Solarbayer®

We develop for your future

PRODUCT INFORMATION

Solar DHW storage tank SKL

High performance solar tank, bivalent

Technical description

Content

Sicherheitshinweise / Vorschriften

Please read the manual carefully to prevent damages due to improper installation. The installation has to be carried out by a specialized company in accordance with the „generally accepted codes of practice“ as well as with the valid regulations and norms. Country-specific regulations have to be regarded. Non-professional installation as well as other than the intended use will lead to the expiration of warranty.

The following engineering rules have to be regarded:

TrinkwV
Drinking water regulation[1]

DVGW- guideline W 551/April 2004 (German Technical and Scientific Association for Gas and Water)
Systems for heating up drinking water and drinking water pipelines; technical arrangements for decreasing the legionella growth; planning, isntallation,operation and renovation of DHW installations

DIN 1988
Codes of practice for drinking water systems[2]

DIN 4751
Safety requirements for heating installations

DIN 4753
Water heaters and water heating installations for drinking water and service water; requirements, marking, equipment and testing

DIN EN 12975
Thermal solar systems and components

DIN 4807
Expansion vessels

DIN EN 12828
Heating systems in buildings - Design for water-based heating systems

DIN 18380
Systems for heating and central water heating

DIN 18381
Gas, water and sewage plumbing works inside of buildings

VDI 2035
Prevention of damage in water heating installations

DIN 18382
Electric Cable and Wiring Systems Inside Buildings

VDE 0100
Erection of power installations

VDE 0105
Operation of electrical installations

VDE 0190
Potential equalizing of electrical installations

[1]The installation of a DHW storage tank with a capacity from 400 liter and higher has in multi-family houses' heating systems has to be announced at the responsible Health Office (TrinkwV). Before the installation it has to be checked if the Health Office is already informed.

[2]Before the installation it has to be tested if the DHW installation, especially the connection to the public water supply, is carried out in accordance with DIN 1988 and if the, stated in part 8, prescribed maintenance had taken place. The operability of security-relevant units (e.g. pressure regulator) has to be checked in any case.

Brief description

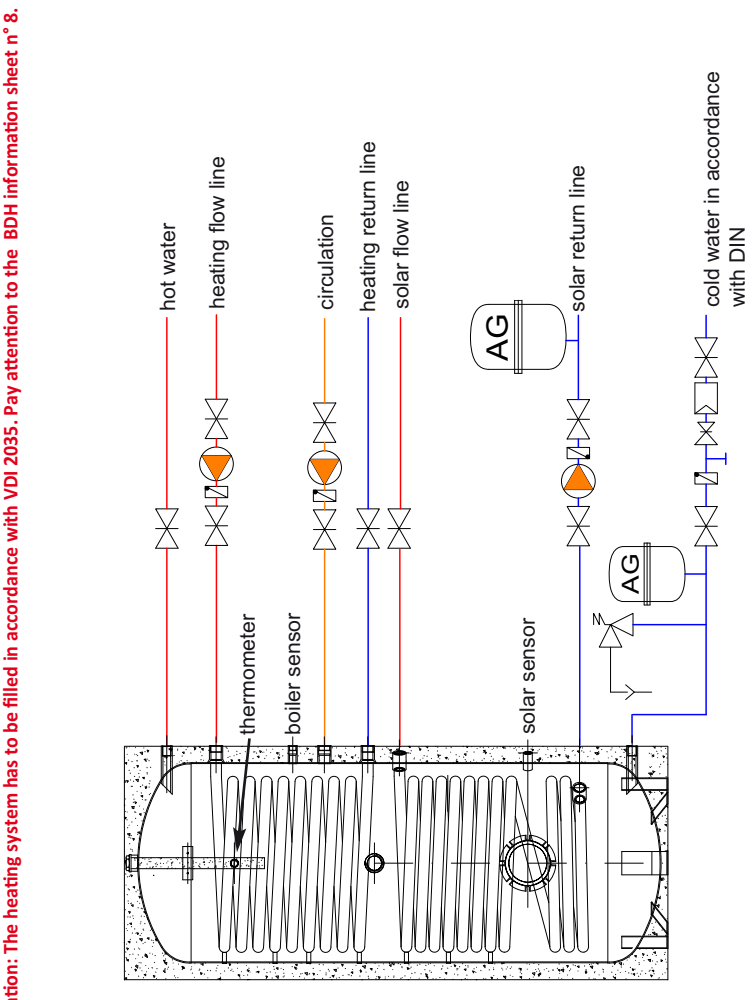
The solar DHW tank SKL is used either in solar systems just for the preparation of domestic hot water or in multi-tank sytems in combination with buffer tanks

