It is recommended to balance the load across all phases and retighten the connection of Y phase.</p>
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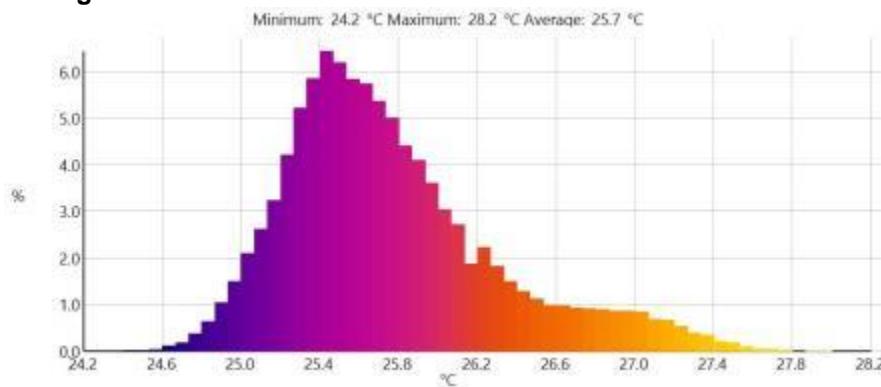
SR004587 First Floor Sub Main Panel-7, Feeder-1F4 Distribution Panel

Visible Light Image

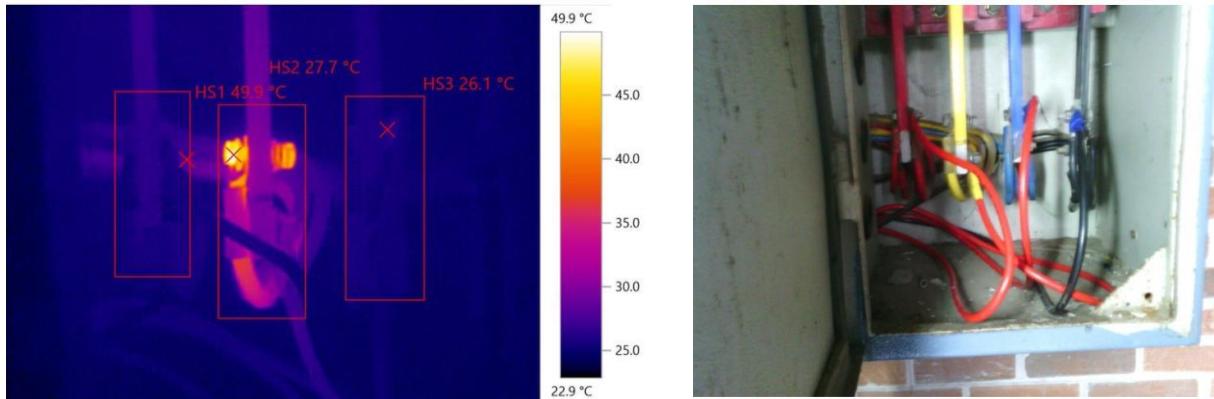
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	27.9	0.95	30.0
Hot spot 2	28.2	0.95	30.0

Histogram:



Analysis and Recommended Action	Observation: In the above picture marking the temperature difference between HS1 and HS2 (ΔT) is 0.3°C. The thermograph is classified under Normal .
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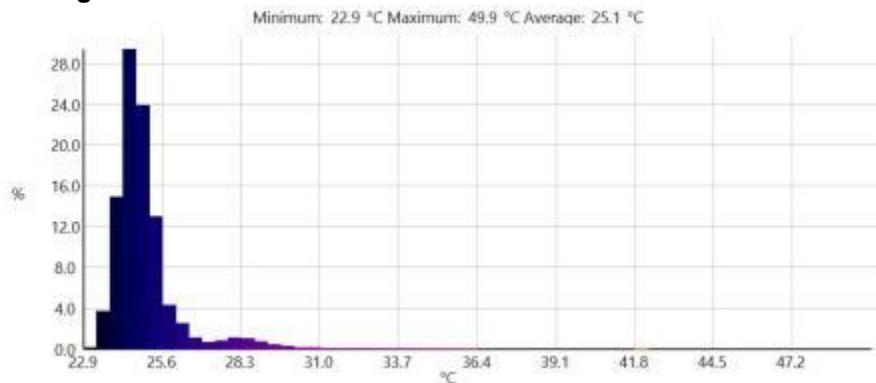
SR004589 Library Sub Main Panel-6, Feeder-1F4
Distribution Bus bar

