



## CLIVET SINERGY

Single-phase and three-phase energy storage solution (ESS) for residential applications

**MideaGroup**  
*humanizing technology*

# Clivet Sinergy

## THREE-PHASE VERSION



### GENERAL FEATURES

- Suitable for both new and retrofit installations
- Extended operating range from -25°C up to 60°C
- IP65 protection, suitable for outdoor installation
- Easy installation, all-in-one stackable system
- Wide application range 10/20/30/40 kWh (modular approach)
- Up to 4 systems can be connected in parallel

### 10kW HYBRID INVERTER

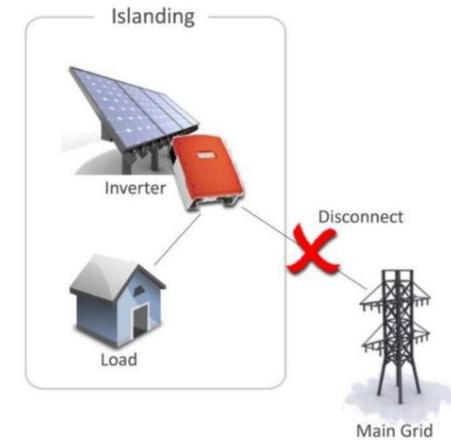
- 400Vac three phase
- Direct Input for PVs panels up 20 kWp
- Anti-islanding protection
- Back-up output line to ensure continuous operation (ups-like function)

### 5kWh BATTERY PACK

- High-end construction technology (LFP low density)
- Fire & explosive prevention



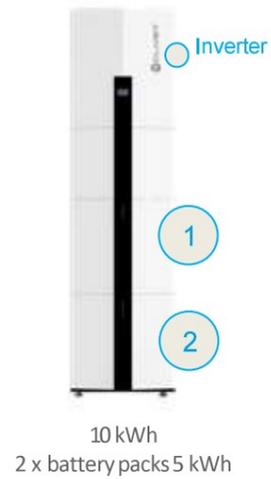
**ANTI-ISLANDING PROTECTION**  
PREVENTS THE OPERATORS ELECTRICAL SHOCK  
IN CASE OF GRID'S POWER FAILURES



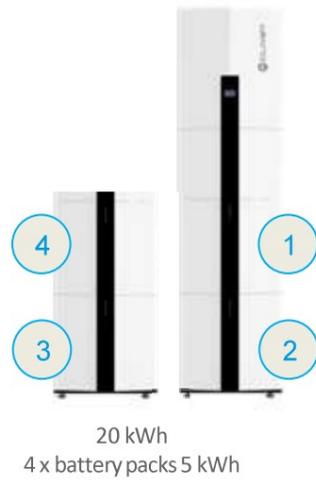
# Clivet Sinergy

Sinergy three-phase product range – 4 sizes 10 / 20 / 30 / 40 kWh

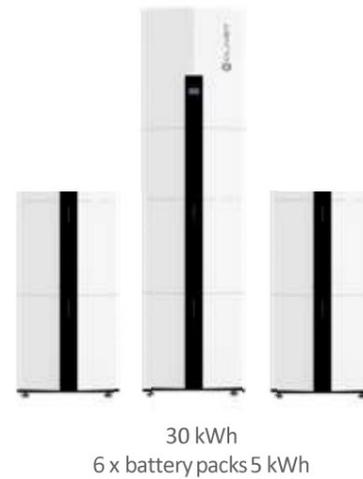
CLIVET SINERGY  
103.10



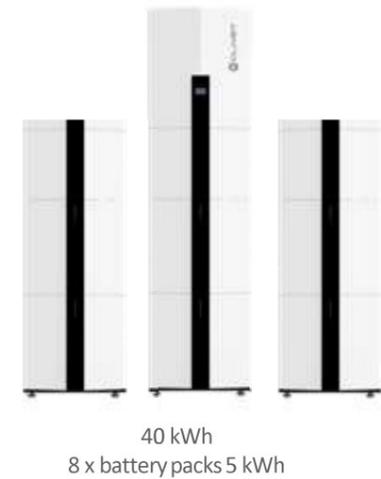
CLIVET SINERGY  
103.20



CLIVET SINERGY 103.30

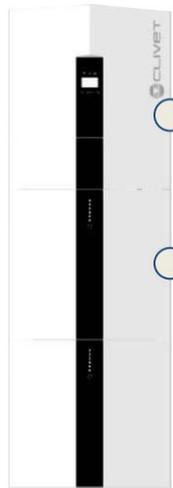


CLIVET SINERGY  
103.40



## CLIVET SINERGY

### SINGLE-PHASE VERSION



#### GENERAL FEATURES

- Suitable for both new and retrofit installations
- Extended operating range from -25°C up to 60°C
- IP65 protection, suitable for outdoor installation
- Easy installation, all-in-one stackable system
- Wide application range 5/10/15/20 kWh (modular approach)

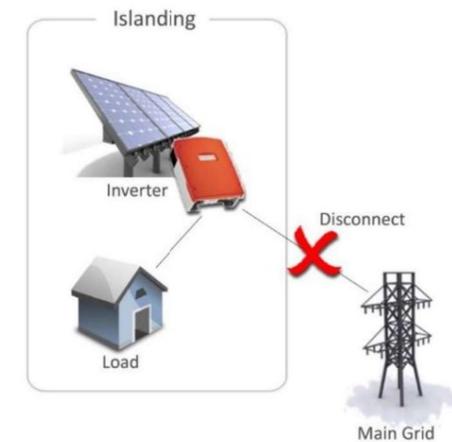
#### 5kW / 3,68kW HYBRID INVERTER

- 230Vac single phase
- Direct Input for PVs panels up to 6.5 kWp (5K) / 4.8kWp (3K)
- Anti-islanding protection
- Back-up output line to ensure continuous operation (ups-like function)

#### 5kWh BATTERY PACK

- High-end construction technology (LFP low density)
- Fire & explosive prevention

