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Note: As a result of the company's commitment to an ongoing product improvement program, Ingeteam S.A. reserves the right to amend this document without prior notice.

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Related documentation



1. INTRODUCTION

This document refers to the PC program: Ingecon®Sun Planner

The Ingecon® Sun Planner software has been conceived to serve as a design guide for those users responsible for sizing grid-connected PV systems incorporating Ingecon® Sun inverters.

1.1 Hardware and Software requirements

To use Ingecon® Sun the following are required:

- PC with the Windows® XP operating system.
- Adobe Acrobat 7.0 or higher.

1.2 Usage regulations

<u>Copyright</u>

The Ingecon[®] Sun Planner software is the property of Ingeteam, S.A.



Ingeteam is not liable for any direct or indirect damage caused by the use of this program.

2. INSTALLATION.

The software shall be installed via the Internet. The installation process is as follows:

- 1. Download the software from the Ingeteam website (<u>www.ingeteam.es</u> or <u>www.ingeteam.com</u>).
- 2. Execute file Setup.exe and commence installation.
- 3. Follow the installation instructions given.



3. ICONS AND LANGUAGES.

ICONS

The following icons appear in the Ingecon® Sun Planner main menu:



(New) To create a new project.



(Open) To open an earlier project that has already been saved.



(Save) To save the current project on the selected path.



(Reports) To generate a report in pdf format.

Click on "informe" (report) to open a text box to save the data to the selected path.



Click on this icon for a drop down user help menu.

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	About Ingecon® Sun Planner			
 Ingecon Sun Planner	Manuals	•		
User Manual Ingecon Sun Single Phase				
Installation Manual Ingecon Sun Single Phase				
User Manual Ingecon Sun Three Phase IP20				
Installation Manual Ingecon Sun Three Phase IP20	1			
User Manual Ingecon Sun Three Phase IP54				
Installation Manual Ingecon Sun Three Phase IP54				
Ingecon Sun Manager				
Communication options				

LANGUAGES

Click on the appropriate flag to select the desired language for the Ingecon® Sun Planner. The following languages are available:

• Spanish, English, German, Italian and French.

4. PV SYSTEM DESIGN WITH THE INGECON® SUN PLANNER

The aim of the Ingecon® Sun Planner is to automatically provide the PV configuration that is best suited to the Ingecon ® Sun inverter selected, based on the operating conditions indicated in the following table.

Extreme operating temperatures	Irradiance
Cell temperature from -10°C to +70°C	1000 W/m2

Although the software proposes a PV system configuration, the user also has the possibility of manually creating an alternative solution, and can modify the extreme operating temperatures and decide whether the system voltage and current values are adequate. However, it is only possible to analyse the performance of module configurations for irradiance levels of 1000 W/m2.



When designing the PV system, the user should also take into account any specific characteristics of the PV system in question given the fact that the system automatically sized by the Ingecon® Sun Planner does not do so. Such characteristics include: voltage drops along the wiring, shadows, system cooling, length, latitude and PV array tilt angle.

5. PROJECT PROCESS.

5.1. Project

The "Proyecto" or Project tab offers the possibility of customising the gridconnected PV system design for each customer and project. However, for the PV system sizing, completion of the fields under this tab is optional; it is therefore possible to go directly to the "Instalación" or system tab, if desired.

	CUSTOMER L	
	Company / Customer	And the second s
	Contact person	
	Address	
	Post Code	A COL COMMA TO A COL
	City Country/Region	
	E-mail	/ #### COCCOS 107 (1914)
	Telephone Fax	
L L	PROJECT	
	Project title	
	Address	and the second s
	Post Code	A COLOR MARKEN PROVIDENCE AND
	City Country/Region	
		CONTRACTOR OF CONTRACTOR
	PV plant size	The second s
C	solaimer. Ingeteam Energy S.A. is not responsable for any direct and indirect damane resulting from the use of	this program

The user is completely free to solely fill in those fields desired or considered advisable. There are no mandatory fields to be completed.

