PRO-CLEAN® STRATIFIED TANK

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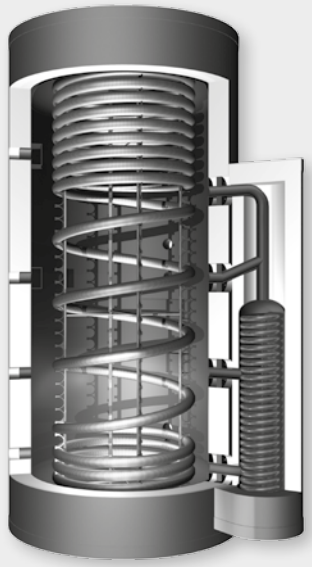
PRODUCT DESCRIPTION



Stratified tank PC – Pro-Clean for domestic hot water and heating

Multifunctional stratified tank system made of steel (S235JR) with an integrated stainless steel corrugated pipe (1.4401/1.4404) for heating applications and hygienic domestic hot water preparation in a continuous heating process. In combination with a spherical exchanger, optimum stratified charging of the solar energy without tank mixing, integrated inflow absorbers for optimum retention of the stratification and boosting efficiency. Incl. 5 pre-mounted special immersion sleeves that can hold up to 3 sensors each. From 1,500 l with access flange DN 200, incl. blind flange plate. Upwards of 2,000 l with larger heating connections. Can be expanded with the backup tank PS.

New model with feet and transport device for easier delivery, less thermal losses thanks to reduced sleeve lengths. ST-connection flanges are supplied with spherical exchangers. The spherical exchanger and the polyester fibre fleece insulation must be ordered separately (compare Accessories).

Area of use

Water heating and heating operation with a solar system for single-family and semi-detached houses or projects.

Product benefits

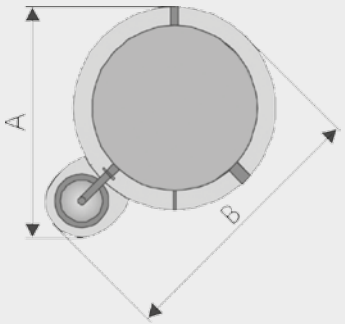
- Efficient use of solar energy for hot water and heating
- Simple functional concept without complicated technology or supplementary electrical energy (gravity circulation principle)
- Backup heating from all common systems possible
- Inflow absorbers prevent the layers in the tank from mixing – especially during heat pump operation
- Hygienic water heating due to a special corrugated stainless steel pipe[1] (DN 40, 1.4404)
- 5 temperature measuring points (sensor pockets) for each of three temperature sensors on the tank
- Access flange DN 200 from 1500 litres
- Prepared for use with 2 electric screw-in heating elements (photovoltaic feed-in)

Standards, guidelines and regulations

- "Pressure Equipment Directive" 97/23/EC
- "Directive on the quality of water intended for human consumption" 98/83/EC
- Sized according to guideline AD-2000
- Welding as per EN 287-1 and EN ISO 3834-2

SPECIFICATIONS

Max. operating temperature:	110°C
Max. tank operating pressure:	3 bar
Max. stainless steel pipe operating pressure:	6 bar
Boiler/heating connections	Rp 6/4" / Rp 2" (partially with inflow absorber)
Domestic hot water connections	Rp 1"
Cylinder feed and drain cock connections	Rp ½"
Thermometer connection	Rp ½"



Specifications

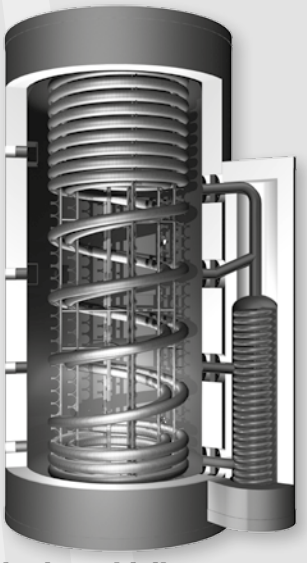
Type	PC 500	PC 800	PC 1000-B	PC 1000-S	PC 1250	PC 1500	PC 2000	PC 2500	PC 3000
Item no.	1611123	1611124	1611125	1611126	1611127	1611128	1611129	1611130	1611131
Nominal volume [l]	530	766	980	937	1260	1540	1930	2430	2910
Height without insulation [mm][2]	1760	1910	1950	2120	2200	2190	2280	2170	2645
Height with insulation [mm][2]	1860	2010	2050	2220	2300	2290	2380	2270	2770
Diameter without insulation [mm][2]	650	750	850	790	900	1000	1100	1300	1250
Diameter with insulation [mm][2]	850	950	1050	990	1100	1200	1300	1500	1470
Width A with insulation [mm][2]	1020	1105	1180	1140	1235	1320	1400	1600	1540
Width B with insulation [mm][2]	1175	1280	1380	1320	1440	1540	2330	1840	1800
Tilt height [mm][2]	1820	1950	1990	2160	2240	2235	2380	2335	2755
Weight [kg]	154	184	207	214	246	292	330	488	536

1)For problem free **maintenance of the corrugated stainless steel pipe** (e.g. decalcification), when installing the tank, we recommend installation of flush connections with isolation valves at the hot water connections of the tank. Also, **to protect the corrugated stainless steel pipe from excessive calcification**, we recommend measures to stabilise or soften the water at tank temperatures of over 60 °C and water hardness of over 2.5 millimoles calcium carbonate per litre (= 14 °dH) (compare DIN 1988-200).

