Keymark Certificate
Solar thermal energy

078/000227

AENOR, Spanish Association for Standardization and Certification, certifies that the organization

SYSTOVI

registered office	5, RUE DU CHÈNE LASSÉ - CP 1008 44806 SAINT-HERBLAIN (France)
supplies	Air heating solar collectors
in compliance with	Specific CEN Keymark Scheme Rules for Solar Thermal Products Version 24.00 – November 2014
Trade Mark	R-VOLT
Technical characteristics	Specified in Annexs to the Certificate
Production site	5, RUE DU CHÈNE LASSÉ - CP 1008 44806 SAINT-HERBLAIN (France)
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 78.01. The tests have been done according to the standard EN ISO 9806:2013. The specific requirements for certifying solar air collectors are established in Annex L of these Specific Rules.
	This certificate supersedes 078/000225, dated 2014-12-26

First issued on	2014-12-26
Modified on	2015-01-22
Validity date	2019-12-26

Avelino BRITO
Chief Executive Officer

AENOR Asociación Española de Normalización y Certificación
Génova, 6. 28004 Madrid. España
Tel. 902 102 201 – www.aenor.es

Summary of EN 12975 Test Results, annex to Solar KEYMARK Certificate		Licence Number	078/000227
		Issued	2015-01-22

Company holding the	SYSTOVI	Country	FRANCE
Brand (optional)	--	Website	www.systovi.com
Street, street number	5. Rue du Chene Lassé CP 1008	E-mail	M.BENABDELKARIM@systovi.com
Postal Code / City, province	44806 SAINT HERBLAIN	Tel/Fax	02 40 92 44 20

Collector Type (flat plate glazed/un-glazed; evacuate tubular)	Flat plate collector (air heating)- unglazed
Thermal / photo voltaic hybid collector? (PVT collector)	Yes
Integration in the roof possible ? (manufacturers declaration)	Yes

Collector name	Aperture area (Aa) m²	Gross length mm	Gross width mm	Gross height mm	Gross area (Ag) m²	Power output per collector module G = 1000 W/m² ; u = 1m/s				
						Tm - Ta [K] =		8,3	9	9,9
						ṁ [kg/h] =		280,8	244,8	187,2
R-Volt	3,12	1.700	1.974	40	3,36	Power output [W] =		1.524	1.440	1.225

Performance test method		Glazed air heating collector - steady state - indoor								
Performance parameters (gross area)		η0,hem	b1	b2	bu					
Units		-	W/(m²K)	Ws/(m³K)	s/m					
Test results	187,2(kg/h)	0,358	--	--	0,0405					
	244,8 kg/h	0,419	--	--	0,0469					
	280,8 kg/h	0,443	--	--	0,0470					

Bi-directional incidence angle	No	Kθ *values are obligatory for 50°.*								
Incidence angle modifiers Kθ(θ)	Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
	Kθ(θ)					0,96				0,00
Incidence angle modifier not bi-directional - leave fields blank										

Stagnation temperature - *Weather conditions see note 2*	T_{stg}	75,3	°C
Effective thermal capacity	$c_{eff} = C/A_g$	2,55	kJ/(m²K)
Max. intende operation temperature - *see note 3*	$T_{max,op}$	70	°C
Max. operation pressure - *see note 3*	$p_{max,op}$	0,15	kPa

Pressure drop table - for a collector family, the values shall be for the module with highest ΔP per m² gross area

Flow rate	kg/(s m²)	0,000	0,045	0,050	0,058	0,062					
Pressure drop, ΔP	Pa	0	105	142	215	248					

Optional weather data	Location		Link	
Testing Laboratory	Fundación CENER-CIEMAT, LEST			
Website	www.cener.com			
Test report id. number	30.2200.0-3-1 30.2200.0-4-1	Date of test report	2014/12/16	

During the test G_{DIF}/G_{TOT} was always between	0,14	and	0,15

Comments of testing laboratory:

1 For open to ambient solar air heaters, sucking in ambient air, it is just possible to determine the instantaneous efficiency at certainmass 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
3 Thermal performance parameters are given for the PV-module working with max. electrical power output ('MPP mode')

Note 1	Flow rate	--	Fluid	Air
Note 2	Irradiance, G = 1000 W/m²; Ambient temperature , T_a=30 °C			
Note 3	Given by manufacturer			

Datasheet version: 4.06, 2014-01-15