

## STORAGE INVERTER FOR UTILITY SCALE PLANTS

### INGECON® SUN STORAGE 350TL

#### Three-phase bidirectional Power Conversion System (PCS)

The INGECON® SUN STORAGE 350TL is a three-phase bidirectional converter for energy storage systems. Maximum DC voltage (1,500 V) and wide voltage range. Awesome power density, with up to 350 kW. It features an innovative control unit that performs a more efficient and sophisticated inverter control.

#### Highest flexibility and scalability for any battery configuration

The INGECON® SUN STORAGE 350TL can be parallelized in order to adjust the PCS power to different battery configurations. This way, it facilitates the design of a wide diversity energy storage systems. Furthermore, it allows augmentation so old and new batteries can be mixed without accelerating the aging of the new ones. The string inverter philosophy permits an easy and immediate replacement that does not require qualified technicians.

#### Long-lasting and rugged design

Aluminium casing, especially conceived for indoor and outdoor applications (IP66). The INGECON® SUN STORAGE 350TL inverters have been designed to guarantee a long life expectancy and to withstand extreme temperatures.

#### SPE (Single Pair Ethernet)

The inverter features SPE communication as standard. The SPE offers high-speed IP communication without the 100-meter distance limitation of standard Ethernet. Using SPE, the communication with the inverters can be established up to 1,000 meters. Moreover, these inverters enables daisy chain connection. Thus, several inverters can be connected to the same SPE line. The versatility and possibilities offered by the SPE are an important improvement at the plant's communication network.



## INGECON® SUN STORAGE 350TL

### Maximum performance

Maximum performance In order to achieve the maximum performance the INGECON® SUN STORAGE 350TL Power Conversion System (PCS) is supplied totally equipped with all the electrical protections.

### Integrated components

|  |   |
|--|---|
| AC quick connectors                      | ✓ |
| DC switch                                | ✓ |
| DC surge arresters, type II              | ✓ |
| AC surge arresters, type II              | ✓ |
| DC & AC pre-charge system                | ✓ |
| Wi-Fi communication                      | ✓ |
| SPE (Single Pair Ethernet) communication | ✓ |

### Real power related functionalities

Renewable resources integration:

- Ramp limits.
- Power smoothing / firming / curtailment.
- Time shifting.
- Micro grids.
- BLACK START.

Grid support / Ancillary services:

- Frequency regulation.
- Synthetic inertia.
- Frequency control / protection.
- Virtual "Synchronous Machine".

Investment deferral:

- Peak shaving.
- Load shifting / Load following.
- Real power response improvement of conventional power plants.

Power efficiency:

- Time shifting.
- Price arbitrage.
- Real power response improvement of conventional power plants.
- Peak shaving.

Safety and quality:

- Grid code compliance.
- Transmission congestion relief / Power quality-reliability.

### Reactive power related functionalities

- Voltage control (Q/V).
- Voltage control / protection.
- Fixed power factor (QPF).
- Fixed reactive power output (Qref).
- Limitation of response of Reactive Power.



AC quick connectors

#### PROTECTIONS

- DC switch.
- Shortcircuits and overloads at the output.
- Anti-islanding with automatic disconnection.
- Insulation faults.
- AC overvoltages with type II surge arresters.
- DC overvoltages with type II surge arresters.

#### BENEFITS

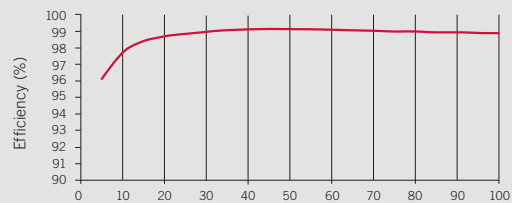
- Greater power density.
- Flexibility and scalability.
- High availability.
- High efficiency rates.
- Easy maintenance.

