WIT 4-15K-HU
System Solution Introduction

Preliminary Version

GROWATT

SHENZHEN GROWATT NEW ENERGY CO.,LTD

Overseas Marketing Department
202502

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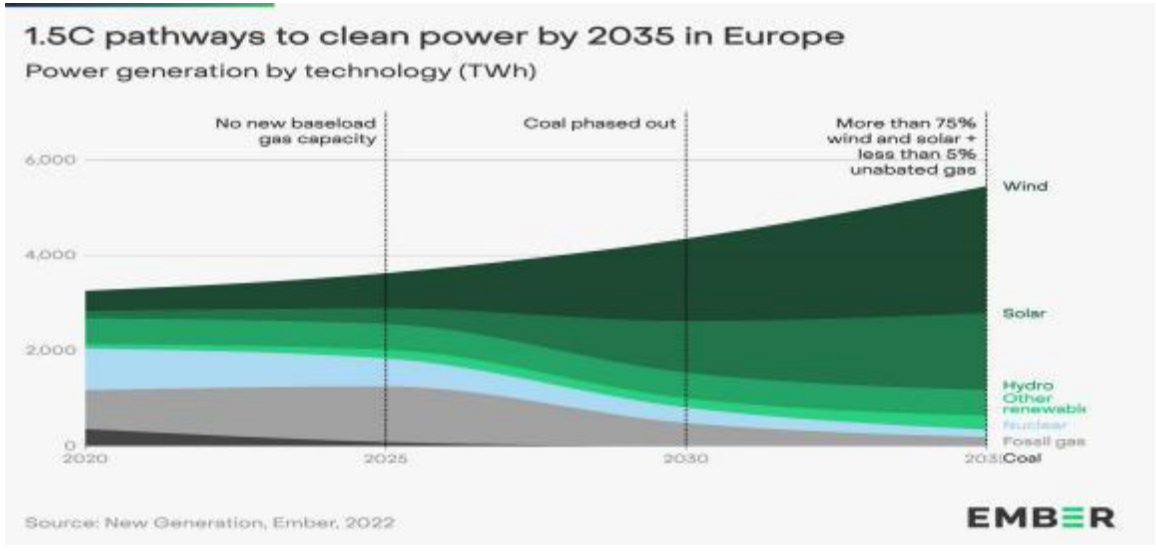
To Build the World's Largest
Intelligent Sustainable Energy Ecosystem for Human Kind

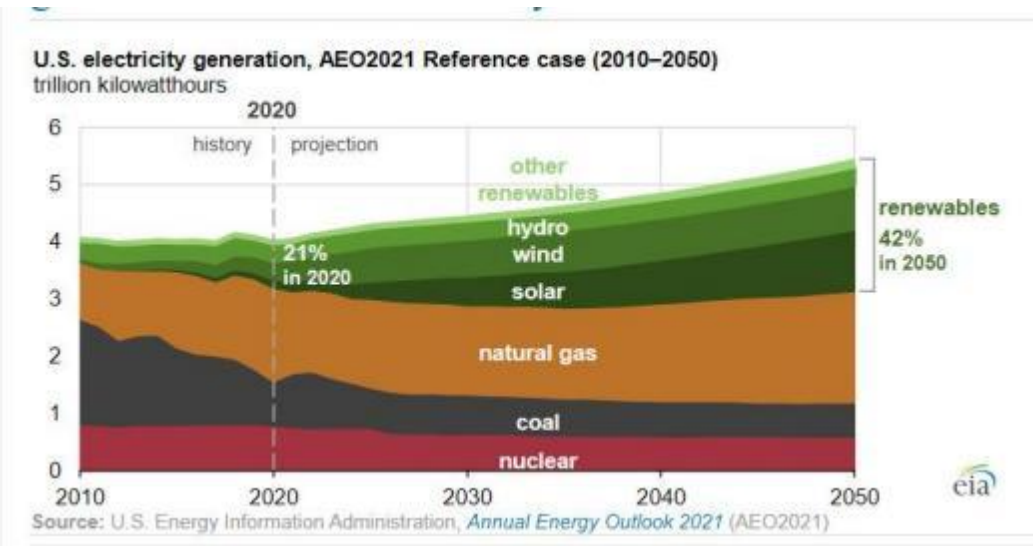
01

General Introduction

Renewable Energy Becomes the Main Body of Future Power Generation



From: New Generation, Ember

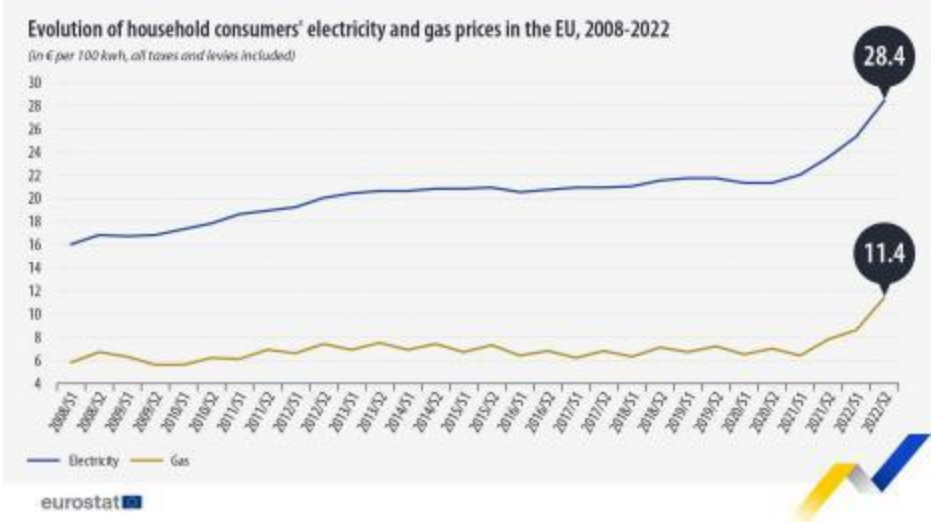


From: US Energy Information

- New Generation predicts that in 2025, new energy generation will account for about 25%, and in 2050, new energy generation will account for 75% in Europe
- US Energy information predicts that in 2020, new energy generation will account for about 21%, and in 2050, new energy generation will account for 42% in US

Higher Energy and Electricity bill, Large Areas Without Electricity

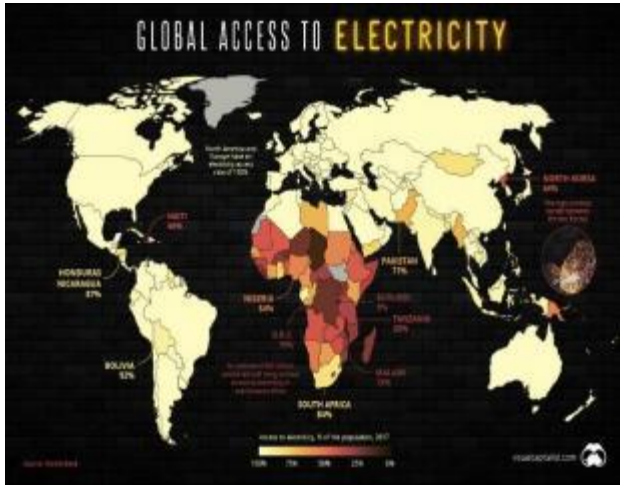
Higher energy price, higher electricity bill



From: EUROSTART Report

- According to eurostart report, consumer prices for electricity and gas price averagely increased by ***18.3%*** and ***42%*** between 2021 and December 2022.

Without access to electricity



From: World Bank

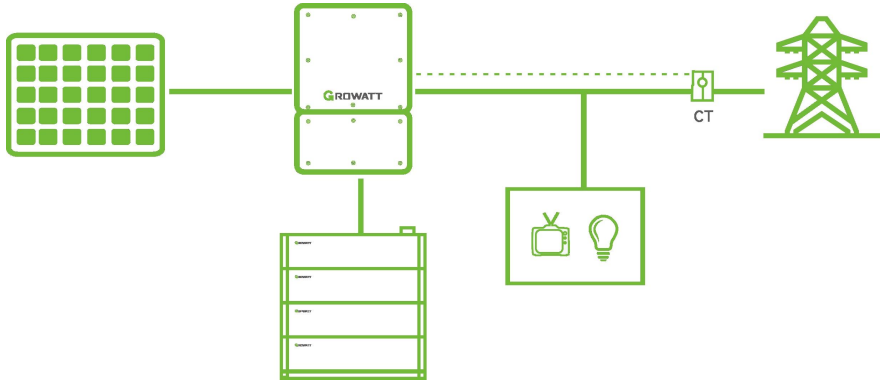
- According to world bank data, Estimated ***1.2bilion*** people live without access to electricity. People still living in dark, what are they suffering?

02

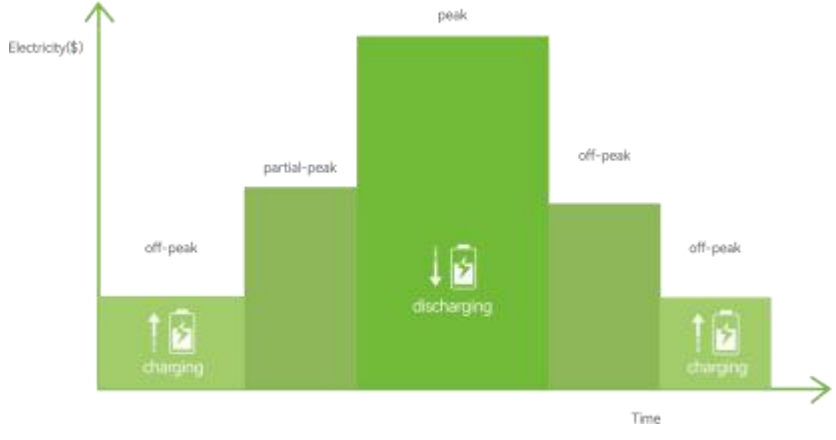
Flexible application in multiple scenarios

Energy Storage System Application

- **Export Limit:** Set a limit value on the feed power, and when it exceeds this power value, the PV output will be limited.

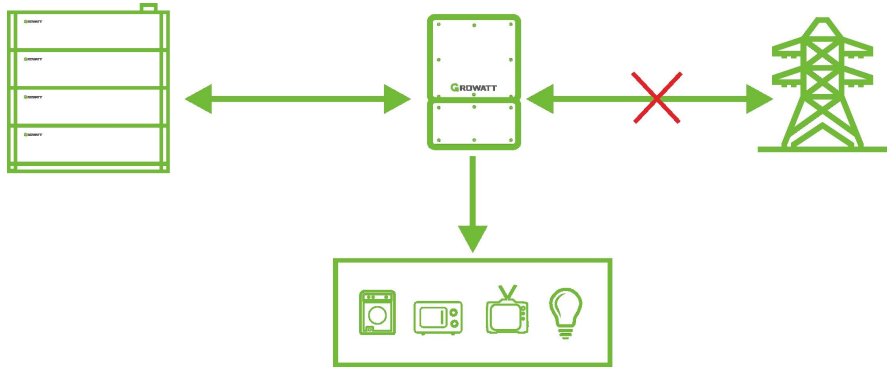


- **Time of Use:** Charge the battery at off-peak tariff and use it at peak tariff to reduce the electricity bill.



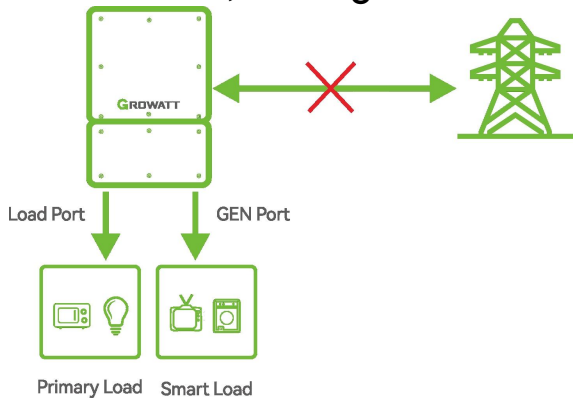
- **Self-Consumption:** Storing the surplus solar power into the battery during the day and using it at night, which maximizes the solar energy self-consumption rate.

- **Backup Power:** The energy storage system as a backup power will supply power to the load when the power grid fails.