2) All size specifications have a tolerance range of +/- 3%

PRO-CLEAN® 2 CORRUGATED PIPE STRATIFIED TANK

PRODUCT DESCRIPTION



Stratified tank Pro-Clean® - 2 corrugated pipe for Heating and high need of domestic hot Water

Multifunctional stratified tank system in steel (S235JR) with 2 integrated stainless steel corrugated pipes (1.4401/1.4404) for heating applications and hygienic domestic hot water preparation in a continuous flow process for high discharge capacities. When combined with a spherical exchanger, optimum stratified charging of the solar energy without tank mixing, integrated inflow absorbers ensure optimum retention of the stratification and boost energy efficiency. Incl. 5 pre-mounted special immersion sleeves that can each old up to 3 sensors. From a volume of 1,500 l, with inspection flange DN 200, incl. blind flange plate. From a volume of 2,000 l, with larger heating connections. Can be expanded with the backup tank PS.
New model with feet and transport device for easier delivery, less thermal losses thanks to reduced sleeve lengths. ST-connection flanges are supplied with spherical exchangers.The spherical exchanger and the polyester fibre fleece insulation must be ordered separately (compare Accessories).

Area of use

Water heating and heating operation with a solar system for projects with increased hot water requirement.

Standards, guidelines and regulations

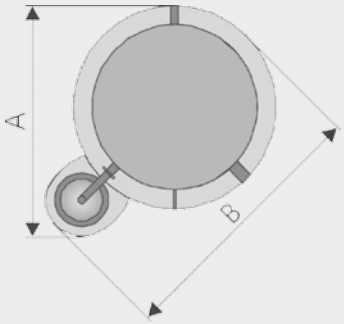
- "Pressure Equipment Directive" 97/23/EC
- "Directive on the quality of water intended for human consumption" 98/83/EC
- Sized according to guideline AD-2000
- Welding as per EN 287-1 and EN ISO 3834-2

Product benefits

- Efficient use of solar energy using a natural principle for hot water and heating
- Simple functional concept without complicated technology or supplementary electrical energy (gravity circulation principle)
- Backup heating from all common systems possible
- Inflow absorbers prevent the layers in the tank from mixing – especially during heat pump operation
- Hygienic water heating due to two special corrugated stainless steel pipes[1] (DN 40, 1.4404)
- 5 temperature measuring points (sensor pockets) for each of three temperature sensors on the tank
- Access flange DN 200 from 1500 litres
- Prepared for use with 2 electric screw-in heating elements (photovoltaic feed-in)

SPECIFICATIONS

Max. operating temperature:	110°C
Max. tank operating pressure:	3 bar
Max. stainless steel pipe operating pressure:	6 bar
Boiler/heating connections	Rp 6/4" / Rp 2" (partially with inflow absorber)
Domestic hot water connections	Rp 1"
Cylinder feed and drain cock connections	Rp ½"
Thermometer connection	Rp ½"



Specifications

Type	PC 2WR 1250	PC 2WR 1500	PC 2WR 2000	PC 2WR 2500	PC 2WR 3000	PC 2WR 4000	PC 2WR 5000	PC 2WR 8000	PC 2WR 10000
Item no.	1611144	1611145	1611146	1611147	1611148	1611149	1611150	1611151	1611152
Nominal volume [l]	1260	1540	1930	2430	2910	3920	4950	7940	9840
Height without insulation [mm][2]	2200	2190	2280	2170	2645	2290	2800	3400	4200
Height with insulation [mm][2]	2300	2290	2380	2270	2770	2400	2910	3560	4310
Diameter without insulation [mm][2]	900	1000	1100	1300	1250	1600	1600	1800	1800
Diameter with insulation [mm][2]	1100	1200	1300	1500	1470	1820	1820	2020	2020
Width A with insulation [mm][2]	1100	1200	1300	1500	1470	1820	1820	2020	2020
Width B with insulation [mm][2]	1235	1320	1400	1600	1530	1830	1830	2030	2030
Tilt height [mm][2]	2240	2235	2330	2335	2755	2555	3000	3580	4450
Weight [kg]	277	334	370	532	580	622	778	925	1050

1)For problem free **maintenance of the corrugated stainless steel pipe** (e.g. decalcification), when installing the tank, we recommend installation of flush connections with isolation valves at the hot water connections of the tank. Also, **to protect the corrugated stainless steel pipe from excessive calcification**, we recommend measures to stabilise or soften the water at tank temperatures of over 60 °C and water hardness of over 2.5 millimoles calcium carbonate per litre (= 14 °dH) (compare DIN 1988-200).
2) All size specifications have a tolerance range of +/- 3%

