

ICEA (ODARS)

System Plan

Created with Solar-Planit by Sarah Hollard
COURANT NATUREL in 81580 SOUAL.



YOUR PHOTOVOLTAIC SPECIALIST

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CUSTOMER

Name	
Address	

SYSTEM INFORMATION

Number of Modules	112
System Output	35.84 kWp
Modules	112 x JASolar JAM60S09 320 (35.84 kWp)

Project Information - Building

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Roof

Roof Type	Pitched Roof
Ridge to eaves (m)	7.200
Ridge Length (m)	21.400
Roof Inclination (°)	20.00
Building Height (m)	6.000
Protrusion of bargeboard (m)	0.000
Protrusion of eaves (m)	0.000
Building Width (m)	13.532
Building Length (m)	21.400
Roof Orientation (°)	-30.00

Roof Covering

Type of Roof Covering	Tile
Type of tile	Pan Tile
Tile Length (cm)	40.00
Batten Spacing (cm)	32.50
Batten Height (cm)	3.00
Counter batten height (cm)	3.00
Counter batten width (cm)	4.80
Use additional woods	no
Insulation Height (cm)	0.00
Underlay thickness approx. (cm)	0.00
Overlap (cm)	7.50

Substructure

Substructure	Rafter (Wood)
Rafter Distance (cm)	70.00
Number of Rafters	31
Rafter Width (cm)	8.00
Rafter Height (cm)	16.00
Distance first Rafter (cm)	16.00
Distance last Rafter (cm)	16.00

Location

Country	France
Address	216 En Combes, 31450 Odars, France
Terrain Category	IIIa
Altitude (m.a.s.l.)	223
Windload Zone	2
Snowload Zone	A2



Project Information - Array

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Module field	Champ de panneaux 7	Array 6	Champ de panneaux 4
Module	JASolar JAM60S09 320	JASolar JAM60S09 320	JASolar JAM60S09 320
Number of modules	32	24	28
L / W / H (mm)	1657 / 996 / 35	1657 / 996 / 35	1657 / 996 / 35
Weight (kg)	18.4	18.4	18.4
Power	10.24 kWp	7.68 kWp	8.96 kWp
Mounting system	Flush 1 layered Portrait	Flush 1 layered Portrait	Flush 1 layered Portrait
Layout (rows x columns)	4 x 8	3 x 8	3 x 10

Module field	Array 5
Module	JASolar JAM60S09 320
Number of modules	28
L / W / H (mm)	1657 / 996 / 35
Weight (kg)	18.4
Power	8.96 kWp
Mounting system	Flush 1 layered Portrait
Layout (rows x columns)	3 x 10

Modules

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Module	JASolar JASolar JAM60S09 320
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Electrical Data

Nominal Output Power P _{mp} (Wp)	320
Maximum Power Voltage (V)	-
Maximum Power Current (A)	-
Open Circuit Voltage U _{oc} (V)	-
Short Circuit Current I _{sc} (A)	-
Temperature Coefficient P _{mp} (%/°C)	0.0
Temperature Coefficient I _{sc} (%/°C)	0.0
Temperature Coefficient U _{oc} (%/°C)	0.0
Module Efficiency (%)	#

Extreme Value

Max. System Voltage (V)	#
Max Reverse Current (A)	#

Dimensions and Weight

Module Area (m ²)	1.65
Module Length (mm)	1657
Module Width (mm)	996
Frame Thickness (mm)	35
Mounting Hole Diameter (mm)	9.0
Weight (kg)	18.4

Specifications

Connection Type	-
Cable Length +/- (mm)	- / -
Owner	Sarah Hollard
Item Number	UM002334

Bill of materials

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Item No.	Article	Number of units	Amount per pack
03-000001	Rail connector set C47	27	1
03-000007	Module slip guard set M8	112	1
03-000012	Grounding connector set AF 18	13	1
03-000271	Roof hook mounting screw 6x90	191	1
03-000272	Roof hook mounting screw 6x120	191	1
03-000276	Middle clamp set 34-42 C black	198	1
03-000284	End clamp set 34-42 C black	52	1
03-000291	C-rail 47-2 6.12 m	38	1
03-001111	End cap C-rail C47 black	52	1
03-001149	Flex roof hook set 30 M10	191	1
03-001185	Contact latch module clamp	198	1

Weight of the mounting system (without packaging): 315 kg

Optional:

Item No.	Article	Number of units	Amount per pack
03-000011	Special lock nut AF 18 deep	1	1
03-000099	Cable clip d 10mm	112	1
03-000134	Top cover C-rail 2.000 mm	1	1
03-000260	Slip guard/ End Cap Set C47 black	52	1
03-000508	Cable-tie clip for profile flange 1-3 mm	112	1
03-000744	Bit-8 for hex head, with spring ring	1	1

Notes on the parts calculation

The components in the part list were determined based on the data entered. If conditions on site differ from this then the structural calculations and parts list must be recalculated. The installer must check the design before ordering.

