

ISMG Solar Inverter



- High PV input voltage range (suitable for voltage between 100 VDC to 450VDC) and efficient MPP Tracking
- Up to 2 / 3 independent MPP Tracking controlled by an exclusive Smart MPPT Technology
- Transformerless (equipped with electronic RCMU device for galvanic insulation)
- Integrated security and filtering system according to relevant EMC standards
- RS232/RS485 serial communication for local/remote control
- Integrated data display (2 x 16 LCD) and LEDs for monitoring of the operational status and signalling of failures
- Active anti-islanding protection for grid monitoring able to ensure high safety level for qualified installers and end users
- Integrated interface protection device for monitoring the grid according to the national standards
- High reliability, light weight, easy to install and start up, large cost saving
- IP 65 protection degree (can be installed outdoors or indoors)

General Description

The Carlo Gavazzi ISMG PV solar inverter series converts direct current from the solar cells into alternating current. This enables you to feed your self-produced solar energy into the public grid. The integrated security and monitoring system guarantees an high disturbance immunity according to relevant electromagnetic compatibility standards and enable the highest levels of efficiency.

The exclusive Smart MPPT technology allows to control up to 2/3 independent strings of PV panels and it ensures the increase of energy up to 20%, thanks to the fully functional PV string control software. The maximum capacity utilization of the solar energy plant is guaranteed even in case of a misty and clouded over sky. The high input voltage range of the solar inverter enables to use

PV modules from different manufacturers. Integrated data display ensures an immediate monitoring of the inverter operational status and failure messages. The internal temperature control protects the device against too high temperatures in the interior of the solar inverter. In case of high ambient temperatures, the external cooling fans switch them on. The solar

inverter is functional in grid parallel operation exclusively. The automatically-acting isolation point, guarantees secure disconnection in case of circuit isolation or interruptions in power supply and it avoids isolated operation.

Ordering Key

ISMG 1 45 EN PL3

Model _____
 Grid connection _____
 Max. DC power _____
 Country _____
 Nil = Standard _____

Type Selection

Grid connection Single Phase	1
Rated Output Power 2.99kW 3.8kW 4.4kW 5.1kW	45 PL3 45 50 60
Country EN ES IT DE FR UK GR	Europe Spain Italy Germany France Great Britain Greece

Approvals



RD 1663/2000¹
RD 661/2007

DK5940²
Ed. 2.2 April 2007

VDE0126-1-1³

Notes: ⁽¹⁾ Spanish Recommendation
⁽²⁾ Italian Recommendation
⁽³⁾ this Recommendation is currently adopted by: Germany, Austria, Belgium, France, Greece, Holland, UK (with G83 in addition), Czech Republic, Poland, Portugal

Photovoltaic DC Input Data

Model	ISMG 1 45 PL3	ISMG 1 45	ISMG 1 50	ISMG 1 60
Nominal DC power	3.15kW	3.48kW	4.0kW	4.85kW
Max. DC power	3.6kW	4.0kW	4.64kW	5.38kW
Nominal voltage	450V			
Max. DC voltage	500V			
Min. DC voltage (P _{nom})	150V			
MPP voltage range	100...450V			
Full MPP range	300...400V			
Max. DC current per each string	10A			
DC current range per each string	0...10A			
Number of MPP trackers	1~2		1~3	
Max. No. of parallel strings for MPP	2		3	
Overvoltage protection	Yes			
Ground fault monitoring	Yes			
Polarity safeguard	Short circuit diode			
Surge absorption	MOV varistor			

AC Output Data

Model	ISMG 1 45 PL3	ISMG 1 45	ISMG 1 50	ISMG 1 60
Rated Output AC power	2.99kW	3.8kW	4.4kW	5.1kW (4.6kW)*
Max. AC power	2.99kW	3.8kW	4.4kW	5.1kW (5.0kW)*
Power factor	> 0.99			
Distortion factor (THD)	< 3%			
Grid connection	Single phase; True sine-wave			
AC voltage range	ES: 196...253V (VAC _{nom} : 230V) - IT: 184...276V (VAC _{nom} : 230V) - FR, EN, DE: 184...264V (VAC _{nom} : 230V)			
AC nominal current	13A	14.34A	16.52A	20A
Max. AC current	13A	16.52A	19.13A	22A
Frequency range	ES: 49...51Hz (f _{nom} : 50Hz) - IT: 49.7...50.3Hz (f _{nom} : 50Hz) - FR, EN, DE: 47.5...50.2Hz (f _{nom} : 50Hz)			
Safety class	I			
All Pole sensitive RCMU	Yes			

