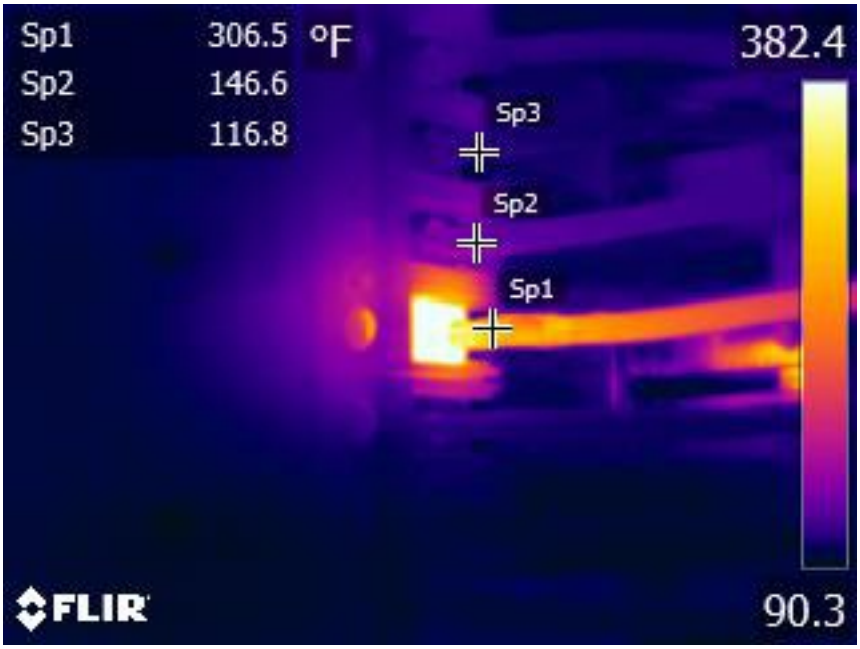


Infrared Thermography Report

USG

June 2022

All electrical panels were scanned using a FLIR **T865** infrared camera. The following report only contains defects that were found during the survey. Below is our classification system for each defect included in this report. If there are any questions or comments, please feel free to contact us at any time.

HI-SPEED employs a three-tier defect rating system:

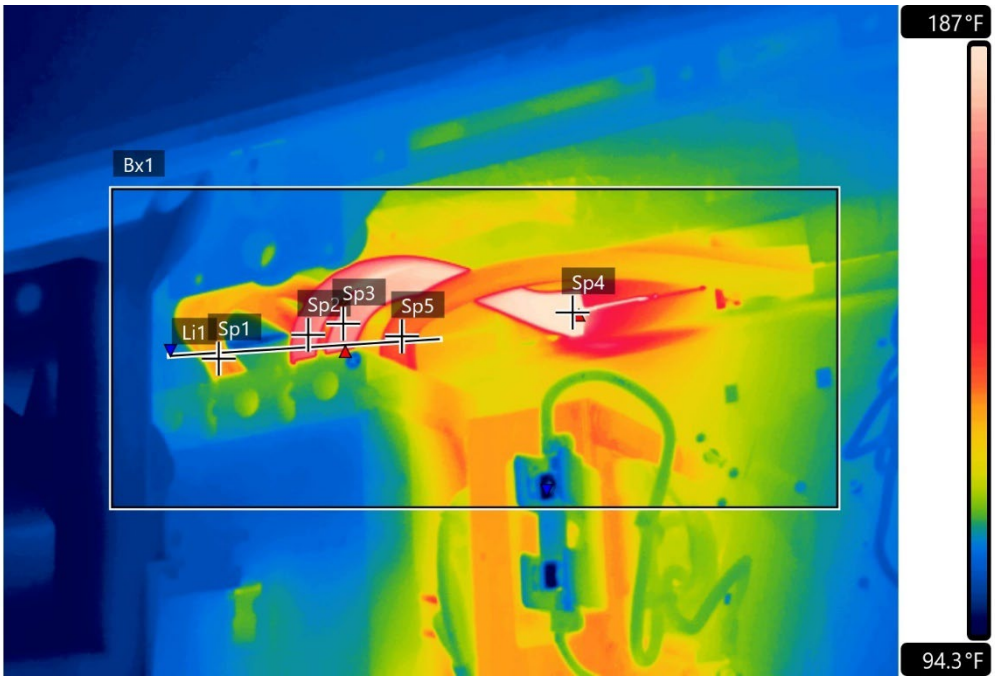
CLASS I: A defect or defects are present that are likely to cause a problem in the long term (2-6 months). Should be addressed in the normal course of maintenance scheduling.