The parts list is based on these assumptions:

- The structural calculations of the mounting structure (fasteners, rails etc.) is based on the design data entered, the results are only valid for the components in the parts list.
- The array corresponds to the given design
- A) equal spacing of the roof members (rafter, purlin) for the fixing points (roof hook, stock bolt)
- B) Equal spacing of the roof covering (trapezoidal peaks, seam spacing) for the fixing points (C-rail direct mounting set, seam clamp)
- The calculations depend on the chosen panel (both size and frame colour), and the result is only valid for that panel

All the components listed in the parts list are needed for the installation. The optional part list includes the tools for the installation of the mounting structure as well as other useful components which are not essential, but which protect the cables and are aesthetically pleasing.

*The prices in the part list (whether in packaging units or in actually required quantities) exclude any discount and tax. This is also applies to the cost per kW of the system.

General Notes

The static calculation of the mounting system is based on the specification given in Eurocode 1. Further more, wind tunnel tests and the different national regulations for the choice of countries in the software is taken into account. Switzerland is an exception - there the load determination corresponds to the standards of SIA 261 (2003).

Special local cases in regards to Eurocode 1, e. g. snow accumulation, overhanging snow on the eaves, snow drop and loads due to ice or exposed building locations are not taken into account automatically by the software but have to be checked separately.

The mounting structure must be installed in accordance with the manual. It contains all the required information, e.g. required torque settings and installation of expanding joints.

The mounting structure including the structural calculations are certificated by TÜV Rheinland.

The structural calculations refer only to the Novotegra mounting system and not to the structure of the building. The building must be assessed by a structural engineer.

Please note that the panels must to be installed according to the manufacturer's manual. You must adhere to the relevant local safety regulations and building standards.

Key

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Roof

Obstacles: Chimney, skylight or dormer.

Modules.

Beams: Rafter or purlin.

Depend on selected covering: Corrugations or seams.

Mounting system components

Roof fastening: Roof hook/stock screw and double roof hook.

Module support and base foot

End and mid clamps

Rail connector, expansion joint and cross rail connector.