Visible Light Image

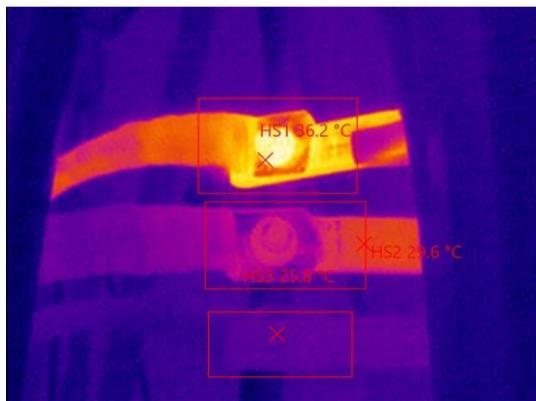
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	49.9	0.95	30.0
Hot spot 2	27.7	0.95	30.0
Hot spot 3	26.1	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above picture marking the temperature difference between HS1 and HS3 (ΔT) is 23.8°C and HS2 and HS3 (ΔT) is 1.6°C. The thermograph is classified under Alarming.</p> <p>Recommendation: Heating was observed on the Y phase bus bar. It is recommended to retighten the connection of Y phase bus bar.</p>
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SR004590 Library Sub Main Panel-6, Feeder-1F2
Main Incoming

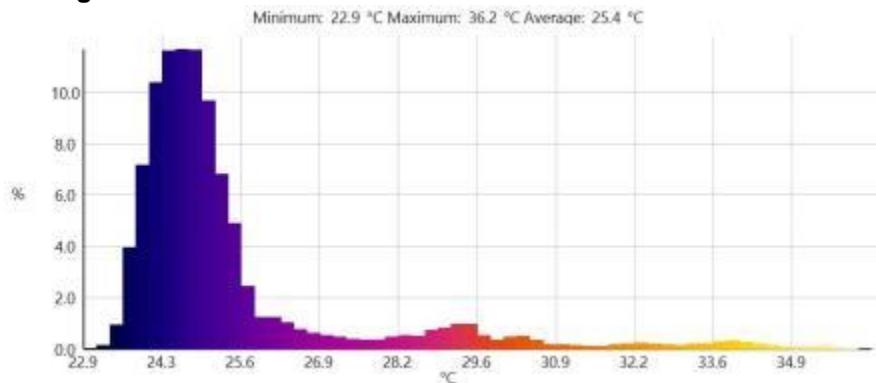


Visible Light Image

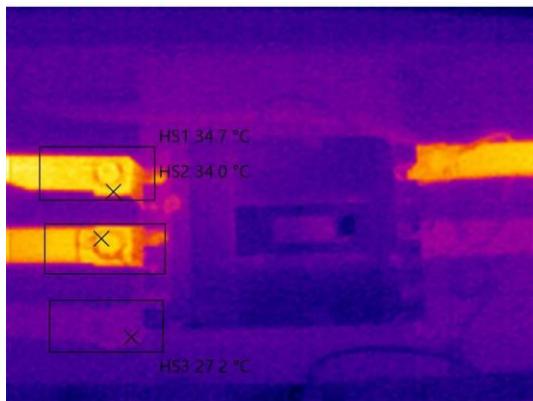
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	36.2	0.95	30.0
Hot spot 2	29.6	0.95	30.0
Hot spot 3	25.8	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above picture marking the temperature difference between HS1 and HS3 (ΔT) is 10.4°C and HS2 and HS3 (ΔT) is 3.8°C. The thermograph is classified under Caution.</p> <p>Recommendation: Heating was observed on the R phase. It is recommended to retighten the connection of R phase.</p>
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SR004591 Library Sub Main Panel-6, Feeder-1F2
Main Incoming MCCB

