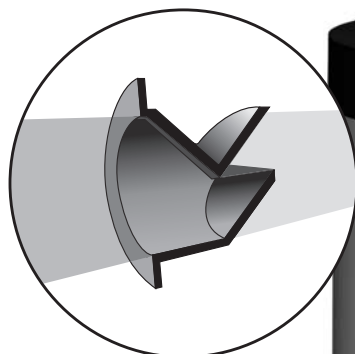




ECOplus Solar Cylinder

Connection options for CONVECTROL II

The effective convection brake
Technically and fluidically optimized barriers separate the water cooled in the pipes safely from the hot storage tank water.



This reduces heat losses at the pipe connections by up to 50%.

Minimal heat losses

due to convection brakes in the pipe connections, as well as due to close-fitting, CFC-free 100-mm thick jacket insulation made from soft PU foam as well as the 150-mm thick and close fitting lid insulation and 50-mm thick floor insulation with robust polystyrene shell.

Double corrosion protection

due to durable high-quality enamel coating and magnesium protection anode.

Quick assembly

with flat-sealing screw connections, sensor terminal block, removable heat insulation with hook closure; horizontal attachment of the connection pipes made possible by CONVECTROL II.

Stable thermal stratification

due to slim, columnar design and stabilized cold water inlet and hot water outlet flows.

Heat exchanger resistant to lime buildup

made from plain pipe for solar and heating circuit with optimized installation design, generously dimensioned.

High quality

due to the use of high-grade and environmentally friendly materials. Manufactured and inspected in accordance with DIN 4753. Options for circuit line and electrical immersion heater, cleaning flange.



Figure 1 The ECOplus solar cylinder - great quality at a great price - available sizes are 300, 400, 500, and 750 liters.