Vertical and horizontal rail, tie / wind deflector

Underlined ballast values indicate that a ballast trough is required

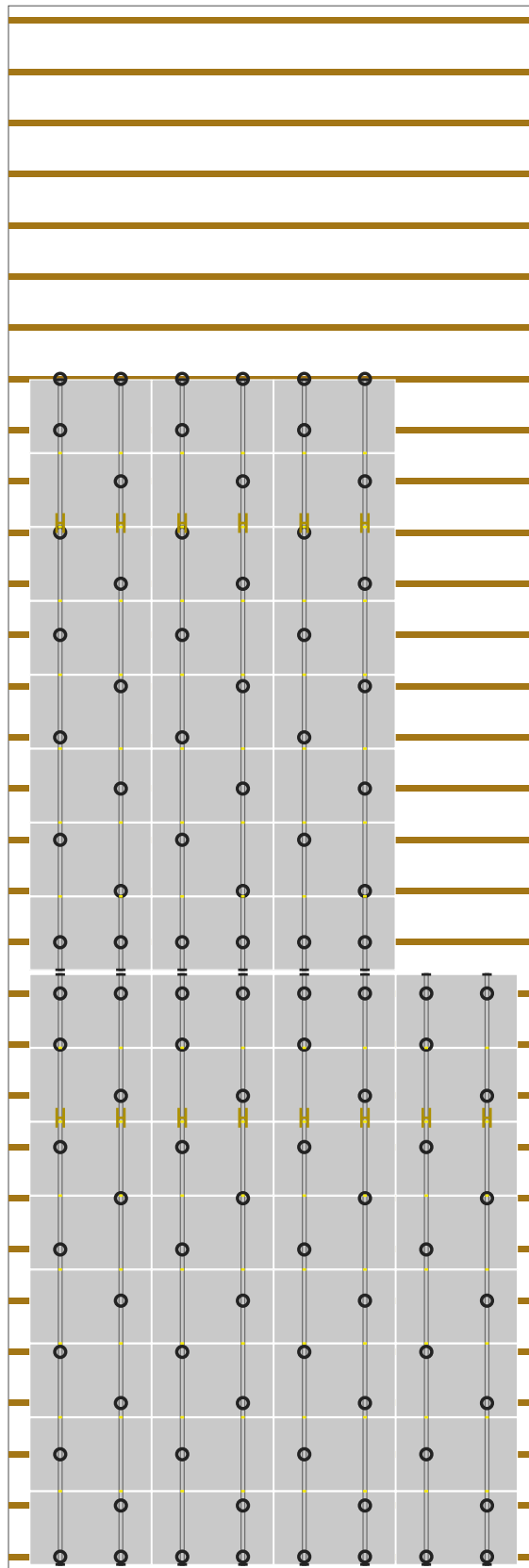
Advice/Warnings

Color code which highlights a corrected error.

Color code which highlights a warning in the design.

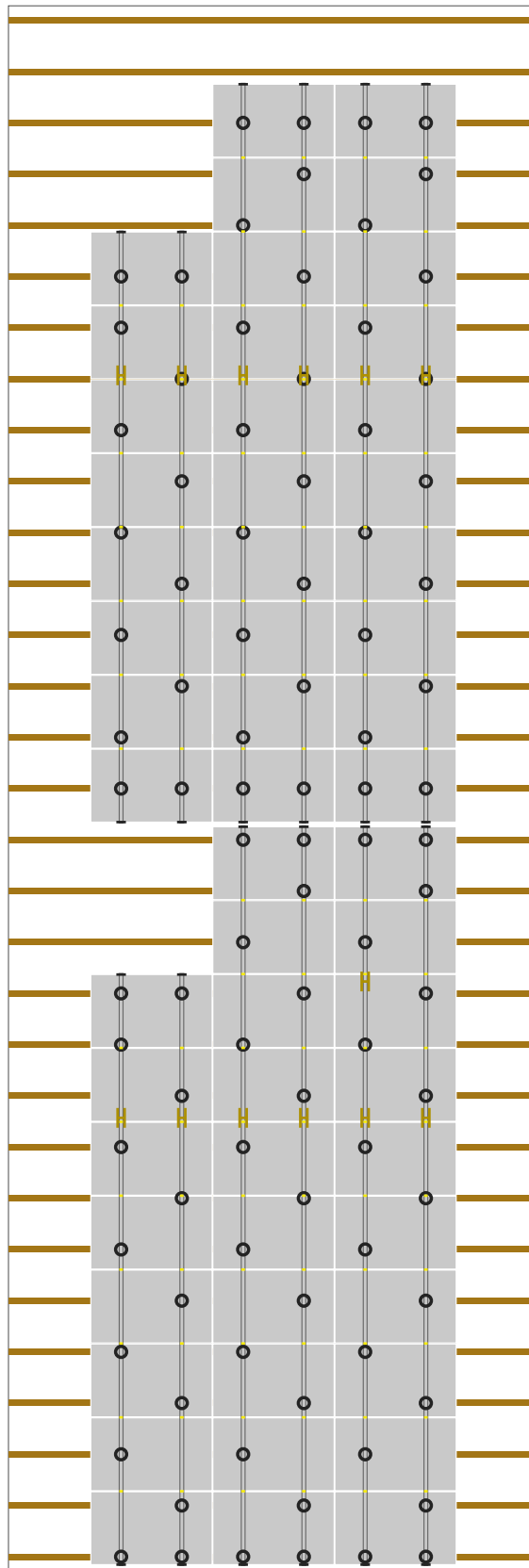
Installation Plan Roof 1

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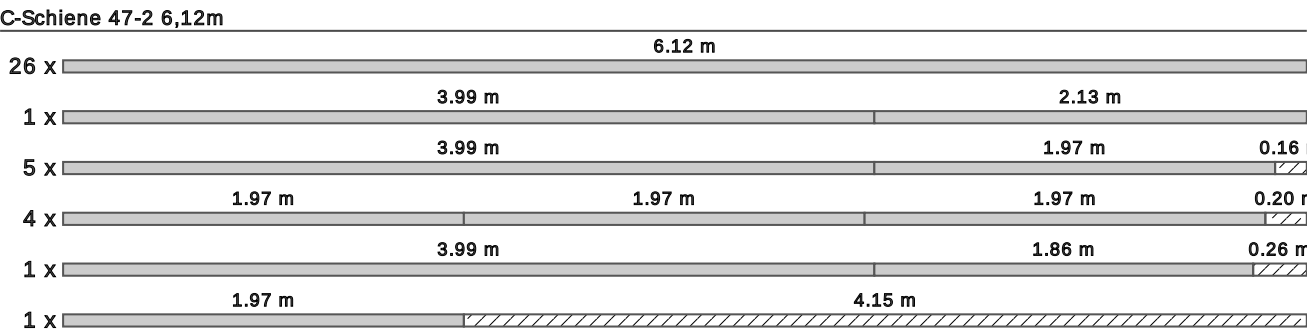
Installation Plan Roof 2

