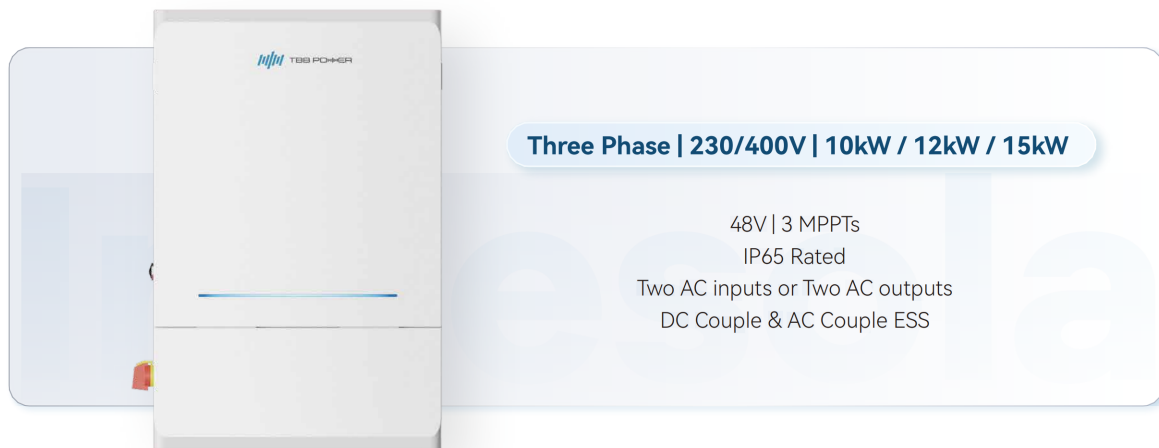


Ingesola

- Hybrid Inverter -



TBB Ingesola 10T/12T/15T series are three-phase hybrid inverters for residential hybrid ESS, to cut electricity cost and reliance on the grid. Suitable for low voltage battery(48V) systems, it features a 1.95 max DC/AC ratio and 3 MPPT trackers for efficient solar integration. It handles three-phase unbalanced outputs, and supports both off-grid and grid-tie operations.

It offers a smart port for configurations like secondary AC output, AC Coupling for retrofitting, generator input for backup power, and EV charging with EV and V2G chargers. Ideal for optimizing self-consumption, the Ingesola series also includes an EMS for peak shaving with eight configurable time periods for charging and discharging, and has an IP65-rated design for durability in harsh environments.

Enhanced Flexibility

- Supports both off-grid and grid-tie operations
- For Hybrid ESS, AC Coupling Retrofitting, Backup Power and EV Charging applications
- Two AC inputs or two AC outputs
- Smart port for GEN input, AC Coupling with PV inverter, EV charging, or 2nd AC output
- Support battery heterogeneity across different types or same-type with varying capacities
- Scalable up to 3 units in parallel
- Built-in 3 MPPT trackers for flexible system design and higher yields
- Built-in EMS with 8 time periods for battery charging & discharging

Superior Reliability

- Three-phase unbalanced output
- Max. charging/discharging current of 300A
- Dust-and water-proof IP65 rated enclosure
- 0-10ms UPS ability
- Intelligent control

ESS Capabilities

- Maximize self-consumption
- Lower electricity bills via peak shaving & time-of-use
- Grid feed-in for utility credits
- AC Coupling retrofitting existing grid-tie systems

Easy O&M

- Support CAN, RS485, and DRM
- Local monitoring via E4 LCD Monitor
- Remote monitoring and control via Nova Web & APP

Model No.	Ingesola 10T	Ingesola 12T	Ingesola15T
Grid input			
Grid feedback	Yes		
Nominal AC input voltage	Three phase 3P4W+PE, 220/380Vac, 230/400Vac, 240/415Vac, 50/60Hz		
AC Input range	-25%~+20% or According to Grid Code Standard; 50Hz:+/-5Hz; 60Hz:+/-5Hz		
AC input Current (transfer switch)	45A		
AC Input Current Limit Function & Surge Protection	Yes		
Generator input			
Nominal AC input voltage	Three phase 3P4W+PE, 220/380Vac, 230/400Vac, 240/415Vac, 50/60Hz		
AC Input range	-25%~+20%; 40Hz-70Hz		
AC input Current (transfer switch)	32A		
AC Input Current Limit Function	Yes		
Inverter			
Nominal AC output range	Three phase 3P4W+PE, 230/400Vac+/-2%; 50/60Hz+/-0.1%		
Harmonic distortion	Linear load<2%, Non-linear load <5%		
Nominal Output Power	10000VA	12000VA	15000VA
Max. AC output power	11000VA	13200VA	16500VA
Peak power (off grid)	20000VA 60S	24000VA 60S	30000VA 10S
Nominal AC Output Current	15.2A	18.2A	22A
Maximum efficiency	97.8%	97.8%	97.8%
Zero load power (W)	80	80	80
DC			
DC Voltage Range	40V-60V		
Battery types	Lead acid battery, Lithium battery		
Charging strategy for Li-Ion battery	Self adaption to BMS		
Max. Charging/ Discharging Current	210A/210A	250A/250A	300A/300A
Solar			
Max. DC input power	19500W		
Max. PV Input Voltage	1000V		
MPPT Voltage Range / Start-up Voltage	150-800V / 160V		
Max. PV Input Current / Max.Short Current	16A+16A+16A / 20A+20A+20A		
MPPT Number / No. Strings Per MPPT Tracker	3 / 1+1+1		
General			
Backup	UPS		
Max. AC Pass-through Current	32A		
Protection	a) output short circuit, b) overload , c) battery voltage too high , d) battery voltage too low, e) temperature too high, f) input voltage out of range, g) input voltage ripple too high, h) Fan block		
CAN Bus communication port	For parallel operation		
General purpose com. Port	DRM, RS485		
Display	LED+ External Touch LCD screen		
Operating temperature range & relative humidity	-25°C~60°C>45°C de-rating; 95% without condensation		
Altitude (m)	3000		
Dimension (Wx D x H) (mm)	484*250*740		
Weight (kg)	30	31	32
IP Protection	IP65 (Outdoor)		
Grid Regulation	AS/NZS 4777.2, IEC61727, IEC62116, IEC61683, NRS097-2-1		
Safety & EMC	IEC62109-1/-2,IEC61000-6-1,IEC61000-6-3,IEC61000-3-11,IEC61000-3-12,NTS2.1(A),RD1699		
Warranty	5 Year Product Warranty, 10 Year Performance Warranty		