**ANTI-ISLANDING PROTECTION**  
PREVENTS THE OPERATORS ELECTRICAL SHOCK  
IN CASE OF GRID'S POWER FAILURES



## CLIVET SINERGY

Sinergy single-phase 5kW – 4 sizes 5 / 10 / 15 / 20 kWh

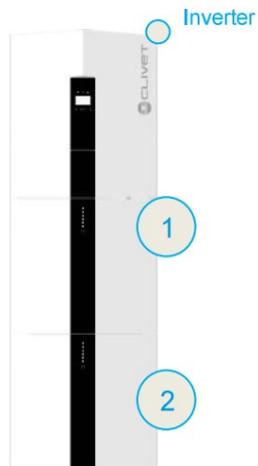
### SINERGY 51.05



Single 5kWh  
battery pack

5KWh

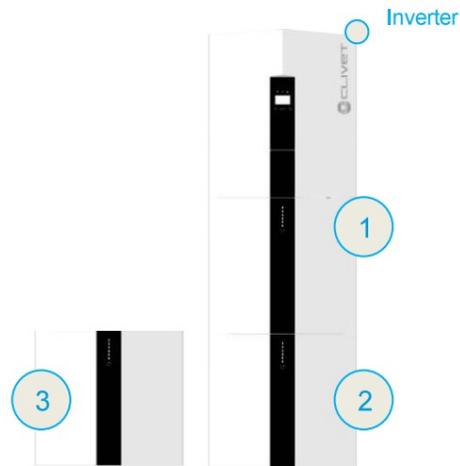
### SINERGY 51.10



2 x 5kWh  
battery packs

10KWh

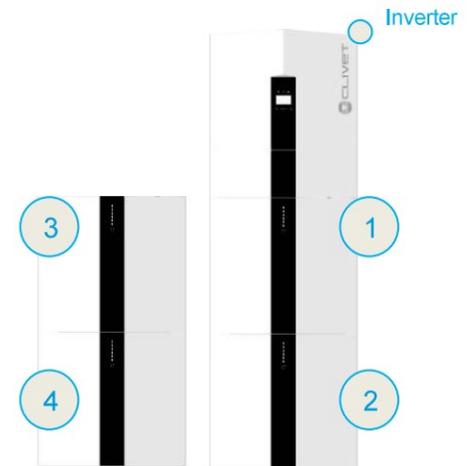
### SINERGY 51.15



3 x 5kWh  
battery packs

15KWh

### SINERGY 51.20



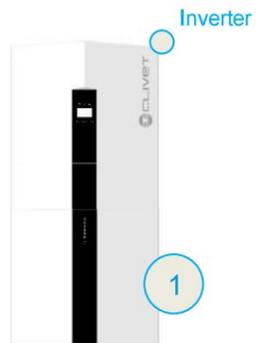
4 x 5kWh  
battery packs

20KWh

## CLIVET SINERGY

Sinergy single-phase 3kW – 2 sizes 5 / 10 kWh

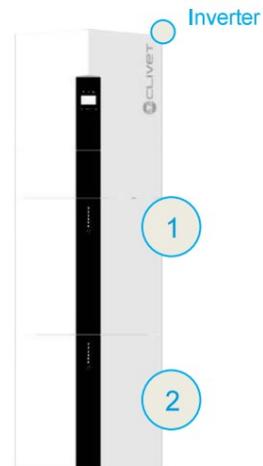
### SINERGY 31.05



3,68 kW single-phase  
hybrid inverter  
Single battery pack 5kWh  
No cable kit

5KWh

### SINERGY 31.10

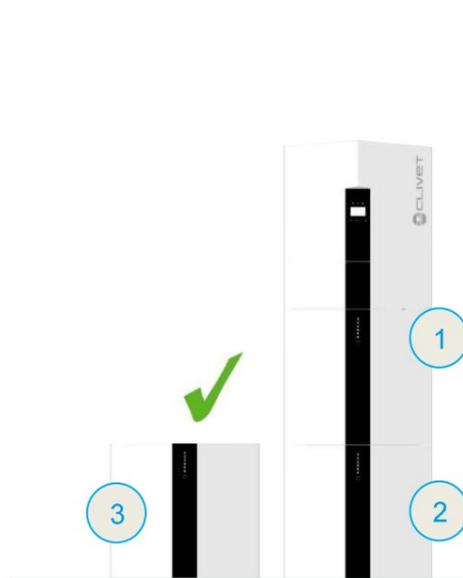


3,68 kW single-phase  
hybrid inverter  
Two battery packs 5kWh  
1 cable kit

10KWh

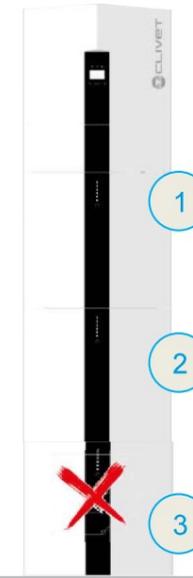
## Installation guidelines

ALLOWED



3 x 5kWh  
Battery packs

NOT ALLOWED



- Clearances over the inverter module (60cm min to the ceiling)
- Excess weight on the module installed on the bottom of the stack
- Inefficient ventilation flow on the rear side (natural convection)

## Unique selling points

### Operating cycles



Lithium ferrophosphate

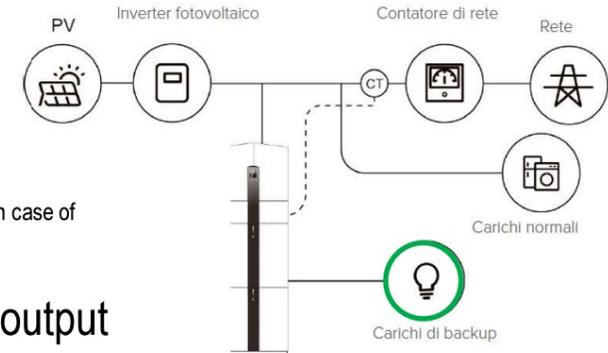
10'000 cycles

27 years

BMS (Battery Management System) integrated in each battery pack

- the whole system operates without the faulty battery pack
- better control of charging/discharging cycles