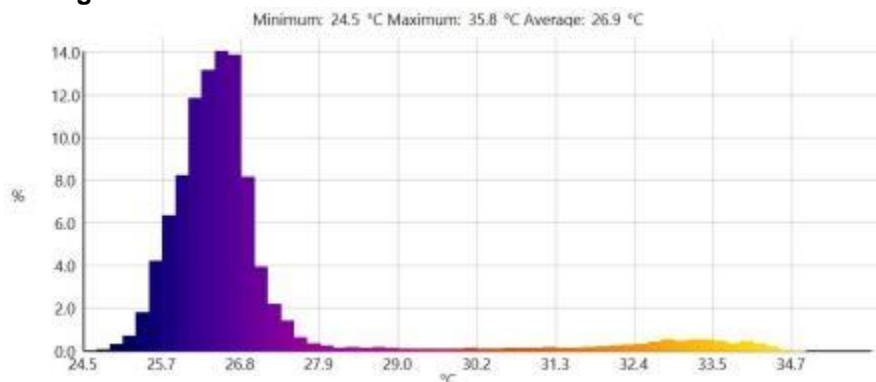


Visible Light Image

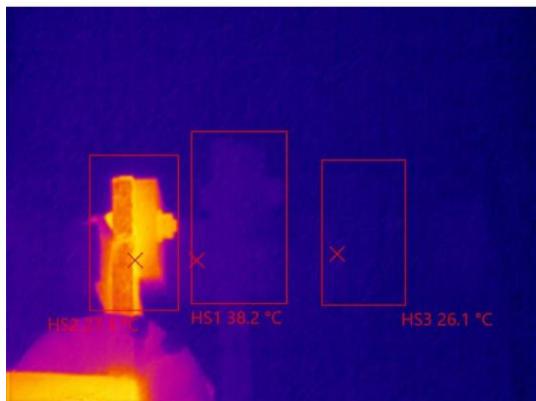
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	34.7	0.95	30.0
Hot spot 2	34.0	0.95	30.0
Hot spot 3	27.2	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above picture marking the temperature difference between HS1 and HS3 (ΔT) is 7.5°C and HS2 and HS3 (ΔT) is 6.8°C. The thermograph is classified under Caution.</p> <p>Recommendation: Heating was observed on the R and Y phase. It is recommended to retighten the connection of R and Y phase.</p>
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SR004592 Library Sub Main Panel-6, Feeder-1F2
Distribution Bus bar

