# SOLAX X3-IES





# INTRODUCTION

This is an integrated residential ESS which comes with a 5-15kW hybrid Three-phase inverter and extensible battery modules, plug and play, capacity range from 10 to 30 kWh. It has excellent performance in economy, safety and robustness. In addition, intelligent functions like VPP, micro-grid, smart schedule and smart scene are all ready. It would be the best choice for householders.

# SolaX IES Features

## Economic

- All in one design, plug and play, expandable and installation easily
- Maximum 200% oversize and 200% PV input power
- Maximum 20A DC single string input current, support high power solar panel
- Low start output voltage makes inverter longer working time
- Built-in shadow tracking function

## Safe

- IP66 protection level
- AC&DC SPD type II, always guarding the inverter
- AFCI optional

## Robust

- Robust back-up ability, switchover time ＜10ms(UPS level) , up to 200% EPS output for 10s, support half-wave loads
- Battery heating technology, -30°C extreme environment operation

## Intelligent

- AI ready, forecasting solar generation and home consumption, smart energy management strategy
- VPP ready, SolaX cloud support resource aggregator(IEEE 2030.5, OpenADR)
- Micro-grid ready, supporting a variety of scenarios, both on-grid and off-grid, balancing power between PCS and Hybrid in real time.
- Support smart scene function, intelligent loads management(e.g., Heat pump, EV charger)
- Support 7×24h scheduling mode
- Support Wireless meter solution

## SYSTEM OVERVIEW

| | | | | | |
|---|---|---|---|---|---|
| System schematic |  | | | | |
| Rated output power [kW] | 5 / 6 / 8 / 10 / 12 / 15 | | | | |
| Number of batteries | 2 | 3 | 4 | 5 | 6 |
| Nominal capacity [kWh]① | 10.2 | 15.3 | 20.4 | 25.6 | 30.7 |
| Usable energy [kWh]② | 9.2 | 13.8 | 18.4 | 23.0 | 27.6 |
| Max. charge / discharge power [kW]③ | 10.2 | 15 | 15 | 15 | 15 |
| Degree of protection | IP66 | | | | |
| Operating temperature range [°C] | -30 to 53 | | | | |
| Allowable relative humidity range [% ] | 5-95 (No condensation) | | | | |
| Max. operating altitude [m] | 3000 | | | | |
| Net weight [kg]④ | 144.2 | 191.2 | 144.2 / 100.5 | 144.2 / 147.5 | 191.2 / 147.5 |
| Dimension (W x H x D) [mm] | 730 x 1281 x 209.5 | 730 x 1599 x 209.5 | 730 x 1281 x 209.5/ 730 x 809 x 150 | 730 x 1281 x 209.5/ 730 x 1127 x 150 | 730 x 1599 x 209.5/ 730 x 1127 x 150 |
| Display | LCD | | | | |
| Cooling concept | Natural cooling | | | | |
| Topology | Transformerless | | | | |
| Communication | RS485, Pocket-X, USB, CAN, DO, DI | | | | |

① Test conditions: 25°C, 100% depth of discharge (DoD), 0.2C charge & discharge.
② System usable energy may vary with inverter different setting.
③ The max.charge/discharge power must not exceed the rated output power (the table takes the maximum power inverter as an example).
④ Different inverter models have different weights. The heaviest one is taken as an example.

