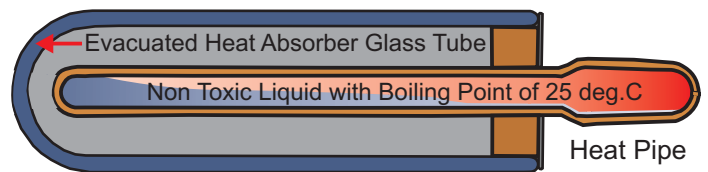


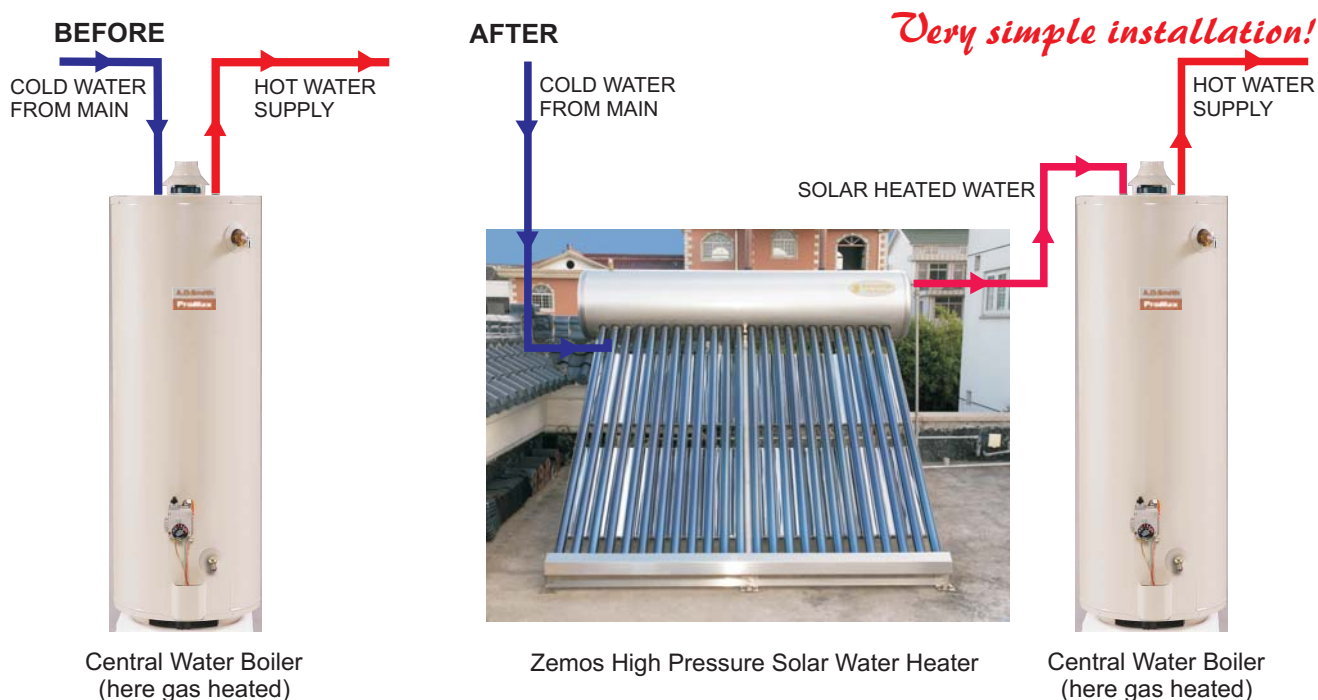


Zemos High pressure Solar Heater with advanced Heat Pipe Technology



*Many possible domestic, commercial & industrial
Applications for great Energy Cost Savings!*