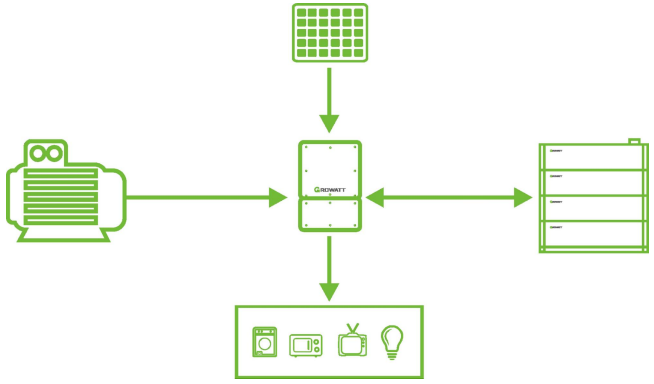


Energy Storage System Application

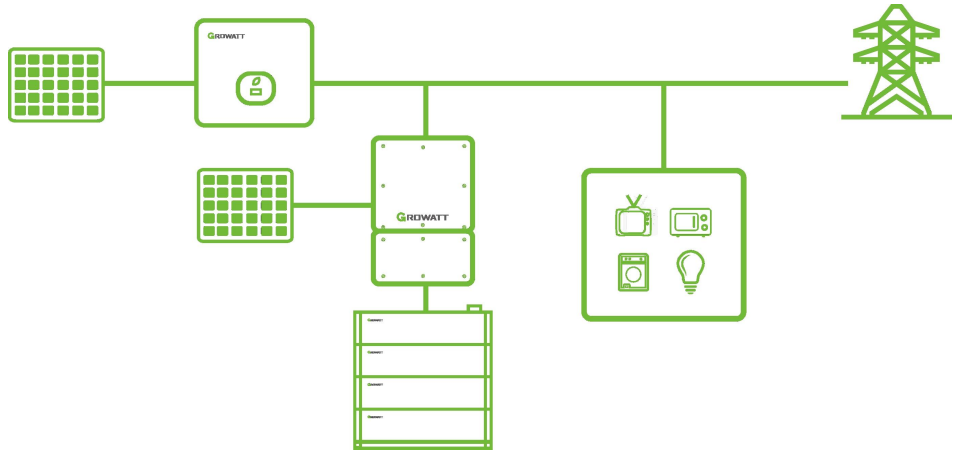
- **Smart Load:** The generator port can be used as an intelligent load output port. When in off-grid, the smart load will be disconneced, making load control more intelligent.



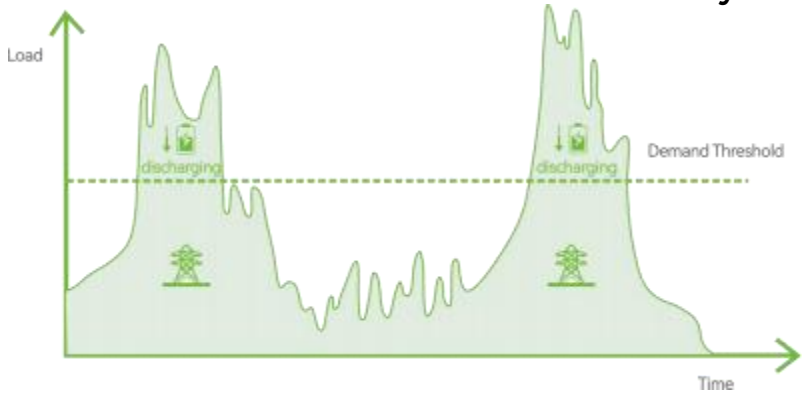
- **Micro-grid:** Work with multiple energy source to guarantee 24/7 power supply where there is no grid.



- **AC-Couple:** Hybrid inverter solution for retrofit project, support work with on-grid inverters.



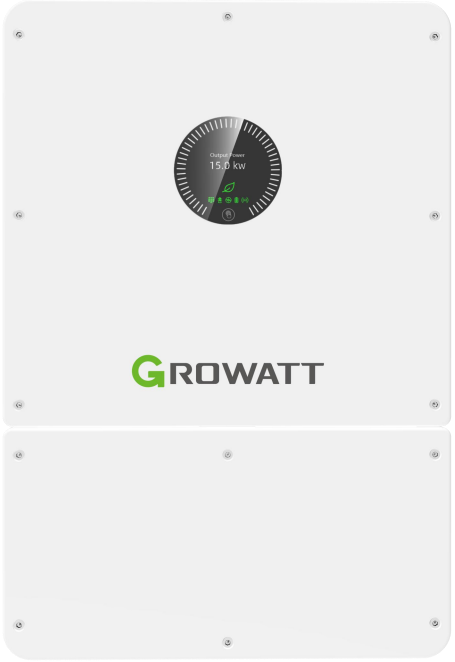
- **Peak Shaving:** The battery will discharge to offset portions of the load consumption beyond the power demand threshold to reduce the electricity bill.



03

Product Introduction

WIT Product Main Parameters



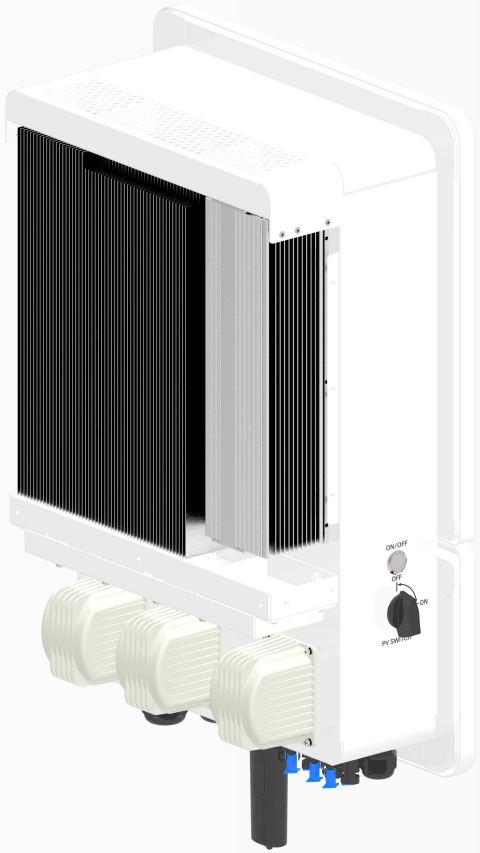
WIT 4-15k-HU

Main Parameter

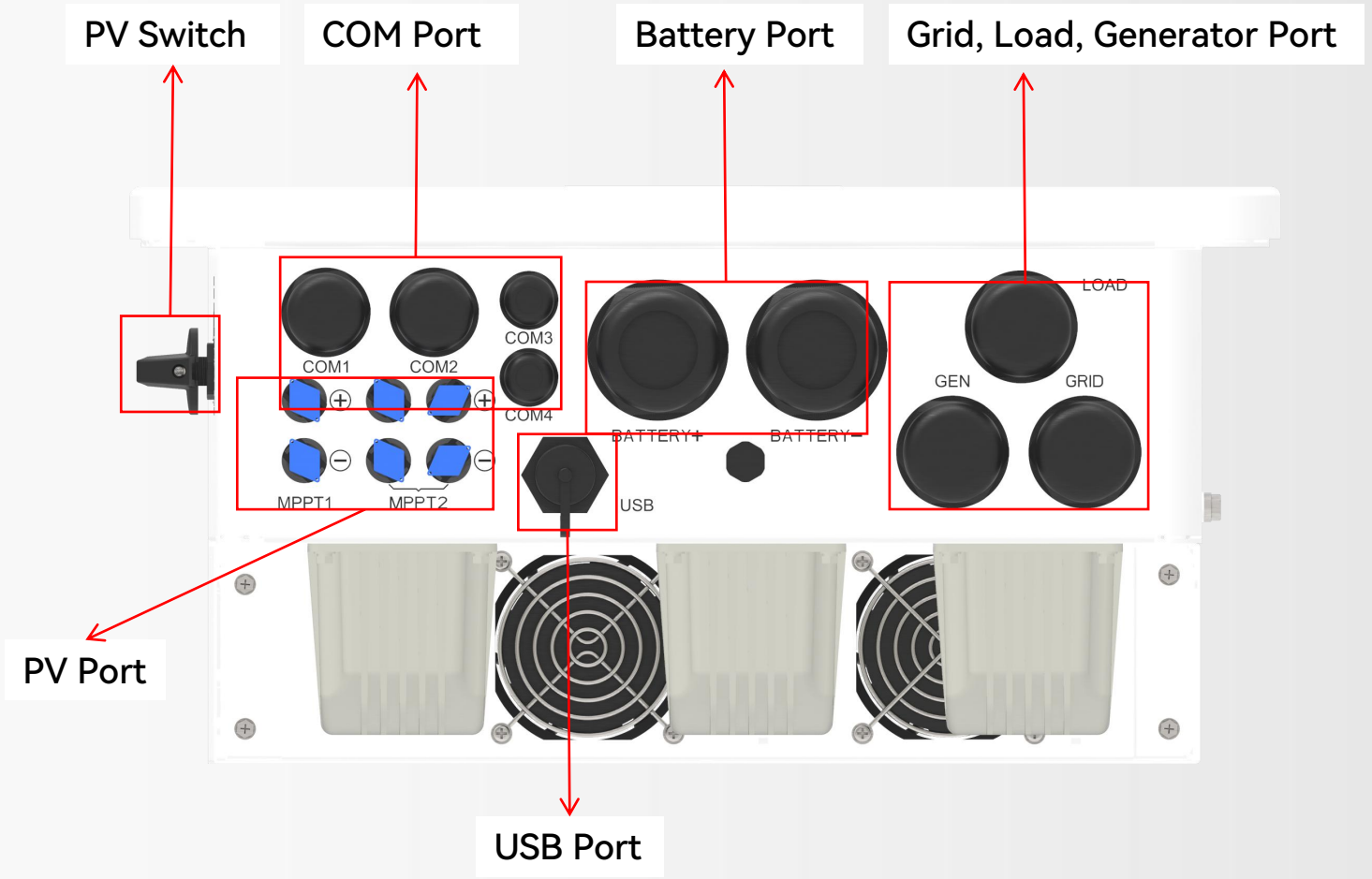
- **Product Model:** WIT 4/5/6/8/10/12/15k-HU
- **Max. input voltage:** 1000V
- **Max. input current per string:** 20A
- **Nominal Output Power:** 4/5/6/8/10/12/15k
- **Nominal AC Voltage:** 380V/400V
- **Nominal AC Frequency:** 50/60Hz
- **Max Continuous AC Outpot Power:** 110% rated power
- **AC Grid Connection Type:** 3P3W+PE or 3P4W+PE
- **Max. Efficiency:** 97.6%
- **Ingress Protection:** IP66
- **Wide Temperature Range:** -30°C ~ 60°C

WIT Product Appearance

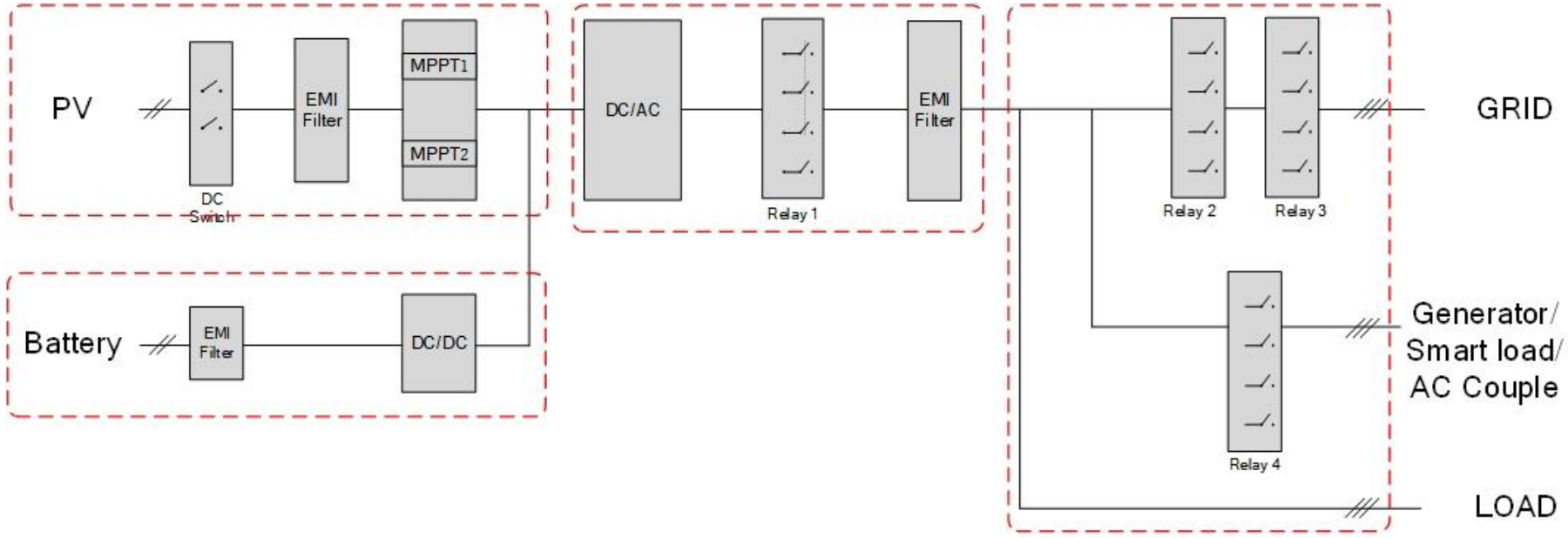
Dimensions (W / H / D)
475/698/240mm



WIT 4-15k-HU



Hybrid Inverter(HU Model)Topology



- The hybrid inverter receives DC inputs from PV strings which go through the MPPT routes. The DC power is then converted into AC power through the inverter circuit to power the loads and feed power into the grid;
- The PV strings can supply power to charge the battery through the MPPT routes;
- Convert battery power to AC power supplies for the loads and feeding to the grid;
- Charge the battery from the grid through a rectifier circuit;
- Generator/Smart Load/AC-Couple port for different output requirements.