Technical Data

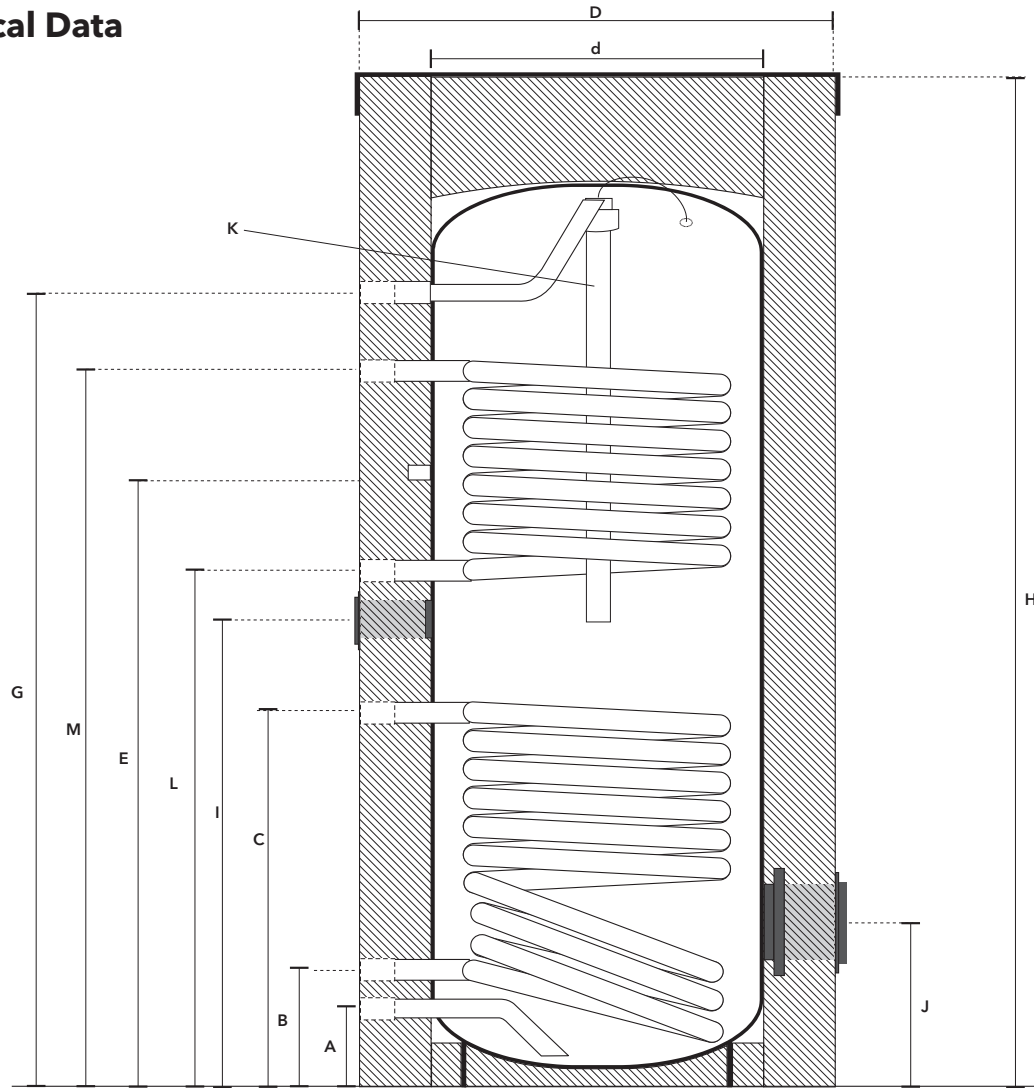


Figure 2 Sectional view of the ECOplus solar cylinder with dimensions.

Accessories	
ECOplus connection kit STANDARD with soldered connections Art. No. 139 000 08	5 soldered connection sets 5/4"-22 mm, 1 soldered connection set 1"-22 mm, plug 1 1/2" and cap 3/4"
ECOplus connection kit STANDARD with threaded connections Art. No. 139 000 29	5 threaded connection sets 5/4"x1", 1 threaded connection set 1"x3/4", plug 1 1/2" and cap 3/4"
ECOplus connection kit Kombi STANDARD Art. No. 13900055	5 combination fitting sets 5/4"x22", 1 combination fitting set 1"x22", 1 plug 1 1/2" and cap 3/4"
ECOplus connection kit CONVECTROL with soldered connections Art. No. 139 000 30	5 convection brakes, soldered connection sets 5/4"-22 mm, soldered connection set 1"-22 mm, plug 1 1/2" and cap 3/4"
ECOplus connection kit CONVECTROL with threaded connections Art. No. 139 000 31	5 convection brakes, threaded connection sets 5/4"x1", 1 threaded connection set 1"x3/4", plug 1 1/2" and cap 3/4"
ECOplus connection kit Kombi CONVECTROL Art. No. 139 000 56	5 combination fitting sets 5/4"x22", 1 combination fitting set 1 1/2", 1 plug 1 1/2" and cap 3/4", 5 convection brakes
Cylinder height adjustment unit, Art. No. 139 000 16	To align tank in case of uneven floor
Cylinder safety subassembly, Art. No. 130 100 56	Complete safety subassembly acc. to DIN 1988
CORREX-UP impressed current anode, Art. No. 130 101 26	Maintenance-free corrosion protection, 230 V
Electrical immersion heater, 3 kW (130 101 66), 6 kW (130 101 65)	3 kW/230 V/400V or 6.0 kW/400 V, immers. depth 500 or 620 mm
Service water mixing valve BM, Art. No. 100 89	35 to 55°C, 22-mm soldered union screw connection
Service water mixing valve BM, Art. No. 150 300 75	35 to 55°C, 3/4"-mm threaded union screw connection
Assembly tool, Art. No. 130 002 39	Aids in the closure of the hook closure, length 200 mm

