
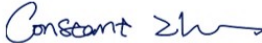


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|--|--|---|----------------------|------------------------------------|---|---------------------------|--------------------------|---|---|------------------------------------|------|------|------|------|
| Annex to Solar Keymark Certificate | | | | | Licence Number | | 011-7S3056 R | | | | | | | |
| | | | | | Date issued | | 2023-12-15 | | | | | | | |
| | | | | | Issued by | | DIN CERTCO | | | | | | | |
| Licence holder | | Jiaying JinYi Solar Energy Technology Co., Ltd. | | | Country | | China | | | | | | | |
| Brand (optional) | | JinYi | | | Web | | www.jinyi-solar.com | | | | | | | |
| Street, Number | | Caozhuang Industrial Park, Yuxin Town | | | E-mail | | info@jinyi-solar.com | | | | | | | |
| Postcode, City | | 314022, Jiaying City, Zhejiang Province | | | Tel | | +86 573-82848871 | | | | | | | |
| Collector Type | | | | | Evacuated tubular 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 | 10 K | 30 K | 50 K | 70 K | 91 K |
| | | | | | W | W | W | W | W | W | | | | |
| JMC-5818-10 | | | | | 1.55 | 1930 | 805 | 160 | 711 | 687 | 630 | 561 | 482 | 384 |
| JMC-5818-12 | | | | | 1.84 | 1930 | 955 | 160 | 843 | 814 | 747 | 666 | 571 | 455 |
| JMC-5818-15 | | | | | 2.28 | 1930 | 1180 | 160 | 1042 | 1006 | 922 | 822 | 706 | 563 |
| JMC-5818-18 | | | | | 2.71 | 1930 | 1405 | 160 | 1241 | 1198 | 1099 | 979 | 841 | 670 |
| JMC-5818-20 | | | | | 3.00 | 1930 | 1555 | 160 | 1373 | 1326 | 1216 | 1084 | 930 | 742 |
| JMC-5818-22 | | | | | 3.29 | 1930 | 1705 | 160 | 1506 | 1454 | 1333 | 1189 | 1020 | 813 |
| JMC-5818-24 | | | | | 3.58 | 1930 | 1855 | 160 | 1638 | 1582 | 1450 | 1293 | 1110 | 885 |
| JMC-5818-25 | | | | | 3.73 | 1930 | 1930 | 160 | 1704 | 1646 | 1509 | 1345 | 1155 | 920 |
| JMC-5818-30 | | | | | 4.45 | 1930 | 2305 | 160 | 2036 | 1966 | 1802 | 1607 | 1379 | 1099 |
| | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| Power output per m² gross area | | | | | 458 | 442 | 405 | 361 | 310 | 247 | | | | |
| 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 ² K) | - | J/(m ² K) | s/m | W/(m ² K ⁴) | W/(m ² K ⁴) | - | | | |
| Test results | | 0.461 | 1.48 | 0.009 | 0.000 | 0.00 | 9150 | 0.000 | 0.00 | 0.0E+00 | 0.95 | | | |
| Incidence angle modifier test method | | Quasi dynamic - outdoor | | | | | | | | | | | | |
| Incidence angle modifier | | Angle | 10° | 20° | 30° | 40° | 50° | 60° | 70° | 80° | 90° | | | |
| Transversal | | K _{θT, coll} | 1.00 | 1.00 | 1.01 | 1.03 | 1.09 | 1.14 | 0.97 | 0.55 | 0.00 | | | |
| Longitudinal | | K _{θL, coll} | 1.00 | 1.00 | 0.99 | 0.97 | 0.92 | 0.84 | 0.70 | 0.44 | 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} | 61.45 | K | | | | | | | | | | |
| Standard stagnation temperature (G = 1000 W/m²; θ_a = 30 °C) | | θ _{stg} | 240 | °C | | | | | | | | | | |
| Maximum operating temperature | | θ _{max op} | 120 | °C | | | | | | | | | | |
| Maximum operating pressure | | p _{max, op} | 1000 | kPa | | | | | | | | | | |
| Testing laboratory | | TÜV Rheinland (Guangdong) Ltd. | | | | http://www.tuv.com | | | | | | | | |
| Test report(s) | | CN23CQQ1 001 CN23I53L 001 | | | | Dated | | 2023-12-05 2023-12-05 | | | | | | |
| Comments of testing laboratory | | Ver. 6.2 (13.01.2022) | | | | | | | | | | | | |
| | | Above performance parameters come from test type JMC-5818-10. | | | | | |  TÜVRheinland® Precisely Right.  | | | | | | |
| DIN CERTCO • Alboinstraße 56 • 12103 Berlin, Germany Tel: +49 30 7562-1131 • Fax: +49 30 7562-1141 • E-Mail: info@dincertco.de • www.dincertco.de | | | | | | | | | | | | | | |

