

|                                                                                                                                                                                                                                   |  |                                                                           |  |       |                                                                                                                                                          |                      |                                                                     |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------|--|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------------------------------------------------------------------|----------------------|-----------------------|------------------------------------------------------------|---------------------|------------------------------------|--------------------------------------------------------------------------------------------------------|-------|------|------|------|------|
| <b>Annex to Solar Keymark Certificate</b>                                                                                                                                                                                         |  |                                                                           |  |       | <b>Licence Number</b>                                                                                                                                    |                      | <b>011-7S3163 R</b>                                                 |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
|                                                                                                                                                                                                                                   |  |                                                                           |  |       | <b>Date issued</b>                                                                                                                                       |                      | <b>2023-01-11</b>                                                   |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
|                                                                                                                                                                                                                                   |  |                                                                           |  |       | <b>Issued by</b>                                                                                                                                         |                      | <b>DIN CERTCO</b>                                                   |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
| <b>Licence holder</b>                                                                                                                                                                                                             |  | <b>Apricus Energy Co., Ltd</b>                                            |  |       | <b>Country</b>                                                                                                                                           |                      | <b>China</b>                                                        |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
| <b>Brand (optional)</b>                                                                                                                                                                                                           |  | <b>Apricus</b>                                                            |  |       | <b>Web</b>                                                                                                                                               |                      | <b><a href="http://www.apricus.com">http://www.apricus.com</a></b>  |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
| <b>Street, Number</b>                                                                                                                                                                                                             |  | <b>Room 1208, PV Technology Zone North Road 6 Yuhe, Jiangbei New Area</b> |  |       | <b>E-mail</b>                                                                                                                                            |                      | <b><a href="mailto:service@apricus.com">service@apricus.com</a></b> |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
| <b>Postcode, City</b>                                                                                                                                                                                                             |  | <b>211899, Nanjing City, Jiangsu Province</b>                             |  |       | <b>Tel</b>                                                                                                                                               |                      | <b>+86 25-58600889</b>                                              |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
| <b>Collector Type</b>                                                                                                                                                                                                             |  |                                                                           |  |       | <b>Evacuated tubular collector</b>                                                                                                                       |                      |                                                                     |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
| <b>Collector name</b>                                                                                                                                                                                                             |  |                                                                           |  |       | <b>Gross area (A<sub>G</sub>)</b>                                                                                                                        |                      | <b>Gross length</b>                                                 |                      | <b>Gross width</b>    |                                                            | <b>Gross height</b> |                                    | <b>Power output per collector</b>                                                                      |       |      |      |      |      |
|                                                                                                                                                                                                                                   |  |                                                                           |  |       |                                                                                                                                                          |                      |                                                                     |                      |                       |                                                            |                     |                                    | Gb = 850 W/m <sup>2</sup> , Gd = 150 W/m <sup>2</sup> & u = 1.3 m/s<br>θ <sub>m</sub> - θ <sub>a</sub> |       |      |      |      |      |
|                                                                                                                                                                                                                                   |  |                                                                           |  |       | m <sup>2</sup>                                                                                                                                           |                      | mm                                                                  |                      | mm                    |                                                            | mm                  |                                    | 0 K                                                                                                    | 10 K  | 30 K | 50 K | 70 K | 93 K |
|                                                                                                                                                                                                                                   |  |                                                                           |  |       |                                                                                                                                                          |                      |                                                                     | W                    | W                     | W                                                          | W                   | W                                  | W                                                                                                      |       |      |      |      |      |
| <b>ETC-20</b>                                                                                                                                                                                                                     |  | 3.03                                                                      |  | 2 025 |                                                                                                                                                          | 1 495                |                                                                     | 160                  |                       | 1 399                                                      | 1 338               | 1 204                              | 1 052                                                                                                  | 883   | 668  |      |      |      |
| <b>ETC-22</b>                                                                                                                                                                                                                     |  | 3.31                                                                      |  | 2 025 |                                                                                                                                                          | 1 635                |                                                                     | 160                  |                       | 1 529                                                      | 1 462               | 1 315                              | 1 149                                                                                                  | 965   | 730  |      |      |      |
| <b>ETC-30</b>                                                                                                                                                                                                                     |  | 4.44                                                                      |  | 2 025 |                                                                                                                                                          | 2 195                |                                                                     | 160                  |                       | 2 050                                                      | 1 961               | 1 764                              | 1 541                                                                                                  | 1 294 | 979  |      |      |      |
|                                                                                                                                                                                                                                   |  |                                                                           |  |       |                                                                                                                                                          |                      |                                                                     |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
