

Holder/Issued to/Manufacturer

HAYA SOLAR GROUP LIMITED

509 of West Tower Of Urban Development International Center, No.800, Yinxiu Road, Binhu District,
CN-214072 Wuxi, China

Product name and description

Vacuum tube solar thermal collectors for water heating.

For technical information see Appendix (2 pages).

Models:	HY-H58-10	HY-H58-12	HY-H58-15	HY-H58-18
	HY-H58-20	HY-H58-22	HY-H58-24	HY-H58-25
	HY-H58-30			

Performance specification

The product is found to comply with the requirements in EN 12975-1:2006+A1:2010 Solar collectors, Part 1: General requirements and the Specific CEN Keymark Scheme Rules for Solar Thermal Products, and are based on test results according to EN ISO 9806:2013 Solar thermal collectors – Test methods.

Marking

Products conforming to this certificate shall be marked in accordance with the requirements in the Specific CEN Keymark Scheme Rules for Solar Thermal Products. The marking shall, together with the Keymark logo, show the identification code of the empowered certification body (RISE Research Institutes of Sweden AB, No. 012), also see CEN-CENELEC Internal Regulations Part 4 Certification, Annex A.

Validity

This certificate is valid until 2022-12-12 provided that the conditions in the Solar Keymark Rules are fulfilled and the standard or rules are not modified significantly. The validity of the certificate can be checked in the database, see Solar Keymark website <http://www.solarkeymark.org>.

Miscellaneous

The manufacturer's factory production control procedures are under surveillance by the responsibility of RISE. RISE certification rules SPCR 402 for Keymark – Solar Thermal Products applies.

Lennart Aronsson

Magnus Sturesson

Certificate No. SC1378-17 | issue 1 | 2017-12-13


RISE Research Institutes of Sweden AB | Certification
Box 857, SE-501 15 Borås, Sweden
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2017-08-08



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Annex to Solar Keymark Certificate - Summary of EN ISO 9806:2013 Test Results					Licence Number		SC1378-17							
					Date issued		2017-12-13							
					Issued by		RISE							
Licence holder		HAYA SOLAR GROUP LIMITED			Country		China							
Brand (optional)		HAYA			Web		www.hayasolar.com							
Street, Number		509 of West Tower Of Urban Development International Center, No.800, Yinxiu Road, Binhu District			E-mail		info@hayasolar.com							
Postcode, City		214072 Wuxi		Tel		+86 510-85160845								
Collector Type					Evacuated tubular collector									
					Power output per collector G _b = 850 W/m ² ; G _d = 150 W/m ² θ _m - θ _a									
										0 K	10 K	30 K	50 K	70 K
Collector name					Gross area (A _G) m ²	Gross length mm	Gross width mm	Gross height mm	W	W	W	W	W	W
HY-H58-10					1,41	1930	730	155	623	606	563	510	445	490
HY-H58-12					1,68	1930	870	155	742	722	671	607	530	584
HY-H58-15					2,08	1930	1080	155	921	896	833	754	658	725
HY-H58-18					2,49	1930	1290	155	1100	1070	996	901	786	866
HY-H58-20					2,76	1930	1430	155	1220	1187	1104	998	871	960
HY-H58-22					3,03	1930	1570	155	1339	1303	1212	1096	956	1054
HY-H58-24					3,30	1930	1710	155	1459	1419	1320	1194	1042	1148
HY-H58-25					3,44	1930	1780	155	1518	1477	1374	1243	1084	1195
HY-H58-30					4,11	1930	2130	155	1817	1767	1644	1487	1298	1430
Power output per m² gross area					442	430	400	362	316	348				
Performance parameters test method					Steady state - outdoor									
Performance parameters (related to AG)					η _{0,hem}	a ₁	a ₂							
Units					-	W/(m ² K)	W/(m ² K ²)							
Test results					0,442	1,105	0,010							
Incidence angle modifier test method					Steady state - outdoor									
Bi-directional incidence angle modifiers					Yes									
Incidence angle modifier					Angle	10°	20°	30°	40°	50°	60°	70°	80°	90°
Transversal					K _{θT, coll}	1,01	1,02	1,07	1,11	1,25	1,33	0,89	0,44	0,00
Longitudinal					K _{θL, coll}	1,00	0,99	0,98	0,96	0,92	0,86	0,72	0,31	0,00
Heat transfer medium for testing					Water									
Flow rate for testing (per gross area, A_G)					dm/dt	0,020	kg/(sm ²)							
Maximum temperature difference for thermal performance calculations					(θ _m - θ _a) _{max}	56,4	K							
Standard stagnation temperature (G = 1000 W/m²; θ_a = 30 °C)					θ _{stg}	210	°C							
Effective thermal capacity, incl. fluid (per gross area, A_G)					C/m ²	5,02	kJ/(Km ²)							
Maximum operating temperature					θ _{max, op}	--	°C							
Maximum operating pressure					p _{max, op}	800	kPa							
Testing laboratory					Intertek Testing Services Shenzhen Ltd. Guangzhou Branch					http://www.intertek.com				
Test report(s)					170630060GZU-001					Dated		2017-12-04		
Comments of testing laboratory					Datashet version: 5.01, 2016-03-01									
					 <i>William zheng</i>									
Certification Body: RISE Research Institutes of Sweden Certification Box 857, SE-501 15 Borås, Sweden, Phone:+46 10 516 50 00, certifying@ri.se www.ri.se														