5.2. System.

It is possible to distinguish three different areas within the "Instalación" or system tab:

- Solar module.
- Inverter
- Configuration values.

ject Installation	Report												
OLAR MODULE	3.				INVERTER								
Manufacturer	Model		New	Clear	Single-phase In	gecon Sun	· Ingeco	n Sun 5 Tl	. IP65 💌				
JP Solar	T 18P 3160 S		Edit	Delete					Clear				
Electronic Mecha	anic		Lak			DC	AC Me	chanic					
Туре	poly					Volta	de rande DC		150 - 4	50	V		
Nominal Power	160	W				Maxir	num voltage DC		550		V.		
Voltage V _{MPP}	35,1	V			1000	Maxir	num Current DC		33		A		
Current I _{MPP}	4,55	A			-	_							
Temp. Coefficient F	Pow. 0,50	%/ºC				lf yo	ur solar field is n	ot floating	due to the phot	ovolta	ic array ne	gative or positi	ive pole
Lown Coofficient)	/oc 0,46	%/ºC				bein	ig grounded, coi	ntact ingete	eam Energy 5.4	A. 10 VA	alidate you	ir configuration	
Temp. Coencient V		1 X / 100 1											
Temp. Coefficient I	sc 0,07	%/=L	_										
Temp. Coefficient I Max. System Voltag	sc 0,07 ge 1000	V											
Temp. Coefficient I Max. System Voltag Voc	sc 0,07 ge 1000 44,2												
Temp. Coefficient I Max. System Voltag Voc Ilsc	sc 0.07 ge 1000 44,2 4,8												
Temp, Coefficient I Temp, Coefficient I Max, System Voltag Voc Isc	aLUES	A A			5.70		Nº Total	20					
Temp, Coefficient I Max System Voltag Vac Isc	sc 0,07 ge 1000 44,2 4,8 ALUES	V V A Nº Strings	4	Power (kWp)	5,76		N ^e Total	36					
Teinp, Coefficient I Temp, Coefficient I Max, System Voltag Voc Isc	sc 0,07 ge 1000 44,2 4,8 ALUES I modules 9 ↔ Min. Limit F 70® ♥	V V V A N ^e Strings 4 V Parameters 7	4 📩 Cell Temper	Power (kWp)	5,76 Max. Limit		Nº Total	36					
Terup, Coefficient I Terup, Coefficient I Max, System Voltay Voc Isc	ALUES Min. Limit Inverter VMPP 0.07 44.2 4.8 Min. Limit VMPP	V V V A N [®] Strings 4 V Parameters 7 VMPP * 1s	4	Power (kWp)	5,76 Max. Limit Invester	Module	N ^e Total	36	065	ervatio	ons		
Temp, Coefficient I Temp, Coefficient I Max, System Voltay Voc Isc CONFIGURATION V. N [®] Seria	ALUES Min. Limit 70 Inverter VMPP 150.0 V 250.5 V	N [®] Strings V V V V A V Parameters / 22 V _{MPP} * 1s 315.9 V	4 Cell Temper. 5 8 c *	Power (kWp) ature 10" Voc 451.8 V 450	5,76 Max. Limit Inverter 0 V	Module	N ^e Total	36 erter are co	Obs smect	ervatio	ons		
Teinp, Coefficient I Tenp, Coefficient I Max, System Voltag Voc Itsc CONFIGURATION V N [®] Seria	ALUES I modules 9 I modules 9 Inverter VMPP 150.0 V 250.5 V	27% V V A A A A A A A A A A	4	Power (kWp) ture 10° × V ₀ C 461.8V 450	5,76 Max. Limit Inverter 0 V	Module 1000 V	N ^e Total Voltages for inv Max. system vc	36 erter are co ltage corre	Obs orrect ct	ervatio	ons		
Tellip, Coefficient I Tenp, Coefficient I Max, System Voltay Voc Isc CONFIGURATION V, N [®] Seria oltage Range Max, System Max, System	ac 0.07 ge 1000 44.2 4.8 ALUES I modules 3 ÷ Min. Limit F 70° ⊻ Inverter VMPP 150.0 V 250.5 V	27% V V A A V Parameters / 215,9.V 15,9.V	4	Power (kWp) ature 10 ⁸ ▼ Voc 461.8V 45(5,76 Max. Limit Inverter 0 V 550 V 33 A	Module 1000 V	N [®] Total Voltages for inv Suitable Curren	36 erter are cr ltage corre	Obs orrect	ervatio	ons		

