

**STORAGE SOLUTIONS**  
for commercial and industrial

***Ingeteam***



## STORAGE SOLUTIONS

for commercial and industrial systems

- STORAGE OF SELF-PRODUCED SOLAR ENERGY USABLE WHEN NEEDED
- UNUSED ENERGY STORED IN THE BATTERY, AS A SUPPLY OF CLEAN ENERGY
- IMPLEMENTATION OF SELF-CONSUMPTION FAVORING NEW SYSTEMS SUCH AS ELECTRIC CAR CHARGING OR HEATING SYSTEMS, ALLOWING THE CUT OF YOUR BILL

**INGECON SUN STORAGE 3Play**



## INGECON SUN STORAGE 100TL

Three-phase transformerless battery inverter with the maximum power density.

Three-phase battery inverters for commercial and industrial systems. These bidirectional storage inverters feature the same technology as ingeteam's string photovoltaic inverters.

### Lower operational costs

Thanks to the wireless communication network that the INGECON® SUN STORAGE 100TL enables, the storage system could be commissioned, monitored and controlled without cables.

Moreover, its string inverter philosophy allows for a fast and easy replacement that does not require qualified technicians.

### Greater flexibility and power density

A greater flexibility is possible thanks to its maximum DC voltage (1,100 V) and to its wide input voltage range (627-850 V). Great power density, with 100 kW of power in only 80 kg.

### Robust and long-lasting design

Aluminium casing, especially conceived for outdoor installations (IP65).

The design of the INGECON® SUN STORAGE 3Play inverter family guarantees the maximum life expectancy and the best features, even with high temperatures.

### Ethernet and Wi-Fi as standard

This battery inverter features Ethernet and Wi-Fi communications as standard. These communications, together with the webserver that the inverter integrates, allow for a faster and more reliable commissioning by using a mobile phone, tablet or laptop.

Furthermore, it is compatible with an external Cloud Connect.

### Standard 5 year warranty, extendable for up to 10 years

# INGECON SUN STORAGE 100TL

## MAIN FEATURES

- Low-voltage ride-through capability.
- Reactive power capability.
- Compatible with external Cloud Connect software.
- 98.8% maximum efficiency.
- Ethernet and Wi-Fi communications supplied as standard.
- Integrated Webserver.
- Software INGECON® SUN Monitor for PV plant monitoring.
- Suitable for indoor and outdoor installations (IP65).
- High temperature performance.
- 4 digital inputs and 2 digital outputs.

## PROTECTIONS

- Shortcircuits and overloads at the output.
- Anti-islanding with automatic disconnection.
- Insulation faults.
- AC overvoltages with type 2 surge arresters.
- DC overvoltages with type 2 surge arresters.

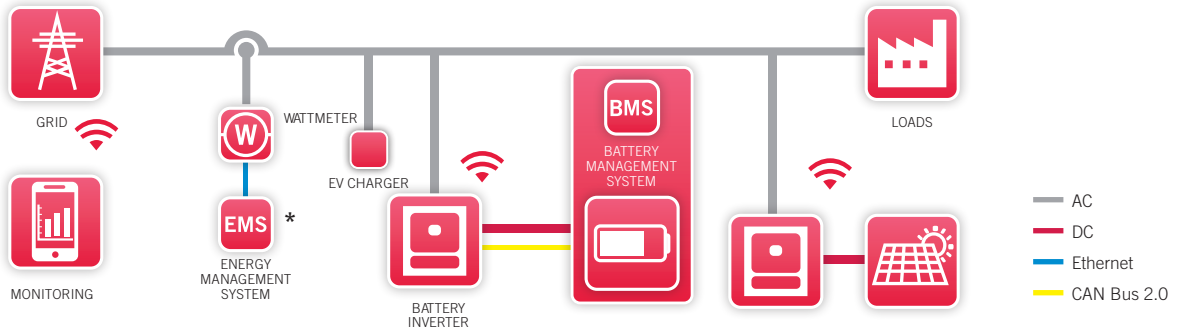
## OPTIONAL ACCESSORIES

- Self-consumption kit.
- RS-485 communication.

## BENEFITS

- Greater power density.
- Greater cost-effectiveness thanks to the cabling cost reduction.
- High availability compared to central inverters.
- High efficiency rates.
- Easy maintenance.

## WIRING DIAGRAM

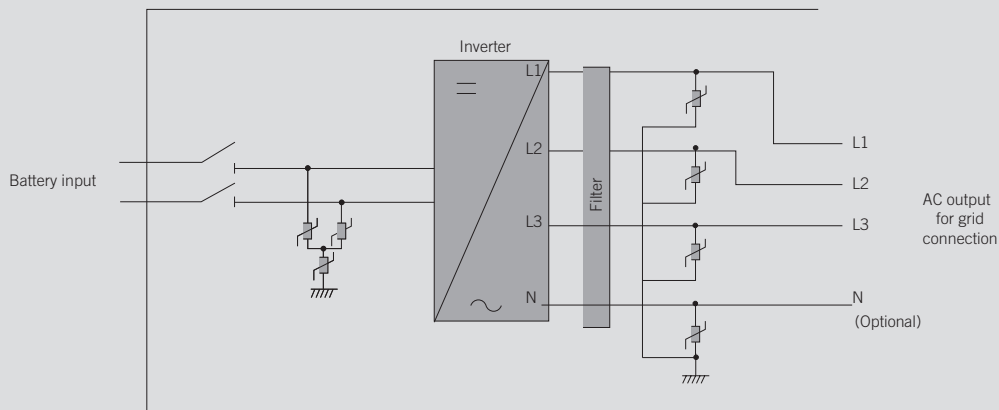


\* EMS provided only for Ingeteam Inverters (PV and Storage)

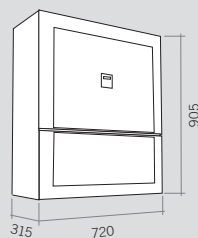
## Integrated elements

Terminal blocks	✓
DC switch	✓
DC surge arresters, type 2	✓
AC surge arresters, type 2	✓

## 3Play TL



## Size and weight (mm)

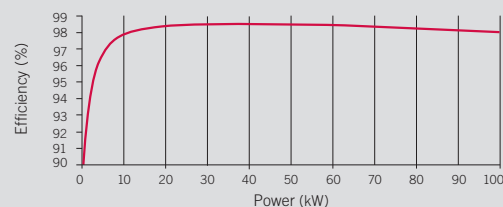


**100TL**  
80 kg.

INGECON SUN STORAGE 100TL	
<b>Input (DC)</b>	
Voltage range <sup>(1)</sup>	627 - 850 V
Maximum voltage <sup>(2)</sup>	1,100 V
Maximum power (charge/discharge)	60 kW / 100 kW
Maximum current (charge/discharge)	96 A / 159 A
Battery type	Li-ion, lead
Shortcircuit current	240 A
Communication with the BMS (Battery Management System)	CAN Bus 2.0 / Ethernet
<b>Output (AC)</b>	
Rated power	60 kW / 100 kW
Max. temperature at rated power <sup>(3)</sup>	50 °C
Maximum current	87 A / 145 A
Rated voltage	400 V
Rated frequency	50 / 60 Hz
Power Factor	1
Adjustable power factor	Yes. 0 - 1 (leading / lagging)
THD	<3%
<b>Efficiency</b>	
Maximum efficiency	98.8%
Euroefficiency	98.1%
<b>General Information</b>	
Refrigeration system	Forced ventilation
Air flow	570 m <sup>3</sup> /h
Stand-by consumption	20 W
Consumption at night	1 W
Ambient temperature	-25 °C to 60 °C
Relative humidity (non-condensing)	0 - 100%
Protection class	IP65 / NEMA 4
RCD	1,000 mA
Max. operating altitude <sup>(4)</sup>	3,000 m
Connection	AC: Max. Cross section: 240 mm <sup>2</sup> (one wire) DC connection: Max. Cross section: 300 mm <sup>2</sup> (one wire) Copper and Aluminium cabling permitted for DC and AC
Marking	CE
EMC and safety 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> The minimum battery voltage (627 V) has been calculated for  $V_{gridmax} = 1.085$  p.u. and  $\cos \phi = 1$ . If  $V_{gridmax}$  is different from this value, then the minimum battery voltage must be calculated as  $V_{batmin} = 627 * V_{gridmax} / 1.085$  <sup>(2)</sup> The inverter does not start operating until  $V_{dc} < 1,000$  V <sup>(3)</sup> For each °C of increase, the output power will be reduced at the rate of 2.3% <sup>(4)</sup> Beyond 1,000 m, the maximum temperature at rated will decrease at the rate of 5.5 °C per every additional 1,000 m.