| INGECON® SUN STORAGE 350TL                     |  |               |               |                 |                 |
|--|--|---------------|---------------|-----------------|-----------------|
|  | 600 V  | 615 V         | 630 V         | 645 V           | 660 V           |
| <b>Input (DC)</b>                              |  |               |               |                 |                 |
| Battery voltage range <sup>(1)</sup>           | 933 - 1,500 V  | 957 - 1,500 V | 980 - 1,500 V | 1,003 - 1,500 V | 1,027 - 1,500 V |
| Maximum voltage                                | 1,500 V  |               |               |                 |                 |
| Maximum current                                | 280 A  |               |               |                 |                 |
| <b>Output (AC)</b>                             |  |               |               |                 |                 |
| Charge/Discharge power                         | 260 kVA  | 266 kVA       | 273 kVA       | 279 kVA         | 286 kVA         |
| Charge/Discharge current                       | 250 A  |               |               |                 |                 |
| Ambient temperature for rated power            | 40°C   |               |               |                 |                 |
| Voltage range                                  | 400 - 800 V  |               |               |                 |                 |
| Rated voltage                                  | 3 / PE, 600 V  | 3 / PE, 615 V | 3 / PE, 630 V | 3 / PE, 645 V   | 3 / PE, 660 V   |
| Frequency                                      | 50 / 60 Hz   |               |               |                 |                 |
| Type of grid                                   | IT   |               |               |                 |                 |
| Power Factor                                   | 1  |               |               |                 |                 |
| Power Factor adjustable <sup>(2)</sup>         | Yes, 0-1 (leading / lagging)   |               |               |                 |                 |
| THD (Total Harmonic Distortion) <sup>(3)</sup> | <3%  |               |               |                 |                 |
| <b>Efficiency</b>                              |  |               |               |                 |                 |
| Maximum efficiency                             | 99.05%   |               |               |                 |                 |
| Euroefficiency                                 | 98.60%   |               |               |                 |                 |
| <b>General Information</b>                     |  |               |               |                 |                 |
| Cooling system                                 | Forced ventilation   |               |               |                 |                 |
| Air flow                                       | 900 m³/h   |               |               |                 |                 |
| Aux. consumption                               | 20 W   |               |               |                 |                 |
| Operation temperature                          | -30 °C to 60 °C  |               |               |                 |                 |
| Relative humidity (non-condensing)             | 0 - 100%   |               |               |                 |                 |
| Protection class                               | IP66 / NEMA 4  |               |               |                 |                 |
| Residual current monitoring unit               | Yes  |               |               |                 |                 |
| Maximum operating altitude                     | 4,000 m.a.s.l. (for installations beyond 1,000 m.a.s.l., please contact Ingeteam's Solar Sales Department)   |               |               |                 |                 |
| Connection                                     | AC connection: max. cross section: 120 mm² (one wire) copper / DC connection: up to 2 x 400 mm² aluminium  |               |               |                 |                 |
| DC parallel connection                         | Yes (please contact Ingeteam's Solar Sales Department)   |               |               |                 |                 |
| Marking  | CE   |               |               |                 |                 |
| EMC and security standards                     | EN 61000-6-1, EN 61000-6-2, EN 61000-6-4, EN 61000-3-11, EN 61000-3-12, EN 62109-1, EN 62109-2, EN 50178, IEC 62116, IEC 61683, EN 50530, IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-14, IEC 60068-2-30, IEC 60068-2-68 |               |               |                 |                 |
| Grid connection standards                      | IEC 61727, EN 50549-1, EN 50549-2, UNE 206007-1 IN, NTS 2.1 SEPE, NTS 1.1 SENP, CEI 0-21, CEI 0-16, Arrete 9 du Juin, ABNT NBR 16149, ABNT NBR 16150, NDU-015, Portaria 73   |               |               |                 |                 |

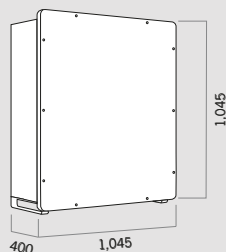
**Notes:**

- <sup>(1)</sup> Minimum voltage DC (VDC, min) for  $V_{grid,max} = 1.1$  p.u. and Power Factor = 1. If  $V_{grid,max}$  is higher than this value, the minimum voltage should be corrected as  $VDC, min * V_{grid,max} / 1.1$ . For other DC voltage ranges, please contact Ingeteam's BESS sales department.
- <sup>(2)</sup> Extended adjustment range for nominal working points.
- <sup>(3)</sup> For rated AC power and voltage in accordance with IEC 61000-3-4.

