SolarEdge CSS-OD: Routine Maintenance Guide

Version: 1.0

Safety Precautions

For safe and effective maintenance of the system, maintenance personnel are requested to carefully read and observe the following safety requirements.

1. Obtain an electrician's license and complete professional training before commencing work.
2. Observe related safety precautions, use necessary tools, and wear personal protective equipment.
3. It is strictly forbidden to wear jewelry or metal accessories such as watches.
4. Clean up tools and materials after maintenance and check if there are any metal objects left inside or on top of the equipment.
5. During maintenance, place a warning sign indicating that the switch must remain off at its position & for the BUI it's mandatory to use the mechanical interlock due to safety reasons.
6. Before starting maintenance or repair, It must be verified that all grounding cables are properly connected to the PE bus bars.
7. Before connecting or removing cables, disconnect lockout–tagout (LOTO) all feeders to the CSS-OD.
8. During maintenance, insulate any exposed contacts for safety reasons.
9. After completing maintenance or repair, remove the ground cable between the maintained loop and the main ground loop.
10. If you have any inquiries regarding the operation and maintenance of the equipment, please contact SolarEdge Customer Service. Unauthorized operation of the equipment is strictly prohibited.

Tools Required

Insulated gloves

Protective gloves

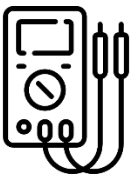
Goggles

Dust mask

Insulated shoes

Reflective vest

Safety helmet



Multimeter

Medical kit

CSS-OD: Battery Cabinet 102.4 kWh

NOTE

The battery cabinet can only be maintained by personnel with expertise in battery systems and experience in safety training.

NOTE

The battery cabinet poses potential hazards. Ensure proper precautions are taken during its operation and maintenance. Improper operation may lead to severe personal injury and significant property damage.

NOTE

The battery cabinet must be operated using appropriate tools and protective equipment.

NOTE

Do not open the door to maintain the Battery Cabinet in rainy, humid or windy days. SolarEdge shall not be held liable for any damage caused by violation of the notice.

NOTE

To avoid electric shock, do not perform any other maintenance operations beyond those described in this manual. If necessary, contact SolarEdge Customer Service.

Monthly Maintenance Routine

If CSS-OD is installed in ambient temperature higher than 35°C or lower than 0°C, the following shall be maintained monthly.

Device	**Action Required**	**Pass Criteria**	**Power – Off Required**
HVAC	1. External & internal visual examination 2. Audial check-up of the fans noise	1. There are no visible signs of damage to the appearance of the HVAC. 2. There are no obvious indications of paint peeling or rust. 3. The screws are firmly secured. 4. The fans rotate smoothly without abnormal sounds. 5. The filter is clean and free from any blockages.	No

Quarterly Maintenance Routine

Device	**Action Required**	**Pass Criteria**	**Power – Off Required**
Battery Cabinet	1. External & internal visual examination 2. Rust checkup 3. Door lock visual & physical evaluation 4. Door seal inspection	1. Cabinet coating shows no signs of peeling or scratching. 2. There are no visible indications of paint peeling or rust. 3. The door locks remain undamaged. 4. No dust is present at the vents.	No

		5. There are no insects, rodents or other animals present. 6. The integrity of the sealing strip should undergo thorough inspection, and any damage should be promptly replaced to maintain its effectiveness. 7. Ensure there are no flammable objects around the Battery Cabinet.	
HVAC	1. External & Internal visual examination 2. Audial check-up of the fans noise 3. Review vent condition 4. Filter cleaning[1] [2]	1. There are no visible signs of damage to the appearance of the HVAC. 2. There are no obvious indications of paint peeling or rust. 3. The screws are firmly secured. 4. The fans rotate smoothly without abnormal sounds. 5. The filter is clean and free from any blockages.	Yes[3]
Cluster management units (x2)	Check the indicator status of the cluster management unit	Indicator light shall be solid green	No
Power distribution area	Check whether there are foreign objects in the power distribution area.	1. The area is clean and free from foreign objects. 2. Sealing Clay Integrity (no signs of crack). If needed, replace it.	No