- ✓ perfectly aligned to all our solar systems, also suitable for condensing technology
- ✓ bivalent tank, two plain tube heat exchangers
- ✓ high quality steel S235JR
- ✓ internal corrosion protection with double enameling (Made in Germany)
- ✓ magnesia anode
- ✓ insulation for SKL 200 to SKL 500: PU rigid foam (non-removable), insulation thickness approx. 50 mm
- ✓ insulation for SKL 750 and SKL 1000: removable flexible foam insulation WLG 0,039, insulation thickness approx. 75 mm
- ✓ silver PVC jacket, fire protection classification: B2
- ✓ installation of an electric heating elements

Corrosion protection

The DHW storage is suitable for all water conditions and in every piping system.
Corrosion protection is given by the double enameling of the internal tank wall in accordance with DIN 4753 part 3.
Additional corresion protection offers the magnesia anode in accordance with DIN 4753 part 6.

Description of connections



Attention: The heating system has to be filled in accordance with VDI 2035. Pay attention to the BDH information sheet n° 8.

Technical specifications

Solar- DHW storage tank SKL			200	300	400	500	750	1000
capacity DHW approx.		L	200	300	400	500	750	1000
height with insulation	[A]	mm	1265	1515	1630	1805	1870	2120
height without insulation	[B]	mm	-	-	-	-	1805	2055
tilted height		mm	1450	1650	1780	1960	1900	2150
diameter with insulation	[C]	mm	610	650	700	750	950	950
diameter without insulation	[D]	mm	-	-	-	-	790	790
solid foam PU insulation (non-removable)		mm	50	50	50	50	-	-
flexibel foam insulation (removable)		mm	-	-	-	-	75	75
jacket			PVC, Farbe Silber					
max. operating pressure tank		bar	10	10	10	10	10	10
max. operating temperature tank		°C	95	95	95	95	95	95
weight aaprox.		kg	92	114	149	173	238	250
max. size of electric heating element (optional)		kW	4,5	4,5	4,5	6	9	9

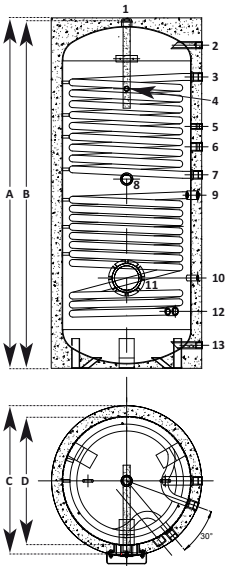
Specifications heat exchanger top		200	300	400	500	750	1000
heating surface heat exchanger	m^2	0,9	1,4	1,4	1,4	2,5	2,5
capacity heat exchanger	L	5,5	6,5	6,5	6,5	15	15
max. operating pressure heat exchanger	bar	10	10	10	10	10	10
max. operating temperature heat exchanger	°C	95	95	95	95	95	95

Specifications output performance		200	300	400	500	750	1000
continuous output 10/45 – 80/60 (kW) heat exchanger top	L/h	340 (20)	1020 (41)	1020 (41)	1020 (41)	1850 (75)	1850 (75)
performance indicator N_L at 70/50 WT top	N_L	2,4	3,1	3,6	4,8	11,6	16,8
continuous output 10/45 – 80/60 (kW) heat exchanger bottom	L/h	480 (28)	1290 (52)	1570 (64)	1720 (70)	1850 (75)	1850 (75)
performance indicator N_L at 70/50 both exchangers	N_L	5,6	7,2	11,4	13,7	26,5	34,2