### Back-up output

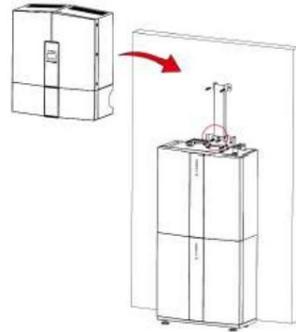


UPS like operating mode in case of power failure

5kW Direct output

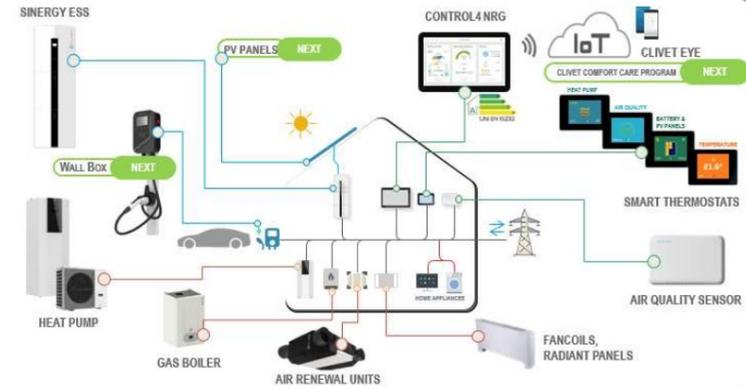
### Installation

All-in-one stackable system  
Easy of installation

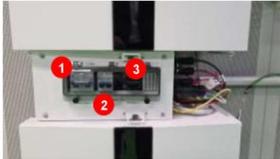


Self-supporting base system  
Wall fixing is to prevent the modules' overturning

### Smart Home

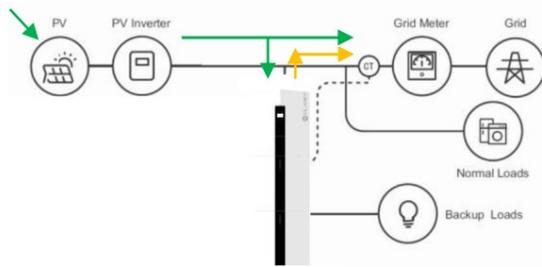


## Clivet Sinergy - Premium features

	1. Integrated battery charger	2. Integrated smart meter	3. Backup output	4. Battery pack	5. BMS Battery Management System	6. Electrical panel
Caractéristiques principales	<p>Integrated</p> <p>Slowly increasing the power supply to the battery pack</p>	<p>Integrated with external 3CTs</p> <p>The CTs (current transformer) to detecting the flow direction of the current is included with the inverter supply</p>	<p>Continuous operation</p> <p>No limits on time duration (DoD) and capacity (4.6kW on single-phase and 9.2kW on three-phase)</p>	<p>CEC-S 5B is the same battery pack suitable for</p> <p>CEC-S 5K and CEC-T 10K</p>	<p>Distributed on each battery</p> <p>Each battery has its own Battery Management System to control charging &amp; discharging operations</p>	<p>Integrated</p>
Avantages	<p>Native battery wake-up function</p> <p>No onsite professional personnel (Clivet ATC or electrical installer) to wake-up the battery packs</p>	<p>Ease of installation</p> <p>Remote installation up to 20 meters</p> <p>The majority of ESS manufacturers need to install the power meter separately</p> <div style="border: 1px dashed red; padding: 5px; margin-top: 10px;"> <p style="text-align: center; color: red; font-weight: bold;">NO NEED</p>  <p>The main ESS systems manufacturers provide it separately</p> </div>	<p>Extended operating time due to the possibility of using the full battery charge</p> <p>UPS-like function</p>	<p>Warehouse management is easier with Clivet products (re-sellers, distributors, Clivet)</p>	<p>Equal charge &amp; discharge levels</p> <p>Direct view of charge level</p> <p>Top Reliability In case of 1 battery is damaged, all the other one keep on working regularly</p> <p>Battery duration (life)</p> 	<p>Ease of installation</p> <p>Cost effectiveness</p>  <ol style="list-style-type: none"> <li>1. BATTERY PACKS SWITCH</li> <li>2. PVS PANELS SWITCH</li> <li>3. BACK-UP OUTPUT SWITCH</li> </ol>

## Application/installation architecture

### 1 RETROFIT APPLICATIONS

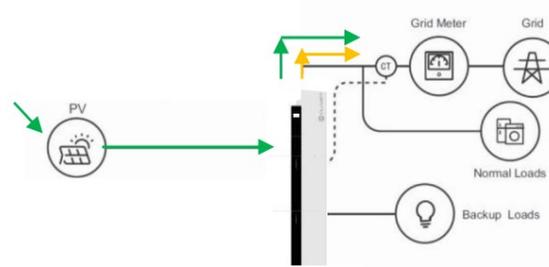


Connection to existing installation without replacing the PV panels & Inverter

ESS accumulates the solar energy not used by the households automatically

Easy to install to the home main electrical grid

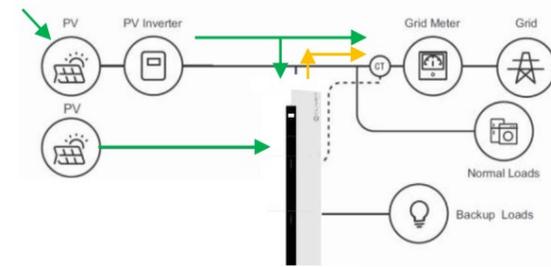
### 2 NEW INSTALLATIONS



New installation without, the PV panels are connected to the inverter of the ESS

The Inverter includes 2 strings for a 6,5kW PV panels for single-phase version  
20kW PV panels for three-phase version

