3 / 6 - 3TL / 6TL

The INGECON® SUN STORAGE 1Play battery inverter is a single-phase, two-way unit that can either be used in off-grid systems or connected to the general supply network.

Battery management
The INGECON® SUN STORAGE 1Play inverters feature cutting-edge technology to control the charging and discharging of the storage system in order to maximise the battery service life. The battery temperature could be controlled at all times, ensuring correct battery operation and durability. The inverter incorporates a pre-charge system to avoid battery inrush currents.

Back-up genset
The INGECON® SUN STORAGE 1Play permits the connection of a back-up genset, should this be necessary. Furthermore, the inverter can be started-up using this generator, in order to charge the batteries when these are completely discharged.

PV input
INGECON® SUN STORAGE 1Play inverters incorporate a PV input. Thanks to this input, the PV array can be connected directly to the inverter.

Energy Management System
Optionally, the inverter can integrate an energy management system (EMS Board or EMS Manager). The EMS Board can be integrated inside the inverter. It enables some more advanced features, like peak shaving. Additionally, the EMS Manager offers load control possibilities.

3 year warranty, extendible up to 25 years

- Protocols
  - Galvanic isolation between the DC and AC sides. (Only for 1Play with transformer)
  - AC overvoltages.
  - Insulation faults.
  - Output shortcircuits and overloads.

Optional accessories
- Inverter communication via RS-485 and Ethernet.
- DC switch for the PV field.
- AC power supply system.
- INGECON® EMS Board.
- INGECON® EMS Manager.
- USB port for Wi-Fi communication (in combination with EMS Board).

Main features
- PV input.
- CAN communication for smart batteries.
- Configurable potential-free inputs.
- Configurable potential-free outputs, some for the connection and disconnection of the back-up genset.
- DC pre-charge system.
- Battery temperature measurement circuit built-in. PT100 (3-wire) needed.
The INGECON® SUN STORAGE 1Play battery inverter is a single-phase, two-way unit that can either be used in off-grid systems or connected to the general supply network.

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3 year warranty, extendible up to 25 years

PROTECTIONS
- Galvanic isolation between the DC and AC sides. (Only for 1Play with transformer)
- AC overvoltages.
- Insulation faults.
- Output shortcircuits and overloads.

OPTIONAL ACCESSORIES
- Inverter communication via RS-485 and Ethernet.
- DC switch for the PV field.
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- INGECON® EMS Board.
- INGECON® EMS Manager.
- USB port for Wi-Fi communication (in combination with EMS Board).

MAIN FEATURES
- PV input.
- CAN communication for smart batteries.
- Configurable potential-free inputs.
- Configurable potential-free outputs, some for the connection and disconnection of the back-up genset.
- DC pre-charge system.
- Battery temperature measurement circuit built-in. PT100 (3-wire) needed.
Operating modes:

- **Stand-alone mode**
  The INGECON® SUN STORAGE 1Play inverter generates a stand-alone AC grid and acts as a grid manager, guaranteeing the correct balance between generation, consumption and the storage system. To do so, it controls the energy flow between the grid and the batteries, based on the status at any given time.

  The INGECON® SUN STORAGE 1Play inverter makes it possible to integrate a solar energy source into the grid, into the grid, as it integrates a photovoltaic input. An advanced control system, requiring no communications, manages the power generated by the PV inverters, based on consumption data and the battery charge status. The back-up power source (a genset or the public grid) only connects when the battery state of charge is below a certain programmable threshold.

- **Back-up mode**
  This operating mode has been designed for grid-connected systems, where grid outages are long and frequent, meaning that a back-up power source is required. The INGECON® SUN STORAGE 1Play inverter operates through a connection to the AC grid. In order to guarantee a power source, the inverter maintains the batteries charged. During a grid outage, the battery inverter generates the AC network and the energy stored in the batteries is used to power the loads.

  If any renewable energy sources are connected to the grid and the energy generated is greater than the one demanded, then the surplus could be injected into the grid.

- **Self-consumption mode**
  This operating mode is conceived for grid-connected systems with renewable energy sources, in order to minimise grid consumption. If the energy generated is greater than the one demanded, any surplus energy could charge the batteries or, if they are fully charged, the energy could be injected into the grid. If the loads demand more energy than the one produced by the renewable sources, then the batteries would cover this demand, increasing the self-consumption ratio.

- **Grid support**
  In combination with an external wattmeter and the EMS Board or the EMS Manager, the inverter is able to adapt the output power from the PV plant to a pre-established value, in order to maintain a constant power output or to control the ramp rate. Furthermore, this operating mode makes it possible to implement peak-shaving strategies to reduce the electricity bill by decreasing the contracted power.