Feature	300 l	400 l	500 l	750 l
Article No.	130 140 01	130 140 11	130 140 21	130 140 31
Total capacity in liter	313	391	490	755
Aux. heating volume share in liter	135	165	220	310
Permiss. working overpressure in bar	10			
Max. temperature in °C	95			
Usable hot water volume with indicated aux. heating temp. in liter at 50°C ¹	138	162	215	260 ²
Coefficient of performance N_L / assoc. boiler output ¹ per kW	1.6 / 10	2.4 / 12.5	3.5 / 13.5	5.7 / 17.5
Thermal insulation rating	Jacket insulation 100 mm PU soft foam with polystyrene shell Lid 150 mm and floor 50 mm PU soft foam			
Heat loss rate acc. to DIN ENV 12977-3 ^{3,4} in W/K	2.59	2.88	3.29	4.38
Anode, 1 1/4" IT ⁶	K	Magnesium protection anode		CORREX-UP
CW connection / HW connection, 1" OT / 5/4" ⁶ mm	O/T	110 / 1370	120 / 1440	130 / 1541
Circulation, R (con.) 3/4" OT x 30mm in mm	E	1050	1115	1120
Cleaning flange (outer diameter 180 mm) in mm	J	280	295	300
Height with insulation in mm	H	1695	1775	1885
Tilted dimension, without insulation in mm		1600	1680	1800
Diameter (without/with insulation) in mm	d / D	550 / 750	600 / 800	650 / 850
Weight without insulation in kg		130	170	230
Solar Circuit Heat Exchanger ⁵				
Area (m ²) / volume (l)		1.4 / 8.5	1.7 / 10.0	1.9 / 12.0
Pressure loss at 40°C/h mbar / volume flow in l/h		2 / 200	3 / 280	5 / 360
Permiss. working overpressure in bar		16		
Inlet/Return f. solar circuit HT, 5/4" OT ⁶ mm	C / B	675 / 205	690 / 220	705 / 225
Recommended collector area in m ²		4.5 - 8	5 - 10	6 - 14
Aux. Heating Heat Exchanger ⁵				
Area m ² / capacity		1.0 / 6.0	1.2 / 7.0	1.3 / 8.0
Pressure loss at 60°C/h mbar / volume flow in l/h		4 / 450	6 / 550	11 / 700
Permiss. working overpressure in bar		16		
Inlet/Return f. aux. heating circuit HT, 5/4" OT ⁶ mm	L / M	930 / 1270	1000 / 1340	1020 / 1440
Constant output ¹ in kW		10	13	14
Electrical Aux. Heating (Optional)				
Connection, 1 1/2" IT ⁶ mm	I	803	845	863
IT = Inner threading; OT = Outer threading 1) Storage tank with 45°C tappable water quantity if the aux. heating section was heated to the indicated aux. heating temperature (cold water temperature 10°C), values acc. to test report by ITW Stuttgart based on DIN ENV 12977-3 2) Calculated based on DIN EN 12977 3) Acc. to test report by ITW Stuttgart based on DIN ENV 12977-3 4) Calculated based on DIN EN 12977 5) Heat exchanger acc. to DIN 1988 T2 model C 6) Pipe thread DIN ISO 228-1 (cyl.), flat-sealing				

Convection Brake CONVECTROL

Using the CONVECTROL convection brakes make it possible to lower heat losses of the solar cylinder by up to 50% per pipe connection. The patented design of the barriers separates the water cooled in the connection pipes from the hot content of the cylinder. Annual cylinder heat losses are thus reduced by 10% to 20%.

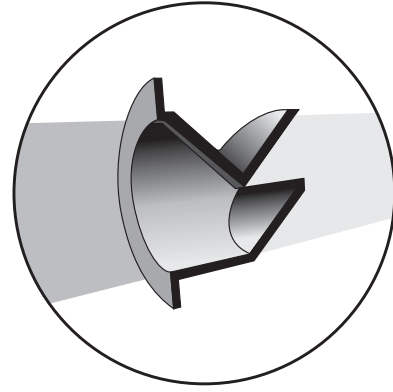


Figure 3 Convection brake CONVECTROL.

Without convection brake

If the solar cylinder is in standby mode, hot water from the storage tank enters the upper section of the connection pipe and flows along the pipe. While in this pipe, the water cools down to the ambient temperature and drops into the lower pipe section due to the increasing density. In the lower pipe section, the cold water returns to the cylinder (one-pipe convection). Energy is continuously withdrawn from the cylinder.

With convection brake

The inlet opening at the pipe sleeve positioned high prevents the water cooled in the connection pipe from flowing back to the solar cylinder. The upper barrier prevents the hot water from the cylinder from flowing into the connection pipe. The thermal conduction via the pipe fitting is blocked between the end faces with the flat seals. The heat losses of the pipe connection are reduced by up to 50%.