## SPECIFICATIONS

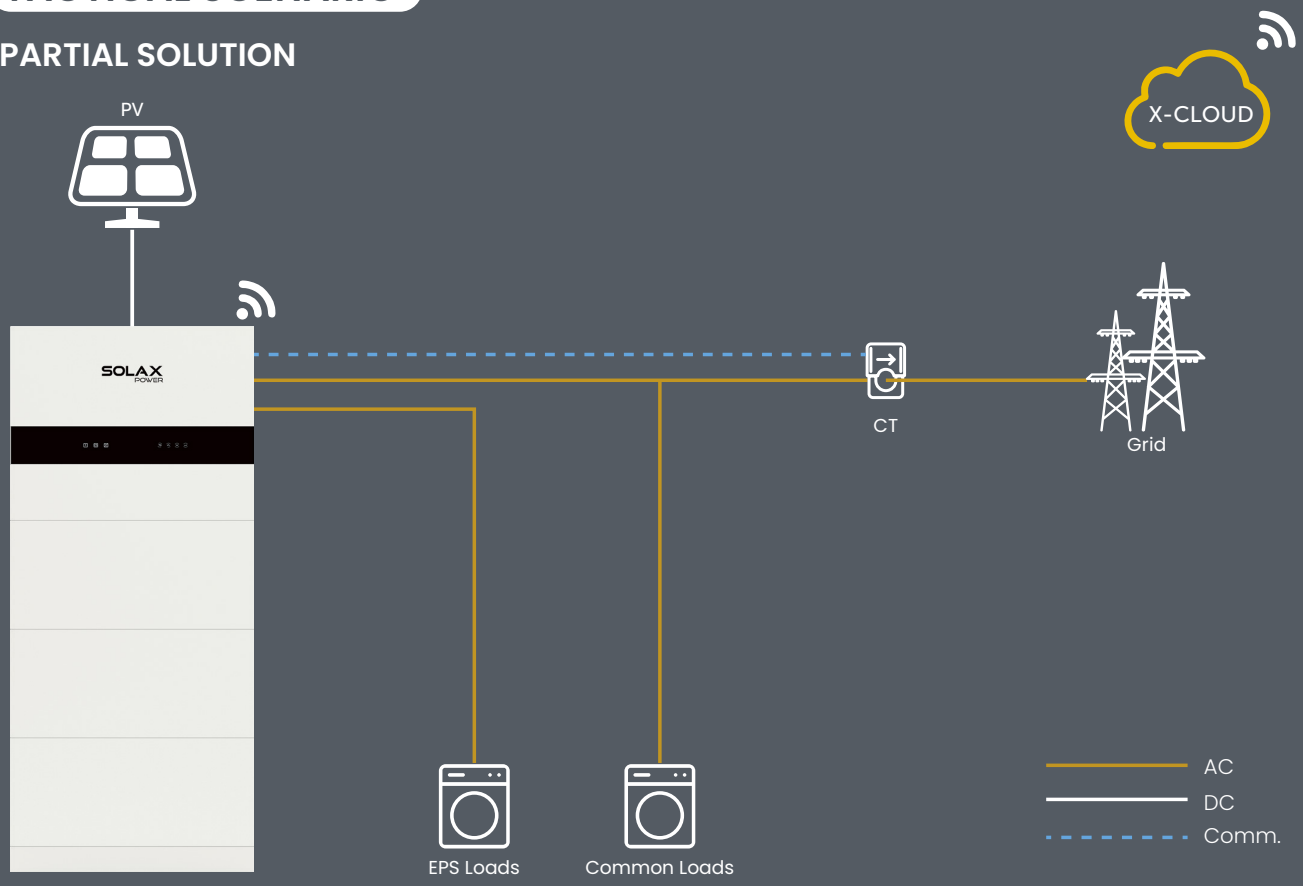
| | X3-IES-5K | X3-IES-6K | X3-IES-8K | X3-IES-10K | X3-IES-12K | X3-IES-15K |
|---|---|---|---|---|---|---|
| **INPUT PV** | | | | | | |
| Max. recommended PV array power [Wp] | 10000 | 12000 | 16000 | 20000 | 24000 | 30000 |
| Max. DC voltage [V] | 1000 | | | | | |
| Nominal DC operating voltage [V] | 600 | | | | | |
| Max. input current (input PV1 / input PV2) [A] | PV1: 20 / PV2: 20 | PV1: 20 / PV2: 20 | PV1: 32 / PV2: 20 | PV1: 32 / PV2: 20 | PV1: 32 / PV2: 20 | PV1: 32 / PV2: 20 |
| Max. short circuit current (input PV1 / input PV2) [A] | PV1: 25 / PV2: 25 | PV1: 25 / PV2: 25 | PV1: 40 / PV2: 25 | PV1: 40 / PV2: 25 | PV1: 40 / PV2: 25 | PV1: 40 / PV2: 25 |
| MPPT voltage range① [V] | 110 to 950 | | | | | |
| Start output voltage [V] | 140 | | | | | |
| No. of MPP trackers / Strings per MPP tracker | 2 / (1 / 1) | 2 / (1 / 1) | 2 / (2 / 1) | 2 / (2 / 1) | 2 / (2 / 1) | 2 / (2 / 1) |
