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| Annex to Solar Keymark Certificate Supplementary Information | Licence Number | 011-7S425 |
| | Issued | 2021-12-13 |

| Annual collector output in kWh/collector at mean fluid temperature ϑ_m | | | | | | | | | | | | | |
|--|--------------------|---|-------|-------|-------------------------|-------|------|-------------------------|-------|------|-------------------------|-------|------|
| Collector name | Standard Locations | Athens | | | Davos | | | Stockholm | | | Würzburg | | |
| | 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 |
| CS 155 | | 2 339 | 1 623 | 1 022 | 1 749 | 1 173 | 706 | 1 290 | 818 | 475 | 1 410 | 886 | 507 |
| CS 255 | | 2 339 | 1 623 | 1 022 | 1 749 | 1 173 | 706 | 1 290 | 818 | 475 | 1 410 | 886 | 507 |
| CS 350 | | 2 933 | 2 035 | 1 282 | 2 193 | 1 470 | 885 | 1 618 | 1 025 | 596 | 1 768 | 1 111 | 635 |
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| Annual output per m ² gross area | | 1 164 | 807 | 509 | 870 | 583 | 351 | 642 | 407 | 236 | 702 | 441 | 252 |
| Annual efficiency, η_a | | 66% | 46% | 29% | 53% | 36% | 22% | 55% | 35% | 20% | 56% | 35% | 20% |
| 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 | 2800 | | Pa |
| Hail resistance using steel ball (maximum drop height) | 1.6 | | 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 checked="" 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) |
| CS 155 | 2.01 | 5,5-V-12V-7.2,1856-16.6,990 | 1.87 |
| CS 255 | 2.01 | 10-V-1234S-7.2,1839-16.6,1070-D | 1.87 |
| CS 350 | 2.52 | 6,5-V-12V-7.2,2076-16.6,1110 | 2.35 |
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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}) | 56% | Zero-loss efficiency (η_0) | 0.73 |
| 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) | 3.75 |
| | | Second-order coefficient (a_2) | 0.012 |
| | | Incidence angle modifier IAM (50°) | 0.94 |
| | | 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. | |