OpenVVVF

TEST REPORT

Induction Motor 1-Hour No-Load Test

> One-hour no-load run of the TECO MAX-IE3 induction motor at 120 VDC to establish a gate-driver and system thermal baseline.

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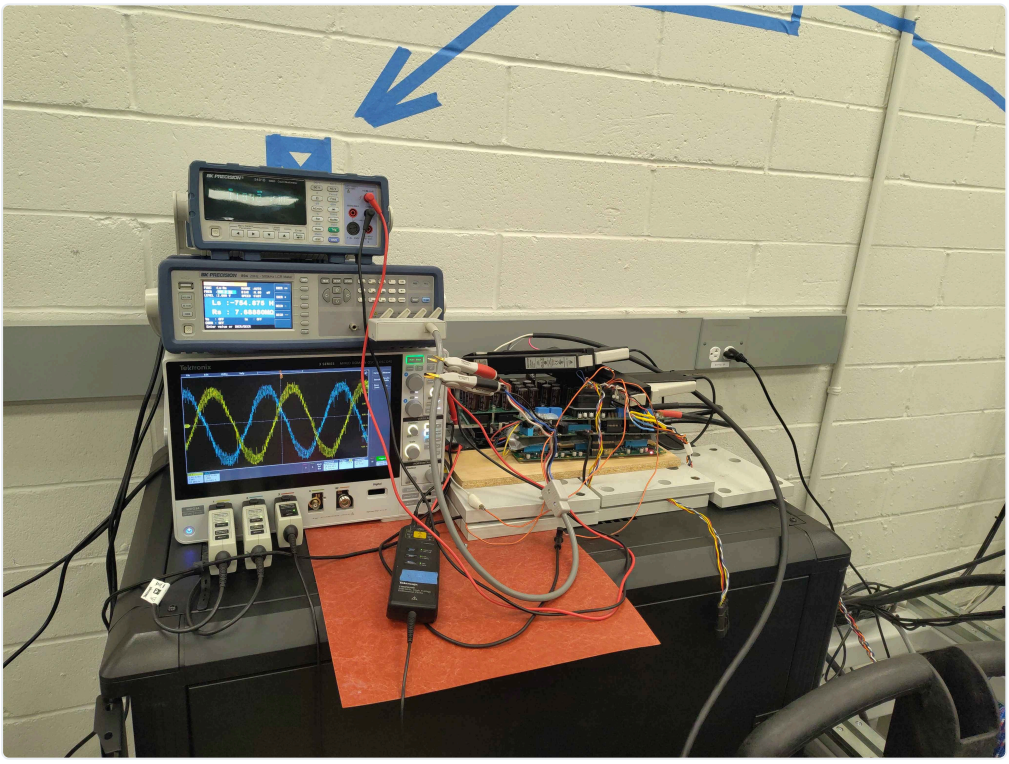
1. Induction Motor 1-Hour No-Load Test

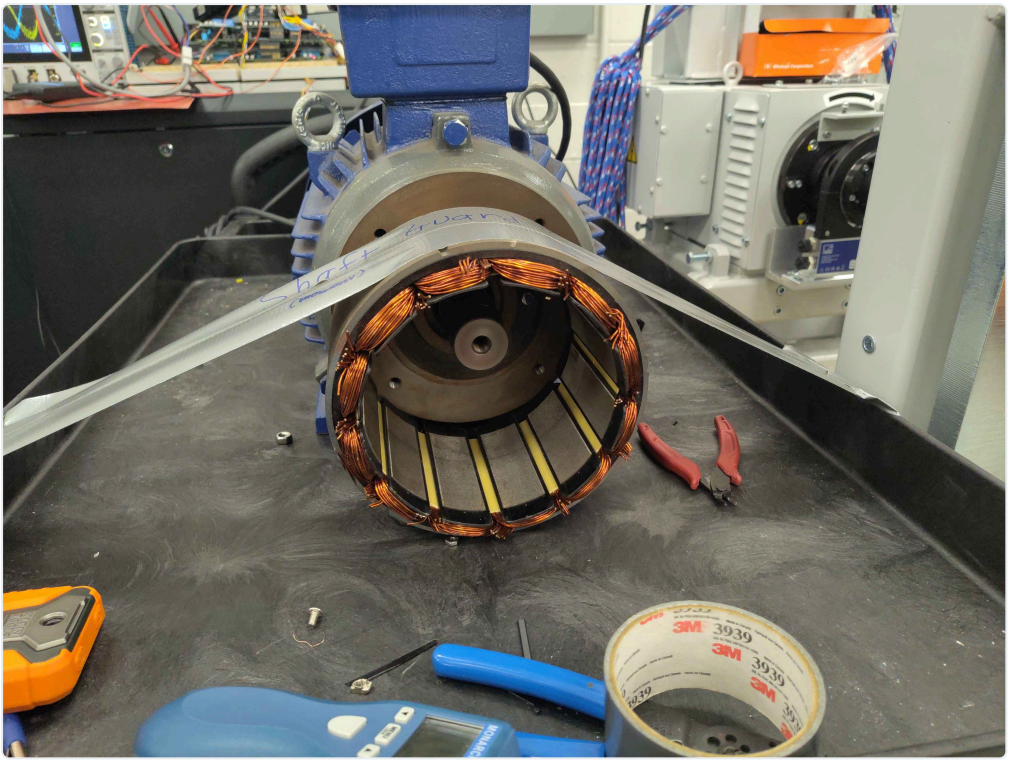
This report records a one-hour no-load run of the TECO MAX-IE3 7.5 kW induction motor powered by the C2 chassis inverter at 120 VDC. The objective is to validate gate-driver switching, confirm stable V/Hz operation, and capture a thermal baseline for the power stage and motor under light load.