|                                                                                                                                                                                                                                   |  |                                                                           |  |       |                                                                                                                                                          |                      |                                                                     |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
|                                                                                                                                                                                                                                   |  |                                                                           |  |       |                                                                                                                                                          |                      |                                                                     |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
|                                                                                                                                                                                                                                   |  |                                                                           |  |       |                                                                                                                                                          |                      |                                                                     |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
|                                                                                                                                                                                                                                   |  |                                                                           |  |       |                                                                                                                                                          |                      |                                                                     |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
|                                                                                                                                                                                                                                   |  |                                                                           |  |       |                                                                                                                                                          |                      |                                                                     |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
|                                                                                                                                                                                                                                   |  |                                                                           |  |       |                                                                                                                                                          |                      |                                                                     |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
|                                                                                                                                                                                                                                   |  |                                                                           |  |       |                                                                                                                                                          |                      |                                                                     |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
|                                                                                                                                                                                                                                   |  |                                                                           |  |       |                                                                                                                                                          |                      |                                                                     |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
|                                                                                                                                                                                                                                   |  |                                                                           |  |       |                                                                                                                                                          |                      |                                                                     |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
|                                                                                                                                                                                                                                   |  |                                                                           |  |       |                                                                                                                                                          |                      |                                                                     |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
|                                                                                                                                                                                                                                   |  |                                                                           |  |       |                                                                                                                                                          |                      |                                                                     |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
|                                                                                                                                                                                                                                   |  |                                                                           |  |       |                                                                                                                                                          |                      |                                                                     |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
|                                                                                                                                                                                                                                   |  |                                                                           |  |       |                                                                                                                                                          |                      |                                                                     |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
|                                                                                                                                                                                                                                   |  |                                                                           |  |       |                                                                                                                                                          |                      |                                                                     |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
|                                                                                                                                                                                                                                   |  |                                                                           |  |       |                                                                                                                                                          |                      |                                                                     |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
| <b>Power output per m<sup>2</sup> gross area</b>                                                                                                                                                                                  |  |                                                                           |  |       | 462                                                                                                                                                      | 442                  | 397                                                                 | 347                  | 291                   | 221                                                        |                     |                                    |                                                                                                        |       |      |      |      |      |
| <b>Performance parameters test method</b>                                                                                                                                                                                         |  |                                                                           |  |       | <b>Steady state - outdoor</b>                                                                                                                            |                      |                                                                     |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
| <b>Performance parameters (related to A<sub>G</sub>)</b>                                                                                                                                                                          |  |                                                                           |  |       | η <sub>0</sub> , b                                                                                                                                       | a1                   | a2                                                                  | a3                   | a4                    | a5                                                         | a6                  | a7                                 | a8                                                                                                     | Kd    |      |      |      |      |
| <b>Units</b>                                                                                                                                                                                                                      |  |                                                                           |  |       | -                                                                                                                                                        | W/(m <sup>2</sup> K) | W/(m <sup>2</sup> K <sup>2</sup> )                                  | J/(m <sup>2</sup> K) | -                     | J/(m <sup>2</sup> K)                                       | s/m                 | W/(m <sup>2</sup> K <sup>4</sup> ) | W/(m <sup>2</sup> K <sup>4</sup> )                                                                     | -     |      |      |      |      |