1. DOMESTIC/COMMERCIAL/INDUSTRIAL APPLICATION FOR HOT WATER SUPPLY



2. APPLICATION FOR THE HEATING OF SWIMMING POOLS, WHIRL POOLS AND SPA'S

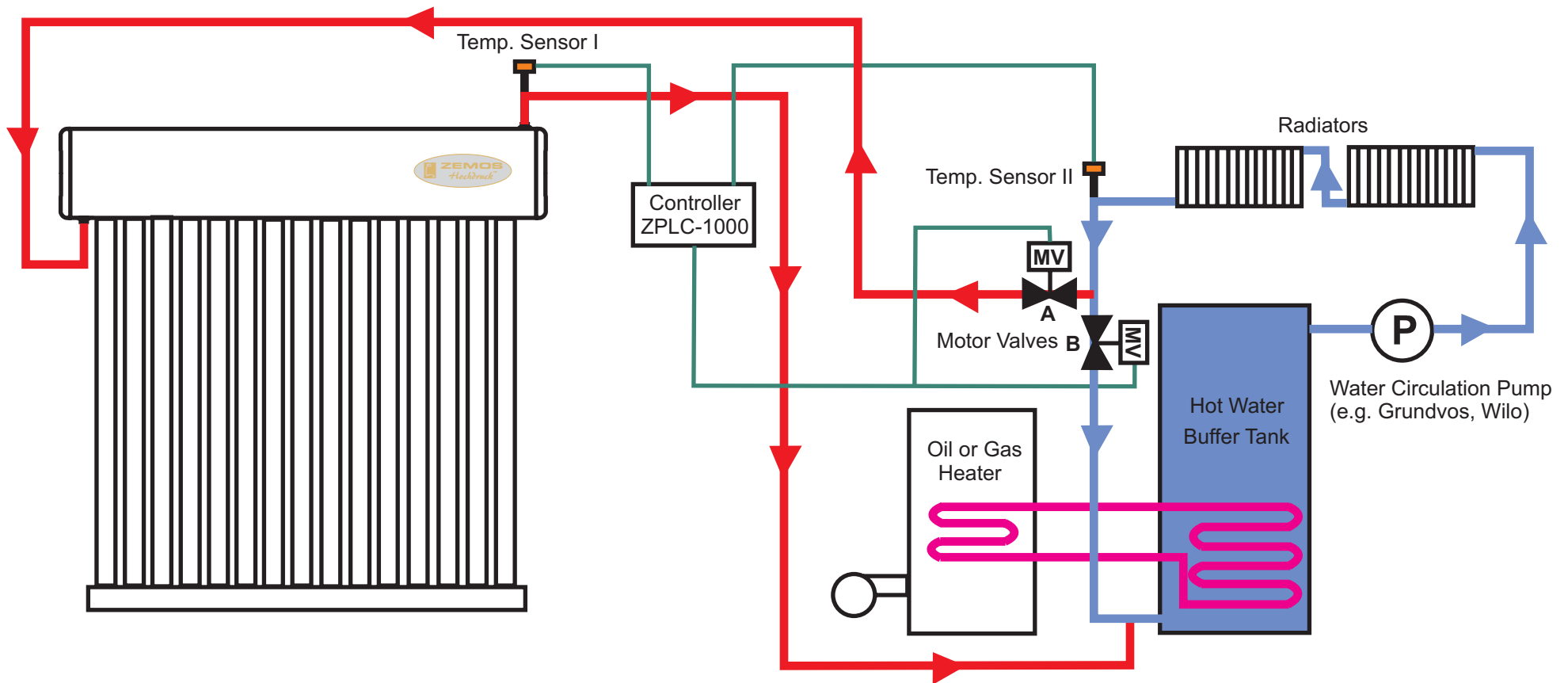
The **Zemos High Pressure Solar Heater** can easily be used for the heating of swimming pools, whirl pools and spas by connecting one or several **Zemos High Pressure Solar Heaters** in series with an existing electrical or gas heating system. By having the water flowing first through a **Zemos High Pressure Solar Heater** will first preheat the water before it will enter the existing electrical or gas heating system. Depending on the sun radiation the temperature of the preheated water will vary. As a result the energy savings due to the preheated water will vary as well. But in any case the energy consumption of the existing electrical or gas heating system will be substantially reduced by the installation of a **Zemos High Pressure Solar Heater**. It is also possible to use the **Zemos High Pressure Solar Heater** as a stand alone system, where a simple immersion pump with a mesh filter can be used to circulate the pool water through the solar heater. For a stand alone system preferably a few **Zemos High Pressure Solar Heaters** should be connected in series to maximize the water heating power.