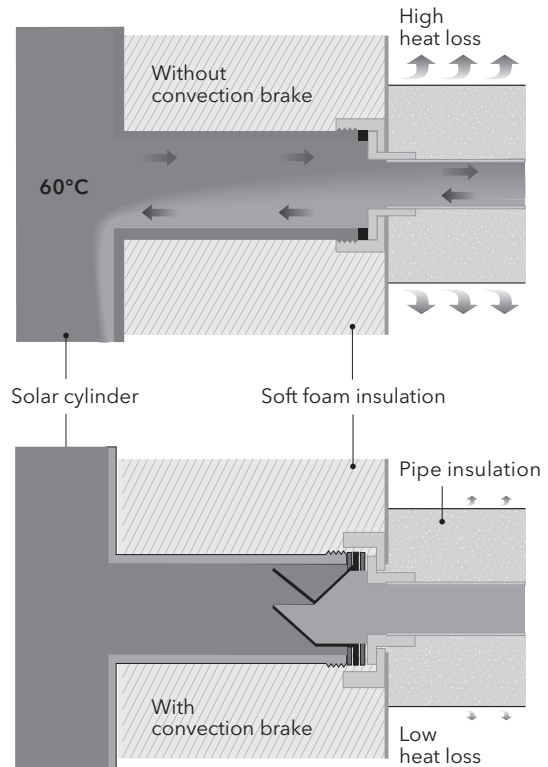


Figure 4 Heat losses at cylinder pipe connections with and without CONVECTROL II convection brake.

Technical Data CONVECTROL	
Outer diameter	Ø38.5 mm/27 mm f. 5/4" OT
Length	30 mm
Material	PA 6-3-T, 40% fiberglass reinforced
Thermal stability acc. to ISO 75, Version A+B	> 230°C
Continuous operation temperature	max. 95 °C
Temporary max. temperature	max. 140°C
Tensile e-modulus ISO 527	11000 MPa
Creep modulus (1000h)	5200 MPa
Coefficient of linear expansion	0.222x10 ⁻⁴ K ⁻¹
Permits and certificates:	DVGW-DZW, KTW, BgVV

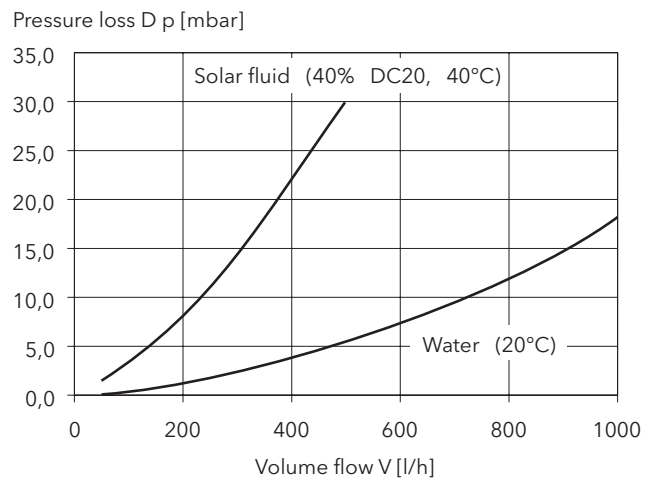


Figure 5 Pressure loss of the CONVECTROL convection brake with passage of water and solar fluid.

