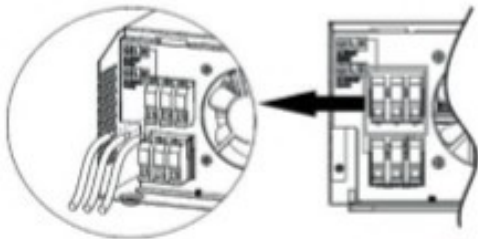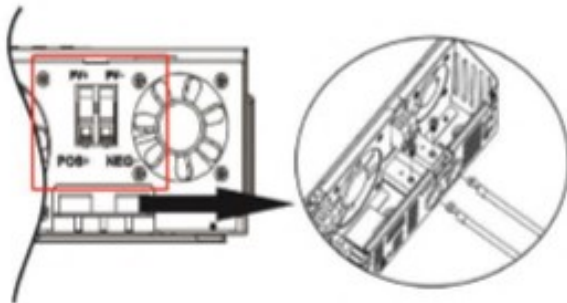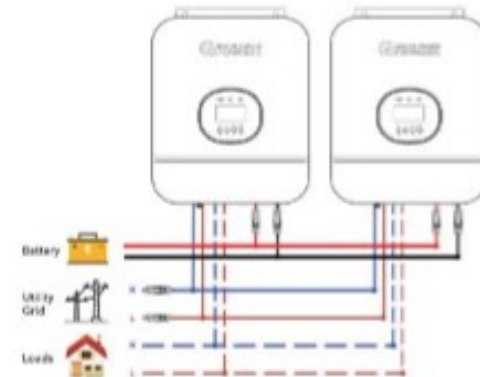# Preparation

Note:

1. All wiring must be well-fastened to avoid shedding.

2. Make sure that the polarity of PV and batteries connected to the product is correct.

3. Should install utility, battery and PV input switch to ensure safety.
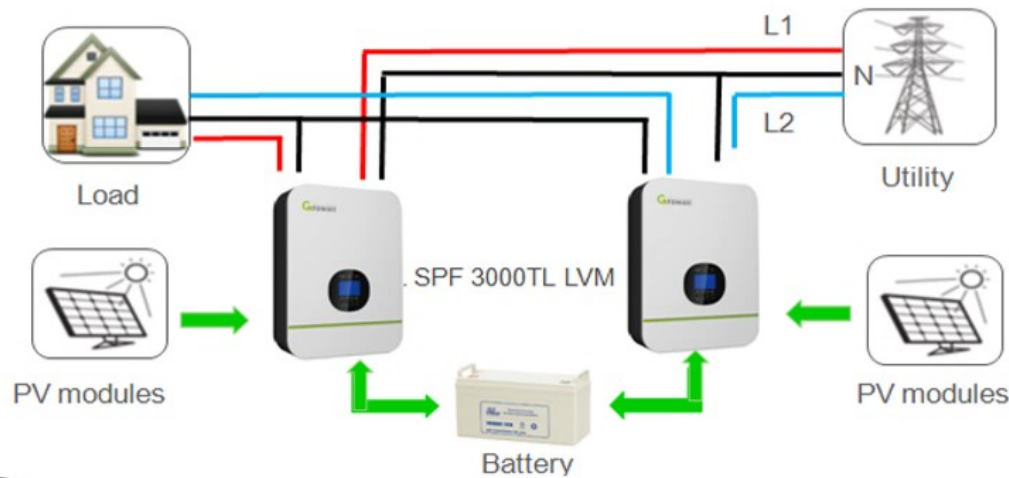
4. Battery and solar panel connections must be within the parameters of the product.