SOLAR MODULE

The "módulo solar" or solar module area displays the electrical and mechanical characteristics of the solar modules. As can be seen in the following figure, there is a tab to select the type of characteristics to be displayed. By default, the PV module electrical characteristics are shown.

Manufacturer	Model		Лем	1 Cle	Manufacturer	Model		New	1 Clear
3P Solar 📃	BP 3160 S	· .	14644		BP Solar	BP 3160 S	· -	14644	
Electronic Mechanic			Edit	Deli	Electronic Mechanic		_	Edit	Delet
Туре	poly				Width	1593	mm		
Nominal Power	160	W			Depth	790	mm		
Voltage V _{MPP}	35,1	V			Height	50	mm		
Current IMPP	4,55	A			Weight	15,4	Kg		
Temp. Coefficient Pow.	0,50	%/ºC							
Temp. Coefficient Voc	0,46	%/ªC							
Temp. Coefficient Isc	0,07	%/9C							
Max. System Voltage	1000	V							
Voc	44,2	V							
Isc	4.8	A							

The Ingecon® Sun Planner incorporates a database which includes the different module models available on the PV sector market.

Due to the ongoing growth of the PV sector, the Ingecon® Sun Planner database could possibly become outdated. To overcome this problem, database updates can be downloaded when the button is enabled with the text "Hay una versión más reciente en la base de datos" (There is a more recent version in the database). For system sizing with a model not included in the database, this new model can be incorporated using the buttons available in the solar module section. These buttons have the following functionalities:

Manufacturer *	Model	×	Type *
Rated power*	W	Voc* [
Voltage V _{MPP} *	V	lsc *	A
Current I _{MPP} *	A	Width	mm.
Temp. Coefficient Pow. *	<u>%/®C</u> ▼	Depth	mm.
Temp. Coefficient Voc *	×/ºC ▼	Height	mm.
Temp. Coefficient Isc *	[₩/40]	Weight	Kg.
Max. System Voltage *	V	Ok [Cancel

• New: New. To add a new module to the database.



- **Edit:** Edit. To modify any of the electrical or mechanical characteristics of any PV module.
- **Clear:** Clear. To delete the data appearing on the screen associated with the solar module.
- **Delete:** Delete. To delete the selected module from the database.

INVERTER

In the "linversor" or inverter area, the Ingecon® Sun inverter desired for the PV system is selected. The inverter characteristics are then shown: the "DC" and "AC" tabs for the electrical characteristics and the "Mecánica" tab for the mechanical characteristics.

To delete the data associated with the Inverter section of the screen, click on the clear button: **Clear**.

DC AC Mechanic	Clear	
Voltage range DC	150 - 450	
Maximum voltage DC	550	V
Maximum Current DC	33	A

le-buase mi	gecon Sun 💌 🛛 Ingecor	n Sun 5 TL IF	P65 🔳
	DC AC Med	hanic -	Clear
	Rated power AC	5	kW
	Nominal voltage AC	230	V
	Rated power HP	5	kW
	Rated power HT	5,5	kW
	Frequency	50 / 60	Hz
	Harmonic distortion	< 3	%
	Phi cosine	1	
	Temperature range	-10 a 65	PC .
	Maximum efficiency	97	%
RTER	HP Mode (high powe	er) - Rated ou	tputs at 40
e-phase Ing	econ Sun 🚬 🛛 Ingecon Su	in 5 TL IP65	<u> </u>
	DC AC Mechar	ic Clea	ar d
	DC AC MOOND		
	Width 360		mm
	Width 360 Depth 180		mm mm
	Width 360 Depth 180 Height 470		mm mm mm