* Only for DE version according to VDEW

General Features

Model	ISMG 1 45 PL3	ISMG 1 45	ISMG 1 50	ISMG 1 60
Max. efficiency	96.3% @ 350VDC		96.3% @ 350VDC	96.2% @ 350VDC
EU efficiency	95.1% @ 350VDC		95.1% @ 350VDC	95.4% @ 350VDC
Stand-by consumption	< 10W			
Night consumption	0.5W			
Protection device	Grid monitoring system			
Anti-islanding monitoring	Yes			
Grid monitoring	Integrated interface protection (ES: according to RD 1663/2000; RD 661/2007) (IT: according to DK5940 Ed. 2.2 April 2007) (FR, EN, DE: according to VDE0126-1-1)			

Environmental Data

Model	ISMG 1 45 PL3	ISMG 1 45	ISMG 1 50	ISMG 1 60
Operating temperature @ 350VDC	-10°C...+60°C / 14°F...140°F without derating; Shut-down at 75°C/167°F		-10°C...+55°C / 14°F...131°F without derating; Shut-down at 75°C/167°F	
Max. acceptable temperature @ P _{nom}	+55°C / 131°F			
Storage temperature	-25°C...+80°C / -13°F...176°F			
Humidity	0...95% (without condensation)			
Temperature control	Automatic temperature control by software			
Cooling	Forced ventilation (2 x IP54 external fans)			
Protection degree	IP 65 (according to DIN EN60529)			
Installation location	Outdoor / Indoor			
Noise level	< 40dB			

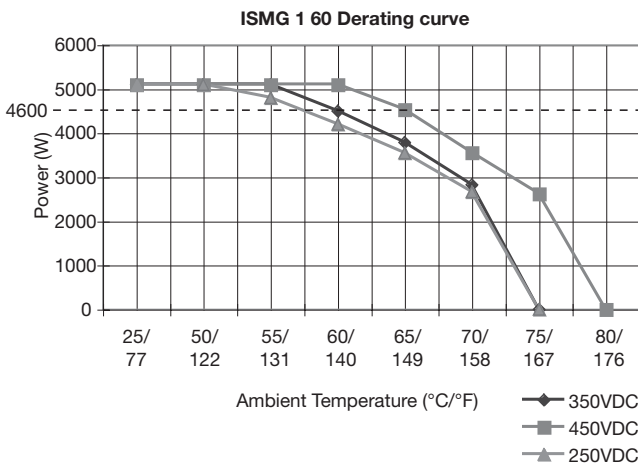
Mechanical Data

Model	ISMG 1 45 PL3	ISMG 1 45	ISMG 1 50	ISMG 1 60
User interface	2 x 16 LCD Data display and 3 monitoring LEDs			
AC connectors	1 x Wieland			
DC connectors	2 x 2 Multicontact (MC4 series)			3 x 2 Multicontact (MC4 series)
Serial interface connectors	2 x RJ45			
Housing material	Powder coated aluminium			
Weight	22.5kg/49.60lb			23.0kg/50.70lb

Standard Norms and Certifications

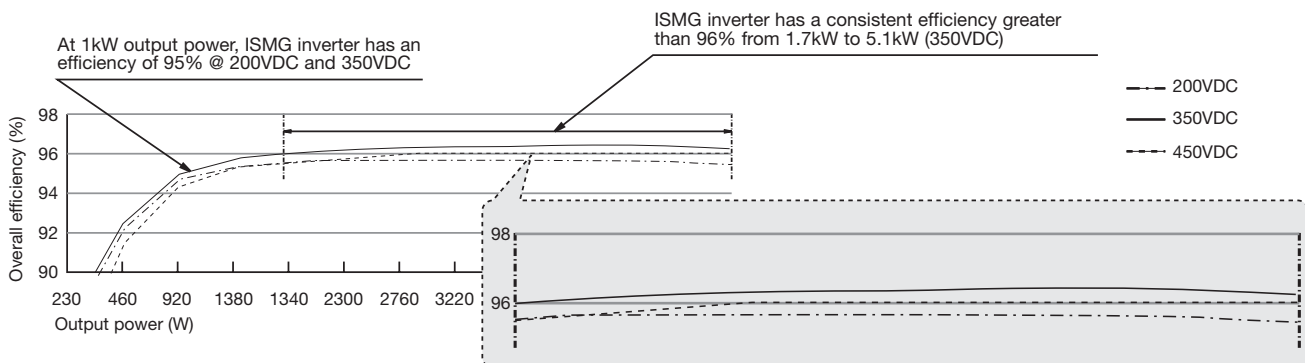
Model	ISMG 1 45 PL3	ISMG 1 45	ISMG 1 50	ISMG 1 60
Safety Standard	EN50178			
EMC capability	EN61000-3-2, EN61000-3-3 EN61000-3-11, EN61000-3-12 EN61000-6-2, EN61000-6-3			
Grid monitoring	ES: according to RD 1663/2000; RD 661/2007 IT: according to DK5940 Ed. 2.2 April 2007 FR, EN, DE: according to VDE0126-1-1			