Key Features

Growatt powering tomorrow

SPF 3000TL LVM
(Offered Split-phase)

Load

PV modules

SPF 3000TL LVM

Battery

PV modules
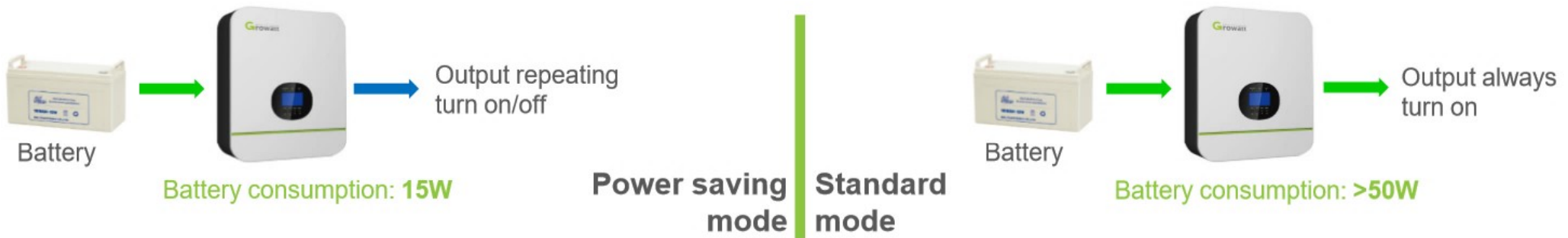
L1

N

L2

Utility

Support

1. Power factor 1.0

2. MPPT solar charge controller

3. WIFI/GPRS remote monitoring

4. Compatible with generator power

5. Configurable AC/solar input and charging priority

6. Parallel operation available

7. Compatible with lithium battery

8. Low voltage 120Vac output

Operation Benefits

Growatt
powering tomorrow

## Power Saving Mode

When the load is pretty low or not, inverter will turn off the output (Low consumption from battery)

Battery → [Inverter] → Output repeating turn on/off

Battery

Battery consumption: **15W**

Power saving mode | **Standard mode**

Battery → [Inverter] → Output always turn on

Battery

Battery consumption: **>50W**

Off-Grid System Overview

Growatt

Off-grid energy storage system is generally consist of PV modules, off-grid inverter, MPPT charger controller (bidirectional DC/DC converter), battery, generator, monitoring devices and electrical appliances.

PV modules

Battery

Utility

Generator

AC load

Off-grid inverter with MPPT charger controller
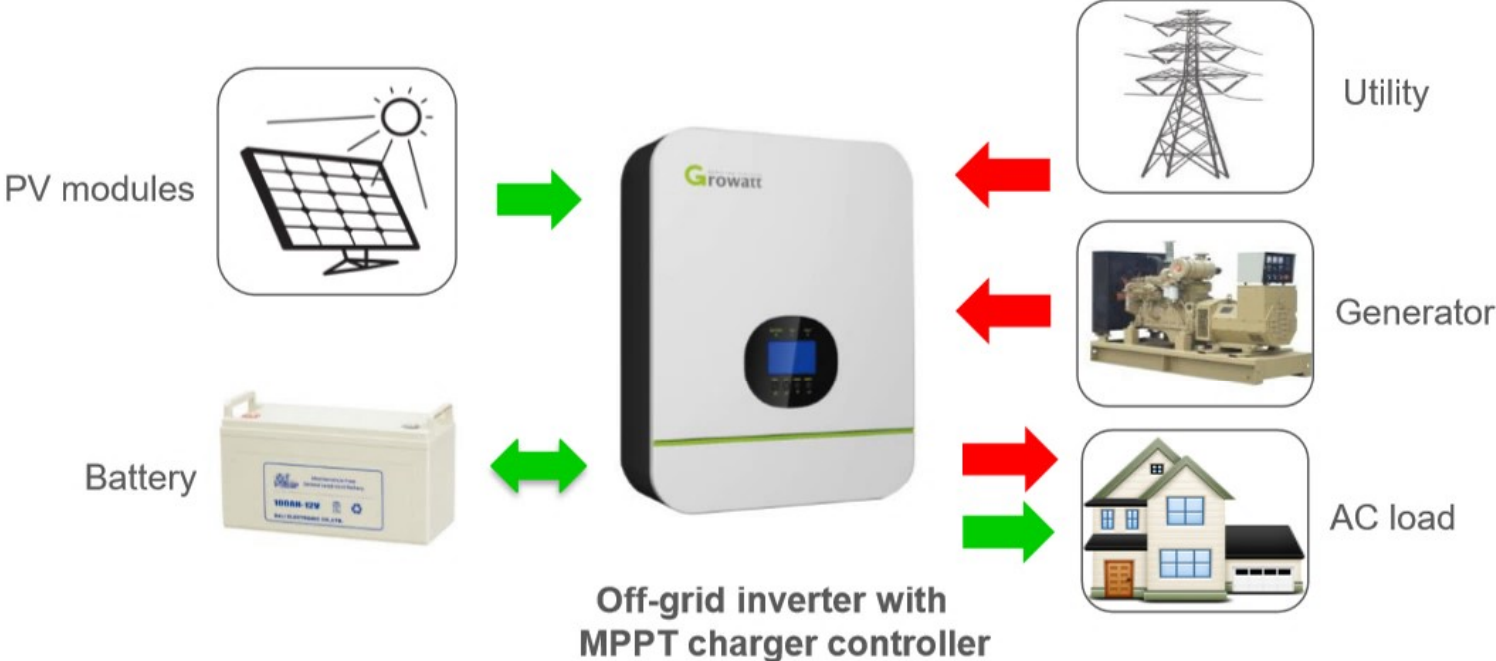
Operation Functions