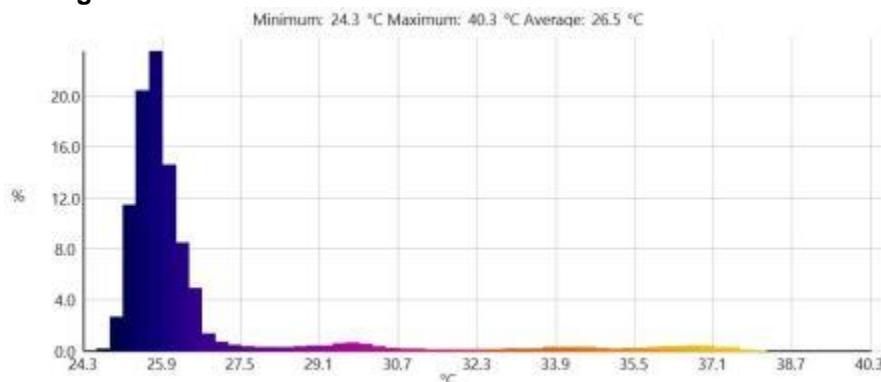


Visible Light Image

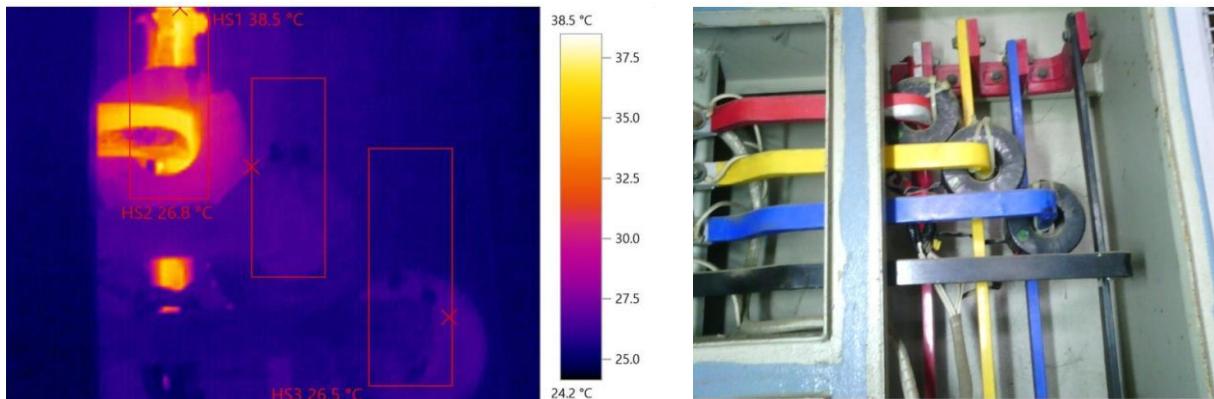
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	38.2	0.95	30.0
Hot spot 2	27.1	0.95	30.0
Hot spot 3	26.1	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above picture marking the temperature difference between HS1 and HS3 (ΔT) is 12.1°C and HS2 and HS3 (ΔT) is 1.0°C. The thermograph is classified under Caution.</p> <p>Recommendation: Heating was observed on the R phase bus bar. It is recommended to retighten the connection of R phase bus bar.</p>
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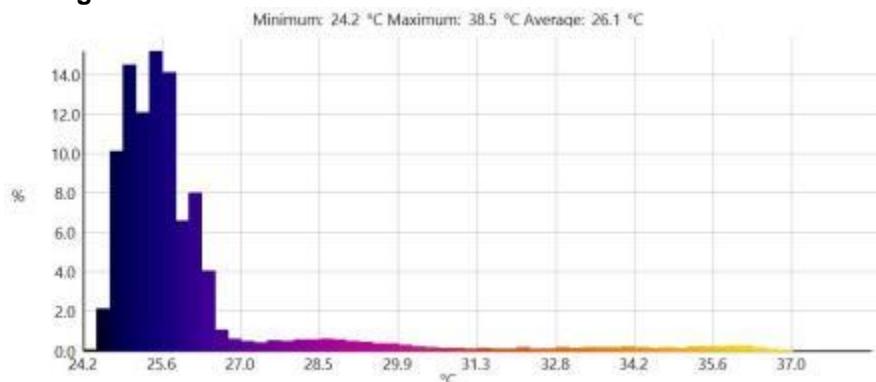
SR004593 Library Sub Main Panel-6, Feeder-1F2
Distribution Busbar