1.1. Test setup

- **Motor:** TECO Westinghouse MAX-IE3 3-phase induction motor, 10 HP / 7.5 kW, 208 V, 60 Hz
- **Inverter:** OpenVVVF C2 chassis, 120 VDC bus
- **Control:** V/Hz open-loop excitation, ~60 Hz, no mechanical load
- **Instrumentation:** Tektronix 5 Series MSO oscilloscope, BK Precision 894 LCR meter, Klein Tools TI250 thermal imager



Test bench with scope, LCR meter, and C2 inverter driving the induction motor



Induction motor stator windings prior to the run

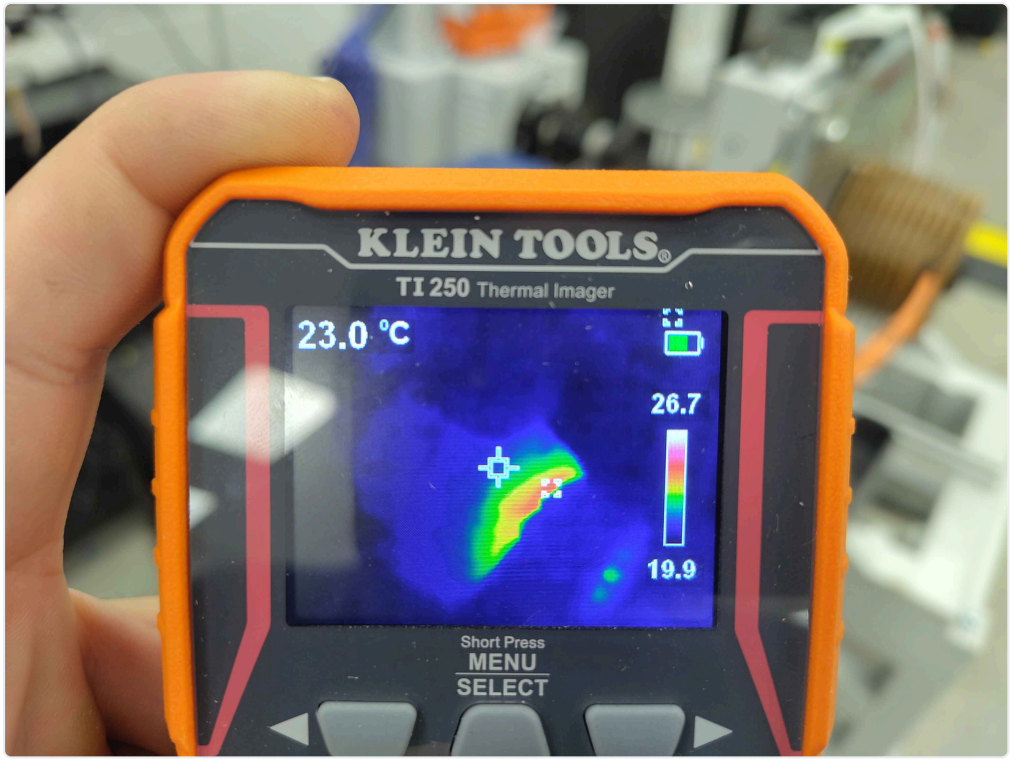
1.2. Test conditions

Parameter	Value
DC bus voltage	120 VDC
Commanded frequency	~60 Hz
Mechanical load	None (free spinning shaft)
Duration	1 hour
Ambient temperature	~23 °C

1.3. Thermal results

Thermal images were taken at several points during the run.