---

**Connection Schema**

**Single-phase**
(either with 1Play transformerless or 1Play with transformer)

- PV array
- Batteries
- INGECON® SUN STORAGE 1Play
- Genset or grid
- Consumption

**Three-phase**
(only 1Play with transformer)

- PV array
- Batteries
- INGECON® SUN STORAGE 1Play
- Genset or grid
- Consumption

* Bidirectional only when grid is connected.
INTEGRITY SUN STORAGE

**PV Input (DC)**

<table>
<thead>
<tr>
<th></th>
<th>3</th>
<th>3TL</th>
<th>6</th>
<th>6TL</th>
</tr>
</thead>
<tbody>
<tr>
<td>PV array max. power</td>
<td>7.5 kWp</td>
<td>7.5 kWp</td>
<td>11.5 kWp</td>
<td>11.5 kWp</td>
</tr>
<tr>
<td>Voltage range MPP for stand-alone mode</td>
<td>300 - 480 V</td>
<td>300 - 480 V</td>
<td>300 - 480 V</td>
<td>300 - 480 V</td>
</tr>
<tr>
<td>Voltage range MPP for grid-connected mode</td>
<td>330 - 480 V</td>
<td>330 - 480 V</td>
<td>330 - 480 V</td>
<td>330 - 480 V</td>
</tr>
<tr>
<td>Maximum open circuit voltage</td>
<td>550 V</td>
<td>550 V</td>
<td>550 V</td>
<td>550 V</td>
</tr>
<tr>
<td>Maximum current</td>
<td>20 A</td>
<td>20 A</td>
<td>30 A</td>
<td>30 A</td>
</tr>
<tr>
<td>Inputs</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>MPPT</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

**Battery Input (DC)**

- Voltage range with PV installation | 40 - 300 V | 40 - 300 V | 40 - 300 V | 40 - 300 V |
- Voltage range without PV installation | 40 - 450 V | 40 - 450 V | 40 - 450 V | 40 - 450 V |
- Maximum charge / discharge current | 50 A | 50 A | 50 A | 50 A |
- Battery type | Lead, Ni-Cd, Li-ion | Lead, Ni-Cd, Li-ion | Lead, Ni-Cd, Li-ion | Lead, Ni-Cd, Li-ion |

**Generator / Grid Input (AC)**

- Rated voltage | 230 V | 230 V | 230 V | 230 V |
- Voltage range | 172 - 264 V | 172 - 264 V | 172 - 264 V | 172 - 264 V |
- Rated frequency | 50 / 60 Hz | 50 / 60 Hz | 50 / 60 Hz | 50 / 60 Hz |
- Frequency range | 40 - 70 Hz | 40 - 70 Hz | 40 - 70 Hz | 40 - 70 Hz |
- Charge current range | 0 - 13 A | 0 - 13 A | 0 - 26 A | 0 - 26 A |
- Generator or grid maximum power | 11,500 W | 11,500 W | 11,500 W | 11,500 W |

**Output (AC)**

- Rated power | 3 kW | 3 kW | 6 kW | 6 kW |
- Power (25 °C) | 3,500 / 3,900 / 5,080 W | 3,500 / 3,900 / 5,080 W | 6,400 / 6,900 / 7,900 W | 6,400 / 6,900 / 7,900 W |
- Current | 13 A | 13 A | 26 A | 26 A |
- Rated voltage | 200 - 240 V | 200 - 240 V | 200 - 240 V | 200 - 240 V |
- Rated frequency | 50 / 60 Hz | 50 / 60 Hz | 50 / 60 Hz | 50 / 60 Hz |

**Efficiency**

- Maximum efficiency | 95.5% | 95.5% | 96% | 96% |

**General Information**

- Stand-by consumption | <10 W | <10 W | <10 W | <10 W |
- Ambient temperature | -20 °C to +65 °C | -20 °C to +65 °C | -20 °C to +65 °C | -20 °C to +65 °C |
- Relative humidity (non-condensing) | 0 - 100% | 0 - 100% | 0 - 100% | 0 - 100% |
- Protection class | IP65 | IP65 | IP65 | IP65 |

**Compliance with standards:** EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-3-12, EN 61215-9-1, EN 61215-9-2, IEC62103, EN 50178, FCC Part 15, AS 3100*, RD1699/2011, DIN V VDE V 0126-1-1, EN 50438, CEI 0-21*, VDE-AR-N 4105:2011-08, G59/2, G83/2*, AS4777.2*, AS4777.3*, IEC 62116, UNE 206007-1, NRS 097-2-1 (*third party certification pending)

**Notes:**
- Grid-connected modes include Back-up, Self-consumption and Grid Support. Minimum voltage DC (Voc, min) for Voc, max = 1.1 p.u. If Voc, max is higher than this value, the minimum voltage should be corrected as Voc, min * Voc, max / 1.1. ** The inverter’s maximum power will be the battery voltage multiplied by the maximum discharge current (50 A)
- AC power up to 40 °C ambient temperature. ** This power is only available if the battery voltage multiplied by the maximum discharge current reaches these values. ** This parameter is configurable through the display. Related only to inverters up to 16 A.