Product Features

Higher Yields

- Up to 1.6 DC/AC Ratio
- PV max. voltage 1000V，operating voltage range150V-850V
- String current 20A for high power modules
- Dual battery input port for two cluster of battery system in parallel
- Build-in PID recovery function

Safe and Reliable

- Fuse free design
- IP66 protection degree
- Type II/III SPD on DC/AC side
- Active ARC protection (AFCI)

AC Power Ability

- Support smart load function
- 100% unbalanced output: each phase up to 50% of rated power
- Support connect to GEN to supply the load and charge the battery

Smart and Flexible

- Compatible with ALP/AXE/Hope and third party battery
- Intelligent string monitoring
- Online monitoring and maintenance
- MODBUS TCP available

Higher Yields

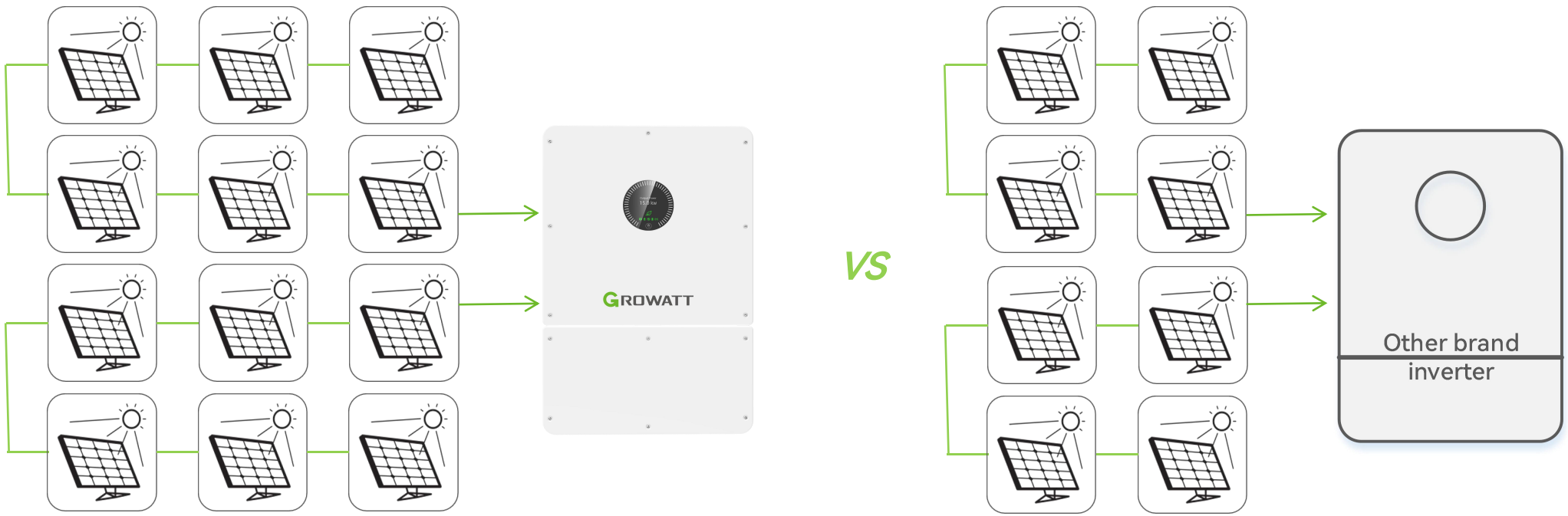
Excellent PV Side Performance Allows More PV Panels

WIT 4-15k-HU

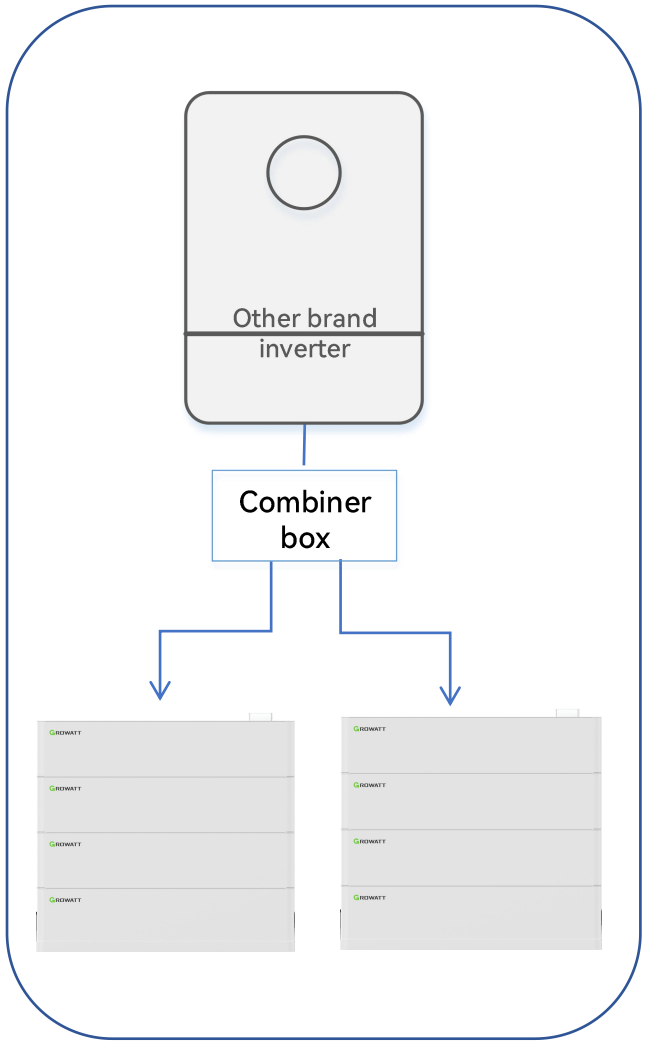
- Up to 1.6 DC/AC Ratio
- Max. PV input voltage up to 1000V
- Max. string current up to 20A
- Up to 3 string PV inputs for 12kW and 15kW model

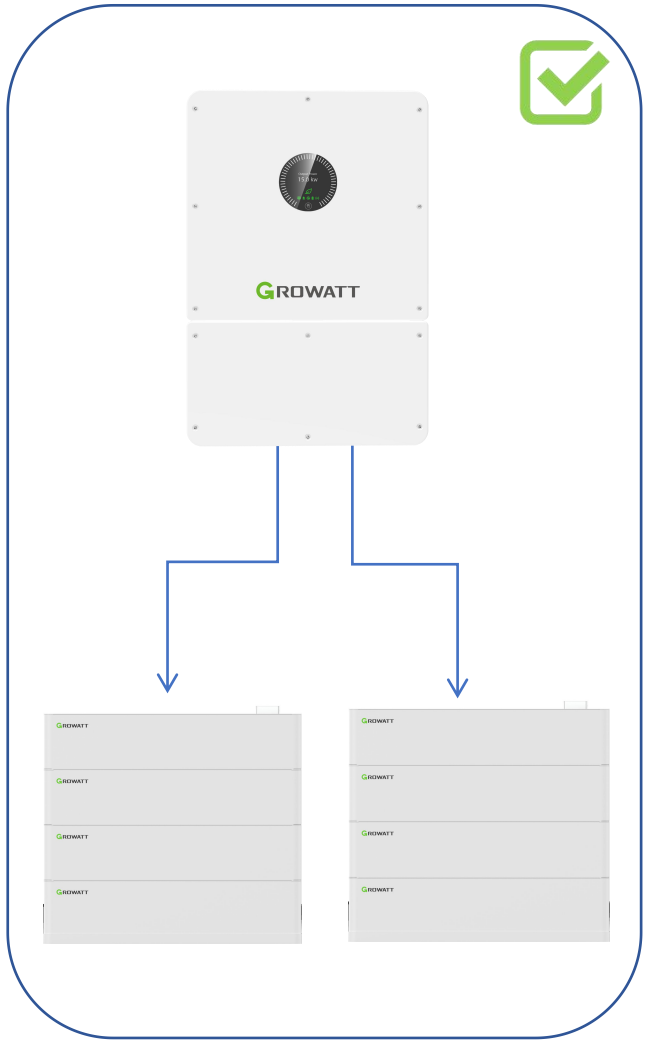
Other inverters

- Up to 1.5 DC/AC Ratio
- Max. PV input voltage 800V
- Max. string current 20A
- Up to 2 string PV inputs for 12kW



Dual Battery Inputs

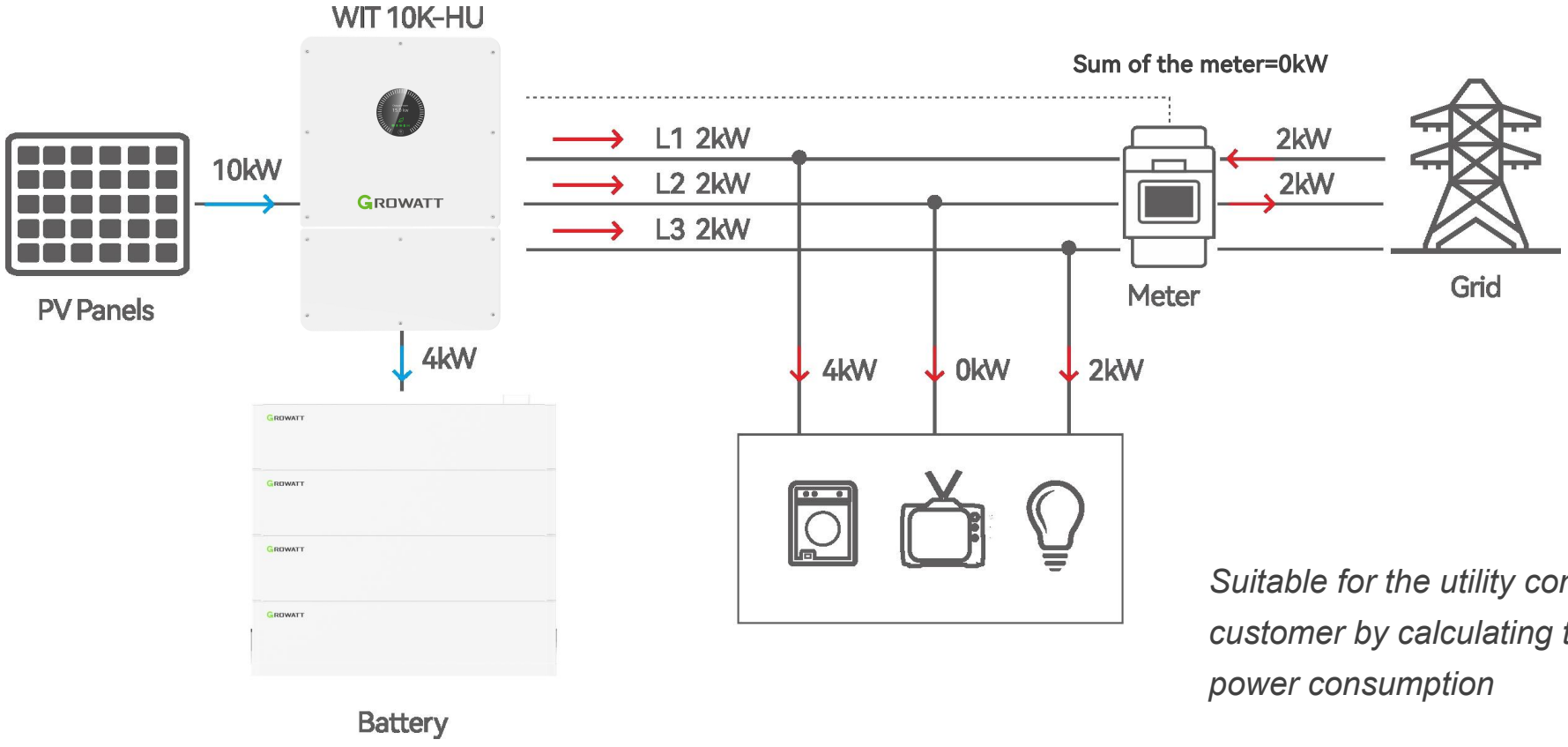




- Battery charging and discharging current/power up to 290A/15kW
- Dual battery input port for two clusters of battery system in parallel
- No need for an additional battery combiner box, simplifying the installation process and reducing costs.

