TERMO Combi Cylinder

Tank-in-tank system
Now you can use solar heat for hot water and heating!
The TERMO combination storage tank can be integrated into the heating system as a return flow booster or as a hydraulic switch.

Available in two sizes 700 l (160 l potable water tank) and 1000 l (230 l potable water tank).

Flow flue
for the effective potable water heating and support of the temperature stratification in the buffer storage.

Connection options CONVECTROL II
The effective convection brake
Technically and fluidic 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%.

Optional:
Add-on kit for the circulation unit with minimized pipework. Time and space-saving, approved visual appearance.

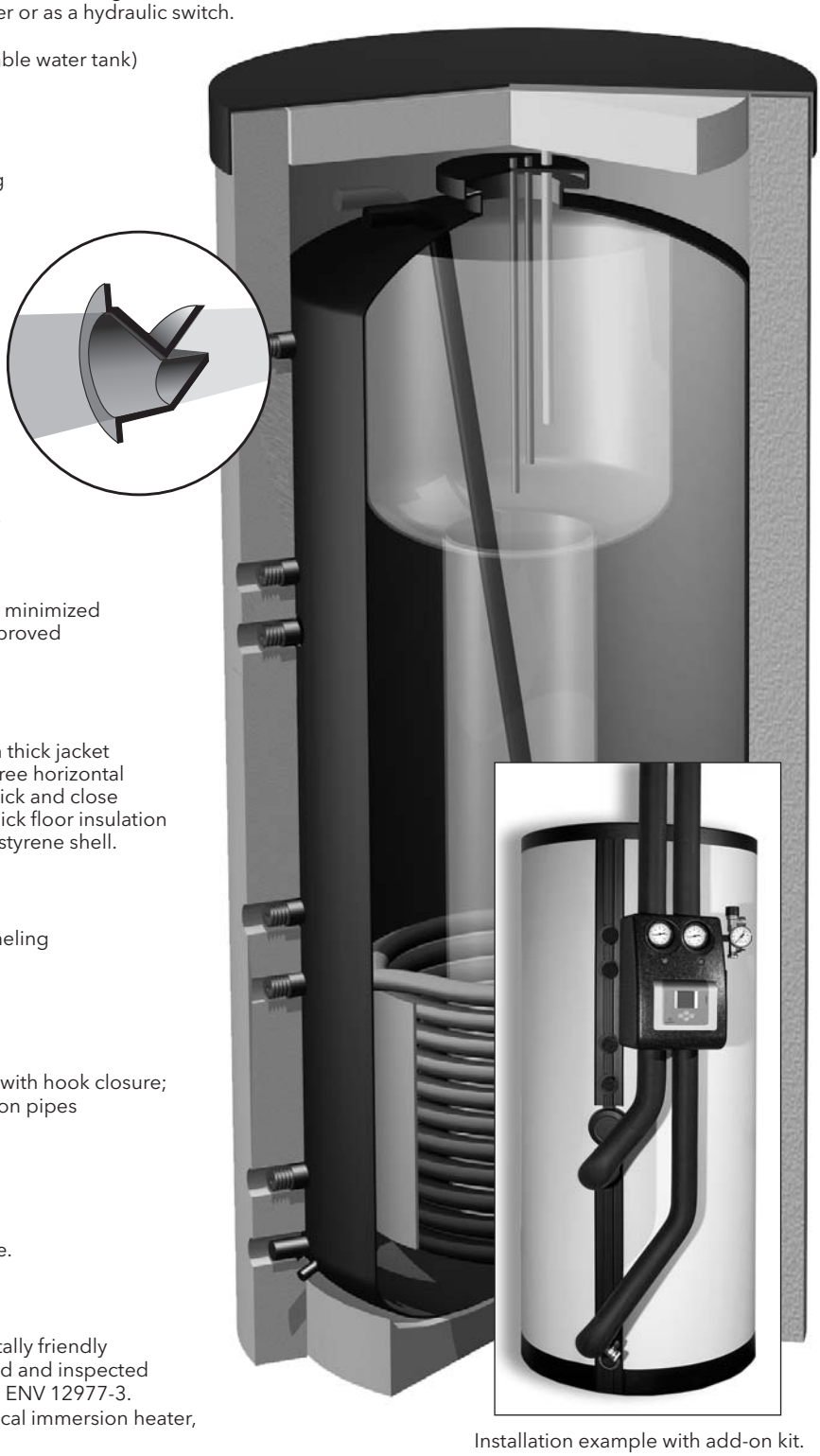
Minimal heat losses
due to close-fitting, CFC-free 120-mm thick jacket insulation made from soft PU foam, three horizontal insulating strips, as well as 150-mm thick and close fitting lid insulation and 60-/30-mm thick floor insulation with scratch and impact resistant polystyrene shell.

