



CERTIFICATE OF CONFORMITY

Certificate No SKM 10093.2

DQS Hellas grants the present certificate to the enterprise:

CICERO HELLAS S.A.

for the product/ type:

**Flat plate Solar Collector type:
PRISMA 2.0, PRISMA 2.5**

which is produced in conformity with the normative document:

**EN 12975-1:2011
EN ISO 9806:2017**

at the following location:

**Kyra Vrissi Korinthias
P.O.Box.25, Korinthos**



The present certificate is granted in accordance with:

*the DQS Hellas General Rules for the Certification of Products ,
the Specific Rule for Certification EKIPI.001 «Specific Rule for Certification
of Solar Collectors, and Thermal Solar Heating Systems for Domestic Hot
Water»,*

*and is ruled by the terms of the relevant contract between DQS Hellas and the
enterprise.*

Date of issue: **2020-09-10**

Date of valid: **2023-05-30**

Panagiotis Giannoutsos
Director of Certification

Dr. Emmanuel Deliyannakis
Managing Director



Products Certification
Accreditation No 735

Accredited Body: 4, Kalavriton Street, 14564 Kifisia - Athens, Greece

ΓΚΠΠ-08 – 15/12/2014



CERTIFICATION LICENCE TO USE KEYMARK

Certificate No SKM 10093.2

DQS Hellas grants the present certificate to the enterprise:

CICERO HELLAS S.A.

for the product:

**Flat plate Solar Collector type:
PRISMA 2.0, PRISMA 2.5**

which is produced in conformity with the normative document:

**EN 12975-1 : 2011
EN ISO 9806:2017**

at the following location:

**Kyra Vrissi Korinthias
P.O.Box.25, Korinthos**



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The present certificate is granted in accordance with:

- *the DQS Hellas General Rules for the Certification of Products ,*
- *the Specific Rule for Certification EKIII.001 «Specific Rule for Certification of Solar Collectors, and Thermal Solar Heating Systems for Domestic Hot Water»,*
- *the Specific CEN Keymark Scheme Rules for Solar Thermal Products,*

and is ruled by the terms of the relevant contract between DQS Hellas and the enterprise.