Output priority mode setting:

1. SOL first
2. UTI first
3. SBU first

Charging priority mode setting:

1. CSO first   4. OSO
2. CUT first
3. SNU first

Off-Grid inverter with MPPT charge controller

PV modules → Growatt ← Utility

Battery ↔ → AC load

Off-grid inverter

Monitoring Platform

Remote monitoring
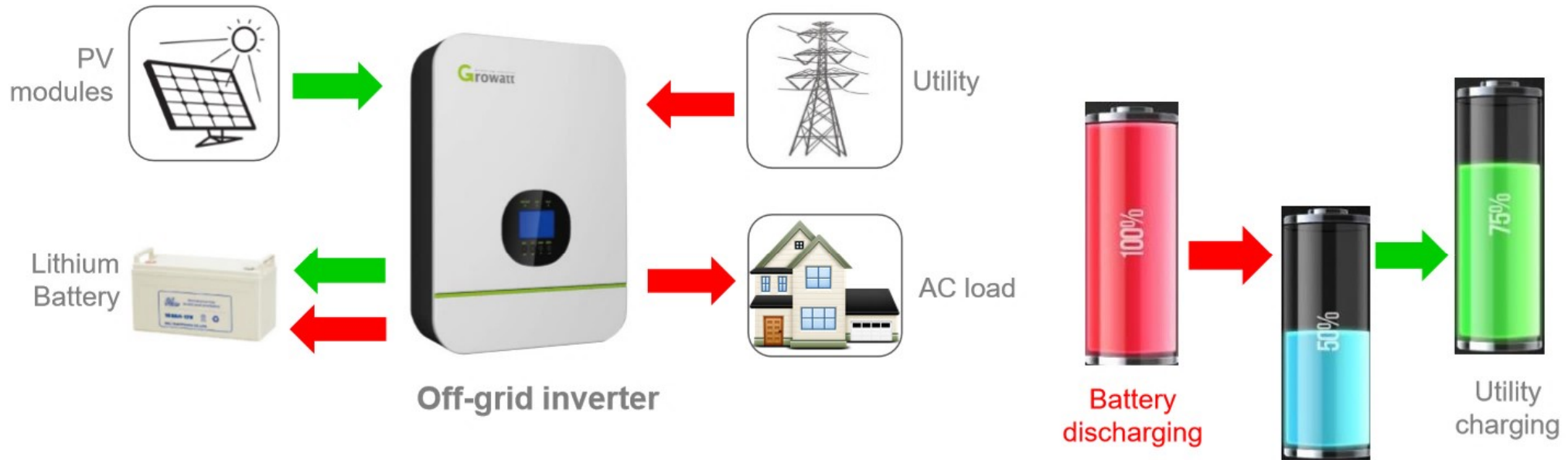
WIFI-F   GPRS-F
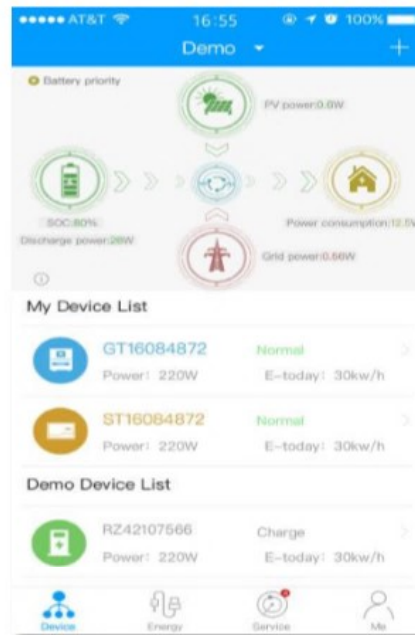
Shine Phone APP

