


CERTIFICATE

Certificate holder	Riello S.p.A. Via Ing. Pilade Riello 7 37045 Legnago VR ITALY
Production facility	Morbegno
Product	Thermal solar systems
Type, Model	NB-SOL 150/1 TP, NB-SOL 200/1 , NB-SOL 220/2 TP, NB-SOL 300/2 TP, NB-SOL 300/3 TP, NB-SOL 150/1 TI, NB-SOL 200/1 TI, NB-SOL 220/2 TI, NB-SOL 300/2 TI, NB-SOL 300/3 TI brand: BERETTA
Testing basis	DIN EN 12976-1:2017-04 DIN EN 12976-2:2017-04 Specific CEN Keymark Scheme Rules for Solar Thermal Products Version 30 (2017-04)
Mark of conformity	
Registration No.	011-7S2833 A
Valid until	2023-01-31
Right of use	This certificate entitles the holder to use the mark of conformity shown above in conjunction with the specified registration number.

Further information see annex.

ANNEX

Page 1 of 1

Certificate

011-7S2833 A dated 2018-02-20

Technical Data

see data sheet, part of the test report of 2018-01-31

1. System variant(s):

Designation	Tank	Collector (Registration No.: 011-7S2400 F)
NB-SOL 150	150 l	1 CP20TSS
NB-SOL 200	200 l	1 CP20TSS
NB-SOL 220	220 l	2 CP20TSS
NB-SOL 300	300 l	2 CP20TSS
NB-SOL 300	300 l	3 CP20TSS

2. Note(s):

- The freeze resistance test according to DIN EN 12975-2, clause 5.8 was not necessary. According to the manufacturer's declaration, the certified solar collectors may be used in frost exposed areas only in combination with appropriate frost protection mixtures or with appropriate frost protection controller.

- The optional impact resistance test for the solar collector according to DIN EN 12975-2, clause 5.10 was not carried out.

**Testing laboratory/
Inspection body**

Institut für Solartechnik SPF
Hochschule für Technik
Rapperswil
Oberseestraße 10
8640 Rapperswil
SWITZERLAND

Test report(s)

S233QPEN, S232EN dated 2018-01-31





Summary of	EN12976-2	test results	Certification No.	011-7S2833 A
Annex to Solar KEYMARK Certificate			Issued	2017-02-01

Company	Riello S.p.A.	Country	Italy
Brand (optional)	BERETTA	Website	www.riello.com
Street	Via Ing. Pilade Riello 7	E-mail	info@riello.com
Postal Code	IT-37045 Legnago	Tel. / Fax	+39 0499 323911

System family overview

Collector name	For each storage and collector size, give number of collectors			
	150lt	200lt	220lt	300lt
CP20TSS	1	1	2	2 3

Name of system configuration	NB-SOL 150/1 TP; NB-SOL 150/1 TI				
Collector name	CP20TSS	No. Collectors	1	Storage name	150lt

Calculated annual results for "solar-only / preheat system"

Location	Qd,sh MJ/y	Daily drawoff 110 l				Daily drawoff 140 l				Daily drawoff 170 l			
		Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol
		MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%
Stockholm SE	--	6150	2970	--	48	7821	3426	--	44	9492	3759	--	40
WürzburgDE	--	5897	3025	--	51	7506	3603	--	48	9114	4056	--	45
Davos CH	--	6654	4299	--	65	8483	4997	--	59	10281	5500	--	54
Athens GR	--	4573	3695	--	81	5834	4463	--	76	7064	5107	--	72

Perf. indicators for the table above



Qd,sh	MJ/y	Not relevant for solar domestic hot water system
Qd	MJ/y	Annual heat demand for domestic hot water
QL	MJ/y	Annual heat energy delivered by the solar system
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)
f _{sol} =Q _L /Q _d	-	Solar fraction

Ref. conditions		Stockholm SE	Würzburg DE	Davos CH	Athens GR
	G	1'157	1'230	1'684	1'736
	T _{a,ave}	7.5	9.0	3.2	18.5
	T _{c,ave}	8.5	10.0	5.4	17.8
	± ΔT _c	6.4	3.0	0.8	7.4

G	kWh/m ²	Annual irradiation South, 45°
T _{a,ave}	°C	Annual average outdoor air temperature
T _{c,ave}	°C	Annual average mains cold water temp.
ΔT _c	K	Seasonal variation of T _c
Th	45 °C	Desired hot water temperature (mixing valve temperature).