Double corrosion protection
due to high-quality and durable enameling and magnesium protection anode.

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

Stable thermal stratification
due to stabilized cold water inlet and inflow brakes in the buffer storage.

High quality
by using high-grade and environmentally friendly materials, made in Germany, produced and inspected in accordance with DIN 4753 and DIN ENV 12977-3. Options for circulation line and electrical immersion heater, cleaning flange.



Installation example with add-on kit.

Figure 1 The TERMO combi cylinder – solar heat for hot water and heating in one tank sizes 700 and 1000 l.

Technical Data

Feature	Dimensions	TERMO 700	TERMO 1000
Part No.		130 002 04	130 002 03
Total height (with/without insulation) in mm	**h / H**	1805 / 1905	2105 / 2205
Tilted dimension (without insulation) in mm		1830	2230
Diameter (without/with insulation) in mm	**d / D**	750 / 990	800 / 1040
Total weight (with insulation) in kg		230	270
Total capacity (without solar heat exchanger) in liter		698	982
Coefficient of performance NL / assoc. boiler output in kW		1.6 / 15	3.2 / 20
DHW internal cylinder tank made from high grade steel, twice enameled acc. to DIN 4753 T3 (St 37-2)			
Permissible working overpressure in bar / perm. operating temp. in °C		10 / 95	
Total capacity / in auxiliary heating area (above P2) in liter		163 / 108	229 / 161
Usable hot water volume with indicated aux. heating temp. in liter [1]		118 liter (49°C) 152 liter (60°C)	200 liter (49°C) 256 liter (60°C)
Cold / hot water connections (stainless steel and brass, OT 1¼" x 45), height in mm [2 7]	**A**	1775	2085
Cleaning and inspection opening (inner diameter) in mm	**J**	Ø 115	
Connection for circulation (OT ¾" x 45) [2 7]	**E**	Flange	
Brass protection anode acc. to DIN 4753 T6 [3]	**K**	Flange	
Immersion sleeve f. aux. heat. temp. sensor (inner Ø 15 mm, l in mm)	**U**	550	700
Buffer part made from high grade steel (St 37-2), primed on outside			
Permissible working overpressure in bar / perm. operating temp. in °C		3 / 95	
Net volume (without DHW part and heat exchanger) in liter		535	753
Auxiliary heating volume (above P2) net in liter		170	238
Heating buffer volume net (between P2 and P4) in liter		105	162
Solar buffer volume (below P4) net in liter		260	353
Aux. heat flow (P1)/return (P2), OT 1¼" x 45 in mm [2 4]	**O / F**	1525 / 1100	1840 / 1260
Aux. heat flow (P3)/return (P5), OT 1¼" x 45 in mm [2 4]	**L / N**	1020 / 315	1140 / 375
Heat return (P4), OT 1¼" x 45 [2] in mm	**M**	825	890
Sleeve for electr. immersion heater (IT 1½" x40) closed with plug mm [2 5]	**I**	1100	1260
Emptying / bleeding (IT ½" x 33 for KFE cock) in mm	**P / Q**	100 / 1680	110 / 2010
Flow flue (diameter x height) in mm	**R**	500 x 520	540 x 520
Sensor terminal block, length in mm	**T**	approx. 1400	approx. 1700
Thermal insulation rating			
Jacket insulation PU soft foam, jacket insulation 120 mm, cover 150 mm and floor 60/30 mm; outer shell polystyrene (1 mm), 3 horizontal insulating strips			
Heat loss rate acc. to DIN EN V 12977-3 in W/K [6]		3.16	3.98