CLASS II: A defect or defects are present that are likely to cause a failure in the short term (less than 2 months). Should be addressed as soon as practical, on a high maintenance priority. Consideration should be given to increase monitoring frequency.

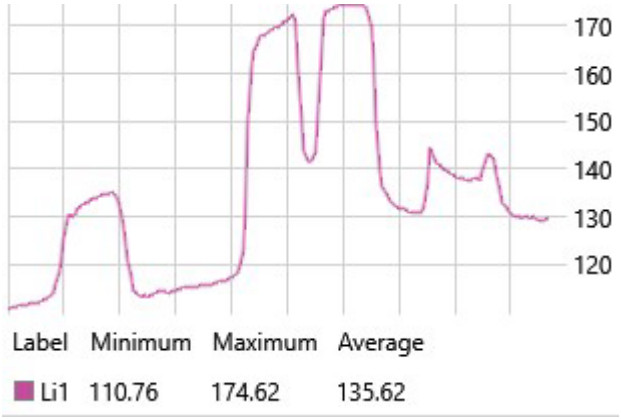
CLASS III: A defect or defects are present that make continued component reliability unpredictable and likelihood of secondary damage is high. Consideration should be given to an unscheduled shutdown to correct.

HI-SPEED tests and inspects industrial machinery and equipment and makes recommendations concerning maintenance and repairs based on its experience in the field of industrial repair and maintenance. The information contained herein is provided as an opinion only, not as a guaranty or warranty of the matters discussed herein.

Component	Incoming Power Leads
Equipment/Bucket ID	Whiter Water Loop Pump



Sp1	134.7 °F
Sp2	171.5 °F
Sp3	175.2 °F
Sp4	194.4 °F
Sp5	137.5 °F
Li1 Minimum	110.8 °F
Li1 Maximum	174.6 °F
Bx1 Minimum	94.8 °F
Bx1 Maximum	202.6 °F