| <b>Test results</b>                                                                                                                                                                                                               |  |                                                                           |  |       | 0.465                                                                                                                                                    | 1.94                 | 0.007                                                               | 0.000                | 0.00                  | 7 860                                                      | 0.000               | 0.00                               | 0.0E+00                                                                                                | 0.95  |      |      |      |      |
| <b>Incidence angle modifier test method</b>                                                                                                                                                                                       |  |                                                                           |  |       | <b>Steady state - outdoor</b>                                                                                                                            |                      |                                                                     |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
| <b>Incidence angle modifier</b>                                                                                                                                                                                                   |  |                                                                           |  |       | Angle                                                                                                                                                    | 10°                  | 20°                                                                 | 30°                  | 40°                   | 50°                                                        | 60°                 | 70°                                | 80°                                                                                                    | 90°   |      |      |      |      |
| <b>Transversal</b>                                                                                                                                                                                                                |  |                                                                           |  |       | K <sub>θT, coll</sub>                                                                                                                                    | 1.00                 | 1.00                                                                | 1.01                 | 1.03                  | 1.09                                                       | 1.13                | 0.96                               | 0.55                                                                                                   | 0.00  |      |      |      |      |
| <b>Longitudinal</b>                                                                                                                                                                                                               |  |                                                                           |  |       | K <sub>θL, coll</sub>                                                                                                                                    | 1.00                 | 1.00                                                                | 0.99                 | 0.97                  | 0.93                                                       | 0.86                | 0.72                               | 0.46                                                                                                   | 0.00  |      |      |      |      |
| <b>Heat transfer medium for testing</b>                                                                                                                                                                                           |  |                                                                           |  |       | <b>Water</b>                                                                                                                                             |                      |                                                                     |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
| <b>Flow rate for testing (per gross area, A<sub>G</sub>)</b>                                                                                                                                                                      |  |                                                                           |  |       | dm/dt                                                                                                                                                    |                      | 0.020                                                               |                      | kg/(sm <sup>2</sup> ) |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
| <b>Maximum temperature difference during thermal performance test</b>                                                                                                                                                             |  |                                                                           |  |       | (θ <sub>m</sub> -θ <sub>a</sub> ) <sub>max</sub>                                                                                                         |                      | 63                                                                  |                      | K                     |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
| <b>Standard stagnation temperature (G = 1000 W/m<sup>2</sup>; θ<sub>a</sub> = 30 °C)</b>                                                                                                                                          |  |                                                                           |  |       | θ <sub>stg</sub>                                                                                                                                         |                      | 240                                                                 |                      | °C                    |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
| <b>Maximum operating temperature</b>                                                                                                                                                                                              |  |                                                                           |  |       | θ <sub>max op</sub>                                                                                                                                      |                      | 110                                                                 |                      | °C                    |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
| <b>Maximum operating pressure</b>                                                                                                                                                                                                 |  |                                                                           |  |       | p <sub>max, op</sub>                                                                                                                                     |                      | 850                                                                 |                      | kPa                   |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
| <b>Testing laboratory</b>                                                                                                                                                                                                         |  |                                                                           |  |       | <b>TÜV Rheinland (Guangdong) Ltd.</b>                                                                                                                    |                      |                                                                     |                      |                       | <b><a href="http://www.tuv.com">http://www.tuv.com</a></b> |                     |                                    |                                                                                                        |       |      |      |      |      |
| <b>Test report(s)</b>                                                                                                                                                                                                             |  |                                                                           |  |       | <b>CN229GQU 001</b>                                                                                                                                      |                      |                                                                     |                      |                       | <b>Dated</b>                                               |                     | <b>2022-12-30</b>                  |                                                                                                        |       |      |      |      |      |
| <b>Comments of testing laboratory</b>                                                                                                                                                                                             |  |                                                                           |  |       | <b>Ver. 6.2 (13.01.2022)</b>                                                                                                                             |                      |                                                                     |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
| <b>Above performance parameters come from test type ETC-20.</b>                                                                                                                                                                   |  |                                                                           |  |       | <br><b>TÜVRheinland®</b><br>Precisely Right.<br><i>Constant Zhu</i> |                      |                                                                     |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |
| DIN CERTCO • Alboinstraße 56 • 12103 Berlin, Germany<br>Tel: +49 30 7562-1131 • Fax: +49 30 7562-1141 • E-Mail: <a href="mailto:info@dincertco.de">info@dincertco.de</a> • <a href="http://www.dincertco.de">www.dincertco.de</a> |  |                                                                           |  |       |                                                                                                                                                          |                      |                                                                     |                      |                       |                                                            |                     |                                    |                                                                                                        |       |      |      |      |      |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                                       |             |                      |                         |             |                                                                                |                                                  |                     |             |                                                 |             |             |                                    |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------|-------------|----------------------|-------------------------|-------------|--------------------------------------------------------------------------------|--------------------------------------------------|---------------------|-------------|-------------------------------------------------|-------------|-------------|------------------------------------|--|--|