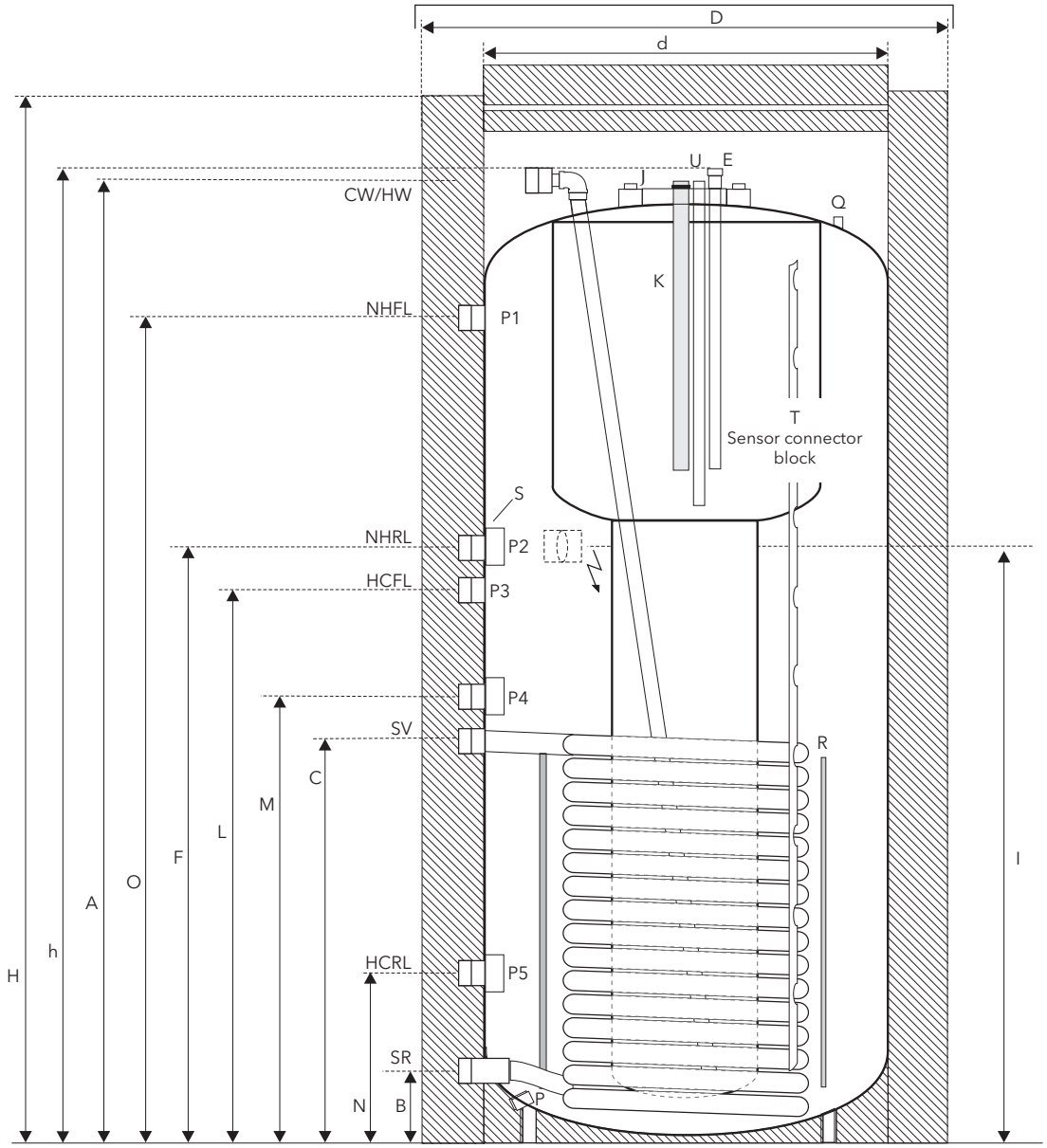


Figure 2 Cross-sectional view of the TERMO combi cylinder with dimensions marked.