| **INPUT AC** | | | | | | |
| Norminal AC power [VA] | 10000 | 12000 | 16000 | 20000 | 20000 | 20000 |
| Max. AC current [A] | 16.1 | 19.3 | 25.8 | 32.0 | 32.0 | 32.0 |
| Rated grid Frequency [Hz] | 50 / 60 | | | | | |
| Power factor | ~1 (Adjustable from 0.8 leading to 0.8 lagging) | | | | | |
| **OUTPUT AC(On-Grid)** | | | | | | |
| Nominal AC power [VA] | 5000 | 6000 | 8000 | 10000 (AS4777 9999) | 12000 | 15000 |
| Max. apparent AC power [VA] | 5500 | 6600 | 8800 | 10000 (AS4777 9999) | 13200 | 16500 |
| Rated grid voltage(AC voltage range) [V] | 3P4W, 380 / 400 | | | | | |
| Rated grid Frequency [Hz] | 50 / 60 | | | | | |
| Rated AC Output Current [A] ( at 230V, 50Hz) | 7.3 | 8.7 | 11.6 | 14.5 | 17.4 | 21.8 |
| Max. AC current [A] | 8 | 9.6 | 12.8 | 14.5 | 19.2 | 24.0 |
| Displacement power factor | ~1 (Adjustable from 0.8 leading to 0.8 lagging) | | | | | |
| Total harmonic distortion (THDi, rated power) [%] | < 3 | | | | | |