Semi – Annual Maintenance Routine

Device	**Action Required**	**Pass Criteria**	**Power – Off Required**
HVAC	1. External & Internal visual examination 2. Rust checkup including the screws holding the HVAC 3. Fans visual & noise inspection 4. Filters visual inspection 5. Clean the air filter of the external fan	1. The appearance shows no evident damage. 2. There are no noticeable signs of paint peeling or rust. 3. The screws are firmly secured. 4. The fans rotate smoothly without abnormal sounds. 5. The filter is clean and free from blockage	No
Smoke detector, Temperature & humidity sensor	Conduct spot checks on the smoke detector and temperature & humidity sensor using dedicated devices that generate smoke or heat.	The smoke detector indicator shows a steady red light, and the temperature sensor reports the temperature change on the Battery Cabinet HMI main screen	No

Fire Suppression Module	1. Check the green led indicator on the on the JR10 fire suppression control box. 2. Visually examine the fire suppression modules 3. Ensure that wiring from aerosol units is undamaged, securely connected, and not lose or disconnected.	1. Pressing the test button, if the circuit detection indicator light on the right side of the control panel is on, it indicates that the fire suppression system is properly connected. 2. The module is clean and free of dust. 3. Cables are intact and securely connected. (In case of disconnected, cables can be connected only when no power is supplied to starter box) 4. Verify status of the fire suppression module on the HMI main screen.	Yes[3]

Annual Maintenance Routine

Device	**Action Required**	**Pass Criteria**	**Power – Off Required**
Energy Module	1. Visual Inspection 2. Rust checkup including the external screws 3. Front vent opening	1. The appearance shows no evident damage. 2. There are no noticeable signs of paint peeling or rust. 3. The screws are firmly secured. 4. The front panel vent is clean and free from blockage.	Yes[3]
Cluster management units (x2)	Check the indicator status of the cluster management unit	Indicator light shall be solid green	No

[1] The recommended tool for filter cleaning is high pressure water gun or air gun externally only.

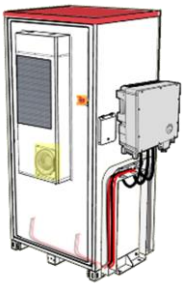
[2] In sandstorm-prone areas, it is recommended to clean the filter after each sandstorm and before each summer.

[3] Detailed power – off sequence is elaborated below, follow it.

Devices & items visual illustrations (highlighted)

1 Battery Cabinet HVAC Vent

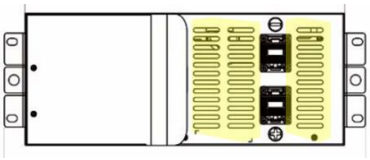
2 HVAC external fan filter



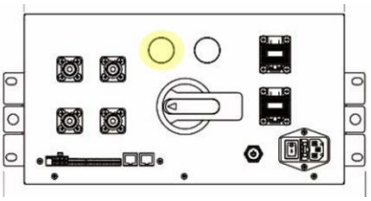
3 JR10 fire suppression control box

(located on the bottom left area of the Battery Cabinet)

4 Energy Module front vent opening



5 Cluster Management Unit (green indicator)



CSS-OD: Battery Inverter 50 kW

Semi – Annual Maintenance Routine

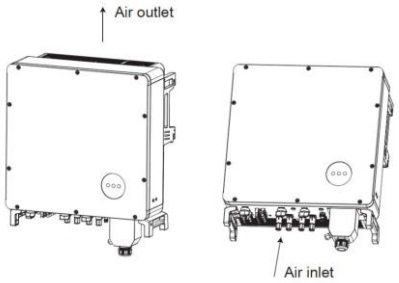
1. Visual Inspection: observe whether the Battery Inverter is damaged, deformed or rusted.
2. Audial Inspection: Listen to whether there is any abnormal sound during the operation of the power conversion system. Try to detect if any abnormal vibrations occur during the running of the fan.
3. Validate all settings are correct via BUI100/250 HMI & ONE for C&I cloud platform.
4. Air Duct: check dust in the air duct and clean it if it is dusty.
5. Verify whether BAT1 & BAT2 DC switches are in correct position.
6. If the external layer of paint of the battery inverter is damaged, it is required to repaint it.