Feature	Dimensions	TERMO 700	TERMO 1000
Solar heat exchanger, smooth pipe, made from high grade steel (St 37-2), welded into buffer cylinder			
Heat transfer area in m²		2.2	2.4
Permissible working overpressure in bar		10	
Pressure loss (with indicated volume flow) in mbar		7 (400 l/h)	12 (550 l/h)
Solar flow / solar return (OT 1¼" x 45) in mm	**C / B**	745 / 133	765 / 150
Fluid volume of solar heat exchanger in liter		12.9	14.1

1) Storage with 45 °C tappable hot water volume of aux. heating range was heated to indicated aux. heating temperature (cold water temp. 10 °C), measurements based on DIN ENV 12977-3:2001

2) Pipe thread DIN ISO 228-1 (cyl.), flat-sealing

3) For union assembly (1" IT), electr. insulated integrated, removable ground wire

4) Connections P2, P4, and P5 equipped with flow brakes

5) Max. immersion length of immersion heater: 630 mm or 650 mm

6) Measurements acc. to test reports of the ITW Stuttgart based on DIN ENV 12977-3:2001

7) Cold water and circulation connection inside the cylinder are made from plastic approved for potable hot water (test acc. to KTW recommendations)

Convection Brake CONVECTROL

Using the CONVECTROL convection brakes makes 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 %.

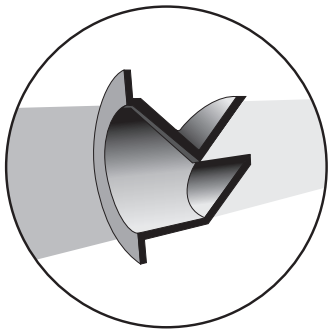


Figure 3 CONVECTROL II convection brake.

Without convection brake

If the solar cylinder is in standby mode, hot water from the cylinder 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 into the 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 connections are reduced by up to 50 %.

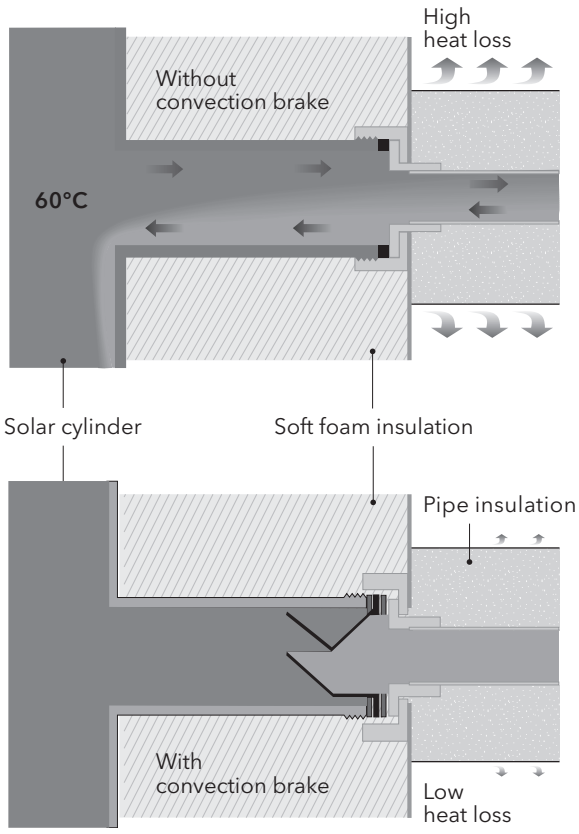


Figure 4 Heat losses at cylinder pipe connection with and without CONVECTROL II convection brake.