PC + PC 2WR STRATIFIED TANK

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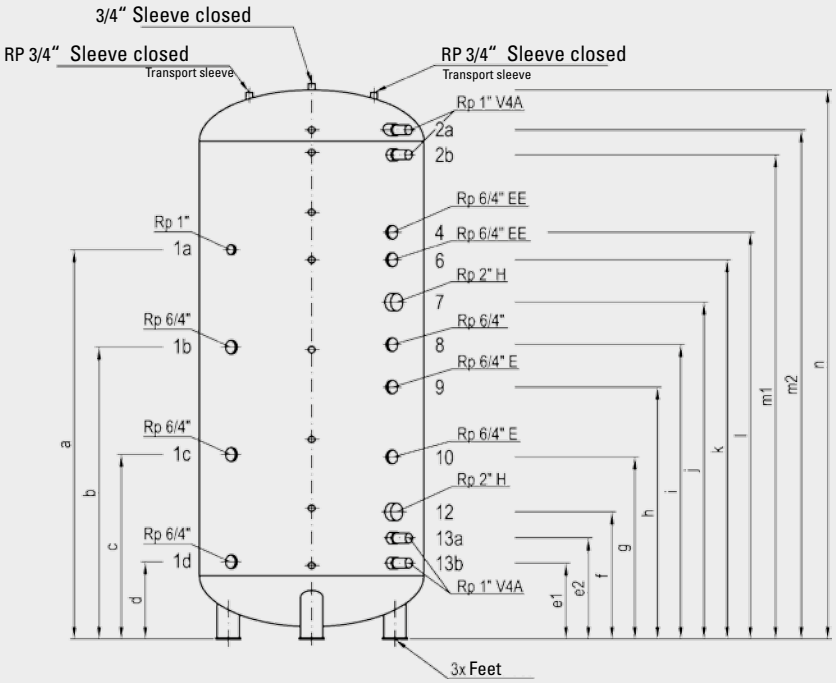
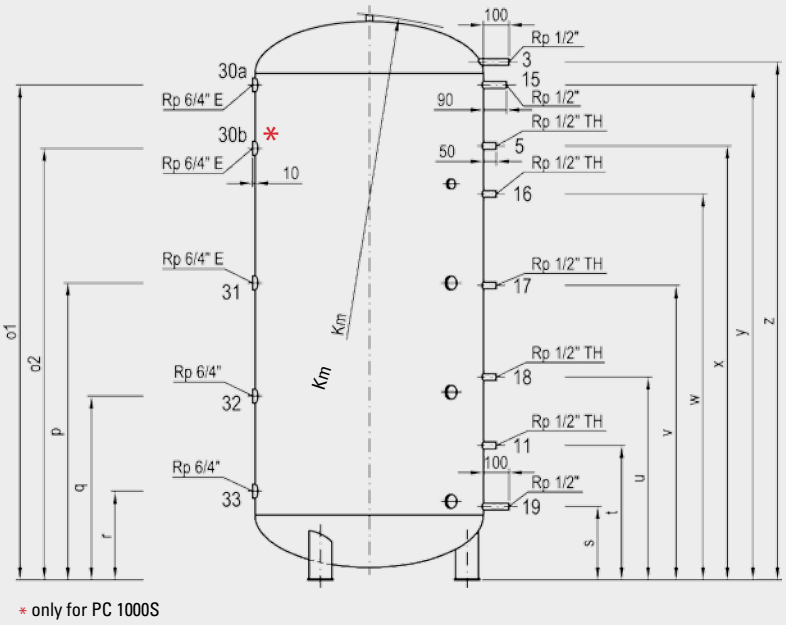
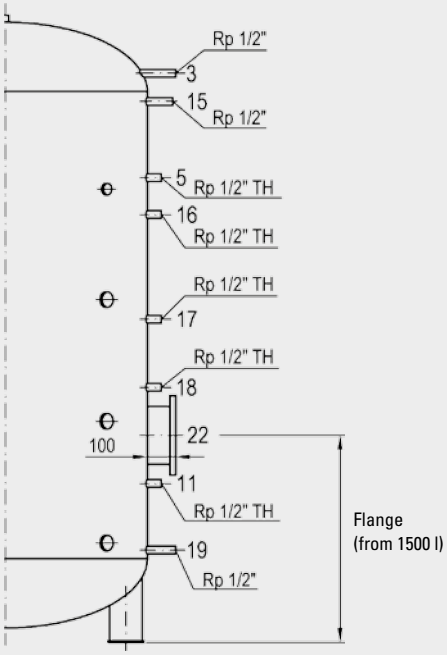
DIMENSIONS AND SLEEVE ASSIGNMENTS

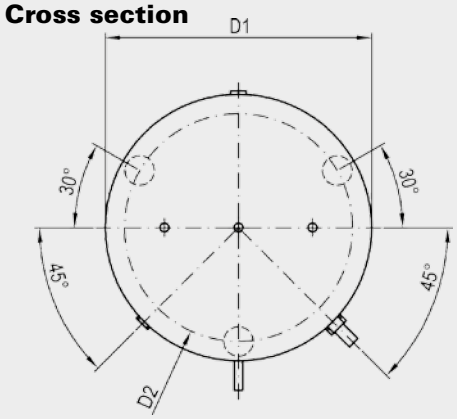


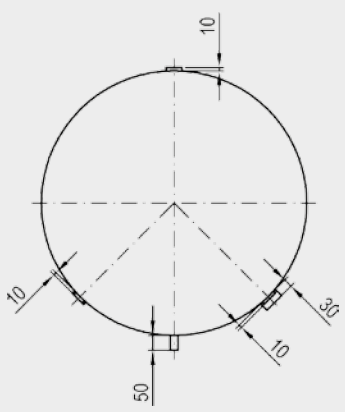


* only for PC 1000S



Cross section





Volume at sleeve

Sleeve no.	Sleeve height (measured from the lid)	Content
4	H1	I1
6	H2	I2
7	H3	I3
8	H4	I4
9	H5	I5
10	H6	I6
12	H7	I7
13	H8	I8
Total volume		