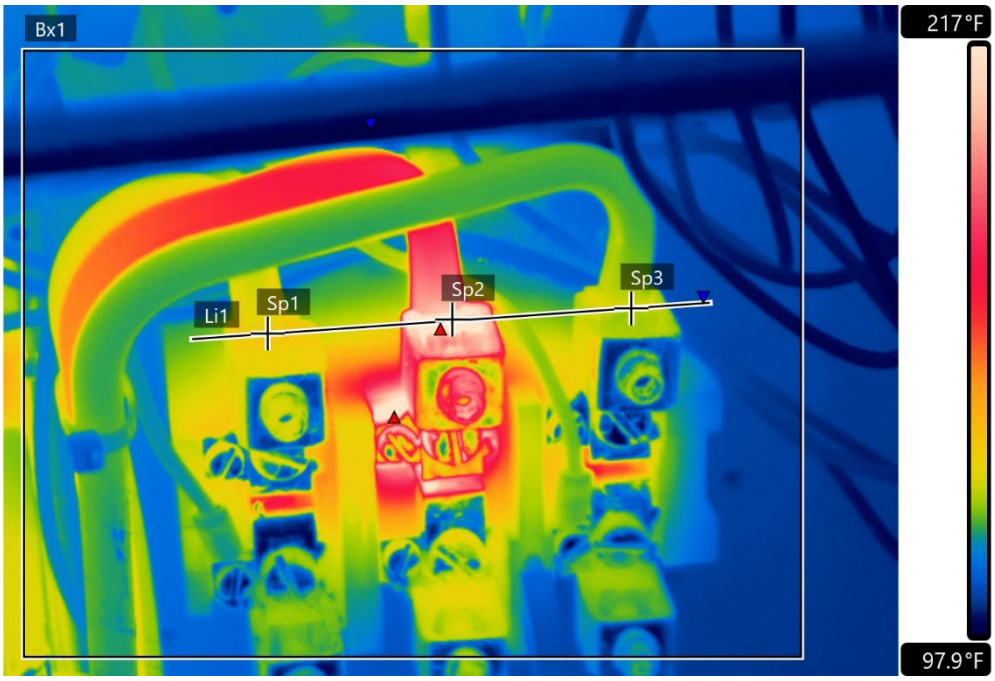


Fault	Possible connection issue or lead issue
Defect Rating	**CLASS II**

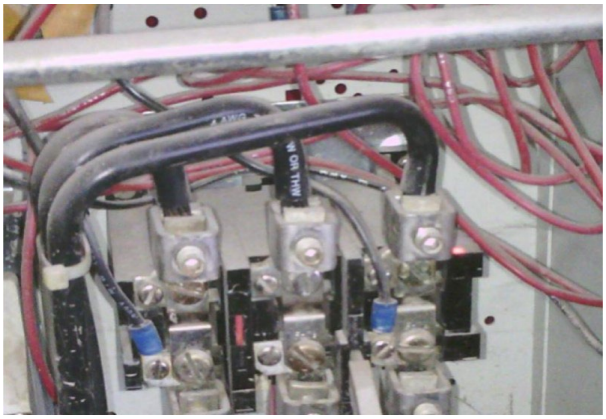
Recommendations

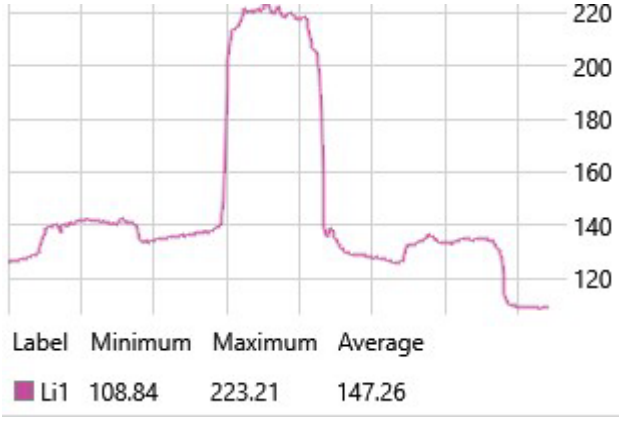
IR image shows a strange issue here. Notice that B phase leads are around 25 degrees hotter as the leads go into the cabinet. These are incoming power leads. Unfortunately, we could not see where the origin of the heat is. We believe that there may be a connection issue up the lead or some other issue. It is highly recommended to inspect the B phase lead and connections on the incoming power side.

Component	B phase connection
Equipment/Bucket ID	M1443 Seal water collector tank pump/MCC-7B2



Sp1	142.3 °F
Sp2	221.3 °F
Sp3	134.6 °F
Li1 Minimum	108.8 °F
Li1 Maximum	223.2 °F
Bx1 Minimum	96.2 °F
Bx1 Maximum	230.5 °F