Temperature range



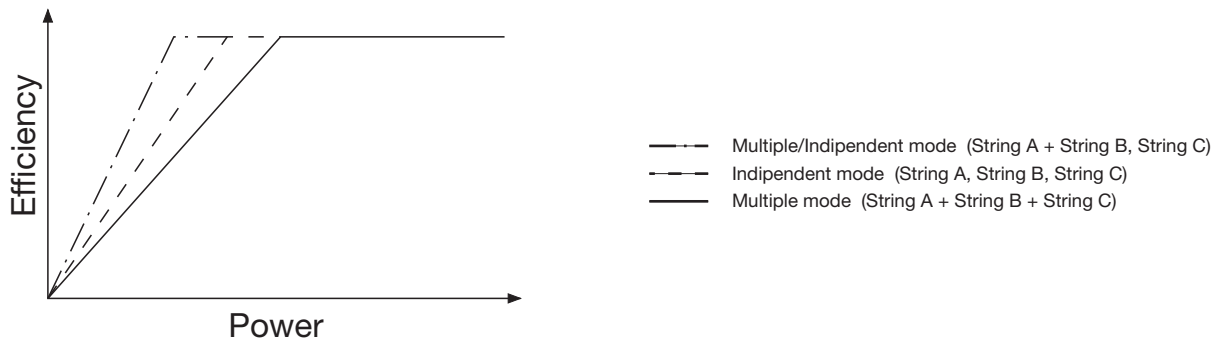
Cooling FAN control	
Command	Heat-sink temperature (°C/°F)
FAN start	50/122
FAN stop	45/113
Derating temperature	72/161.6
Inverter shut-down temperature	80/176

Efficiency



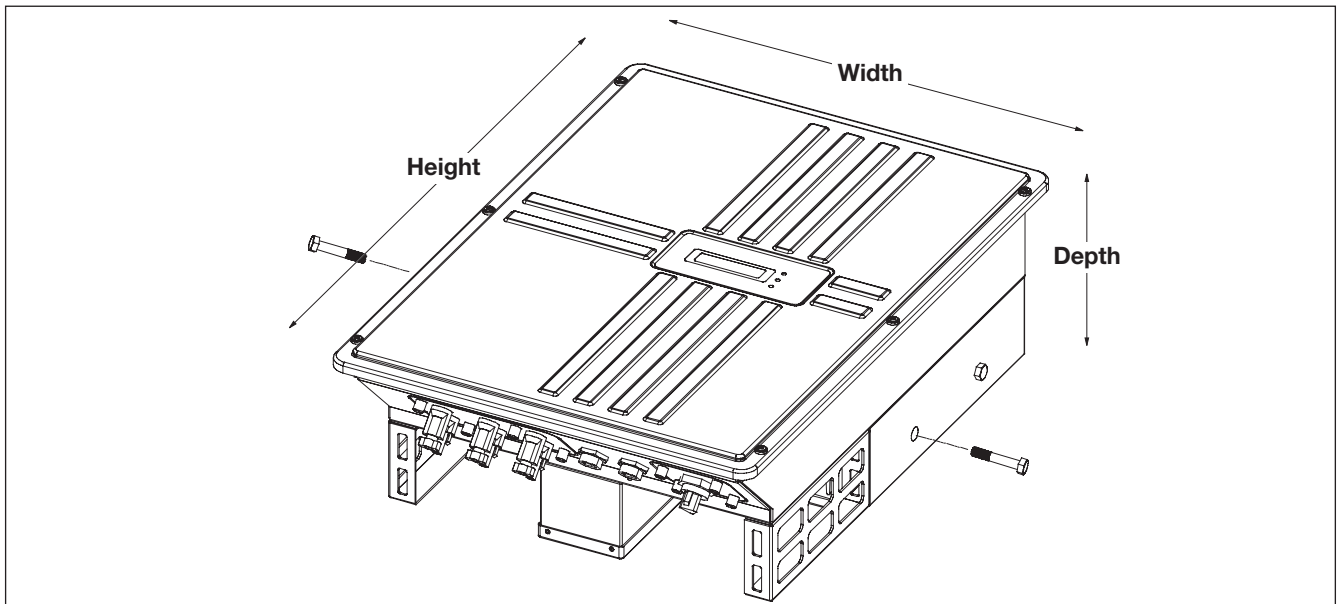
Model	ISMG 1 45 PL3	ISMG 1 45	ISMG 1 50	ISMG 1 60
Efficiency 5% P_{nom}	84.42%	84.42%	85.70%	87.65%
Efficiency 10% P_{nom}	91.19%	91.19%	90.94%	92.04%
Efficiency 20% P_{nom}	94.27%	94.27%	94.43%	94.86%
Efficiency 30% P_{nom}	95.37%	95.37%	95.36%	95.62%
Efficiency 50% P_{nom}	96.04%	96.04%	95.58%	96.11%
Efficiency 100% P_{nom}	96.28%	96.28%	96.07%	96.10%

