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O & M Manuel.

For

Roof Top Grid Tied Solar PV Plant.

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OPERATION CHART

Turn on the PV Inverters

Turn ON MCCB on the Solar AC Metering Panel
Turn ON Inverter MCBs on the AC Metering panel
Turn ON PV LOAD SWITCH of individual Inverters

To Turn – off PV Inverters

Turn off PV load switch at the bottom of the Each inverter
Turn off inverter MCBs on the Solar AC Metering Panel
Turn off Inverter MCCB on the Solar AC Metering panel

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O&M MANUAL

Please read and follow the following steps for preventive maintenance & regular operation.

TO START POWER GENERATION:

STEP1: Check whether all the disconnector switches are in ON position in Disconnector box.

STEP2: Charge the AC metering panel by Turning ON the main MCCB which is located in front of panel. After charging ON indicator (RED) will be glowing in the AC metering panel.

STEP3: Switch ON all inverter MCB's in AC metering panel.

STEP4: Turn PV load switch ON, which is located below the each inverters.

STEP5: Wait for a while, the inverter starts automatically if sufficient solar irradiation is available. The start-up will take few minutes. During this period, the inverter performs a self-test.

STEP6: After successful completion of self test the inverters will try to synchronize with EB grid supply. It will be indicated by means of flashing (green) ON LED

STEP7: After synchronization the ON LED will glow steady.

TO STOP THE GENERATION

STEP1: Turn PV load switch OFF, which is located below the each inverters.

STEP2: Switch OFF all inverter MCCB's in AC metering panel.

STEP3: Turn OFF the main MCCB in AC metering Panel. OFF indicator (Red) will glow in AC Metering Panel

HOW TO RESTART A PARTICULAR INVERTER IN CASE OF ERRORS OR FAILS TO SYNCHRONIZE?

Hardware Method

Restart both PV and AC input to the inverter →wait for 2 minutes →Switch ON AC →Wait until restart (Follow procedure given under "Restart").

MAINTENANCE:

1. **PV MODULE:**
   a. All PV modules should be cleaned well periodically at the interval of a week (depends on the dust & dirt conditions of the operation environment).
   b. During the PV module cleaning, it is advised to turn off AC MCCB.

MODULE CLEANING:

Items required:

1. Clean water
2. Soft brush / Plastic scourers

For safety reasons, it's advised to clean your panels from the ground if possible. A good quality soft brush and a squeegee with a plastic blade on one side and a cloth covered sponge on the other coupled with a long extension can make for the perfect tools allowing you to stay on the ground. Use a hose with a suitable nozzle to allow the stream of water to reach the panels.

NOTE: If cleaning your panels from the ground is not possible, do not attempt to access your rooftop unless you have the appropriate safety equipment and training. If you don't; hire a suitably qualified professional instead.

Caution: avoid detergents & mineral rich hard water; don't use metal objects or harsh abrasive products for removing caked on materials.

For oil stains:

Isopropyl alcohol can be used as a spot – cleaning substance.

2. INVERTER:

- Normally, the inverter needs no maintenance or calibration.
- Ensure that heat sink at the rear of the inverter is not covered.
- Clean the contacts of the PV load switch once per year.
- Clean by cycling the switch to on and off positions 10 times. The PV load switch is located at the base of the inverter.
- For correct operation and long service life, ensure free air circulation around the heat sink at the top and side of the inverter where the air exhausts, and to the fan at the inverter base.
- To clear obstruction, clean using pressurized air, a soft cloth, or a brush.
- Close all the unused connectors with the blank caps and do not remove it

3. Dos & Don'ts:

1. Do not touch the inverter heat sink during operation.
2. Do not remove or pull out any connection in the system (PV array and panel) while the inverters are loaded.
3. Avoid all possibilities of shadows on the PV modules. Do not allow anything to place on the top of the PV modules.
4. In case of any physical damage of any of the PV modules in the system, keep the string isolator switch turned off until it is replaced.
5. It is important to periodically check the earthing of the inverter. Ensure that the bolting to the ground stud of the inverter is tightened and free of corrosion.
6. Check the MC4 connectors used in the PV array is locked tightly and having good IP65 protection and free from dust or dirt accumulation.
7. In case of any errors note down the error code from display and wait for at least 10 minutes, let the inverter recover by its own automatically.
8. Even after 10 minutes if the problem persists and inverter fails to recover on its own refer the operating manual with error code and do as it guides.
9. In case of any unknown errors or faults, deactivate the inverter immediately and inform TORP Systems as soon as possible.
10. For more details, read the operators manual supplied by Inverter manufacturer.

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FOR THE CUSTOMER'S KNOWLEDGE:

- If the operating temperature of the PV modules increases, the energy conversion will proportionally decrease.
- No user serviceable parts inside the inverter.
- Even if a small portion of a module is subjected to shadow, it will affect the power generation of the entire string drastically.
- The instantaneous parameters, yield for the day, etc are displayed on the graphic LCD during the normal operation.
- The maximum operating temperature of the inverter must be less than 55°C. If the room temperature exceeds this level, the inverters get turned OFF and allow getting the temperature to cool down.
- MFM in AC metering panel shows the total energy generated from the solar PV module in kWh.