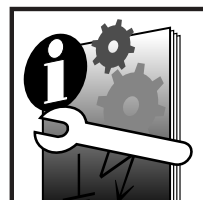


CONUS 502



Solar Thermal Storage tank

Before installing the CONUS 502
please read the planning and
installation advice in the technical
documentation.



Installation and

Operating Manual

Transport

► NOTE

Always transport upright in vehicles



CONUS 502 can be carried in a horizontal position using the hollows in the insulation but during transport the lid of the tank should never be lower than the base

The insulation has to be handled with care. Do not place heavy items on the insulation, as there is a danger of marking.



If necessary the insulation lid, side panels and the base panel can be removed to ease access. The lid can be lifted at the gaps, which are intended for this use.

► NOTES:

The hot water tank has not been stabilised against UV and should therefore not be exposed to direct sunlight for more than a few days.

Tensioning straps can be used for the transport of the tank if necessary.



Installation

CONUS 502 has to be installed in a frost-free room.

► NOTES:

When installing and operating CONUS 502 it is important to keep a minimum distance of 0.5m from hot objects (>90 °C) (i.e. flue pipe, blowlamp)

Avoid contact with other materials that might damage polypropylene, copper or other components of the tank i.e. some solvents.



The baseboard should stand level and secure on all of the synthetic runners.



Remove all soiling from the tank base and position the tank onto the baseboard.

Do not fill the tank yet, as it would make it impossible to centralise it on the baseboard.



Press the insulation panels together and, using the four straps, pull tight without leaving a gap.



The water level indicator is pressed into the slot intended for insertion on one half of the insulation, depending on access needs. The pipe has to reach up to the top right hand corner of the slot.

If the tank is un-steady on the base, a little water can be let in to stabilise the tank before connecting the pipes.

The tank base will adjust itself within a few weeks and then stand level.

Connection

The connection diagrams for CONUS 502 can be found in the technical documentation.

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With installation the regulations of the local water board have to be observed. Compression joints are required. Tested safety equipment according to DIN 4753 T.1 sec. 6.3.1 has to be installed in the cold water supply. The tested safety equipment has to have a connection diameter of DN20 (up to a maximum heating output of 150 kW) and should be unable to be disconnected from the hot water tank. A sign has to be installed at the safety valve or its ventilation pipe which reads as follows: "During the heating process water can escape from the ventilation pipe for security reasons. Do not turn off."

In order to avoid water losses through the safety valve due to water heat expansion of the domestic hot water in the heat exchanger it is possible to install a water hammer damper.

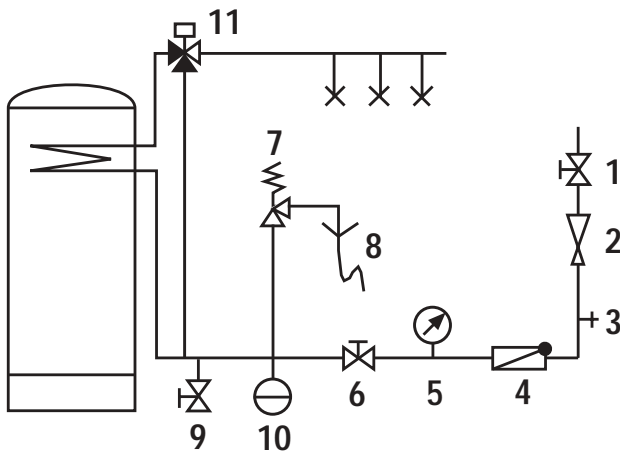
In case of poor water quality or old pipes a fine-filter has to be installed at the tank entrance.

Do not exceed the operations pressure of 8 bar, as indicated on the model plate, if necessary a pressure-reducing device has to be installed. When installing the connections a

drain point should be provided at the cold water supply. The connections have to be carried out according to the relevant regulations, especially according to DIN-standards (see following diagram).

In case of hard water a way to de-scale the DHW coil should be provided. Isolating and rinsing valves should be installed on both the coldwater inlet and hot water outlet. Additionally it is advisable to install a de-scaler in the cold-water feed. You can obtain advice about suitable equipment from your supplier or Consolar.