**Efficiency INGECON® SUN STORAGE 100TL**  $V_{dc} = 627$  V





**ISSB 110 HV is the most advanced Lithium Module for Commercial and Industrial Energy Storage systems.**

Each application has its own Lithium Chemistry cell in order to guarantee the highest durability and Safety.



## **INGECON® SUN STORAGE BATTERY Features**

- FAST CONNECTIONS
- WALL MOUNTED, FLOOR MOUNTED, STACKABLE IN RACK IP56 AND PARALLEL APPLICATIONS
- HIGH CAPACITY THANKS TO ITS SCALABILITY AND SIMPLE CONFIGURATION.
- WIRELESS MONITORING FOR REAL TIME INTERVENTION AND MAINTENANCE.



## ISSB 110 HV

A State-of-the-Art Technology.

They have been conceived with a series of features designed to satisfy very stringent and wide Market needs, the ones that today expert Customers are calling for.

We have thought to our Battery bank being as “modular”, that is the Customer is free to start from a very simple solution, 13 or 14 battery modules stacked (in two towers side by side, together with the HV Box, to form the rack) and up to 6 Racks coupled to one Inverter, up to a multi-block “clustered” system so from multiple of 100kW up to multiple MW system equivalent.

Like that, the vast majority of C&I needs is discovered even after the Installation gets done, being our Architecture conceived as an open one.

The IP entry level 21 is suited for classical indoor applications in commercial premises.

The battery bank is built out of a light metal housing to reduce the local weight impact and the layout takes into account the “stacked-like” modularity, that is the battery bank is stackable, making it easy and fast to increase the number of mod-

ules afterwards, from 13 (68,9 kWh) to 14 (74,2 kWh) and up to 6 battery stacks in parallel (445,2 kWh) for each 100kW single Inverter.

Main communication protocols are RS485, CAN, 232, Wifi and the expected cycle life is well beyond 7000. All above has been considered to offer the best flexibility and operative approach, without forgetting that things can get improved from time to time, depending on the Customer's needs and interests.



**ISSB 110 HV**



**INGECON® SUN STORAGE BATTERY 110 HV**

	<b>Single Module Hv</b>
Basic Parameters	ISSB 110 HV
Battery System Capacity*	5,3 kWh
Single Module Nominal Voltage	51,2 Vdc
Application	HV
Modules Expandibility	HV Mode: from 13 to 14 Modules in Series with Single HV Box = One HV Cluster
Cluster Net Capacity	Max 84 Modules per HV System
Voltage Range	45,5-58,4 Vdc
Net Capacity	105 Ah
Usable Capacity	100 Ah
Dimension	580 x 463 x 155 mm
Weight	57,3 Kg
Charge / Discharge Current	100 A (150 A 30 s)
Peak	200 (Peak 5 s)
Depth of Discharge	100%
Communication Port	RS485, CAN, 232, Wi-Fi
Single string quantity	13-14 pcs
Discharge Temperature**	-20 ~ 60°C
Charge Temperature**	-10 ~ 55°C
Shelf Temperature**	-10 ~ 45°C
Humidity	5% ~ 95%
Altitude	< 3000 m
Design life	10 ↑ Years (25°c)
Expected Life Cycles @ STC	> 7000 ↑ (25°c)
Standards	IEC62619/UL1973 CE/UN38.3
Features	Pre-Charge + Fuse LV + Fuse HV + Auto Contactor + Dual BMS + Multi BMS FW management
	Applicable for High Voltage systems, Four protection levels for HV Box, Real time balancing, Adaptive charge/discharge CAN logic, Three step adaptive charging logic, 2xDI/DO programmable ports, Mobile app for monitoring, control, debugging, firmware update and historical information.

\* Module net usable energy is managed by the BMS control logic to 100Ah

\*\* See Warranty Terms and the Standard Test Conditions "STC" and the operative temperature

# INGECON SUN STORAGE Battery



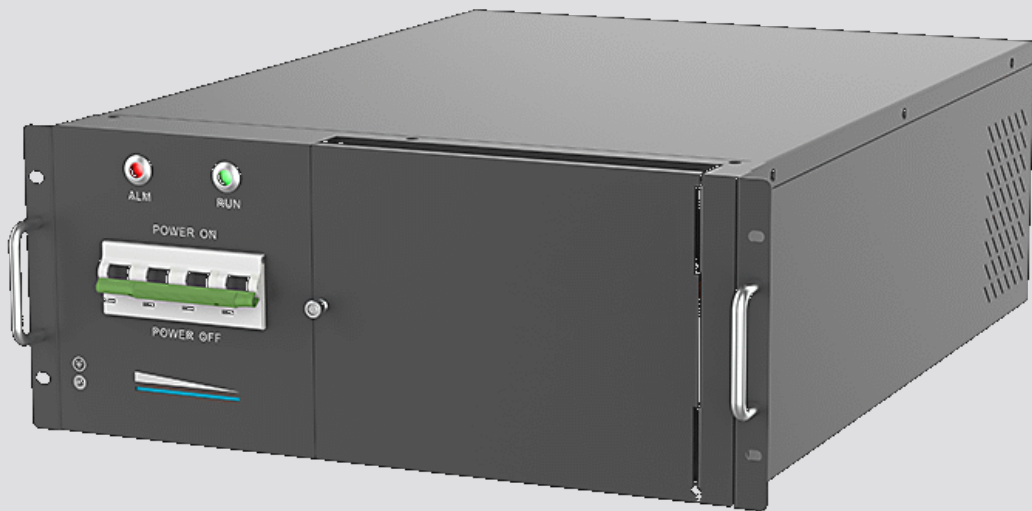
+



HV BOX***	INGECON® SUN STORAGE BATTERY 110 HV*	
Battery Module	6+7	7+7
Battery System Capacity	68,9 kWh	74,2 kWh
Min Voltage (SOC 0%)	617,5V	665V
Recommended Voltage	min 650V max 754V	min 700V max 812V
Dimensions	580x463x990 mm X 1 580x463x1155 mm X 1	580x463x1155 mm X 2
Weight	744,9 kg	802,2 kg
Depth of Discharge	100%	
Charge/Discharge	100A/100A	
Communication	RS485, CAN, 232, Wifi	
Protection Class	IP21	
Working Temperature (Discharge**/Charge)	-20°C +60°C / -10°C +55°C	
Storage Temperature**	0°C + 40°C self discharge 1%/month; -15°C +55°C self discharge 2%/month	
Humidity	5% ~ 95%	
Altitude	< 3000 m	
Design life	10 ↑ Years (25°C)	
Expected Life Cycles @ STC	> 7000 ↑ (25°C/80%DoD >75% residual)	
Standards	IEC62619/UL1973/CE/UN38.3	

\* Module net usable energy is managed by the BMS control logic set to 100Ah  
 \*\* See Warranty Terms and the Standard Test Conditions "STC" and the operative temperature  
 \*\*\* HV BOX is compulsory

**INGECON SUNSTORAGE Battery**



## ISSB 110 HV RACK

A State-of-the-Art Technology.

