



Solar Keymark
Certification Body
CEN 025

Certificazione di Prodotto

Product Certification

Certificato N. **115BN/1**
Certificate No.

ALL'AZIENDA / TO THE FIRM

Costruzioni Solari S.r.l.

Zona Industriale P.I.P. – Via Rosario Romeo, 4
73020 Cavallino (LE) - IT

UNITÀ OPERATIVE / OPERATIVES UNITS

Zona Industriale P.I.P. – Via Rosario Romeo, 4
73020 Cavallino (LE) - IT

PER I SEGUENTI PRODOTTI / FOR THE FOLLOWING PRODUCTS

Collettore solare
Solar collector

CON DENOMINAZIONE COMMERCIALE / WITH TRADE NAME/S

Trade Mark: **Costruzioni Solari**
Model / Type ref.: **Panda 2.0**
Panda 2.3
Panda 2.7

Caratteristiche: vedi Allegato / Characteristics: see Annex

CONFORMEMENTE ALLA NORMA ED AL DOCUMENTO NORMATIVO ICIM
IN COMPLIANCE WITH THE STANDARD AND WITH ICIM NORMATIVE DOCUMENT

UNI EN 12975-2:2006 - EN 12976-2:2006
Specific CEN Keymark Scheme Rules for Solar Thermal Products ICIM 0062CS

RAPPORTI DI PROVA ACCREDITATI EN 17025 / REFERENCE TEST REPORT ACCREDITED EN 17025

No. 304809 and 304807 issued by Istituto Giordano

Il presente Certificato è da ritenersi valido solo se accompagnato dal relativo Allegato / This Certificate is valid only with the relative Annex

ICIM S.p.A.

PRIMA EMISSIONE
FIRST ISSUE

30/04/2013

EMISSIONE CORRENTE
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DATA DI SCADENZA
EXPIRING DATE

29/04/2019



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DATI TECNICI / TECHNICAL DATA			
<i>Tipo di collettore</i> Collector type	Flat plate	<i>Materiale struttura</i> Frame material	Galvanized steel
<i>Massa a vuoto</i> Dry weight	45 kg 49 kg 57 kg	<i>Dimensioni</i> Dimensions	1796 x 1130 x 110 mm 1996 x 1130 x 110 mm 2380 x 1130 x 110 mm
<i>Area totale</i> Gross area	2,02 m ² 2,25 m ² 2,69 m ²	<i>Area di apertura</i> Aperture area	1,81 m ² 2,02 m ² 2,40 m ²
		<i>Area dell'assorbitore</i> Absorber area	1,81 m ² 2,02 m ² 2,40 m ²
<i>Numero coperture</i> Number of Coverings	1	<i>Materiale copertura</i> Covering material	Glass
<i>Numero di tubi</i> Tubes number	12	<i>Diametro tubi</i> Tubes diameter	8 mm
		<i>Spessore tubi</i> Tubes thickness	0,5 mm
<i>Fluido termovettore</i> Heat transfer fluid	Water-Glycol	<i>Fluido alternativ</i> Alternate fluid	--
<i>Materiale assorbitore</i> Absorber material	Copper	<i>Trattam. Superficiale</i> Coating	Selective coating
		<i>Fluido contenuto</i> Absorber fluid volume	1,5 l 1,6 l 1,8 l
<i>Peso a vuoto</i> Absorber dry weight	7,0 kg 7,8 kg 8,6 kg	<i>Dimens. Assorbitore</i> Absorber dimensions	1686 x 1075 x 0,18 mm 1886 x 1075 x 0,18 mm 2270 x 1075 x 0,18 mm
<i>Materiale isolante</i> Thermal insulation	Glass Wool + Polyurethane	<i>Spessore</i> Thickness	Bottom: 50 mm Sides: 20 mm
<i>Temperat. nominale</i> Nom. temperature	140 °C	<i>Pressione nominale</i> Nominal pressure	10 bar


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PRESTAZIONI TERMODINAMICHE / THERMAL PERFORMANCES				
Potenza di picco Peak power	1448 W (Panda 2.0) 1928 W (Panda 2.7)			
Efficienza istantanea Area assorbitore Instantan. Efficiency Absorber area	$\eta_{0A} = 0,800$ $\eta_{0A} = 0,803$	$a_{1A} = 3,443 \text{ Wm}^{-2}\text{K}^{-1}$ $a_{1A} = 3,693 \text{ Wm}^{-2}\text{K}^{-1}$	$a_{2A} = 0,012 \text{ Wm}^{-2}\text{K}^{-2}$ $a_{2A} = 0,009 \text{ Wm}^{-2}\text{K}^{-2}$	
Efficienza istantanea Area apertura Instantan. Efficiency opening area	$\eta_{0A} = 0,800$ $\eta_{0A} = 0,803$	$a_{1A} = 3,443 \text{ Wm}^{-2}\text{K}^{-1}$ $a_{1A} = 3,693 \text{ Wm}^{-2}\text{K}^{-1}$	$a_{2A} = 0,012 \text{ Wm}^{-2}\text{K}^{-2}$ $a_{2A} = 0,009 \text{ Wm}^{-2}\text{K}^{-2}$	
Costante di tempo Time constant	90 s (Panda 2.0) 80 s (Panda 2.7)			
Capacità termica Thermal capacity	20,4 kJ/K (Panda 2.0) 23,1 kJ/K (Panda 2.7)			
Variazione sull'angolo di incidenza Incidence angle modifier	$K_{\theta(50^\circ)} = 0,92$ (Panda 2.0) $K_{\theta(50^\circ)} = 0,93$ (Panda 2.7)			
Temp. Di stagnazione Stagnation temp.	195 °C			


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[illegible]

Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate	Licence Number	115BN/0
	Issued	30/04/2013

[illegible]

Collector mounting: Fixed or tracking	Fixed; slope = latitude - 15° (rounded to nearest 5°)
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Overview of locations				
Location	Latitude °	Gtot kWh/m²	Ta °C	Collector orientation or tracking mode
Athens	38	1.765	18,5	South, 25°
Davos	47	1.714	3,2	South, 30°
Stockholm	59	1.166	7,5	South, 45°
Würzburg	50	1.244	9,0	South, 35°

G _{tot}	Annual total irradiation on collector plane	kWh/m ²
T _a	Mean annual ambient air temperature	°C
T _m	Constant collector operating temperature (mean of in- and outlet temperatures)	°C

The calculation of the annual collector performance is performed with the official Solar Keymark spreadsheet tool ScenoCalc. The collector output is calculated hour by hour according to the efficiency parameters from the Keymark test using constant collector operating temperature (T_m). A detailed description of the calculations is available at <http://www.sp.se/en/index/services/solar/ScenoCalc/Sidor/default.aspx>.

	Datasheet version:
	4.06, 2014-01-15
	ScenoCalc version:
	Ver. 4.06 (Jan. 2014)