Shine Server

Operation Functions

Mode selection setting: Utility or Battery mode:

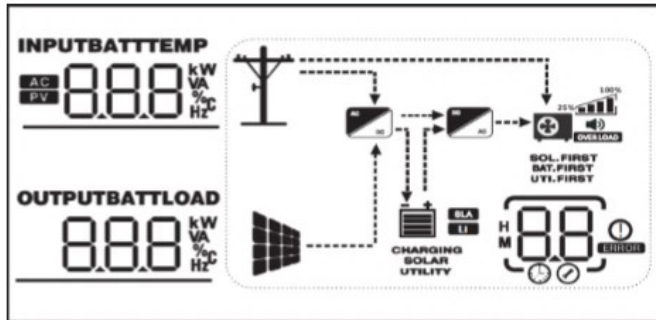1.   Back to Utility Mode   (Voltage Range: 44-51.2 VDC)

PV modules

Lithium Battery

Off-grid inverter

Utility

AC load

Battery discharging

100%

50%

75%

Utility charging

Operation Functions

Mode selection setting: Utility or Battery mode:

Monitoring Platform

Local monitoring

1. Input information (PV voltage, AC voltage, frequency, PV generator, battery voltage, charging current)

2. Output information (Voltage, load percentage, frequency, load in VA, load in watt, discharging current)

USB cable

PC install monitoring software

PVkeeper platform

Operation Functions

Mode selection setting: Utility or Battery mode:

| 2. Back to Battery Mode | (Voltage Range: 48-58VDC / 24-29VDC) |

PV modules

Battery

Off-grid inverter

Utility

AC load

25%

100%

50%

Utility charging

Battery discharging
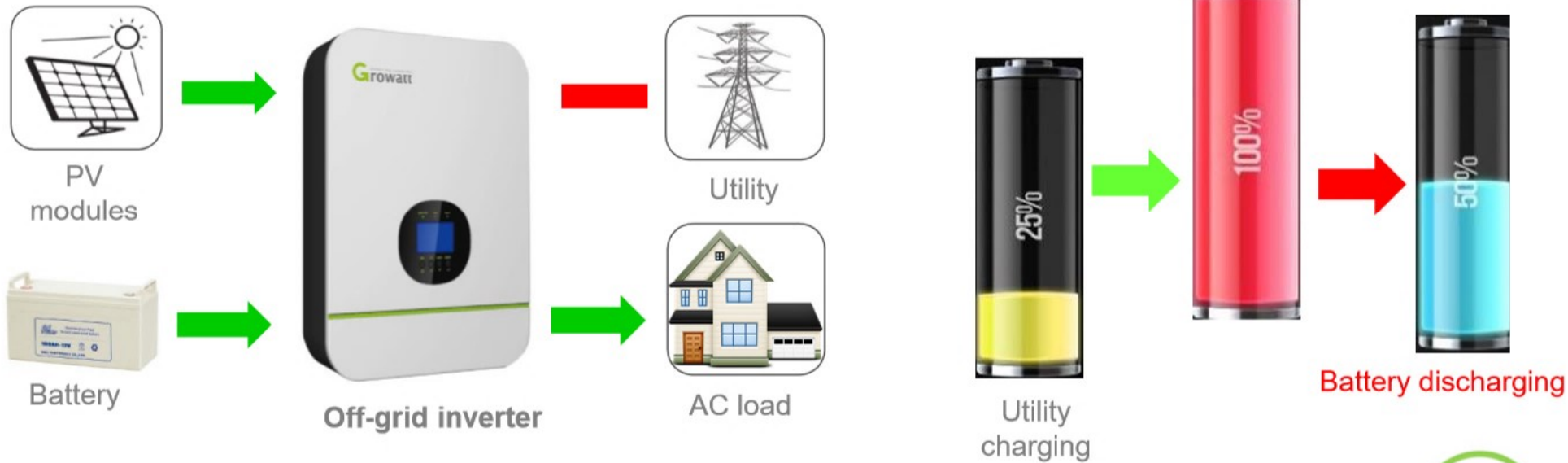
Operation Functions

Lithium battery :

Operation Functions

Split phase L1-N and L2-N:

For 120Vac system, SPF 3000TL LVM series inverter can configuration output L1-L2 of 240V system
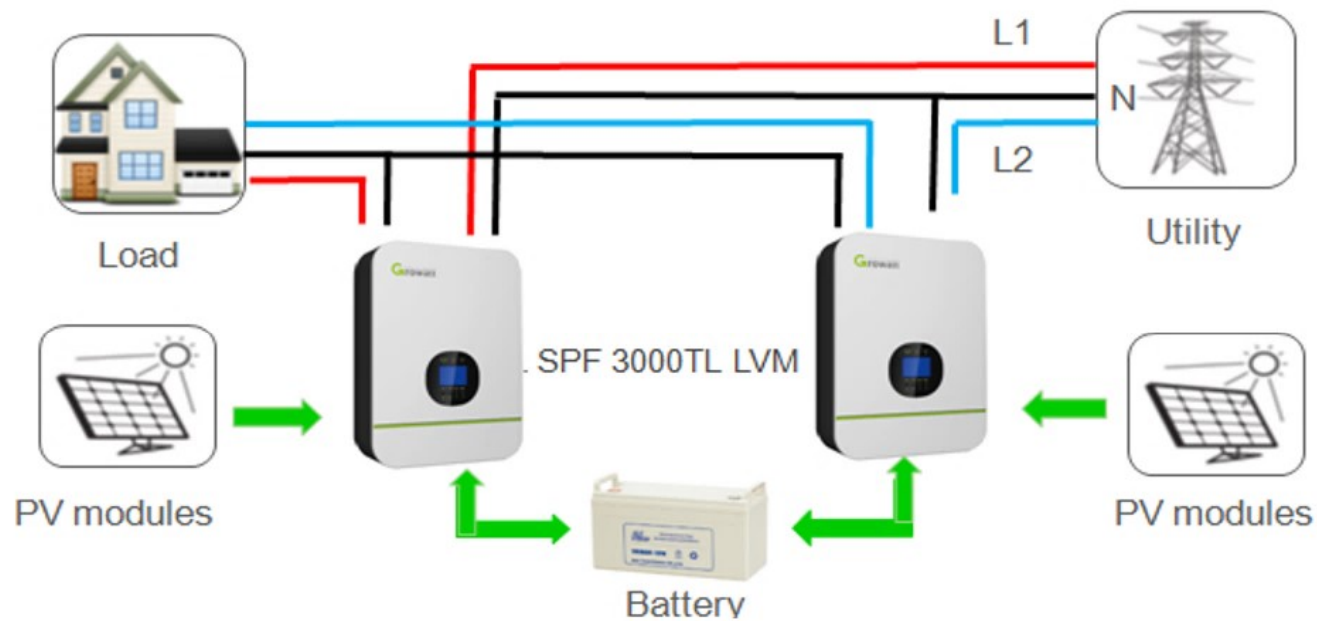
Operation Functions

Parallel mode:

Parallel operation with up to 6 units only for 4/5KVA and 3KVA LVM series transformerless inverter, maximum capacity up to 30kW, and it can also be set to 3-phase system

