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|---|---|------------------------------|--------------------------|---------------------------|--|---|----------------------|-----------------------------|----------------------------|-------------|-----------|------------------|------|------|
| Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate | | | | | | Licence Number | | 011-7S2265 R | | | | | | |
| | | | | | | Issued | | 09 Desember 2013 | | | | | | |
| Company holding the | | | | | | Country | | | | | | | | |
| Brand (optional) | | | | | | Website | | | | | | | | |
| Street, street number | | | | | | E-mail | | | | | | | | |
| Postal Code / City, province | | | | | | Tel/Fax | | | | | | | | |
| Collector Type (flat plate glazed/un-glazed; evacuate tubular) | | | | | | Evacuated tubular collector | | | | | | | | |
| Thermal / photo voltaic hybrid collector? (PVT collector) | | | | | | No | | | | | | | | |
| Integration in the roof possible? (manufacturers declaration) | | | | | | No | | | | | | | | |
| Collector name | Aperture area (Aa) m ² | Gross length mm | Gross width mm | Gross height mm | Gross area (AG) m ² | Power output per collector module Gb = 850 W/m ² ; Gd = 150 W/m ² | | | | | | | | |
| | | | | | | Tm-Ta | | | | | | | | |
| | | | | | | 0 K | 10 K | 30 K | 50 K | 70 K | | | | |
| | | | | | | W | W | W | W | W | | | | |
| SZ58/1800-10HA | 0.92 | 2 000 | 870 | 150 | 1.74 | 682 | 658 | 609 | 561 | 512 | | | | |
| SZ58/1800-15HA | 1.38 | 2 000 | 1 260 | 150 | 2.52 | 1 024 | 987 | 914 | 841 | 768 | | | | |
| SZ58/1800-20HA | 1.84 | 2 000 | 1 650 | 150 | 3.30 | 1 365 | 1 316 | 1 219 | 1 121 | 1 024 | | | | |
| SZ58/1800-25HA | 2.31 | 2 000 | 2 040 | 150 | 4.08 | 1 706 | 1 645 | 1 523 | 1 401 | 1 280 | | | | |
| SZ58/1800-30HA | 2.77 | 2 000 | 2 430 | 150 | 4.86 | 2 047 | 1 974 | 1 828 | 1 682 | 1 536 | | | | |
| Performance test method | | | | | | Liquid heating collector - quasi-dynamic - outdoor | | | | | | | | |
| Performance parameters related to aperture | | | | | | η_{0b} | c1 | c2 | c3 | c4 | c6 | Kθd | | |
| Units | | | | | | - | W/(m ² K) | W/(m ² K) | J/(m ³ K) | - | s/m | - | | |
| Test results - Flow rate and fluid see note 1 | | | | | | 0.733 | 2.643 | 0.000 | 0.000 | 0.000 | 0.000 | 1.065 | | |
| Bi-directional incidence angle | | | | | | Yes | | | | | | | | |
| Incidence angle modifiers Kθ(θL) longitudinal direction | | | | | | Kθ values are obligatory for 50°. | | | | | | | | |
| Angle | | | | | | 10° | 20° | 30° | 40° | 50° | 60° | 70° | 80° | 90° |
| Kθ(θL) | | | | | | 1.00 | 1.00 | 0.99 | 0.98 | 0.96 | 0.94 | 0.88 | 0.00 | 0.00 |
| Incidence angle modifiers Kθ(θT) transversal direction | | | | | | Yes | | | | | | | | |
| Angle | | | | | | 10° | 20° | 30° | 40° | 50° | 60° | 70° | 80° | 90° |
| Kθ(θT) | | | | | | 1.02 | 1.08 | 1.19 | 1.37 | 1.52 | 1.58 | 1.50 | 1.20 | 0.00 |
| Stagnation temperature - Weather conditions see note 2 | | | | | | Tstg | | 227 °C | | | | | | |
| Effective thermal capacity | | | | | | ceff = C/Ag | | 63.57 kl/(m ² K) | | | | | | |
| Max. intended operation temperature - see note 3 | | | | | | Tmax,op | | 120 °C | | | | | | |
| Max. operation pressure - see note 3 | | | | | | pmax,op | | 600 kPa | | | | | | |
| Pressure drop table - for a collector family, the values shall be for the module with highest ΔP per m² aperture area | | | | | | | | | | | | | | |
| Flow rate | kg/(s m ²) | 0.003 | 0.007 | 0.010 | 0.013 | 0.017 | 0.020 | 0.023 | 0.027 | 0.030 | 0.033 | | | |
| Pressure drop, ΔP | Pa | 39 | 109 | 176 | 254 | 376 | 482 | 599 | 774 | 918 | 1075 | | | |
| Optional weather data | | | | | | Location | Link | | | | | | | |
| Testing Laboratory | | | | | | TUV Rheinland (Shanghai) Co., Ltd. | | | | | | | | |
| Website | | | | | | www.tuv.com | | | | | | | | |
| Test report id. number | | | | | | 154019941_EN_Sunrain_30_Report | | | Date of test report | | | 04 Desember 2013 | | |
| During the test GDIF/GTOT was always between | | | | | | 0.065 | and | 0.892 | | | | | | |
| Comments of testing laboratory: | | | | | | | | | | | | | | |
| Example comment. | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| Note 1 | Flow rate | 0.028 kg/(s m ²) | Fluid | Water | | | | | | | | | | |
| Note 2 | Irradiance, G = 1000 W/m ² ; Ambient temperature, Ta=30 °C | | | | | | | | | | | | | |
| Note 3 | Given by manufacturer | | | | | | | | | | | | | |
|  Date sheet version: 4.04, 2013-04-22 | | | | | | | | | | | | | | |