Annual Maintenance Routine

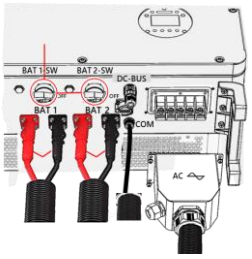
1. Check for any loose or poorly connected electrical connections.
2. Inspect all cables and their contact points for damage or scratches.
3. Verify that the insulation tape on any wiring terminals is intact.
4. Inspect the warning signs on the machine body and other equipment symbols. If any symbol is blurred or damaged, replace it promptly.

Battery Inverter component's location and designation

1 CSS-OD: Battery Inverter Air Duct



2 BAT1 & BAT2 DC Switches



CSS-OD: Commercial Backup Interface 100 / 250 kW

NOTE

Before beginning the maintenance procedure, disconnect all power sources and initiate the Lockout-Tagout (LOTO) process to ensure they remain disconnected throughout the maintenance. Remove covers and verify the absence of voltage using a voltage tester or multimeter. Ensure the accuracy of your tester by checking it on a known live source before and after testing the circuit.

NOTE

The BUI device contains lethal high voltage, posing a risk of fatal electric shock if accidentally touched. After shutting down the machine, wait at least 10 minutes before opening the cabinet door. Ensure the unit is completely de-energized before conducting any maintenance.

NOTE

Only qualified and authorized personnel are permitted to perform maintenance and other operations on the Commercial Backup Interface cabinets. When conducting maintenance, do not leave metal parts such as screws and washers inside the Commercial Backup Interface cabinet, as this can cause equipment damage.

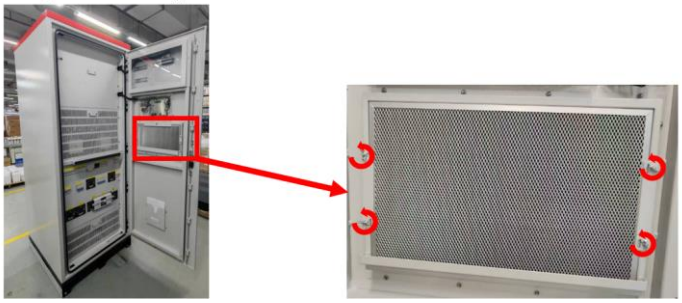
NOTE

Wind, sand, and moisture can damage the electrical equipment inside the system cabinet or impact its operational performance. Do not open the Commercial Backup Interface cabinets door during sandy seasons or when the relative humidity exceeds 95%. Do not begin maintenance work until there is no sand, and the weather is clear and dry.