Date of issue: **2020-09-10**

Date of valid: **2023-05-30**

Panagiotis Giannoutsos
Director of Certification

Dr. Emmanuel Deliyannakis
Managing Director



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|---|--|--|----------------------|------------------------------------|-----------------------|--|----------------------------|-----------|------------------------------------|------------------------------------|-----------|--|
| Annex to Solar Keymark Certificate | | | | | Licence Number | | SKM 10093.2 | | | | | |
| | | | | | Date issued | | 2020-09-10 | | | | | |
| | | | | | Issued by | | DQS Hellas | | | | | |
| Licence holder | | CICERO HELLAS S.A. | | | Country | | Greece | | | | | |
| Brand (optional) | | CALPAK | | | Web | | www.calpak.gr | | | | | |
| Street, Number | | 9, Sygrou Ave. | | | E-mail | | export@calpak.gr | | | | | |
| Postcode, City | | 11743, 'Athens | | | Tel | | 30 2109247250 / 2109231616 | | | | | |
| Collector Type | | | | | Flat plate collector | | | | | | | |
| Collector name | | Gross area (A _g) m ² | Gross length mm | Gross width mm | Gross height mm | Power output per collector G _b = 850 W/m ² , G _d = 150 W/m ² & u = 1.3 m/s θ _m - θ _a | | | | | | |
| | | | | | | 0 K W | 10 K W | 30 K W | 50 K W | 70 K W | 85 K W | |
| PRISMA 2.0 | | 2.00 | 1,625 | 1,235 | 85 | 1,524 | 1,459 | 1,296 | 1,090 | 841 | 624 | |
| PRISMA 2.5 | | 2.50 | 2,020 | 1,235 | 85 | 1,905 | 1,823 | 1,620 | 1,363 | 1,052 | 780 | |
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| Power output per m ² gross area | | | | | | 762 | 729 | 648 | 545 | 421 | 312 | |
| Performance parameters test method | | Steady state - outdoor | | | | | | | | | | |
| Performance parameters (related to A _g) | | η ₀ , b | a1 | a2 | a3 | a4 | a5 | a6 | a7 | a8 | Kd | |
| Units | | - | W/(m ² K) | W/(m ² K ²) | J/(m ³ K) | - | J/(m ² K) | s/m | W/(m ² K ⁴) | W/(m ² K ⁴) | - | |
| Test results | | 0.777 | 2.99 | 0.027 | 0.000 | 0.00 | 0 | 0.000 | 0.00 | 0.0E+00 | 0.87 | |
| Incidence angle modifier test method | | Steady state - outdoor | | | | | | | | | | |
| Incidence angle modifier | | Angle | 10° | 20° | 30° | 40° | 50° | 60° | 70° | 80° | 90° | |
| Transversal | | K _{θT, coll} | 1.00 | 1.00 | 0.98 | 0.96 | 0.91 | 0.82 | 0.68 | 0.43 | 0.00 | |
| Longitudinal | | K _{θL, coll} | 1.00 | 1.00 | 0.98 | 0.96 | 0.91 | 0.82 | 0.68 | 0.43 | 0.00 | |
| Heat transfer medium for testing | | Water | | | | | | | | | | |
| Flow rate for testing (per gross area, A _g) | | dm/dt | 0.020 | | kg/(sm ²) | | | | | | | |
| Maximum temperature difference during thermal performance test | | (θ _m - θ _a) _{max} | 55.14 | | K | | | | | | | |
| Standard stagnation temperature (G = 1000 W/m ² ; θ _a = 30 °C) | | θ _{stg} | 180 | | °C | | | | | | | |
| Maximum operating temperature | | θ _{max, op} | - | | °C | | | | | | | |
| Maximum operating pressure | | p _{max, op} | 1000 | | kPa | | | | | | | |
| Testing laboratory | | NCSR Demokritos / Solar & other Energy System | | | | | www.solar.demokritos.gr | | | | | |
| Test report(s) | | 4272 DE1 4273 DE1 4274 DQ1 | | | | | Dated | | 20/7/2020 20/7/2020 6/8/2020 | | | |
| Comments of testing laboratory | | Datasheet version: 6.1, 2019-09-26 | | | | | | | | | | |
| | | N.C.S.R. "DEMOKRITOS" SOLAR ENERGY LABORATORY Tel: +210 6503815 - Fax: +210 6544592 P.O. BOX 60037, 15310 Ag. Paraskevi, Greece | | | | | | | | | | |
| Central Offices: Kalavriton 4, 145 64 kifisia, Athens, Tel: +301 6233493-4, Fax: +301 6233495, http://www.dqshellas.gr, e-mail: ioannisalexiou@dqshellas.gr | | | | | | | | | | | | |