They have been conceived with a series of features designed to satisfy very stringent and wide Market needs, the ones that today expert Customers are calling for.

We have thought to our Battery bank being as “modular”, that is the Customer is free to start from a very simple solution, 13 or 14 battery modules in series (install in the IP54 cabinet, together with the HV Box, to form the rack) and up to 6 Racks coupled to one Inverter, up to a multi-block “clustered” system so from multiple of 100kW up to multiple MW system equivalent.

Like that, the vast majority of C&I needs is discovered even after the Installation gets done, being our Architecture conceived as an open one.

The IP entry level 54 is suited for classical outdoor applications in commercial premises.

The battery bank is built out of a light metal housing to reduce the local weight impact and the layout takes into account the “stacked-like” modularity, that is the battery bank is stackable, making it easy and fast to increase the number of mod-

ules afterwards, from 13 (68,9 kWh) to 14 (74,2 kWh) and up to 6 battery stacks in parallel (445,2 kWh) for each 100kW single Inverter.

Main communication protocols are RS485, CAN, 232, Wifi and the expected cycle life is well beyond 7000. All above has been considered to offer the best flexibility and operative approach, without forgetting that things can get improved from time to time, depending on the Customer’s needs and interests.

## ISSB 110 HV RACK



### INGECON® SUN STORAGE BATTERY 110 HV RACK

#### Single Module Hv

Basic Parameters	ISSB 110 HV RACK
Battery System Capacity*	5,3 kWh
Single Module Nominal Voltage	51,2 Vdc
Application	HV
Modules Expandibility	HV Mode: from 13 to 14 Modules in Series with Single HV Box = One HV Cluster
Cluster Net Capacity	Max 84 Modules per HV System
Voltage Range	45,5-58,4 Vdc
Net Capacity	105 Ah
Usable Capacity	100 Ah
Dimension	550 x 430 x 155 mm
Weight	57,3 Kg
Charge / Discharge Current	100 A (150 A 30 s / 10 s)
Peak	150 A
Depth of Discharge	100%
Communication Port	RS485, CAN, 232, Wi-Fi
Single string quantity	13-14 pcs
Discharge Temperature**	-20 ~ 55°C
Charge Temperature**	-10 ~ 55°C
Shelf Temperature**	-10 ~ 45°C
Humidity	5% ~ 95%
Altitude	< 3000 m
Design life	10 ↑ Years (25°C)
Expected Life Cycles @ STC	> 7000 ↑ (25°C)
Standards	IEC62619/UL1973 CE/UN38.3
Features	Pre-Charge + Fuse LV + Fuse HV + Auto Contactor + Dual BMS + Multi BMS FW management
	Applicable for High Voltage systems, Four protection levels for HV Box, Real time balancing, Adaptive charge/discharge CAN logic, Three step adaptive charging logic, 2xDI/DO programmable ports, Mobile app for monitoring, control, debugging, firmware update and historical information.

\* Module net usable energy is managed by the BMS control logic to 100Ah

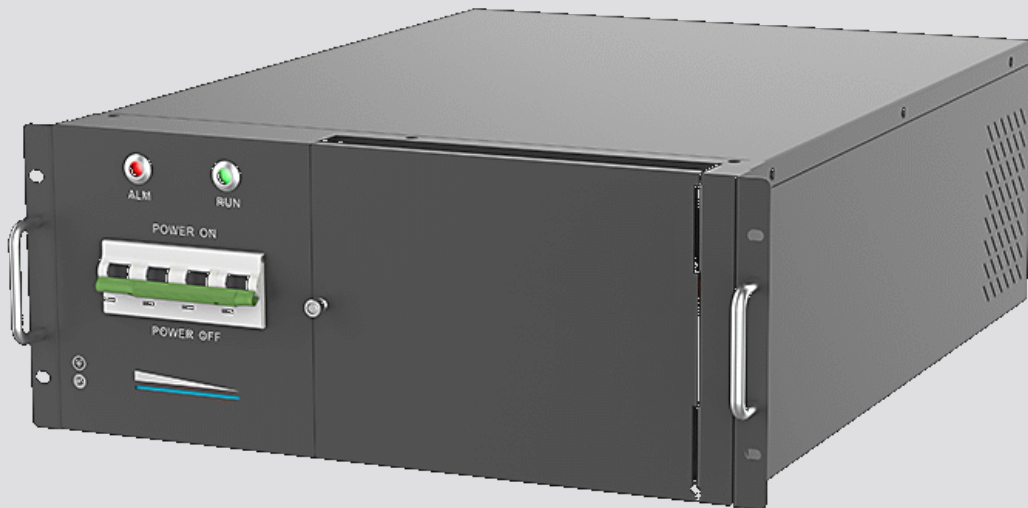
\*\* See Warranty Terms and the Standard Test Conditions "STC" and the operative temperature

**INGECON SUNSTORAGE Battery**



INGECON® SUN STORAGE BATTERY 110 HV RACK*		
Battery Module	<b>13</b>	<b>14</b>
Battery System Capacity	68,9 kWh	72,4 kWh
Min Voltage (SOC 0%)	617,5V	665V
Recommended Voltage	min 650V max 754V	min 700V max 812V
Dimensions	approx. 1200x2000x600 mm	
Weight	approx. 1.150 kg	approx 1.210 kg
Depth of Discharge	100%	
Charge/Discharge	100A/100A	
Consumption	Max idle consumption 65 W / Max heat pump consumption 2500 W - 230 Vac 1ph	
Communication	RS485, CAN, 232, Wifi	
Protection Class	IP54	
Working Temperature (Discharge/Charge)	-15°C +60°C	
Storage Temperature**	0°C + 40°C self discharge 1%/month; -15°C +55°C self discharge 2%/month	
Humidity	5% ~ 95%	
Altitude	< 3000 m	
Design life	10 ↑ Years (25°C)	
Expected Life Cycles @ STC	> 7000 ↑ (25°C/80%DoD >75% residual capacity)	
Standards	IEC62619/CE/UN38.3	

\* Module net usable energy is managed by the BMS control logic set to 100Ah  
 \*\* See Warranty Terms and the Standard Test Conditions "STC" and the operative temperature



## ISSB 150 HV RACK

A State-of-the-Art Technology.

They have been conceived with a series of features designed to satisfy very stringent and wide Market needs, the ones that today expert Customers are calling for.

We have thought to our Battery bank being as “modular”, that is the Customer is free to start from a very simple solution, 13 or 14 battery modules in series (install in the IP54 cabinet, together with the HV Box, to form the rack) and up to 6 Racks coupled to one Inverter, up to a multi-block “clustered” system so from multiple of 100kW up to multiple MW system equivalent.

Like that, the vast majority of C&I needs is discovered even after the Installation gets done, being our Architecture conceived as an open one.

The IP entry level 54 is suited for classical outdoor applications in commercial premises.

The battery bank is built out of a light metal housing to reduce the local weight impact and the layout takes into account the “stacked-like” modularity, that is the battery bank is stackable, making it easy and fast to increase the number of mod-

ules afterwards, from 13 (100,1 kWh) to 14 (107,8 kWh) and up to 6 battery stacks in parallel (646,8 kWh) for each 100kW single Inverter.

Main communication protocols are RS485, CAN, 232, Wifi and the expected cycle life is well beyond 7000. All above has been considered to offer the best flexibility and operative approach, without forgetting that things can get improved from time to time, depending on the Customer's needs and interests.