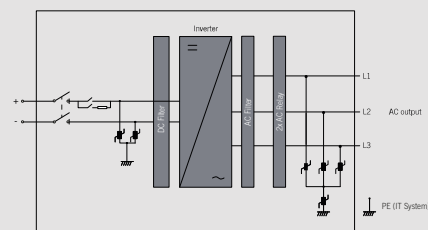
**Efficiency INGECON® SUN STORAGE 350TL**



**Size and weight (mm)**



**350TL**  
105 kg.

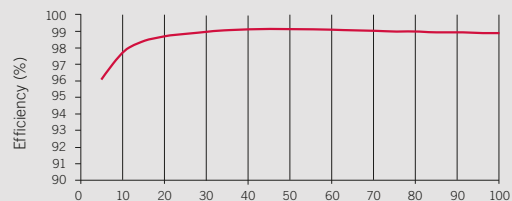


|  | INGECON® SUN STORAGE 350TL   |                 |                 |                 |                 |                 |
|--|--|-----------------|-----------------|-----------------|-----------------|-----------------|
|  | 675 V  | 690 V           | 710 V           | 730 V           | 750 V           | 800 V           |
| <b>Input (DC)</b>                              |  |                 |                 |                 |                 |                 |
| Battery voltage range <sup>(1)</sup>           | 1,050 - 1,500 V  | 1,073 - 1,500 V | 1,104 - 1,500 V | 1,136 - 1,500 V | 1,167 - 1,500 V | 1,245 - 1,500 V |
| Maximum voltage                                | 1,500 V  |                 |                 |                 |                 |                 |
| Maximum current                                | 280 A  |                 |                 |                 |                 |                 |
| <b>Output (AC)</b>                             |  |                 |                 |                 |                 |                 |
| Charge/Discharge power                         | 292 kVA  | 299 kVA         | 307 kVA         | 316 kVA         | 325 kVA         | 346 kVA         |
| Charge/Discharge current                       | 250 A  |                 |                 |                 |                 |                 |
| Ambient temperature for rated power            | 40°C   |                 |                 |                 |                 |                 |
| Voltage range                                  | 400 - 800 V  |                 |                 |                 |                 |                 |
| Rated voltage                                  | 3 / PE, 675 V  | 3 / PE, 690 V   | 3 / PE, 710 V   | 3 / PE, 730 V   | 3 / E, P50 V    | 3 / PE, 800 V   |
| Frequency                                      | 50 / 60 Hz   |                 |                 |                 |                 |                 |
| Type of grid                                   | IT   |                 |                 |                 |                 |                 |
| Power Factor                                   | 1  |                 |                 |                 |                 |                 |
| Power Factor adjustable <sup>(2)</sup>         | Yes, 0-1 (leading / lagging)   |                 |                 |                 |                 |                 |
| THD (Total Harmonic Distortion) <sup>(3)</sup> | <3%  |                 |                 |                 |                 |                 |
| <b>Efficiency</b>                              |  |                 |                 |                 |                 |                 |
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| <b>General Information</b>                     |  |                 |                 |                 |                 |                 |
| Cooling system                                 | Forced ventilation   |                 |                 |                 |                 |                 |
| Air flow                                       | 900 m³/h   |                 |                 |                 |                 |                 |
| Aux. consumption                               | 20 W   |                 |                 |                 |                 |                 |
| Operation temperature                          | -30 °C to 60 °C  |                 |                 |                 |                 |                 |
| Relative humidity (non-condensing)             | 0 - 100%   |                 |                 |                 |                 |                 |
| Protection class                               | IP66 / NEMA 4  |                 |                 |                 |                 |                 |
| Residual current monitoring unit               | Yes  |                 |                 |                 |                 |                 |
| Maximum operating altitude                     | 4,000 m (for installations beyond 1,000 m, please contact Ingeteam's Solar Sales Department)   |                 |                 |                 |                 |                 |
| Connection                                     | AC connection: max. cross section: 120 mm² (one wire) copper / DC connection: up to 2 x 400 mm² aluminium  |                 |                 |                 |                 |                 |
| DC parallel connection                         | Yes (please contact Ingeteam's Solar Sales Department)   |                 |                 |                 |                 |                 |
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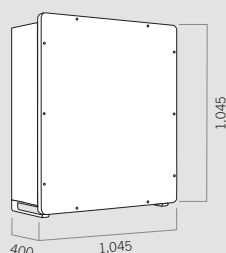
**Notes:**

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- <sup>(2)</sup> Extended adjustment range for nominal working points.
- <sup>(3)</sup> For rated AC power and voltage in accordance with IEC 61000-3-4.

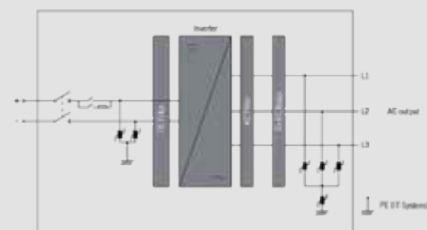
**Efficiency INGECON® SUN STORAGE 350TL**



**Size and weight (mm)**



**350TL**  
105 kg.



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