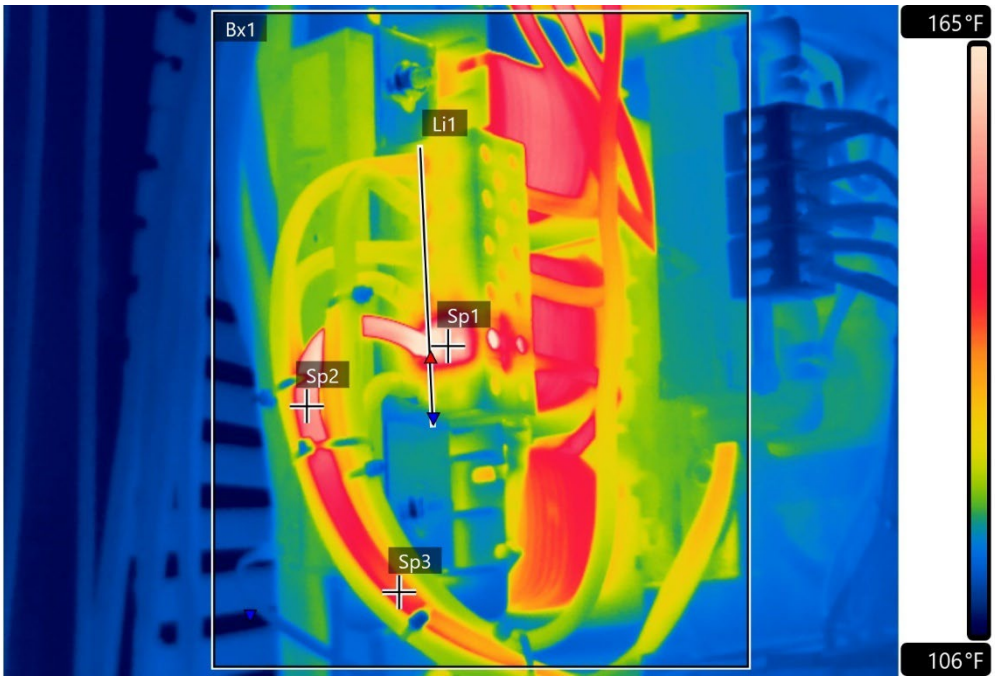




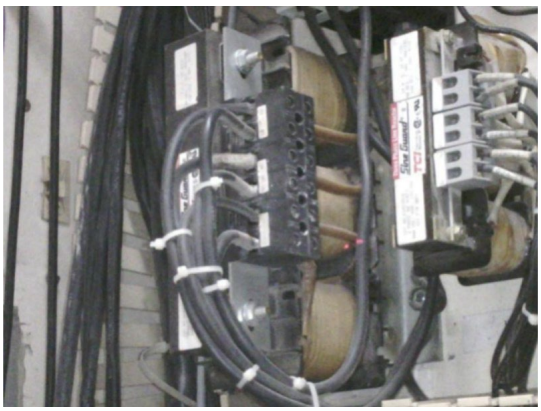
Fault	Faulty connection
Defect Rating	CLASS III

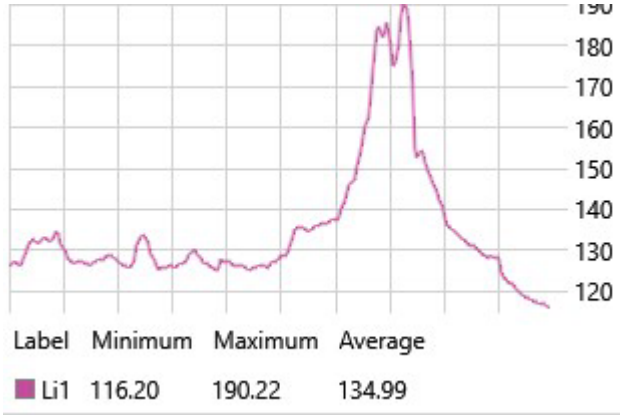
Recommendations
IR shows some high heat on B phase connection. Ensure connection is clean and tight. Repair ASAP.

Component	Lead connection
Equipment/Bucket ID	VFD-Forming Main Power



Sp1	155.3 °F
Sp2	154.1 °F
Sp3	138.7 °F
Li1 Minimum	116.2 °F
Li1 Maximum	190.2 °F
Bx1 Minimum	105.5 °F
Bx1 Maximum	190.2 °F