No need of combiner box

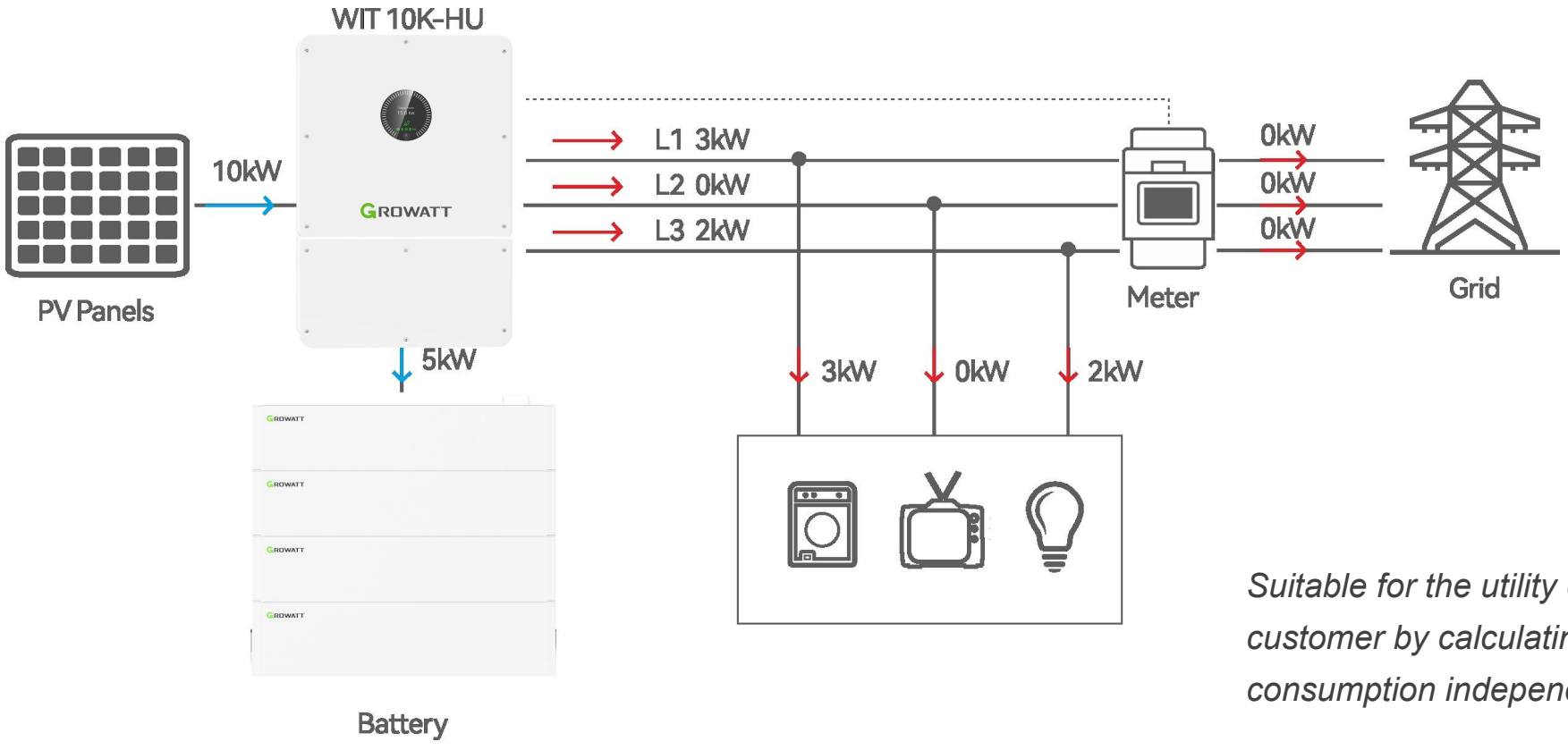
Standard Three-phase Power Control Basic Solution



Suitable for the utility company which charges customer by calculating total three phase power consumption

*Note: It's a default mode and suits most areas in EU

Smart Phase-level Power Control Basic Solution

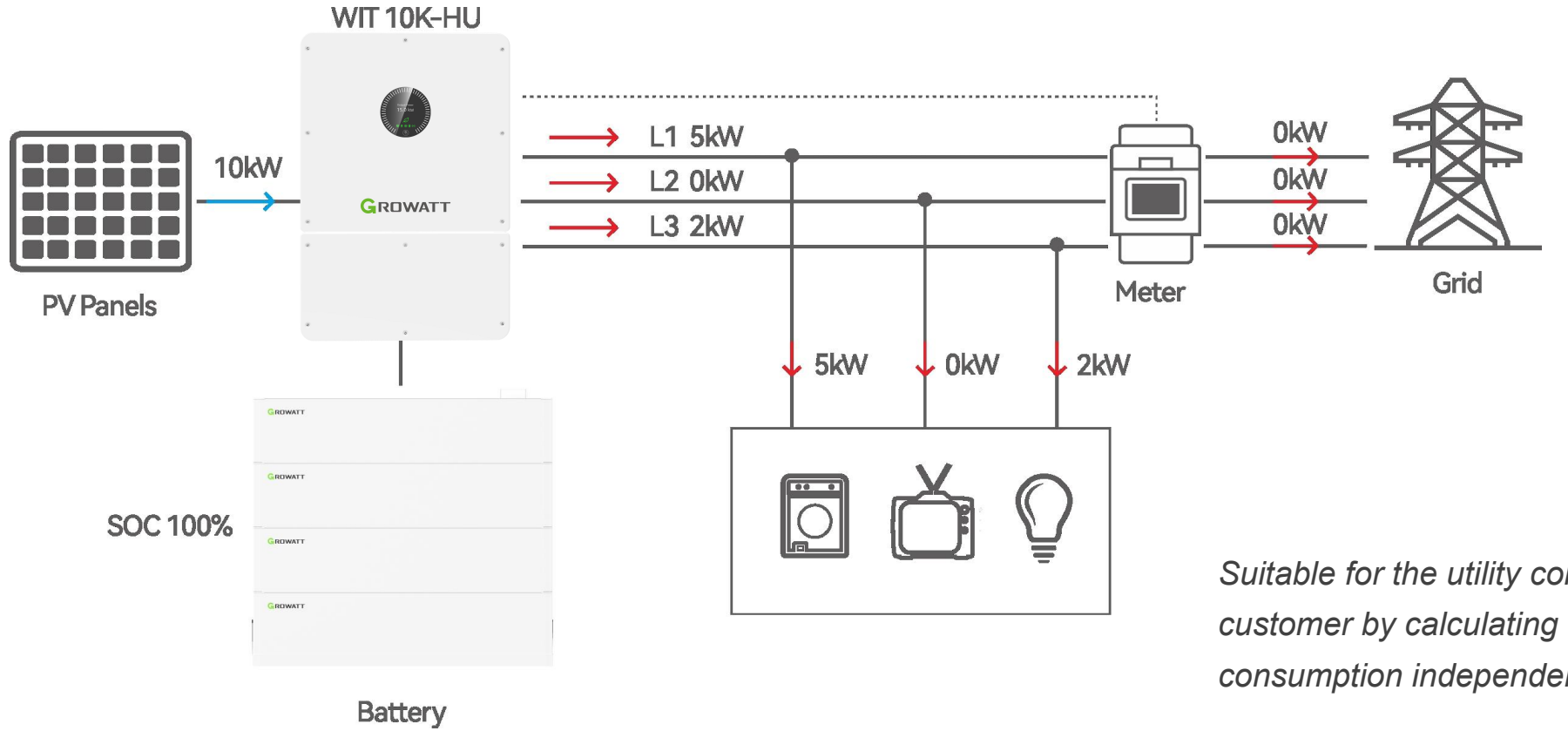


Suitable for the utility company which charges customer by calculating each phase power consumption independently

*Customer needs to enable single phase control function, especially design for the grid in Czech, Portugal, part of the Denmark
**The inverter will prioritize load output and not feed to the grid, and the excess power will be charged to the battery.

Three-phase 100% Unbalanced Output

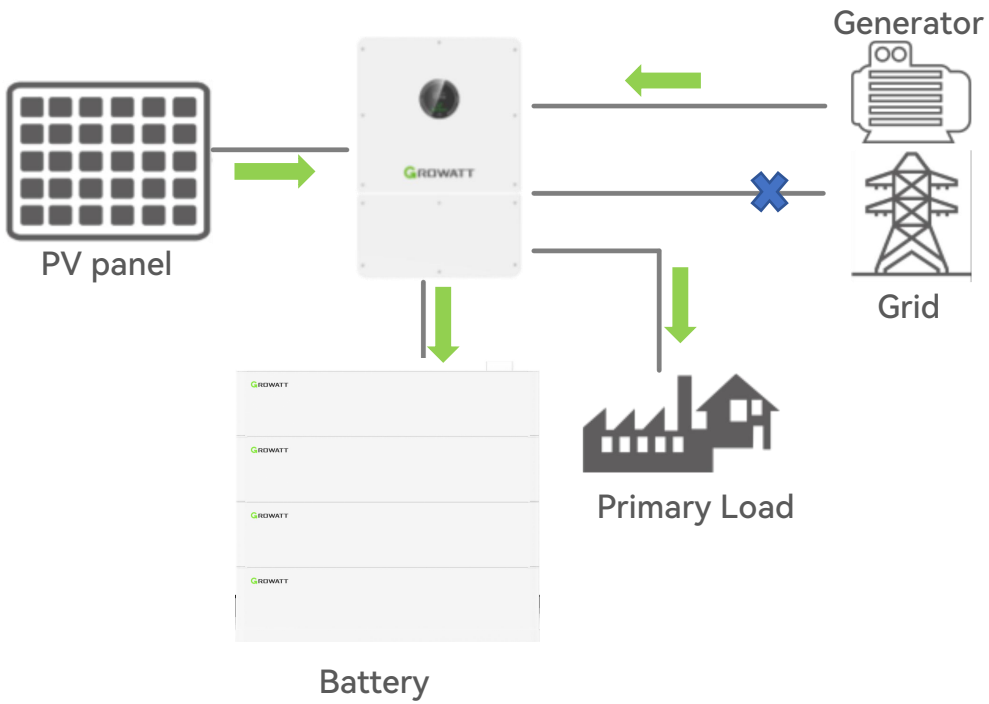
Three-phase 100% Unbalanced Output and Smart Phase-level Export Limit Function

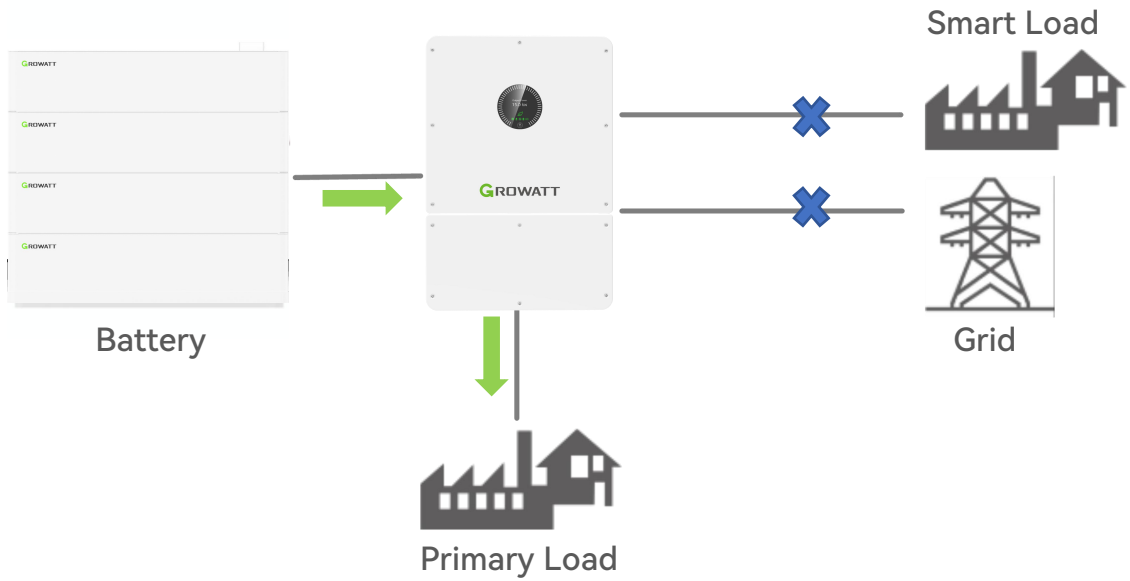


Suitable for the utility company which charges customer by calculating each phase power consumption independently

*Customer needs to enable single phase control function, especially design for the grid in Czech, Portugal, part of the Denmark
**Max. power output of single phase is 5kW, and the system will draw the power from the grid once exceeding it.