| <b>Annex to Solar Keymark Certificate</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                    |                                                       |             |                      |                         |             | <b>Licence Number</b>                                                          |                                                  | <b>011-7S3163 R</b> |             |                                                 |             |             |                                    |  |  |
| <b>Supplementary Information</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                    |                                                       |             |                      |                         |             | <b>Issued</b>                                                                  |                                                  | <b>2023-01-11</b>   |             |                                                 |             |             |                                    |  |  |
| <b>Gross Thermal Yield in kWh/collector at mean fluid temperature <math>\vartheta_m</math></b>                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                    |                                                       |             |                      |                         |             |                                                                                |                                                  |                     |             |                                                 |             |             |                                    |  |  |
| <b>Standard Locations</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                    | <b>Athens</b>                                         |             |                      | <b>Davos</b>            |             |                                                                                | <b>Stockholm</b>                                 |                     |             | <b>Würzburg</b>                                 |             |             |                                    |  |  |
| <b>Collector name</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b><math>\vartheta_m</math></b>                    | <b>25°C</b>                                           | <b>50°C</b> | <b>75°C</b>          | <b>25°C</b>             | <b>50°C</b> | <b>75°C</b>                                                                    | <b>25°C</b>                                      | <b>50°C</b>         | <b>75°C</b> | <b>25°C</b>                                     | <b>50°C</b> | <b>75°C</b> |                                    |  |  |
| ETC-20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                    | 2 360                                                 | 1 767       | 1 234                | 1 830                   | 1 331       | 894                                                                            | 1 349                                            | 934                 | 608         | 1 464                                           | 1 012       | 646         |                                    |  |  |
| ETC-22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                    | 2 578                                                 | 1 931       | 1 348                | 2 000                   | 1 454       | 977                                                                            | 1 474                                            | 1 021               | 664         | 1 599                                           | 1 106       | 706         |                                    |  |  |
| ETC-30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                    | 3 458                                                 | 2 590       | 1 809                | 2 682                   | 1 950       | 1 311                                                                          | 1 977                                            | 1 369               | 891         | 2 145                                           | 1 483       | 947         |                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                                       |             |                      |                         |             |                                                                                |                                                  |                     |             |                                                 |             |             |                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                                       |             |                      |                         |             |                                                                                |                                                  |                     |             |                                                 |             |             |                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                                       |             |                      |                         |             |                                                                                |                                                  |                     |             |                                                 |             |             |                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                                       |             |                      |                         |             |                                                                                |                                                  |                     |             |                                                 |             |             |                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                                       |             |                      |                         |             |                                                                                |                                                  |                     |             |                                                 |             |             |                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                                       |             |                      |                         |             |                                                                                |                                                  |                     |             |                                                 |             |             |                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                                       |             |                      |                         |             |                                                                                |                                                  |                     |             |                                                 |             |             |                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                                       |             |                      |                         |             |                                                                                |                                                  |                     |             |                                                 |             |             |                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                                       |             |                      |                         |             |                                                                                |                                                  |                     |             |                                                 |             |             |                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                                       |             |                      |                         |             |                                                                                |                                                  |                     |             |                                                 |             |             |                                    |  |  |
| Gross Thermal Yield per m <sup>2</sup> gross area                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                    | 779                                                   | 583         | 407                  | 604                     | 439         | 295                                                                            | 445                                              | 308                 | 201         | 483                                             | 334         | 213         |                                    |  |  |
| Annual efficiency, $\eta_a$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                    | 44%                                                   | 33%         | 23%                  | 37%                     | 27%         | 18%                                                                            | 38%                                              | 26%                 | 17%         | 39%                                             | 27%         | 17%         |                                    |  |  |
| Fixed or tracking collector                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                    | Fixed (slope = latitude - 15°; rounded to nearest 5°) |             |                      |                         |             |                                                                                |                                                  |                     |             |                                                 |             |             |                                    |  |  |
| Annual irradiation on collector plane                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                    | 1765 kWh/m <sup>2</sup>                               |             |                      | 1630 kWh/m <sup>2</sup> |             |                                                                                | 1166 kWh/m <sup>2</sup>                          |                     |             | 1244 kWh/m <sup>2</sup>                         |             |             |                                    |  |  |
| 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 $\vartheta_m$ (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 <a href="http://www.estif.org/solarkeymarknew/">http://www.estif.org/solarkeymarknew/</a>                                                                                                           |                                                    |                                                       |             |                      |                         |             |                                                                                |                                                  |                     |             |                                                 |             |             |                                    |  |  |
| <b>Additional Information</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                    |                                                       |             |                      |                         |             |                                                                                |                                                  |                     |             |                                                 |             |             |                                    |  |  |