Visible Light Image

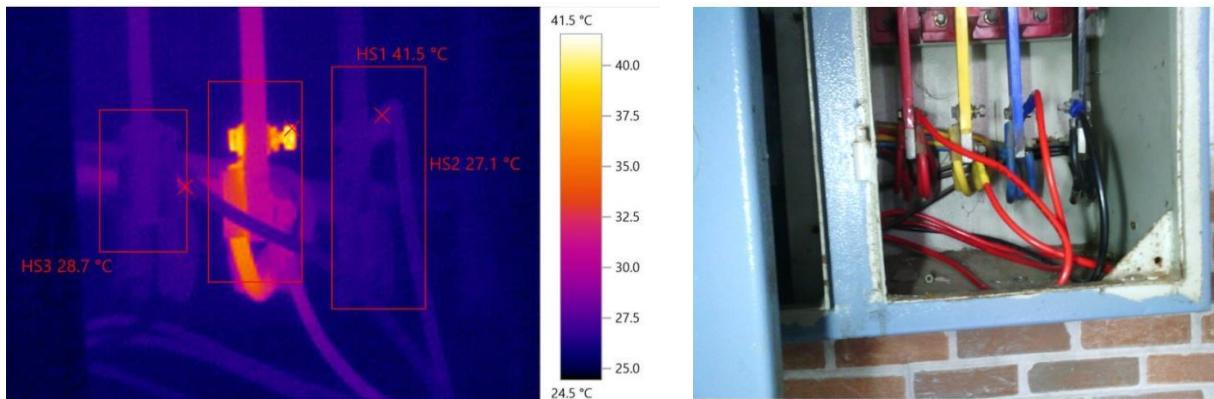
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	38.5	0.95	30.0
Hot spot 2	26.8	0.95	30.0
Hot spot 3	26.5	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above picture marking the temperature difference between HS1 and HS3 (ΔT) is 12.0°C and HS2 and HS3 (ΔT) is 0.3°C. The thermograph is classified under Caution.</p> <p>Recommendation: Heating was observed on the R phase bus bar. It is recommended to retighten the connection of R phase bus bar.</p>
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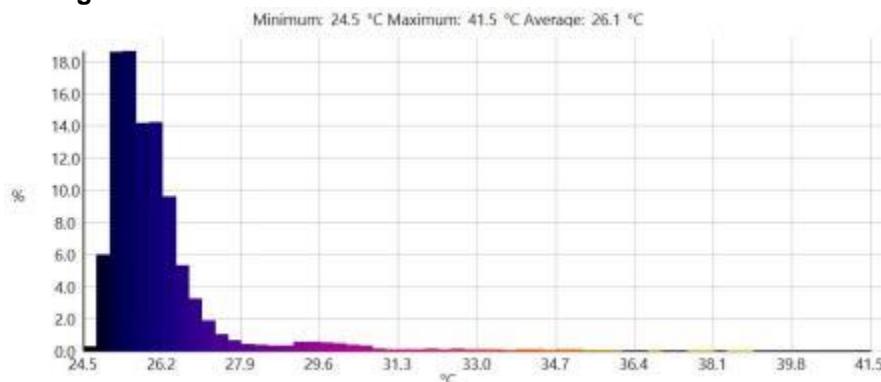
SR004594 Library Sub Main Panel-6, Feeder-1F4
Distribution Bus bar

Visible Light Image

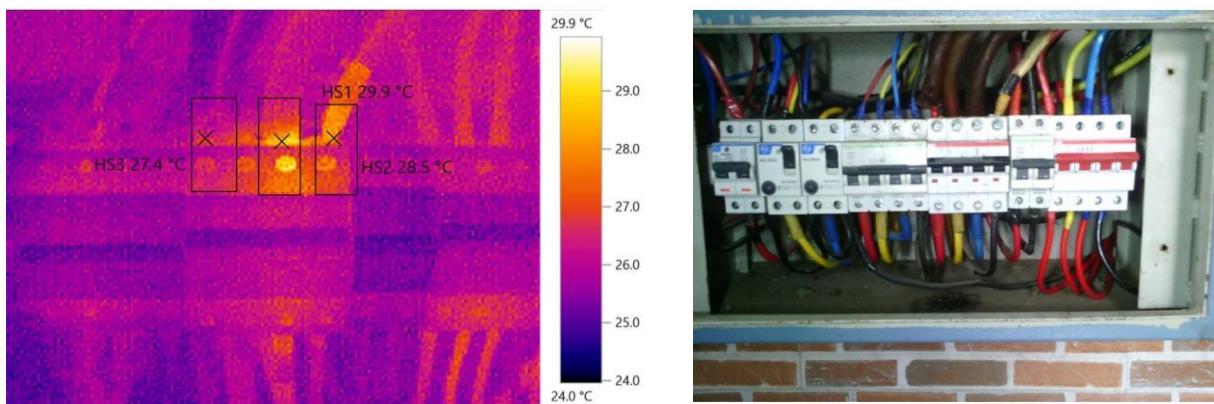
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	41.5	0.95	30.0
Hot spot 2	27.1	0.95	30.0
Hot spot 3	28.7	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above picture marking the temperature difference between HS1 and HS2 (ΔT) is 14.4°C and HS2 and HS3 (ΔT) is 1.6°C. The thermograph is classified under Alarming.</p> <p>Recommendation: Heating was observed on the Y phase bus bar. It is recommended to retighten the connection of Y phase bus bar.</p>
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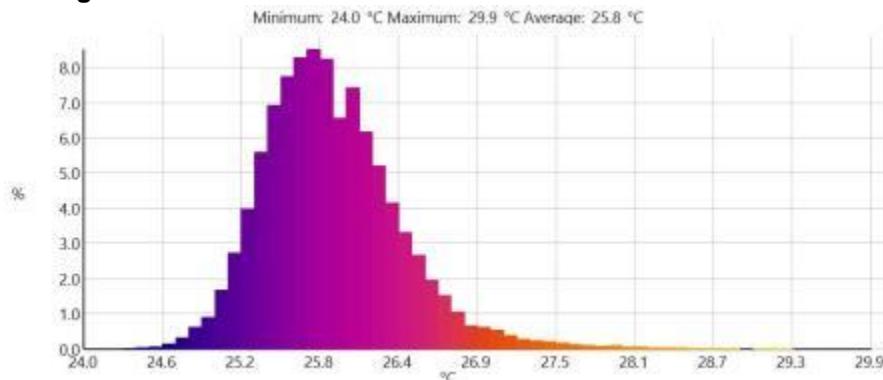
SR004595 Library Sub Main Panel-6, Feeder-1F4
Distribution MCB

