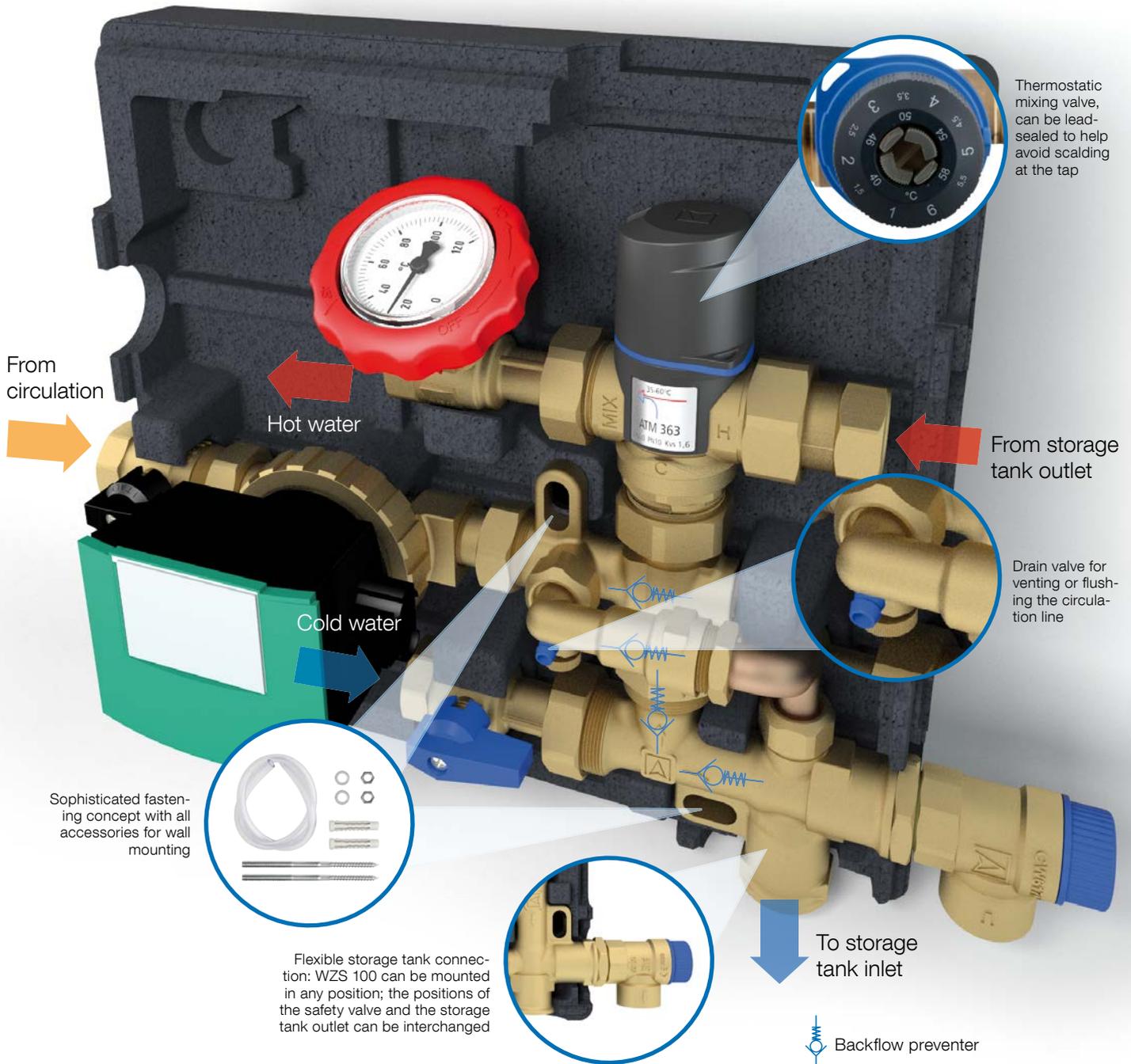


# Hot water circulation system WZS 100



10

## Assembly for easy connection to solar, hot water, hygienic or combination storage tanks (with or without circulation connection at the storage tank)

- + Pre-assembled, tightness-tested and heat-insulated assembly speeds up installation/commissioning and facilitates logistics
- + Fully secured: diaphragm safety valve, backflow preventer and all shut-off valves integrated
- + Intelligent circulation distribution by means of integrated bypass: No back circulation, no "mixing" of thermal layers in the stratified storage tank
- + Integrated pump for plug & play operation
- + Thermometer for easy on-site checks (range 0/120 °C)

# Unwanted, inefficient incorrect installations of stratified storage tanks

As a result of the increasing use of renewable energy in domestic technology applications, the number of hygienic stratified storage tanks with a temporary operating temperature of more than 60 °C is also on the rise. In order to connect such tanks in a more efficient way, to keep the thermal layers and to limit the outlet temperature of the hot water, the installation of the service water line involves several fittings and connection parts.