**ISSB 150 HV RACK**



**INGECON® SUN STORAGE BATTERY 150 HV RACK**

**Single Module Hv**

Basic Parameters	ISSB 150 HV RACK
Battery System Capacity*	7,7 kWh
Single Module Nominal Voltage	51,2 Vdc
Application	HV
Modules Expandibility	HV Mode: from 13 to 14 Modules in Series with Single HV Box = One HV Cluster
Cluster Net Capacity	Max 84 Modules per HV System
Voltage Range	47,5-58,4 Vdc
Net Capacity	150 Ah
Usable Capacity	150 Ah
Dimension	680 x 450 x 190 mm
Weight	80 Kg
Charge / Discharge Current	75 A - peak 150 A
Depth of Discharge	100%
Communication Port	RS485, CAN, 232, Wi-Fi
Single string quantity	13-14 pcs
Discharge Temperature**	-20 ~ 55°C
Charge Temperature**	-10 ~ 55°C
Shelf Temperature**	-10 ~ 45°C
Humidity	5% ~ 95%
Altitude	< 3000 m
Design life	10 ↑ Years (25°C)
Expected Life Cycles @ STC	≥ 7000 ↑ (0.5C, 90%DOD, 70%SOH, 25°C)
Standards	IEC62619/UL1973 CE/UN38.3
Features	Pre-Charge + Fuse LV + Fuse HV + Auto Contactor + Dual BMS + Multi BMS FW management
	Applicable for High Voltage systems, Four protection levels for HV Box, Real time balancing, Adaptive charge/discharge CAN logic, Three step adaptive charging logic, 2xDI/DO programmable ports, Mobile app for monitoring, control, debugging, firmware update and historical information.

\*Module net usable energy is managed by the BMS control logic to 150Ah

\*\* See Warranty Terms and the Standard Test Conditions "STC" and the operative temperature

# INGECON SUNSTORAGE Battery



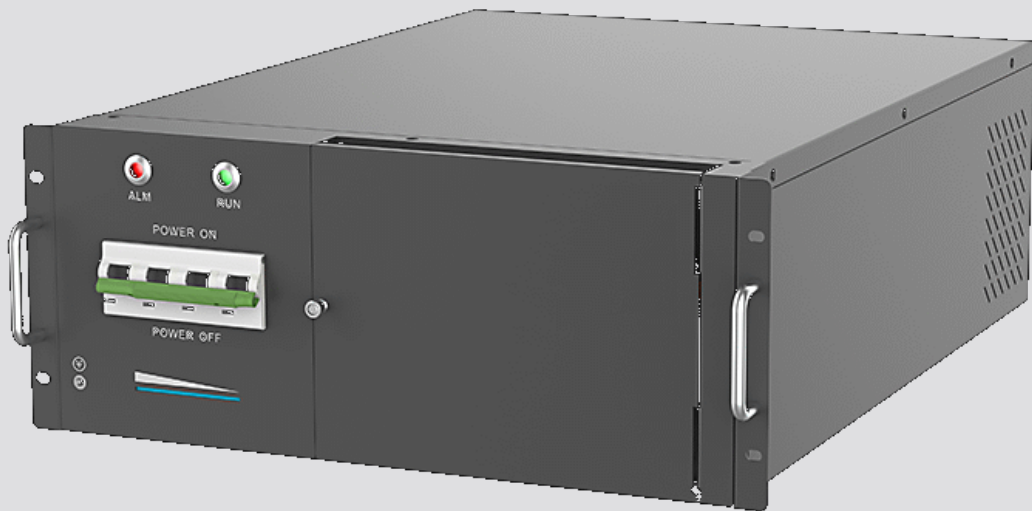
## INGECON® SUN STORAGE BATTERY 150 HV RACK\*

Battery Module	13	14
Battery System Capacity	100,1 kWh	107,8 kWh
Min Voltage (SOC 0%)	617,5V	665V
Recommended Voltage	min 650V max 754V	min 700V max 812V
Dimensions (W*D*H)	approx 1140x1190x2300 mm	
Weight	approx. 1.500 kg	approx. 1.580 kg
Depth of Discharge	100%	
Charge/Discharge	150 A , reccomended 75 A	
Consumption	Max idle consumption 65 W / Max heat pump consumption 2500 W - 230 Vac 1ph	
Communication	RS485, CAN, 232, Wifi	
Protection Class	IP54	
Operative ambiente Temperature (Discharge/Charge)	-15°C +60°C	
Storage Temperature**	0°C + 40°C self discharge 1%/month; -15°C +55°C self discharge 2%/month	
Humidity	5% ~ 95%	
Altitude	< 3000 m	
Design life	10 ↑ Years (25°C)	
Expected Life Cycles @ STC	≥4700 (1C, 90%DOD, 70%SOH, 25°C) / ≥7000 (0.5C, 90%DOD, 70%SOH, 25°C)	
Standards	IEC62619/CE/UN38.3	

\*Module net usable energy is managed by the BMS control logic set to 150Ah  
 \*\* See Warranty Terms and the Standard Test Conditions "STC" and the operative temperature



**INGECON SUN STORAGE Battery**



## ISSB 200 HV RACK

A State-of-the-Art Technology.

They have been conceived with a series of features designed to satisfy very stringent and wide Market needs, the ones that today expert Customers are calling for.

We have thought to our Battery bank being as “modular”, that is the Customer is free to start from a very simple solution, 13 or 14 battery modules in series (install in the IP54 cabinet, together with the HV Box, to form the rack) and up to 6 Racks coupled to one Inverter, up to a multi-block “clustered” system so from multiple of 100kW up to multiple MW system equivalent.

Like that, the vast majority of C&I needs is discovered even after the Installation gets done, being our Architecture conceived as an open one.

The IP entry level 54 is suited for classical outdoor applications in commercial premises.

The battery bank is built out of a light metal housing to reduce the local weight impact and the layout takes into account the “stacked-like” modularity, that is the battery bank is stackable, making it easy and fast to increase the number of mod-

ules afterwards, from 13 (132,6 kWh) to 14 (142,8 kWh) and up to 6 battery stacks in parallel (856,8 kWh) for each 100kW single Inverter.

Main communication protocols are RS485, CAN, 232, Wifi and the expected cycle life is well beyond 5000. All above has been considered to offer the best flexibility and operative approach, without forgetting that things can get improved from time to time, depending on the Customer’s needs and interests.

## ISSB 200 HV RACK



### INGECON® SUN STORAGE BATTERY 200 HV RACK

	Single Module Hv
Basic Parameters	ISSB 200 HV RACK
Battery System Capacity*	10,2 kWh
Single Module Nominal Voltage	51,2 Vdc
Application	HV
Modules Expandibility	HV Mode: from 13 to 14 Modules in Series with Single HV Box = One HV Cluster
Cluster Net Capacity	Max 84 Modules per HV System
Voltage Range	47,5-58,4 Vdc
Net Capacity	200 Ah
Usable Capacity	200 Ah
Dimension	680 x 450 x 190 mm
Weight	89 Kg
Charge / Discharge Current	200 A
Depth of Discharge	100%
Communication Port	RS485, CAN, 232, Wi-Fi
Single string quantity	13-14 pcs
Discharge Temperature**	-20 ~ 55°C
Charge Temperature**	-10 ~ 55°C
Shelf Temperature**	-10 ~ 45°C
Humidity	5% ~ 95%
Altitude	< 3000 m
Design life	10 ↑ Years (25°C)
Expected Life Cycles @ STC	≥ 5000 ↑ (1C, 90%DOD, 70%SOH, 25°C)
Standards	IEC62619/UL1973 CE/UN38.3
Features	Pre-Charge + Fuse LV + Fuse HV + Auto Contactor + Dual BMS + Multi BMS FW management
	Applicable for High Voltage systems, Four protection levels for HV Box, Real time balancing, Adaptive charge/discharge CAN logic, Three step adaptive charging logic, 2xDI/DO programmable ports, Mobile app for monitoring, control, debugging, firmware update and historical information.