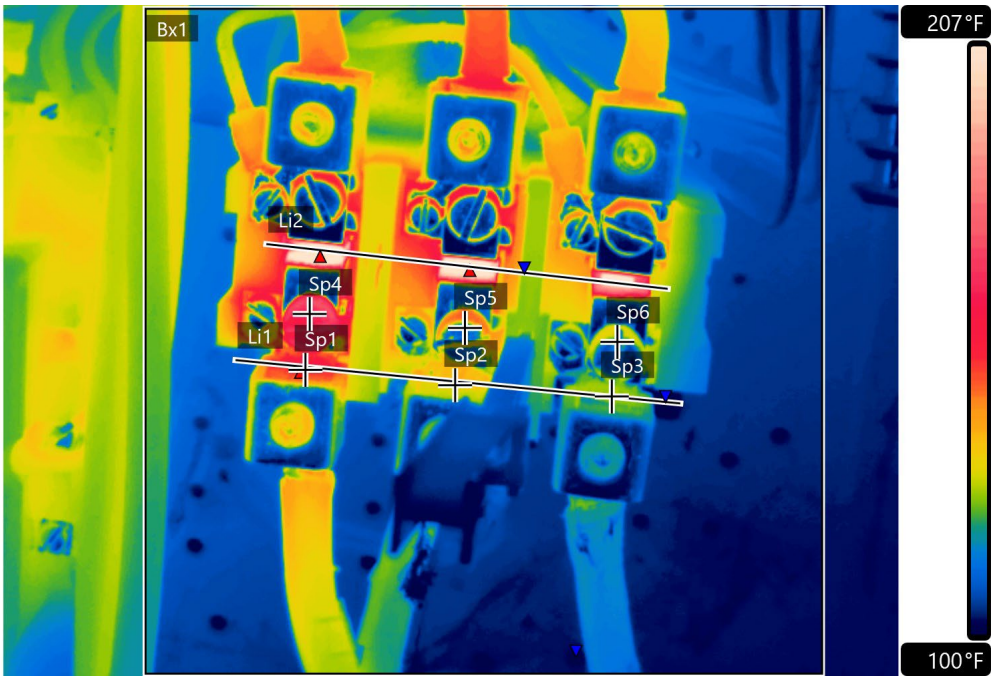




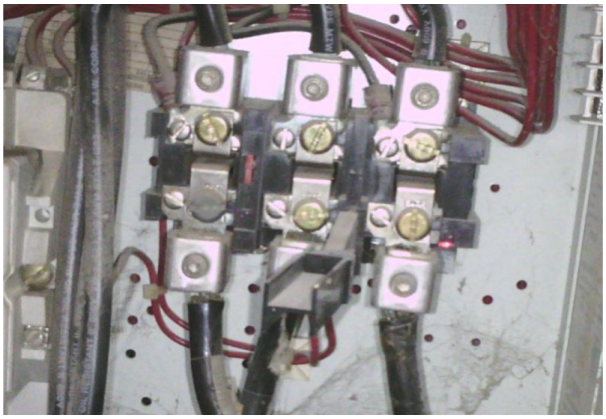
Fault	Faulty Connection
Defect Rating	**CLASS II**

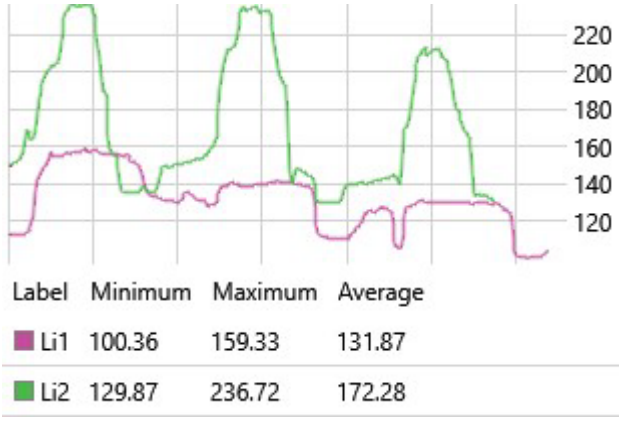
Recommendations
IR image shows some type of connection issue at second from bottom lead. Inspect connection as soon as practical.

Component	A phase connection
Equipment/Bucket ID	#3 machine whitewater pump M1377/MCC-7C1



Sp1	156.0 °F
Sp2	138.6 °F
Sp3	129.8 °F
Sp4	167.2 °F
Sp5	115.6 °F
Sp6	110.9 °F
Li1 Minimum	100.4 °F
Li1 Maximum	159.3 °F
Li2 Minimum	129.9 °F
Li2 Maximum	236.7 °F
Bx1 Minimum	97.6 °F
Bx1 Maximum	240.1 °F