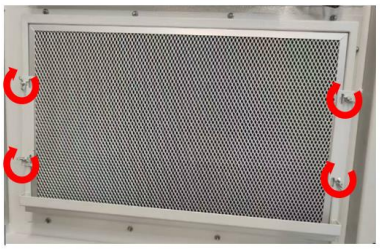
Semi – Annual Maintenance Routine

1. The environmental conditions where the BUI is situated, such as temperature, humidity, dust, and equipment vibration, lead to dust accumulation inside it. This can block air inlets and outlets or infiltrate internal equipment, potentially causing failures and shortening equipment lifespan. Regular inspections and cleaning during equipment operation are necessary to maintain a relatively favorable operating environment for internal equipment.
2. Perform corrosion inspections on all metal components.
3. Internal cleaning shall be conducted every six months with a vacuum cleaner.
4. After completing the cleaning task, it's important to verify whether the door locks, hinges, and other components of the BUI are functioning properly and in good condition. If needed, ensure proper lubrication of the door lock hole, hinges, etc.
5. BUI Cabinet Interior Inspection
    a. Inspect the inside of the BUI for foreign objects, dust, dirt, and condensation.
    b. Check that all cable inlet and outlet cabling openings of the BUI are well sealed.
    a. Inspect the BUI and internal equipment for damage or deformation.
    b. Inspect the BUI for any water leakage.
    c. Check for any loose or fallen screws inside the BUI.
    d. Listen for abnormal noise from the internal equipment during operation.
    e. Verify that the temperature inside the BUI via the screen / C&I ONE platform is ≤ 65 °C.
    f. Check that the weld joints between the BUI and the steel plate are secure and free of rust.

6. BUI Cabinet Exterior Inspection
    a. Surface dirt resulting from water stains and dust shall be cleaned directly.
    b. If the external layer of paint of the cabinet is damaged, it is required to repaint it.
    c. Confirm that the BUI air inlet and outlet are not blocked.
    d. Ensure there are no flammable objects around the BUI.
7. Filters Inspection
    a. Door Front Filter
    b. Door Rear Filter
    c. Cabinet bottom (x3) filters
    d. Filter cleaning procedure: (equivalent both for BUI100 & BUI250)
        i. <u>Front door filter</u>
            ① Open BUI main door.
            ② Validate BUI is completely switched – off (see last chapter for correct sequence).
            ③ Locate the front main filter on the front door.
            ④ Remove the screws fixing the filter cotton from the ventilation port of the front door of the front door.



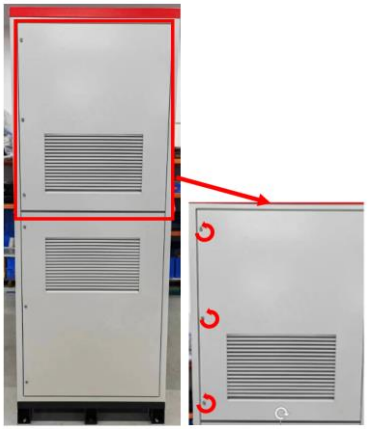
            ⑤ Take out the filter cotton and tap it gently to remove larger foreign object and dust.
            ⑥ Use clean water and dust remover to clean thoroughly with a cleaning brush to remove dirt and impurities and restore it to a clean state.
            ⑦ After the filter cotton is completely dry, install the filter cotton and fix the filter cotton with the 4 fixing screws, as shown in the picture below.



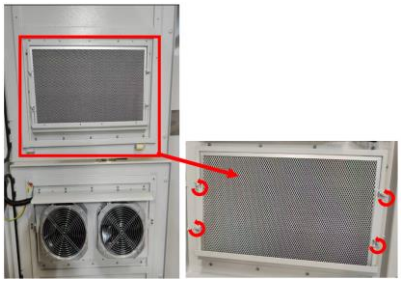
            ⑧ Reassemble all components back to their original location.

ii. Rear door filter

① Use a Phillips screwdriver PH3 to open (CCW) 3x M6 screws on the upper rear door panel of the BUI.



② Remove the four M4 screws of the fan filter. (CCW)



③ Take out the filter cotton and tap it gently to remove larger foreign object and dust.

④ Use clean water and dust remover to clean thoroughly with a cleaning brush to remove dirt and impurities and restore it to a clean state.

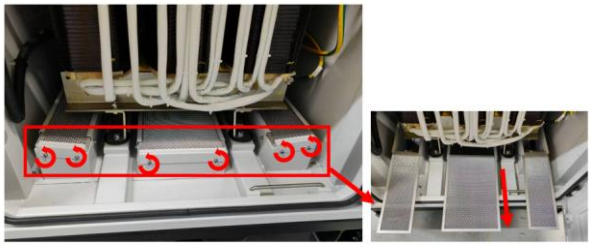
⑤ After the filter cotton is completely dry, install the filter cotton and fix the filter cotton with the 4 fixing screws, as shown in the picture below.