\*Module net usable energy is managed by the BMS control logic to 200Ah

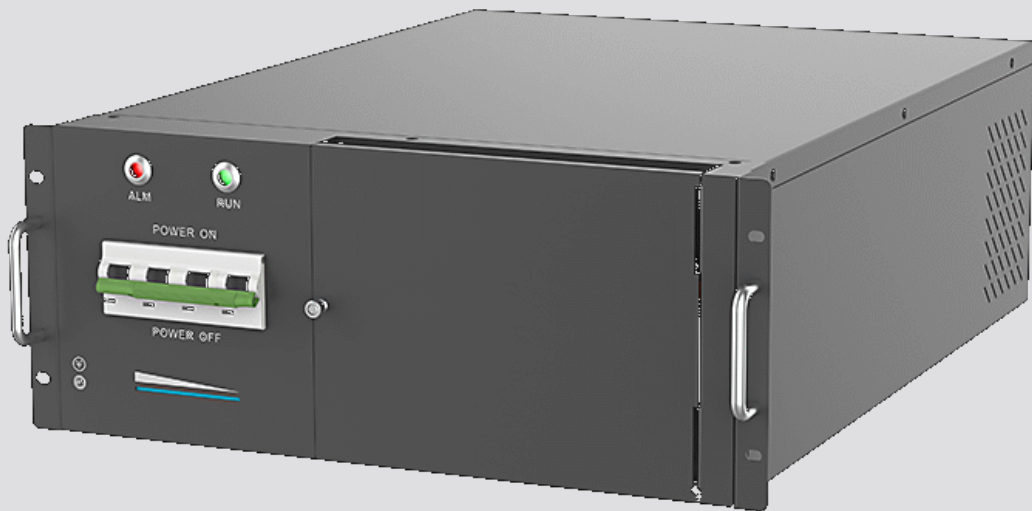
\*\* See Warranty Terms and the Standard Test Conditions "STC" and the operative temperature

**INGECON SUNSTORAGE Battery**



<b>INGECON® SUN STORAGE BATTERY 200 HV RACK*</b>		
Battery Module	<b>13</b>	<b>14</b>
Battery System Capacity	132,6 kWh	142,8 kWh
Min Voltage (SOC 0%)	617,5V	665V
Recommended Voltage	min 650V max 754V	min 700V max 812V
Dimensions (W*D*H)	approx 1330x990x2260 mm	
Weight	approx. 1.600 kg	approx. 1.690 kg
Depth of Discharge	100%	
Charge/Discharge	200 A	
Consumption	Max idle consumption 65 W / Max heat pump consumption 2500 W - 230 Vac 1ph	
Communication	RS485, CAN, 232, Wifi	
Protection Class	IP54	
Operative ambiente Temperature (Discharge/Charge)	-15°C +60°C	
Storage Temperature**	0°C + 40°C self discharge 1%/month; -15°C +55°C self discharge 2%/month	
Humidity	5% ~ 95%	
Altitude	< 3000 m	
Design life	10 ↑ Years (25°C)	
Expected Life Cycles @ STC	≥ 5000 ↑ (1C, 90%DOD, 70%SOH, 25°C)	
Standards	IEC62619/CE/UN38.3	

\*Module net usable energy is managed by the BMS control logic set to 200Ah  
 \*\* See Warranty Terms and the Standard Test Conditions "STC" and the operative temperature



## ISSB 280 HV RACK

A State-of-the-Art Technology.

They have been conceived with a series of features designed to satisfy very stringent and wide Market needs, the ones that today expert Customers are calling for.

We have thought to our Battery bank being as “modular”, that is the Customer is free to start from a very simple solution, 13 or 14 battery modules in series (install in the IP54 cabinet, together with the HV Box, to form the rack) and up to 6 Racks coupled to one Inverter, up to a multi-block “clustered” system so from multiple of 100kW up to multiple MW system equivalent.

Like that, the vast majority of C&I needs is discovered even after the Installation gets done, being our Architecture conceived as an open one.

The IP entry level 54 is suited for classical outdoor applications in commercial premises.

The battery bank is built out of a light metal housing to reduce the local weight impact and the layout takes into account the “stacked-like” modularity, that is the battery bank is stackable, making it easy and fast to increase the number of mod-

ules afterwards, from 13 (185,9 kWh) to 14 (200,2 kWh) and up to 6 battery stacks in parallel (1201,2 kWh) for each 100kW single Inverter.

Main communication protocols are RS485, CAN, 232, Wifi and the expected cycle life is well beyond 8000. All above has been considered to offer the best flexibility and operative approach, without forgetting that things can get improved from time to time, depending on the Customer’s needs and interests.

**ISSB 280 HV RACK**



**INGECON® SUN STORAGE BATTERY 280 HV RACK**

**Single Module Hv**

Basic Parameters	ISSB 280 HV RACK
Battery System Capacity*	14,3 kWh
Single Module Nominal Voltage	51,2 Vdc
Application	HV
Modules Expandibility	HV Mode: from 13 to 14 Modules in Series with Single HV Box = One HV Cluster
Cluster Net Capacity	Max 84 Modules per HV System
Voltage Range	47,5-58,4 Vdc
Net Capacity	280 Ah
Usable Capacity	280 Ah
Dimension	860 x 482 x 230 mm
Weight	116 Kg
Charge / Discharge Current	140A / 280 A peak
Depth of Discharge	100%
Communication Port	RS485, CAN, 232, Wi-Fi
Single string quantity	13-14 pcs
Discharge Temperature**	-20 ~ 55°C
Charge Temperature**	-10 ~ 55°C
Shelf Temperature**	-10 ~ 45°C
Humidity	5% ~ 95%
Altitude	< 3000 m
Design life	10 ↑ Years (25°C)
Expected Life Cycles @ STC	≥ 8000 ↑ (0.5C, 90%DOD, 70%SOH, 25°C)
Standards	IEC62619/UL1973 CE/UN38.3
Features	Pre-Charge + Fuse LV + Fuse HV + Auto Contactor + Dual BMS + Multi BMS FW management
	Applicable for High Voltage systems, Four protection levels for HV Box, Real time balancing, Adaptive charge/discharge CAN logic, Three step adaptive charging logic, 2xDI/DO programmable ports, Mobile app for monitoring, control, debugging, firmware update and historical information.

\*Module net usable energy is managed by the BMS control logic to 280Ah

\*\* See Warranty Terms and the Standard Test Conditions "STC" and the operative temperature