Multiple Functions of the GEN Port





Multiple Power Sources Input

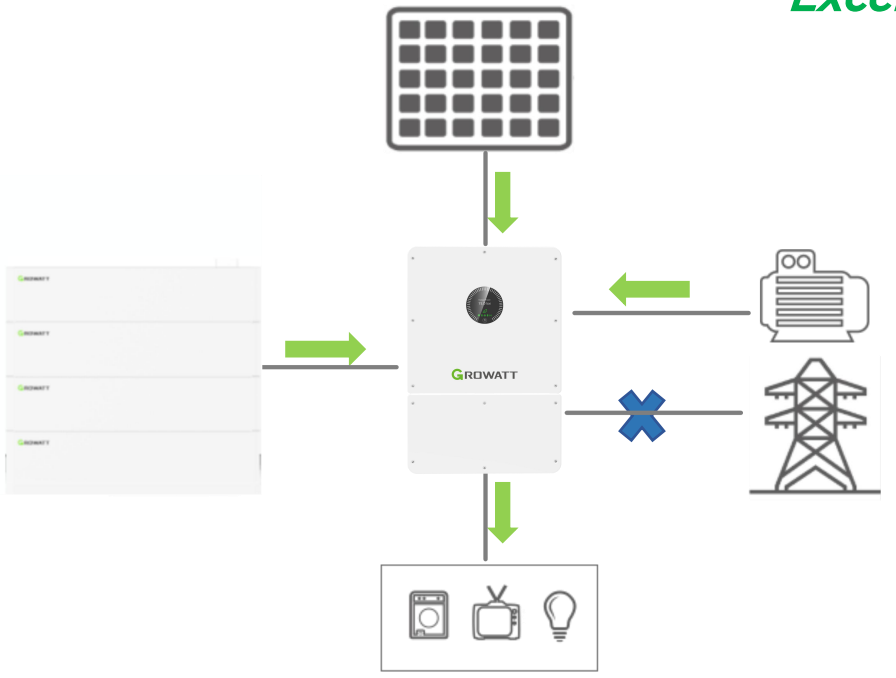
- Support generator supply power to load and charge the battery
- The generator/grid will automatically start to charge the battery when the battery capacity reaches the Min. value

Gen Port Used as Smart Load Function

- The high-power smart load is connected through the GEN port, and can be disconnected based on battery SOC when in off-grid mode
- Load control benefits for battery saving in off-grid situation

Direct Generator Input Serves as a Backup Source

Excellent Off-grid Performance

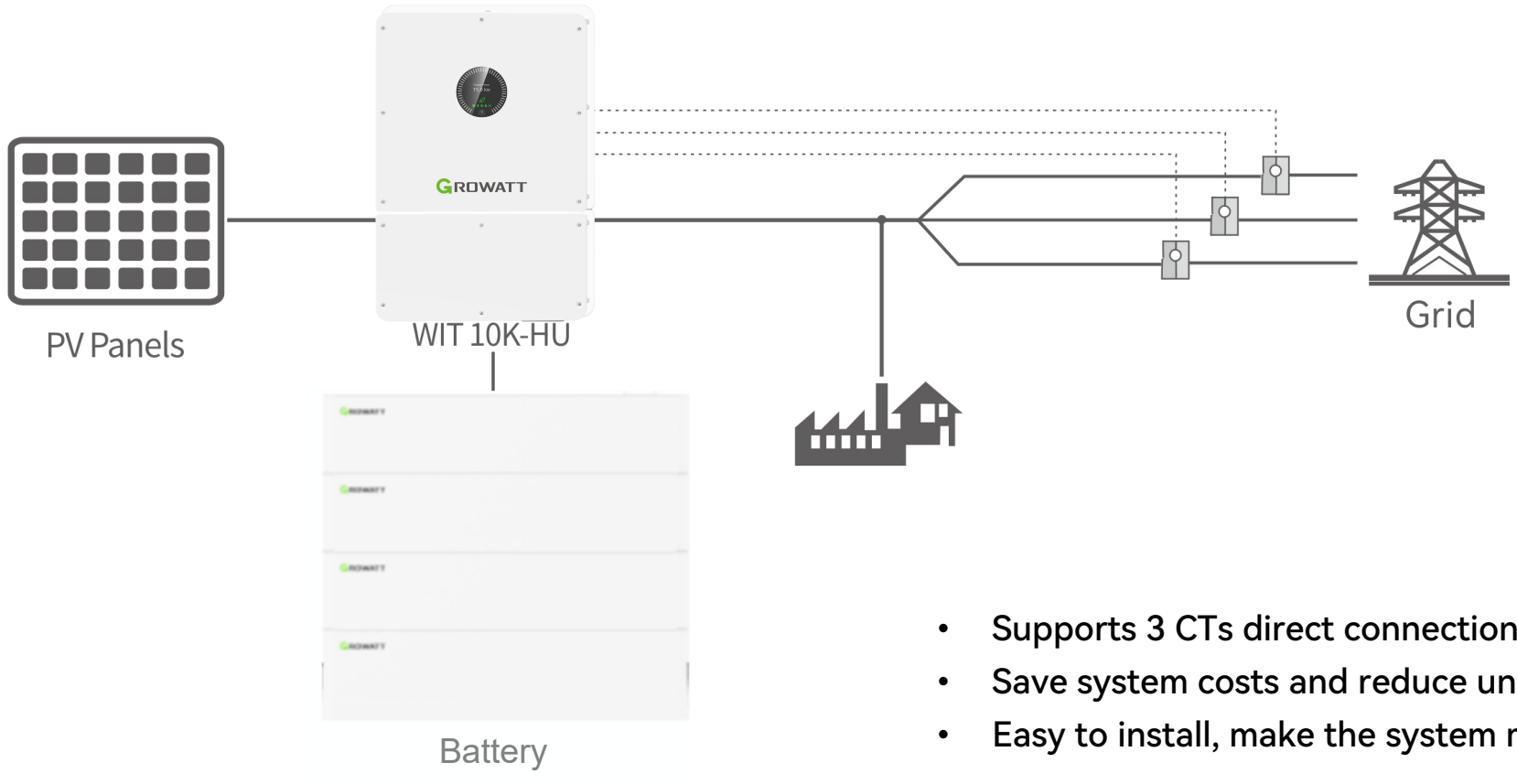


- Direct generator input as backup source
- 10ms transition from on-grid to off-grid mode
- 110% continuous overloading
- 100% unbalanced output: each phase up to 50% of rated power
- 200% overloading for 10s

Backup power (AC)*							
Rated AC output power	4000W	5000W	6000W	8000W	10000W	12000W	15000W
Max. AC apparent power	2 time of rated power, 10s						
Rated AC output voltage	220V/380V, 230V/400V						
Nominal AC output frequency	50/60Hz						
Max. output current	12.2A@220V 11.6A@230V	15.2A@220V 14.4A@230V	18.2A@220V 20.0A@230V	24.2A@220V 23.2A@230V	30.3A@220V 29A@230V	36.4A@220V 34.8A@230V	45.5A@220V 43.4A@230V
THDv	3% (Linear load)						
Load unbalance	100% three-phase unbalanced						
On/off grid transfer time	10ms						

3 CTs Direct Connection

Cost-effective and Easy Installation Solution



- Supports 3 CTs direct connection
- Save system costs and reduce unnecessary expenses
- Easy to install, make the system more concise

* WIT comes standard with 3 CTs. Customers can also purchase additional meters(TPM-CT-E) according to different needs.
**The CT direction is from grid to the load and supports remote correction when reversed.

04

Compatible Battery

AXE LV Battery System

Battery Module AXE 5.0L – C1

AXE LV Battery

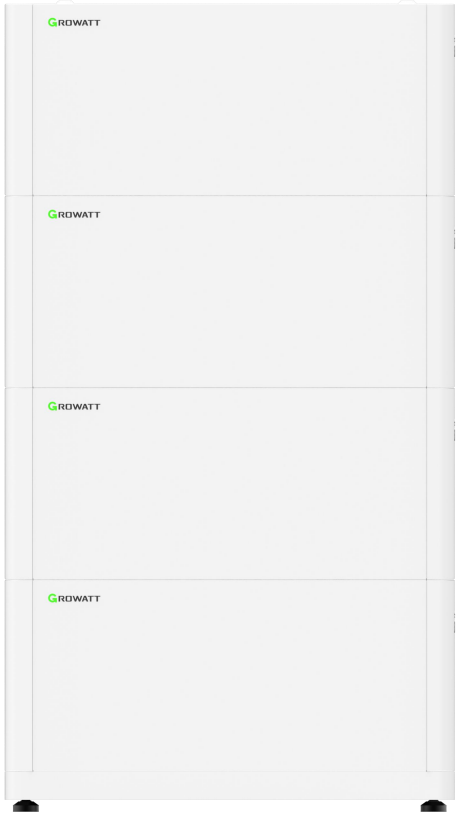
AXE Low Voltage Battery System

- IP20, 5.0kWh / Module
- Flexible capacity : 5.0kWh ~ 400kWh(1~8clusters)
- Excellent safety of cobalt free LiFePO4 battery
- Modular stacked design without cable connection
- Remote firmware upgrade
- Maximum charging/discharging current: 120A

*Growatt will release a new AXE version in 2024 Q4, with a maximum output of 160A per cluster.

ALP LV Battery System

Battery Module
ALP 5.0L-E2



ALP LV Battery

ALP Low Voltage Battery System

- IP65, 5.0kWh / Module
- Remote firmware upgrade
- Flexible capacity : 5.0kWh ~ 320kWh(1~8clusters)
- Excellent safety of cobalt free LiFePO4 battery

Hope Series LV Battery System

Hope 14.3L-A1

Hope 5.0L-B1

Hope 14.3L-A1 Battery System

- Nominal Capacity: 14.3 ~ 686.4kWh(14.3kWh per module, Max. 48 pcs in paralle)
- Max Charge/discharge Current: 140A
- Excellent safety of LiFePO4 battery
- DoD up to 93%

Hope 5.0L-B1 Battery System

- Nominal Capacity: 5 ~ 240kWh(5kWh per module, Max. 48 pcs in paralle)
- Max Charge/discharge Current: 100A
- Excellent safety of LiFePO4 battery
- DoD up to 98%

05

System Introduction

System Overview

Safe and Reliable

- Superior safety using cobalt-free LFP battery
- Multi-level protections from Inverter, battery system

Smart Management

- Supports local display and remote monitoring
- Remote firmware upgrade and lifespan smart online service
- Grid-support functions

Flexible Configuration

- Hybrid Inverter: 4~15kW
- Battery system: AXE 5kWh-400kWh; ALP 5kWh-320kWh; Hope 5.0 5kWh~240kWh; Hope 14.3 14.3kWh~686.4kWh

Flexible deployment

- Supports dual battery input
- Supports multi-brand battery match
- Supports 3CTs or smart meter*

* 6 pcs systems in parallel operation will be ready in **2025 Q2**. If customer is interested in it, you can consult with us about the real-time states.
* Support Growatt TPM-CT-E(SDM630MCT-MA). If the customer needs a meter, just order the meter separately. The CT used for the meter can use the CT that comes standard with WIT.

Battery compatible list:

Battery Compatible List				
No	Model	Battery Capacity	15kW system output requirement	Maximum output current per cluster
1	AXE LV Battery	·5.0kWh per module ·A maximum of 10 pcs in parallel in a cluster ·Support up to 8 cluster in parallel ·400kWh at maximun	·**120A version:** Can reach 12kW if 2 cluster in parallel and each cluster has 2 pcs battery Pack; Full 15kW output requires a Battery Hub for three clusters connected, which can be purchased from Growatt or other brands; ·**160A version:** At least 2 cluster in parallel and each cluster has 3 pcs battery Pack	·**120A version:** 120A Max if the battery pack is more than 2 unit ·**160A version:** 160A Max if the battery pack is more than 2 unit
2	ALP EU/AU Battery	·5.0kWh per module ·A maximum of 10 pcs in parallel in a cluster ·Support up to 8 cluster in parallel ·320kWh at maximun	·Can reach 13.3kW if 2 cluster in parallel and each cluster has 2 pcs battery Pack; · Full 15kW output requires a Battery Hub for three clusters connected, which can be purchased from Growatt or other brands;	130A Max if the battery pack is more than 2 unit
3	Hope 5.0L-B1	·5.0kWh per module ·A maximum of 48 pcs in parallel ·240kWh at maximun	·Can reach 10.2kW if 2 cluster in parallel and each cluster has 2 pcs battery Pack; · Full 15kW output requires at least 2 cluster in parallel and each cluster has 3 pcs battery Pack;	·100A Max if the battery pack is 1 or 2 unit ·150A Max if the battery pack is more than 2 unit
4	Hope 14.3L-A1	·14.3kWh per module ·A maximum of 48 pcs in parallel ·686.4kWh at maximun	·Can reach 14.3kW if 2 cluster in parallel and each cluster has 1 pcs battery Pack; · Full 15kW output requires a Battery Hub for three clusters connected, which can be purchased from Growatt or other brands;	140A Max if the battery pack is more than 1 unit

* The maximum charging and discharging current of the 15kW inverter is 290A.