| | X3-IES-5K | X3-IES-6K | X3-IES-8K | X3-IES-10K | X3-IES-12K | X3-IES-15K |
|---|---|---|---|---|---|---|
| **EPS OUTPUT(With Battery)** | | | | | | |
| EPS peak power [VA] | 2Pn, 10s (Full sun) | 2Pn, 10s (Full sun) | 2Pn, 10s (Full sun) | 2Pn, 10s (Full sun) | 2Pn, 10s (Full sun) | 2Pn, 10s (Full sun) |
| EPS rated power [VA] | 5000 | 6000 | 8000 | 10000 | 12000 | 15000 |
| EPS rated voltage [V], Frequency [Hz] | 3P4W, 380 / 400, 50/60 | | | | | |
| EPS rated current [A] | 7.3 | 8.7 | 11.6 | 14.5 | 17.4 | 21.8 |
| Switchover time [ms] | < 10 | | | | | |
| Total harmonic distortion (THDv, linear Load) [%] | < 3 | | | | | |
| Max. half wave loads [kW] | 2 | | | | | |
| **BATTERY** | | | | | | |
| Battery voltage range [V] | 160 ~ 800 | | | | | |
| Communication interfaces | CAN / RS485 | | | | | |
| BMS module | TBMS-MCS0800E | | | | | |
| Battery module | TP-HS50E | | | | | |
| Composition | TBMS-MCS0800E + TP-HS50E * n + Base Dimensions + Series Box (Required for two columns) | | | | | |
| Battery type | Li-ion (LFP) | | | | | |
| Nominal capacity [kWh] / Nominal capacity [Ah]② | 5.1 / 50 | | | | | |
| Usable energy [kWh]③ | 4.6 | | | | | |
| Standard power [kW] | 3 | | | | | |
| Max power [kW] | 5.1 | | | | | |
| Max. charge / discharge current [A]④ | 50 | | | | | |
| Cycle life [Cycles] | > 6000 | | | | | |
| Warranty [Years] | 10 | | | | | |
| Safety | CE, RCM, TUV (IEC62619), RoHS, REACH | | | | | |
| TBMS-MCS0800E dimensions(W x H x D) [mm] / Weight [kg] | 730 x 165 x 150 / 9.3 | | | | | |
| TP-HS50E dimensions(W x H x D) [mm] / Weight [kg] | 730 x 318 x 150 / 47 | | | | | |
| Base dimensions(W x H x D) [mm] / Weight [kg] | 730 x 75 x 150 / 3.9 | | | | | |
| Series box dimensions(W x H x D) [mm] / Weight [kg] | 167 x 91.5 x 121 / 1.3 | | | | | |
| **EFFICIENCY** | | | | | | |
| Max. efficiency [%] / Euro-efficiency [%] | 98/ 97.7 | | | | | |
| Rated battery charge [%] / Discharge efficiency [%] | 98.5 / 97 | | | | | |
| **GENERAL DATA (Inverter)** | | | | | | |
| Dimensions (W x H x D) [mm] | 717 x 405 x 209.5 | | | | | |
| Weight [kg] | < 37 | | | | | |
| Operating temperature range [°C] | – 35 to 60 (derating at +45) | | | | | |
| Relative humidity [%] | 0 to 100 (condensing) | | | | | |
| Storage temperature [°C] | – 40 to 65 | | | | | |
| Noise emission (typical) [dB(A)] | < 33 | | | | | |
| Internal consumption (night) [W] | < 40 for hot standby, < 5 for cold standby | | | | | |
| Idle mode | Yes | | | | | |
| **PROTECTION** | | | | | | |
| Anti-Islanding protection | Yes | | | | | |
| DC reverse polarity protection | Yes | | | | | |
| Insulation monitoring | Yes | | | | | |
| Residual current monitoring | Yes | | | | | |
| AC overcurrent protection | Yes | | | | | |
| AC short-circuit protection | Yes | | | | | |
| AC overvoltage protection | Yes | | | | | |
| Over-heat protection | Yes | | | | | |
| AFCI | OPT | | | | | |
| Surge protection | Type Ⅱ, DC and AC | | | | | |
| **STANDARD** | | | | | | |
| Safety | IEC62109-1 / IEC62109-2 | | | | | |
| EMC | EN 61000-6-1 / EN 61000-6-2 / EN 61000-6-3 | | | | | |
| Certification | VDE 0126-1-1 A1:2012 / VDE-AR-N 4105 /G98/G99/ AS4777 / EN50549/ CEI 0-21 | | | | | |