### 3 FULL CONFIGURATION



Connection to existing installation without replacing the PV panels & Inverter

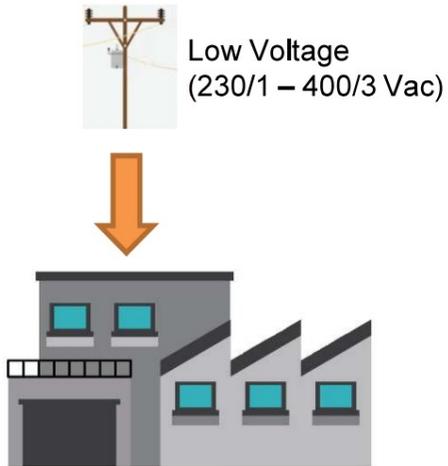
Extension of the PV panels  
The Inverter includes 2 strings for a 6,5kW PV panels for single-phase version  
20kW PV panels for three-phase version

# Clivet Sinergy

Three-phase Sinergy – Parallel function

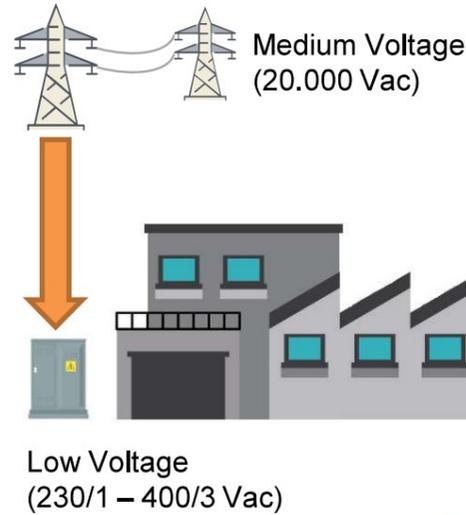
## Parallel of three-phase systems

OK CEI 0-21



Parallelable systems	Max Power	Maximum capacity
4	40 kW	160 kWh

OK CEI 0-21



Parallelable systems	Max Power	Maximum capacity
3	30 kW	120 kWh

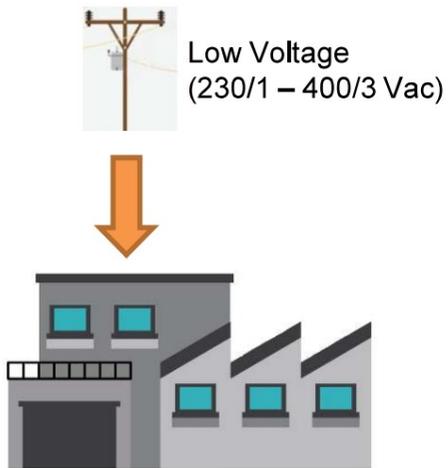


# Clivet Sinergy

Three-phase Sinergy – Parallel function (Italian market)

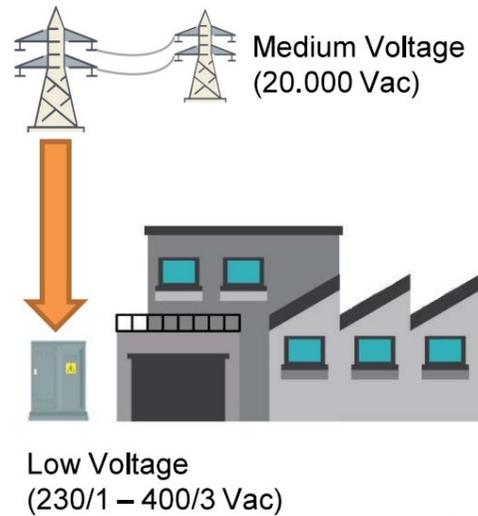
## Parallel of three-phase systems

OK CEI 0-21



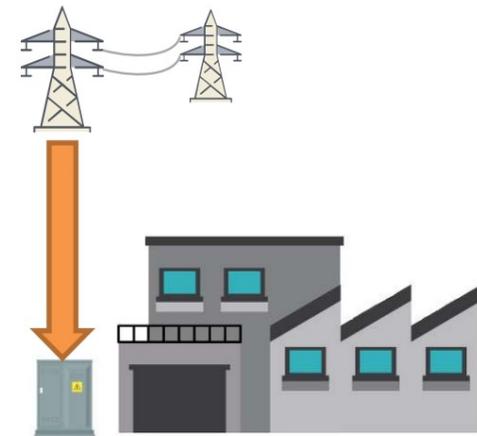
Parallelable systems	Max Power	Maximum capacity
4	40 kW	160 kWh

OK CEI 0-21



Parallelable systems	Max Power	Maximum capacity
3	30 kW	120 kWh

Requires CEI 0-16  
(not available)