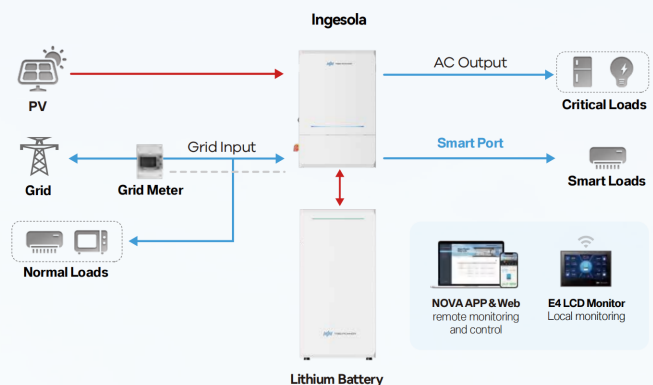
ESS Applications

Ingesola is designed for low voltage batteries

→ Work with Solar

Hybrid ESS Solution

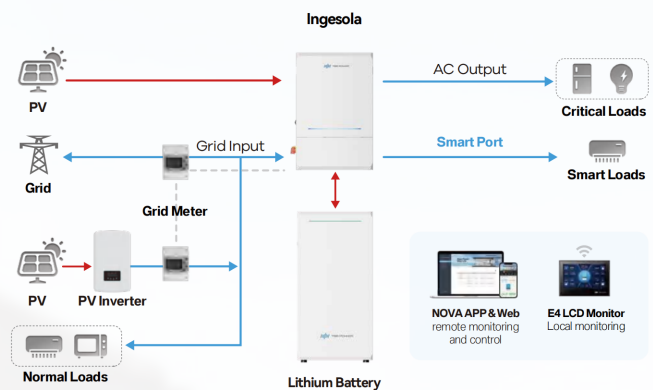
Optimize self-consumption by allocating surplus solar energy to power loads at the AC inputs, reducing system initial investment.



The following two solutions are suitable for scenarios with more energy consumption in the day and less consumption at night, like offices.

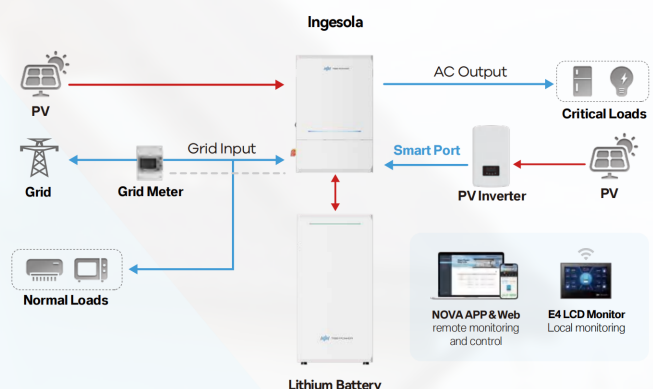
Hybrid ESS Solution with AC Coupled PV on Input

Mostly for retrofitting an existing PV grid-tie system into an ESS system by adding a CT or Energy Meter.



Hybrid ESS Solution with AC Coupled PV on Output

Mostly for retrofitting an existing PV grid-tie system into an AC Coupled PV ESS system without adding CT or Energy Meter. When the grid fails in the daytime, the PV inverter can also keep generating electricity.



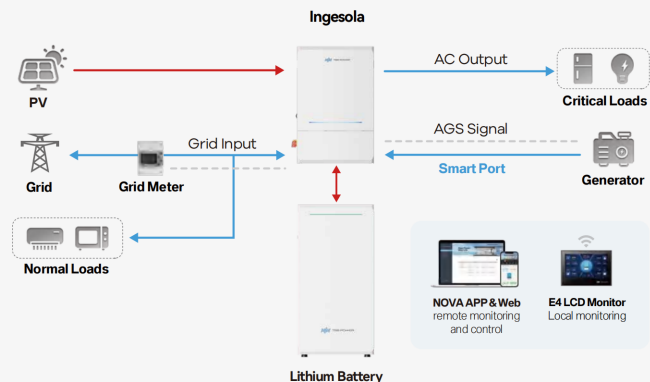


Work with Generator

Power Backup Solution

Suitable for a newly installed system.