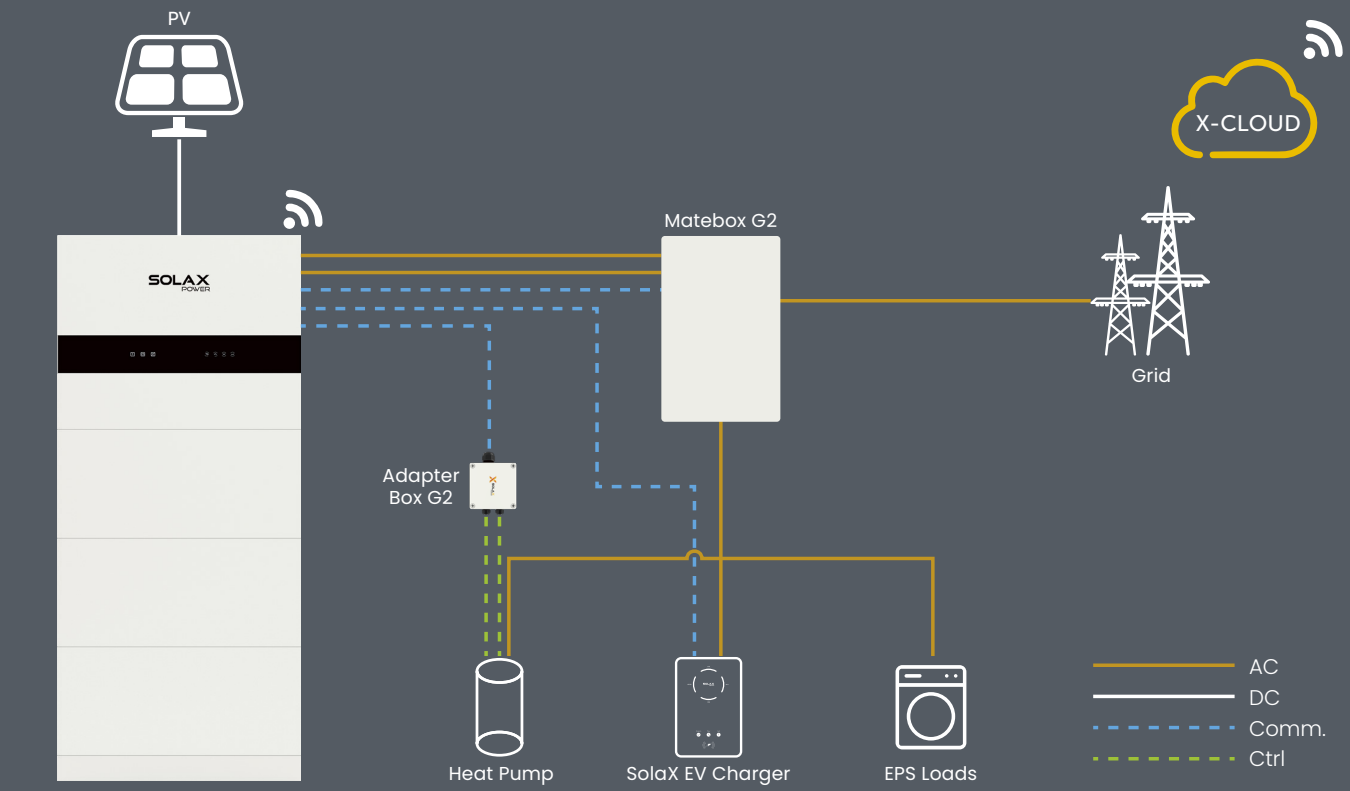
① Any DC input voltage beyond the MPPT voltage range may result in inverter improper operating.
② Test conditions: 25°C, 100% depth of discharge (DoD), 0.2C charge & discharge.
③ System usable energy may vary with inverter different setting.
④ Discharge: In case of battery cell's temperature range of -20°C~10°Cand 45°C~53 °C,the discharge current will be reduced; Charge: In case of battery cell's temperature range of 0°C~25°C and 45°C~53°C, the charge current will be reduced. Product charge or discharge power depends on the actual temperature of battery pack.