Parallelable systems	Max Power	Maximum capacity
4 or more	---	---



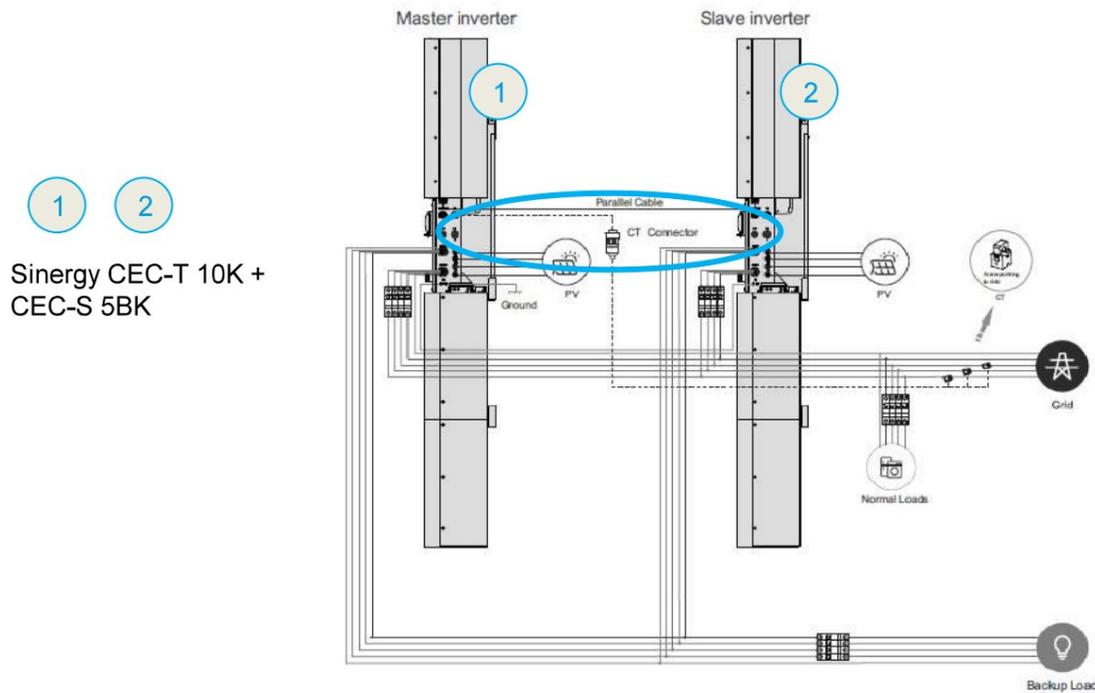
# Clivet Sinergy

## Three-phase Sinergy – System architecture for parallel systems

### Parallel function of up to 2 three-phase Sinergy system

The master (1) and slave (s2) units are directly connected by using a parallel cable

It is necessary to create the parallel connection cables with Cat.5 or higher Ethernet cable in field (to be provided by the customer)



- Both systems work as a single systems
- No additional accessory is required
- The PV field remains independent for the two systems
- Capacity and power outputs are total up

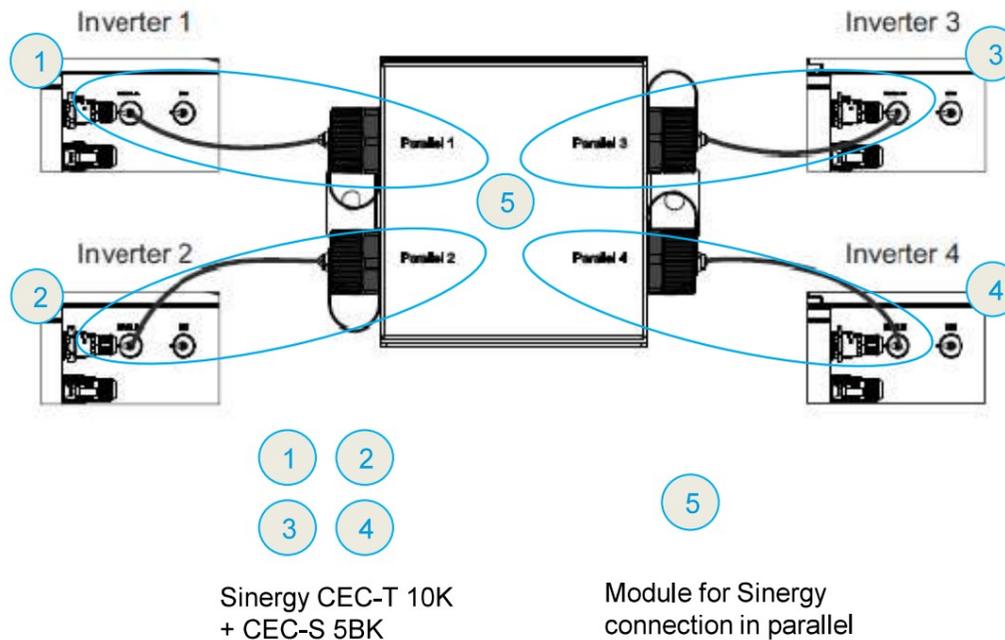
Parallelable systems	Total Output Power	Total Backup Power	Total capacity
2	20 kW	18.4 kW	80 kWh

# Clivet Sinergy

## Three-phase Sinergy – System architecture for parallel systems

### Parallel function up to 4 three-phase Sinergy systems

One additional CB4PSX (Module for Sinergy connection in parallel) accessory is required to manage the parallel connection of up to 4 Sinergy systems. It is necessary to create the parallel connection cables with Cat.5 or higher Ethernet cable in field (to be provided by the customer).



- All systems work as a single systems
- The PV field remains independent for the two systems
- Capacity and power outputs are total up

Parallel systems	Total Output Power	Total Backup Power	Total capacity
3	30 kW	27.6 kW	120 kWh
4	40 kW	38.4 kW	160 kWh

# Operating modes

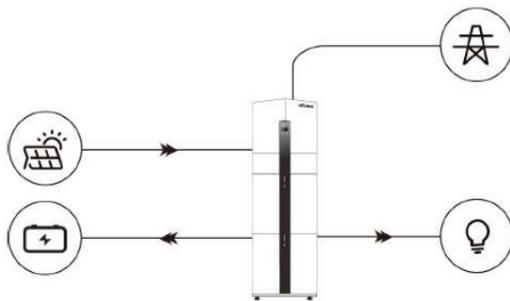
## 1. SELF CONSUMPTION

The energy generated by the solar panels will be used in the following order:

- Feed the home loads;
- Charge the battery and then,
- feed into the grid.

When the sun is off, the load will be supported by battery to enhance self consumption. If the power supply from the batteries is not sufficient, the grid will support the load demand.

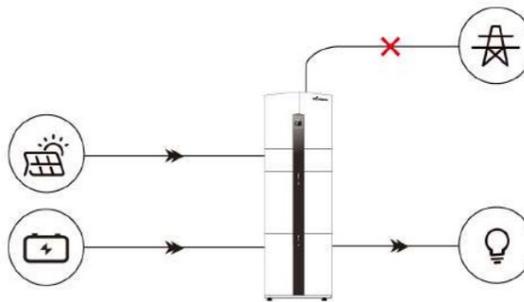
Common used application



## 2. BAT PRIORITY

Under this mode, the **battery is only used as a backup power supply when the grid fails** and as long as the grid works, the batteries won't be used to power the loads.