Multiple/Single Panel String mode

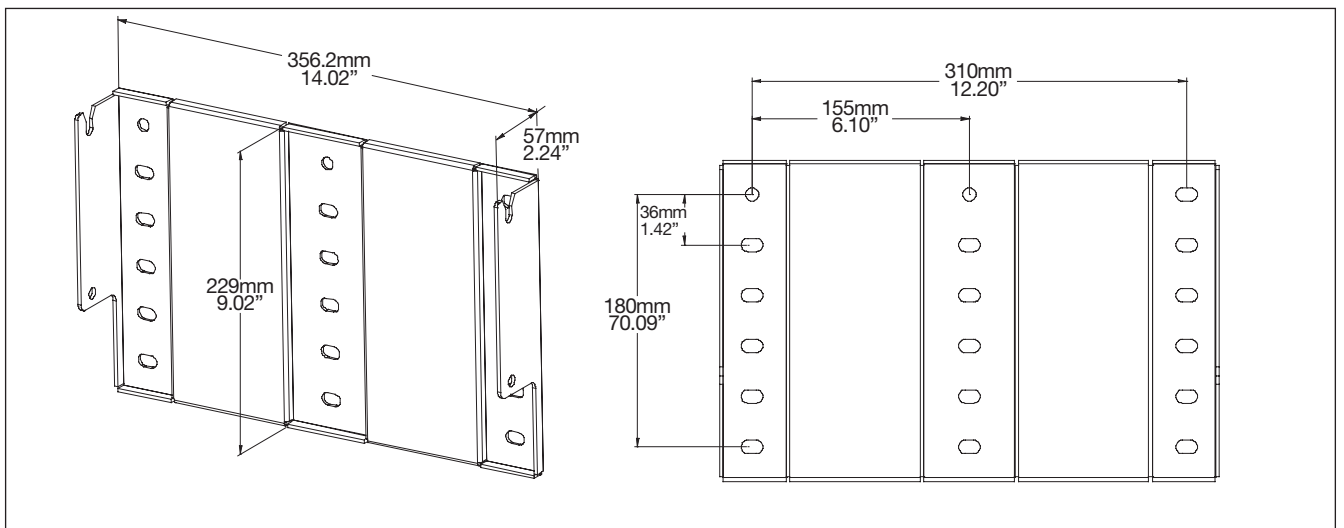


Dimensions

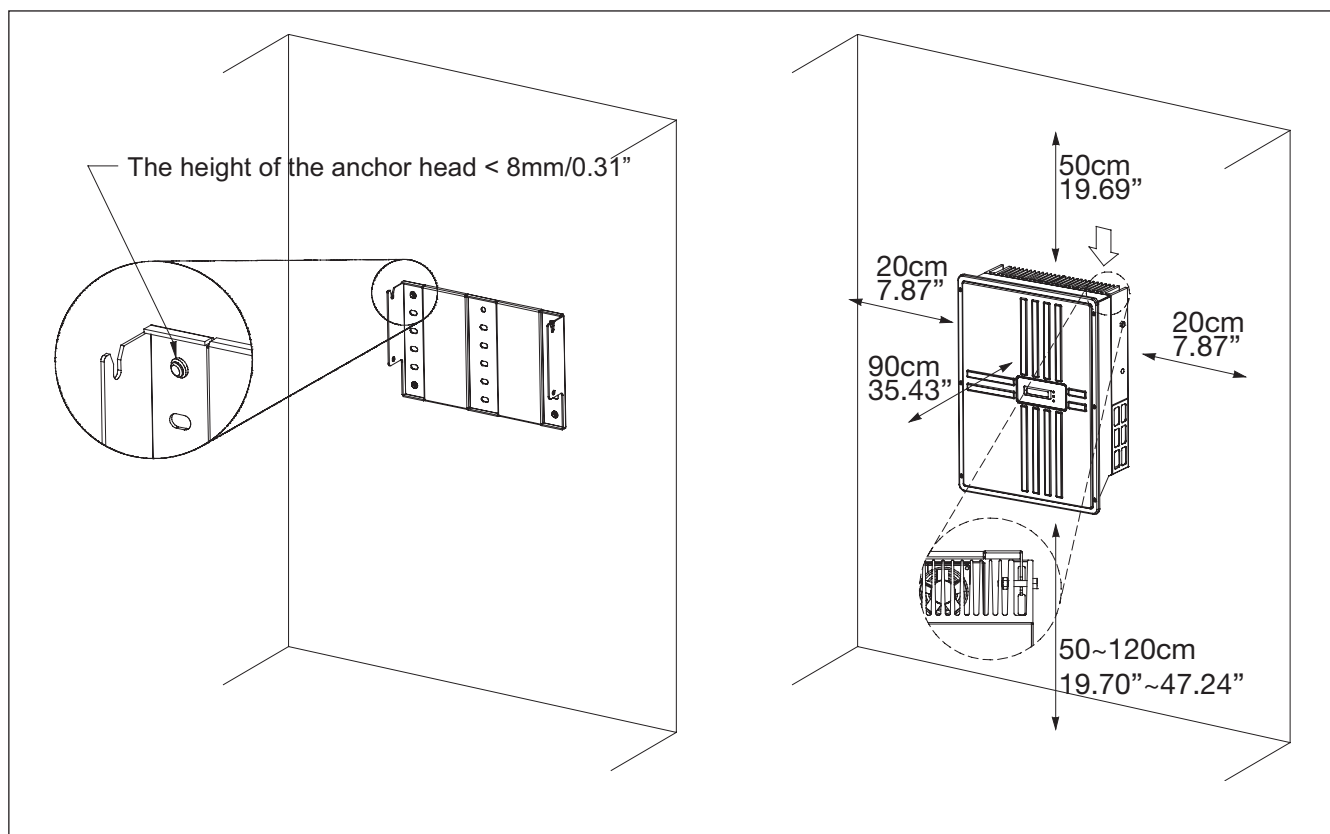
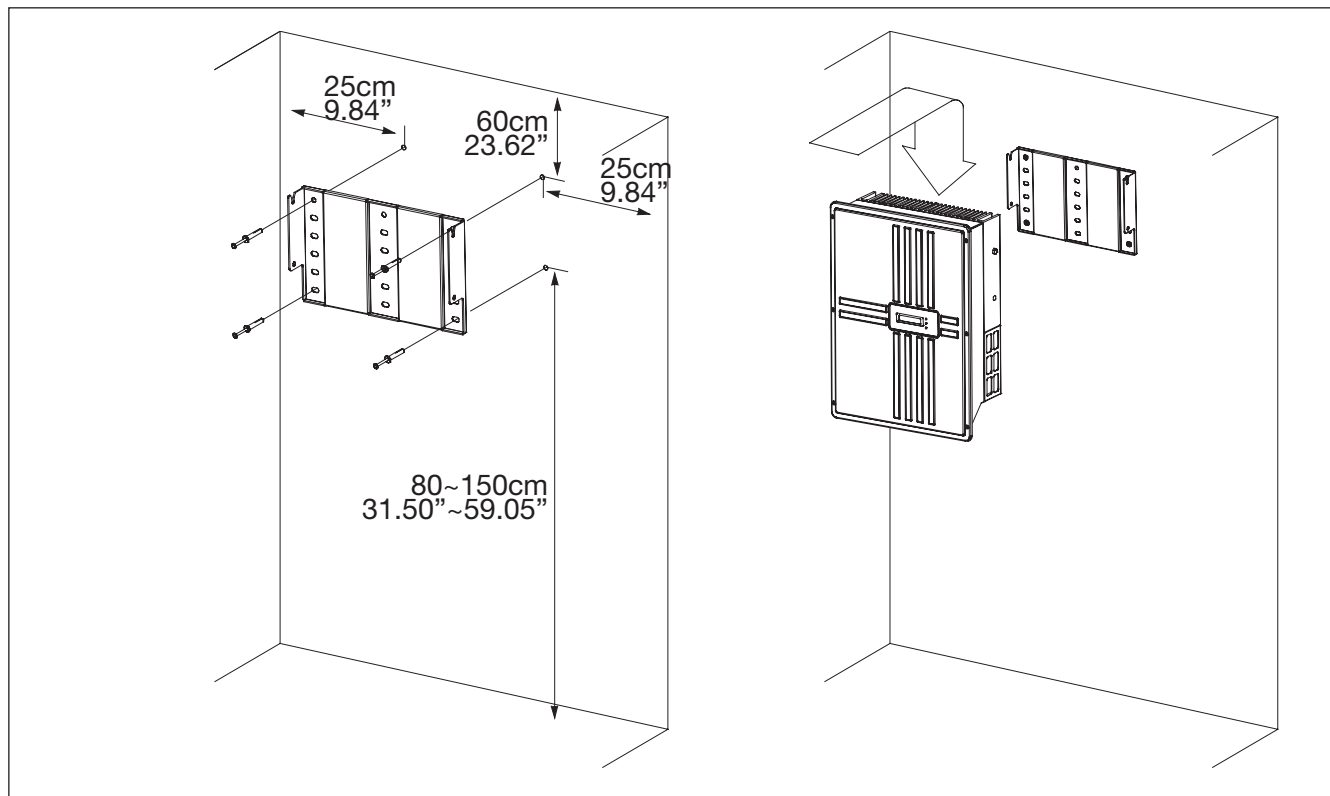
Model	ISMG 1 45 PL3	ISMG 1 45	ISMG 1 50	ISMG 1 60
H x W x D mm	580 x 422 x 182 (+6.5 mounting support)			
inches	22.83" x 16.61" x 7.17" (+0.26" mounting support)			