Technical Data CONVECTROL II	
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	0.222×10^{-4} K^{-1}
Approval	DVGW-DZW, KTW, BgVV

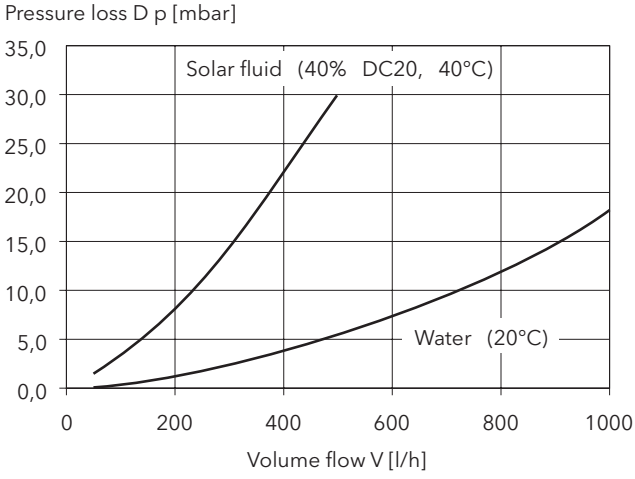


Figure 5 Pressure loss of the CONVECTROL II convection brake with water and solar fluid flows.

System Solutions – Examples

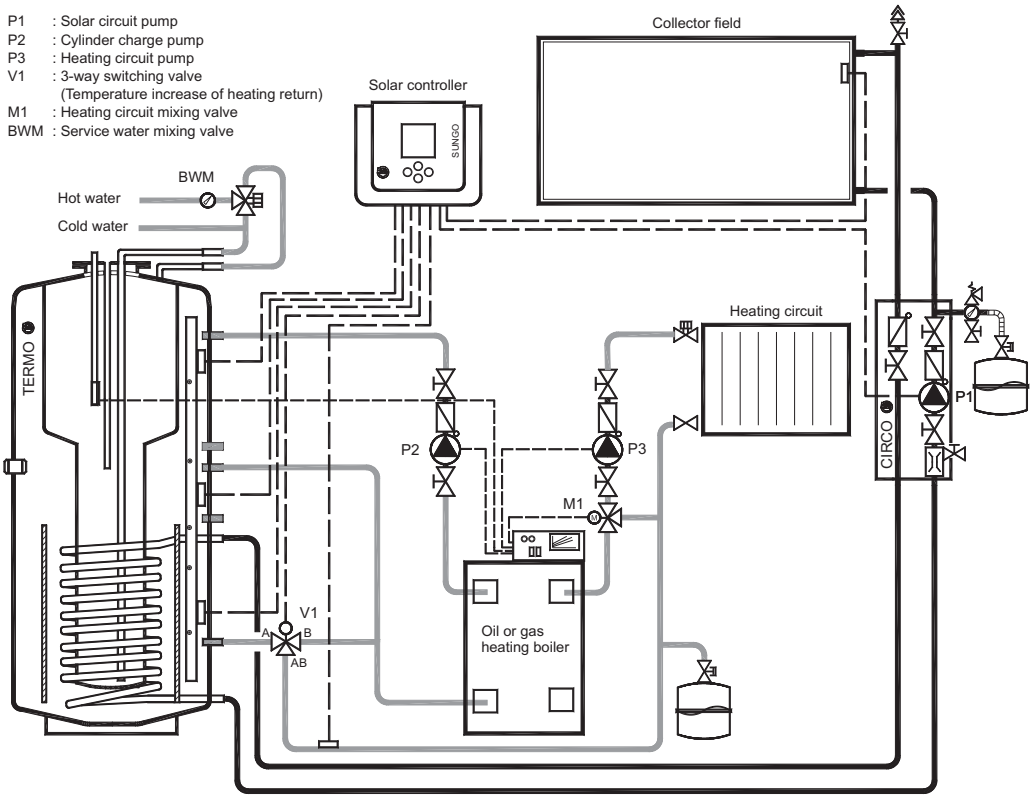


Figure 6 Solar installation for hot water heating and heating support. A storage system with combination cylinder TERMO and oil or gas boiler and a radiator heating circuit (hydronic heating system with pipes and radiators). Potable water is heated in the corrosion-resistant inner container of the combination cylinder. Solar energy for heating is fed to the