Phase 1   Phase 2   Phase 3

Three-phase system

Single-phase system

Applications

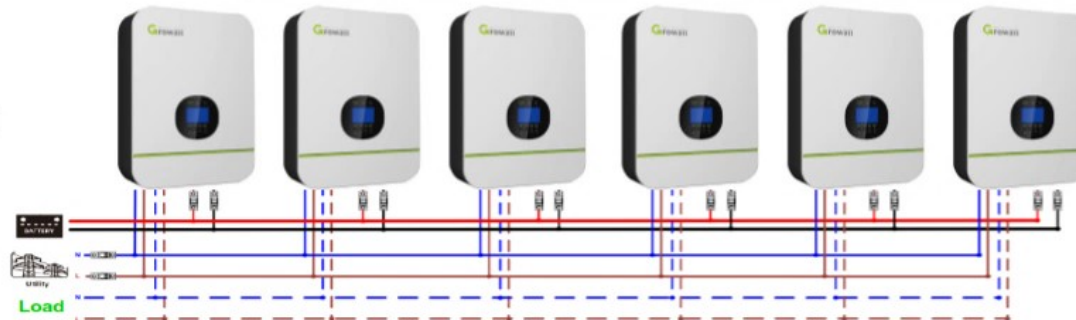## 1. Enhance battery life   (Output : SOL first)

Solar power is sufficient (Feed to load and also charge the battery). When solar power is not available, Utility supply power to the load and charge the battery

Solar power is sufficient

PV modules

Utility

Battery

Off-grid inverter with
MPPT charge controller

AC load

Solar power is not sufficient

PV modules

Utility

Battery

Off-grid inverter with
MPPT charge controller

AC load

Applications

Growatt
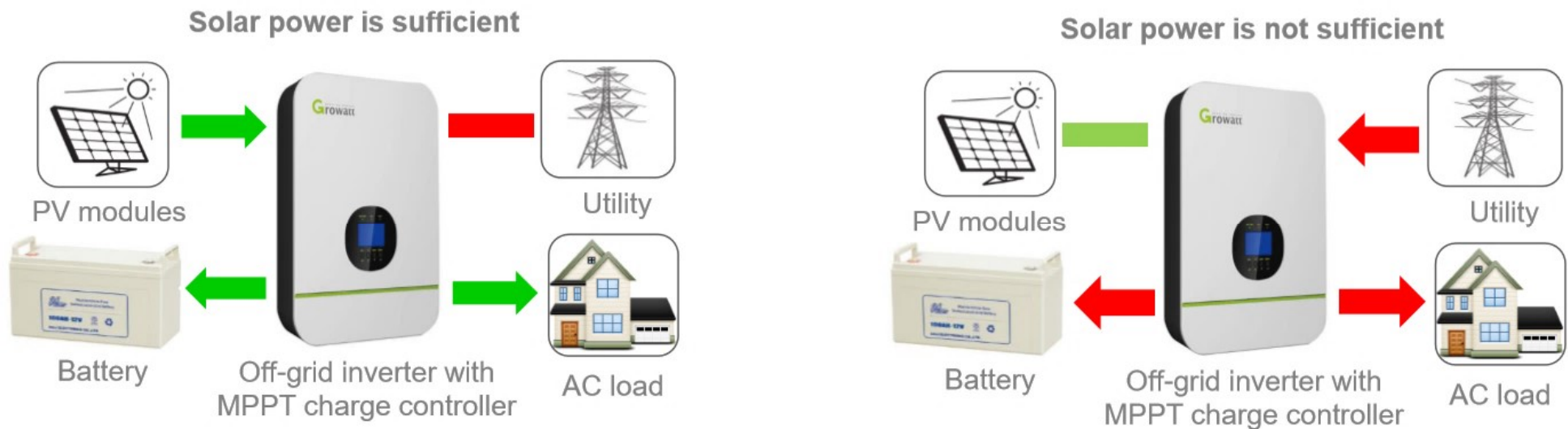
3. Unavailability of sunshine/Raining season (Output : UTI first) ➔ 3K LVM (Default mode)

Utility supply power to load as a priority but solar and battery only provides power to load, if the utility power is not available