Visible Light Image

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	29.9	0.95	30.0
Hot spot 2	28.5	0.95	30.0
Hot spot 3	27.4	0.95	30.0

Histogram:



Analysis and Recommended Action	Observation: In the above picture marking the temperature difference between HS1 and HS3 (ΔT) is 2.5°C and HS2 and HS3 (ΔT) is 1.1°C. The thermograph is classified under Normal .
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SR004596 Auditorium Main Panel, Feeder-1F2
Main Incoming

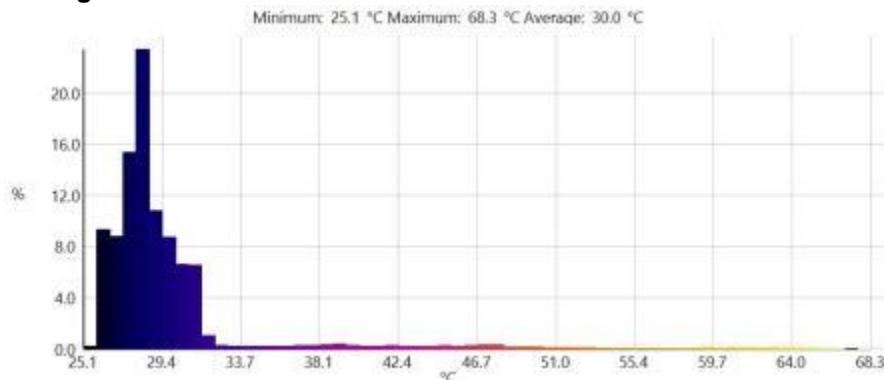


Visible Light Image

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	68.3	0.95	30.0
Hot spot 2	32.3	0.95	30.0
Hot spot 3	30.6	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above picture marking the temperature difference between HS1 and HS3 (ΔT) is 37.7°C and HS2 and HS3 (ΔT) is 1.7°C. The thermograph is classified under Alarming.</p> <p>Recommendation: The B phase is experiencing heating due to the maximum load. It is recommended to balance the load across all phases and It is recommended to retighten the connection of B phase.</p>
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SR004598 Auditorium Main Panel, Feeder-1F2
Main Incoming MCCB Inlet