⑥ Reassemble all components back to their original location.

iii. Rear bottom filters

① Use a Phillips screwdriver PH3 to open (CCW) three (x3) M6 screws on the lower rear door panel of the BUI.

② 2. Use a Phillips screwdriver PH2 to remove the six screws of the three bottom filters.



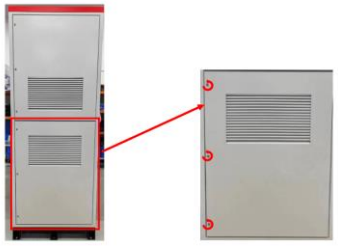
③ Use clean water and dust remover to clean thoroughly with a cleaning brush to remove dirt and impurities and restore it to a clean state.

④ After the filter cotton is completely dry, install the filter cotton and fix the filter cotton with the 4 fixing screws, as shown in the picture below.

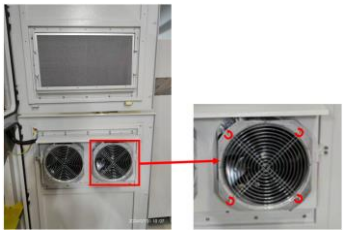
⑤ Reinstall the bottom filters.

⑥ After completing the above steps, use a Phillips screwdriver PH3 to lock and secure the lower rear door panel of the BUI.

8. Fans Inspections & treatment
   a. Check the running status of the fan on rear side of the BUI.
   b. Ensure the fan area is not blocked.
   c. Listen for any abnormal noise when the fan is operating.
   d. After a sandstorm or strong winds carrying sand, conduct an exterior and fan inspection immediately If the fan is blocked, it must be cleaned.
   e. Fan & Fan Filters cleaning procedure:
      i. Validate BUI is completely switched – off & review all notes on the start of this chapter
      ii. Use a Phillips screwdriver (PH3) to open (CCW) x3 M6 screws on the lower rear door panel of the BUI.

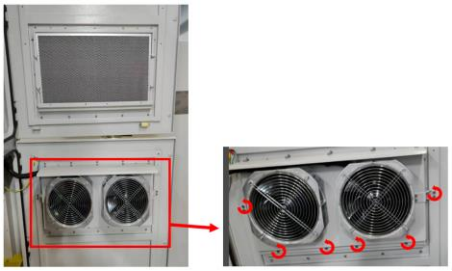


      iii. Use a Phillips (PH2) screwdriver to open 4x M4 screws holding the fan rear door.



      iv. Rotate the fan blades to observe and remove any larger foreign object. Then wet the cleaning cloth with water and wipe off the dust on the fan blades.

v. Use a Phillips screwdriver PH2 to open (CCW) the 6x M4 screws on the AC fan fixing plate.



vi. Take out the fixing plate of the AC fan, and then you can take out the filter cotton of the fan smoothly, as shown in Figure 7.3.

vii. Clean the filter with the same procedure as for 7.d.

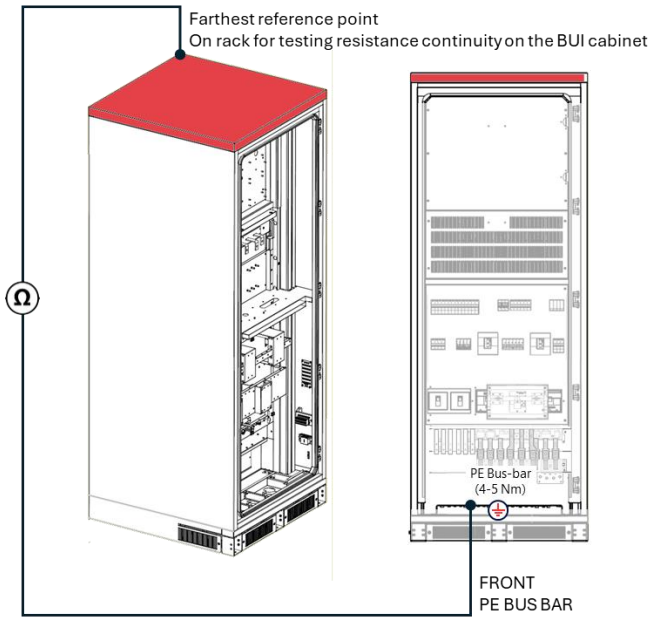
viii. Reassemble all components back to their original location.