3. INDUSTRIAL APPLICATIONS FOR THE HEATING OF CHEMICAL SOLUTIONS

The **Zemos High Pressure Solar Heater** with its unique technical concept is providing almost unlimited opportunities in commerce and industry to reduce energy cost. As long as the used chemicals are not corroding V2A (18/8) stainless steel being the material used for the high pressure tank such cost reduction project will be feasible. One commercial application is e.g. the use of **Zemos High Pressure Solar Heaters** to heat the recycled cleaning solution used in automatic car washing installations. Many applications are possible e.g. in the electroplating industry, where almost all plating processes as e.g. acid zinc plating or nickel-chromium plating are using alkaline soak cleaners at the start of the process to clean the parts prior to plating and a hot rinse before the final drying of the plated parts for preventing water marks. These baths, using electric immersion heaters, are operating usually at between 40 - 60 deg. C. With the use of **Zemos High Pressure Solar Heaters** the energy consumption of these existing electric immersion heaters can be greatly reduced. Factories have usually ample space to setup **Zemos High Pressure Solar Heaters** in an ideal south direction e.g. along the facade of the factory building or on the roof.

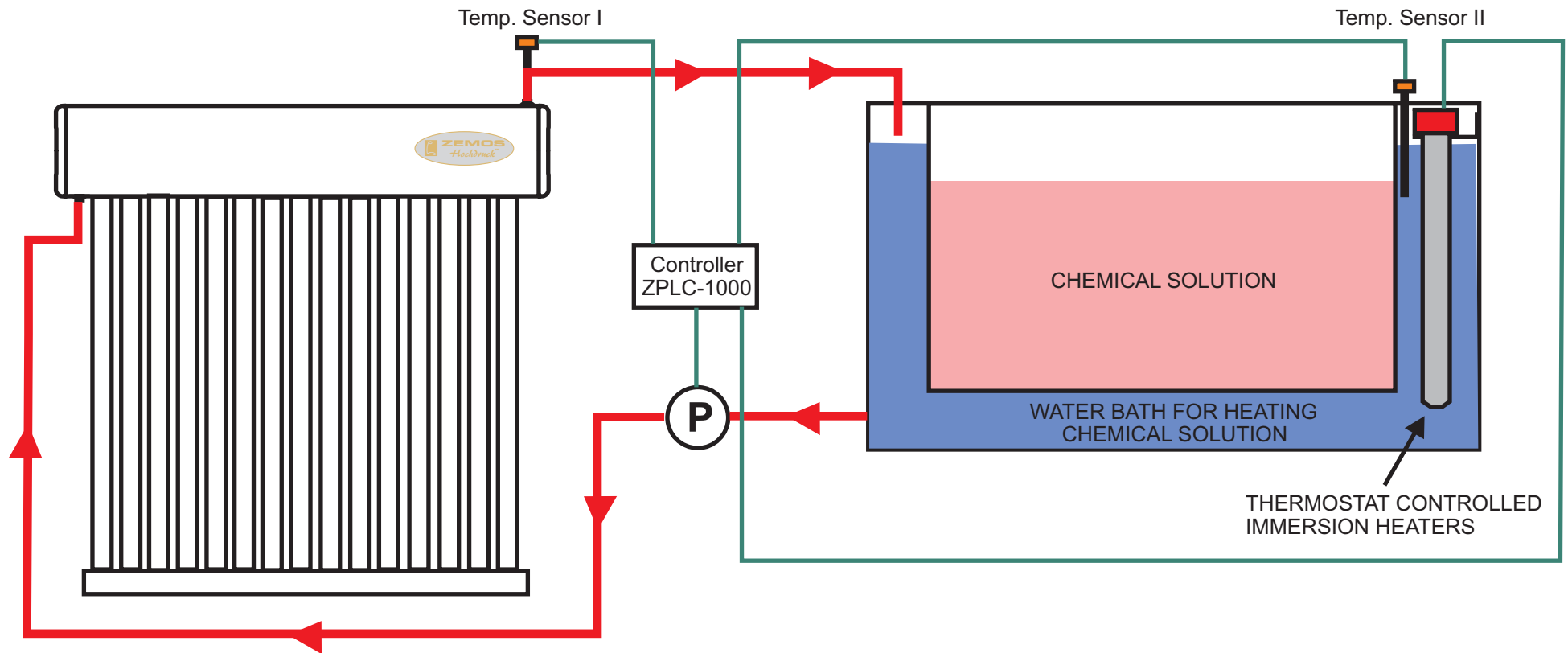
OUTPUT POWER OF THE ZEMOS SUN HEAT ABSORBER TUBES

Measurements by a renowned technical institute in Switzerland show that one Zemos heat pipe solar heat absorber tube supplies an output power of 200 - 900 Watt depending on sun radiation. This means that the most frequently used **Zemos High Pressure Solar Heater** with 24 solar heat absorber tubes has an output power of approx. 