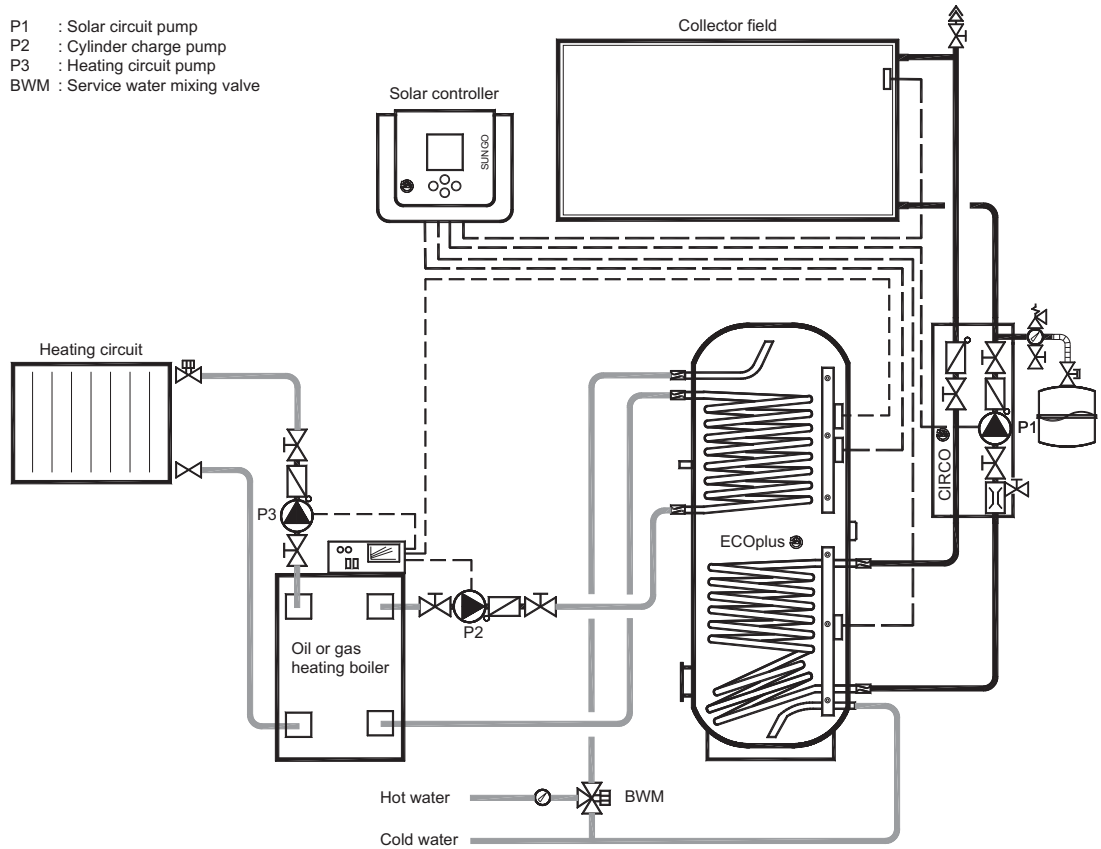


Figure 6 Solar installation for hot water preparation. One cylinder system with solar hot water cylinder ECOplus and auxiliary heating with oil or gas boiler. The solar controller SUNGO operates the solar circuit pump speed-controlled depending on solar irradiation and storage tank temperature. This results in the continuous operation of the system and reduces the electricity consumption of the pump.