return pipe of the heating circuit via the 3-way valve V1 if temperatures in the combination cylinder are sufficient. This ensures a high degree of utilization of the incoming solar energy.

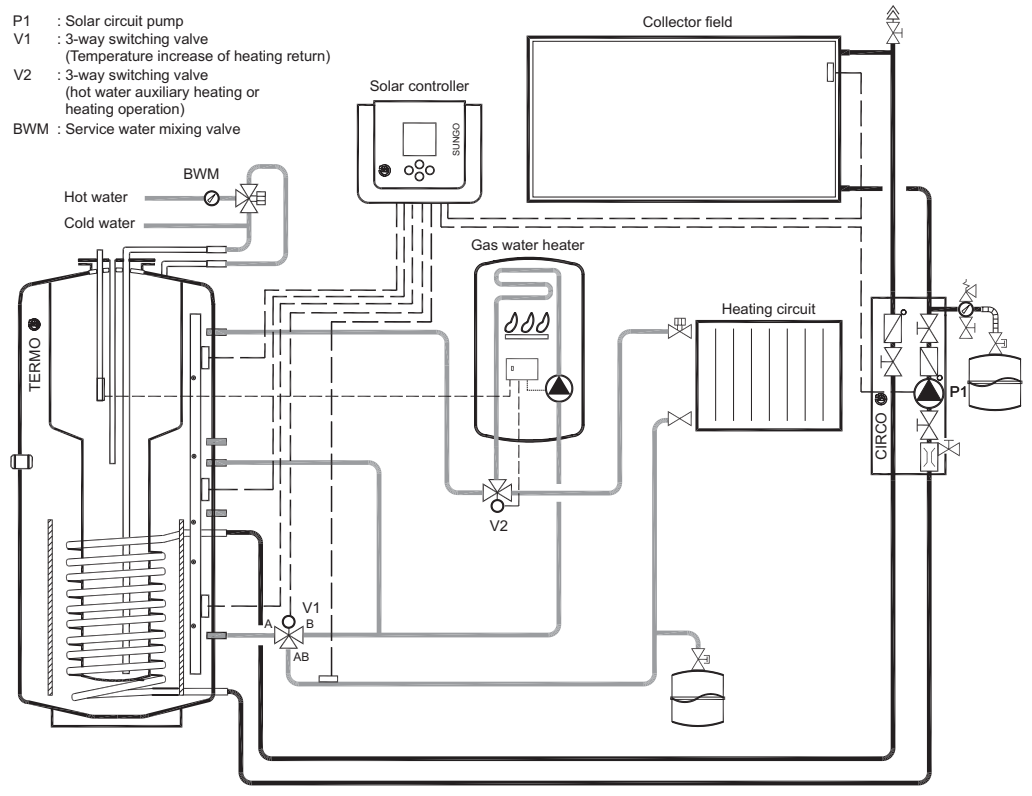


Figure 7 Solar installation for hot water heating and heating support. A storage system with combination cylinder TERMO and a gas hot water heater and a radiator heating circuit (hydronic heating system with pipes and radiators). The switching valve for heating mode or hot water heating is located within the flow pipe of the heat source. Solar energy for heating is fed to the return pipe of the heating circuit via the 3-way valve V1. This achieves a high solar fraction.