5 - 22 Kilowatt. These values can be used as a reference for the dimensioning of heating installations using **Zemos High Pressure Solar Heaters**. It should be noted that the **Zemos High Pressure Solar Heater** is so efficient that it will generate heat even during an overcast day.



PRINCIPLE OF OPERATION

The controller (Zemos ZPLC-1000) will open motor valve A and keep motor valve B closed as soon as the temperature of the water in the solar heater water tank (temp. sensor I) is higher than the temperature of the water coming back from the radiator in the building (temp. sensor II). The returning water from the radiators will flow via the solar heater back to the hot water buffer tank. As a result with the warmer water coming from the Zemos solar heater the oil or gas heater will consume less energy to bring the water in the hot water buffer tank to the desired temperature. In case that the temperature of the water in the solar heater tank is lower than the temperature of the returning water from the radiators it obviously will not make any sense that the returning water will flow through the solar heater. Therefore the controller will close motor valve A and open motor valve B instead, with the result that the returning water from the radiators will flow back directly into the hot water buffer tank. In case that a 3-way motor valve will be available, the two motor valves in the diagram can be replaced with a single 3-way motor valve. The huge advantage of this system, making the installation and operation very simple and reliable, is that it is totally independent from an existing central heating control system. Several Zemos High Pressure Solar Heaters can be connected in series to increase the heating capacity.