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| Annual collector output based on EN 12975 Test Results, annex to Solar KEYMARK Certificate | Licence Number | 011-7S2265 R |
| | Issued | 09 December 2013 |

| Annual collector output kWh/module | | | | | | | | | | | | | | |
|------------------------------------|--|-------|-------|-------|-------|-------|-----------|-------|-------|----------|-------|-------|--|--|
| Collector name | Location and collector temperature (T _m) | | | | | | | | | | | | | |
| | Athens | | | Davos | | | Stockholm | | | Würzburg | | | | |
| | 25°C | 50°C | 75°C | 25°C | 50°C | 75°C | 25°C | 50°C | 75°C | 25°C | 50°C | 75°C | | |
| SZ58/1800-10HA | 1 230 | 999 | 803 | 1 015 | 823 | 663 | 707 | 544 | 418 | 780 | 603 | 461 | | |
| SZ58/1800-15HA | 1 845 | 1 498 | 1 205 | 1 522 | 1 234 | 995 | 1 060 | 817 | 627 | 1 170 | 904 | 692 | | |
| SZ58/1800-20HA | 2 459 | 1 998 | 1 606 | 2 030 | 1 646 | 1 327 | 1 414 | 1 089 | 836 | 1 560 | 1 205 | 923 | | |
| SZ58/1800-25HA | 3 074 | 2 497 | 2 008 | 2 537 | 2 057 | 1 658 | 1 767 | 1 361 | 1 045 | 1 949 | 1 507 | 1 153 | | |
| SZ58/1800-30HA | 3 689 | 2 997 | 2 409 | 3 045 | 2 468 | 1 990 | 2 121 | 1 633 | 1 253 | 2 339 | 1 808 | 1 384 | | |
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| Collector mounting: Fixed or tracking | Fixed; slope = latitude - 15° (rounded to nearest 5°) |
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| Overview of locations | | | | |
|-----------------------|------------|-------------------------------------|-------------------|--|
| Location | Latitude ° | G _{tot} kWh/m ² | T _a °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° |
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|------------------|--|--------------------|
| 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>.

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|---|-----------------------|
| <p align="center">DIN CERTCO • Alboinstraße 56 • 12103 Berlin Tel: +49 30 7562-1131 • Fax: +49 30 7562-1141 • E-Mail: info@dincertco.de • www.dincertco.de</p> | Datasheet version: |
| | 4.04, 2013-04-22 |
| | ScenoCalc version: |
| | Ver. 4.04 (Jun, 2013) |