

# AENOR

## Keymark Certificate Solar thermal energy



**078/000225**

AENOR certifies that the organization

### SYSTOVI

registered office	14 AVENUE SYRMA 44470 CARQUEFOU (Francia)
supplies	Air heating solar collectors
in compliance with	Specific CEN KEYMARK Scheme Rules for Solar Thermal Products Version 28.00 – December 2015
Trade Mark	R -SUN V60
Technical characteristics	Specified in Annex to the Certificate
Production site	14 AVENUE SYRMA 44470 CARQUEFOU (Francia)
Certification scheme	In order to grant this Certificate, AENOR has tested the product and has verified the quality system implemented for its manufacture. AENOR performs these tasks periodically while the Certificate has not been cancelled, in accordance with Specific Rules RP 078.01.  The tests have been performed according to the EN ISO 9806:2013 standard. The specific requirements for certifying solar air collectors are established in annex L of these Specific Rules.
First issued on	2014-12-26
Last issued on	2019-12-26
Validity date	2024-12-26


Rafael GARCÍA MEIRO  
Chief Executive Officer

Original Electronic Certificate

**AENOR INTERNACIONAL S.A.U.**  
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Product certification body accredited by ENAC, number 1/C-PR271



<b>Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate</b>						<b>Licence Number</b>		<b>078/000225</b>							
						<b>Issued</b>		<b>2019-12-26</b>							
<b>Company holding the</b>		<b>SYSTOVI</b>				<b>Country</b>		<b>FRANCE</b>							
<b>Brand (optional)</b>		<b>--</b>				<b>Website</b>		<b>www.systovi.com</b>							
<b>Street, street number</b>		<b>14 AVENUE SYRMA</b>				<b>E-mail</b>		<b>M.BENABDELKARIM@systovi.com</b>							
<b>Postal Code / City, province</b>		<b>44470 CARQUEFOU</b>				<b>Tel/Fax</b>		<b>+33 02 40 92 44 20</b>							
<b>Collector Type</b> (flat plate glazed/un-glazed; evacuate tubular)						<b>Flat plate collector (air heating)- glazed</b>									
<b>Thermal / photo voltaic hybrid collector?</b> (PVT collector)						<b>No</b>									
<b>Integration in the roof possible ?</b> (manufacturers declaration)						<b>Yes</b>									
						<b>Power output per collector module</b>									
						<b>G = 1000 W/m<sup>2</sup></b>									
						<b>#iREF!</b>									
						<b>T<sub>m</sub> - T<sub>a</sub> [K] =</b>		<b>9</b>		<b>9,7</b>		<b>11,7</b>			
<b>Collector name</b>						<b>m<sup>2</sup></b>		<b>mm</b>		<b>mm</b>		<b>mm</b>			
<b>R- SUN V60</b>						<b>2,84</b>		<b>1.700</b>		<b>1.974</b>		<b>40</b>			
						<b>Gross area (A<sub>g</sub>)</b>		<b>m<sup>2</sup></b>		<b>270</b>		<b>241,2</b>			
						<b>2,84</b>		<b>1.700</b>		<b>1.974</b>		<b>40</b>			
						<b>3,36</b>		<b>270</b>		<b>241,2</b>		<b>172,8</b>			
						<b>Power output [W] =</b>		<b>1.654</b>		<b>1.588</b>		<b>1.392</b>			
<b>Performance test method</b>						<b>Glazed liquid heating collector - steady state - indoor</b>									
<b>Mass flow rate depending performance parameters related to aperture area</b>						<b>η(270 kg/h)</b>		<b>η(241,2 kg/h)</b>		<b>η(172,8 kg/h)</b>					
<b>Units</b>						<b>--</b>		<b>--</b>		<b>--</b>					
<b>Test results - Flow rate and fluid see note 1</b>						<b>0,493</b>		<b>0,473</b>		<b>0,415</b>					
<b>Bi-directional incidence angle modifiers?</b>						<b>No</b>		<b>Kθ values are obligatory for 50°.</b>							
<b>Incidence angle modifiers Kθ(θ)</b>						<b>Angle</b>		<b>10°</b>		<b>20°</b>		<b>30°</b>			
						<b>Kθ(θ)</b>						<b>0,96</b>			
<b>Incidence angle modifier not bi-directional - leave fields blank</b>												<b>0,00</b>			
<b>Stagnation temperature - Weather conditions see note 2</b>						<b>T<sub>stg</sub></b>		<b>138</b>		<b>°C</b>					
<b>Effective thermal capacity</b>						<b>C<sub>eff</sub> = C/A<sub>g</sub></b>		<b>2,32</b>		<b>kJ/(m<sup>2</sup>K)</b>					
<b>Max. intended operation temperature - see note 3</b>						<b>T<sub>max,op</sub></b>		<b>70</b>		<b>°C</b>					
<b>Max. operation pressure - see note 3</b>						<b>p<sub>max,op</sub></b>		<b>0,1</b>		<b>kPa</b>					
<b>Pressure drop table - for a collector family, the values shall be for the module with highest ΔP per m<sup>2</sup> aperture area</b>															
<b>Flow rate</b>		<b>kg/(s m<sup>2</sup>)</b>		<b>0,000</b>		<b>0,042</b>		<b>0,053</b>		<b>0,063</b>		<b>0,066</b>		<b>0,075</b>	
<b>Pressure drop, ΔP</b>		<b>Pa</b>		<b>0</b>		<b>54</b>		<b>63</b>		<b>86</b>		<b>98</b>		<b>124</b>	
<b>Optional weather data</b>		<b>Location</b>				<b>Link</b>									
<b>Testing Laboratory</b>						<b>Fundación CENER-CIEMAT, LEST</b>									
<b>Website</b>						<b>www.cener.com</b>									
<b>Test report id. number</b>						<b>30,2200,0-1-1 R Anexo 5</b>				<b>Date of test report</b>		<b>2014/12/16</b>			
						<b>30,2200,0-2-1 R Anexo 6</b>									
<b>During the test G<sub>DIF</sub>/G<sub>TOT</sub> was always between</b>						<b>0,12</b>		<b>and</b>		<b>0,13</b>					
<b>Comments of testing laboratory:</b>															
1 For open to ambient solar air heaters, sucking in ambient air, it is just possible to determine the instantaneous efficiency at certain mass flow rates and ambient temperature.															
2 Efficiency test has been performed in two collectors connected in parallel in an open loop, except for pressure drop test															
<b>Note 1</b>		<b>Flow rate</b>		<b>kg/(s m<sup>2</sup>)</b>		<b>Fluid</b>									
<b>Note 2</b>		<b>Irradiance, G = 1000 W/m<sup>2</sup>; Ambient temperature, T<sub>a</sub>=30 °C</b>													
<b>Note 3</b>		<b>Given by manufacturer</b>													
 <b>CENER</b> Datasheet version: 4.06, 2014-01-15															
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