

March 8, 2021

GOODWE AC Retrofit Solution (North America Only)

For the unique market demands (retrofit solution and split grid), GOODWE developed A-BP series which have an output power ranging from 5 kW to 9.6 kW. GOODWE A-BP series can support full back-up application and partial back-up application.

Application

According to different requirements, GOODWE can provide two different applications. Namely, full back-up application and partial back-up application.

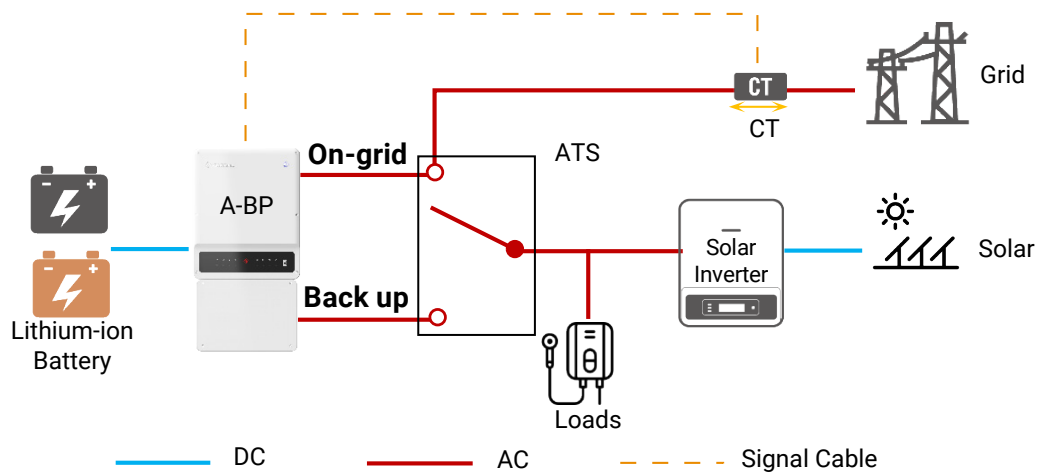


Figure 1. System Diagram of A-BP Full Back-up Solution

Note:

1. Generac ATS has been tested. (GOODWE ATS COMING SOON)
2. GOODWE Smart Meter GM2000 is built in A-BP.

Table 1. Application Scenarios of A-BP Full Back-up Solution

	1. Self-consumption	2. Time of Use	3. Off-Grid	4. Back up
Full back-up application	√	√	√	√
GOODWE A-BP Operation Logic: Solar supply priority: Loads → Battery → Export Load Consumption priority: Solar → Battery → Grid				

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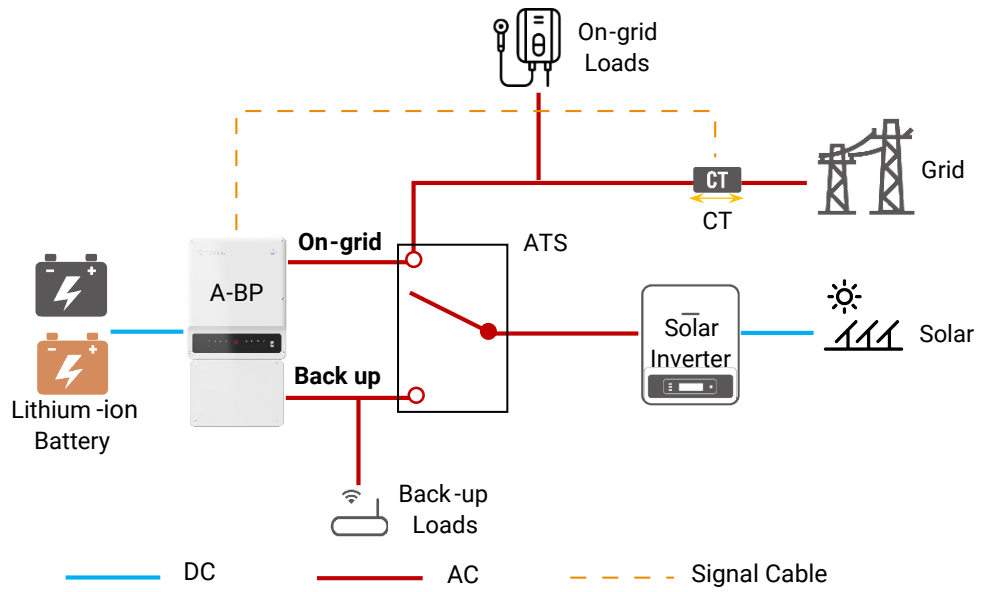


Figure 2. System Diagram of A-BP Partial Back-up Solution

Note:

1. Generac ATS has been tested. (GOODWE ATS COMING SOON)
2. GOODWE Smart Meter GM2000 is built in A-BP.
3. Loads need to be classified into on-grid loads and back-up loads.