Utility power is sufficient

PV modules

Utility

Battery

Off-grid inverter with MPPT charge controller

AC load

Utility power is not available

PV modules

Utility

Battery

Off-grid inverter with MPPT charge controller

AC load
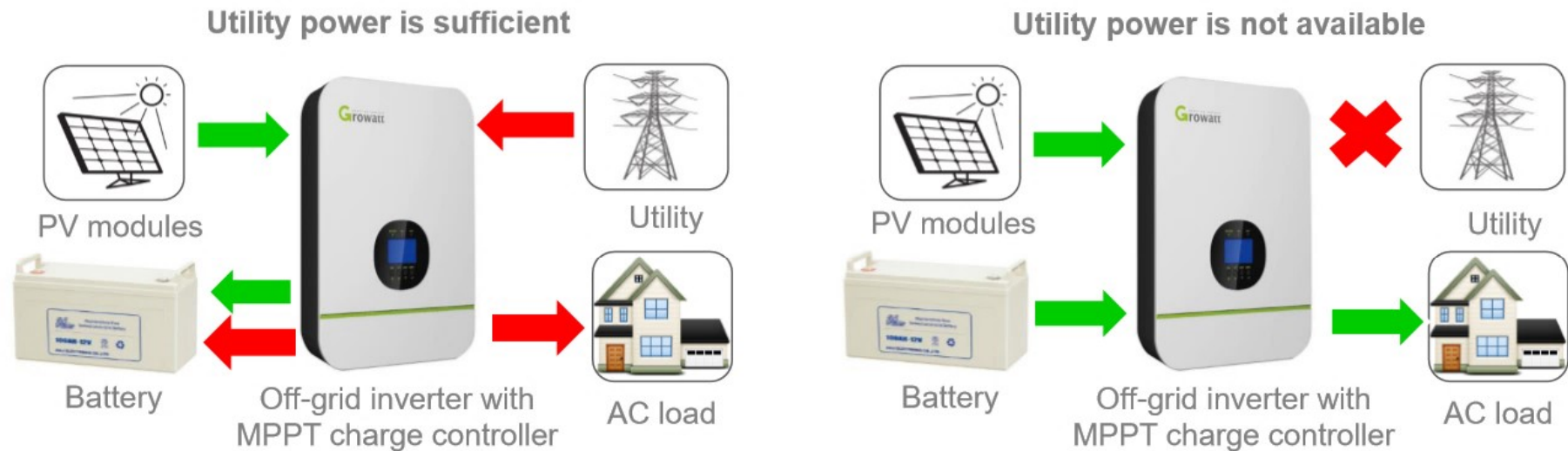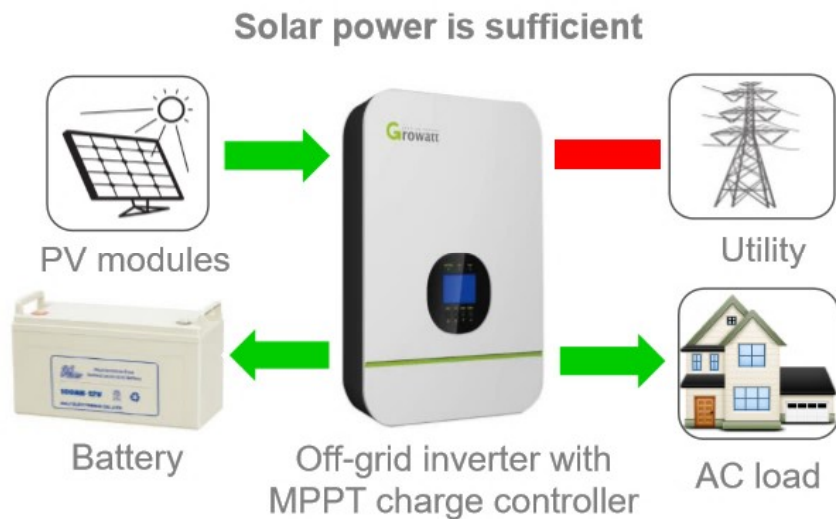
Applications

2. Support cost-effective (Output : SBU first)

When Solar power is sufficient (it feeds to load and charge the battery). For cost-effective support, Utility feeds power only if the battery feeding is under low-level warning