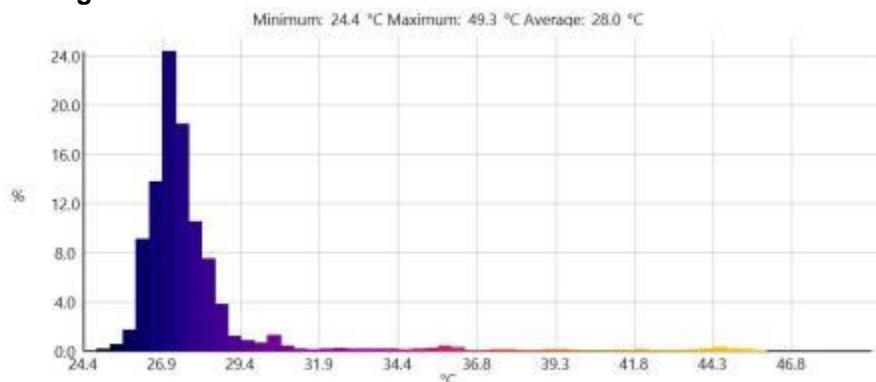


Visible Light Image

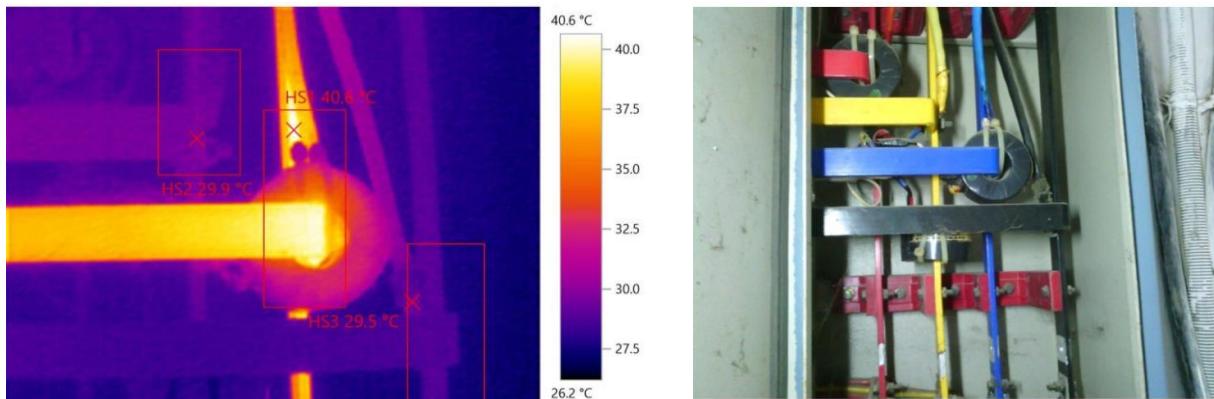
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	49.3	0.95	30.0
Hot spot 2	31.0	0.95	30.0
Hot spot 3	29.1	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above picture marking the temperature difference between HS1 and HS3 (ΔT) is 20.2°C and HS2 and HS3 (ΔT) is 1.9°C. The thermograph is classified under Alarming.</p> <p>Recommendation: The B phase is experiencing heating due to the maximum load. It is recommended to balance the load across all phases and to retighten the connection of B phase.</p>
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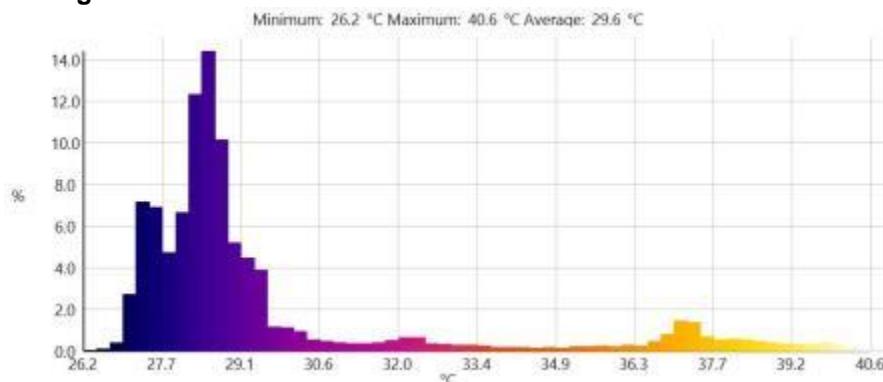
SR004599 Auditorium Main Panel, Feeder-1F2
Main Incoming MCCB outlet

Visible Light Image

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	40.6	0.95	30.0
Hot spot 2	29.9	0.95	30.0
Hot spot 3	29.5	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above picture marking the temperature difference between HS1 and HS3 (ΔT) is 11.1°C and HS2 and HS3 (ΔT) is 0.4°C. The thermograph is classified under Caution.</p> <p>Recommendation: The B phase is experiencing heating due to the maximum load. It is recommended to balance the load across all phases and to retighten the connection of B phase.</p>
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SR004600 Auditorium Main Panel, Feeder-1F3
Distribution Bus bar