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|---|-----------------------|---------------------|
| Annex to Solar Keymark Certificate Supplementary Information | Licence Number | 011-7S3056 R |
| | Issued | 2023-12-15 |

| Gross Thermal Yield 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 |
| JMC-5818-10 | | 1 206 | 951 | 697 | 966 | 733 | 515 | 707 | 517 | 352 | 765 | 560 | 375 |
| JMC-5818-12 | | 1 430 | 1 128 | 826 | 1 145 | 870 | 610 | 839 | 613 | 418 | 907 | 664 | 445 |
| JMC-5818-15 | | 1 767 | 1 394 | 1 021 | 1 415 | 1 074 | 754 | 1 036 | 758 | 516 | 1 121 | 821 | 550 |
| JMC-5818-18 | | 2 105 | 1 660 | 1 216 | 1 685 | 1 280 | 898 | 1 234 | 903 | 614 | 1 335 | 977 | 655 |
| JMC-5818-20 | | 2 329 | 1 837 | 1 345 | 1 865 | 1 416 | 994 | 1 366 | 999 | 680 | 1 478 | 1 081 | 725 |
| JMC-5818-22 | | 2 554 | 2 015 | 1 475 | 2 045 | 1 553 | 1 090 | 1 498 | 1 095 | 746 | 1 620 | 1 186 | 795 |
| JMC-5818-24 | | 2 778 | 2 192 | 1 605 | 2 225 | 1 689 | 1 185 | 1 629 | 1 191 | 811 | 1 763 | 1 290 | 865 |
| JMC-5818-25 | | 2 891 | 2 281 | 1 670 | 2 315 | 1 758 | 1 233 | 1 695 | 1 240 | 844 | 1 834 | 1 342 | 900 |
| JMC-5818-30 | | 3 453 | 2 724 | 1 994 | 2 765 | 2 099 | 1 473 | 2 025 | 1 481 | 1 008 | 2 190 | 1 603 | 1 075 |
| Gross Thermal Yield per m ² gross area | | | | | | | | | | | | | |
| Annual efficiency, η_a | | | | | | | | | | | | | |
| Fixed or tracking collector | | | | | | | | | | | | | |
| Annual irradiation on collector plane | | | | | | | | | | | | | |
| Mean annual ambient air temperature | | | | | | | | | | | | | |
| Collector orientation or tracking mode | | | | | | | | | | | | | |

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. 6.2 (13.01.2022). 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) | | | B |
| G (W/m ²) > | 900 | ϑ_a (°C) > | 15 |
| Maximum tested positive load | | | 1700 |
| Maximum tested negative load | | | 1600 |
| Hail resistance using steel ball (maximum drop height) | | | 0.6 |
| Additional collector attribute(s) | | | |
| Using external power source(s) for normal operation | No | Active or passive measure(s) for self-protection | No |
| Co-generating thermal and electrical power | No | Façade collector(s) | No |

| Energy Labelling Information | | Additional Informative Technical Data | |
|------------------------------|---|---------------------------------------|--|
| | Reference Area, A_{sol} (m ²) | Hydraulic Designation Code | Aperture Area, A_a (m ²) |
| JMC-5818-10 | 1.55 | 1-H-12S-C:15,890-D | 0.95 |
| JMC-5818-12 | 1.84 | 1-H-12S-C:15,1040-D | 1.13 |
| JMC-5818-15 | 2.28 | 1-H-12S-C:15,1265-D | 1.42 |
| JMC-5818-18 | 2.71 | 1-H-12S-C:15,1490-D | 1.70 |
| JMC-5818-20 | 3.00 | 1-H-12S-C:15,1640-D | 1.89 |
| JMC-5818-22 | 3.29 | 1-H-12S-C:15,1790-D | 2.08 |
| JMC-5818-24 | 3.58 | 1-H-12S-C:15,1940-D | 2.27 |
| JMC-5818-25 | 3.73 | 1-H-12S-C:15,2015-D | 2.36 |
| JMC-5818-30 | 4.45 | 1-H-12S-C:15,2390-D | 2.83 |

| 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}) | 38% | Zero-loss efficiency (η_0) | 0.46 |
| 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) | 1.48 |
| | | Second-order coefficient (a_2) | 0.009 |
| | | Incidence angle modifier IAM (50°) | 0.99 |
| | | 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. | |