In order to avoid scalding at high storage temperatures it is strongly recommended that a hot water mixing valve be installed after the tank outlet.



Description of the components

- 1 Isolation valve
- 2 Pressure reducing valve (if mains pressure exceeds 8 bar and no pressure reducing valve connected to house connection)
- 3 Test point
- 4 Non return valve
- 5 Pressure gauge
- 6 Isolation valve
- 7 Safety valve
- 8 Tun-dish
- 9 Drain point
- 10 Expansion vessel for potable water (a small water hammer damper is sufficient)

All circuits have to be completely airtight so that no oxygen can enter the system.

The solar circuit requires a calming section with an expanded diameter at the lowest point of the circuit where corrosion products can settle.

ADVICE NOTE:

The connection pipes of CONUS 502 are shaped at an angle in order to avoid heat loss in the pipes because of microcirculation.

However, this is only effective if the connected pipes are very well insulated or – even better – are guided downwards first. Otherwise the spring loaded non-return valves near the tank connections also provide an effective circulation barrier.

If necessary connection fittings can be soldered onto the outer (60 mm long) ends of CONUS 502 in front of where they are screwed together at the tank.

When soldering, the insulation sleeves of the solar connection should not stay on the curved pipes, the contact of the hot pipes with the insulation foam of the tank has to be avoided.



Connection of the pipes with compression joints:

First push nut, then olive onto the inner end of the curved pipes.



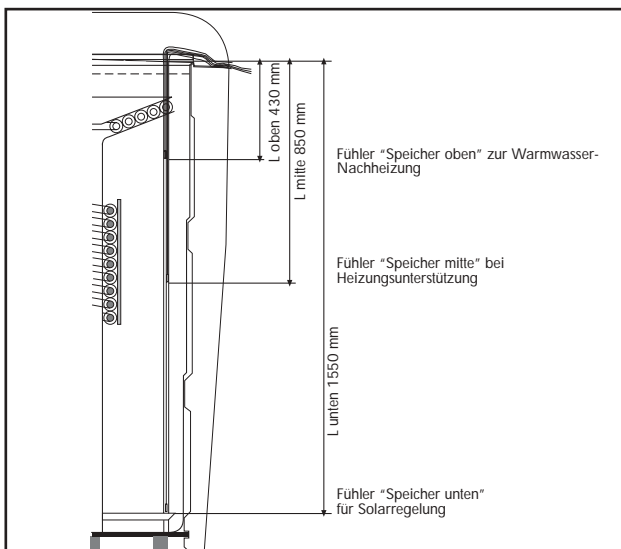
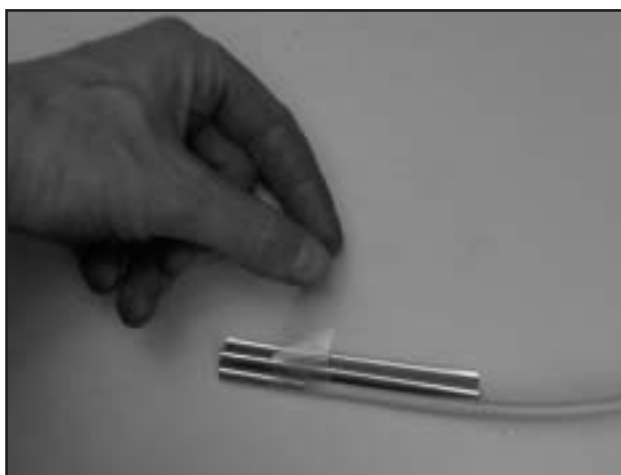
Push the six connection pipes into the provided fittings as far as they will go (ensuring that description on connection pipes and insulation lid correspond).

Once the nuts are tightened by hand, tighten each further with one turn (with Cu 22 mm: 1/2 turn) prevent the fittings turning by holding with a spanner.