The battery will get charged with the power generated by the PV system or from the grid



## 3. PEAK SHIFT

This mode is designed for time-use mode customer.

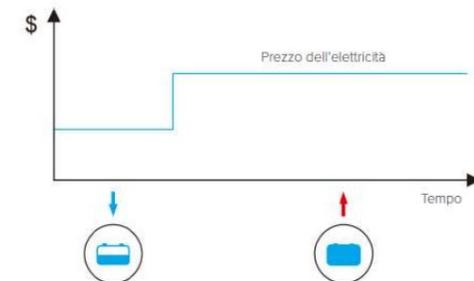
The customer is able to set up the charging/ discharging time & power via inverter screen

Two (2) consequent charging / discharging fascia

- fascia 1 – charge and discharge
- fascia 2 – charge and discharge

Example

- fascia 1 – 8.00..12.00 (charge) e 12.00..16.00 (discharge)
- fascia 2 – 16.00..24.00 (charge) e 00.00..8.00 (discharge)



## Technical benchmark – Installation



Outdoor installation is allowed

Need to protect the ESS from direct exposure to sun and water

- IP protection is not a parameter to be referred to for security
- Outdoor temperature range is much more important
- Outdoor temperature doesn't define the operating range

- All batteries can operate in the range 0..50°C (charge / discharge)
  - 0..50°C charging
  - -10..50°C discharging
- Inverter >45°C de-rating



Clivet

IP65  
-25°C..60°C



ACS  
Zucchetti

IP65  
-10°C..50°C



Huawei

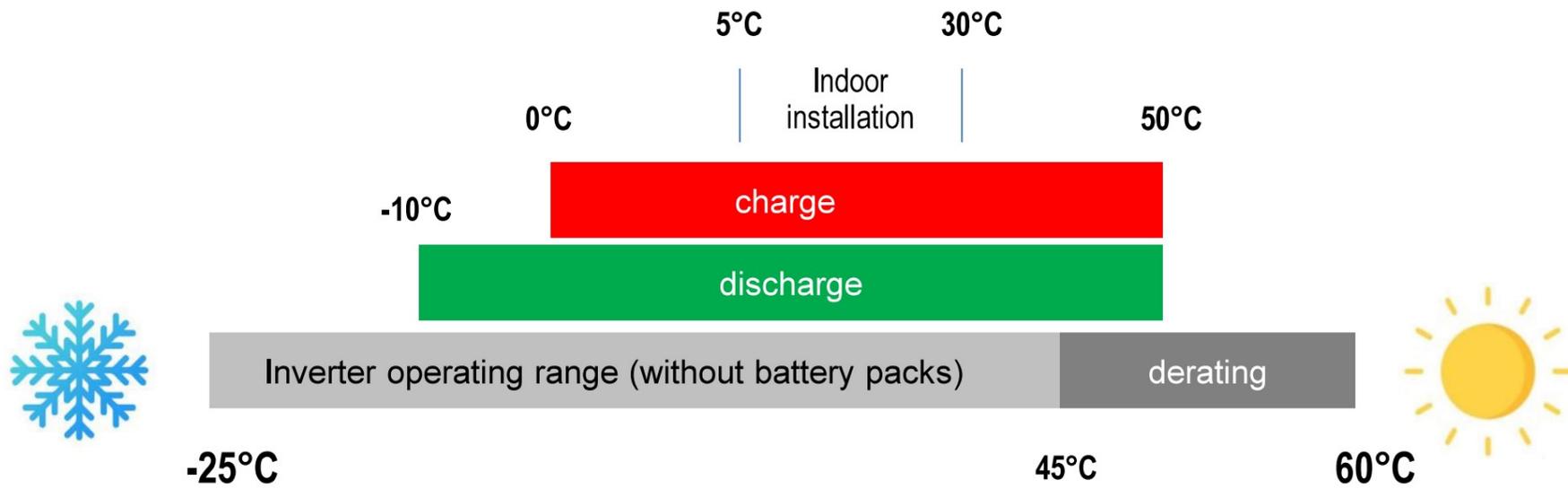
IP66  
-10°C..55°C



Fronius

IP66  
-20°C..50°C

## Operating range based on the outdoor temperature



# Technical benchmark – Indoor / outdoor Installation

Non All-in-one solutions

indoor



TESLA

indoor



ZCS AZZURRO

outdoor



HUAWEI

## Technical benchmark – Indoor Installation

### All-in-one solutions

SONNEN



- The installation location must not be at risk of flooding.
- Installation room should be ventilated.
- The currently applicable building codes must be observed.
- Even floor, suitable for heavy loads.
- Observe fire control standards.
- Free from corrosive and explosive gases (ammonia content max. 20 ppm).
- Free from dust (especially flour dust or sawdust).
- Free from vibrations.
- Free access to the installation location.
- No direct sunlight.