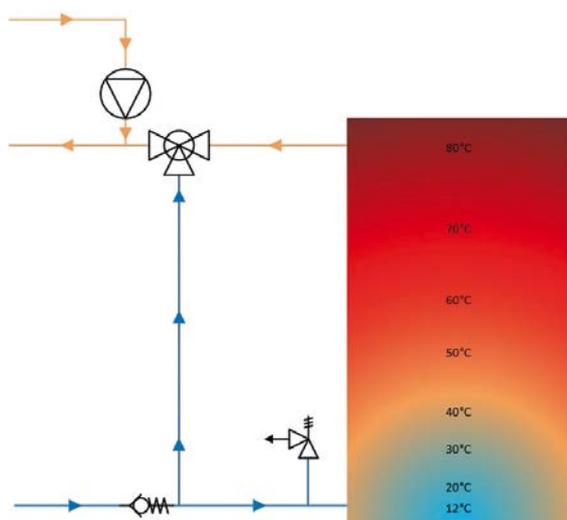
Optimum design of the circulation can often be a major challenge in terms of hydraulics and logistics. For example, the service water connections to the water heater have been made according to the old, inefficient logic or important parts have been "forgotten".

In most cases, the circulation line of stratified storage tanks is connected to the cold water inlet of the hot water tank. This way, the hot circulation water of the return flows through the lower area of the stratified storage tank which is usually cooler. In the lower area, the returning circulation water is cooled - only to be heated up again in the upper thermal layers.

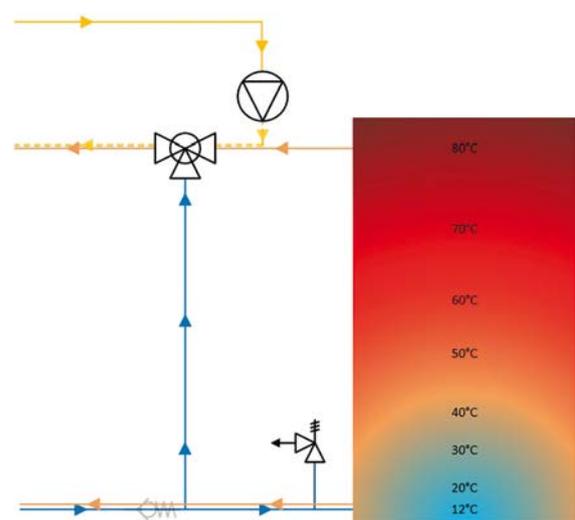
The consequence: The storage medium is evenly heated – which destroys the important thermal layering. The high energy density in the upper thermal layers is lost. In the most adverse case, the function of a solar system is prevented or extremely limited in the transition period.