System Options(AXE/ALP Battery)

System Options-AXE Battery(120A version)									
Clusters	**Capacity**	**Battery Number**	**AC Output Power from battery only**						
One cluster of AXE	≥15kWh, ≤40kWh	≥3, ≤8	√	√	√	Limited, 6kW			
	10kWh	2	√	√	Limited, 6kW				
	5kWh	1	Limited, 3kW						
Two clusters of AXE	2*(≥15kWh, ≤40kWh)	≥6, ≤16	√	√	√	√	√	√	Limited, 12kW
	2*10kWh	4	√	√	√	√	√	√	Limited, 12kW
	2*5kWh	2	√	√	√	Limited, 6kW			
Three clusters of AXE	3*(≥15kWh, ≤40kWh)	≥9, ≤24	√	√	√	√	√	√	√
	3*10kWh	6	√	√	√	√	√	√	√
	3*5kWh	3	√	√	√	√	Limited, 9kW		
	Battery		WIT 4k-HU	WIT 5k-HU	WIT 6k-HU	WIT 8k-HU	WIT 10k-HU	WIT 12k-HU	WIT 15k-HU

System Options-ALP Battery									
Clusters	**Capacity**	**Battery Number**	**AC Output Power from battery only**						
One cluster of ALP	≥15kWh, ≤40kWh	≥3, ≤8	√	√	√	Limited, 6kW			
	10kWh	2	√	√	Limited, 6kW				
	5kWh	1	Limited, 3kW						
Two clusters of ALP	2*(≥15kWh, ≤40kWh)	≥6, ≤16	√	√	√	√	√	√	Limited, 12kW
	2*10kWh	4	√	√	√	√	√	√	Limited, 12kW
	2*5kWh	2	√	√	√	Limited, 6kW			
Three clusters of ALP	3*(≥15kWh, ≤40kWh)	≥9, ≤24	√	√	√	√	√	√	√
	3*10kWh	6	√	√	√	√	√	√	√
	3*5kWh	3	√	√	√	√	Limited, 9kW		
	Battery		WIT 4k-HU	WIT 5k-HU	WIT 6k-HU	WIT 8k-HU	WIT 10k-HU	WIT 12k-HU	WIT 15k-HU

*Labeled with "√ " means the system can have a full load AC output when only battery, and labeled with "Limited" means the AC max output of the system with cosrresponding battery system.

**WIT series have dual battery input port for two clusters of battery system in parallel. If there are more than two battery clusters, please use the battery HUB in parallel.

System Options(Hope Battery)

System Options-Hope5.0L Battery									
Clusters	**Capacity**	**Battery Number**	**AC Output Power from battery only**						
One cluster of Hope5.0	≥15kWh, ≤40kWh	≥3, ≤8	√	√	√	Limited, 7.6kW			
	10kWh	2	√	√	Limited, 5kW				
	5kWh	1	√	√	Limited, 5kW				
Two clusters of Hope5.0	2*(≥15kWh, ≤40kWh)	≥6, ≤16	√	√	√	√	√	√	√
	2*10kWh	4	√	√	√	√	√	Limited, 10kW	
	2*5kWh	2	√	√	√	√	√	Limited, 10kW	
Three clusters of Hope5.0	3*(≥15kWh, ≤40kWh)	≥9, ≤24	√	√	√	√	√	√	√
	3*10kWh	6	√	√	√	√	√	√	√
	3*5kWh	3	√	√	√	√	√	√	√
	Battery		WIT 4k-HU	WIT 5k-HU	WIT 6k-HU	WIT 8k-HU	WIT 10k-HU	WIT 12k-HU	WIT 15k-HU
System Options-Hope14.3 Battery									
Clusters	**Capacity**	**Battery Number**	**Output Power**						
One cluster of Hope14.3	≥42.9kWh, ≤143kWh	≥3, ≤10	√	√	√	√	√	√	Limited, 14.3kW
	28.6kWh	2	√	√	√	Limited, 7.1kW			
	14.3kWh	1	√	√	√	Limited, 7.1kW			
Two clusters of Hope14.3	2*(≥42.9kWh, ≤143kWh)	≥6, ≤20	√	√	√	√	√	√	√
	2*28.6kWh	4	√	√	√	√	√	√	Limited, 14.3kW
	2*14.3kWh	2	√	√	√	√	√	√	Limited, 14.3kW
Three clusters of Hope14.3	3*(≥42.9kWh, ≤143kWh)	≥9, ≤30	√	√	√	√	√	√	√
	3*28.6kWh	6	√	√	√	√	√	√	√
	3*14.3kWh	3	√	√	√	√	√	√	√
	Battery / Inverter		WIT 4k-HU	WIT 5k-HU	WIT 6k-HU	WIT 8k-HU	WIT 10k-HU	WIT 12k-HU	WIT 15k-HU

*Labeled with "√ " means the system can have a full load AC output when only battery, and labeled with "Limited" means the AC max output of the system with cosrresponding battery system.

**WIT series have dual battery input port for two clusters of battery system in parallel. If there are more than two battery clusters, please use the battery HUB in parallel.

Solutions for WIT Application Scenarios

Application Scenario:

1. Stable grid
2. On/Off-grid solution
3. No need for back up box

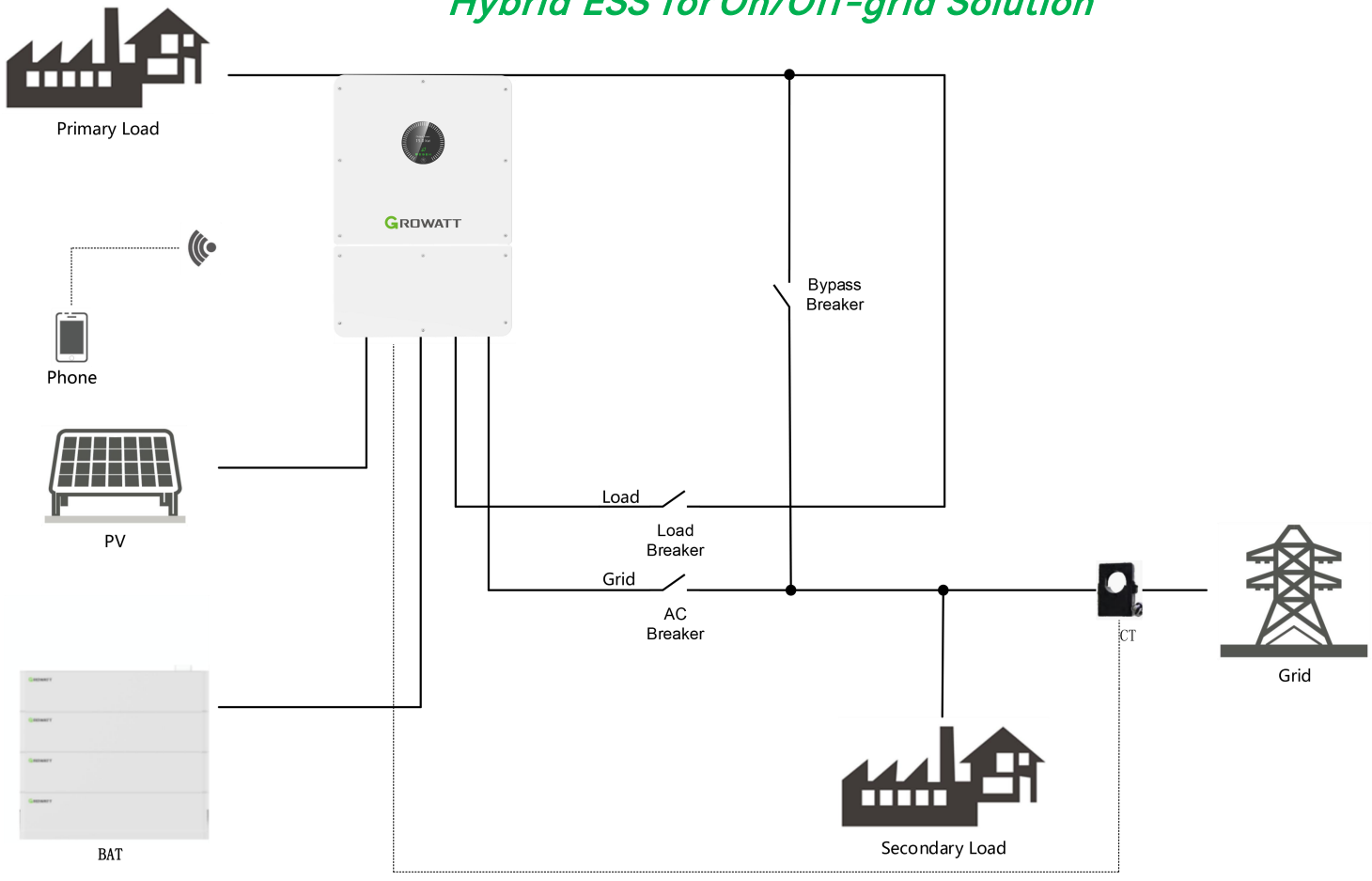
System Composition

- **Inverter:** WIT 4-15K-HU
- **BAT:** AXE 5.0L LV Battery
- **3CTs**

Remark:

- Support export limitation with CTs
- On/Off-Grid transform time 10ms
- Maximum off-grid power up to 2 times rated power, 10s

Hybrid ESS for On/Off-grid Solution



Solutions for WIT Application Scenarios

Application Scenario:

1. Relatively unstable grid

2. Off-grid solution

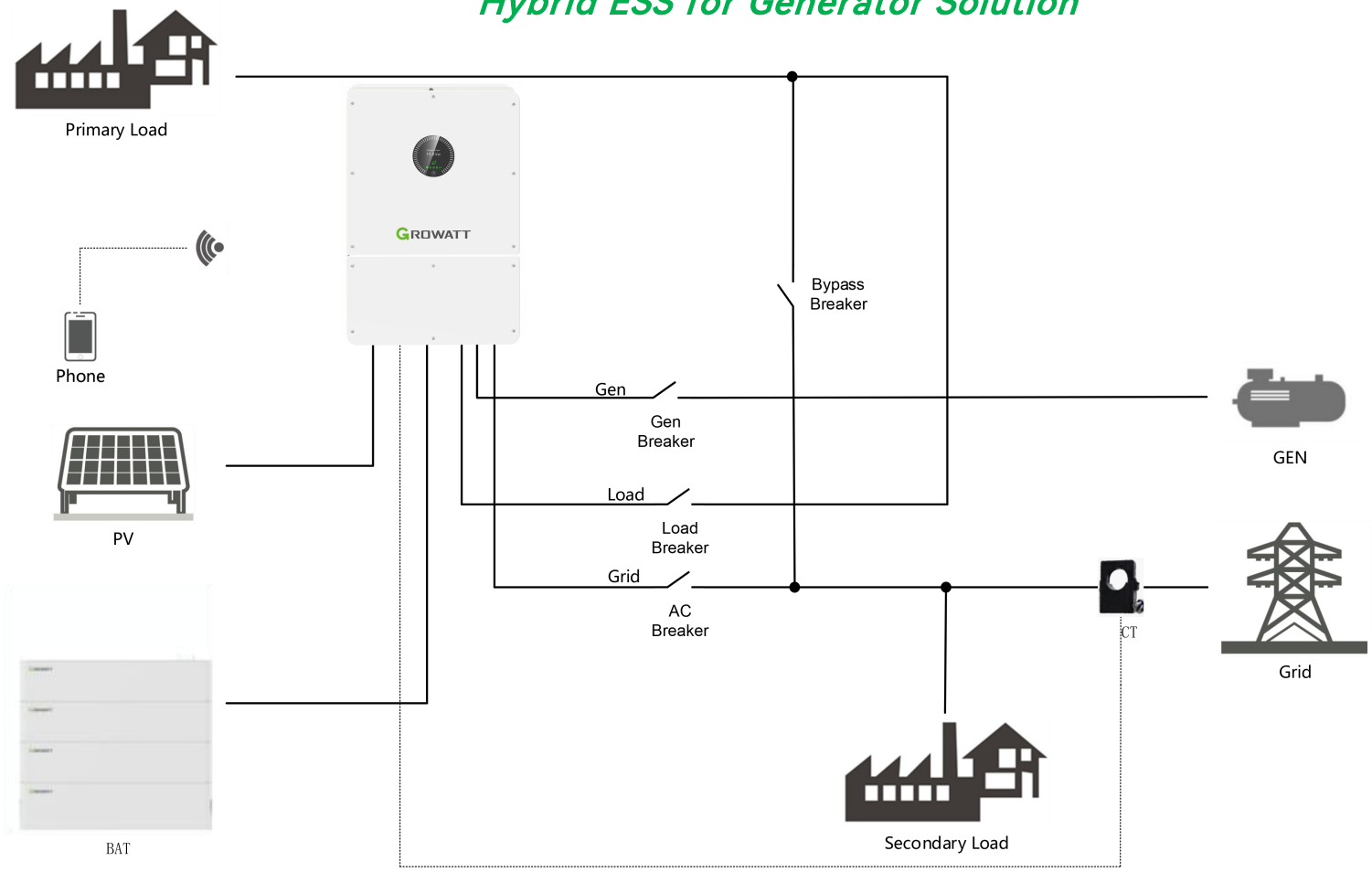
System Composition

- **Inverter:** WIT 4-15K-HU
- **BAT:** AXE 5.0L LV Battery
- **Generator**
- **3CTs**