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Rail Cut Plan (1/1)

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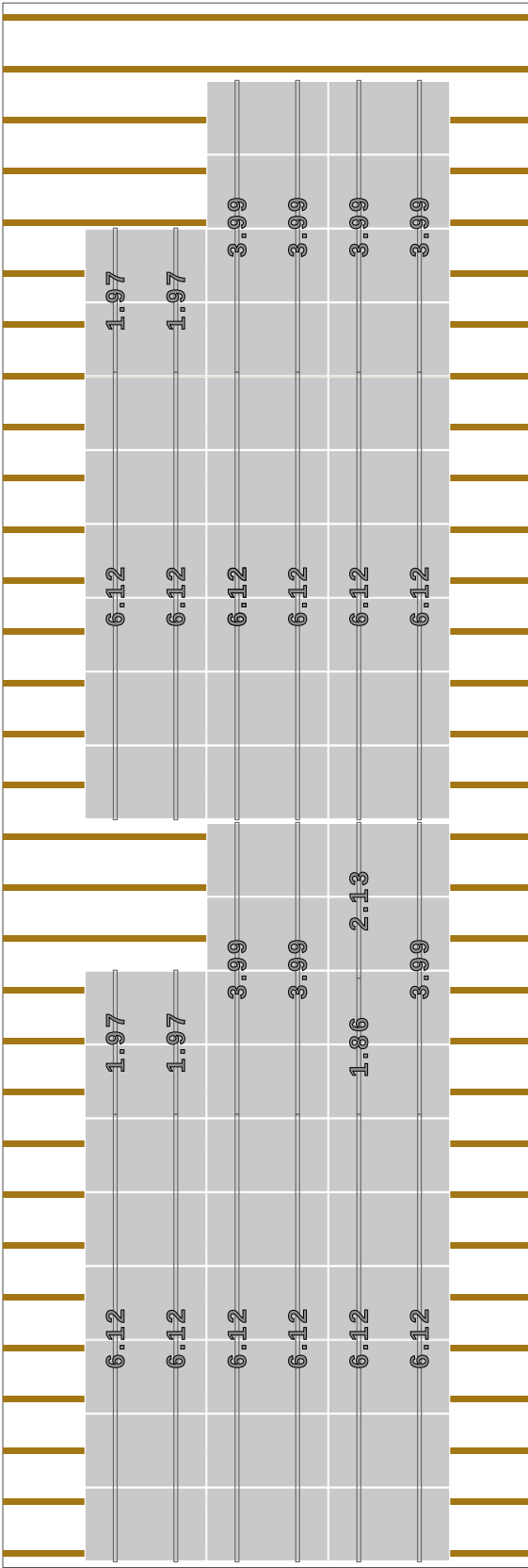


Rail Lengths Plan Module Rail (m) Roof 1
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Rail Lengths Plan Module Rail (m) Roof 2

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Load: Flush 1 layered Portrait

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Characteristic loads, that is, the snow load shape coefficient

Load Substructure	gUK =	0.02	kN/m ²
Module Load	gM =	0.11	kN/m ²
Peak velocity pressure	qp(Z) =	0.59	kN/m ²
Ground Snow Load	sk =	0.48	kN/m ²
Snow load shape coefficient	μ1 =	0.80	
Snow load perpendicular to the module	sM =	0.34	kN/m ²
Wind Load Plant service life		50	years
Snow Load Plant service life		50	years

Scheduled loads for the roof areas

Component Group: Module fastening

Roof Area	Cpe (Suction)	Cpe (Pressure)	Windsuction [kN/m ²]	Windpressure [kN/m ²]	Snowload [kN/m ²]	Load [kN/m ²]
Gable	-1.60	0.27	-0.95	0.16	0.39	0.13
Corner	-1.47	0.37	-0.87	0.22	0.39	0.13
Ridge	-0.93	0.27	-0.55	0.16	0.39	0.13
Eaves	-1.20	0.37	-0.71	0.22	0.39	0.13
Middle	-0.93	0.27	-0.55	0.16	0.39	0.13