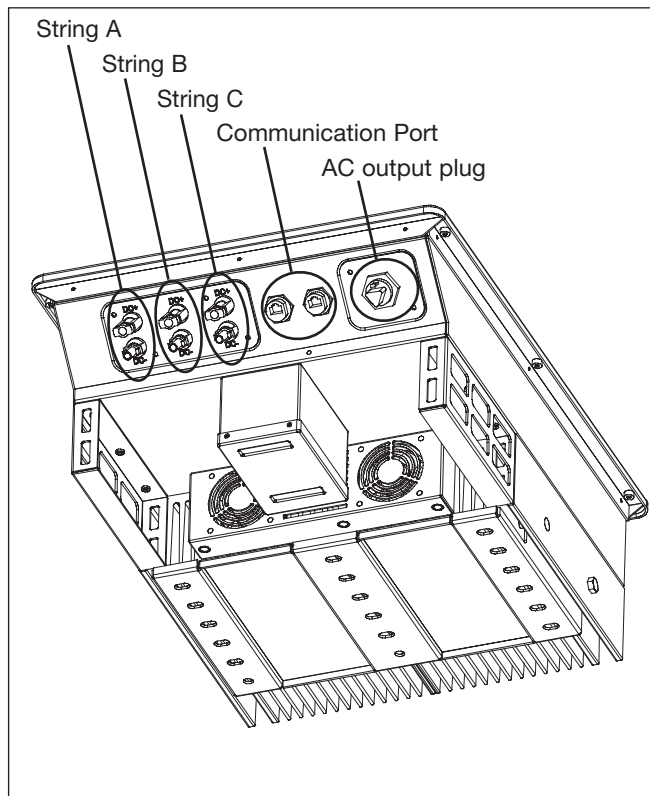
Mounting Plate



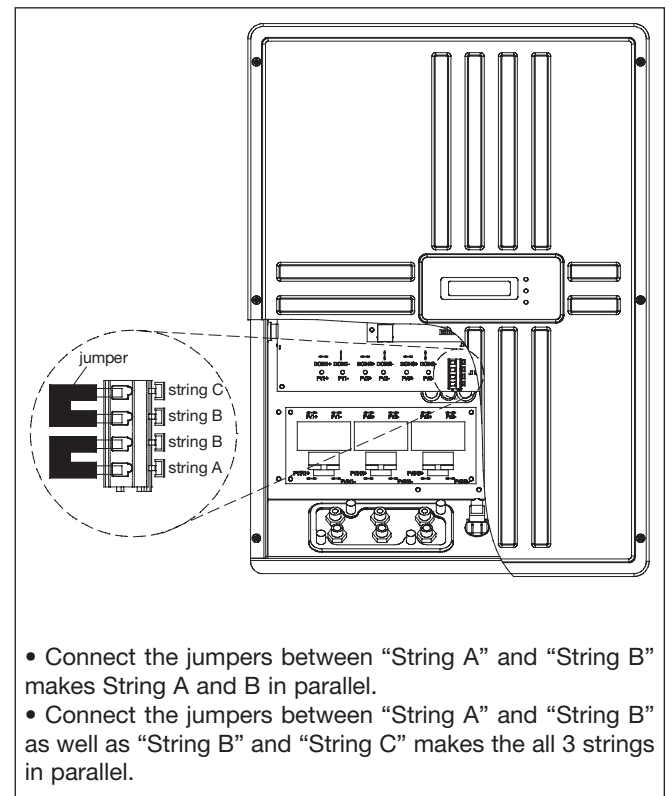
Drilling Plan (mm/inches)