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TABLE OF DIMENSIONS AS PER ILLUSTRATIONS

Position	Unit	PC 500	PC 800	PC 1000B	PC 1000S	PC 1250 (2WR)	PC 1500 (2WR)	PC 2000 (2WR)	PC 2500 (2WR)	PC 3000 (2WR)	PC 4000 2WR	PC 5000 2WR
a	mm	1540	1540	1540	1540	1560	1600	1610	1660	2120	2010	2010
b	mm	1150	1150	1150	1150	1170	1210	1220	1270	1560	1450	1450
c	mm	720	720	720	720	740	780	790	840	1030	920	920
d	mm	290	290	290	290	310	350	360	410	400	290	290
e1	mm	260	280	295	280	305	340	355	410	395	465	465
e2 (2WR)	mm	–	–	–	–	405	440	455	510	495	565	565
f	mm	340	370	380	380	380	425	450	495	475	–	–
f (2WR)	mm	–	–	–	–	510	560	580	630	620	685	685
g	mm	640	660	720	710	730	720	790	800	930	840	1000
h	mm	830	920	950	1000	1010	980	1030	1010	1250	1100	1340
i	mm	940	1060	1090	1160	1180	1160	1210	1160	1450	1240	1520
j	mm	1050	1200	1230	1300	1350	1330	1400	1300	1640	1380	1710
k	mm	1160	1340	1340	1420	1520	1510	1520	1420	1820	1520	1930
l	mm	1270	1450	1450	1530	1630	1620	1630	1530	1930	1630	2040
m1 (2WR)	mm	–	–	–	–	1940	1905	1960	1800	2295	1880	2390
m2	mm	1650	1780	1790	1990	2040	2005	2080	1920	2415	1980	2490
n	mm	1760	1910	1950	2120	2200	2190	2280	2170	2645	2290	2800
o1	mm	1540	1680	1680	1900	1700	1890	1950	1790	2200	1700	2300
o2	mm	–	–	–	1680	–	–	–	–	–	–	–
p	mm	1150	1170	1170	1170	1170	1280	1370	1360	1460	1170	1600
q	mm	720	725	725	725	725	775	860	880	880	725	950
r	mm	270	350	350	350	350	350	360	420	415	350	350
s	mm	240	260	280	265	290	325	340	390	375	450	450
t	mm	480	500	530	500	530	560	580	630	710	600	600
Flange	mm	–	–	–	–	–	730	750	800	880	780	800
u	mm	710	730	790	780	800	900	920	970	1060	970	1130
v	mm	910	1040	1070	1140	1160	1140	1190	1140	1430	1210	1440
w	mm	1160	1320	1340	1420	1520	1510	1510	1420	1820	1500	1815
x	mm	1350	1450	1480	1610	1710	1640	1660	1550	2070	1700	2075
y	mm	1570	1690	1710	1900	1950	1910	1970	1815	2300	1890	2320
z	mm	1650	1780	1800	1990	2040	2010	2065	1905	2410	1980	2490
D1	mm	650	750	850	790	900	1000	1100	1300	1250	1600	1600
D2	mm	520	620	720	660	770	850	950	1200*	1150*	1300*	1300*
Km	mm	1820	1950	1990	2160	2240	2235	2330	2335	2755	2555	3000
H1	mm	490	460	500	590	570	570	650	640	730	660	760
H2	mm	600	570	610	700	680	680	760	750	840	770	900
H3	mm	710	710	720	820	850	860	880	870	1020	910	1090
H4	mm	820	850	860	960	1020	1030	1070	1010	1210	1050	1280
H5	mm	930	990	1000	1120	1190	1210	1250	1160	1410	1190	1460
H6	mm	1120	1250	1230	1410	1470	1470	1490	1370	1730	1450	1800
H7	mm	1420	1540	1570	1740	1820	1765	1830	1675	2185	1750	2190
H8	mm	1500	1630	1655	1840	1895	1850	1925	1760	2265	1825	2335
I1	lt	140	170	240	255	310	355	500	655	725	985	1185
I2	lt	175	220	300	305	380	440	605	800	860	1205	1470
I3	lt	210	285	360	365	490	580	710	960	1080	1490	1850
I4	lt	250	345	440	435	600	715	910	1145	1315	1780	2230
I5	lt	285	405	520	510	705	855	1085	1345	1560	2050	2595
I6	lt	350	520	650	655	885	1060	1310	1625	1955	2575	3280
I7	lt	450	650	845	815	1105	1295	1635	2030	2510	3175	4060
I8	lt	475	690	895	865	1155	1360	1725	2140	2610	3330	4355
I total	lt	530	766	980	937	1260	1540	1930	2430	2910	3920	4950