| 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 <sup>2</sup> ) >                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                    | 900                                                   |             | $\vartheta_a$ (°C) > |                         | 15          |                                                                                | H <sub>x</sub> (MJ/m <sup>2</sup> ) >            |                     | 540         |                                                 |             |             |                                    |  |  |
| Maximum tested positive load                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                    |                                                       |             |                      |                         |             |                                                                                |                                                  |                     |             | 3000                                            |             | Pa          |                                    |  |  |
| Maximum tested negative load                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                    |                                                       |             |                      |                         |             |                                                                                |                                                  |                     |             | 2200                                            |             | Pa          |                                    |  |  |
| Hail resistance using steel ball (maximum drop height)                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                    |                                                       |             |                      |                         |             |                                                                                |                                                  |                     |             | 0.8                                             |             | m           |                                    |  |  |
| <b>Additional collector attribute(s)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                    |                                                       |             |                      |                         |             |                                                                                |                                                  |                     |             |                                                 |             |             |                                    |  |  |
| 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                                 |  |  |
| <b>Energy Labelling Information</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                    |                                                       |             |                      |                         |             | <b>Additional Informative Technical Data</b>                                   |                                                  |                     |             |                                                 |             |             |                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Reference Area, A <sub>sol</sub> (m <sup>2</sup> ) |                                                       |             |                      |                         |             | Hydraulic Designation Code                                                     |                                                  |                     |             | Aperture Area, A <sub>a</sub> (m <sup>2</sup> ) |             |             |                                    |  |  |
| ETC-20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 3.03                                               |                                                       |             |                      |                         |             | 1-H-12S-C:16.74,1495-D                                                         |                                                  |                     |             | 1.88                                            |             |             |                                    |  |  |
| ETC-22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 3.31                                               |                                                       |             |                      |                         |             | 1-H-12S-C:16.74,1635-D                                                         |                                                  |                     |             | 2.07                                            |             |             |                                    |  |  |
| ETC-30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 4.44                                               |                                                       |             |                      |                         |             | 1-H-12S-C:16.74,2195-D                                                         |                                                  |                     |             | 2.83                                            |             |             |                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                                       |             |                      |                         |             |                                                                                |                                                  |                     |             |                                                 |             |             |                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                                       |             |                      |                         |             |                                                                                |                                                  |                     |             |                                                 |             |             |                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                                       |             |                      |                         |             |                                                                                |                                                  |                     |             |                                                 |             |             |                                    |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                                       |             |                      |                         |             |                                                                                |                                                  |                     |             |                                                 |             |             |                                    |  |  |
| <b>Data required for CDR (EU) No 811/2013 - Reference Area A<sub>sol</sub></b>                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                    |                                                       |             |                      |                         |             | <b>Data required for CDR (EU) No 812/2013 - Reference Area A<sub>sol</sub></b> |                                                  |                     |             |                                                 |             |             |                                    |  |  |
| Collector efficiency ( $\eta_{col}$ )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                    |                                                       |             |                      |                         |             | 37%                                                                            |                                                  |                     |             |                                                 |             |             |                                    |  |  |
| Remark: Collector efficiency ( $\eta_{col}$ ) 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 <sup>2</sup> , expressed in % and rounded to the nearest integer. Deviating from the regulation $\eta_{col}$ is based on reference area (A <sub>sol</sub> ) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2017. |                                                    |                                                       |             |                      |                         |             | Zero-loss efficiency ( $\eta_0$ )                                              |                                                  |                     |             | 0.46                                            |             |             | --                                 |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                                       |             |                      |                         |             | First-order coefficient ( $a_1$ )                                              |                                                  |                     |             | 1.94                                            |             |             | W/(m <sup>2</sup> K)               |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                                       |             |                      |                         |             | Second-order coefficient ( $a_2$ )                                             |                                                  |                     |             | 0.007                                           |             |             | W/(m <sup>2</sup> K <sup>2</sup> ) |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                                       |             |                      |                         |             | Incidence angle modifier IAM (50°)                                             |                                                  |                     |             | 0.99                                            |             |             | --                                 |  |  |
| Remark: The data given in this section are related to collector reference area (A <sub>sol</sub> ) 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.                                                                                                                                                                                  |                                                    |                                                       |             |                      |                         |             |                                                                                |                                                  |                     |             |                                                 |             |             |                                    |  |  |
| DIN CERTCO • Alboinstraße 56 • 12103 Berlin, Germany                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                    |                                                       |             |                      |                         |             |                                                                                |                                                  |                     |             |                                                 |             |             |                                    |  |  |
| Tel: +49 30 7562-1131 • Fax: +49 30 7562-1141 • E-Mail: <a href="mailto:info@dincertco.de">info@dincertco.de</a> • <a href="http://www.dincertco.de">www.dincertco.de</a>                                                                                                                                                                                                                                                                                                                                                |                                                    |                                                       |             |                      |                         |             |                                                                                |                                                  |                     |             |                                                 |             |             |                                    |  |  |