Remark:

- Support export limitation with CTs
- Support generator supply to the load
- When the battery SOC is lower than the off-grid GEN start SOC, GEN will automatically be turned on.
- Generator≤30kW, Load≤15kW

Hybrid ESS for Generator Solution



Solutions for WIT Application Scenarios

Application Scenario:

1. Relatively stable grid
2. On/Off-grid solution
3. Different load scenarios

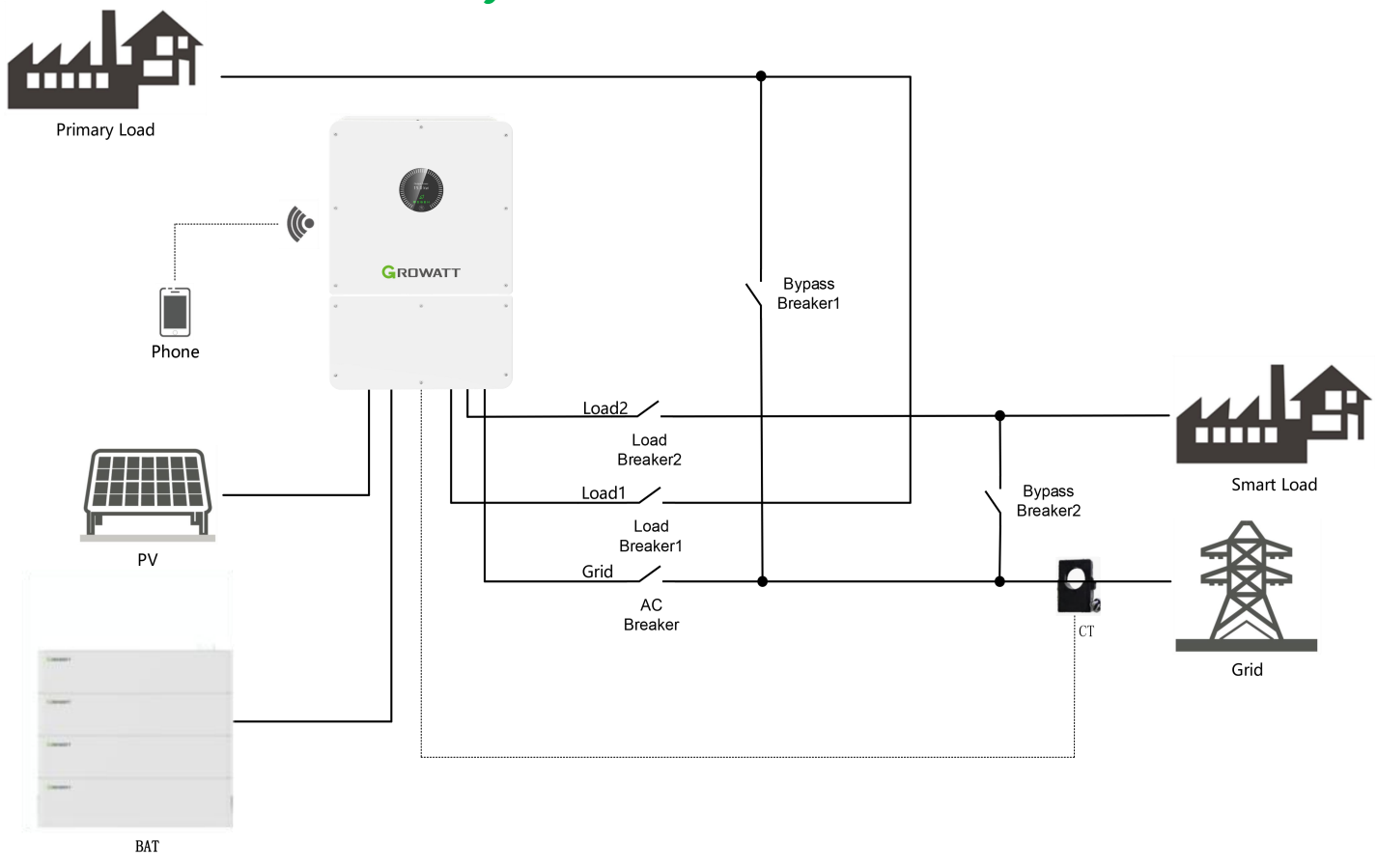
System Composition

- **Inverter:** WIT 4-15K-HU
- **BAT:** AXE 5.0L LV Battery
- **3CTs**

Remark:

- The high-power secondary load is connected through the GEN port, and the secondary load is intelligently cut off when in off-grid mode
- Allows customers to prioritize home loads

Hybrid ESS for Smart Load Solution



Solutions for WIT Application Scenarios

Application Scenario:

1. Stable grid
2. Original PV inverter
3. Easy to extended energy storage

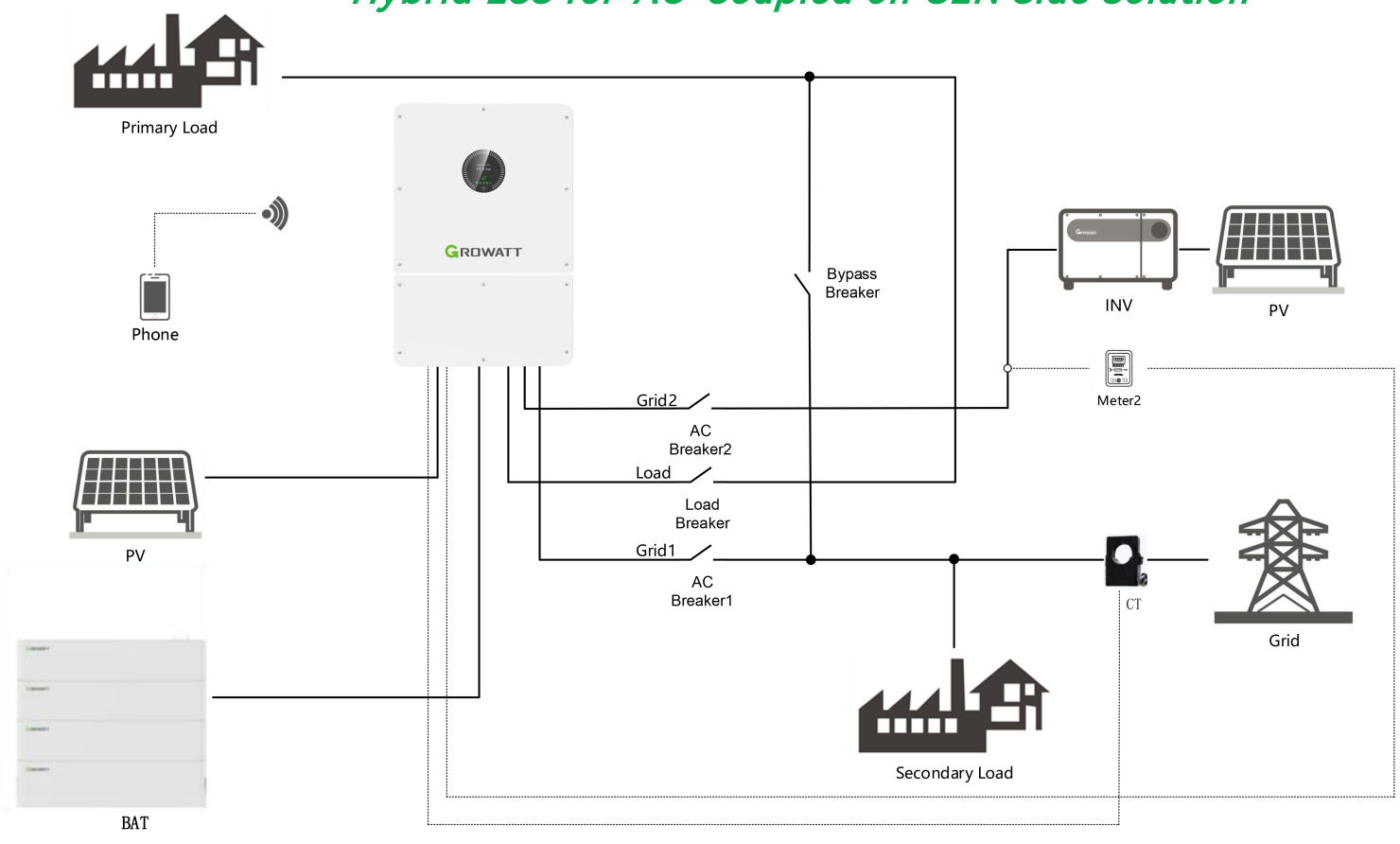
System Composition

- **Inverter:** WIT 4-15K-HU
- **BAT:** AXE 5.0L LV Battery
- **Meter+3CTs**

Remark:

- The PV inverter is connected through the GEN port
- Include UPS load, secondary load, and PV inverter

Hybrid ESS for AC-Coupled on GEN Side Solution



Solutions for WIT Application Scenarios

Application Scenario:

1. Relatively stable grid

2. On/Off-grid solution

3. AC-Coupled inverter basic solution for retrofit project

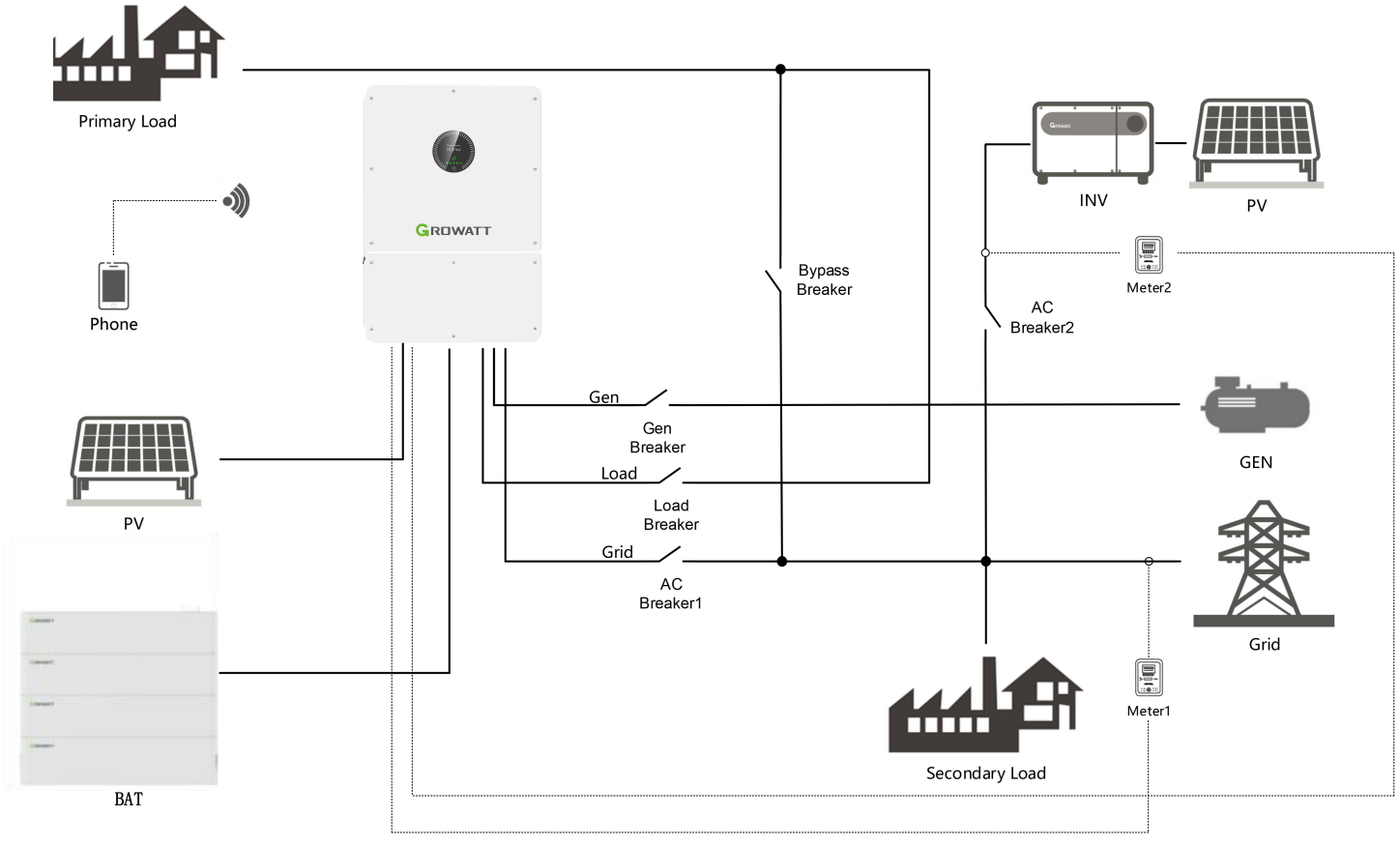
System Composition

- **Inverter:** WIT 4-15K-HU
- **BAT:** AXE 5.0L LV Battery
- **Generator**
- **Meter*2 / Meter+3CTs(Opt)**