* model with foot rim

PC + PC 2WR STRATIFIED TANK

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SLEEVE ASSIGNMENT

No.	Dimension	Use	Comment
1a	1"	Sleeve for ST flange 1"	if combined with a spherical exchanger
1b, c, d	1 1/2"	Sleeve for ST flange 1 1/2"	if combined with a spherical exchanger
2a	1"	Hot water connection (stainless steel)	possibly with circulation lance
2b (2WR)	1"	Hot water connection (stainless steel)	possibly with circulation lance
3	½"	Venting	fill and drain valve required
4	1½" (2")*	Forward flow secondary heat source	with influx damper
5	½"	Sensor sleeve for temperature sensor	immersion pocket (3-fold) pre-mounted
6	1½" (2")*	Forward flow heating circuits	with influx damper
7	2"	Sleeve for E-heating element	extension sleeve necessary
8	1½" (2")*	Return secondary heat source	
9	1½" (2")*	High-temperature heating circuits return	with influx damper
10	1½" (2")*	Low-temperature heating circuits return	with influx damper
11	½"	Sensor sleeve for temperature sensor	immersion pocket (3-fold) pre-mounted
12	2"	Sleeve for E-heating element	extension sleeve necessary
13a (2WR)	1"	Cold water connection (stainless steel)	
13b	1"	Cold water connection (stainless steel)	
15	½"	Sleeve for thermometer	optional
16	½"	Sensor sleeve for temperature sensor	immersion pocket (3-fold) pre-mounted
17	½"	Sensor sleeve for temperature sensor	immersion pocket (3-fold) pre-mounted
18	½"	Sensor sleeve for temperature sensor	immersion pocket (3-fold) pre-mounted
19	½"	Drainage	fill and drain valve required
22	DN200	Inspection flange	possibly for ribbed tube heat exchanger
30a	1½" (2")*	Sleeve for volume expansion	possibly with priority flap
30b	1½" (2")*	Sleeve for volume expansion	possibly with priority flap
31	1½" (2")*	Sleeve for volume expansion	with influx damper
32	1½" (2")*	Sleeve for volume expansion	with influx damper
33	1½" (2")*	Sleeve for volume expansion	with influx damper

* upwards of a reservoir size of 2000 litres

HOT WATER TAP OUTPUT FROM PC WITH ONE CORRUGATED PIPE

Type	PC 500	PC 800	PC 1000B	PC 1000S	PC 1250	PC 1500	PC 2000	PC 2500	PC 3000
Corrugated pipe									
Dimension Corrugated pipe	DN 40	DN 40	DN 40	DN 40	DN 40	DN 40	DN 40	DN 40	DN 40
Volume of corrugated pipe (l)	45	55	55	55	55	60	60	75	75
Length (m)	24	29	29	29	29	34	34	39	39
Surface area (m^2)	6,19	7,48	7,48	7,48	7,48	8,77	8,77	10,06	10,06
Warm water discharge capacity									
Single discharge capacity[2] at 60°C (l)	400	600	810	810	1050	1290	1710	2150	2610
Single discharge capacity[2] at 50°C (l)	285	430	580	580	750	920	1220	1535	1865
Tap output (hot water)									
ΔT[3] at 30 l/min (K)	4	3	3	3	3	3	3	3	3
ΔT[3] at 40 l/min (K)	6	5	5	5	5	5	5	4	4
ΔT[3] at 50 l/min (K)	10	8	8	8	8	7	7	6	6
ΔT[3] at 70 l/min (K)	–	–	–	–	11	11	11	10	9
Area of use (hot water)[4] **(AW)**	1-2	1-4	1-5	1-5	1-5	1-6	1-7	1-9	1-11
Combinable with	ST 10-40	ST 10-40	ST 20-40, ST 60K	ST 20-40, ST 60K	ST 20-40, ST 60K	ST 20-40, ST 60K	ST 20-40, ST 60K	ST 20-40, ST 60K	ST 60

[1] Discharge capacity (hot water up to 38 °C) when the backup tank is loaded at 60 °C / 50 °C.
[2] Temperature difference between backup tank temperature and domestic hot water tap temperature when the tank is half-full.
[3] Figures quoted are based on standard consumption values. Specific calculations are made for extreme consumption e.g. in swimming pools, saunas etc.
[4] Number of apartments (3 occupants/apartment). Applicable only without circulation.

1) All size specifications have a tolerance range of +/- 3%

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HOT WATER TAP OUTPUT FROM PC WITH 2 CORRUGATED PIPES

Type	PC 2WR 1250	PC 2WR 1500	PC 2WR 2000	PC 2WR 2500	PC 2WR 3000	PC 2WR 4000	PC 2WR 5000	PC 2WR 8000	PC 2WR 10000
Corrugated pipe									
Dimension Corrugated pipe	2x DN 40	2x DN 40	2x DN 40	2x DN 40	2x DN 40	2x DN 40	2x DN 40	2x DN 50	2x DN 50
Volume of corrugated pipe (l)	2x 55	2x 55	2x 60	2x 75	2x 75	2x 75	2x 75	2x 110	2x 110
Length (m)	2x 29	2x 29	2x 34	2x 39	2x 39	2x 39	2x 39	2x 39	2x 39
Surface area (m^2)	2x 7,48	2x 7,48	2x 8,77	2x 10,06	2x 10,06	2x 10,06	2x 10,06	2x 13,34	2x 13,34
Warm water discharge capacity									
Single discharge capacity[2] at 60°C (l)	1050	1290	1710	2150	2610	3560	4475	7680	9510
Single discharge capacity[2] at 50°C (l)	750	920	1220	1535	1865	2540	3200	5890	7920
Tap output (hot water)									
ΔT[3] bei 30 l/min (K)	2	2	2	2	2	2	2	2	2
ΔT[3] bei 40 l/min (K)	2	2	2	2	2	2	2	2	2
ΔT[3] bei 50 l/min (K)	3	3	3	3	3	3	3	3	3
ΔT[3] bei 70 l/min (K)	7	6	6	5	5	5	5	4	4
ΔT[3] bei 90 l/min (K)	9	8	8	7	7	6	6	5	5
ΔT[3] bei 110 l/min (K)	11	8	8	8	7	7	7	7	7
ΔT[3] bei 130 l/min (K)	13	12	12	11	10	10	10	9	9
Area of use (hot water)[4] **(AW)**	1-10	1-12	1-14	1-16	1-18	1-20	1-22	1-25	1-28
Combinable with	ST 20-40, ST 60K	ST 20-40, ST 60K	ST 20-40, ST 60K	ST 20-40, ST 60K	ST 60	ST 60-80	ST 60-80	ST 80	ST 80