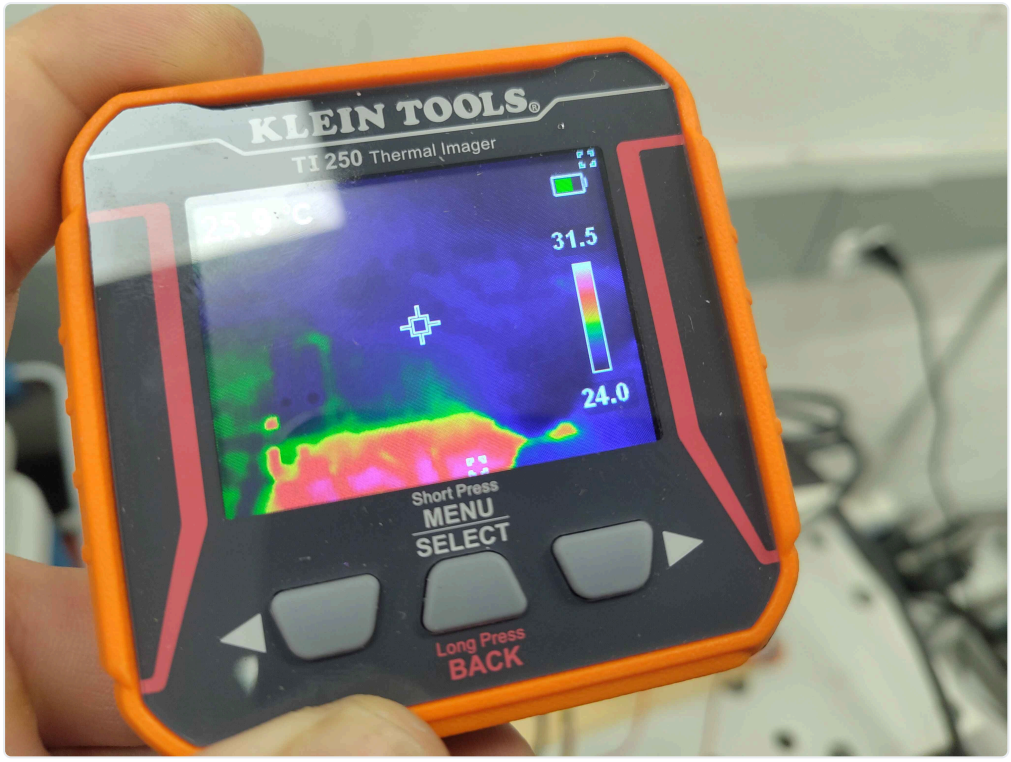
1.3.1. Motor temperature at start



Motor frame at the start of the run, ~23 °C ambient

- **Elapsed:** ~7 min
- **Approximate hotspot:** ~27 °C
- **Notes:** Frame barely above ambient.