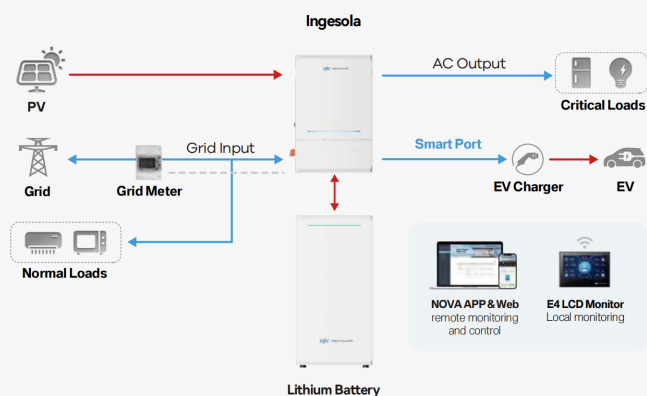
Application scenario: unstable grid or non-stop power supply required, like fire fighting systems.



Work with EV Charger & V2G Charger

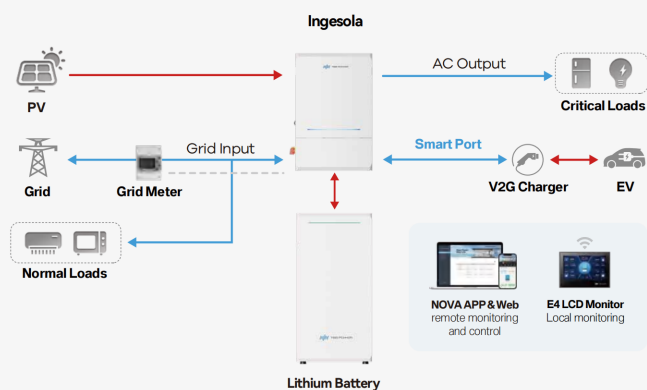
Pair Energy Storage System with EV Chargers

The EVs can be charged with surplus solar energy, with the battery if the battery SoC is higher than a certain level, or with grid power during low or negative price periods, to realize time-of-use arbitrage and cut your bills.



Pair Energy Storage System with V2G Chargers

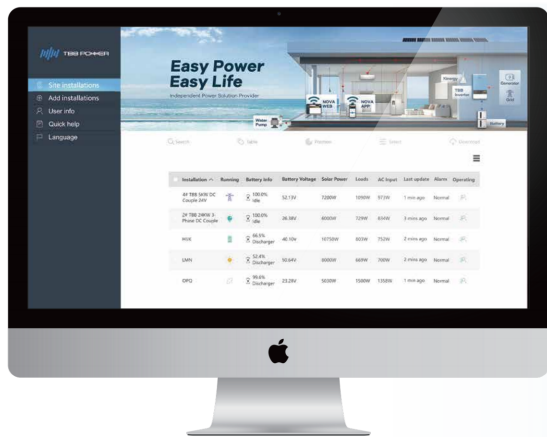
When working with the V2G chargers, the system can charge the EVs with surplus solar energy to save bills. When the PV and the battery are not enough to power loads, the system can also draw the stored energy from EVs to compensate the insufficient part.



TBB NOVA APP & Web

Monitor and Control Your Solar System Anywhere Anytime

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Devices for remote monitoring communication



Ether-Link



E4 LCD Monitor



Kinergy II-WiFi
Wireless Data Logger

Comprehensive Monitoring

- Live data and status overview and system analysis
- System configuration and parameter setting
- Customizable alarm setting
- Detailed report for power harvest, storage and consumption in visual chart and graph
- WEB compatible for Windows and Mac PC
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Intelligent Management for Dealers / Installers

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- Customizable banner to show dealers information and slogan



Android



iOS

nova.tbbrenewable.com



/ Max Self-consumption, Max Savings

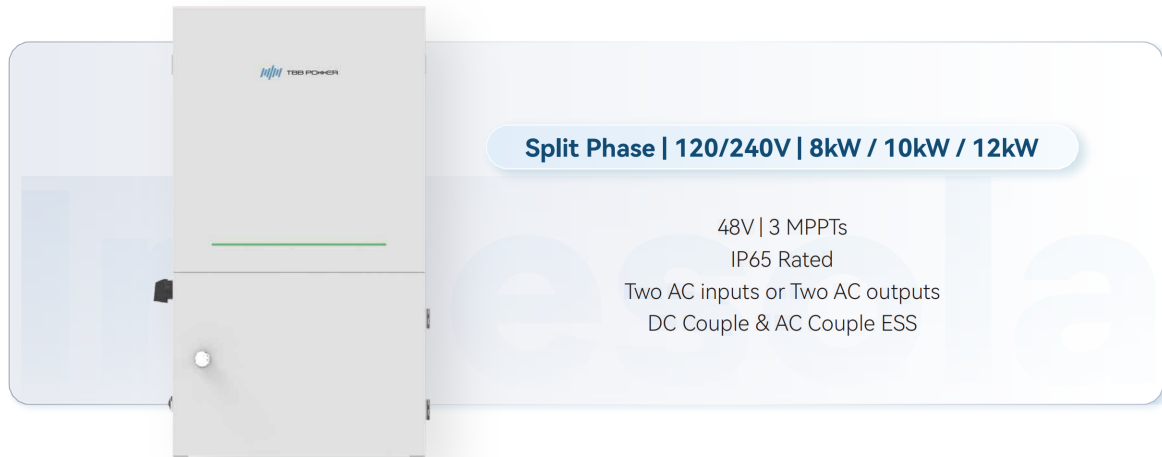


Residential Hybrid **ESS Solution**

T B B R E N E W A B L E

Ingesola

- Hybrid Inverter -



TBB Ingesola P8/P10/P12 series are split-phase hybrid inverters for residential hybrid ESS, to cut electricity cost and reliance on the grid. Suitable for low voltage battery (48V) systems, it features 3 MPPT trackers, and supports both off-grid and grid-tie operations.

