

AENOR

Keymark Certificate Solar thermal energy



078/000367

AENOR certifies that the organization

TERMICOL ENERGÍA SOLAR, S.L.

registered office POLIGONO INDUSTRIAL LA ISLA - CL RIO VIEJO, 39 41703 DOS HERMANAS (Sevilla - España)

supplies Solar collectors

in compliance with UNE-EN 12975-1:2006+A1:2011 (EN 12975-1:2006+A1:2010)

Trade Mark MAGNUM XL30, MAGNUM XL30H
Technical information Specified in Annexes to the Certificate

Production site POLIGONO INDUSTRIAL LA ISLA - CL RIO VIEJO, 39 41703 DOS HERMANAS (Sevilla - España)

Certification scheme In order to grant this Certificate, AENOR has tested the product and has verified the quality system implemented for its manufacture. AENOR performs these tasks periodically while the Certificate has not been cancelled, in accordance with Specific Rules RP 078.01.

This certificate supersedes 078/000367, dated 2020-11-27

First issued on 2020-11-27
Modified on 2020-12-11
Validity date 2025-11-27


Rafael GARCÍA MEIRO
Chief Executive Officer

Original Electronic Certificate

AENOR INTERNACIONAL SAU.
Génova, 6. 28004 Madrid. España
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Product certification body accredited by ENAC, number 1/C-PR271



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|---|--|---|----------------------|--|--|------------------------|----------------------|-----------------------|------------------------------------|------------------------------------|----------------|
| Annex to Solar Keymark Certificate | | Licence Number | | 078/000367 | | | | | | | |
| | | Date issued | | 2020-12-11 | | | | | | | |
| | | Issued by | | AENOR | | | | | | | |
| Licence holder | | TERMICOL ENERGÍA SOLAR, S.L. | | Country | | SPAIN | | | | | |
| Brand (optional) | | -- | | Web | | http://www.termicol.es | | | | | |
| Street, Number | | C/ Río Viejo 39 | | E-mail | | info@termicol.com | | | | | |
| Postcode, City | | 41703 Dos Hermanas - Sevilla | | Tel | | +34 954 930 545 | | | | | |
| 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 | 81 K W | |
| MAGNUM XL30 | 2,86 | 2.304 | 1.240 | 50 | 2.155 | 2.064 | 1.857 | 1.619 | 1.348 | 1.186 | |
| MAGNUM XL30H | 2,86 | 1.240 | 2.304 | 50 | 2.155 | 2.064 | 1.857 | 1.619 | 1.348 | 1.186 | |
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| Power output per m ² gross area | | | | | 753 | 722 | 649 | 566 | 471 | 415 | |
| Performance parameters test method | | Steady state - indoor | | | | | | | | | |
| Performance parameters (related to A _G) | | η ₀ , b | a ₁ | a ₂ | a ₃ | a ₄ | a ₅ | a ₆ | a ₇ | a ₈ | K _d |
| 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 | | 0,778 | 3,05 | 0,014 | 0,000 | 0,00 | 4.898 | 0,000 | 0,00 | 0,0E+00 | 0,79 |
| 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 | 0,98 | 0,96 | 0,92 | 0,85 | 0,73 | 0,48 | 0,00 | 0,00 |
| Longitudinal | | K _{θL, coll} | 1,00 | 0,98 | 0,96 | 0,92 | 0,85 | 0,73 | 0,48 | 0,00 | 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} | | 51 | | K | | | |
| Standard stagnation temperature (G = 1000 W/m ² ; θ _a = 30 °C) | | | | θ _{stg} | | 216,4 | | °C | | | |
| Maximum operating temperature | | | | θ _{max op} | | 210 | | °C | | | |
| Maximum operating pressure | | | | p _{max,op} | | 800 | | kPa | | | |
| Testing laboratory | | Fundación CENER, LEST | | | | http://www.cener.com | | | | | |
| Test report(s) | | 30.3790.0-001 30.3790.0-002 | | | | Dated | | 30/10/2020 | | | |
| Comments of testing laboratory | | Datashet version: 6.1, 2019-09-26 | | | | | | | | | |
| -- | |  | | | | | | | | | |
| AENOR INTERNACIONAL, S.A.U. - Génova, 6. - 28004 - Madrid, España - Tel. 91 432 60 00 - www.aenor.com | | | | | | | | | | | |
| Product certification body accredited by ENAC, number 1/C-PR271 | | | | | | | | | | | |



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|---|----------------|------------|
| Annex to Solar Keymark Certificate Supplementary Information | Licence Number | 078/000367 |
| | Issued | 2020-12-11 |

| 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 |
| MAGNUM XL30 | | 3.189 | 2.322 | 1.554 | 2.476 | 1.755 | 1.140 | 1.802 | 1.218 | 765 | 1.947 | 1.301 | 804 |
| MAGNUM XL30H | | 3.189 | 2.322 | 1.554 | 2.476 | 1.755 | 1.140 | 1.802 | 1.218 | 765 | 1.947 | 1.301 | 804 |
| Annual output per m ² gross area | | 1.115 | 812 | 543 | 866 | 614 | 399 | 630 | 426 | 268 | 681 | 455 | 281 |
| Annual efficiency, η_a | | 63% | 46% | 31% | 53% | 38% | 24% | 54% | 37% | 23% | 55% | 37% | 23% |
| 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 | 2500 | | Pa |
| Maximum tested negative load | 2500 | | Pa |
| Hail resistance using ice balls (diameter) | 25 | | mm |

| 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 | | Additional Informative Technical Data | |
|------------------------------|---|---------------------------------------|--|
| | Reference Area, A_{sol} (m ²) | Hydraulic Designation Code | Aperture Area, A_a (m ²) |
| MAGNUM XL30 | 2,86 | 10-V-1234S-A:7.2,2176-C:16,1284-D | 2,82 |
| MAGNUM XL30H | 2,86 | 18-H-1234S-A:7.2,1115-C:16,2108-D | 2,82 |
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| Data required for CDR (EU) No 811/2013 - Reference Area A_{sol} | | Data required for CDR (EU) No 812/2013 - Reference Area A_{sol} | |
|--|-----|---|-------|
| Collector efficiency (η_{col}) | 61% | Zero-loss efficiency (η_0) | 0,75 |
| 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. | | First-order coefficient (a_1) | 3,05 |
| | | Second-order coefficient (a_2) | 0,014 |
| | | Incidence angle modifier IAM (50°) | 0,84 |
| | | 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. | |