Max. operating press. - collector side	250	kPa	Max. operating press. - tank side	1'000	kPa
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Testing Laboratory	Institut für Solartechnik SPF, CH-8640 Rapperswil
Website	www.spf.ch
Test report id. number	S233QPEN; S232EN
Date of test report	2018-01-31
Test method	ISO 9459-5 (DST)

Comments of test lab	 INSTITUT FÜR SOLARTECHNIK 
NB-SOL 150/1 TP was tested as the "medium" subtype under SPF Test Number S232.	



Summary of	EN12976-2	test results	Certification No.	011-7S2833 A
Annex to Solar KEYMARK Certificate			Issued	2017-02-01

Company	Riello S.p.A.	Country	Italy
Brand (optional)	BERETTA	Website	www.riello.com
Street	Via Ing. Pilade Riello 7	E-mail	info@riello.com
Postal Code	IT-37045 Legnago	Tel. / Fax	+39 0499 323911

System family overview

Collector name	For each storage and collector size, give number of collectors												
	150lt			200lt			220lt			300lt			
CP20TSS	1			1			2			2	3		

Name of system configuration	NB-SOL 200/1 TP; NB-SOL 200/1 TI		
Collector name	CP20TSS	No. Collectors	1
Storage name	200lt		

Calculated annual results for "solar-only / preheat system"

Location	Qd,sh MJ/y	Daily drawoff 170 l					Daily drawoff 200 l					Daily drawoff 250 l				
		Qd,hw		QL		Qpar	Qd,hw		QL		Qpar	Qd,hw		QL		Qpar
		MJ/y	MJ/y	MJ/y	MJ/y	MJ/y	MJ/y	MJ/y	MJ/y	MJ/y	MJ/y	MJ/y	MJ/y	MJ/y	MJ/y	MJ/y
Stockholm SE	--	9492	3332	--	35	11164	3483	--	31	13939	3638	--	26			
WürzburgDE	--	9114	3573	--	39	10691	3731	--	35	13371	3878	--	29			
Davos CH	--	10281	4894	--	48	12110	5098	--	42	15137	5283	--	35			
Athens GR	--	7064	4747	--	67	8326	5145	--	62	10407	5505	--	53			

Perf. indicators for the table above

Qd,sh	MJ/y	Not relevant for solar domestic hot water system
Qd	MJ/y	Annual heat demand for domestic hot water
QL	MJ/y	Annual heat energy delivered by the solar system
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)
f _{sol} =Q _l /Q _d	-	Solar fraction

Ref. conditions		Stockholm SE	Würzburg DE	Davos CH	Athens GR
	G	1'157	1'230	1'684	1'736
	T _{a,ave}	7.5	9.0	3.2	18.5
	T _{c,ave}	8.5	10.0	5.4	17.8
	± ΔT _c	6.4	3.0	0.8	7.4

G	kWh/m ²	Annual irradiation South, 45°
T _{a,ave}	°C	Annual average outdoor air temperature
T _{c,ave}	°C	Annual average mains cold water temp.
ΔT _c	K	Seasonal variation of T _c
Th	45 °C	Desired hot water temperature (mixing valve temperature).

Max. operating press. - collector side	250	kPa	Max. operating press. - tank side	1'000	kPa
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Testing Laboratory	Institut für Solartechnik SPF, CH-8640 Rapperswil
Website	www.spf.ch
Test report id. number	S233QPEN; S232EN
Date of test report	2018-01-31
Test method	ISO 9459-5 (DST)

Comments of test lab

The SPF test number for the system subtype NB-SOL 200/1 TP is S232 ST1. The annual performance for the system subtype was calculated according to the Specific CEN Keymark Scheme Rules for system families.