It offers a smart port for configurations like secondary AC output, AC Coupling for retrofitting, generator input for backup power, and EV charging with EV and V2G chargers. Ideal for optimizing self-consumption, the Ingesola series also includes an EMS for peak shaving with eight configurable time periods for charging and discharging, and has an IP65-rated design for durability in harsh environments.

Enhanced Flexibility

- Supports both off-grid and grid-tie operations
- For Hybrid ESS, AC Coupling Retrofitting, Backup Power and EV Charging applications
- Two AC inputs or two AC outputs
- Smart port for GEN input, AC Coupling with PV inverter, EV charging, or 2nd AC output
- Support battery heterogeneity across different types or same-type with varying capacities
- Scalable up to 3 units in parallel
- Built-in 3 MPPT trackers for flexible system design and higher yields
- Built-in EMS with 8 time periods for battery charging & discharging

Superior Reliability

- Max. charging/discharging current of 210A
- Dust-and water-proof IP65 rated enclosure
- 0-10ms UPS ability
- Intelligent control

ESS Capabilities

- Maximize self-consumption
- Lower electricity bills via peak shaving & time-of-use
- Grid feed-in for utility credits
- AC Coupling retrofitting existing grid-tie systems

Easy O&M

- Support CAN and RS485
- Local monitoring via E4 LCD Monitor
- Remote monitoring and control via Nova Web & APP

Model No.	Ingesola P8	Ingesola P10	Ingesola P12
Grid input			
Grid feedback	Yes		
Nominal AC input voltage (VAC)	Split phase 120/240, 2/3 phase 208		
AC Input Voltage Range (VAC)	-25%~+15%,Split phase : 180~280@240 (L1-L2); 90~138@120V (L1/2-N) 2/3 phase: L1-L2 156~240@208 (L1-L2); 90~138@120V (L1/2-N)		
AC Input Frequency Range (Hz)	50: +/-5; 60: +/-5		
AC Input Current (transfer switch) (A)	200	200	200
AC Input Current Limit Function & Surge Protection	Yes		
Generator input			
Nominal AC Input Voltage (VAC)	Split phase 120/240 ; 2/3 phase 208		
AC Input Range (VAC)	-25%~+15%, Split phase : 180~280@240 (L1-L2); 90~138@120V (L1/2-N)2/3 phase: L1-L2 156~240@208 (L1-L2); 90~138@120V (L1/2-N)		
AC Input Frequency Range (Hz)	40-70		
AC Input Current (transfer switch) (A)	200	200	200
AC Input Current Limit Function	Yes		
Inverter			
Nominal AC output voltage (VAC)	Split phase 120/240, 2/3 phase 208		
Nominal AC output frequency (Hz)	50/60 +/-0.1%		
Harmonic distortion	Linear load<2%, Non-linear load <5%		
Nominal Output Power (VA)*	8000	10000	12000
Max. AC output power (VA)	8800	11000	13200
Peak power (off grid)	2 Times of Rated Power, 10s		
Nominal / Max. AC Output Current (A)	25 / 37.5	33.3 / 50	41.6 / 50
DC			
DC Voltage Range (V)	40-60	40-60	40-60
Battery types	Lead acid battery, Lithium battery		
Charging strategy for Li-Ion battery	Self adaption to BMS		
Max. Charging/ Discharging Current (A)	125/125	167/167	210/210
Solar			
Max. DC input power (W)	9000	12000	15000
Max. PV Input Voltage (V)	500		
MPPT Voltage Range /Start-up Voltage (V)	125-430 / 160		
Max. PV Input Current / Max.Short Current (A)	20+20 / 22+22	20+20+20 / 22+22+22	
MPPT Number / No. Strings Per MPPT Tracker	2 / 1+1	3 / 1+1+1	
General			
Backup	UPS	UPS	UPS
Max.AC Pass-through Current (A)	200	200	200
Protection	a) output short circuit; b) overload, c) battery voltage too high, d) battery voltage too low, e) temperature too high, f) input voltage out of range, g) input voltage ripple too high, h) Fan block		
CAN Bus communication port	For parallel operation		
General purpose com. Port	RS485, CAN (BMS)		
Display	LED		
Operating temperature range & relative humidity	-25°C~60°C>45°Cde-rating; 95% without condensation		
Altitude (m)	3000		
IP Protection	IP65 (Outdoor)		
Grid Regulation	IEEE 1547, IEEE 1547.1, UL 1741SA, CA Rule 21, Hawaiian Rule14H, PRC-024-1		
Safety & EMC	UL 1741, CSA C22.2 No. 107.1, FCC Part 15		
Warranty	5 Year Product Warranty, 10 Year Performance Warranty		

