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| Annex to Solar Keymark Certificate Supplementary Information | Licence Number | 011-7S2624R |
| | Issued | 2019-10-07 |

| Annual collector output in kWh/collector at mean fluid temperature ϑ_m | | | | | | | | | | | | | |
|--|-------------------------------------|---|-------|-------|-------------------------|-------|-------|-------------------------|-------|------|-------------------------|-------|-------|
| Collector name | Standard Locations ϑ_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 |
| lprb 58-12 | | 1 270 | 1 008 | 769 | 1 028 | 801 | 602 | 735 | 545 | 390 | 803 | 598 | 425 |
| lprb 58-18 | | 1 868 | 1 482 | 1 131 | 1 512 | 1 178 | 885 | 1 081 | 802 | 574 | 1 181 | 879 | 625 |
| lprb 58-20 | | 2 073 | 1 645 | 1 256 | 1 678 | 1 308 | 982 | 1 200 | 890 | 637 | 1 311 | 976 | 694 |
| lprb 58-22 | | 2 278 | 1 808 | 1 380 | 1 845 | 1 438 | 1 080 | 1 319 | 978 | 700 | 1 441 | 1 073 | 763 |
| lprb 58-24 | | 2 471 | 1 961 | 1 497 | 2 001 | 1 559 | 1 171 | 1 431 | 1 061 | 760 | 1 563 | 1 163 | 827 |
| lprb 58-30 | | 3 081 | 2 445 | 1 867 | 2 495 | 1 944 | 1 460 | 1 784 | 1 323 | 947 | 1 949 | 1 451 | 1 031 |
| Annual output per m ² gross area | | 623 | 494 | 377 | 504 | 393 | 295 | 360 | 267 | 191 | 394 | 293 | 208 |
| Fixed or tracking collector | | Fixed (slope = latitude - 15°; rounded to nearest 5°) | | | | | | | | | | | |
| Annual irradiation on collector plane | | 1765 kWh/m ² | | | 1714 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. 6.0 (October 2018). A detailed description of the calculations is available at www.solarkeymark.org/scenocalc

| 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) | | | C |
| G (W/m ²) > | ϑ_a (°C) > | H_x (MJ/m ²) > | |
| Maximum tested positive load | | | 2400 Pa |
| Maximum tested negative load | | | 2400 Pa |
| Hail resistance using steel ball (maximum drop height) | | | 1.4 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"/> Wind and/or infrared sensitive collector(s) (WISC) | | |
| <input type="checkbox"/> Façade collector(s) | | | |

| Energy Labelling Information | | |
|------------------------------|---|----------------------------|
| | Reference Area, A_{sol} (m ²) | Hydraulic Designation Code |
| lprb 58-12 | 2.04 | 1-H-12S-C:19.6,1090 |
| lprb 58-18 | 3.00 | 1-H-12S-C:19.6,1570 |
| lprb 58-20 | 3.33 | 1-H-12S-C:19.6,1730 |
| lprb 58-22 | 3.66 | 1-H-12S-C:19.6,1890 |
| lprb 58-24 | 3.97 | 1-H-12S-C:19.6,2050 |
| lprb 58-30 | 4.95 | 1-H-12S-C:19.6,2530 |

| 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}) | 32% | Zero-loss efficiency (η_0) | 0.38 |
| 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) | 1.28 |
| | | Second-order coefficient (a_2) | 0.003 |
| | | Incidence angle modifier IAM (50°) | 1.06 |
| | | 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. | |