Summary of	EN12976-2	test results	Certification No.	011-7S2833 A
Annex to Solar KEYMARK Certificate			Issued	2017-02-01

Company	Riello S.p.A.	Country	Italy
Brand (optional)	BERETTA	Website	www.riello.com
Street	Via Ing. Pilade Riello 7	E-mail	info@riello.com
Postal Code	IT-37045 Legnago	Tel. / Fax	+39 0499 323911

System family overview

Collector name	For each storage and collector size, give number of collectors														
	150lt			200lt			220lt			300lt					
CP20TSS	1			1		2				2	3				

Name of system configuration	NB-SOL 220/2 TP; NB-SOL 220/2 TI														
Collector name	CP20TSS	No. Collectors	2	Storage name	220lt										

Calculated annual results for "solar-only / preheat system"

Location	Qd,sh MJ/y	Daily drawoff 170 l				Daily drawoff 200 l				Daily drawoff 250 l			
		Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol
		MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%
Stockholm SE	--	9492	4955	--	52	11164	5392	--	48	13939	5826	--	42
WürzburgDE	--	9114	5122	--	56	10691	5613	--	53	13371	6231	--	47
Davos CH	--	10281	7526	--	73	12110	8174	--	68	15137	8840	--	58
Athens GR	--	7064	6089	--	86	8326	6835	--	82	10407	7878	--	76

Perf. indicators for the table above

Qd,sh	MJ/y	Not relevant for solar domestic hot water system
Qd	MJ/y	Annual heat demand for domestic hot water
QL	MJ/y	Annual heat energy delivered by the solar system
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)
$f_{sol}=Q_L/Q_d$	-	Solar fraction

Ref. conditions		Stockholm SE	Würzburg DE	Davos CH	Athens GR
	G	1'157	1'230	1'684	1'736
	T _{a,ave}	7.5	9.0	3.2	18.5
	T _{c,ave}	8.5	10.0	5.4	17.8
	± ΔT _c	6.4	3.0	0.8	7.4

G	kWh/m ²	Annual irradiation South, 45°
T _{a,ave}	°C	Annual average outdoor air temperature
T _{c,ave}	°C	Annual average mains cold water temp.
ΔT _c	K	Seasonal variation of T _c
Th	45 °C	Desired hot water temperature (mixing valve temperature).

Max. operating press. - collector side	300	kPa	Max. operating press. - tank side	1'000	kPa
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Testing Laboratory	Institut für Solartechnik SPF, CH-8640 Rapperswil
Website	www.spf.ch
Test report id. number	S233QPEN; S232EN
Date of test report	2018-01-31
Test method	ISO 9459-5 (DST)

Comments of test lab

The SPF test number for the system subtype NB-SOL 220/2 TP is S232 ST2. The annual performance for the system subtype was calculated according to the Specific CEN Keymark Scheme Rules for system families.



Summary of	EN12976-2	test results	Certification No.	011-7S2833 A
Annex to Solar KEYMARK Certificate			Issued	2017-02-01

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Postal Code	IT-37045 Legnago	Tel. / Fax	+39 0499 323911

System family overview

Collector name	For each storage and collector size, give number of collectors														
	150lt			200lt			220lt			300lt					
CP20TSS	1			1			2			2	3				

Name of system configuration	NB-SOL 300/2 TP; NB-SOL 300/2 TI											
Collector name	CP20TSS	No. Collectors	2	Storage name	300lt							

Calculated annual results for "solar-only / preheat system"

Location	Qd,sh MJ/y	Daily drawoff 250 l				Daily drawoff 300 l				Daily drawoff 400 l			
		Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol
		MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%
Stockholm SE	--	13939	6091	--	44	16746	6497	--	39	22327	7011	--	31
WürzburgDE	--	13371	6472	--	48	16052	6966	--	43	21413	7366	--	34
Davos CH	--	15137	9173	--	61	18165	9682	--	53	24220	10124	--	42
Athens GR	--	10407	8045	--	77	12488	8967	--	72	16651	10174	--	61

Perf. indicators for the table above

Qd,sh	MJ/y	Not relevant for solar domestic hot water system
Qd	MJ/y	Annual heat demand for domestic hot water
QL	MJ/y	Annual heat energy delivered by the solar system
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)
$f_{sol}=Q_L/Q_d$	-	Solar fraction