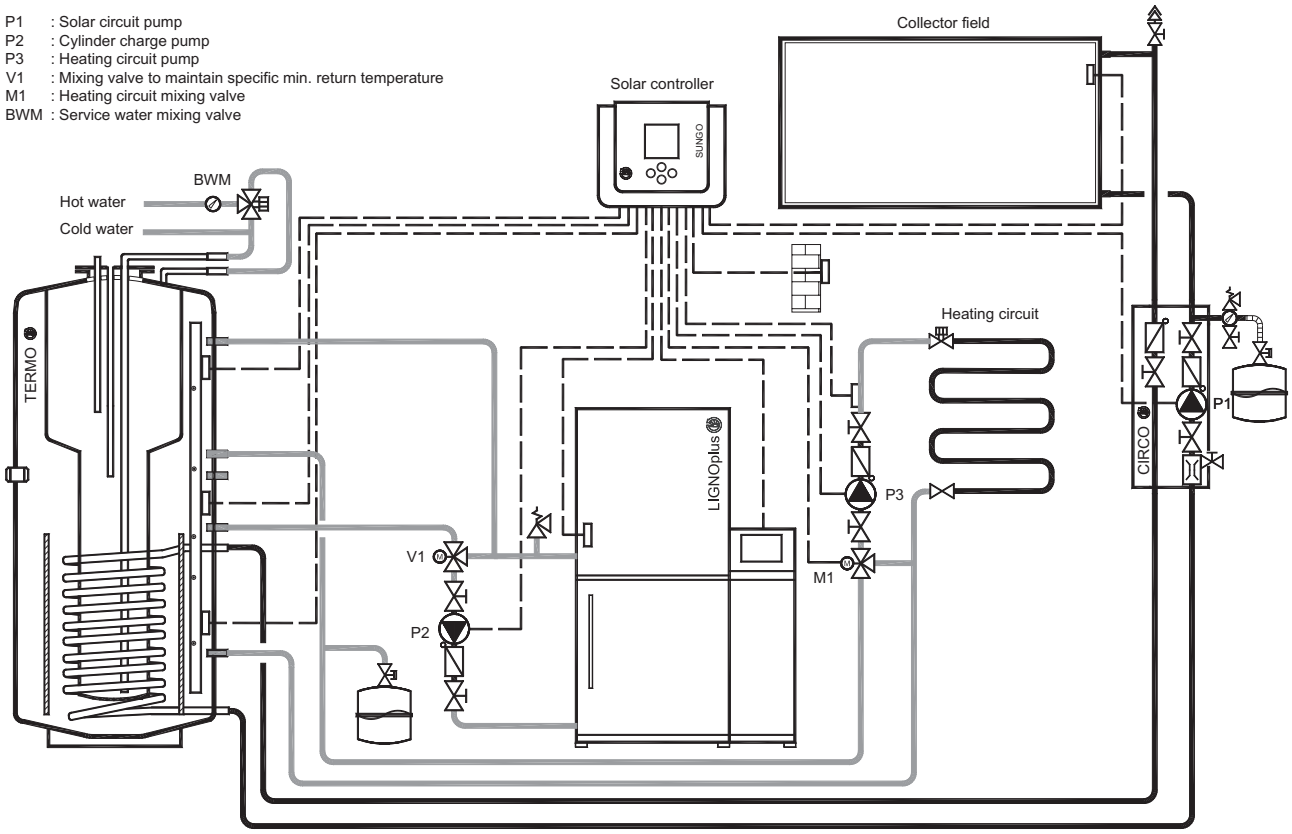


Figure 8 Solar installation for hot water heating and heating support. Single storage system with combination cylinder TERMO, a pellet boiler LIGNOplus and a floor heater circuit. The combination cylinder is integrated into the heating system like a hydraulic switch. Potable water is heated in the corrosion-resistant inner container of the combination cylinder.