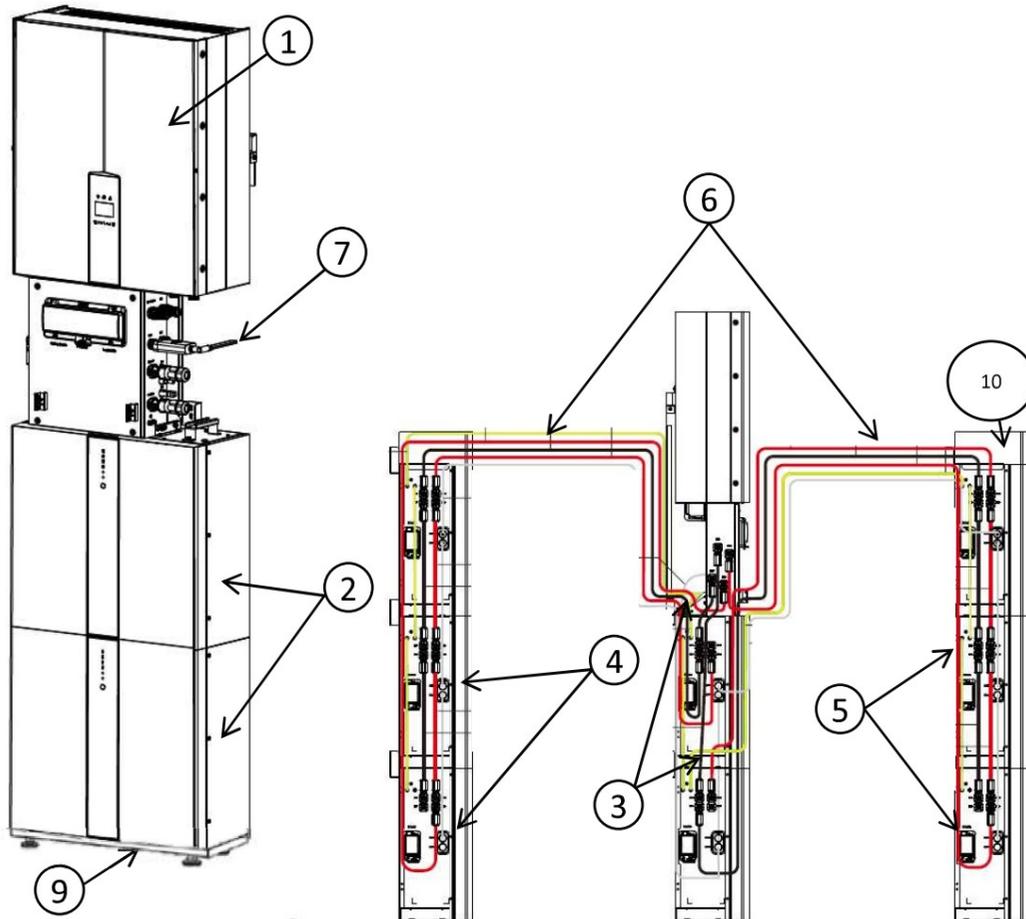
**Installation inside habitable rooms is critical**

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**Installation inside habitable rooms are not allowed**

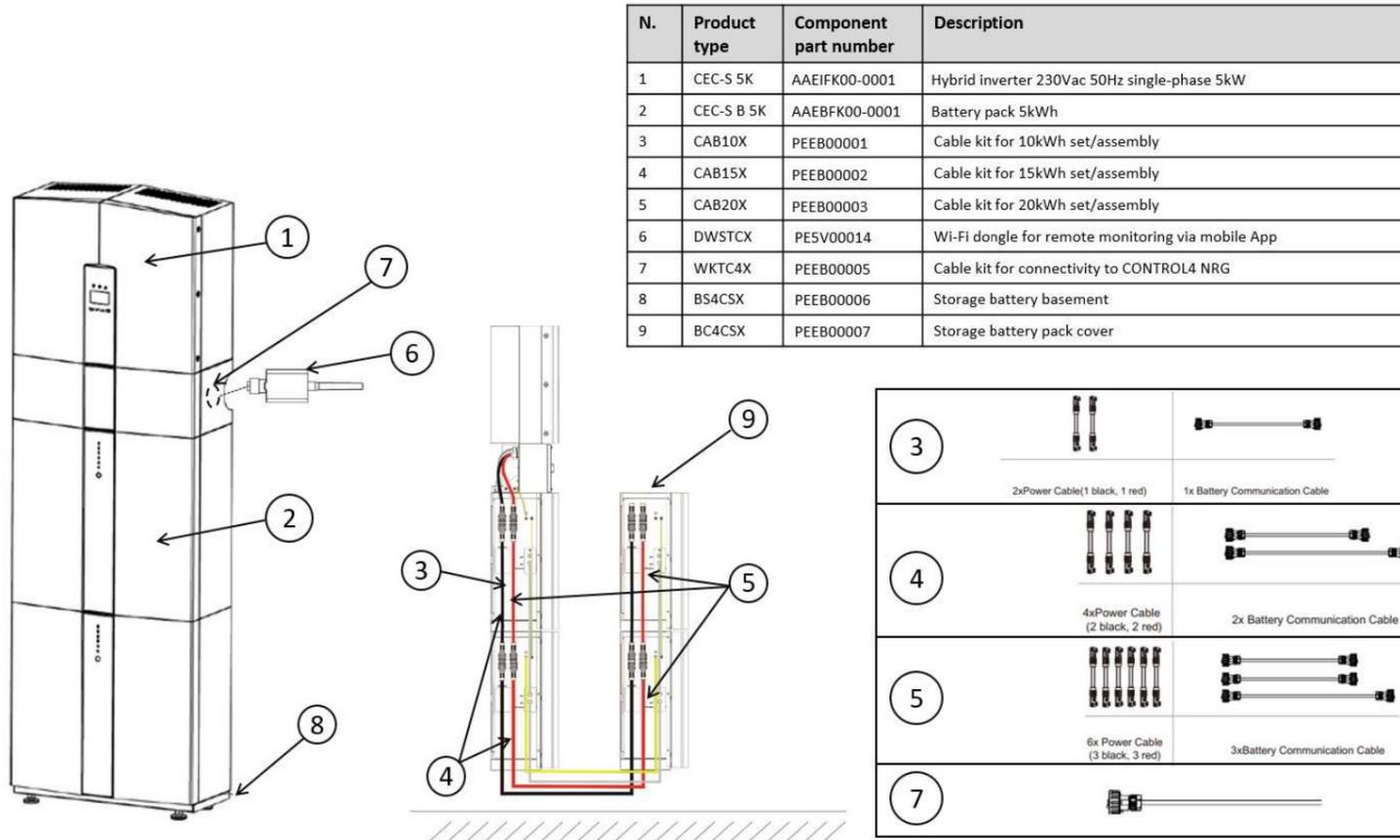
## Clivet Sinergy three-phase - List of components