Join outer pipe connections corresponding to the chosen diagram to heating- and solar circuit as well as to cold and hot water (see technical documentation).

Connection of temperature sensors

The sensors "tank centre" (when supporting the heating) and "tank top" are fixed in positions as shown in the following diagram. Therefore each sensor tip is taped together with one of the enclosed sensor contact springs with adhesive tape (temperature resistant up to 90 °C) at the sensor cable of the "tank bottom" sensor. A sensor contact spring is also attached to the "tank bottom" sensor.



If the boiler coil is not controlled with a CONTROL-regulator but directly through the boiler control, the hot water tank sensor of the boiler control is also inserted into the temperature probe tube. It is connected in the position of the sensor "tank top", which is then fixed directly above. If the sensor of the boiler control is too large to fit into the temperature probe tube, the CONTROL-sensor "tank top" could be fixed at the outside of the tank. Therefore it is pressed at the corresponding height into the groove of the insulation so that it can still touch the tank.



- ◆ **NOTES:**
- If the hot water volume needs to be increased, the top sensor can be lowered further in the tube. In this case heating support is not possible.
 - All sensors are lowered together to the bottom of the temperature probe tube. The cables are secured against slippage with cable ties at the top at the opening of the tube.



Connect the temperature sensors to the control according to the assembly - and operations manual.

Insert water level indicating float in water level indicator and press tube back into the groove. Finish filling when reaching the Max-level.

Remove filling pipe and put black cover cap tightly back on.



Bleed air from the solar- and heating circuits (if connected) after rinsing and filling, let the pumps run.



Filling

► NOTES:

Using tapwater, CONUS 502 is filled according to the technical documentation. In case of very hard water it is possible for scale to appear once on the outside of the heat exchangers. Generally this does not noticeably influence the function, however, it can be avoided altogether if de-scaled water is used (see also below: putting into operation)

Pull off the black cover cap from the tank lid. The filling pipe can be screwed onto the joining spout, which lies underneath. When the tank is filled roughly to the height of the level indicator U-pipe, the rising of the water level can be observed after water has been sucked into the water level indicator.



After filling and bleeding check every compression joint for leaks, tighten further if necessary. This also applies to the pre-installed compression joints above the tank lid.

Now the insulation lid can be replaced.

► NOTES:

Tank and insulation can expand during the filling process. In order to ease the installation of the lid, talcum or soapy water can be spread on the sealing groove. If necessary an additional tension strap can be pulled around the side panels right at the top. After a while the insulation material will adapt so that later lid removal and replacing will be possible without aids.

Operating advice

Putting into operation:

Before putting into operation check that the cold water supply is turned on and the hot water tank is filled with water up to the Max mark.

If the tank has been filled with very hard water it can be heated up to 70 °C before putting it into operation for the first time. This precipitates the scale on to the boiler heat exchanger, which has little effect on its operation.

Safety settings at the control:

The maximum tank temperature of CONUS 502 is 90 °C. The control should be set in such a way that from 80–85 °C the tank is cooled via the boiler coil, as otherwise the solar system might shut down in order to protect its components and the antifreeze.

The maximum tank entrance temperature, in particular for the solar circuit lies at 100 °C. If there is no temperature restriction at collector level, the control has to switch off the solar circuit pump independently of the maximum tank temperature when temperatures exceed 100 °C at the entrance of the solar heat exchanger. Controls of the CONTROL-range allow slightly higher solar entrance temperatures for a limited period of time.

Holidays:

In case no hot water will be consumed over a longer period of time in summer, the cooling function of the control should be adjusted to 70 °C in order to protect the collectors and the tank.

The insulation lid can be removed in order to save pump energy.

Safety valve:

(according to DIN 4753) Check the function of the safety valve regularly (1 – 2x/month) by ventilating it. An annual service by your plumber is recommended. During the heating of the hot water tank water has to escape from the ventilation pipe for security reasons (if there is no expansion vessel). The ventilation pipe has to remain open at all times.