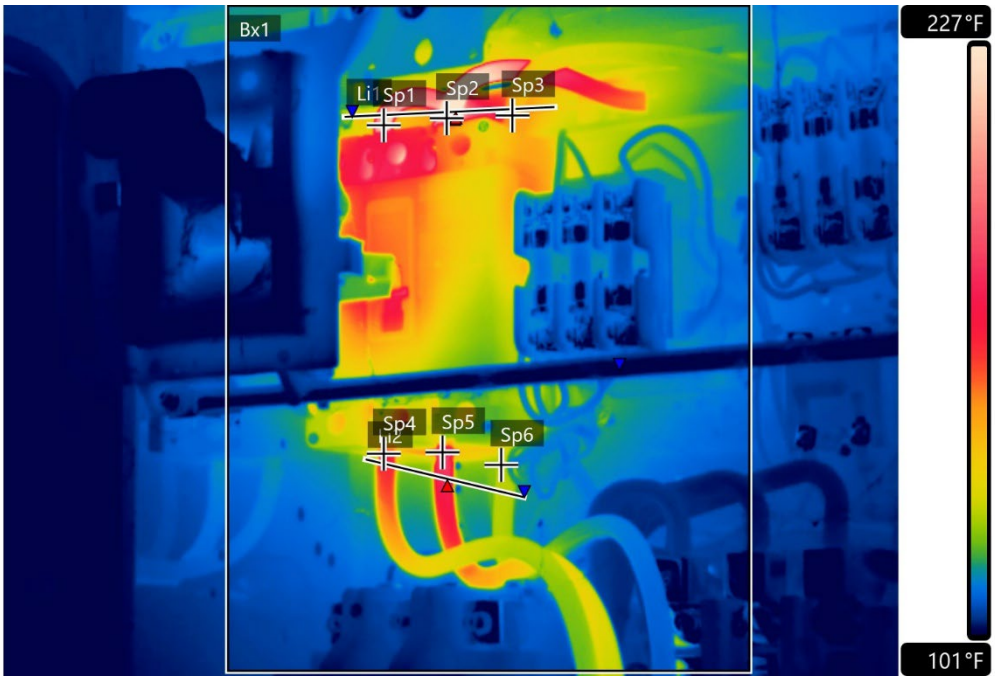


Fault	Connection issue
Defect Rating	CLASS I

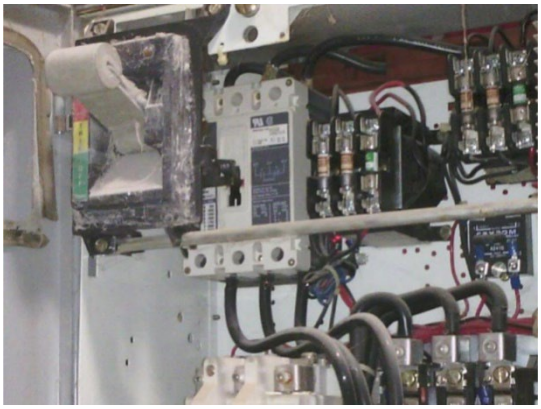
Recommendations

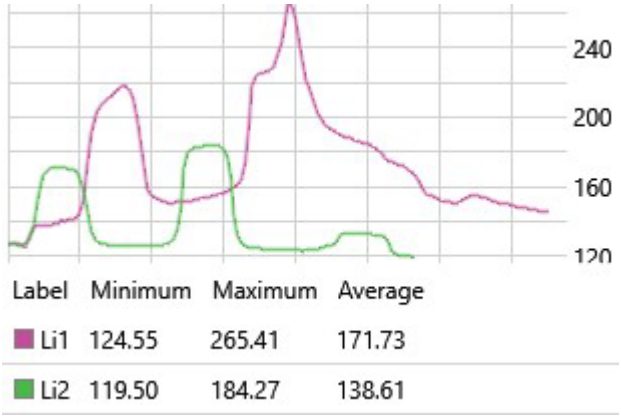
A phase likely has a connection issue. Notice in the IR image that the A phase Heater screw head is discolored. This may be influencing the emissivity of the screw which is showing a higher temp in IR image. However, there may also be a connection issue here. Inspect A phase heater connections and main lead connection as time allows.

Component	Leads/Connections
Equipment/Bucket ID	VFD-MCP2/MCC-7C1



Sp1	220.0 °F
Sp2	227.1 °F
Sp3	153.7 °F
Sp4	173.6 °F
Sp5	194.8 °F
Sp6	134.4 °F
Li1 Minimum	124.6 °F
Li1 Maximum	265.4 °F
Li2 Minimum	119.5 °F
Li2 Maximum	184.3 °F
Bx1 Minimum	94.5 °F
Bx1 Maximum	266.4 °F