# INGECON SUN STORAGE Battery



## INGECON® SUN STORAGE BATTERY 280 HV RACK\*

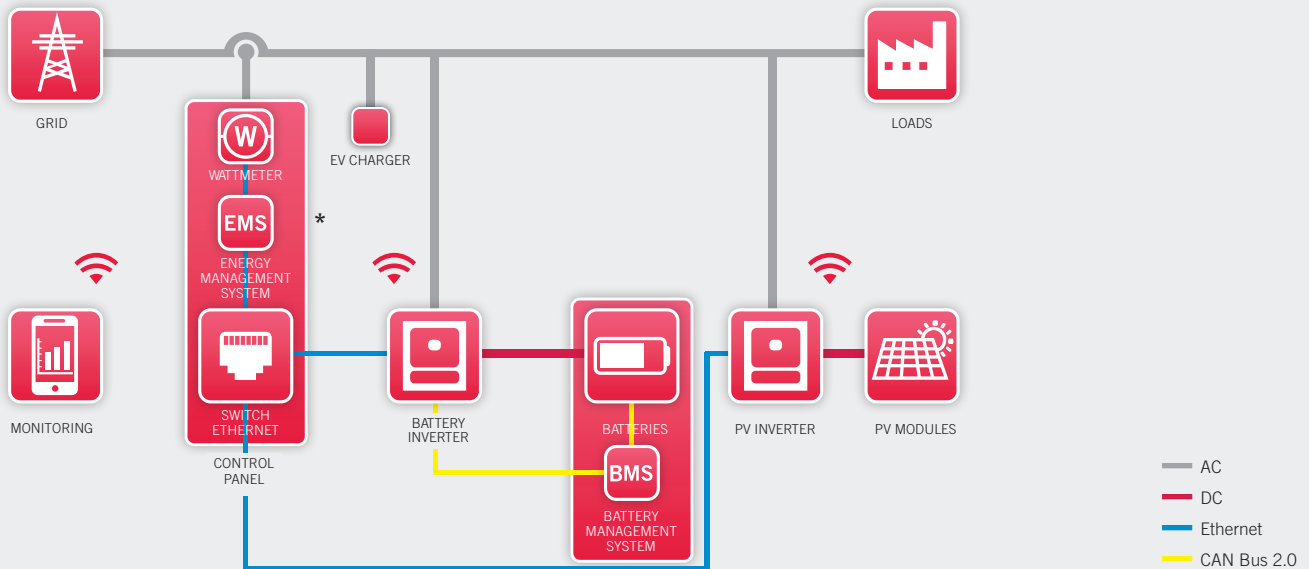
Battery Module	13	14
Battery System Capacity	185,9 kWh	200,2 kWh
Min Voltage (SOC 0%)	617,5V	665V
Recommended Voltage	min 650V max 754V	700V max 812Vm
Dimensions (W*D*H)	approx 1140x1380x2300 mm	
Weight	approx. 2.180 kg	approx. 2.290 kg
Depth of Discharge	100%	
Charge/Discharge	140A / 280 A peak	
Consumption	Max idle consumption 65 W / Max heat pump consumption 2500 W - 230 Vac 1ph	
Communication	RS485, CAN, 232, Wifi	
Protection Class	IP54	
Operative ambient Temperature (Discharge/Charge)	-15°C +60°C	
Storage Temperature**	0°C + 40°C self discharge 1%/month; -15°C +55°C self discharge 2%/month	
Humidity	5% ~ 95%	
Altitude	< 3000 m	
Design life	10 ↑ Years (25°C)	
Expected Life Cycles @ STC	≥ 8000 ↑ (0.5C, 90%DOD, 70%SOH, 25°C)	
Standards	IEC62619/CE/UN38.3	

\*Module net usable energy is managed by the BMS control logic set to 280Ah

\*\* See Warranty Terms and the Standard Test Conditions "STC" and the operative temperature

SET-UP OPTIONS

**Option 1:** 1 inverter storage with 1 battery rack of 13 or 14 modules in total



\* EMS provided only for Ingeteam Inverters (PV and Storage)

**Scope of supply**

- ISS 100TL
- ISS Battery 110 HV + BMS
- PV Inverters (any Ingeteam model)
- INGECON® SUN MONITORING

**Description:**

The system developed by Ingeteam for the industrial and commercial market comprises, in addition to the INGECON® SUN 3 PLAY inverters for photovoltaic applications, the INGECON® SUN STORAGE 3 Play, a three-phase inverter specifically designed for storage, characterised by a high power density (100 kW of power in just 80 kg).

Operating costs are reduced thanks to the wireless communication network that enables commissioning and monitoring of batteries without the need for a cable network, but with an alternative wired Ethernet connection.

Commissioning is fast and reliable, thanks to the app from which all important information can be viewed, allowing any errors to be quickly identified, and also allowing considerable savings in routine and extraordinary maintenance.

Its robust and durable design, with an aluminium casing, is also designed for outdoor installation (IP65).

The second component of this system is the INGECON® SUN STORAGE BATTERY 110 HV, which can be installed on walls, floors and stacked.

Configuration is simple and expandable, and wireless monitoring allows for real-time intervention and maintenance.

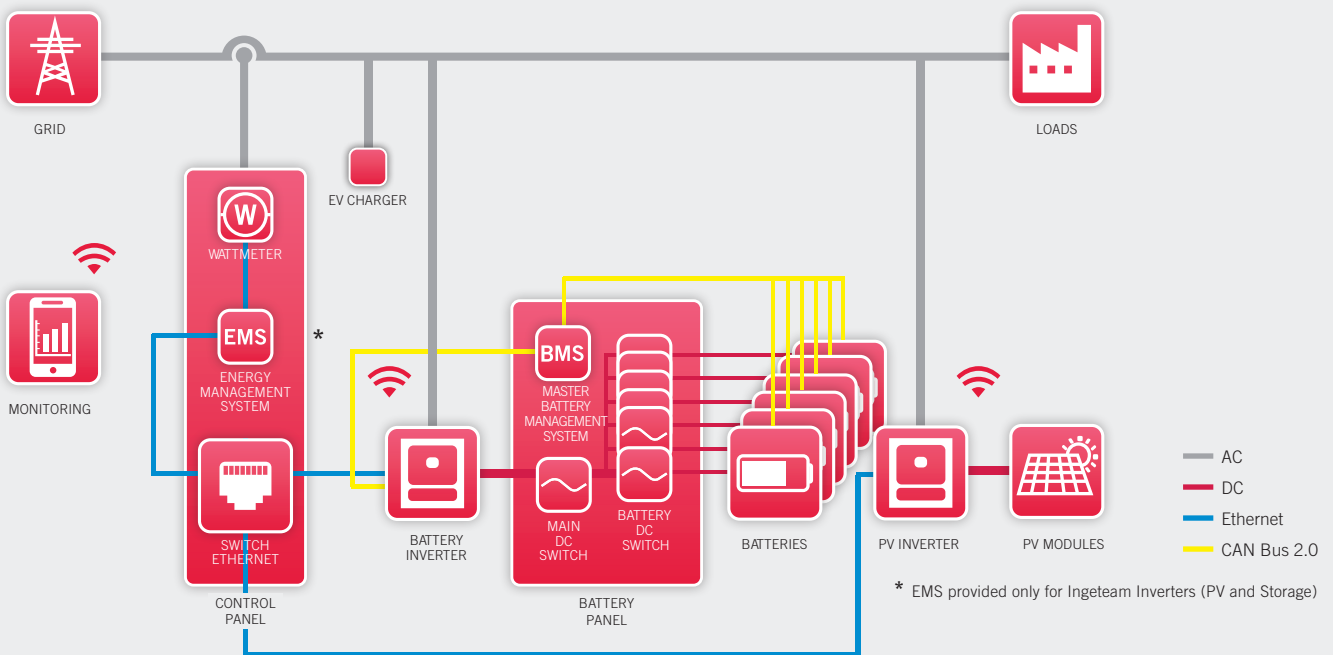
The batteries consist of lithium cells for maximum durability and safety.

The battery pack includes the BMS that communicates with the inverter via the CAN Bus protocol and consists of 13 to 14 modules divided into 1 rack that allows up to 72.8 kWh of energy.

Each battery module is constructed of metal law-ro to reduce weight impact and the layout provides modularity, i.e. the battery bank is stackable, which makes it easy and quick to increase capacity later. The batteries are designed for more than 7,000 cycles, ensuring an optimal return on investment.