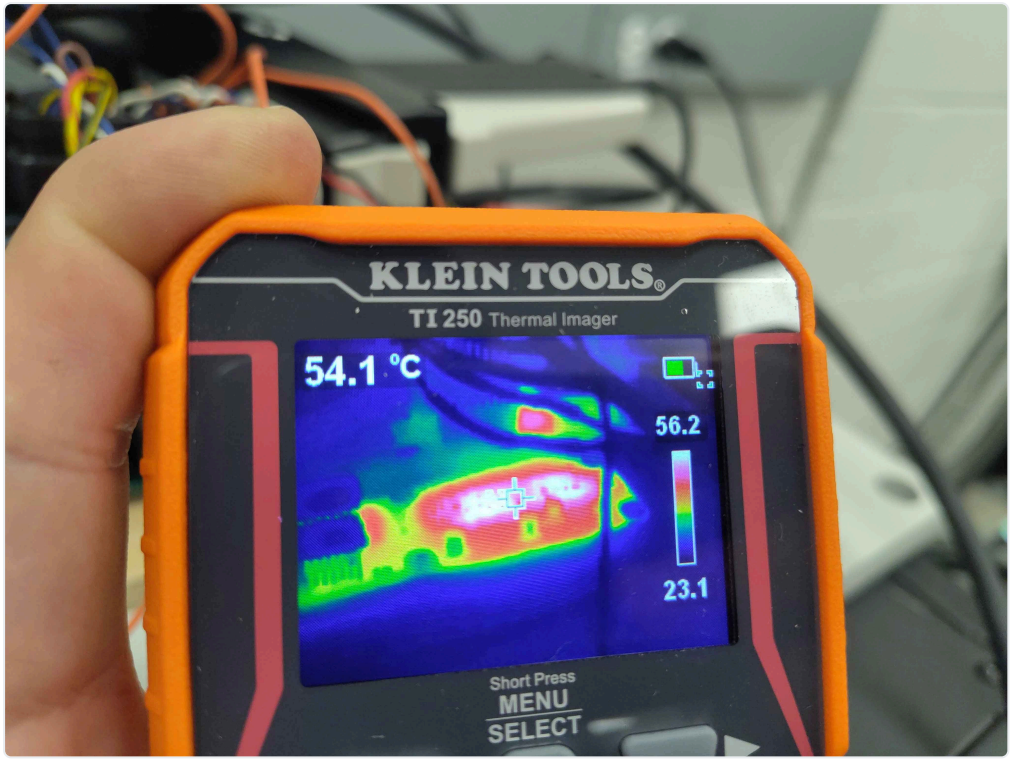
1.3.2. Power stage temperature near end



Power stage near the end of the run

- **Elapsed:** ~21 min
- **Approximate hotspot:** ~29 °C
- **Notes:** Slow, steady rise on the power stage.

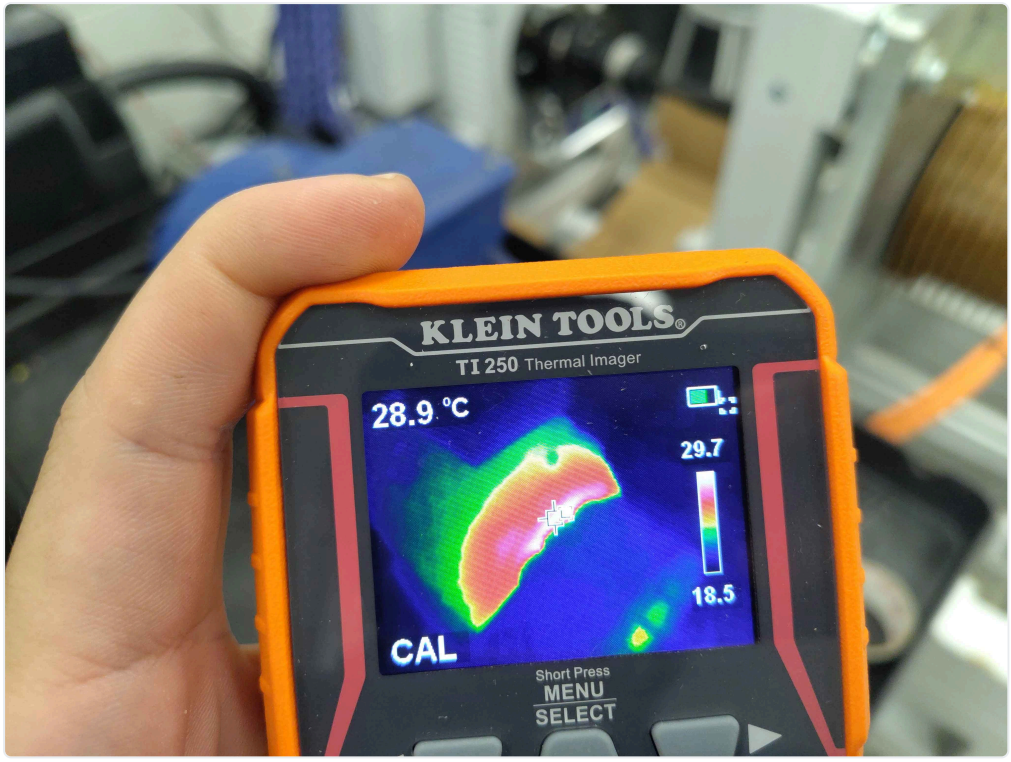
1.3.3. Hottest component: gate driver



Gate-driver area, the hottest point during the run

- **Elapsed:** ~51 min
- **Approximate hotspot:** ~56 °C
- **Notes:** Motor shell clearly warm; this shot captures the warmest region on the gate-driver board.