# TACTICAL SCENARIO

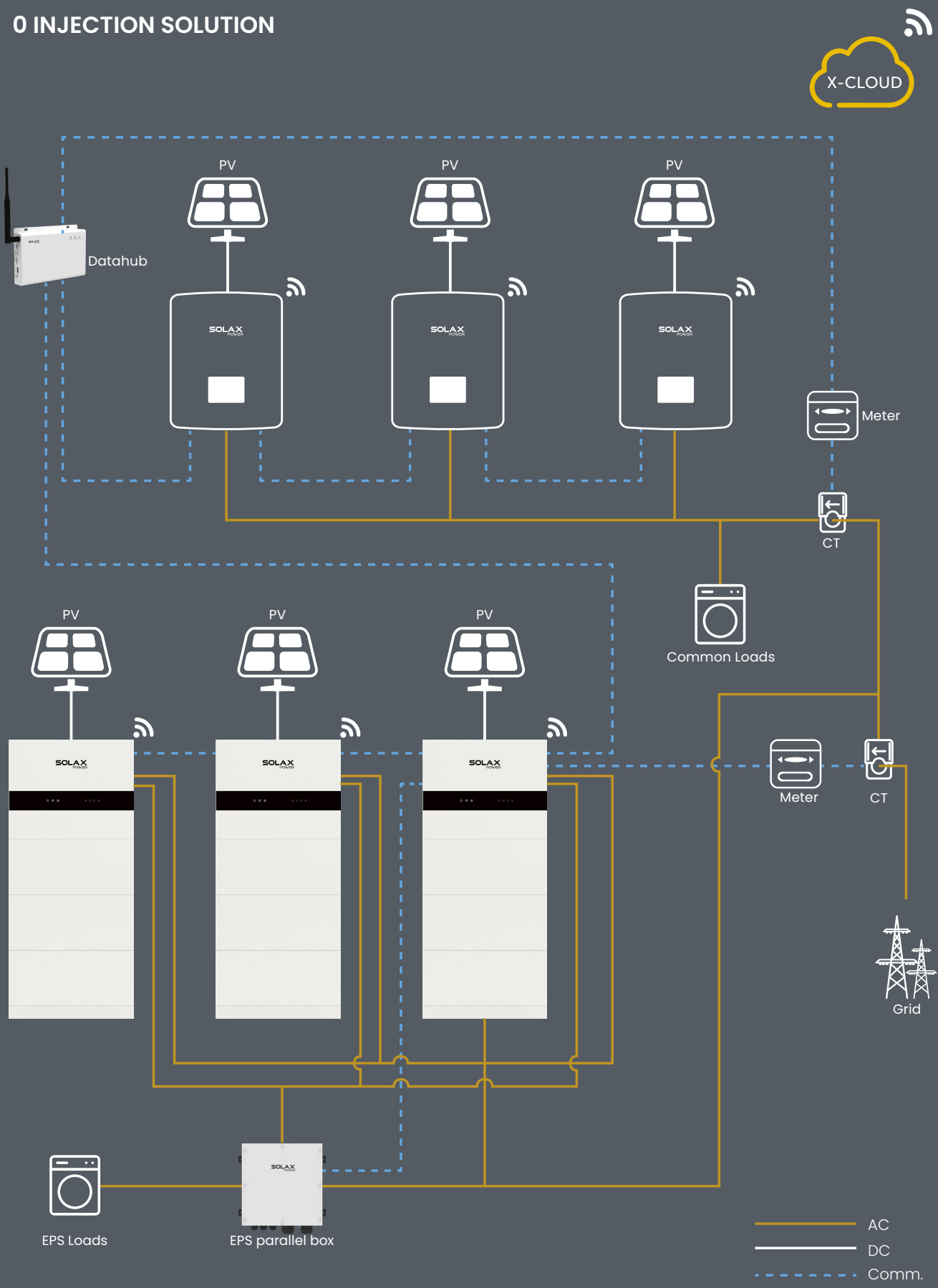
## PARTIAL SOLUTION



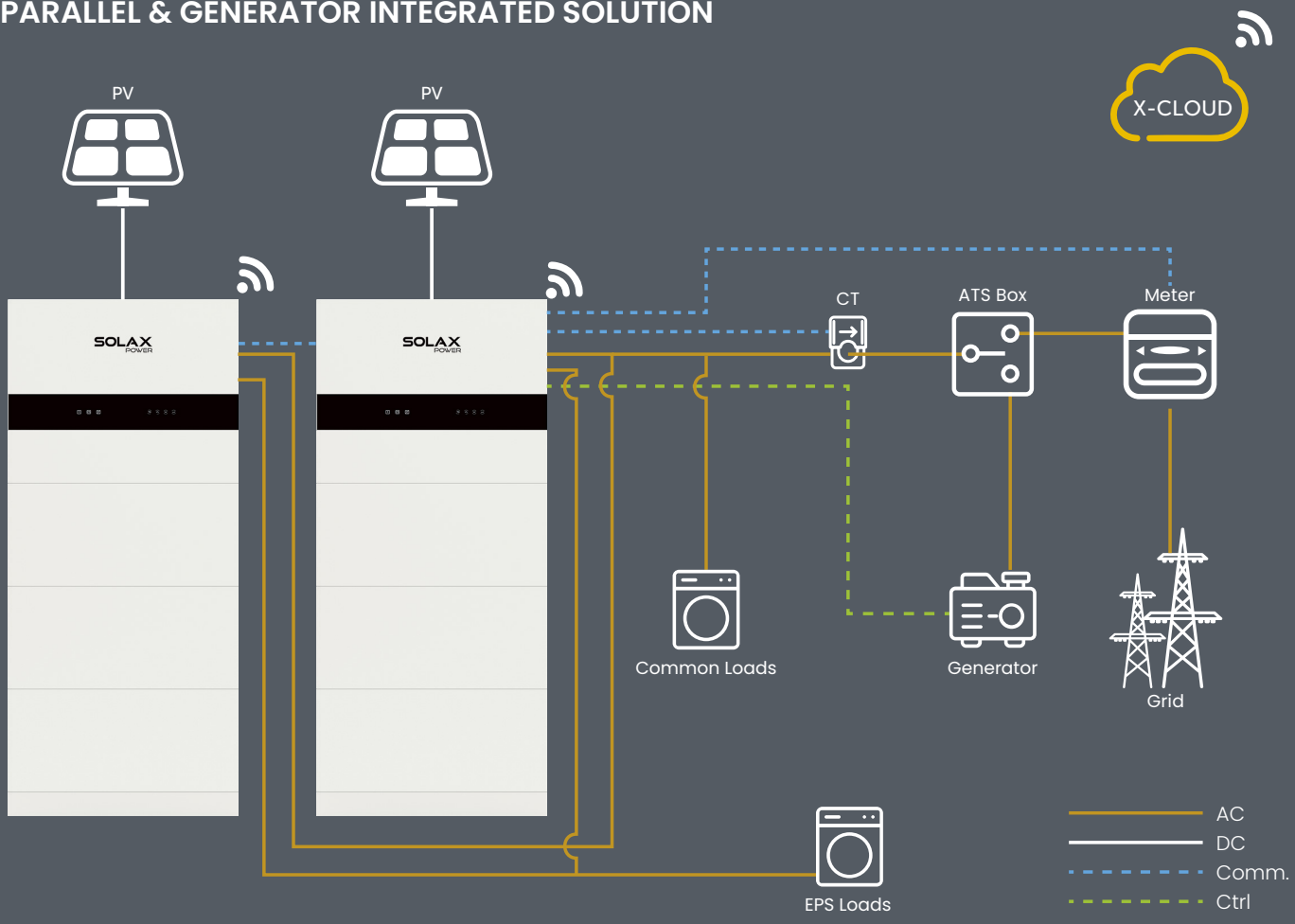

## WHOLE HOME BACKUP SOLUTION