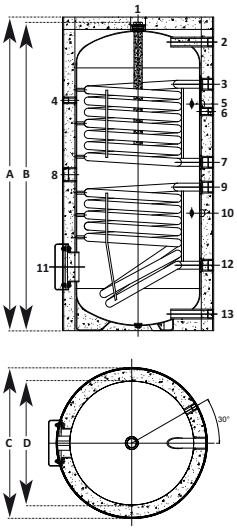
Specifications heat exchanger bottom		200	300	400	500	750	1000
heating surface heat exchanger	m^2	0,9	1,8	2,2	2,4	2,5	2,5
capacity heat exchanger	L	5,5	8,3	10,5	13,5	15	15
max. operating pressure heat exchanger	bar	10	10	10	10	10	10
max. operating temperature heat exchanger	°C	110	110	110	110	110	110
recommended min. collector surface	m^2	4	6	8	10	14	17

Technical specifications, dimensions

series: SKL 300
SKL 400
SKL 500



series: SKL 200
SKL 750
SKL 1000



Connections with dimensioning			200	300	400	500	750	1000
anode (from SKL 400 on an additional anode in the flange)	[1]	oben	1¼"	1¼"	1¼"	1¼"	1¼"	1¼"
hot water	[2]	mm	1165 (1"IG)	1345 (¾"IG)	1505 (¾"IG)	1640 (¾"IG)	1590 (1¼"IG)	1840 (1¼"IG)
heating flow line	[3]	mm	995 (1¼"IG)	1245 (1"IG)	1355 (1"IG)	1510 (1"IG)	1440 (1¼"IG)	1440 (1¼"IG)
thermometer	[4]	mm	930 (½"IG)	1200 (½"IG)	1300 (18x2)	1450 (18x2)	1460 (½"IG)	1680 (½"IG)
boiler sensor	[5]	mm	915 (½"IG)	1080 (½"IG)	1125 (½"IG)	1285 (½"IG)	1340 (½"IG)	1340 (½"IG)
circulation	[6]	mm	885 (¾"IG)	985 (¾"IG)	1030 (¾"IG)	1185 (¾"IG)	1235 (1"IG)	1235 (1"IG)
heating return line	[7]	mm	680 (1¼"IG)	885 (1"IG)	935 (1"IG)	1060 (1"IG)	990 (1¼"IG)	990 (1¼"IG)
electric heating element	[8]	mm	630 (1½"IG)	830 (1½"IG)	880 (1½"IG)	1010 (1½"IG)	890 (1½"IG)	890 (1½"IG)
solar flow line	[9]	mm	580 (1¼"IG)	770 (¾"IG)	805 (¾"IG)	885 (¾"IG)	835 (1¼"IG)	835 (1¼"IG)
solar sensor	[10]	mm	475 (½"IG)	400 (½"IG)	420 (½"IG)	370 (½"IG)	685 (½"IG)	685 (½"IG)
flange Ø 114 mm (from SKL 400 on with anode)	[11]	mm	260	400	420 (M8x30)	390 (M8x30)	400 (M8x30)	400 (M8x30)
solar return line	[12]	mm	265 (1¼"IG)	245 (1"AG)	265 (1"AG)	285 (1"AG)	385 (1¼"IG)	385 (1¼"IG)
cold water	[13]	mm	70 (1"IG)	145 (¾"IG)	110 (¾"IG)	165 (¾"IG)	220 (1¼"IG)	220 (1¼"IG)

Thermotechnical facts		200	300	400	500	750	1000
rate of heat loss in stagnancy according to DIN EN 12976 or DIN ENV 12977-3	W/K	1,07	1,31	1,54	1,84	1,40	1,62
rate of standby loss ΔT 45°C according DIN 4753-8	kWh/d	1,15	1,41	1,66	1,99	1,52	1,75

Installation / general information

Location

The tank hast to be located in a frost-protected place. Ice formation inside the system may lead to the tank's destruction.

The location has to have the necessary space for maintenance and repair work, as well as sufficient load-bearing capacity of the ground!

Site clearance for dismounting the tank and for transport has to be ensured permanently.

Insulation

The insulation has to be mounted before piping begin.

Do not get near the insulation with fire, brazing flame, welding torch, etc.; fire hazard!

Piping

The tank is to be installed in accordance with the piping diagram *[chapter: Description of connections]*. This diagram is only a mounting proposal and does not replace professional planning.

The connection has to be carried out in accordance with DIN. .

The minimum diameter of the safety valve has to be DN20 (¾").