## Typical implementation issues:

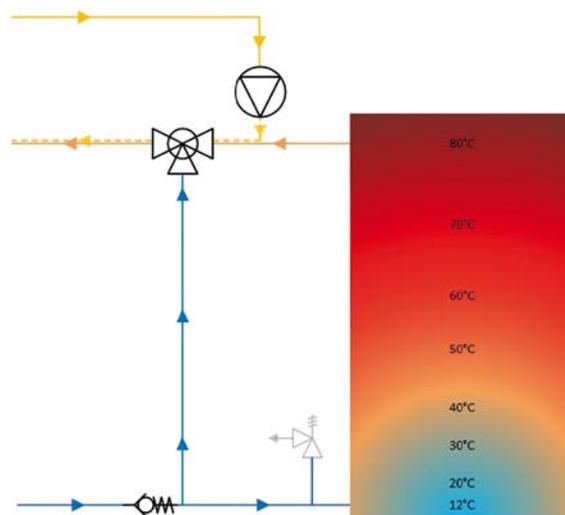
Incorrectly installed circulation pump



Incorrectly installed circulation pump and "forgotten" backflow preventer



Incorrectly installed circulation pump and "forgotten" safety-related equipment

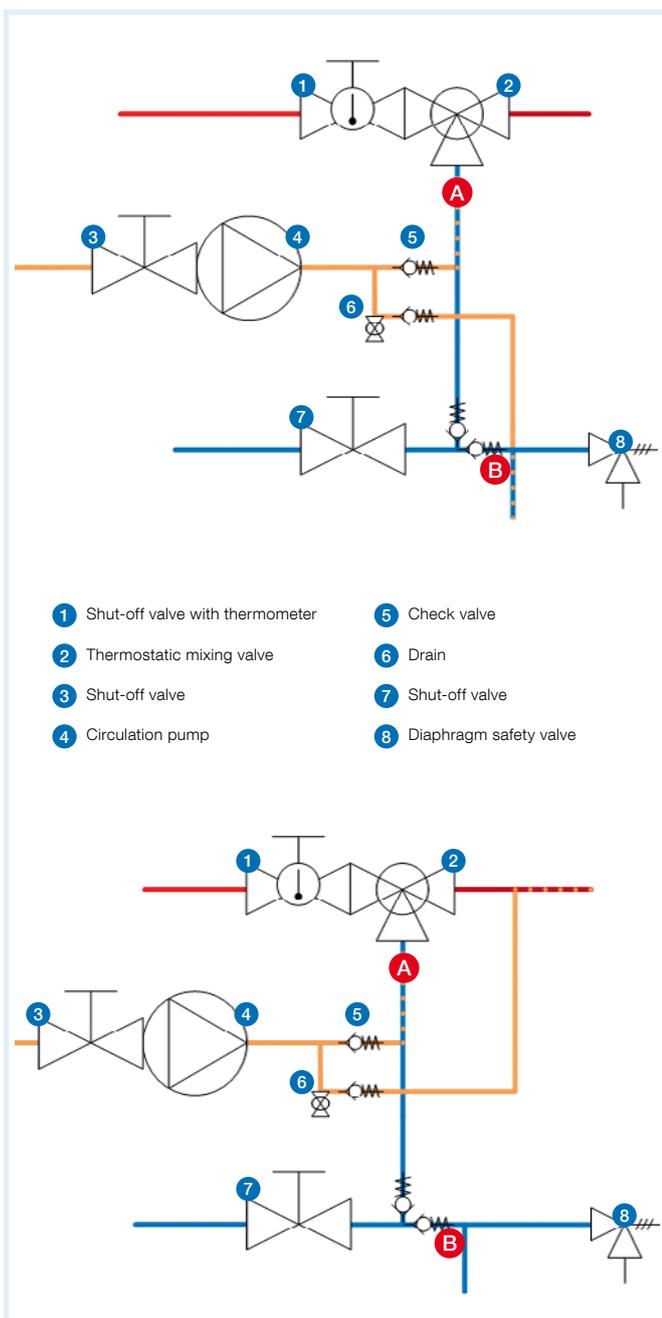
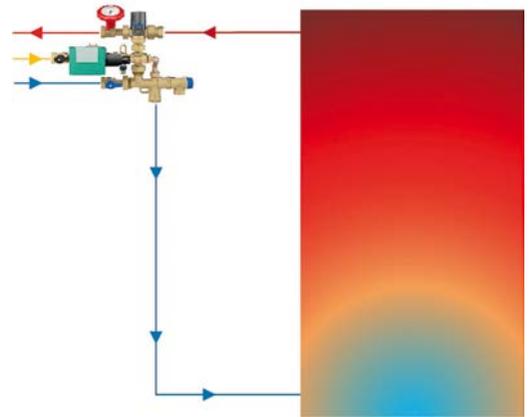


10

# WZS 100 ensures reliable function and efficient operation

With the use of WZS 100, the return part of the circulation line has a direct connection to the cold water inlet of the thermostatic mixing valve. Depending on the water temperatures at the inlets of the mixing valve, they will open or close the hot water inlet and the cold water inlet to a higher or less high degree. A partial volume of the returning circulation water flows directly to the cold water connection of the mixing valve. Depending on the mounting situation (internal/external circulation), the other partial volume can be resupplied upstream of the tank. This allows for considerable energy savings.

WZS 100 thus allows for intelligent circulation distribution without back-circulation and without "mixing" of the temperatures in the stratified storage tank. With minimum installation effort, all possibilities of advanced stratified storage systems for efficient heating of water can be used to their full potential.



## Function example 1 (internal circulation via bypass)

Cold water flows via the safety fitting of WZS 100 to the cold water end via line A to the mixing valve and via line B to the water heater. In the example, the temperature adjustment knob of the thermostatic mixing valve ATM 363 is set to a hot water temperature of 60 °C. The unmixed hot water temperature at the storage outlet is 80 °C due to the high buffer temperature as a result of solar or regenerative energy. The mixing valve now opens or closes the path to the hot and cold water end depending on the temperature. Due to the fast control characteristics of ATM 363, the adjusted temperature is reached at the valve outlet (mix). Only the amount of heating energy really required to ensure the desired water temperature is actually used. If the hot water has reached the last consumer or the point or re-entry (service water to circulation), it is pumped back to the circulation unit via the newly developed flow distributor. Depending on the temperature, it distributes the water via line A to the mixing valve or via line B to the water tank. What's best: Even though there are two flow lines, the pump has to overcome only one check valve. The circulation pump has to overcome less counterforce which results in enormous energy savings and a prolonged service life of the pump.

## Function example 2 (operation with circulation lance)

Same system requirements as in function example 1, but with use of circulation lance ZL 2. In this configuration, the water can only flow the direct path via the circulation lance (as opposed to the bypass version). This results in doubled benefits: Increased comfort as well as energy and heating cost savings.

This is achieved by supplying the returning hot water of the circulation directly to the upper thermal layer of the water heater so that it does not have to flow through the complete tank. At the same time, there is always enough hot water available to supply the fittings without inconvenient delays.