If you look at the figures above, in the figure showing the inverter DC information, the following warning message appears:

"Si su campo solar no es flotante por conexión a tierra del polo positivo o del polo negativo del campo fotovoltaico, contacte con INGETEAM ENERGY S.A para validar su configuración" (If your solar field is not floating due to the PV array negative or positive pole being grounded, contact INGETEAM ENERGY SA in order to validate your configuration).

For correct operation, some solar modules need to have their positive pole or negative pole grounded. When this connection is made, the PV array is no longer floating.

If the module specifications require a non-floating connection for the solar array, then the Ingecon® Sun inverters require an additional kit that is not included with the equipment and must be requested from Ingeteam S.A. For this reason, the above mentioned warning message indicates that it is necessary to contact Ingeteam S.A.

The Ingecon® Sun Planner does not include the data sheets provided by the solar module manufacturers and which indicate whether the solar array should have a non floating configuration.

CONFIGURATION VALUES.

A PV array configuration automatically appears once the panel has been selected in the SOLAR MODULE area and the Ingecon® Sun inverter has been selected in the INVERTER area, or vice versa. The figure below shows an example of a configuration automatically made by an Ingecon® Sun 5.

-VALORES CONFIGUE Nº Panele	RACIÓN — s en serie	9		Nº St	rings 4	*	Potenc	ia kWp	5,76		№ Módulos total 36
	Límite Parámetros FV / Temperatura célula										
	mínimo	70º	4		25 º	5 º -10º 🗸 Limite máximo					
	Inversor	V _{MF}	РΡ	$V_{MPP} *$	Isc *	FD *	V _{oc}	Inve	ersor	Módulo	Observaciones
Tensión de trabajo	125,0 V	264,0	OV.	315,9 V			448,7 V	450 V			Tensiones trabajo correctas para inversor
V _{MAX} , Sistema									450 V	1000 V	Tensión max, sistema correcta
I _{MAX} , Sistema					19,20 A				33 A		Corriente DC adecuada
Factor dimensionado						1,15					Potencia adecuada del campo FV
									_		
🗥 * Datos obtenidos er	STC 1000 Y	W/m ² 2	5 ºC	(célula) Esp	ectro AM 1	.5 según el	fabricante d	le módulos	Hay	una vers	ión más reciente de la base de datos

Although the Ingecon® Sun Planner gives a PV array configuration by default, the user always has the possibility of modifying the number of panels connected in series and the number of strings, in addition to the extreme temperature conditions for which the system is to be sized, which by default are for a solar module cell temperature ranging from + 70°C to - 10°C.

For any configuration whatsoever, whether given by default by the Ingecon® Sun Planner or user-created, the "Observaciones" or observations section provides an analysis of the quantities of various PV array variables, indicating whether there is any possibility of damaging the PV modules and / or the inverter. Below it is possible to see how, when the extreme design temperature for the cell is changed to -20°C, for the configuration of the figure shown above, a message appears indicating that this situation would cause damage to the inverter.