Attention has to be paid to possible electro-chemical reactions when choosing the installation material (mixed installation)! Galvanzied pipe installations have to be replaced.

With DHW temperatures of more than 60°C it is generally recommended to limit the temperature by a mixing valve to 60°C!

The connection components have to be aligned to these temperatures or the temperature has to be limited by means of a mixing valve!

Operating pressure

The permissible operating pressures according to our technical specifications *[chapter: technical specifications]* have to be observed. Exceeding the permissible operating pressure may lead to leakages and destruction of the tank!

Pressure-reducing valve

The installation of a pressure-reducing valve is recommended. If the DHW supply is operated with higher pressure a pressure reducing valve has to be installed.

In order to reduce sounds caused by fluxion inside the building the pipeline pressure should be adjusted to approx. 3,5 bar.

DHW filter

It is highly recommended to install a DHW filter in the cold water pipeline since floating particles may block fittings, etc. and may cause corrosion in the pipes.

Safety devices

The tank has to be equipped with a non-lockable safety valve. Moreover, an expansion vessel has to be installed that is dimensioned according to the tank's capacity. It is to be locked only with a cap valve.

An expansion vessel for sanitary water has to be installed for the stainless steel heat exchanger.

A safety temperature limiter has to be installed in accordance with heating system regulations for scalding protection means.

Next to the exhaust line of the safety valve, or even better, on the valve itself, an indication plate has to be installed, saying: :

"Water is leaking from the valve's pipe for safety reasons during the heating. Do not close!"

Draining/de-airing

The tank hast to be installed in such a way that it can be drained without demounting it.

While draining, hot water might exit and cause injuries.

The upper socket is provided for de-airing the tank.
We do not recommend the use of an automatic bleeder.

Immersion heater (optional)

The tank can additionally be equipped with an electric heating element. You have to respect the regulations of your local public utility when installing an immersion heater.

The electric heating elements have to be insulated. It is only with insulation that the corrosion protection is guaranteed.

Electric heating elements with insulation and integrated temperature control and safety temperature limiter are optional available at Solarbayer.

If electric heating elements without insulation are used, the tank's warranty expires.

Initial operation

Connections that are not used have to be sealed professionally with plugs.

Thoroughly rinse pipes and tank after mounting, heating system has to filled with treated water according to VDI 2035 and bleeded.

The DHW temperature control for tanks with a capacity of 400l and more have to adjusted that they will meet the requirements of the DVGW-guidlineW 551/April 2004; Systems for heating up drinking water and drinking water pipelines; technical arrangements for decreasing the legionella growth; planning, isntallation,operation and renovation of DHW installations

Maintenance:

The protection effect is based on an electro-chemical reaction when a magnesia anodes is installed. Its result is the decomposition of the magnesia anode.

When the magnesia anode is used up the corrossion protection of the tank is no longer guaranteed! Result: perforation, water emersion. Thus, the anode has to be checked every 2 years and replaced when wasted more than 2/3!

In order to exchange the magnesia anode the tank has to be depressurized. Close the cold water outlet, shutt off circulation pump and open any hot water tap in the house.

The DHW tank should be drained in regular intervals (e.g. every 2 years) and cleaned.

Flange:

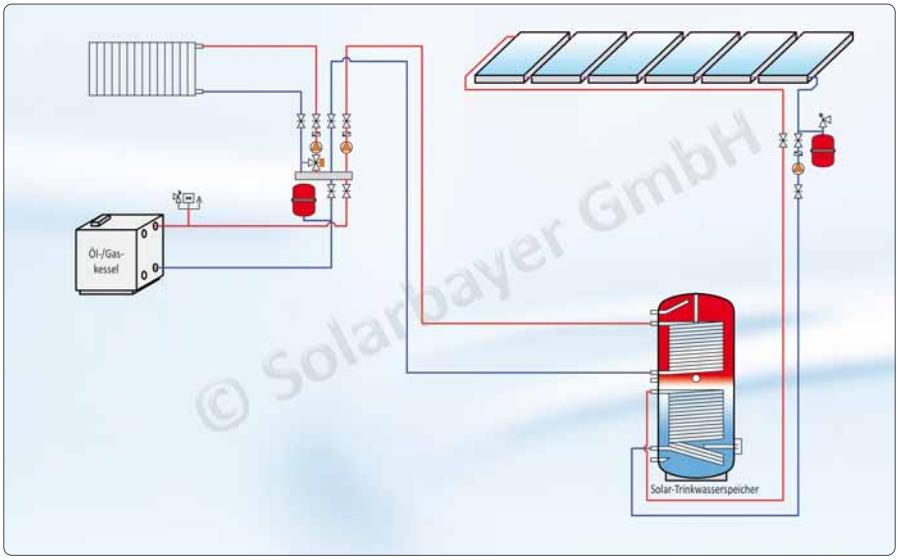
After demounting the flange the sealing has to be renewed when the flange is re-installed. The tightening of the screw nuts is 20-25 Nm.