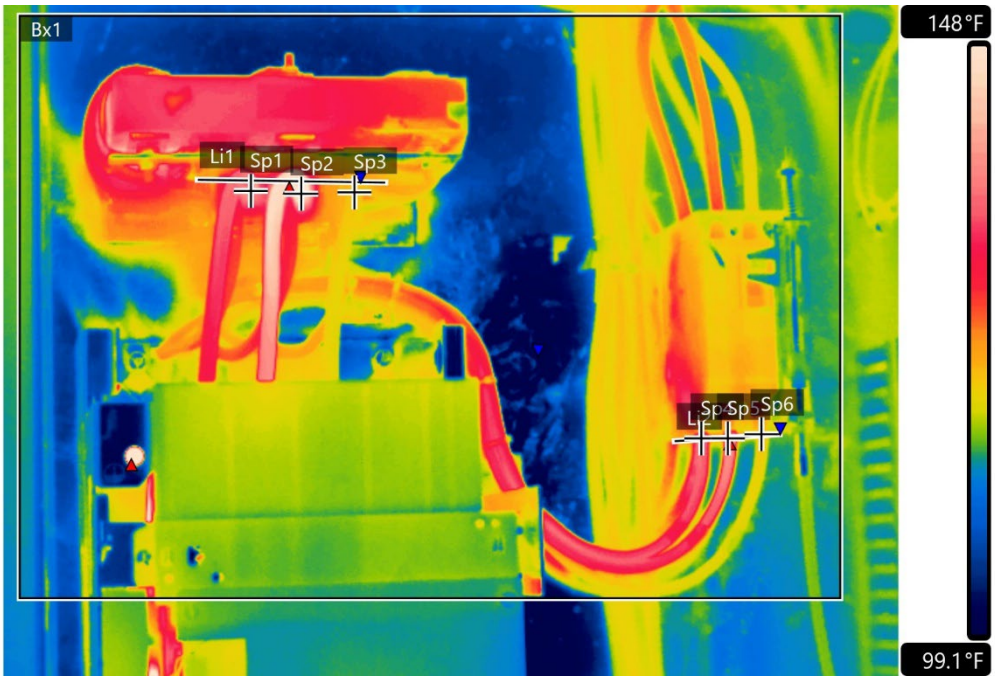




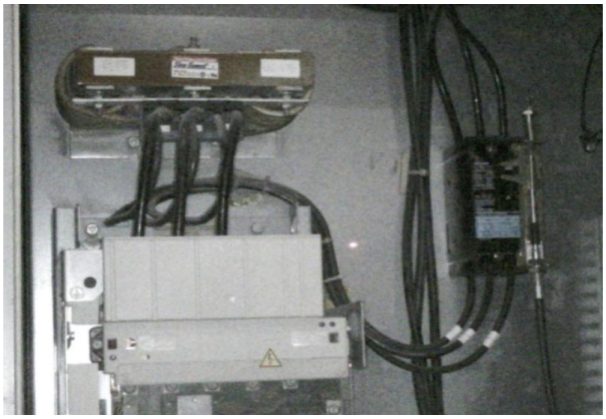
Fault	Corroded leads/Faulty connections
Defect Rating	CLASS III

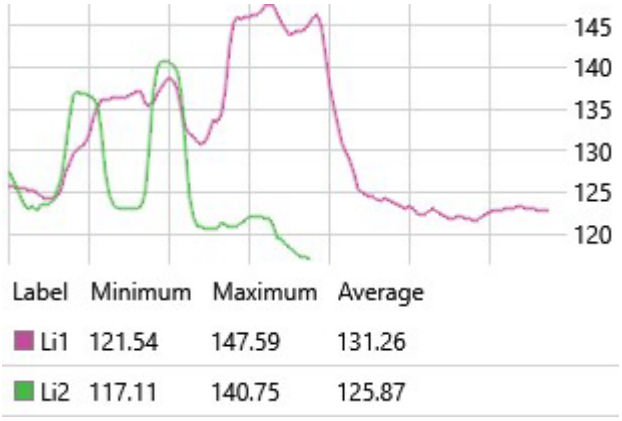
Recommendations
B phase lead connections appear to be the issue here. There is visible corrosion/oxidizing on the leads. Replace leads as needed and ensure a clean tight connection on all lead connections ASAP.

Component	Lead connections
Equipment/Bucket ID	VFD-MCP1 Machine chest pump 3B



Sp1	140.0 °F
Sp2	146.5 °F
Sp3	121.4 °F
Sp4	136.7 °F
Sp5	140.6 °F
Sp6	122.0 °F
Li1 Minimum	121.5 °F
Li1 Maximum	147.6 °F
Li2 Minimum	117.1 °F
Li2 Maximum	140.7 °F
Bx1 Minimum	97.5 °F
Bx1 Maximum	156.6 °F





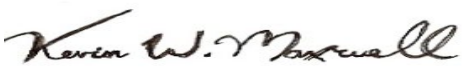
Fault	Possible connection issue/Load imbalance
Defect Rating	CLASS I

Recommendations
IR image shows a possible load imbalance and or connection issues. Inspect load on each phase and ensure all connections are clean and tight.

Summary

This concludes our survey report. Please feel free to contact us at any time for question or comments.

Thank you for your business,



ITC Certified Level II Infrared Thermographer

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