-VALORES CONFIGUE Nº Panele:	RACIÓN — s en serie	9	St	rings 4	*	Potenci	ia kWp	5,76	_	Nº Módulos total 36	
	Límite	Pa	rámetros P	//Tempe	eratura cé	itura célula			Peligro de ruptura del inversor a -20°C. Reduzca su número de paneles por String.		
mínimo		709 💙		25 8		-20º 💙			Confi	guración del campo fotovoltaico inadecuada.	
	Inversor	V _{MPP}	V _{MPP} *	Isc *	FD *	V _{oc}	Inve	ersor	Moaulo	Ubservaciones	
Tensión de trabajo	125,0 V	264,0 V	315,9 V			463,2 V	450 V			Peligro, superado límite máximo -20ªC Voc	
V _{MAX} , Sistema								450 V	1000 V	Superada tensión máxima inversor	
I _{MAX} , Sistema				19,20 A				33 A		Corriente DC adecuada	
Factor dimensionado					1,15					Potencia adecuada del campo FV	
* Datos obtenidos er	n STC 1000 '	W/m ² 25 ≌C	(célula) Esp	ectro AM 1	.5 según el	fabricante d	e módulos	Hay u	ına vers	ión más reciente de la base de datos	

VALORES CONFIGURACIÓN Nº Paneles en serie 9 3 Nº Strings 4 7 Potencia kWp 5,76 Nº Módulos total 36											
	70º	Par	ámetros F\	//Tempe 25	eratura cé	iula -20º 🗸	Li	ímite máxin	10		
	Inversor	V _{ME}	PP	$V_{MPP} *$	Isc *	FD *	V _{oc}	Inve	ersor	Módule	Peligro de ruptura del inversor.
Tensión de trabajo	125,0 V	264,	٥V	315,9 V			463,2 V	450 V		(
V _{MAX} , Sistema									450 V	1000 V	Superada tensión máxima inversor
I _{MAX} , Sistema					19,20 A				33 A		Corriente DC adecuada
Factor dimensionado						1,15					Potencia adecuada del campo FV
-											
🗥 * Datos obtenidos er	n STC 1000 \	W/m ² 2	5 ºC	(célula) Esp	ectro AM 1	.5 según el	fabricante d	e módulos	Hay	una vers	sión más reciente de la base de datos

As can be seen in the two figures above, in addition to the comments which appear in the observations table, more detailed information is also provided as to the potential repercussions that the various parameter quantities could have on the inverter in the specific PV system sizing.



In the observations section, in order to see whether there is any additional information for any of the PV system parameters, move the mouse pointer over the comments. The information shown for the PV system parameters can range from recommendations to improve the system operation to messages warning of the possibility of damaging the modules or the inverter.

Provided below is an explanation of each of the parameters indicated in the valuation table. In order to read the table correctly, it should always be read in two directions. For each line, read the enabled columns as shown below.

~VALORES CONFIGUI Nº Panele	RACIÓN — s en serie	9		Nº St	rings 4	*	Potenci	a kWp	5,76	_	Nº Módulos total 36
	Límite mínimo	70º	Par	ámetros P	V / Tempe 25 º	eratura ce	élula -20º 🗸	L	ímite máxin	ю	
	Inversor	V _M	PP	$V_{MPP} \times$	Isc *	FD *	V _{oc}	Inve	ersor	Módulo	Observaciones
Tensión de trabajo	125,0 V	264,	٥V	315,9 V			463,2 V	450 V			Peligro, superado límite máximo -20ºC Voc
V _{MAX} , Sistema	4						▲		450 V	1000 V	Superada tensión máxima inversor
I _{MAX} , Sistema		1		1	19,20 A		- I.		33 A		Corriente DC adecuada
Factor dimensionado						1,15					Potencia adecuada del campo FV
* Datos obtenidos er	stc 1000 v	W/m ² 2	:5 ºC	(célula) Esp	ectro AM 1.	5 según e	l fabricante d	e módulos	Hay	una vers	sión más reciente de la base de datc

Tensión de trabajo – operating voltage

This line indicates the PV array operating voltages. Starting from left to right, the information enabled in this line is: *Limite mínimo inversor - Minimum inverter limit:* This parameter indicates the minimum value of the MPP voltage range for the inverter.

VMPP +70°C: This is the MPP voltage shown by the PV system sized at a cell temperature of 70°C and 1000 W/m2. It is possible to analyse the MPP voltage for a value other than + 70°C for the cell, which is the value given by default by the Ingecon® Sun Planner for the automatic configuration.