* When PV energy is sufficient

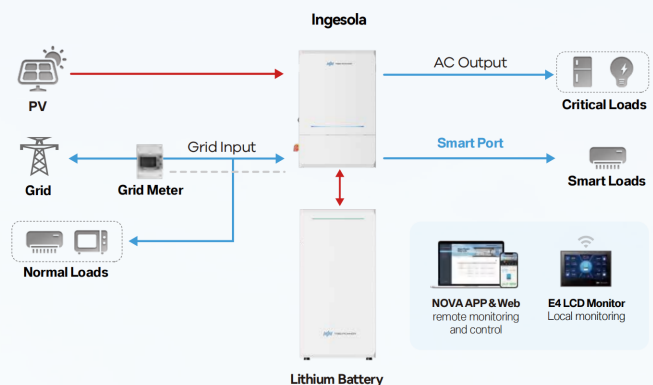
ESS Applications

Ingesola is designed for low voltage batteries

→ Work with Solar

Hybrid ESS Solution

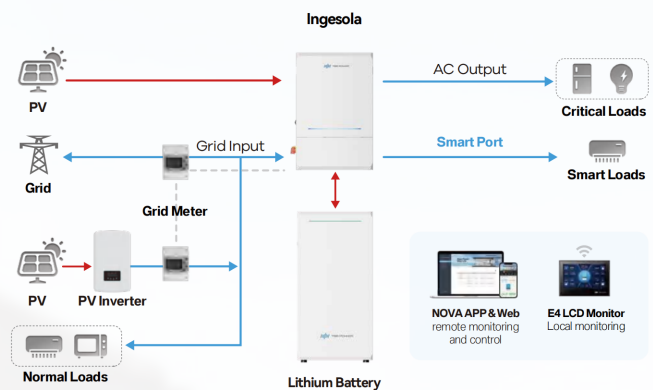
Optimize self-consumption by allocating surplus solar energy to power loads at the AC inputs, reducing system initial investment.



The following two solutions are suitable for scenarios with more energy consumption in the day and less consumption at night, like offices.

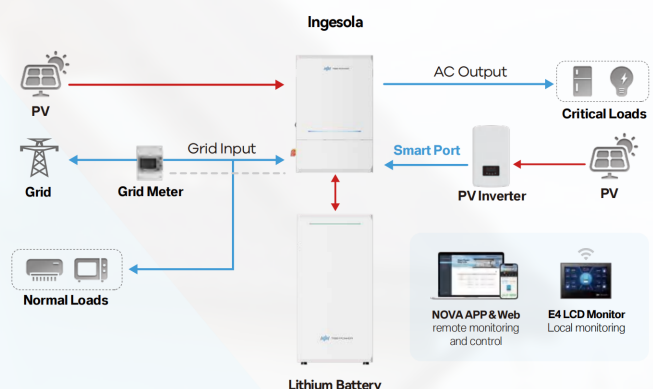
Hybrid ESS Solution with AC Coupled PV on Input

Mostly for retrofitting an existing PV grid-tie system into an ESS system by adding a CT or Energy Meter.



Hybrid ESS Solution with AC Coupled PV on Output

Mostly for retrofitting an existing PV grid-tie system into an AC Coupled PV ESS system without adding CT or Energy Meter. When the grid fails in the daytime, the PV inverter can also keep generating electricity.



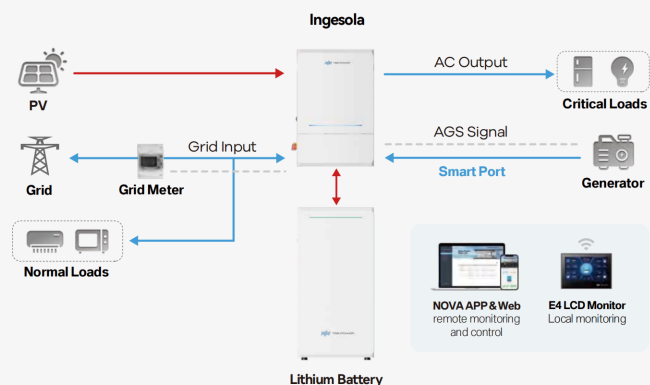


Work with Generator

Power Backup Solution

Suitable for a newly installed system.

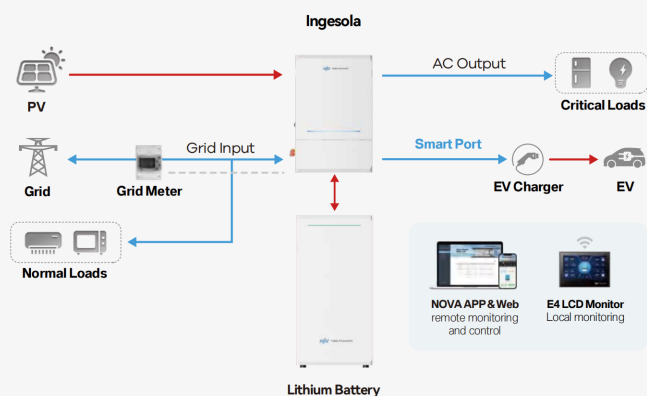
Application scenario: unstable grid or non-stop power supply required, like fire fighting systems.