N.	Product type	Product part number	Description
1	CEC-T 10K	13512328	Three-phase 400Vac 50Hz hybrid inverter with 10kW nominal power
2	CEC-S B 5K	37022296	Battery pack 5kWh
3	CAB10TX	63502370	Cable kit for three-phase 10kWh electric storage system
4	CAB20TX	63502369	Cable kit for three-phase 20kWh electric storage system
5	CAB30TX	63502371	Cable kit for three-phase 30kWh electric storage system
6	CAB40TX	63502368	Cable kit for three-phase 40kWh electric storage system
7	DWTTCX	76612336	Wi-Fi dongle for remote monitoring via mobile App (3P version)
8	WKTC4X	91342242	Cable kit for connectivity to CONTROL4 NRG
9	BS4CSX	62442326	Storage battery basement
10	BC4CSX	62442322	Storage battery pack cover
11	SM4CSX	74522308	Smart meter for Sinergy 3P system
	CB4PSX	62812410	Module for Sinergy connection in parallel (required for paralleling 3 and 4 system)

<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">3</div> <div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">4</div> </div>	<p>Every cable kit contains the cable quantity related to the specific capacity size:</p> <ul style="list-style-type: none"> <li>• Power cables (red &amp; black)</li> <li>• Battery communication cables</li> <li>• Earth cable</li> </ul>
<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">5</div> <div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">6</div> </div>	
<div style="display: flex; justify-content: center; align-items: center;"> <div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">8</div> </div>	
<div style="display: flex; justify-content: center; align-items: center;"> <div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;">11</div> <div style="margin-left: 20px;"> <p>3x CTs</p> </div> </div>	

## Clivet Sinergy single-phase - List of components





## Standard & certifications

**CLIVET** DECLARATION OF CONFORMITY UE  
 DICHIARAZIONE DI CONFORMITÀ UE  
 KONFORMITÄT ERKLÄRUNG UE  
 DÉCLARATION DE CONFORMITÉ UE  
 DECLARACIÓN DE CONFORMIDAD UE

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WE DECLARE UNDER OUR SOLE RESPONSIBILITY THAT THE PRODUCT  
 DICHIARIAMO SOTTO LA NOSTRA SOLA RESPONSABILITÀ CHE IL PRODOTTO  
 WIR ERKLÄREN EIGENVERANTWORTLICH DASS DIE PRODUKT  
 NOUS DÉCLARONS SOUS NOTRE SEULE RESPONSABILITÉ QUE LE PRODUIT  
 EL FABRICANTE DECLARA BAJO SU EXCLUSIVA RESPONSABILIDAD QUE LE PRODUCTO

CATEGORY: BATTERY PACK  
 CATEGORIA: PACCO BATTERIE  
 KATEGORIE: BATTERIEPACK  
 CATEGORIE: PAQUETE DE BATERIAS  
 CATEGORIA: PACK DE BATERIAS

TYPE / TIPO / TYP / TYPE / TIPO: CEC-S B 5K

COMPLIES WITH THE FOLLOWING EC DIRECTIVES, INCLUDING THE MOST RECENT AMENDMENTS, AND THE RELEVANT NATIONAL HARMONISATION LEGISLATION CURRENTLY IN FORCE:  
 RESULTA IN CONFORMITÀ CON QUANTO PREVISTO DALLE SEGUENTI DIRETTIVE CE, COMPRESSE LE ULTIME MODIFICHE, E CON LA RELATIVA LEGISLAZIONE NAZIONALE DI RECEPIMENTO.  
 DEN IN DEN FOLGENDEN EG-RICHTLINIEN VORGESCHRIEBEN VORSCHRIFTEN, EINSCHLIEßLICH DER LETZTEN ÄNDERUNGEN, SOWIE DEN ANGEWANDTEN LANDESGESETZEN ENTSPRECHEND.  
 EST CONFORME AUX DIRECTIVES CE D'ACTUELLES, Y COMPRIS LES DERNIÈRES MODIFICATIONS, ET À LA LEGISLATION NATIONALE D'ACCUEIL CORRESPONDANTE.  
 ES CONFORME A LAS SIGUIENTES DIRECTIVAS CE, INCLUIDAS LAS ÚLTIMAS MODIFICACIONES, Y A LA LEGISLACIÓN LEGISLACION NACIONAL DE RECEPCIÓN.

2014/35/EC low voltage directive  
 direttiva bassa tensione  
 Bestimmungen der Niederspannungsrichtlinie  
 directive basse tension  
 directiva de baja tensión

2014/53/UE electromagnetic compatibility  
 compatibilità elettromagnetica  
 Elektromagnetische Verträglichkeit  
 compatibilité électromagnétique  
 compatibilidad electromagnética

2011/65/UE 2015/863/UE RoHS

-I/It is manufactured and tested according to the following standards: CEI EN IEC 62008:2021 IEC 62040-1:2017 IEC 62410:2017  
 -Il/è costruito e collaudato in conformità alle seguenti normative: CEI 62008:2021 IEC 62040-1:2017 IEC 62410:2017  
 -It is manufactured and tested according to the following standards: CEI EN IEC 62008:2021 IEC 62040-1:2017 IEC 62410:2017  
 -El/está construido y probado de acuerdo con las siguientes normativas: CEI EN IEC 62008:2021 IEC 62040-1:2017 IEC 62410:2017  
 -Fabricado y probado de acuerdo con las siguientes normas: CEI EN IEC 62008:2021 IEC 62040-1:2017 IEC 62410:2017

NAME / NOME / VORNAME / PRÉNOM / NOM: STEFANO BELLI  
 SURNAME / COGNOME / ZUJAME / NOM / APPELLIDIO: BELLI  
 FULFILLER: 30/11/2022 COMPANY POSITION / POSITIONE / BETRUEBSPOSITION / FONCTION / CARGO: Responsabile del Servizio Clienti

CLIVET S.p.A. - Via Carlo Linco, 26 - Z.I. VILLAFRANCA - 32030 FELTRE (BL) - ITALIA  
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- Declaration of conformity CE



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# Thank you



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