VMPP +25°C: MPP voltage of PV system sized at a cell temperature of 25 °C for and 1000 W/m2.

Voc -10°C: This is the open circuit voltage shown by the PV system sized at a cell temperature of -10 °C and 1000 W/m2. As can be seen in the table, it is possible to analyse the open circuit voltage Voc for a cell temperature value other than -10 °C , which is the value given by default by the Ingecon® Sun Planner for the automatic configuration.

Límite máximo - Maximum limit: This column is sub-divided into the Inverter and module. This sub-division enabled will show the most restrictive voltage value in order not to damage the module or inverter.

Observaciones - Observations: A check is made of the PV system values: VMPP+70°C, VMPP+25°C, and Voc -10°C to ensure their adequacy. Should different temperature conditions be taken for the extreme values, such as, VMPP+80°C and Voc -20°C, the observations are also made for these operating conditions.

<u>Vmax, Sistema – Vmax, System</u>

This line checks that the PV array configuration does not have a voltage that could damage the PV modules or the inverter.

Límite máximo – maximum limit: This is subdivided into Inverter and Module. In this case, the maximum voltage values are given, going upwards, that the PV system elements can withstand, in other words the module and inverter, or vice versa.

Observaciones - observations: A check is made to ensure that the PV system is within the maximum voltage limits of the elements making up the system.

<u>Imax, Sistema – Imax, System</u>

The line corresponding to Imax, System is responsible for analysing the direct current value which the PV array delivers to the inverter.

Imax,Sistema – Imax System: This parameter indicates the short-circuit current of the PV array at a cell temperature of 25°C and 1000 W/m2.

Observaciones - observations: The idea of the Imax, System line is to verify that at conditions of 25°C and 1000 W/m2 the maximum permitted PV inverter input current is not exceeded.

Factor dimensionado - Sizing factor

In the Ingecon® Sun Planner, the sizing factor line aims to show the ratio between the size of the PV system and the rated power of the Ingecon® Sun inverter used.

Factor dimensionad0 - Sizing factor: The sizing factor (FD) is defined as the ratio between the peak power of the PV array at a cell temperature of 25 °C and 1000 w/m2 and the AC rated power of the inverter.

Observaciones - observations: Here the FD value is analysed in order to avoid excessively high or low values.

5.3. Informe - Report.

The report tab displays a compilation of the information provided under the Project and System tabs. By clicking on the "Informes" or report icon in the main menu, a PDF document is generated with all the information appearing on screen with regard to the configuration of the PV system obtained.

Ingecon Sun Planner	»					×
New Open Save	Reports					Ingeteam
Project Installation Rep	port					
CUSTOMER Company / Customer Contact person Address Post code City Country/Region E-mail Telephone Fax	Ingeteam Energy S.A Avenida Ciudad de la innovac 31621 Pamplona Navarra solar.energy@ingeteam.com 948288000 948288001	ión, nº13 PROJE Project t Address Post coc City Country PV plant THE SY	CT Itle xx Je 11 Region xx size 52 STEM IS CORRECTL	000000000 000000000 2345 000000 2,80 KWp 2,80 KWp Y DIMENSIONED]	
Total 10 inverters	PV Rated outputs	50 Kw P^	/ plant size	52,80 kWp	32 Modules	
SYSTEM Nº Serial modules Voc till -10 ºC Power (kWp)	16 N ^e Strings 549,6 V VMPP [×] 5,28 AC Power	2 Modules 376,0 V VMPP till 5 kW Sizing fac	70 ºC lor *	32 316,8∨ Isc* 1,06	14,70 A	
UDSELVERUNIS	Voltages for inverter are corre	ect				
Voltage Range					-	
Vmax, System	Max. system voltage correct					
Imax, System	Suitable Current DC Photovoltaic field Current Isc	at 25ºC cell temperature an	d 1000 W/m2 in allow	ed range		
Sizing factor	Suitable PV power					
SOLAR MODULE Manufacturer Rated power Temp. Coefficient Pow. Max: System Voltage Width Weight	Aleo Solar AG 165 ₩ 0.43 %/*C 1000 ↓ 800 mm 16 kg	Model Voltage VMPP Temp. Coefficient Voc Voc Depth	aleo 150-6 XL 23,5 V 0,35 mV/≢C 30,6 V 50 mm	Type Current IMPP Temp. Coefficient Isc Isc Height	poly 7 A 0.03 mA/®C 7.35 A 1600 mm	
INVERTER Voltage range DC Rated power AC Harmonic distortion Maximum efficiency	Ingecon Sun 5 TL IP65 150 - 450 V 5 kW < 3 % 97	Maximum voltage DC Nominal voltage AC Phi cosine Protection class	550 V 230 V 1 IP65	Maximum Current DC Frequency Temperature range Width	33 A 50 / 60 Hz -10 a 65 ºC 360 mm	-