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|--|--|---|-------------|-----------------------------------|-------------------------|-------------|-------------|---------------------------------------|-------------|---|-------------------------|-------------|-------------|
| Annex to Solar Keymark Certificate | | | | | | | | Licence Number | | SKM 10093.2 | | | |
| Supplementary Information | | | | | | | | Issued | | 2020-09-10 | | | |
| Annual collector output in kWh/collector at mean fluid temperature ϑ_m | | | | | | | | | | | | | |
| Standard Locations | | Athens | | | Davos | | | Stockholm | | | Würzburg | | |
| Collector name | ϑ_m | 25°C | 50°C | 75°C | 25°C | 50°C | 75°C | 25°C | 50°C | 75°C | 25°C | 50°C | 75°C |
| PRISMA 2.0 | | 2,393 | 1,723 | 1,068 | 1,845 | 1,248 | 714 | 1,355 | 878 | 492 | 1,470 | 947 | 522 |
| PRISMA 2.5 | | 2,991 | 2,154 | 1,335 | 2,306 | 1,560 | 893 | 1,694 | 1,097 | 615 | 1,837 | 1,184 | 652 |
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| Annual output per m ² gross area | | 1,197 | 862 | 534 | 923 | 624 | 357 | 677 | 439 | 246 | 735 | 474 | 261 |
| Annual efficiency, η_a | | 68% | 49% | 30% | 57% | 38% | 22% | 58% | 38% | 21% | 59% | 38% | 21% |
| Fixed or tracking collector | | Fixed (slope = latitude - 15°; rounded to nearest 5°) | | | | | | | | | | | |
| Annual irradiation on collector plane | | 1765 kWh/m ² | | | 1630 kWh/m ² | | | 1166 kWh/m ² | | | 1244 kWh/m ² | | |
| Mean annual ambient air temperature | | 18.5°C | | | 3.2°C | | | 7.5°C | | | 9.0°C | | |
| Collector orientation or tracking mode | | South, 25° | | | South, 30° | | | South, 45° | | | South, 35° | | |
| The collector is operated at constant temperature ϑ_m (mean of in- and outlet temperatures). The calculation of the annual collector performance is performed with the official Solar Keymark spreadsheet tool Scenocalc Ver. 6.1 (September 2019). A detailed description of the calculations is available at http://www.estif.org/solarkeymarknew/ | | | | | | | | | | | | | |
| Additional Information | | | | | | | | | | | | | |
| Collector heat transfer medium | | | | | | | | | | Water-Glycole | | | |
| The collector is deemed to be suitable for roof integration | | | | | | | | | | No | | | |
| The collector was tested successfully under the following conditions: | | | | | | | | | | | | | |
| Climate class (A+, A, B or C) | | | | | | | | | | A | | -- | |
| G (W/m ²) > | | 1000 | | ϑ_a (°C) > | | 20 | | H _x (MJ/m ²) > | | 600 | | | |
| Maximum tested positive load | | | | | | | | | | 3000 | | Pa | |
| Maximum tested negative load | | | | | | | | | | 3000 | | Pa | |
| Hail resistance using steel ball (maximum drop height) | | | | | | | | | | 2 | | m | |
| Additional collector attribute(s) | | | | | | | | | | | | | |
| <input type="checkbox"/> Using external power source(s) for normal operation | | | | | | | | | | <input type="checkbox"/> Active or passive measure(s) for self-protection | | | |
| <input type="checkbox"/> Co-generating thermal and electrical power | | | | | | | | | | <input type="checkbox"/> Façade collector(s) | | | |
| Energy Labelling Information | | | | | | | | | | | | | |
| | Reference Area, A _{sol} (m ²) | | | Hydraulic Designation Code | | | | | | Aperture Area, A _a (m ²) | | | |
| PRISMA 2.0 | 2.00 | | | 12-VH-1234S-A:7.2,1525- | | | | | | 1.91 | | | |
| PRISMA 2.5 | 2.50 | | | 12-VH-1234S-A:7.2,1920- | | | | | | 2.39 | | | |
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| Data required for CDR (EU) No 811/2013 - Reference Area | | | | | | | | | | | | | |
| Collector efficiency (η_{col}) | | 60% | | | | | | | | | | | |
| Remark: Collector efficiency (η_{col}) is defined in CDR (EU) No 811/2013 as collector efficiency of the solar collector at a temperature difference between the solar collector and the surrounding air of 40 K and a global solar irradiance of 1000 W/m ² , expressed in % and rounded to the nearest integer. Deviating from the regulation η_{col} is based on reference area (A _{sol}) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2017. | | | | | | | | | | | | | |
| Data required for CDR (EU) No 812/2013 - Reference Area A_{sol} | | | | | | | | | | | | | |
| Zero-loss efficiency (η_0) | | 0.76 | | | | | | | | | | | |
| First-order coefficient (a_1) | | 2.99 | | | | | | | | | | | |
| Second-order coefficient (a_2) | | 0.027 | | | | | | | | | | | |
| Incidence angle modifier IAM (50°) | | 0.91 | | | | | | | | | | | |
| Remark: The data given in this section are related to collector reference area (A _{sol}) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806. Consistent data sets for either aperture or gross area can be used in calculations like in the regulation 811 and 812 and simulation programs. | | | | | | | | | | | | | |
| Central Offices: Kalavriton 4, 145 64 kifisia, Athens, Tel: +301 6233493-4 , Fax: +301 6233495, http://www.dqshellas.gr , e-mail: ioannisaalexou@dqshellas.gr | | | | | | | | | | | | | |