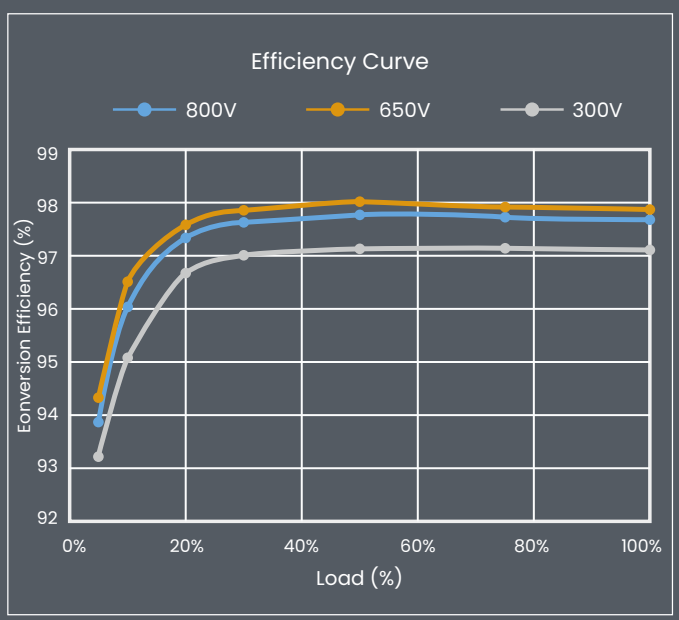
## 0 INJECTION SOLUTION



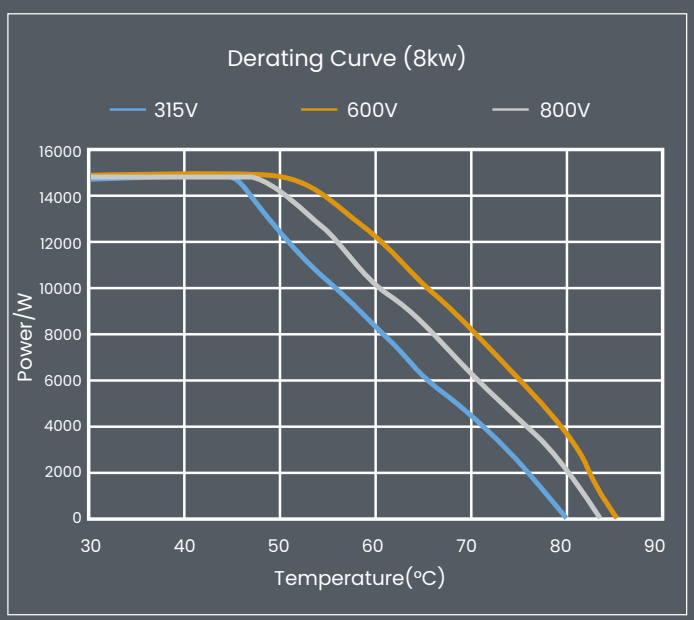
## PARALLEL & GENERATOR INTEGRATED SOLUTION