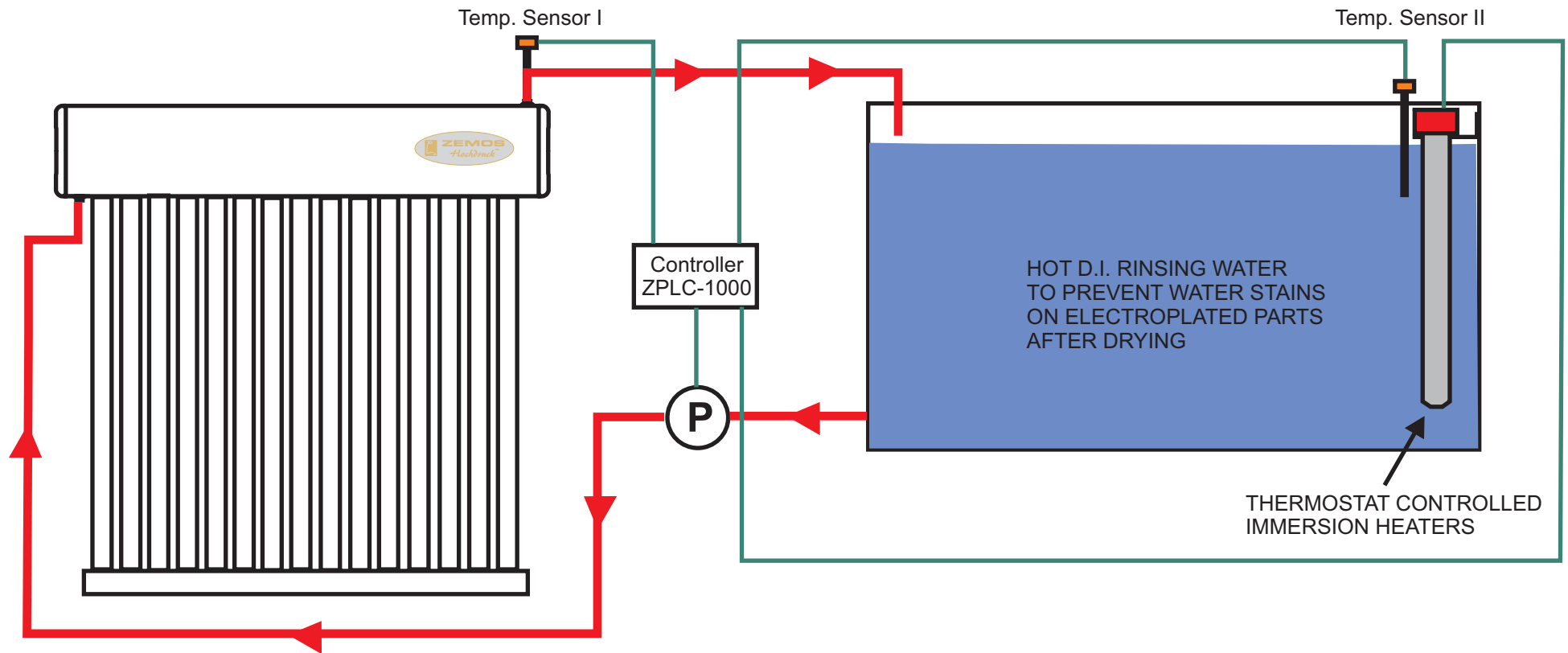


PRINCIPLE OF OPERATION

The controller (Zemos ZPLC-1000) will switch on the circulation pump (e.g. Wilo) as soon as the water temperature in the high pressure water tank at the exit of the solar heater (temp. sensor I) is higher than the temperature of the water bath for heating of the chemical solution (temp. sensor II) and switch off the circulation pump, if the temperature at the exit of the solar heater is equal or lower than temperature of the water bath. The controller will as well switch off the circulation pump as soon as the water bath has reached the required temperature. The controller has the additional feature that the user can select the water temperature at the exit of the solar heater, where the electric heaters will be switched on, if the temperature is equal or below the selected value. This will allow the user to maximize the use of the solar energy, where the electrical heater will only be switched on, if the water temperature at the exit of the solar heater is not high enough to raise the temperature of the water bath to the required temperature. Several Zemos High Pressure Solar Heaters can be connected in series to increase the heating capacity.



EXAMPLE OF USE OF THE ZEMOS HIGH PRESSURE SOLAR HEATER FOR HEATING A D.I. HOT WATER RINSE PRIOR TO DRYING IN AN ELECTROPLATING LINE



PRINCIPLE OF OPERATION

The controller (Zemos ZPLC-1000) will switch on the circulation pump (e.g. Wilo) as soon as the D.I. water temperature in the high pressure water tank at the exit of the solar heater (temp. sensor I) is higher than the temperature of the D.I. rinsing water in the rinsing tank (temp. sensor II) and switch off the circulation pump, if the temperature at the exit of the solar heater is equal or lower than temperature of the D.I. water in the rinsing tank. The controller will as well switch off the circulation pump as soon as the D.I. rinsing water has reached the required temperature. The controller has the additional feature that the user can select the D.I. water temperature at the exit of the solar heater, where the electric heaters will be switched on, if the temperature is equal or below the selected value. This will allow the user to maximize the use of the solar energy, where the electrical heater will only be switched on, if the D.I. water temperature at the exit of the solar heater is not high enough to raise the temperature of the D.I. water in the rinsing tank to the required temperature. Several Zemos High Pressure Solar Heaters can be connected in series to increase the heating capacity.