Table 2. Application Scenarios of A-BP Partial Back-up Solution

	1. Self-consumption	2. Time of Use	3. Off-Grid	4. Back up
Partial back-up application	✓	✓	✓	✓
GOODWE A-BP Operation Logic: Solar supply priority: Loads → Battery → Export Load Consumption priority: Solar → Battery → Grid				

Micro-Grid Solution

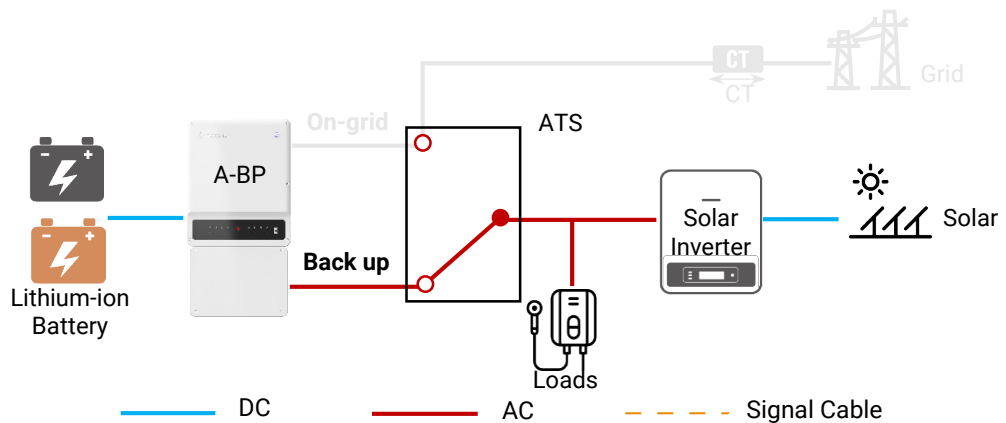


Figure 3. System Diagram of Micro-Grid System

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When grid power fails, A-BP automatically switches to back-up mode. The solar inverter automatically switches to back-up side from on-grid side of A-BP through Generac ATS. The solar inverter continues to work to support loads and charge the battery.

A micro-grid system works according to the following table:

Table 3. Micro-Grid System Working Logic

Condition	Battery energy sufficient		Battery energy insufficient
Criterion	$P_{\text{battery output}} + P_{\text{solar inverter output}} \geq P_{\text{Loads}}$	$P_{\text{battery output}} + P_{\text{solar inverter output}} < P_{\text{Loads}}$	$P_{\text{solar inverter output}} \geq P_{\text{Loads}} + P_{\text{battery input}}$
Behavior	Self-consumption	Overloaded, A-BP auto-restart	Charge the battery to 85 % SOC, then frequency shifting

Micro Grid Frequency Shifting

When the battery SOC is high and the charging power is detected or charging current is limited, A-BP will increase the output frequency, causing the solar inverter to reduce the output power, until the battery enters a low-power discharge state.

A micro-grid system configuration must meet the following rules.

1. A micro-grid system only supports one solar inverter.
2. If the solar panel and solar inverter have been installed, when you select the capacity of A-BP and battery, please satisfy the following constraint formula.

$$P_{A-BP} \geq P_{\text{solar inverter}}$$

$$\text{Min} \{ \text{Min. } V_{\text{BAT}} * \text{Min} \{ \text{Max. } I_{\text{BAT_Chg}}, \text{Max. } I_{A-BP_BatChg} \}, P_{A-BP} \} \geq \text{Min} \{ P_{\text{Panel}}, P_{\text{PVI}} \}$$

3. The battery voltage in the micro-grid system must not be higher than 405V.
4. The solar inverter must respond to the following Frequency-Watt curve. (in Figure 4)
5. When the frequency is shifted to over 60.5 Hz, solar inverter will shut down in 5 minutes.