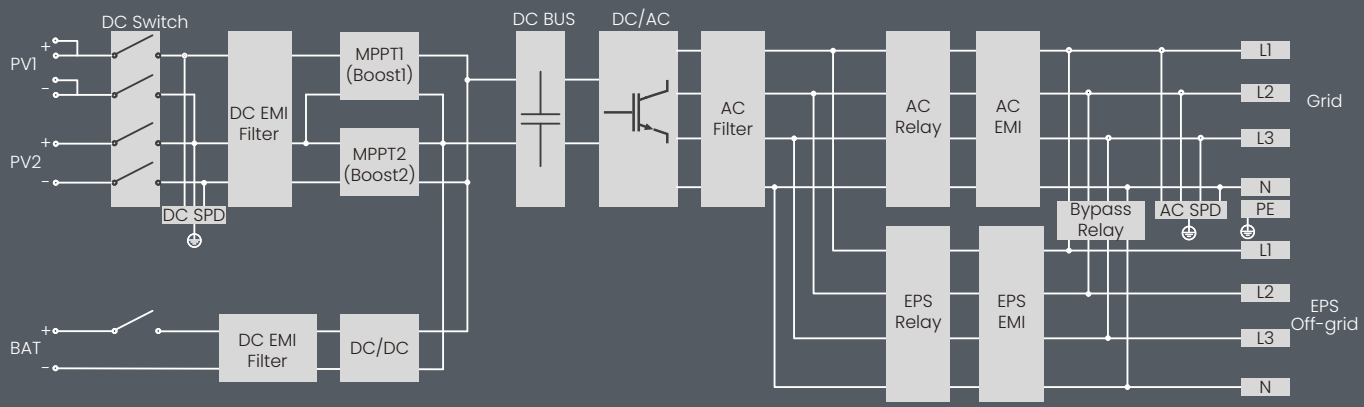

## EFFICIENCY CURVE




## DERATING CURVE



## CIRCUIT DIAGRAM




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