[1] Discharge capacity (hot water up to 38 °C) when the backup tank is loaded at 60 °C / 50 °C.
[2] Temperature difference between backup tank temperature and domestic hot water tap temperature when the tank is half-full.
[3] Figures quoted are based on standard consumption values. Specific calculations are made for extreme consumption e.g. in swimming pools, saunas etc.
[4] Number of apartments (3 occupants/apartment). Applicable only without circulation.

CONTINUOUS OUTPUT WITH PRO-CLEAN® WITH TWO CORRUGATED PIPES (PC 2WR 2000)

Continuous output	**CW**	**100**	**200**	**300**
When heating drinking water from **10 to 45 °C** and heating circuit forward flow temperature of 70 °C at the hot-water flow rate specified below	l/h	2335	4658	6981
Hot water flow rate for the specified continuous output levels	l/h	1920	3830	5740

Continuous output	**CW**	**100**	**200**	**300**
When heating drinking water from **10 to 55 °C** and heating circuit forward flow temperature of 70 °C at the hot-water flow rate specified below	l/h	1830	3666	4500
Hot water flow rate for the specified continuous output levels	l/h	2460	4920	7380

Note on continuous output: The boiler's rated heat output must be greater or equal to continuous output. Plan for a circulation pump that is appropriate for the flow rate.

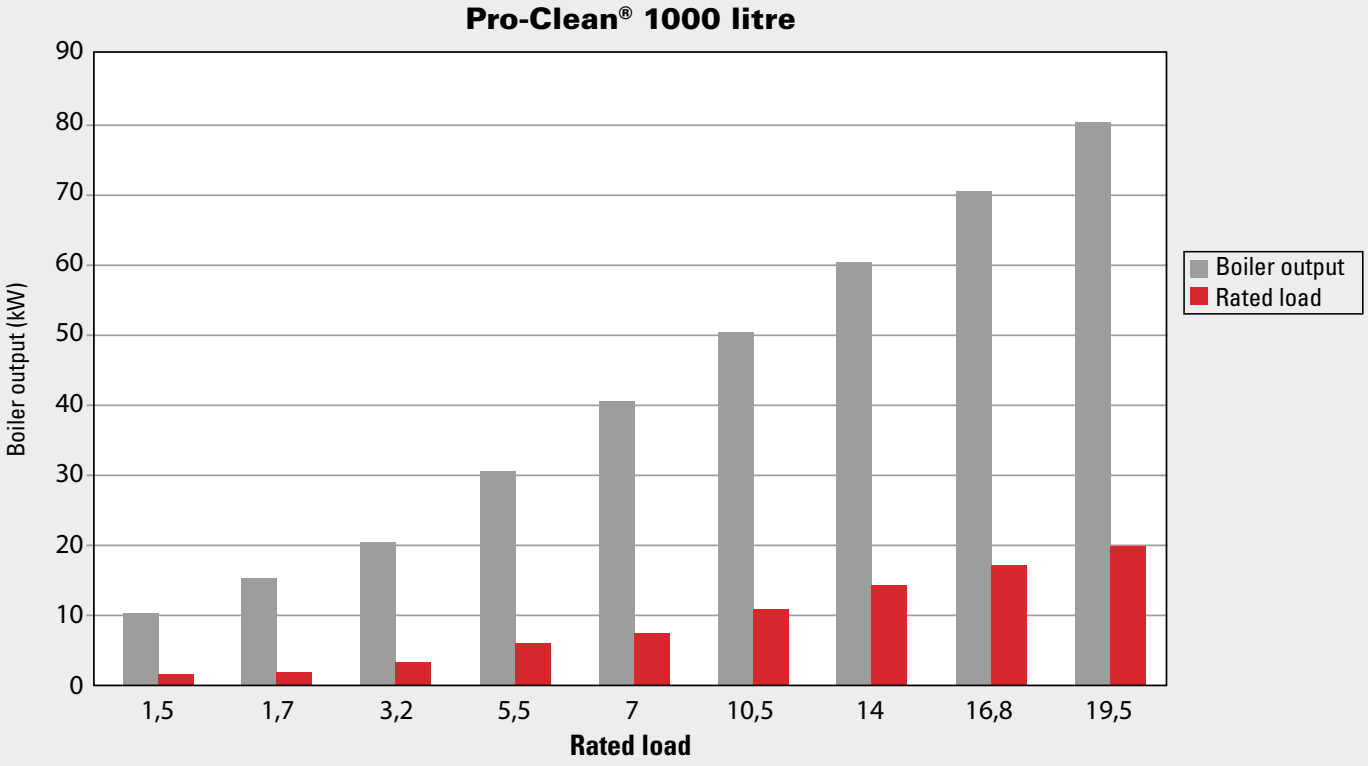
MAX. HEATING WATER FLOW RATE WITH PRO-CLEAN® TANK WITHOUT MIXING THE LAYERS

Tank size [l]	500	800	1000	1250	1500	2000	2500	3000	4000	5000
Volumetric flow, [m^3/h]	2.7	3.2	3.4	3.4	4.0	4.3	4.4	4.5	4.9	5.0