## SET-UP OPTIONS

### Option 2: 1 inverter storage plus battery racks of 13 or 14 modules



#### Scope of supply

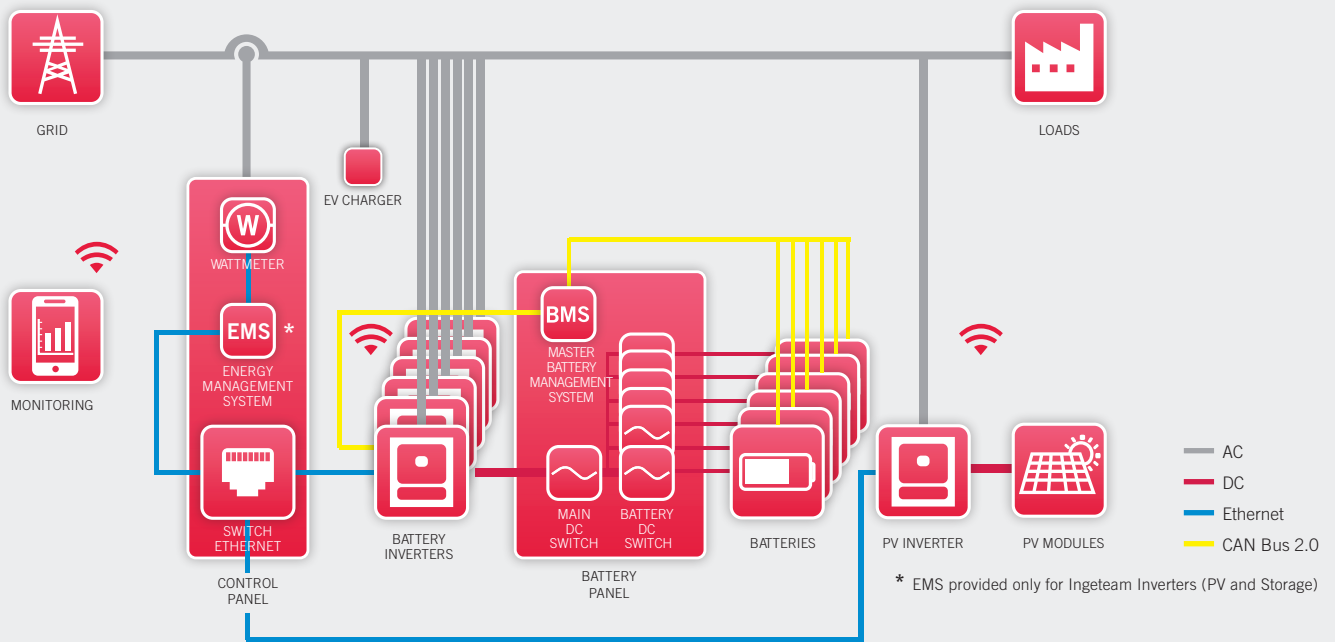
- ISS 100 TL
- ISS Battery 110 HV
- PV Inverters (any Ingeteam model)
- Battery Panel + BMS
- INGECON® SUN MONITORING

#### Description:

Compared to option 1, this configuration provides use of multiple battery racks (up to 6) coupled to the same inverter, reaching a maximum capacity of 436,8 kWh. A battery parallel panel is also provided to manage the connection/disconnection of the batteries through dedicated switches.



**Option 3:** several inverters storage each combined with their own 13 or 14 module battery racks



**Scope of supply**

- ISS 100TL
- ISS Battery 110 HV
- PV Inverters (any Ingeteam model)
- Battery Panel + BMS
- INGECON® SUN MONITORING (app)

**Description:**

Compared to the previous option, this configuration allows the management of several storage inverters and consequently the battery groups associated with them. In addition to the battery parallel panel to manage the connection/disconnection of the batteries, a EMS is used to supervise the control and monitoring of the entire system.

## INGECON SUN Ems Control Panel

Includes wattmeter and switch ethernet.

The control panel designed by Ingeteam includes, in addition to a sophisticated EMS, a wattmeter with a high accuracy class and an Ethernet switch that allows a secure and reliable connection with all the elements of the network.

Provided only for Ingeteam Inverters (PV and Storage).



## EMS for 100TL Inverters

The most efficient energy management solution for selfconsumption systems with 100TL INVERTERS.

This energy management system developed by Ingeteam is directed at optimizing energy consumption in commercial and industrial PV systems equipped with 100TL solar inverters. The EMS is designed to increase the amount of energy generated from renewable sources, to match on-site consumption requirements.

### The smart energy manager

The INGECON® SUN EMS Control Panel uses readings from a wattmeter at the point of connection to manage the system energy flows, by sending operating set-points to the various inverters.

### Advanced connectivity

The energy manager can be connected to the devices and equipment forming part of the system either through its Ethernet or WiFi interface (built-in as standard) and can be monitored with the INGECON® SUN EMS Control Panel Tools software. This software is also used to configure the control strategy. Additionally, this device features an RS-485 port for communication with the external wattmeter.

### Maximum control of the energy consumed

The system energy manager constantly controls the amount of energy exchanged with the public grid.

This information is transferred in real time from the wattmeter and is available for viewing through the INGECON® SUN EMS Control Panel Tools software.

### Designed to operate in a whole range of systems

Many different types of systems can be controlled by an INGECON® SUN EMS Control Panel:

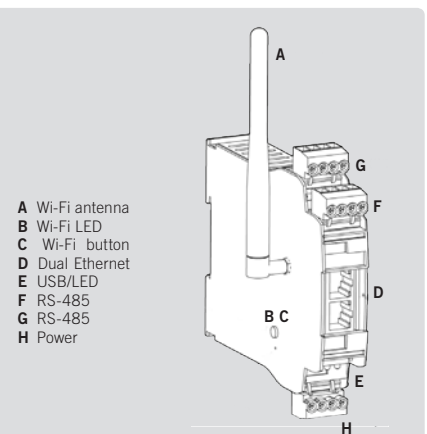
- Self-consumption with PV generation.
- PV-diesel hybrid systems.
- Public grid-PV-diesel hybrid systems.
- Monitoring.

### Standard 3 year warranty



	EMS
<b>Power supply</b> <sup>(1)</sup>	Power
consumption	15 W
Voltage supply	7 - 42 Vdc
<b>Connectivity</b>	
Wi-Fi	✓
Ethernet	2
RS-485	2
USB for firmware updates	✓
Advanced EMS strategies	✓
Compatible with IS Manager	✓
Compatible with IS EMS Tools	✓
<b>Communication interface with other equipment</b>	
Ingeteam inverters	Ethernet, Wi-Fi
Monitoring systems	Ethernet, Wi-Fi, 3G <sup>(2)</sup>
Wattmeter	RS-485

**Notes:** <sup>(1)</sup> Not supplied by Ingeteam <sup>(2)</sup> An external 3G modem can be connected using the Ethernet or Wi-Fi connection on the IS EMS device.



- A Wi-Fi antenna
- B Wi-Fi LED
- C Wi-Fi button
- D Dual Ethernet
- E USB/LED
- F RS-485
- G RS-485
- H Power

**INGECON SUN PPC Control Panel**

Includes wattmeter and switch ethernet.

The control panel designed by Ingeteam includes, in addition to a sophisticated PPC (Power Plant Controller), a wattmeter with a high accuracy class and an Ethernet switch that allows a secure and reliable connection with all the elements of the network.  
 Provided only for Ingeteam Inverters (PV and Storage).



**BESS Control System**

An advanced algorithm combined with a fast and efficient communications system.

The INGECON® SUN PPC Control Panel helps the grid operator to manage the BESS performance and to guarantee the quality and stability of the electricity supply.

**Maximum BESS control**

An advanced algorithm combined with a fast and efficient communications system, with response times of less than one second, allows for a precise control of the active and reactive power delivered by the plant to the grid.

The INGECON® SUN PPC Control Panel controls the BESS inverters, ensuring compliance with the grid operator's re-

quirements at the BESS connection point. It is also possible to manage energy storage systems and other devices such as diesel generators, through the use of INGECON® SUN STORAGE Power inverters. This is a flexible system that can easily be adapted to the needs and configurations of each particular plant, whilst complying with the country-specific standards and regulations.