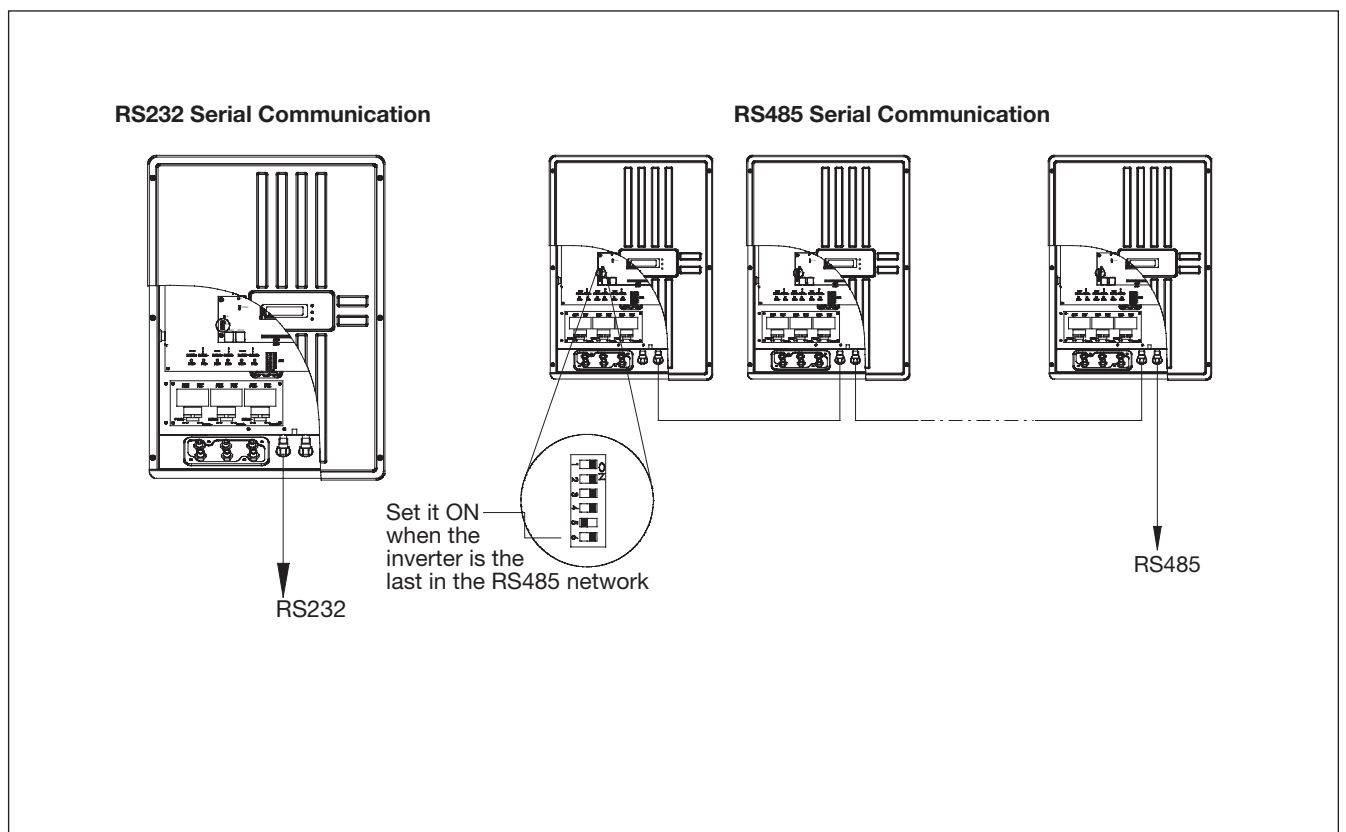
Connectors



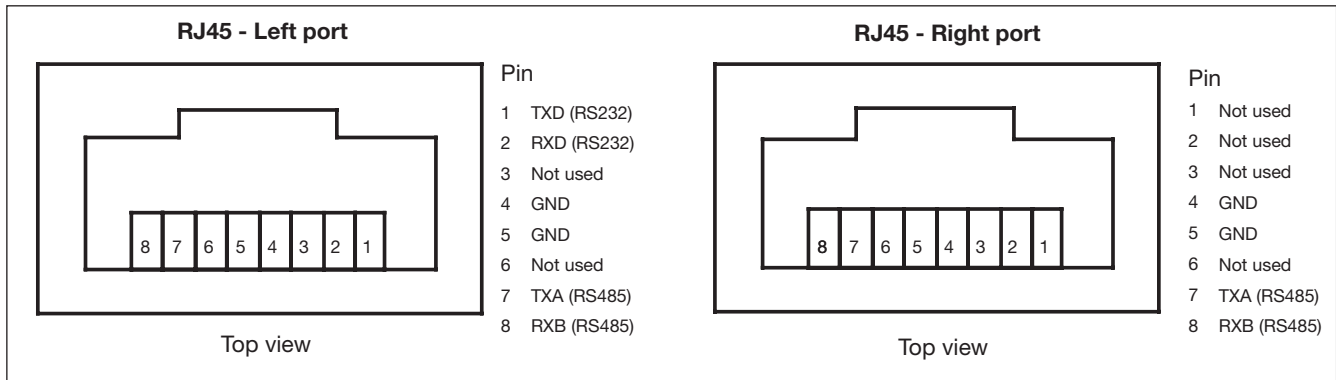
Smart MPPTs Configuration



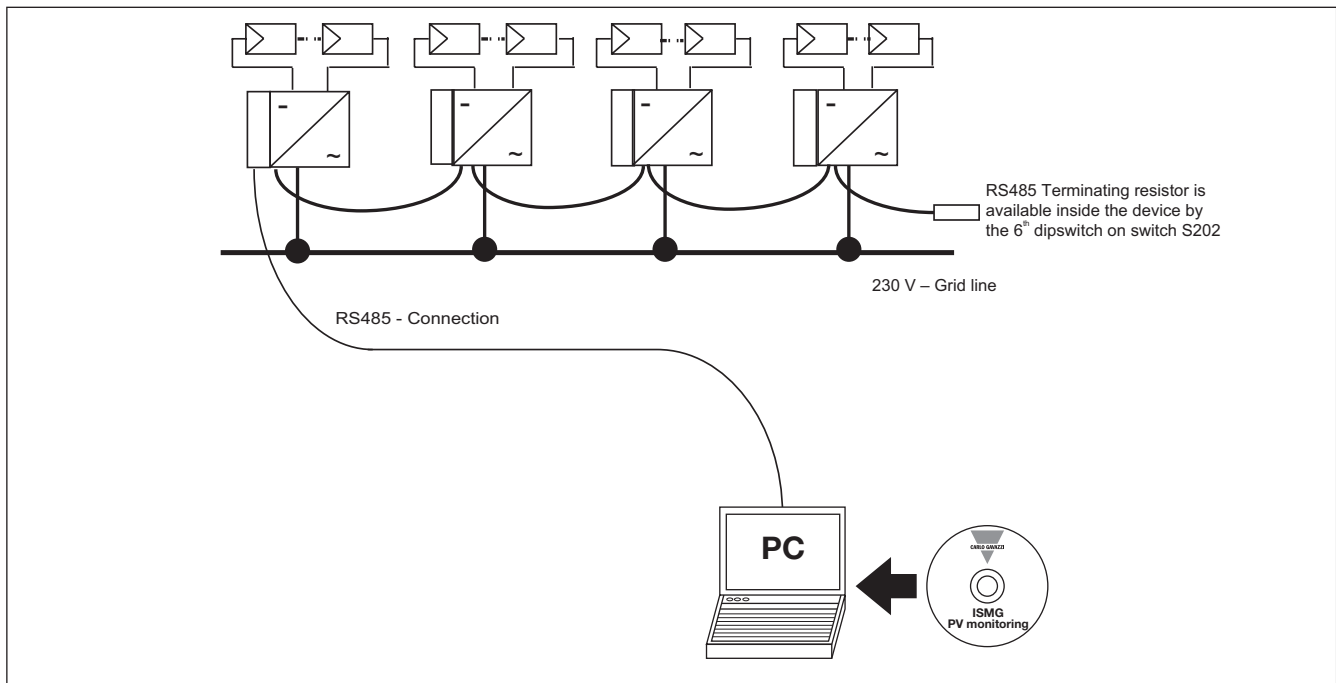
Serial Communication RS232 / RS485



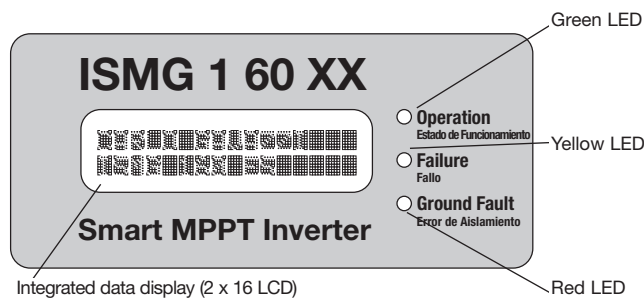
Serial Communication Pin View



Serial Communication Flow-chart



Display and LEDs



Inverter Software Tools

Monitoring system software	ISMG PV monitoring
PV panel configurator	Carlo Gavazzi PV Generator Design
Auto-test software	ISMG Smart MPPT Inverter Auto Test (available only for Italian Market, according to DK5940 Ed. 2.2 April 2007)