Work with EV Charger & V2G Charger

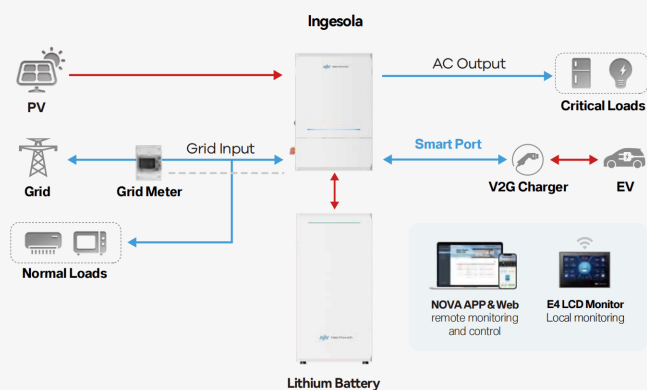
Pair Energy Storage System with EV Chargers

The EVs can be charged with surplus solar energy, with the battery if the battery SoC is higher than a certain level, or with grid power during low or negative price periods, to realize time-of-use arbitrage and cut your bills.



Pair Energy Storage System with V2G Chargers

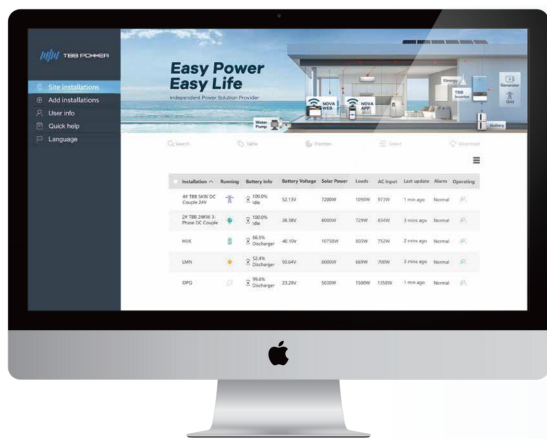
When working with the V2G chargers, the system can charge the EVs with surplus solar energy to save bills. When the PV and the battery are not enough to power loads, the system can also draw the stored energy from EVs to compensate the insufficient part.



TBB NOVA APP & Web

Monitor and Control Your Solar System Anywhere Anytime

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Devices for remote monitoring communication



Ether-Link



E4 LCD Monitor



Kinergy II-WiFi
Wireless Data Logger

Comprehensive Monitoring

- Live data and status overview and system analysis
- System configuration and parameter setting
- Customizable alarm setting
- Detailed report for power harvest, storage and consumption in visual chart and graph
- WEB compatible for Windows and Mac PC
- APP available for Android and iOS phone

Intelligent Management for Dealers / Installers

- Comprehensive management for multiple installations
- Catch potential issues early with alarm setting to prevent system failure
- Optimize the energy harvest and usage with history graphs and detailed analytical reports
- Proactive maintenance services to keep good relationship with customers
- Customizable banner to show dealers information and slogan



Android



iOS

nova.tbbrenewable.com



/ Max Self-consumption, Max Savings

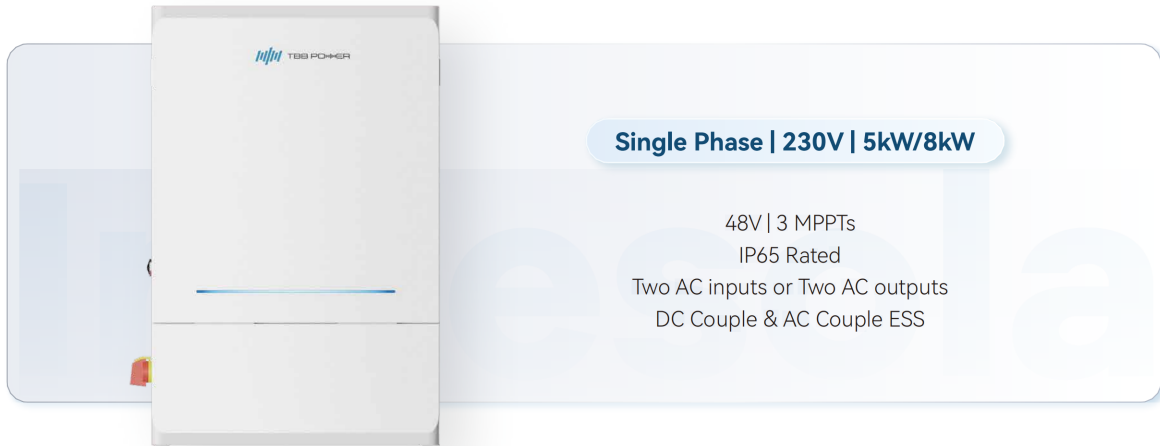


Residential Hybrid **ESS Solution**

T B B R E N E W A B L E

Ingesola

- Hybrid Inverter -



TBB Ingesola S5/S8 series are single-phase hybrid inverters for residential hybrid ESS, to cut electricity cost and reliance on the grid. Suitable for low voltage battery (48V) systems, it features a 1.5 max DC/AC ratio and 2 MPPT trackers for efficient solar integration. It supports both off-grid and grid-tie operations.

It offers a smart port for configurations like secondary AC output, AC Coupling for retrofitting, generator input for backup power, and EV charging with EV and V2G chargers. Ideal for optimizing self-consumption, the Ingesola series also includes an EMS for peak shaving with eight configurable time periods for charging and discharging, and has an IP65-rated design for durability in harsh environments.