**Continuous communication with all the devices**

The Power Plant Controller dynamically receives the grid operator's setpoints. For this purpose, a number of communi-

cation protocols are incorporated such as Modbus TCP / RTU, DNP3, IEC 60870-5-101, IEC 60870-5104 and OPC UA. Likewise, it is also possible to add digital and analogue I/O modules in order to extend the communication capabilities with third-party devices.

Furthermore, the INGECON® SUN PPC Control Panel permits communication with the plant SCADA to transmit the connection point data. It is also possible a manual control for temporary maintenance or engineering operations.

**Parallel DC Battery Panel**

Includes Master BMS and switch disconnectors

When a storage capacity greater than that provided by a single rack of 13 or 14 modules is required, it is necessary to install the Parallel DC Battery Panel which includes the DC switches to parallel up to six battery racks with a single inverter and the Master BMS.





## Web portal and Smartphone application to monitor solar power plants and self-consumption systems

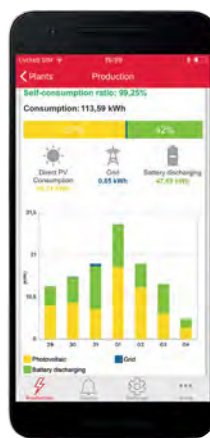
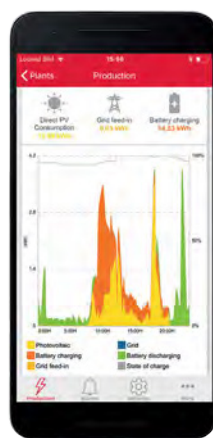
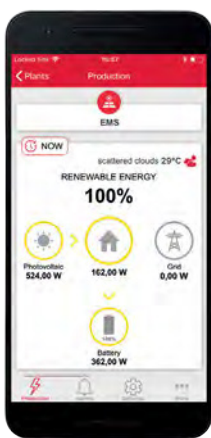
The INGECON® SUN Monitor application enables accessing all the data of any solar PV plant or self-consumption installation from a PC, a tablet or a Smartphone ([www.ingecsunmonitor.com](http://www.ingecsunmonitor.com)).

Its userfriendly configuration allows system owners, installers and developers to control the installation.

**Maximum control of the system status**  
With this software we can get real-time information about the solar system's status and production levels. This information is gathered and represented through graphics and lists, and it is also possible to generate an automated email report with production and alarms information. The data collection and storage is done during all the inverter's lifetime.

### Also available as Smartphone app

Thanks to the Smartphone app, every solar plant owner or self-consumption system user, with or without batteries, can access all the generation, consumption, and batteries charging/discharging data on a daily, weekly, monthly or yearly basis. Moreover, the application can also calculate the savings achieved on the electric bill.



INGEREV FUSION



## FUSION

The charging station for public and private installations.

The **FUSION** range is available in two models, **FUSION Street** for ground mounting and **FUSION Wall** for wall mounting.

This dual equipment range has been designed to cover all electric vehicle charging demands in public and private settings alike.

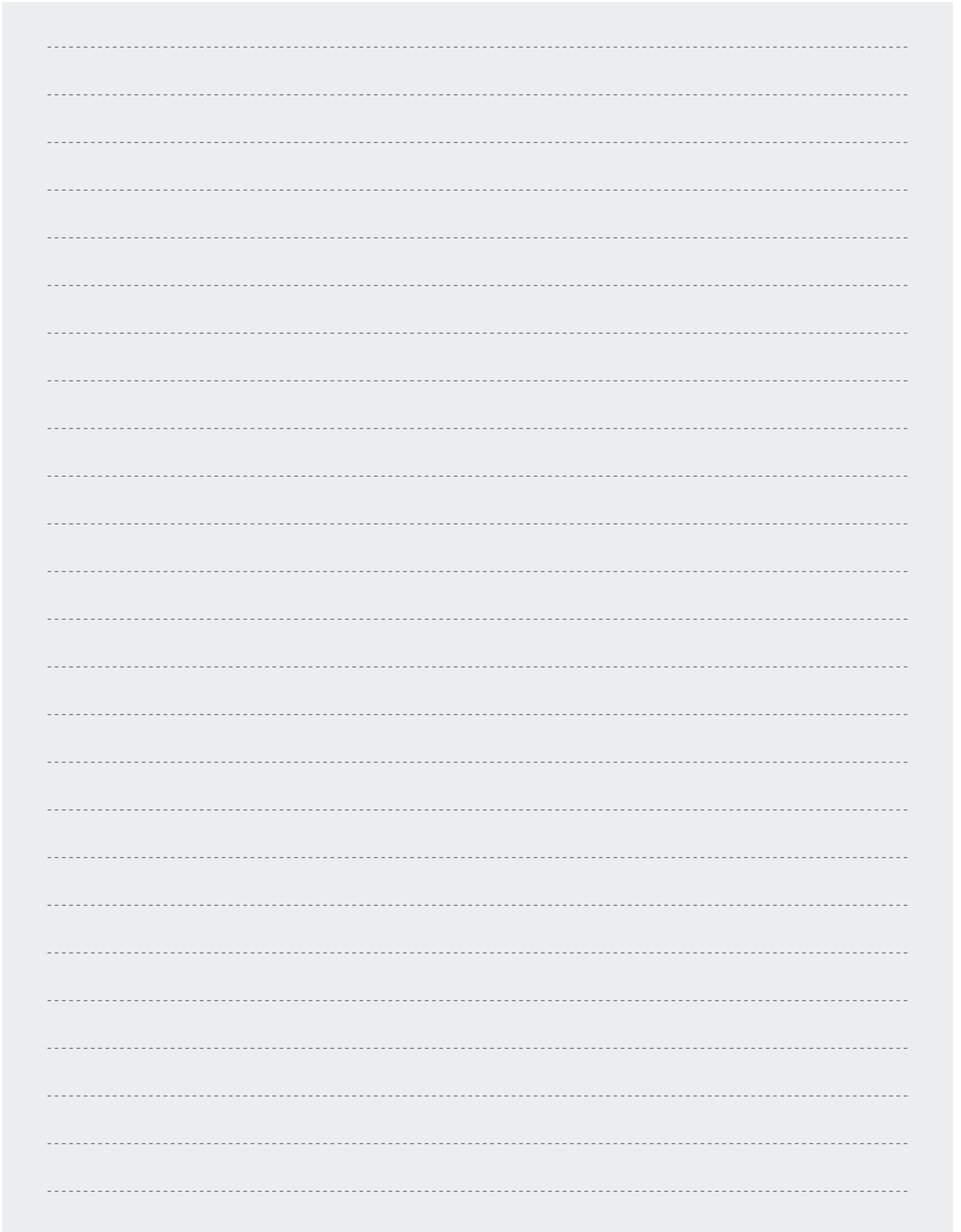
Its standard features include Ethernet and WIFI communications, as well as the latest generation advanced functions such as Dynamic Load Management 2.0 (DLM 2.0) and OCPP protocols.

### FEATURES

- Floor and wall mountable models, suitable for outdoor installation.
- Single phase and three phase models, with up to 32 amps per charging socket.
- Multiple charging sockets available, Mode 1 + 2 sockets, cables and Mode 3 sockets
- MID wattmeter.
- RGB LED status indicators.
- Multi-language colour screen.
- RFID reader.
- Ethernet and WIFI.
- DLM 2.0.
- Compatibility with OCPP.
- Updates through USB.
- Thermal-Magnetic Differential circuit breakers.
- Front door for ease of operation and maintenance.
- Ethernet switch to minimize the cost of Ethernet cabling.
- Warning message in the event of an outage.
- Possible customization with vinyl decals on all four faces<sup>(1)</sup>.
- General breaker for the rapid disconnection of the charger.
- Security lock with key.
- Door-opening sensor.
- Automatic software updates (OCPP, ISO15118,...) for the entire product life.

Notes: <sup>(1)</sup> Large surface for vinyl decals.

## NOTES

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