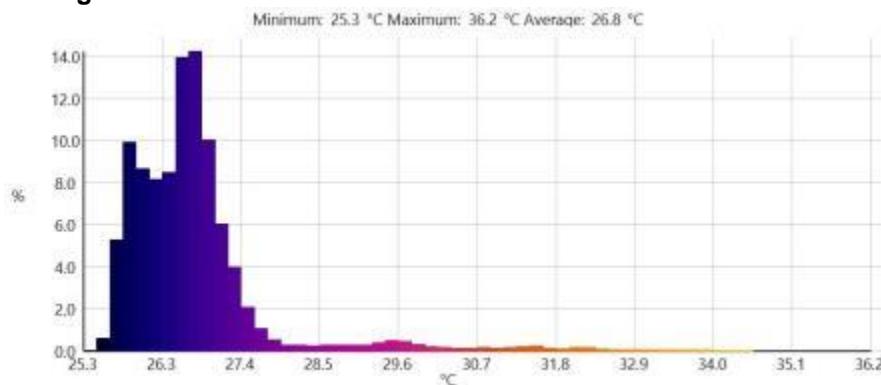


Visible Light Image

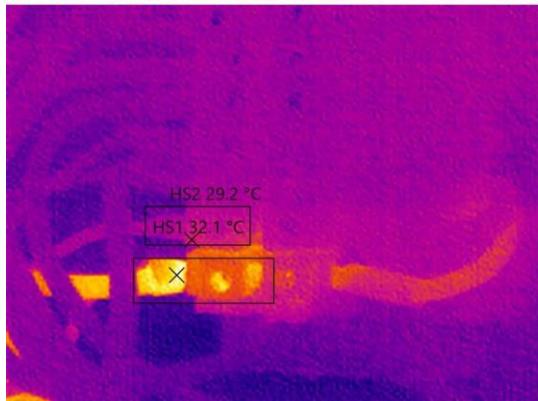
Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	32.2	0.95	30.0
Hot spot 2	27.8	0.95	30.0
Hot spot 3	27.3	0.95	30.0

Histogram:



Analysis and Recommended Action	<p>Observation: In the above picture marking the temperature difference between HS1 and HS3 (ΔT) is 4.9°C and HS2 and HS3 (ΔT) is 0.5°C. The thermograph is classified under Caution.</p> <p>Recommendation: Heating was observed on the B phase. It is recommended to retighten the connection of B phase.</p>
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SR004601 Auditorium Main Panel, Feeder-1F3
Distribution Panel outgoing

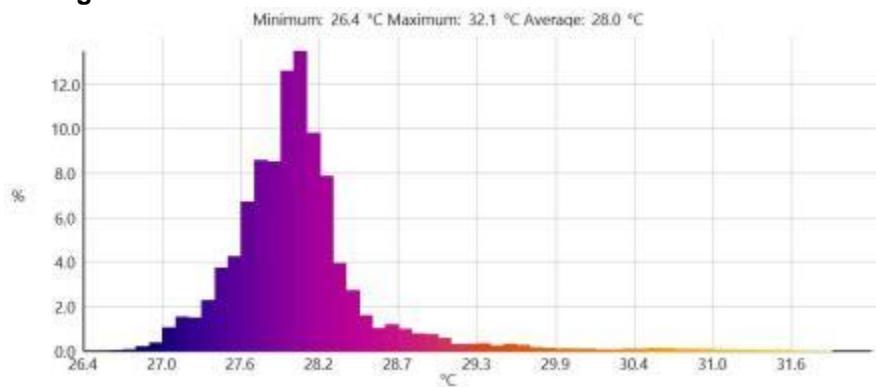


Visible Light Image

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Ambient Temp.
Hot spot 1	32.1	0.95	30.0
Hot spot 2	29.2	0.95	30.0

Histogram:



Analysis and Recommended Action	Observation: In the above picture marking the temperature difference between HS1 and HS2 (ΔT) is 2.9°C. The thermograph is classified under Normal .
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