Ref. conditions		Stockholm SE	Würzburg DE	Davos CH	Athens GR
	G	1'157	1'230	1'684	1'736
	T _{a,ave}	7.5	9.0	3.2	18.5
	T _{c,ave}	8.5	10.0	5.4	17.8
	± ΔT _c	6.4	3.0	0.8	7.4

G	kWh/m ²	Annual irradiation South, 45°
T _{a,ave}	°C	Annual average outdoor air temperature
T _{c,ave}	°C	Annual average mains cold water temp.
ΔT _c	K	Seasonal variation of T _c
Th	45 °C	Desired hot water temperature (mixing valve temperature).

Max. operating press. - collector side	250	kPa	Max. operating press. - tank side	1'000	kPa
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Testing Laboratory	Institut für Solartechnik SPF, CH-8640 Rapperswil
Website	www.spf.ch
Test report id. number	S233QPEN; S232EN
Date of test report	2018-01-31
Test method	ISO 9459-5 (DST)

Comments of test lab

The SPF test number for the system subtype NB-SOL 300/2 TP is S232 ST3. The annual performance for the system subtype was calculated according to the Specific CEN Keymark Scheme Rules for system families.



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Summary of	EN12976-2	test results	Certification No.	011-7S2833 A
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Company	Riello S.p.A.	Country	Italy
Brand (optional)	BERETTA	Website	www.riello.com
Street	Via Ing. Pilade Riello 7	E-mail	info@riello.com
Postal Code	IT-37045 Legnago	Tel. / Fax	+39 0499 323911

System family overview

Collector name	For each storage and collector size, give number of collectors			
	150lt	200lt	220lt	300lt
CP20TSS	1	1	2	2 3

Name of system configuration	NB-SOL 300/3 TP; NB-SOL 300/3 TI		
Collector name	CP20TSS	No. Collectors	3
Storage name	300lt		

Calculated annual results for "solar-only / preheat system"

Location	Qd,sh MJ/y	Daily drawoff 250 l				Daily drawoff 300 l				Daily drawoff 400 l			
		Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol	Qd,hw	QL	Qpar	fsol
		MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%	MJ/y	MJ/y	MJ/y	%
Stockholm SE	--	13939	7374	--	53	16746	8071	--	48	22327	9020	--	40
WürzburgDE	--	13371	7622	--	57	16052	8459	--	53	21413	9422	--	44
Davos CH	--	15137	11262	--	74	18165	12316	--	68	24220	13248	--	55
Athens GR	--	10407	9044	--	87	12488	10278	--	82	16651	12139	--	73

Perf. indicators for the table above

Qd,sh	MJ/y	Not relevant for solar domestic hot water system
Qd	MJ/y	Annual heat demand for domestic hot water
QL	MJ/y	Annual heat energy delivered by the solar system
Qpar	MJ/y	Annual parasitic energy: (electricity for pumps/controllers)
$f_{sol}=Q_L/Q_d$	-	Solar fraction

Ref. conditions		Stockholm SE	Würzburg DE	Davos CH	Athens GR
	G	1'157	1'230	1'684	1'736
T _{a,ave}	7.5	9.0	3.2	18.5	
T _{c,ave}	8.5	10.0	5.4	17.8	
± ΔT _c	6.4	3.0	0.8	7.4	

G	kWh/m ²	Annual irradiation South, 45°
T _{a,ave}	°C	Annual average outdoor air temperature
T _{c,ave}	°C	Annual average mains cold water temp.
ΔT _c	K	Seasonal variation of T _c
Th	45 °C	Desired hot water temperature (mixing valve temperature).

Max. operating press. - collector side	250	kPa	Max. operating press. - tank side	1'000	kPa
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Testing Laboratory	Institut für Solartechnik SPF, CH-8640 Rapperswil
Website	www.spf.ch
Test report id. number	S233QPEN; S232EN
Date of test report	2018-01-31
Test method	ISO 9459-5 (DST)

Comments of test lab

The SPF test number for the system subtype NB-SOL 300/3 TP is S232 ST4. The annual performance for the system subtype was calculated according to the Specific CEN Keymark Scheme Rules for system families.



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