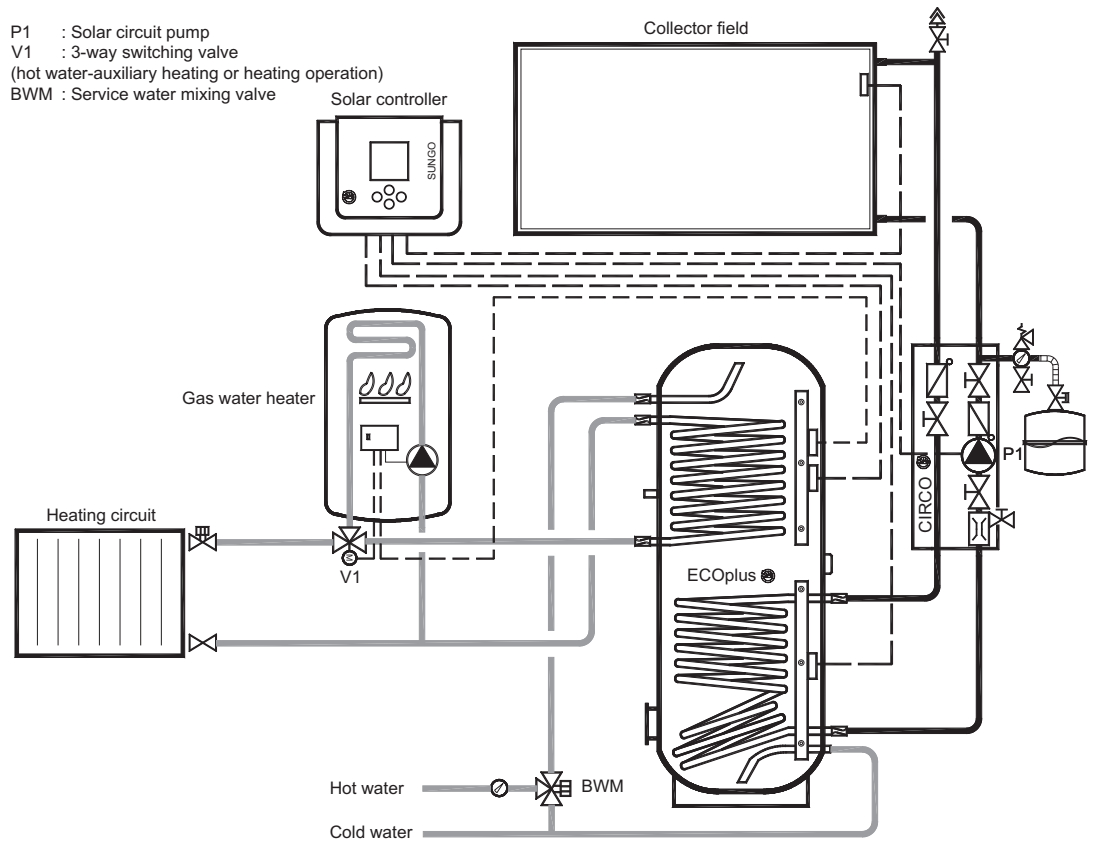


Figure 7 Solar installation for hot water preparation. A one-cylinder system with solar hot water cylinder ECOplus and a gas-fired wall-mounted heating boiler. Switching between heating mode and hot water auxiliary heating is carried out by the 3-way valve installed in the wall boiler inlet flow pipe. The heater controller controls the switching operation. The solar controller SUNGO operates the solar circuit pump speed-controlled depending on solar irradiation intensity. This results in the continuous operation of the system and reduces the electricity consumption of the solar pump.

- P1 : Solar circuit pump
- P2 : Cylinder charge pump
- P3 : Heating circuit pump
- V1 : 3-way switching valve
(cylinder charging)
- BWM : Service water mixing valve