9. Door Seal Inspection:

   a. The integrity of the sealing strip is crucial to effectively prevent water infiltration inside the BUI cabinet. It should undergo thorough inspection, and any damage should be promptly replaced to maintain its effectiveness.

Annual Maintenance Routine

1. Wiring and Cable Routing
    a. Check if the power cable connections are loose and retorque them according to the specified torque in the quick installation guide.
    b. Inspect the power cables and control cables for damage, especially for any cuts on the insulation where they contact metal surfaces.
    c. Ensure the insulation wrapping tape on the power cable terminals is intact and not peeled off.
2. Grounding and Equipotential Bonding
    a. Verify that the grounding connection is correct, ensuring the grounding resistance is less than 4Ω.
    b. Ensure the equipotential connection inside the BUI is correct.



Commercial Backup Interface 100 component's location and designation

1 BUI100 Fan Location
(Rear side of the BUI100 cabinet)

3 BUI100 bottom rear filters (x3)

4 BUI100 rear door filter

5 BUI100 front door filter

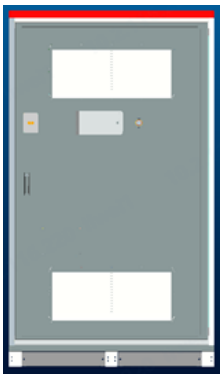
Commercial Backup Interface 250 component's location and designation

1 BUI250 Fan Location
(Rear side of the BUI250 cabinet)

3 BUI250 bottom rear filters (x3)

4 BUI250 rear door filter
(top left door)

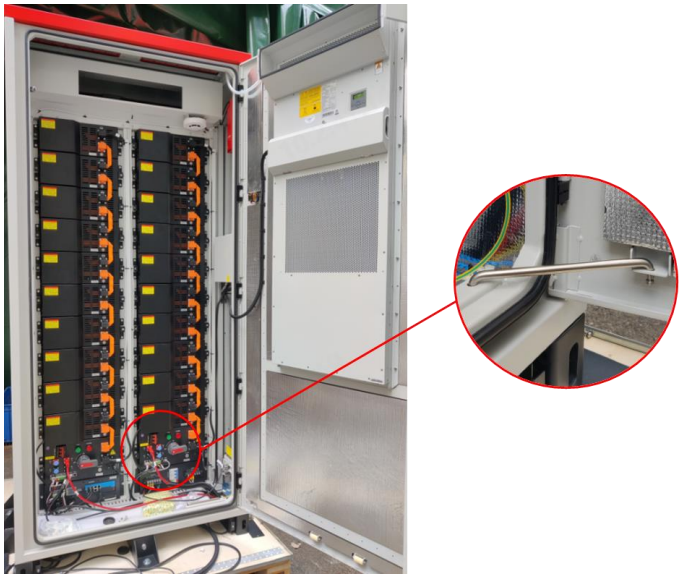
5 BUI250 front door filter (x2)