Maintenance

Water level indicator:

When operating CONUS 502 water losses can appear over time through condensation, as the system is not entirely sealed. The water level indicator float shows the water level. Usually it is sufficient to check the level once a year.

The water level should always remain between the min- and max-arrows. Should it exceed the max-mark water will escape through the water level indicator pipe. This can also happen after the first heating of the tank due to heat expansion.

If the water level falls below the min-mark tank water is unable to run through the domestic hot water heat exchanger. The domestic hot water will then not be heated sufficiently. Tank water is topped-up through the filling pipe (see page 6).

De-scaling of the domestic hot water heat exchanger:

Because of the separation of drinking water and the tank medium there will be no scaling on the outside of the fined-pipe-heat exchanger, especially if the precaution under "Putting into Operation" is followed.

When using hard water scale could appear on the inside of the hot water heat exchanger .

The de-scaling of the domestic hot water heat exchanger is easily done with 10 – 15% citric acid via isolating and rinsing valves at the cold and hot water connections.

Warning: if not used properly acid can cause injuries and damage to objects and the floor.

Citric acid is pumped into the heat-exchanger with the tank at 55 – 60 °C. Isolate the external pipework and use an acid-resistant pump to flush through the rinsing valves at the cold-water inlet and hot water outlet. The de-scaling is usually finished within 15 – 30 minutes.

If no pump is available drain and empty the heat-exchanger and fill with citric acid. This can react overnight, afterwards the heat exchanger needs to be rinsed.

It is strongly advised not to use other acids for de-scaling that are unsuitable for copper, as they could damage the heat exchangers!

Emptying and dismantling

When dismantling, empty CONUS 502 via the filling tube (siphon or pump). Afterwards dismantle the tank in reverse order as for the installation.

Change of water:

The tank water of CONUS 502 does not need changing during its life. It may be changed but not more than 2 – 3 times.

What to do when...

There is no hot water:

Please check:

Has CONUS 502 been freshly filled with cold tapwater and is only partly heated?

If the lower part of CONUS 502 is still very cold, the thermo-siphon current starts up comparatively slowly when taking out hot water and the domestic hot water will be heated less than usual. After water has been taken out several times the typical temperature distribution is re-established and the hot water temperatures will rise.

Is the CONUS 502 heated in the upper area to 55 – 60 °C?

Should the temperature be lower activate boiler (re-heating) and check.

Has the tank not been filled to the top?

This can happen if there is an air bubble in the level indicator pipe so that it indicates between "Min" and "Max" but the actual water level is lower.

Take level indication pipe out of the groove and hold it down to drain the water. When there are no more air bubbles in the pipe press back into the groove. Should the level lie below "Min"-mark refill with water.

Is the temperature sensor for the boiler (re-heating) located at the correct position in the temperature probe tube and has it good contact to it?

Ensure sensor is correctly positioned and if necessary improve contact.

Have you got very hard water?

If you suspect scaling of the heat exchanger (inside) please call your plumber for checking and possibly de-scaling (see maintenance).*

The water comes hot out of the tank but is only lukewarm after the domestic hot water mixing valve?

The mixing valve adds cold water. Should this still be the case in "Max"-adjustment the mixing valve might be soiled or faulty. Move the adjuster knob during water removal and knock against the mixing valve. Particles possibly caught in the mixing valve could thus be loosened.

If the above-described measures do not deliver the hot water temperatures according to the technical data of CONUS 502 please call your plumber.

* For checking loosen the compression joint of the hot water connection and look into the thus opened heat exchanger. If the scale layer exceeds 0.5mm it is recommended to de-scale.

If the tank cools down quickly:

Please check:

Are all connected pipes (solar, boiler, cold- and hot water) at ambient temperature when not in use?

If this is not the case please call your plumber for checking and possible installation of non-return valves.

Is all insulation in place and well fitted without gaps?

If not seal gaps with e.g. silicon.

You have to refill water several times a year:

Please check:

Is the tank lid tightly fitted everywhere and are all holes in the tank tightly closed with rubber grommets?

If not please press back into position.



Consolar products and services are available in the UK exclusively from:

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