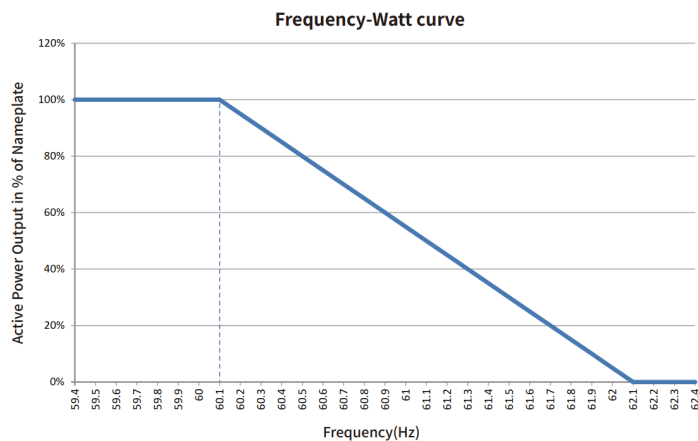


Figure 4. Frequency-Watt Curve

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Note:

P_{A-BP} : Rated Power of A-BP

$P_{solar\ inverter}$: Rated Power of the solar Inverter

P_{Panel} : Rated Power of the Panel

$Min.V_{BAT}$: Minimum Output Voltage of the Battery

$Max.I_{BAT-Chg}$: Maximum Charging Current of the Battery

$Max.I_{A-BP_BatChg}$: Maximum Battery Charging Current of A-BP

Export Power Limitation

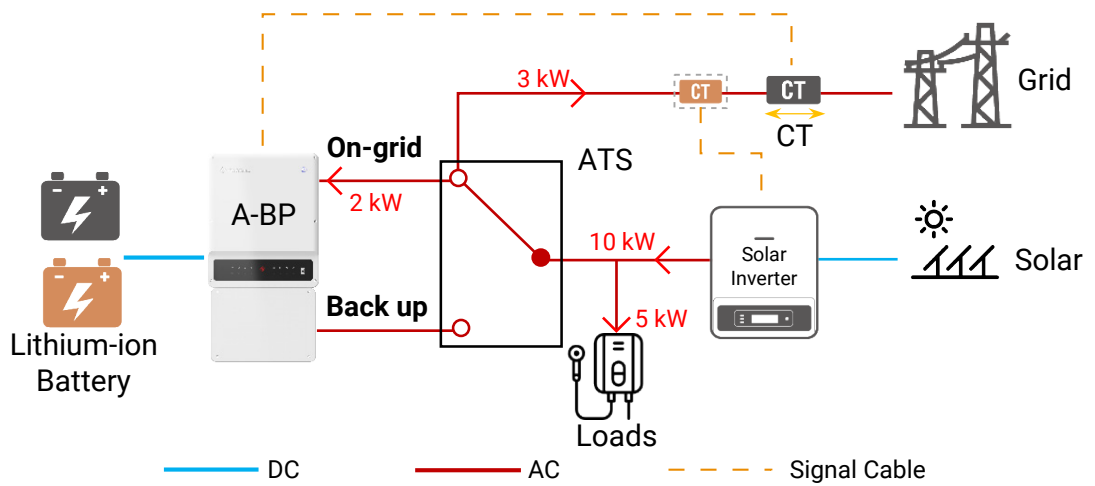


Figure 5. Schematic Diagram of Export Power Limitation

When the CT detects the signal of exporting power, export power limitation can be realized if Lithium-ion battery hasn't been full charged. After the Lithium-ion battery has been full charged, export power limitation totally depends on whether solar inverter has such function or not.

Note:

When grid is unavailable, solar inverter will lose signal of export power limitation which is enabled. A continue working solar inverter ensures a successful micro-grid system.

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Table 4. A-BP Compatible Battery List

Battery Brand	Battery Series
OLOID	LBS102100A
	LBS153100A
	LBS205100A
BYD	HVL
LG*	RESU 10H Type -R
GOODWE	SECU-S
	LYNX-F

Note:

*LG RESU 10H Type-R battery is incompatible with A-BP under micro-grid system circumstance.

Table 5. GOODWE Battery Information

	SECU-S	LYNX-F
Brand	GOODWE	GOODWE
Outlook		
IP Protection	IP 65 (Indoor/Outdoor)	IP 65 (Indoor/Outdoor)
Operating Temperature Range (°C)	Charge: 0 - 50, Discharge: -20 - 50	Charge: 0 - 50, Discharge: -20 - 50
Installation	Ground Mounted, Stackable	Ground Mounted, Stackable
Pack Capacity (kWh)	2.56	2.56
Parallel Number	5-8	2-4
Operating Voltage	240-448	192-460.8
Max. Charge/Discharge Current (A)	50	25