Annex to Solar Keymark Certificate Supplementary Information	Licence Number	SC1378-17
	Issued	2017-12-13

Annual collector output in kWh/collector at mean fluid temperature ϑ_m , based on ISO 9806:2013 test results													
Collector name	Standard Locations ϑ_m	Athens			Davos			Stockholm			Würzburg		
		25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C	25°C	50°C	75°C
HY-H58-10		1107	916	703	910	721	531	664	511	367	717	554	393
HY-H58-12		1319	1091	837	1085	859	632	791	610	437	854	660	468
HY-H58-15		1637	1355	1040	1347	1067	785	982	757	542	1060	819	581
HY-H58-18		1955	1618	1242	1609	1274	937	1173	904	648	1267	979	694
HY-H58-20		2168	1794	1376	1783	1412	1039	1300	1002	718	1404	1085	769
HY-H58-22		2380	1969	1511	1958	1551	1141	1428	1100	788	1542	1191	845
HY-H58-24		2592	2145	1646	2132	1689	1243	1555	1198	859	1679	1297	920
HY-H58-25		2698	2232	1713	2220	1758	1294	1619	1247	894	1748	1350	957
HY-H58-30		3229	2671	2050	2656	2104	1548	1937	1492	1070	2092	1616	1146
Annual output per m ² gross area		785	650	499	646	512	377	471	363	260	509	393	279
Fixed or tracking collector		Fixed (slope = latitude - 15°; rounded to nearest 5°)											
Annual irradiation on collector plane		1765 kWh/m ²			1714 kWh/m ²			1166 kWh/m ²			1244 kWh/m ²		
Mean annual ambient air temperature		18,5°C			3,2°C			7,5°C			9,0°C		
Collector orientation or tracking mode		South, 25°			South, 30°			South, 45°			South, 35°		

The collector is operated at constant temperature ϑ_m (mean of in- and outlet temperatures). The calculation of the annual collector performance is performed with the official Solar Keymark spreadsheet tool Scenocalc Ver. 5.01 (March 2016). A detailed description of the calculations is available at www.solarkeymark.org/scenocalc

Additional Information		
Collector heat transfer medium	Water-Glycole	
Hybrid Thermal and Photo Voltaic collector	No	
The collector is deemed to be suitable for roof integration	No	
The collector was tested successfully according to EN ISO 9806:2013 under the following conditions:		
Climate class (A, B or C)	B	--
Maximum tested positive load	2400	Pa
Maximum tested negative load	2400	Pa
Hail resistance using steel ball (maximum drop height)	1,0	m

Energy Labelling Information				
	Reference Area, A_{sol} (m ²)	Data required for CDR (EU) No 811/2013 - Reference Area A_{sol}		
HY-H58-10	1,41	Collector efficiency (η_{col})	38	%
HY-H58-12	1,68	<i>Remark: Collector efficiency (η_{col}) is defined in CDR (EU) No 811/2013 as collector efficiency of the solar collector at a temperature difference between the solar collector and the surrounding air of 40 K and a global solar irradiance of 1000 W/m², expressed in % and rounded to the nearest integer. Deviating from the regulation η_{col} is based on reference area (A_{sol}) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806:2013.</i>		
HY-H58-15	2,08			
HY-H58-18	2,49			
HY-H58-20	2,76			
HY-H58-22	3,03			
HY-H58-24	3,30			
HY-H58-25	3,44			
HY-H58-30	4,11	Data required for CDR (EU) No 812/2013 - Reference Area A_{sol}		
		Zero-loss efficiency (η_0)	0,442	--
		First-order coefficient (a_1)	1,11	W/(m ² K)
		Second-order coefficient (a_2)	0,010	W/(m ² K ²)
		Incidence angle modifier IAM (50°)	1,07	--
<i>Remark: The data given in this section are related to collector reference area (A_{sol}) which is aperture area for values according to EN 12975-2 or gross area for ISO 9806. Consistent data sets for either aperture or gross area can be used in calculations like in the regulation 811 and 812 and simulation programs.</i>				