1.3.4. Motor temperature near end

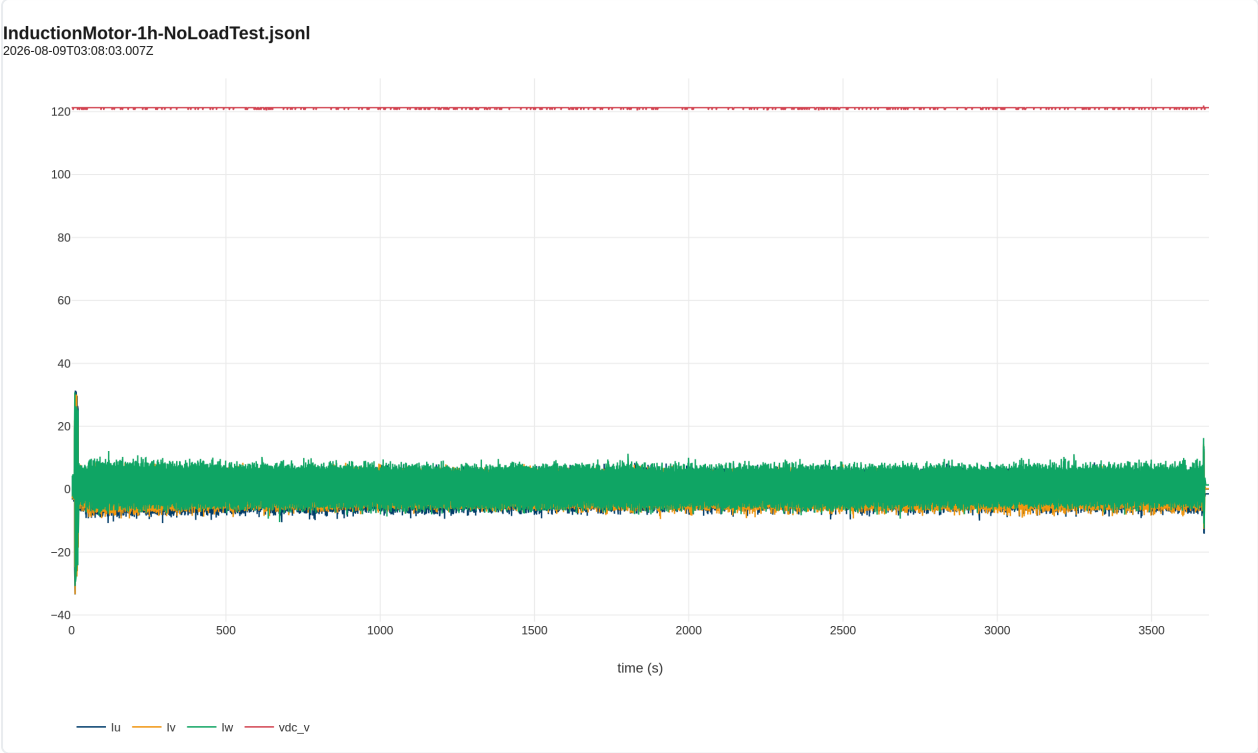


Motor frame near the end of the run

- **Elapsed:** ~57 min
- **Approximate hotspot:** ~30 °C
- **Notes:** Different spot on the frame / terminal box area.

1.4. Electrical observations

The inverter maintained stable V/Hz excitation for the full hour. Telemetry shows the DC bus held at ~121 V and the phase currents remained small, consistent with a no-load magnetizing current. The plot below is a decimated view of the entire run; the full interactive log is linked underneath.



Telemetry overview of the one-hour run: phase currents and DC bus voltage

OPEN TELEMETRY LOG:

View the 1-hour run in the Telemetry Viewer

1.5. Conclusion

The C2 inverter and gate-drive subsystem ran continuously for one hour at 120 VDC with no load without fault. The motor temperature rise was modest and consistent with no-load losses. This run establishes a baseline for future loaded thermal tests and confirms the V/Hz drive is functional on the induction machine.

1.6. Artifacts

- Decimated telemetry log (JSONL, 1 s) - open in Telemetry Viewer
- Test setup photo (JPG)
- Motor stator photo (JPG)
- Thermal images: 7 min, 21 min, 51 min, 57 min

1.7. Notes

- The full-rate telemetry log is ~164 MB; the linked file is decimated to 1 sample per second for the repository.
- Hotspot readings are from the Klein TI250 cross-hair; exact measurement location varied slightly between shots.