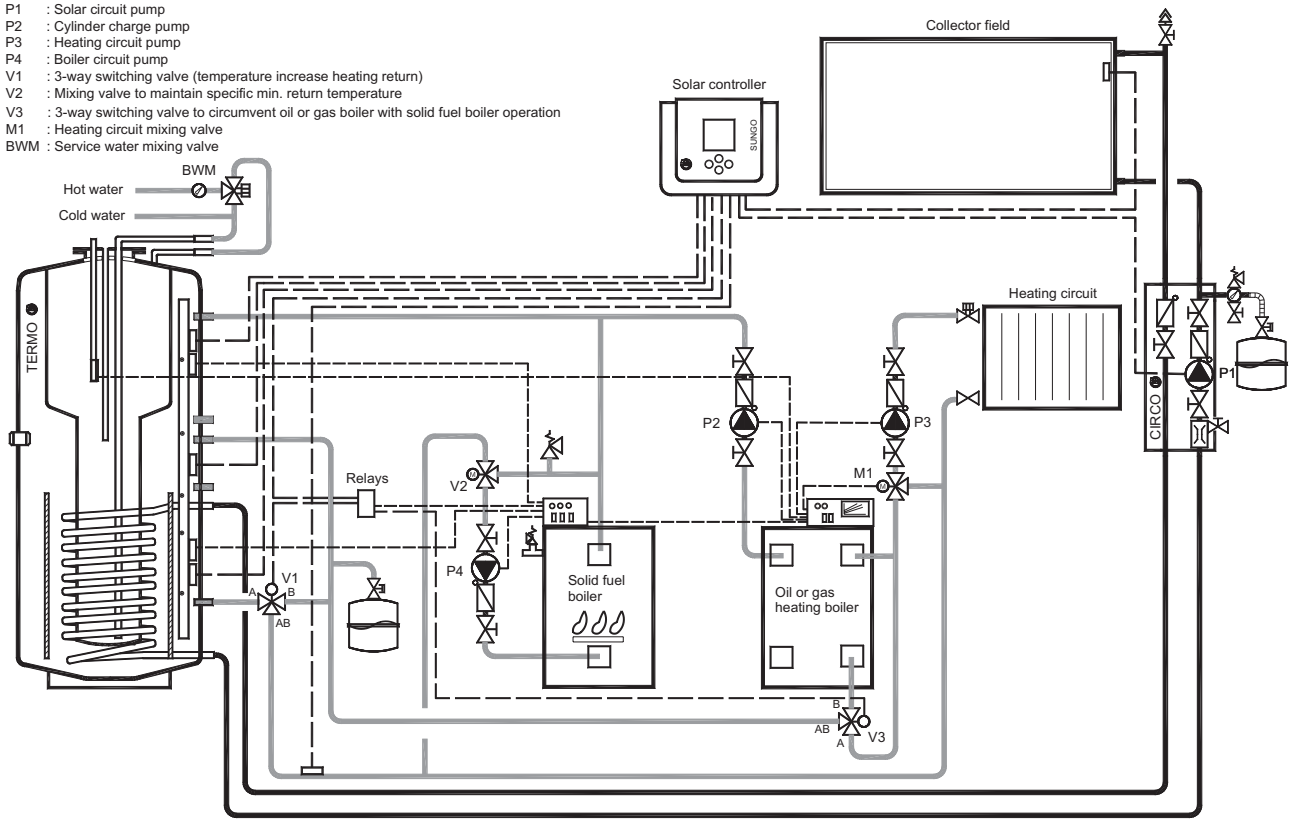


Figure 9 Solar installation for hot water heating and heating support. A storage system with combination cylinder TERMO, an oil or gas boiler or a solid fuel boiler. In case of solid fuel operating mode, the relay RL is used to switch valve V1 to position AB-A and the entire combination cylinder is charged. The oil/gas boiler is then circumvented with valve V3. In case of oil/gas operating mode and sufficient solar energy, the heating return is routed through the combination cylinder. This means valve V1 switches from position AB-B to AB-A. The oil/gas boiler then is not required to supply any or only very little heat.