Enhanced Flexibility

- Supports both off-grid and grid-tie operations
- For Hybrid ESS, AC Coupling Retrofitting, Backup Power and EV Charging applications
- Two AC inputs or two AC outputs
- Smart port for GEN input, AC Coupling with PV inverter, EV charging, or 2nd AC output
- Support battery heterogeneity across different types or same-type with varying capacities
- Parallel and three-phase up to 9 units
- Built-in 2 MPPT trackers for flexible system design and higher yields
- Built-in EMS with 8 time periods for battery charging & discharging

Superior Reliability

- Max. charging/discharging current of 190A
- Dust-and water-proof IP65 rated enclosure
- 0-10ms UPS ability
- Intelligent control

ESS Capabilities

- Maximize self-consumption
- Lower electricity bills via peak shaving & time-of-use
- Grid feed-in for utility credits
- AC Coupling retrofitting existing grid-tie systems

Easy O&M

- Support CAN, RS485, and DRM
- Local monitoring via E4 LCD Monitor
- Remote monitoring and control via Nova Web & APP

Model No.	Ingesola S5	Ingesola S8
Grid input		
Grid feedback	Yes	
Nominal AC input voltage	Single phase, 220/230/240Vac, 50/60Hz	
AC Input range	-20%~+20% or According Grid Code Standard; 50Hz: +/-5Hz; 60Hz: +/-5Hz	
AC input Current (transfer switch)	50A	
AC Input Current Limit Function & Surge Protection	Yes	
Generator input		
Nominal AC input voltage	Single phase, 220/230/240Vac, 50/60Hz	
AC Input range	-20%~+20%; 40Hz-70Hz	
AC input Current (transfer switch)	50A	
AC Input Current Limit Function	Yes	
Inverter		
Nominal AC output range	Single phase, 230Vac+/-2%; 50/60Hz+/-0.1%	
Harmonic distortion	Linear load<2%, Non-linear load <5%	
Nominal Output Power	5000VA	8000VA
Max. AC output power	5500VA	8800VA
Peak power (off grid)	10000VA 10S	16000VA 10S
Nominal AC Output Current	22.7A	36.4A
Maximum efficiency	97.8%	97.8%
Zero load power (W)	40W	45W
DC		
DC Voltage Range	42V-60V	
Battery types	Lead acid battery, Lithium battery (Self adaption to BMS)	
Max. Charging/ Discharging Current	120A/120A	190A/190A
Solar		
Max. DC input power	7500W	12000W
Max. PV Input Voltage	500V	
MPPT Voltage Range / Start-up Voltage	120-425V / 160V	
Max. PV Input Current / Max.Short Current	25A+25A / 25A+25A	
MPPT Number / No. Strings Per MPPT Tracker	2 / 1+1	
General		
Backup	UPS	
Max. AC Pass-through Current	50A	
Protection	a) output short circuit, b) overload , c) battery voltage too high , d) battery voltage too low, e) temperature too high, f) input voltage out of range, g) input voltage ripple too high, h) Fan block	
CAN Bus communication port	For parallel and three phase operation	
General purpose com. Port	DRM, RS485	
Display	LED+ External Touch LCD screen	
Operating temperature range & relative humidity	-40°C~65°C, >45°C de-rating; 95% without condensation	
Altitude (m)	4000	
IP Protection	IP65 (Outdoor)	
Grid Regulation	AS/NZS 4777.2, IEC61727, IEC62116, IEC60068, IEC61683, NRS097-2-1	
Safety & EMC	IEC62109-1/-2, IEC61000-6-1,IEC61000-6-3,IEC61000-3-11,IEC61000-3-12,NTS2.1(A),RD1699	
Warranty	5 Year Product Warranty, 10 Year Performance Warranty	

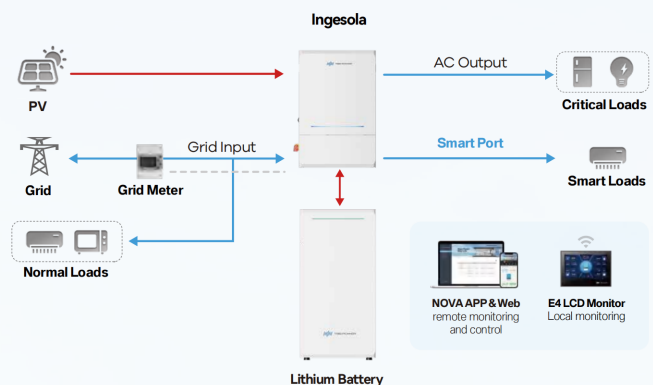
ESS Applications

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Hybrid ESS Solution

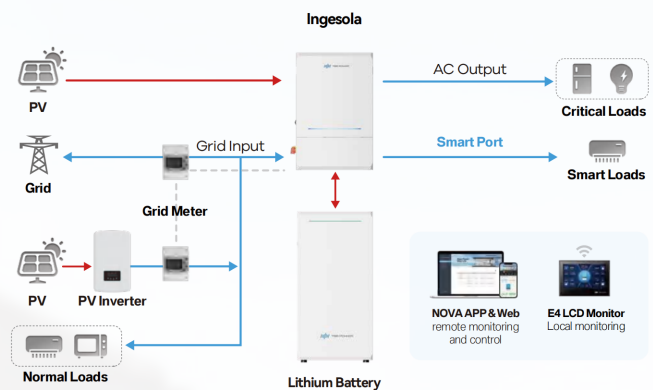
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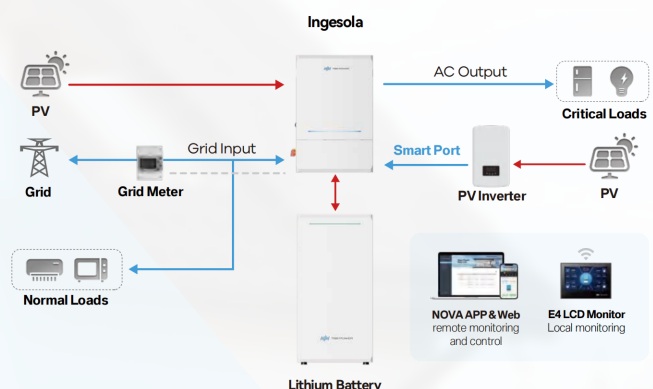
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Hybrid ESS Solution with AC Coupled PV on Output