Remark:

- The PV inverter is connected through the grid side
- Include generator, UPS load, secondary load, and PV inverter

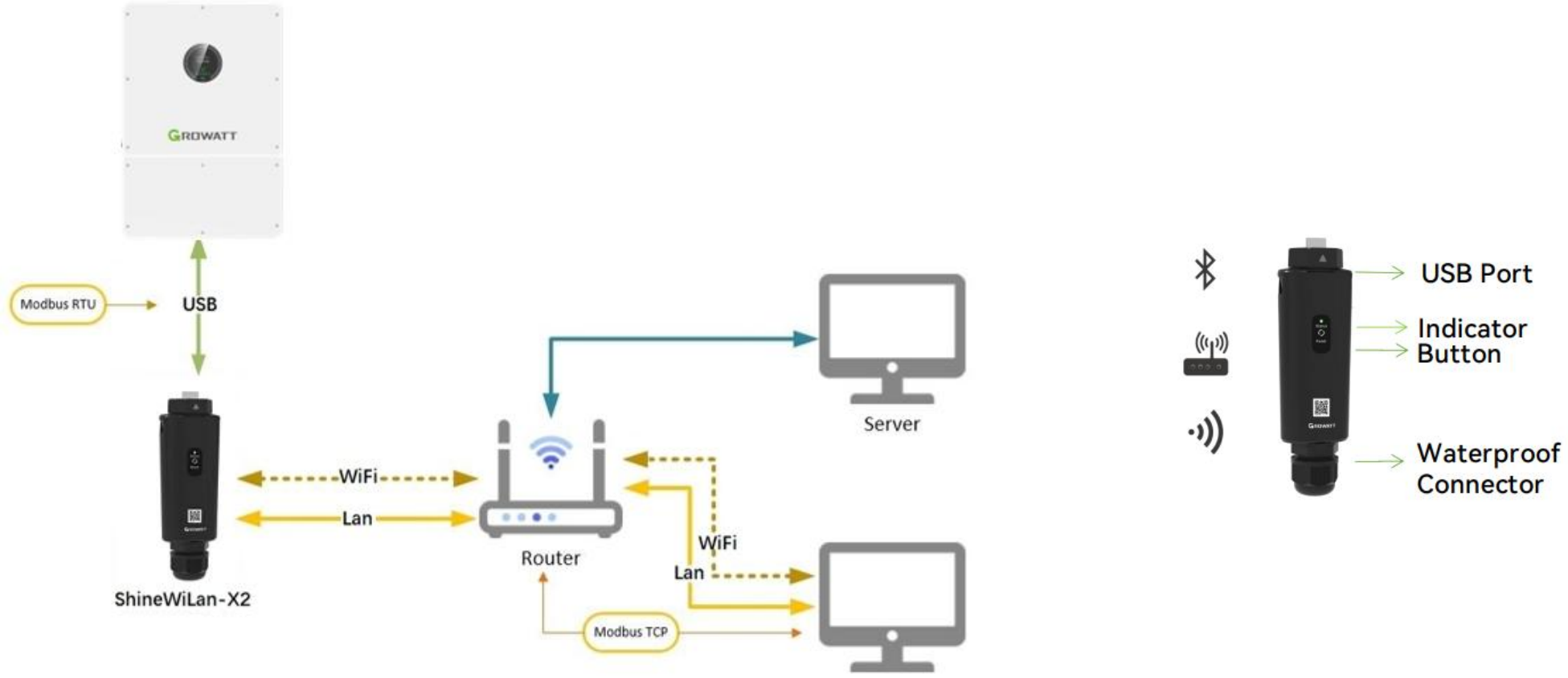
Hybrid ESS for AC-Coupled on Grid Side Solution



06

Advantages

MODBUS TCP Available



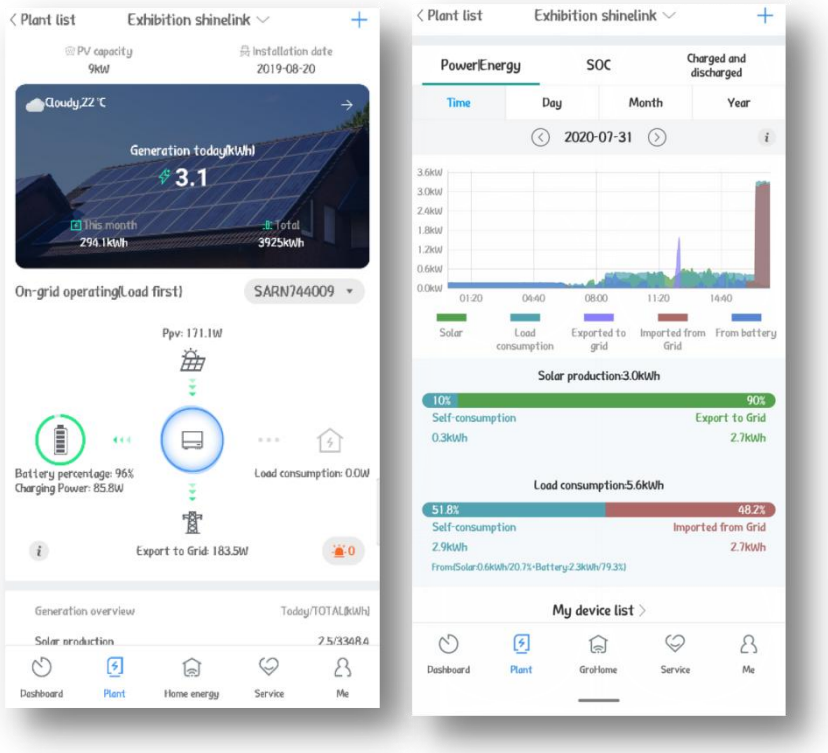
- By using the newest software version, ShineWiLan-X2 could be used to support SCADA control based on MODBUS TCP protocol for the third party.
- The third party system is connected to the router through a LAN cable, the ShineWiLan-X2 is connected to the router through WiFi, and the ShineWiLan-X2 communicates with the inverter via the USB port, and the customer still needs to read and set the inverter values according to Growatt's inverter protocol registration table.

Online Smart Diagnosis

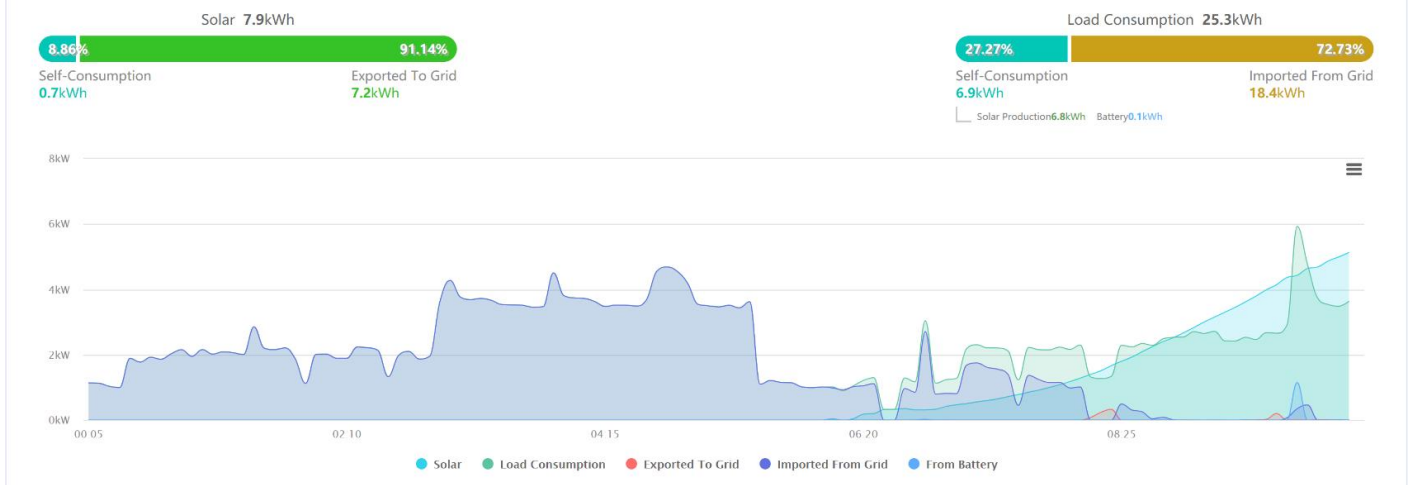
- One-click-diagnosis for solar input side, no need professional people or equipment
- Intelligent I-V curve detection, realizing intelligent operation and maintenance
- Accurate fault location and trouble-shooting guide

Smart Maintenance

Monitoring of Real-time data and system status.
Resumes transmission at break-points

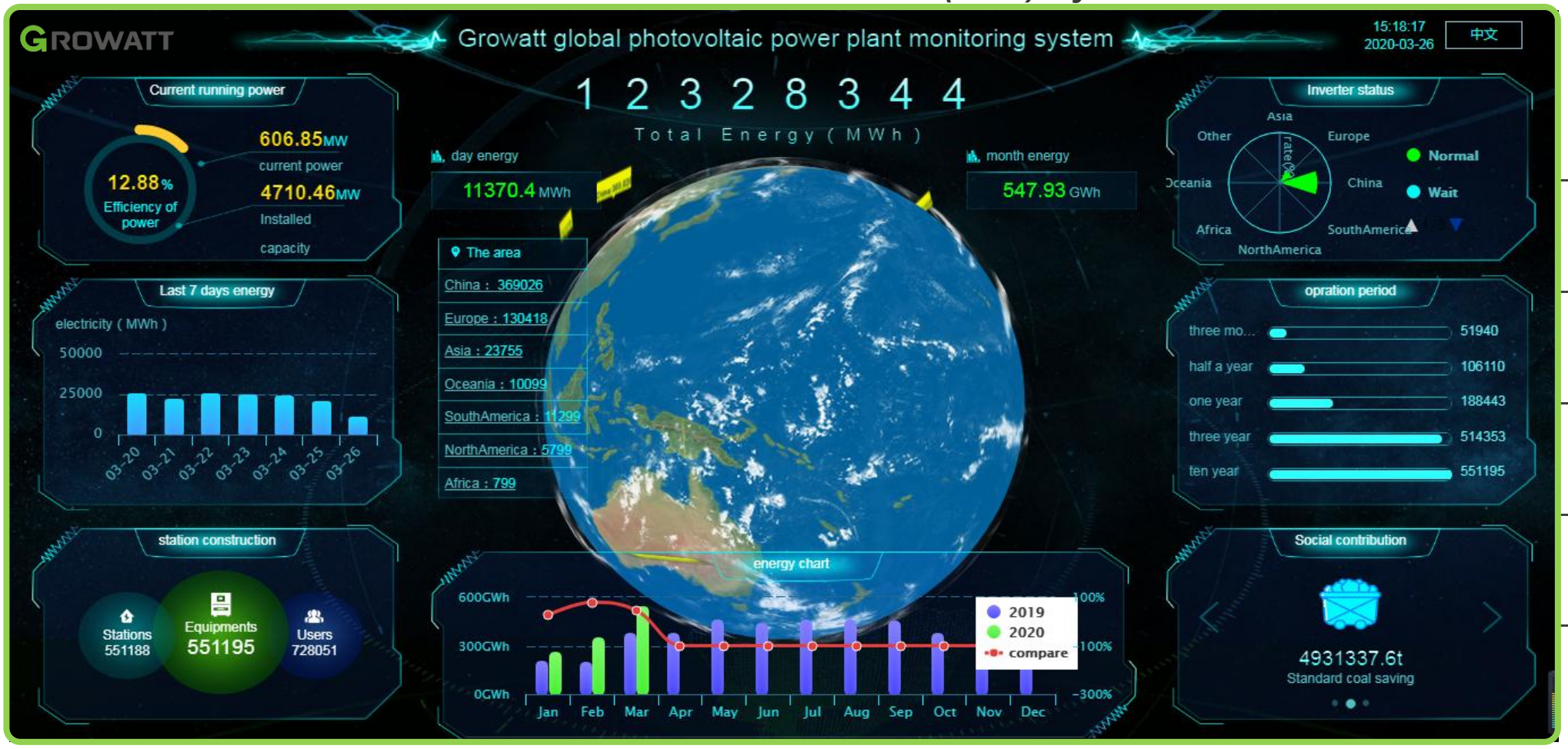


ShinePhone App



Server Monitor

Online Smart Service (OSS) System



- Online failure reporting
- Remote parameter setting
- Remote firmware upgrading
- No need site travelling
- Reduce maintenance cost

Thanks!

www.ginverter.com

Growatt New Energy