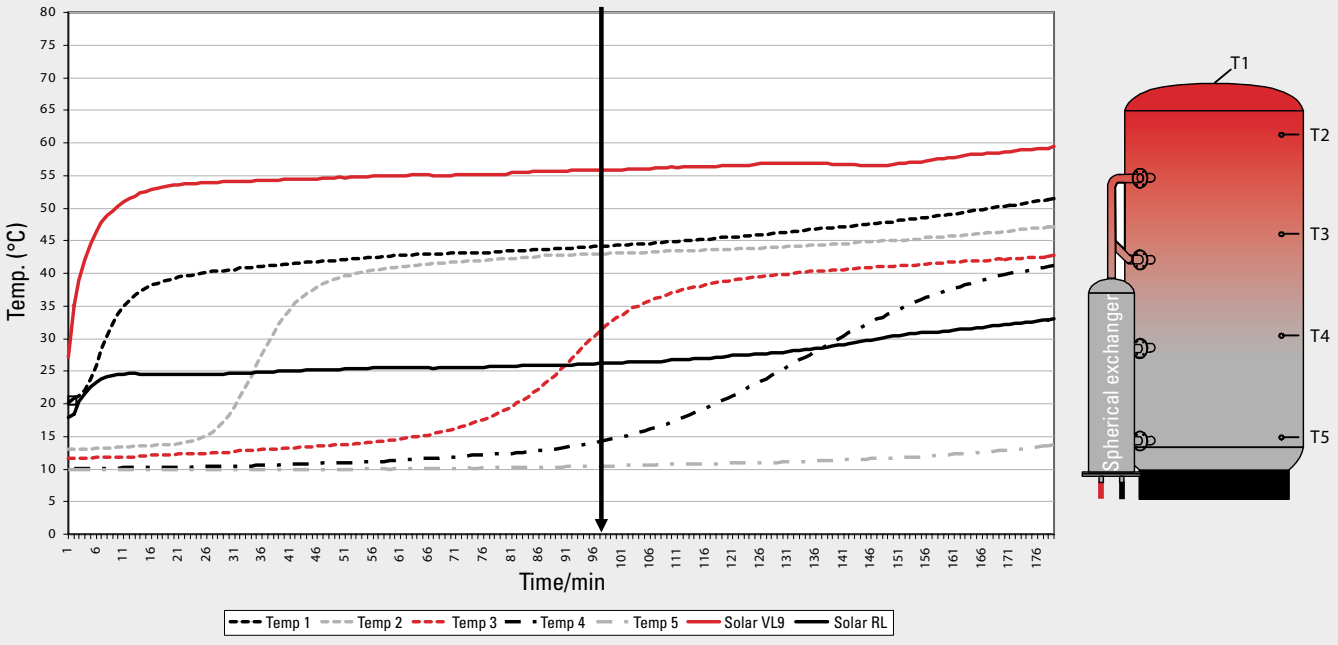
Note: The permissible total volumetric flow for each additional charged sleeve can be calculated as + 30% of the specified value per sleeve.