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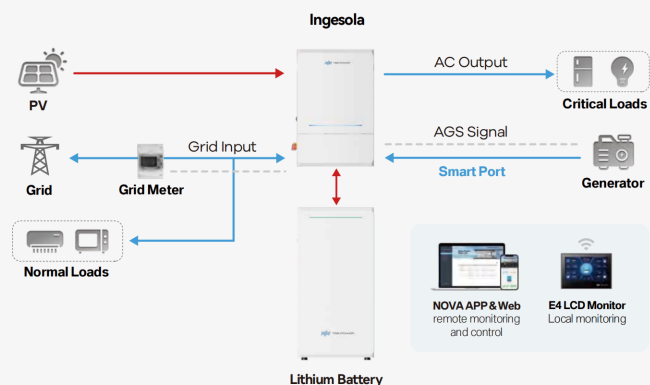


Work with Generator

Power Backup Solution

Suitable for a newly installed system.

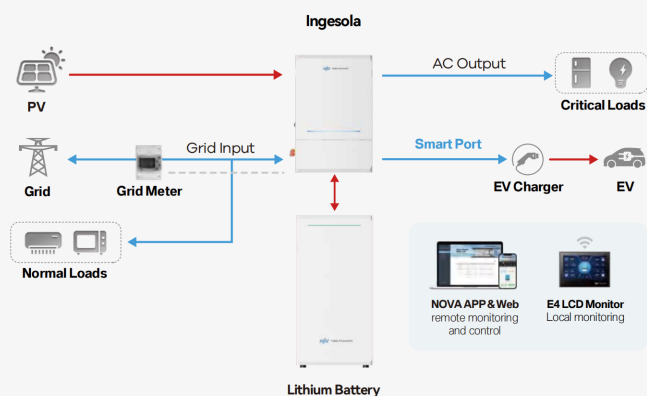
Application scenario: unstable grid or non-stop power supply required, like fire fighting systems.



Work with EV Charger & V2G Charger

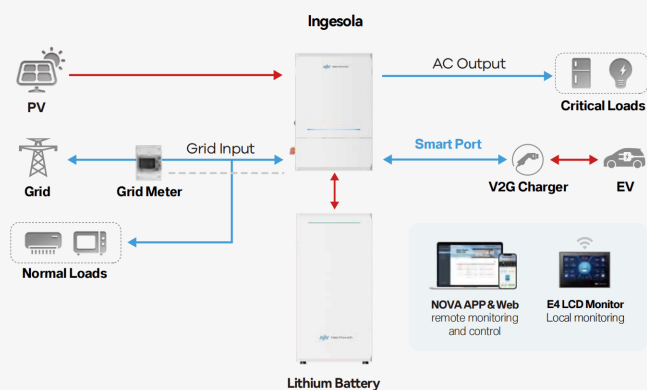
Pair Energy Storage System with EV Chargers

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Pair Energy Storage System with V2G Chargers

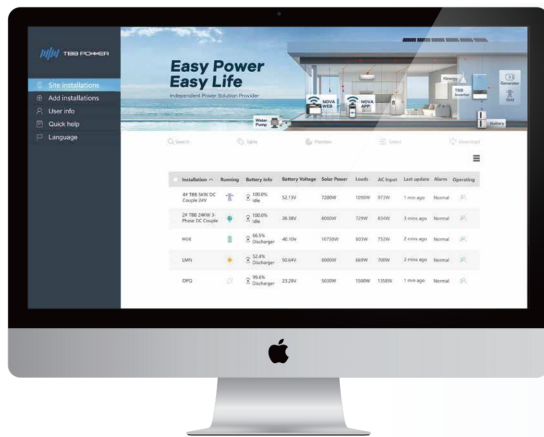
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E4 LCD Monitor



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- Customizable banner to show dealers information and slogan

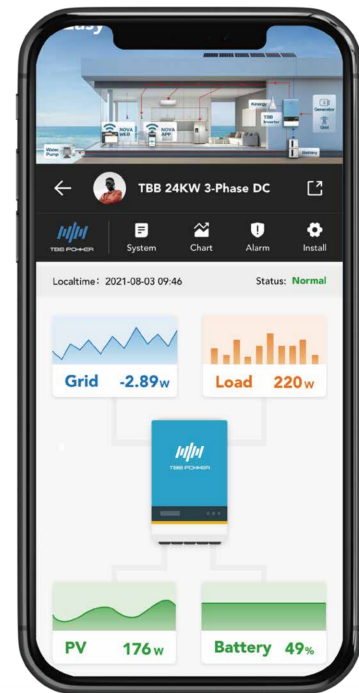


Android



iOS

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Residential Hybrid **ESS Solution**

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