Feche: 28-07-2000 CLIENTE Empreso / Clente Persons de contecto Dirección Código Penal Localidad PelaSingión Esmail Teléfono Fec	Ingelearn S.A Avda Claded de la Innovación, nº13 31621 Santhuran	7	PROYECTO	www.intelletin.ex.	
CLIENTE Empresa / Cliente Persota de contecto Ditectán Ditectán Distribute Senal Emel Teléfono Fer	Ingelearn S.A Avda Cladad de la Intovación, nP13 31621 Santinum		PROYECTO		
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Diripleas / Consum Persona de contecto Dirección Código Portel Localidad PelaStagión E-mail Teléfono Fer	Nyteren w.o. Avda Ciudad de la Innovación, nº13 31621 Recitores	-14	White do remarking	W www WOX seems XX	~~~ ~~ ~~ ~~ ~~ ~~ ~~ ~~ ~~ ~~ ~~ ~~ ~~
Diversion Diversion Codego Postal Localidad PalaStagión E-mail Taléfono Par	Avda Cluded de la Innovación, nº13 31621 Reclamon		Time to shore PV	0121468789 MW	ANA.888.0000
Código Postel Localidad Palafilegión E-mail Teléfono Fiv	31621 Banimum	11	Direction	*2000 20000 20000 2000	
Localidad Palafilegión E-mail Taléfono Erec	Baninamo	11	Código Postal	12345	
Palađilegića E-meil Teléfono Fire	con for or	11	Localidad	300000300000	
E-mail Teléfono	España / Nevera	11	PaisRegion	30000(130000)	
Telélono Fav	solar.energy@ingeleam.com	11	-		
Fare	948238000	11			
	\$48382001				
	EL SISTEMA ESTA DIME	ENSI	ONADO CORRECTA	MENTE	
SISTEMA					
December on the second second	M Shines			AP Michigan Intel	
487V	VMPP *	315	au lau	Yore a 20 KC	364 G V
lec* 19,20 A	Potencia KMp	5,76	,9V 6	Factor dimensionado *	1.15
					1
Observationes					
femsión de trabajo	Tensiones trabajo correctas para inversor				
Vinax, Sistema	Tensión max, sistema consecta				
have the					
TRAC, CREWER'S	Contente DC adecuada Contente liso del campo fotovoltaico a 29	7Cdeo	éule y 1000 Win2 dentro del rar	igo permitido.	
Factor dimensionado	Contente DC adecasda Contente lao del campo fotovolteico a 29 Potencia adecuada del campo PV	PC de o	säule y 1000 Wim2 dentro del na	ngo permitido.	
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6. PV PANEL DATABASE.

The technical data for the PV modules included in the Ingecon® Sun Planner were obtained from the Solar Module 2008 Professional database of the Photon magazine. Ingeteam is in no way liable for any data inaccuracy.



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