Scheduled loads for the roof areas

Component Group: Upper Rail

Roof Area	Cpe (Suction)	Cpe (Pressure)	Windsuction [kN/m ²]	Windpressure [kN/m ²]	Snowload [kN/m ²]	Load [kN/m ²]
Corner	-1.31	0.37	-0.78	0.22	0.39	0.13
Middle	-0.84	0.27	-0.50	0.16	0.39	0.13
Eaves	-1.04	0.37	-0.62	0.22	0.39	0.13
Ridge	-0.85	0.27	-0.51	0.16	0.39	0.13
Gable	-1.48	0.27	-0.88	0.16	0.39	0.13

Statics: Flush 1 layered Portrait

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Components

Item Number	Name
03-001149	Dachhaken-Set flex 30 M10
03-001150	Doppel-Dachhaken-Set flex 30 M10 (4 Mounting Screws)
03-000291	C-Schiene 47-2 6,12m
03-000276	Mittelklemme 34-42 Set C sw
03-000272	Befestigungsschraube Dachhaken 6x120

Results

Roof Area	Component Group	Components	Bearing-distance	Rail-distance	Load [%]	Occupancy
Corner	Module fastening	03-000276	1.00 m	0.83 m	18 %	
Corner	Upper Rail	03-000272 03-000291 03-001150	1.40 m	0.83 m	95 %	every other rafter
Corner	Upper Rail	03-000272 03-000291 03-001149	1.40 m	0.83 m	99 %	every other rafter
Eaves	Module fastening	03-000276	1.00 m	0.83 m	15 %	
Eaves	Upper Rail	03-000272 03-000291 03-001149	1.40 m	0.83 m	86 %	every other rafter
Eaves	Upper Rail	03-000272 03-000291 03-001150	1.40 m	0.83 m	95 %	every other rafter
Gable	Module fastening	03-000276	1.00 m	0.83 m	20 %	
Gable	Upper Rail	03-000272 03-000291 03-001149	1.40 m	0.83 m	93 %	every other rafter
Gable	Upper Rail	03-000272 03-000291 03-001150	1.40 m	0.83 m	83 %	every other rafter
Middle	Module fastening	03-000276	1.00 m	0.83 m	12 %	
Middle	Upper Rail	03-000272 03-000291 03-001150	1.40 m	0.83 m	83 %	every other rafter
Middle	Upper Rail	03-000272 03-000291 03-001149	1.40 m	0.83 m	93 %	every other rafter
Ridge	Module fastening	03-000276	1.00 m	0.83 m	12 %	
Ridge	Upper Rail	03-000272 03-000291 03-001149	1.40 m	0.83 m	93 %	every other rafter
Ridge	Upper Rail	03-000272 03-000291 03-001150	1.40 m	0.83 m	83 %	every other rafter

Permitted rail cantilever from the last fastener

Roof Area	Component Group	Components	Cantilever [m]	Load [%]
Corner	Upper Rail	03-000291 03-001149	0.70 m	99 %

Corner	Upper Rail	03-000291 03-001150	0.70 m	95 %
Eaves	Upper Rail	03-000291 03-001150	0.70 m	95 %
Eaves	Upper Rail	03-000291 03-001149	0.70 m	86 %
Gable	Upper Rail	03-000291 03-001149	0.70 m	93 %
Gable	Upper Rail	03-000291 03-001150	0.70 m	83 %
Middle	Upper Rail	03-000291 03-001149	0.70 m	93 %
Middle	Upper Rail	03-000291 03-001150	0.70 m	83 %
Ridge	Upper Rail	03-000291 03-001149	0.70 m	93 %
Ridge	Upper Rail	03-000291 03-001150	0.70 m	83 %

Permitted roof hook overhang at rafter edge

Roof Area	Area	Components	Cantilever [m]	Load [%]
Corner	Middle area	03-001149	0.02 m	86 %
Corner	Middle area	03-001150	0.08 m	57 %
Eaves	Middle area	03-001149	0.02 m	86 %
Eaves	Middle area	03-001150	0.08 m	57 %
Gable	Middle area	03-001149	0.02 m	80 %
Gable	Middle area	03-001150	0.08 m	53 %
Middle	Middle area	03-001149	0.02 m	80 %
Middle	Middle area	03-001150	0.08 m	53 %
Ridge	Middle area	03-001149	0.02 m	80 %
Ridge	Middle area	03-001150	0.08 m	53 %

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A decorative horizontal bar at the bottom of the page, consisting of several overlapping translucent green rectangles that create a gradient effect from light green to a darker green.