**SUN STORAGE 1Play**

- PV array
- Batteries
- INTEGRITY SUN STORAGE 1Play
- Consumption

**Size and weight (mm)**

<table>
<thead>
<tr>
<th></th>
<th>3</th>
<th>3TL</th>
<th>6</th>
<th>6TL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>470 x 360 x 180</td>
<td>470 x 360 x 180</td>
<td>470 x 360 x 180</td>
<td>470 x 360 x 180</td>
</tr>
<tr>
<td>Weight</td>
<td>43.3 kg</td>
<td>43.3 kg</td>
<td>65 kg</td>
<td>65 kg</td>
</tr>
<tr>
<td>Transformer</td>
<td>140 x 180 x 320</td>
<td>140 x 180 x 320</td>
<td>140 x 180 x 320</td>
<td>140 x 180 x 320</td>
</tr>
<tr>
<td>Weight</td>
<td>23.3 kg</td>
<td>23.3 kg</td>
<td>60 kg</td>
<td>60 kg</td>
</tr>
</tbody>
</table>

**Output power versus battery voltage**

- Pmax at 40 °C, Imax=50A
- 3000
- 6000
- 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 Vb

* Bidirectional only when grid is connected.
Operating modes:

**Stand-alone mode**

The INGECON® SUN STORAGE 1Play inverter generates a stand-alone AC grid and acts as a grid manager, guaranteeing the correct balance between generation, consumption and the storage system. To do so, it controls the energy flow between the grid and the batteries, based on the status at any given time.

The INGECON® SUN STORAGE 1Play inverter makes it possible to integrate a solar energy source into the grid, into the grid, as it integrates a photovoltaic input. An advanced control system, requiring no communications, manages the power generated by the PV inverters, based on consumption data and the battery charge status. The back-up power source (a genset or the public grid) only connects when the battery state of charge is below a certain programmable threshold.

**Back-up mode**

This operating mode has been designed for grid-connected systems, where grid outages are long and frequent, meaning that a back-up power source is required. The INGECON® SUN STORAGE 1Play inverter operates through a connection to the AC grid. In order to guarantee a power source, the inverter maintains the batteries charged. During a grid outage, the battery inverter generates the AC network and the energy stored in the batteries is used to power the loads. If any renewable energy sources are connected to the grid and the energy generated is greater than the one demanded, then the surplus could be injected into the grid.

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This operating mode is conceived for grid-connected systems with renewable energy sources, in order to minimise grid consumption. If the energy generated is greater than the one demanded, any surplus energy could charge the batteries or, if they are fully charged, the energy could be injected into the grid. If the loads demand more energy than the one produced by the renewable sources, then the batteries would cover this demand, increasing the self-consumption ratio.

**Grid support**

In combination with an external wattmeter and the EMS Board or the EMS Manager, the inverter is able to adapt the output power from the PV plant to a pre-established value, in order to maintain a constant power output or to control the ramp rate. Furthermore, this operating mode makes it possible to implement peak-shaving strategies to reduce the electricity bill by decreasing the contracted power.

---

### Connection Schema

**Single-phase**

(either with 1Play transformerless or 1Play with transformer)

- PV array
- Batteries
- INGECON® SUN STORAGE 1Play
- Genset or grid
- Consumption

**Three-phase**

(only 1Play with transformer)

- PV array
- Batteries*
- INGECON® SUN STORAGE 1Play
- Genset or grid
- Consumption

* It must be a single battery bank.

* Illustrative image. It might not correspond with the basic configuration.
### SUN STORAGE 1Play

#### PV Input (DC)

<table>
<thead>
<tr>
<th></th>
<th>3</th>
<th>3TL</th>
<th>6</th>
<th>6TL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>7.5 kW</td>
<td>7.5 kW</td>
<td>11.5 kW</td>
<td>11.5 kW</td>
</tr>
<tr>
<td>Voltage range MPP (stand-alone mode)</td>
<td>300 - 480 V</td>
<td>300 - 480 V</td>
<td>300 - 480 V</td>
<td>300 - 480 V</td>
</tr>
<tr>
<td>Voltage range MPP (grid-connected mode)</td>
<td>330 - 480 V</td>
<td>330 - 480 V</td>
<td>330 - 480 V</td>
<td>330 - 480 V</td>
</tr>
<tr>
<td>Battery Open Circuit Voltage</td>
<td>550 V</td>
<td>550 V</td>
<td>550 V</td>
<td>550 V</td>
</tr>
<tr>
<td>Maximum Current</td>
<td>20 A</td>
<td>20 A</td>
<td>30 A</td>
<td>30 A</td>
</tr>
<tr>
<td>Inputs</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>MPPT</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

