

Lockout/Tagout Procedure

Solar Inverter

Requirements (Apply to All Systems)

- Only qualified personnel may perform LOTO procedures.
- All personnel must be trained in:
 - LOTO procedures
 - System-specific isolation points
 - Incident response

PPE Required: Voltage-rated gloves, face shield, insulated tools, and arc-rated clothing including voltage rated boots and anything else that the site might require.

CRITICAL REMINDERS

- Lockout Tagout steps must be performed by the technician who will be performing the work using their own (Yaskawa supplied) lockout devices.
- Always verify the meter is working before using it to verify absence of power.
- Never assume zero voltage just by reading 0V — always lock out and test.
- Check for current as well to the DC and the AC terminals 0V doesn't mean 0 amps
- Solar panels generate voltage as long as there's light — disconnection is essential.
- Do not work alone — always maintain visual contact or have a standby observer.
- Take a picture of the lockout device and attach to the Service Order

Procedure: With a Combiner Box

1. **Notify Affected Personnel:** Inform operators and team members of shutdown and reason for work.
2. **Shut Down AC Side:** Open the AC disconnect or switchgear downstream of the inverter. Lock and tag. Also shut off the AC switches at the inverter and LOTO as well
3. **Shut Down Inverter:** Use inverter control panel (if available) to safely shut down inverter.
4. **Open Combiner Box Disconnect:** Locate the DC disconnect switch on the combiner box. Turn to OFF. Apply LOTO device and tag with name, date, and reason. Also shut off the DC switches at the inverter and LOTO as well
5. **Verify Absence of Voltage:** Use a multimeter to test inverter DC input and AC output terminals. Always test meter on known live source before and after.
6. **Verify the absence of current:** use the clamp meter to test inverter DC input and AC output terminals.
7. **Discharge Capacitors:** Wait manufacturer-specified time for discharge (usually 5–10 min). Confirm with meter if accessible.
8. **Perform Work:** Continue with maintenance or repair only after all verifications.

Restoration (after work is complete)

1. Remove tools and reinstall all covers.

All incidents involving injury, workplace illness, property damage, or near miss must immediately reported. Go to www.YaskawaSafety.com and open Forms page.

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2. Check the area around the area and ensure no one is exposed to any danger when power is restored.
3. Remove locks/tags in reverse order.
4. Restart inverter.
5. Notify personnel.

Procedure: Without a Combiner Box (Direct Strings to Inverter)

1. **Notify Affected Personnel:** Inform team and site leads of the upcoming shutdown.
2. **Shut Down AC Side:** Open the AC disconnect or switchgear downstream of the inverter. Apply LOTO device and tag.
3. **Shut Down Inverter:** Shut off inverter using built-in controls.
4. **Open DC Disconnect:** Locate and open the inverter's integrated or external DC disconnect. Apply LOTO lock and tag. Ensure all DC channels are disconnected.
5. **Verify Absence of Voltage:** Check inverter DC input terminals and AC output terminals for 0V.
6. **Discharge Capacitors:** Wait required time for discharge. Verify zero stored energy if access allows.
7. **Perform Work.**

Restoration (after work is complete)

1. Remove tools and reinstall all covers.
2. Check the area around the area and ensure no one is exposed to any danger when power is restored.
3. Remove locks/tags in reverse order.
4. Restart inverter.
5. Notify personnel.