Note for installers:

Record the check of the magnesia anode, the pressure test as well as the correct filling of the system in accordance with VDI 2035 and let your customer sign the record.

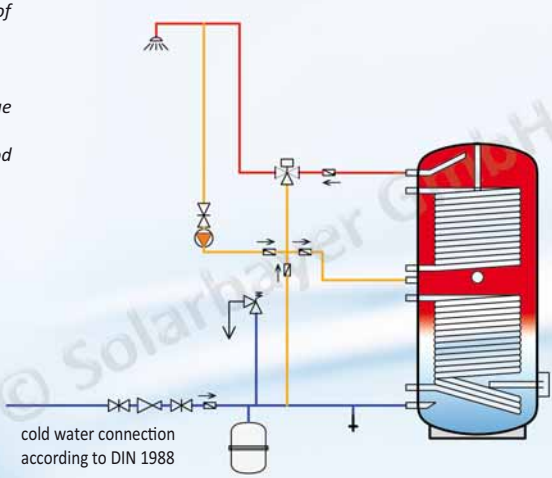
Record the adjustment of the temperature control with tanks from 400 l on in accordance with DVGW-guideline W – 551 and inform the system owner that changings in the settings might lead to objections of the health office during routine checks of DHW quality. Let your customer sign the adjusted settings and the given isntructions. The initial operation of systems with a tank capacity of 400 l onwords in multi-family houses has to be indicated with the local health office since November 1st 2011 (Drinking water regulation).

Connection example



This connection diagram is only an installation proposal and does not replace technical planning!

Connection example of the hot water circulation with DHW storage tank at high tank temperatures due to heating up with solar system and wood log boiler.



This connection diagram is only an installation proposal and does not replace technical planning!

Insulation

With the SKL 300-500 the PU insulation is a solid foam one foam to the tank,the PVC jacket is removable From SKL 750 on the PVC jacket as well as the insulation are removable.

	SKL 300 - 500	SKL 750 - 1000
material:	solid foam	flexible foam
thermal conductivity λ:	0,024 (+/- 5%) W/mK	0,039 (+/- 5%) W/mK
insulation thickness:	50 mm	70 mm
fire protection classification:	B2	
jacket with zipper:	PVC foil 0,8 mm + 5 mm flexible foam	
jacket color:	silver	

Trouble shooting

Problem	Possible reason	Solution
Leakage	pipe connection is leaking	• seal connections • tighten connections
Heating-up period too long	air in the system	• de-air the system
	heating water temperature set too low at the controller	• adjust controller settings
	scaled heat exchanger surfaces	the temperature is set too high for the water hardness when scale occurs
no/too small loa-ding/unloading of the tank when heat is required (heating circuit)	heating controller not set correctly	• set controller anew
	temperature inside the tank too low	• check heat sources (e.g. performance data)
	changeover valve defect or connected wrongly	• check function
	flow-rate is too low in heating circuit	• de-air heating circuit • increase pump performance • check pipe dimensions, when necessary adjust
Unwanted tank cooling	gravity circulation in solar/heating/circulation circuit	• check/install gravity break
	pipelines insufficiently insulated	• insulated pipelines/tank connections
	tank insufficiently insulated	• mount Solarbayer tank insulation
DHW temperature too low	safety temperature limiter set too low	• increase temperature at safety temperature limiter (thermostatic DHW mixing valve)
	heating water temperature too low	• position tank sensor correctly • increase tank temperature at heating controller
	supplementary heating is too late	• check parameter on the heating controller (switch-on temperature difference)

System technology made in Bavaria

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www.solarbayer.de

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