#### Battery Input (DC)

- Voltage range with PV installation (1) | 40 - 300 V | 40 - 300 V | 40 - 300 V | 40 - 300 V |
- Voltage range without PV installation (2) | 40 - 450 V | 40 - 450 V | 40 - 450 V | 40 - 450 V |
- Maximum charge / discharge current | 50 A | 50 A | 50 A | 50 A |
- Battery type | Lead, Ni-Cd, Li-ion | Lead, Ni-Cd, Li-ion | Lead, Ni-Cd, Li-ion | Lead, Ni-Cd, Li-ion |

#### Generator / Grid Input (AC)

<table>
<thead>
<tr>
<th></th>
<th>3 kW</th>
<th>3 kW</th>
<th>6 kW</th>
<th>6 kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td>230 V</td>
<td>230 V</td>
<td>230 V</td>
<td>230 V</td>
</tr>
<tr>
<td>Voltage range</td>
<td>172 - 264 V</td>
<td>172 - 264 V</td>
<td>172 - 264 V</td>
<td>172 - 264 V</td>
</tr>
<tr>
<td>Rated frequency</td>
<td>50 / 60 Hz</td>
<td>50 / 60 Hz</td>
<td>50 / 60 Hz</td>
<td>50 / 60 Hz</td>
</tr>
<tr>
<td>Frequency range</td>
<td>40 - 70 Hz</td>
<td>40 - 70 Hz</td>
<td>40 - 70 Hz</td>
<td>40 - 70 Hz</td>
</tr>
<tr>
<td>Charge current range</td>
<td>0 - 13 A</td>
<td>0 - 13 A</td>
<td>0 - 26 A</td>
<td>0 - 26 A</td>
</tr>
<tr>
<td>Generator or grid maximum power</td>
<td>11,500 W</td>
<td>11,500 W</td>
<td>11,500 W</td>
<td>11,500 W</td>
</tr>
</tbody>
</table>

#### Output (AC)

- Rated power (3) | 3 kW | 3 kW | 6 kW | 6 kW |
- Power (25°C, 30 min, 2 min, 3 s) | 3,500 / 3,900 / 5,080 W | 3,500 / 3,900 / 5,080 W | 6,400 / 6,900 / 7,900 W | 6,400 / 6,900 / 7,900 W |
- Current | 13 A | 13 A | 26 A | 26 A |
- Rated voltage (4) | 200 - 240 V | 200 - 240 V | 200 - 240 V | 200 - 240 V |
- Rated frequency (5) | 50 / 60 Hz | 50 / 60 Hz | 50 / 60 Hz | 50 / 60 Hz |

#### Efficiency

- Maximum efficiency | 95.5% | 95.5% | 96% | 96% |

#### General Information

- Stand-by consumption | <10 W | <10 W | <10 W | <10 W |
- Ambient temperature | -20°C to +65°C | -20°C to +65°C | -20°C to +65°C | -20°C to +65°C |
- Relative humidity (non-condensing) | 0 - 100% | 0 - 100% | 0 - 100% | 0 - 100% |
- Protection class | IP65 | IP65 | IP65 | IP65 |

### Compliance with standards:
- EN 61000-6-1
- EN 61000-6-2
- EN 61000-6-3
- EN 61000-6-4
- EN 61000-3-12
- EN 61000-3-11
- EN 61000-3-1
- IEC62103
- EN 50178
- FCC Part 15
- AS 3100
- RD1699/2011
- DIN V VDE V 0126-1-1
- EN 50438
- CEI 0-21
- VDE-AR-N 4105:2011-08
- G59/2
- G83/2
- AS4777.2
- AS4777.3
- IEC 62116
- IEC 61727
- UNE 206007-1
- NRS 097-2-1

### Notes:
- Grid-connected modes include Back-up, Self-consumption and Grid Support. Minimum voltage DC (VDC, min) for Vgrid, max = 1.1 p.u. If Vgrid, max is higher than this value, the minimum voltage should be corrected as VDC, min * Vgrid, max / 1.1.
- The inverter's maximum power will be the battery voltage multiplied by the maximum discharge current (50 A).
- AC power up to 40°C ambient temperature.
- This power is only available if the battery voltage multiplied by the maximum discharge current reaches these values.
- This parameter is configurable through the display.

### Size and weight (mm)

- 3: 185 x 185 x 140 mm, 63.3 kg
- 3TL: 185 x 185 x 140 mm, 63.3 kg
- 6: 230 x 230 x 180 mm, 65 kg
- 6TL: 230 x 230 x 180 mm, 65 kg

### Output power versus battery voltage

[Graph showing output power versus battery voltage]