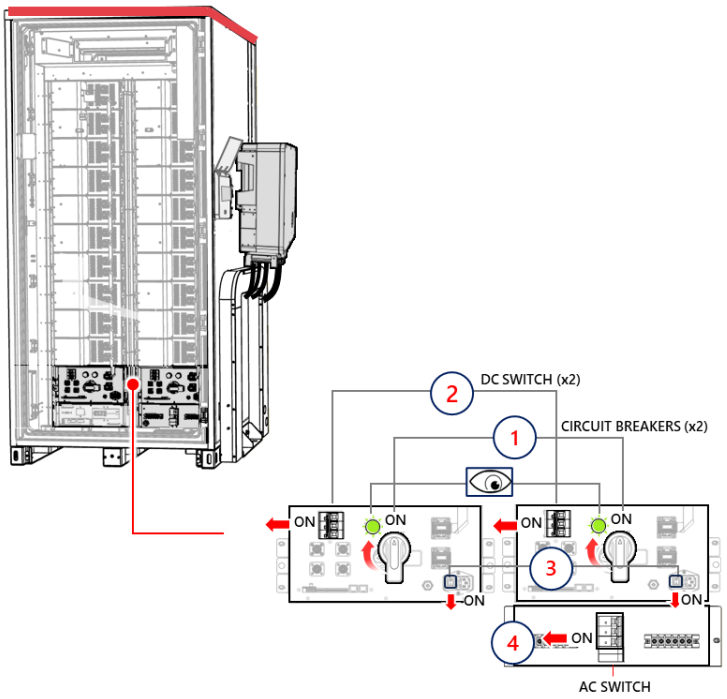
System Power – Off Sequence

1 CSS-OD: Battery Cabinet 102.4 kW

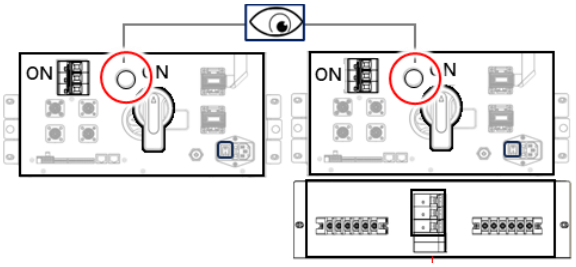
1. Open the battery cabinet front main door & secure it with a dedicated holding bar.



2. Toggle – off the numbered switches in the following order.
    a. 1 – Cluster Management Unit DC Breakers (x2)
    b. 2 – DC Switches (x2)
    c. 3 – Input AC Aux (x2)
    d. 4 – AC Switches (x2)

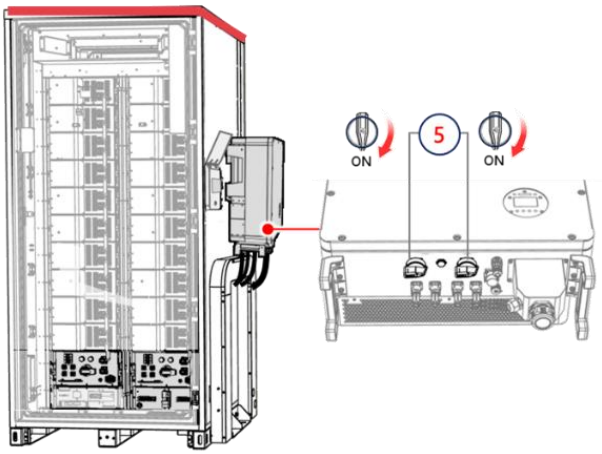


3. Validate cluster management LED indicator in “off” in all batteries entering maintenance.

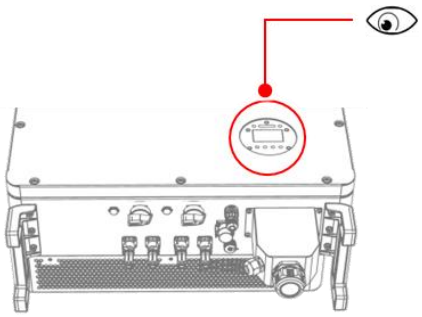


2 CSS-OD: Battery Inverter 50 kW

1. Toggle – off the DC Switches (x2) of the battery Inverter.



1. Battery Inverter “Running“ Indicator is in “off”.



3 CSS-OD: Commercial Backup Interface 100 kW

1. Open the BUI100 front main door & secure it with a dedicated holding bar.

2. Switch – off the numbered switches in the following order.