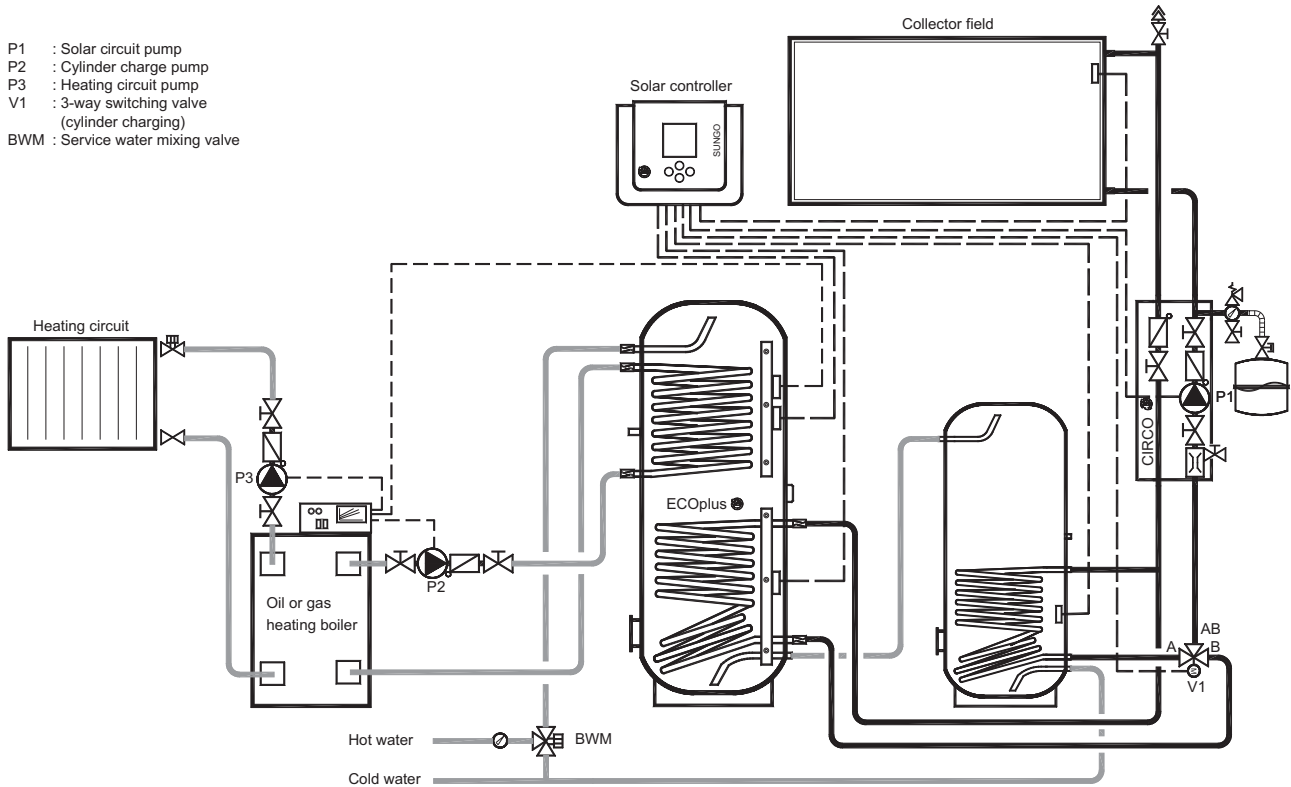


Figure 8 Solar Installation for hot water preparation. Series switching of ECOplus solar cylinder and monovalent hot cylinder tank. The solar energy is distributed optimally to both cylinders by the SUNGO controller. The solar cylinder is integrated in the form of a draw-off cylinder and is heated first by the solar installation. The auxiliary heating carried out with the oil or gas boiler also takes place in the solar cylinder. The monovalent cylinder (only one heat exchanger) serves as preheating tank. This type of layout can be used with an existing hot water cylinder and is characterized by reduced storage tank and system losses.

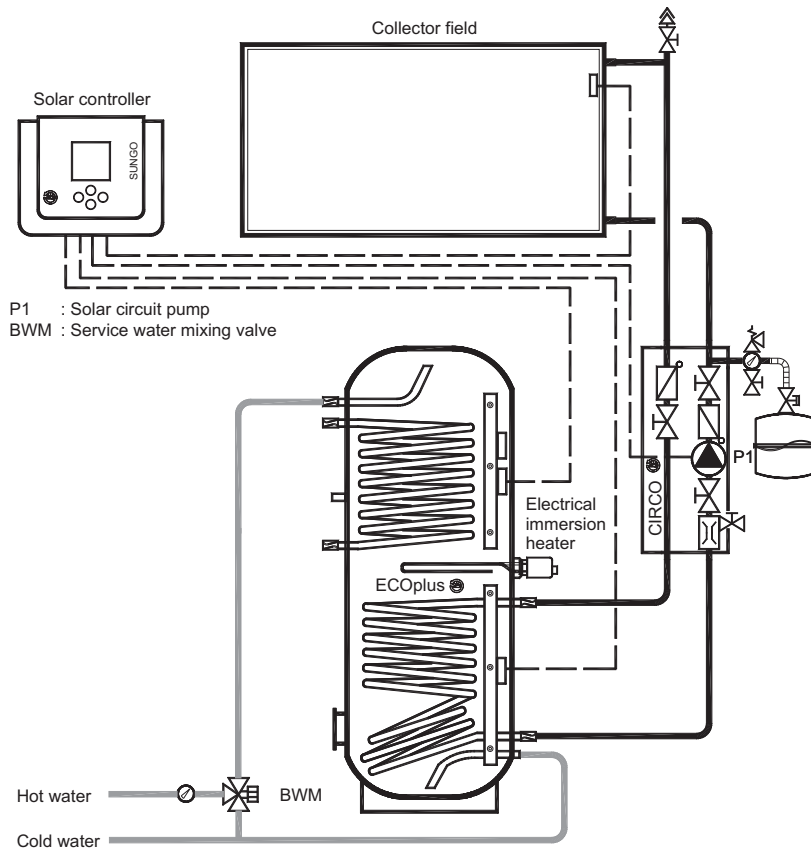


Figure 9 Solar installation for hot water preparation. One-cylinder system with solar hot water cylinder ECOplus and auxiliary heating with electrical immersion heater. If solar charging is insufficient, the immersion heater reheats the upper third of the solar cylinder. The temperature of the auxiliary heating can be adjusted at the thermostats installed the one immersion heater. The solar controller SunGo operates the solar circuit pump speed-controlled depending on solar irradiation and storage tank temperature. This results in the continuous operation of the system and reduces the electricity consumption of the pump.