Solar power is sufficient

PV modules

Utility

Battery

Off-grid inverter with MPPT charge controller

AC load

Solar power is not sufficient

PV modules

Utility

Battery

Off-grid inverter with MPPT charge controller

AC load

Utility Power & Load Selection

Growatt

Voltage	Transformer Type	Single Phase	Split Phase	Three Phase	Home appliance capacity < 5kw	Home appliance capacity > 5kw
120V / 240VAC Split / 3 ph	Transformerless	SPF 3000TL LVM	SPF 3000TL LVM (2 PCS or more units for parallel)	SPF 3000TL LVM (3 PCS or more units for parallel)	SPF 3000TL LVM	SPF 3000TL LVM (2 PCS or more units for parallel)

Battery Selection

Voltage	Transformer Type	Lithium Battery	BTS Sensor	Split Phase	Without battery operation
120V / 240VAC Split / 3 ph	Transformerless	SPF 3000TL LVM	NO	SPF 3000TL LVM	NO

Growatt

Applications

30kw three phase system

5kw single phase system

Growatt

Applications

15kw three-phase system

10kw single-phase system

15kw three-phase system

| Datasheet	SPF 3000TL LVM-24P	SPF 3000TL LVM-48P
Battery voltage	24VDC (19.5V - 30VDC)	48VDC (39V - 60VDC)
Battery type	Lithium/Lead-acid	Lithium/Lead-acid
INVERTER OUTPUT	Split Phase capable with 2 or more	Split Phase capable with 2 or more
RATED POWER	3000VA/ 3000W	3000VA/ 3000W
Parallel Capability	Yes, 6 units maximum	Yes, 6 units maximum
AC Voltage Regulation (Battery Mode)	120VAC ± 5% @ 50/60Hz	120VAC ± 5% @ 50/60Hz
Surge Power (up to 18kW)	6000VA	6000VA
Efficiency (Peak)	93%	93%
Waveform	Pure sine wave	Pure sine wave
Transfer Time	10 ms (For Personal Computers); 20 ms (For Home Appliances)	10 ms (For Personal Computers); 20 ms (For Home Appliances)
SOLAR CHARGER		
Maximum PV Array Power	2000W	4500W
MPPT Range @ Operating Voltage	30VDC ~ 115VDC	60VDC ~ 115VDC
Maximum PV Array Open Circuit Voltage	145VDC	145VDC
Maximum Solar Charge Current	80A	80A
Maximum Efficiency	97%	97%
Standby Power Consumption	2 W	2 W
AC CHARGER		
Charge Current	60A	40A
AC Input Voltage	120 VAC	120 VAC
Selectable Voltage Range	95-140 VAC (For Personal Computers) ; 65-140 VAC (For Home Appliances)	95-140 VAC (For Personal Computers) ; 65-140 VAC (For Home Appliances)
Frequency Range	50Hz/60Hz (Auto sensing)	50Hz/60Hz (Auto sensing)
PHYSICAL		
Dimension (D/W/H) in mm	130/350/455	130/350/455
Net Weight (kgs)	11	11
OPERATING ENVIRONMENT		
Humidity	5% to 95% Relative Humidity(Non-condensing)	5% to 95% Relative Humidity(Non-condensing)
Operating Temperature	0°C - 55°C	0°C - 55°C
Storage Temperature	-15°C - 60°C	-15°C - 60°C

Preparation

1. **Tools**

    Multi-meter
    Screw-driver
    Ampere-meter
    Other installation tools
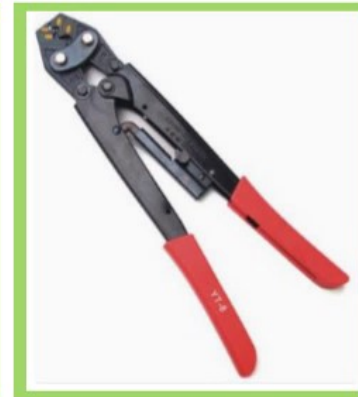
2. **Calculate items (It will influence inverter's capacity)**

    Load type: Home appliance, motor type load (3-6 times rate power).

    Load working time: Peak power working time.

    Back-up time: Battery discharge time.

    Sunlight situation: Peak radiation time per day.

    Utility power situation: Grid power is available or not?