PC + PC 2WR STRATIFIED TANK

RATED LOAD AT 60 °C TANK TEMPERATURE



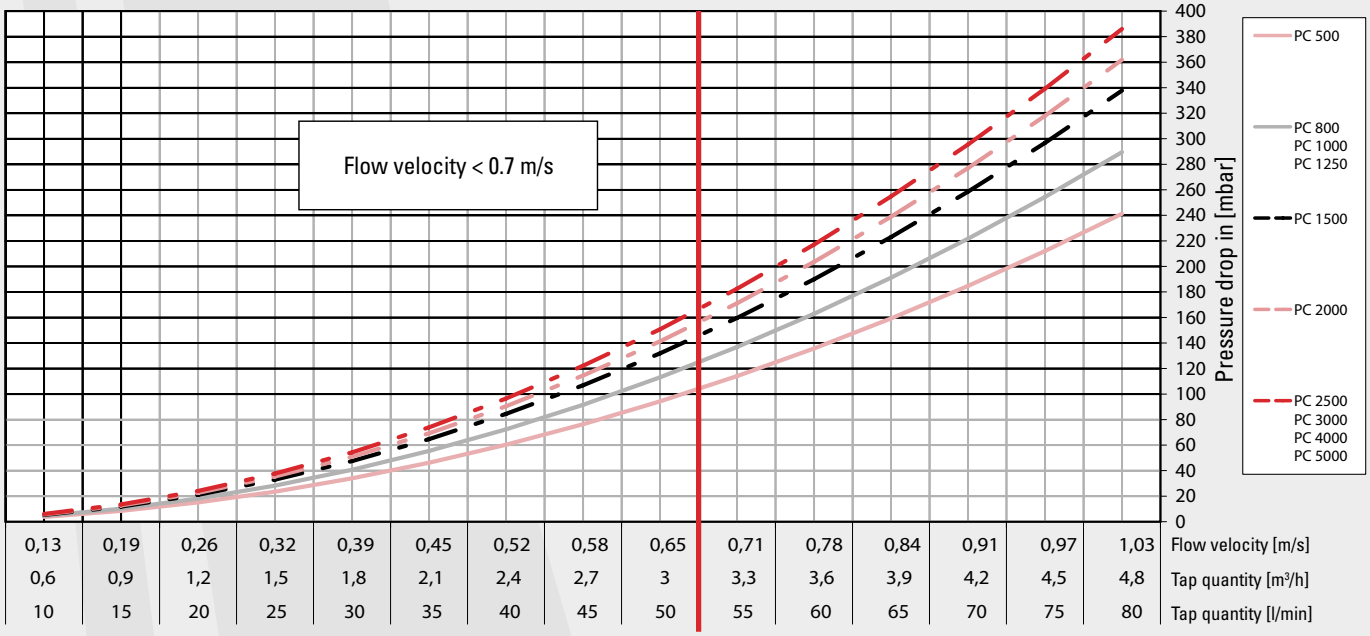
SOLAR STRATIFIED CHARGING



Data while heating using a spherical exchanger (ST20) with a flow volume of 400 l/h and a collector surface area of 16 m².
13 kWh are required to obtain usable hot water at 40 °C (achieved within 98 min).

PC + PC 2WR STRATIFIED TANK

PRESSURE DROP FOR CORRUGATED PIPE DN 40



Tap quantity and flow velocity

CONSTITUENT CONCENTRATION LIMITS

Concentration limits for diverse drinking water constituents when using Pro-Clean® corrugated stainless steel pipe

pH value	6.5-9.5
Sulphates	250 mg/l
Natrium	200 mg/l
Manganese	0.5 mg/l
Iron	0.2 mg/l
Nitrate	50 mg/l
Chloride	200 (250[1]) mg/l
Amonium	0.5 mg/l
Nitrite	0.1 mg/l

These values may not be exceeded!
[1] Austria: 200 mg/l, Germany 250 mg/l

PC + PC 2WR STRATIFIED TANK

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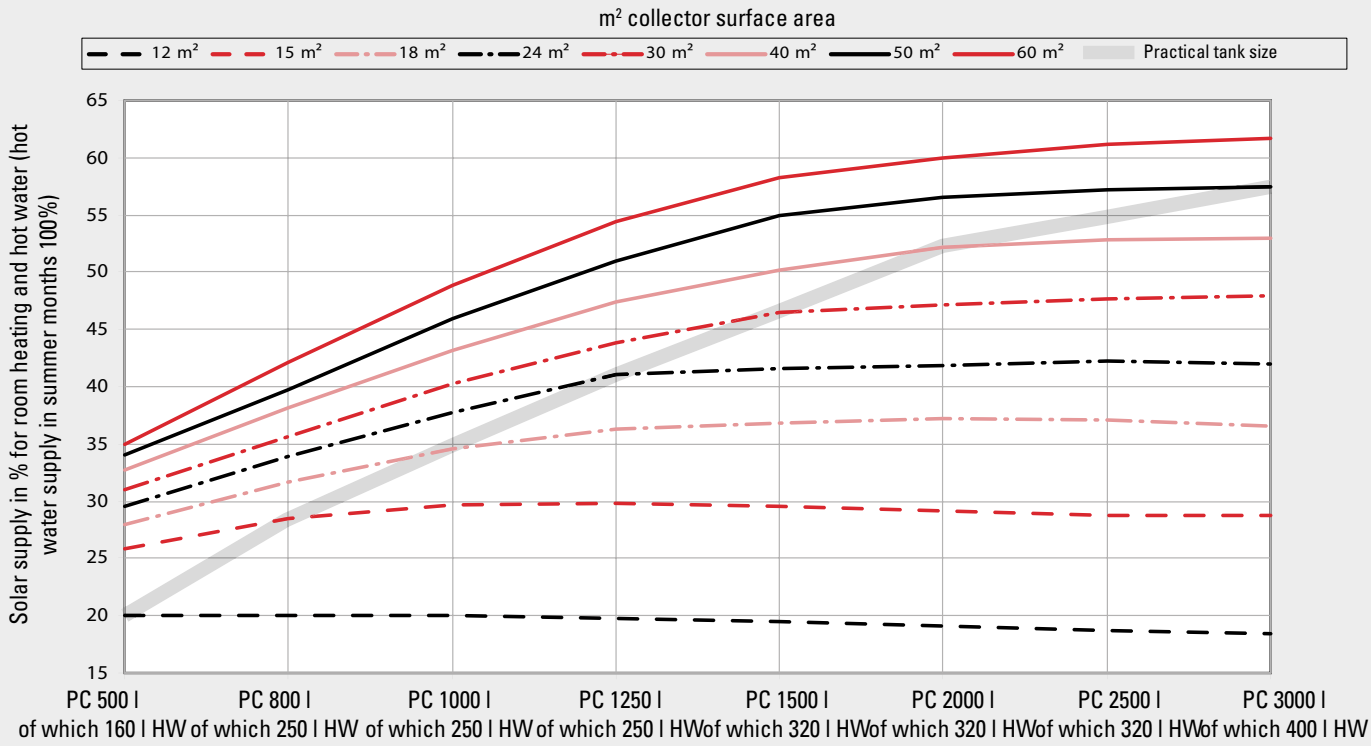
SIZE DETERMINATION WITH SOLAR COLLECTORS



Reference house: 9 kW heat load at -15 °C ambient temperature
Location: Würzburg, Germany, collector orientation 0° south, 30° tilt, average flow temperature 33 °C