

# RS 500 SINGLE OUTPUT

## PROPORTIONAL PUMP CONTROL FOR DOMESTIC WATER HEATING

# PS

The domestic water heating application of the RS500 provides proportional pump motor speed control based on the temperature difference between the solar collectors and the storage tank. This proportional pump control increases solar energy collection efficiency by 6-8% during winter, cloudy days and other periods of marginal solar intensity when maximum efficiency is important. The RS500 is designed to control permanent-capacitor and shaded-pole motors. The control senses very small temperature differentials and modulates the pump speed in response to the small changes in the temperature differential between the collectors and the storage.

Power delivered to the pump by the all-solid-state circuitry is switched on and off at zero crossover, thus eliminating bothersome line noise. The power delivered to the pump reaches full line voltage on each cycle, thus assuring full torque even at low speeds.

Proportional controls should be used in systems where the pump is required to overcome only line friction. Proportional controls are not recommended for use in drain-back systems in which the solar collectors drain when the pump shuts off. In such systems, the pump may not receive enough power in the proportional mode to overcome the high initial static head.

### Standard features:

- pulsing indicator light indicates pump speed.
- switch meets local electrical code requirements for pump power disconnect switch when control is located within 6 feet of pump.
- eliminates the need for balance valves and circuit setters.

### SPECIFICATIONS RS500-1 SERIES:;

Input: 110 VAC, 50-60 Hz

Output: 110VAC, 1/12 hp

Optional configurations available for 220 VAC, 50-60 Hz.

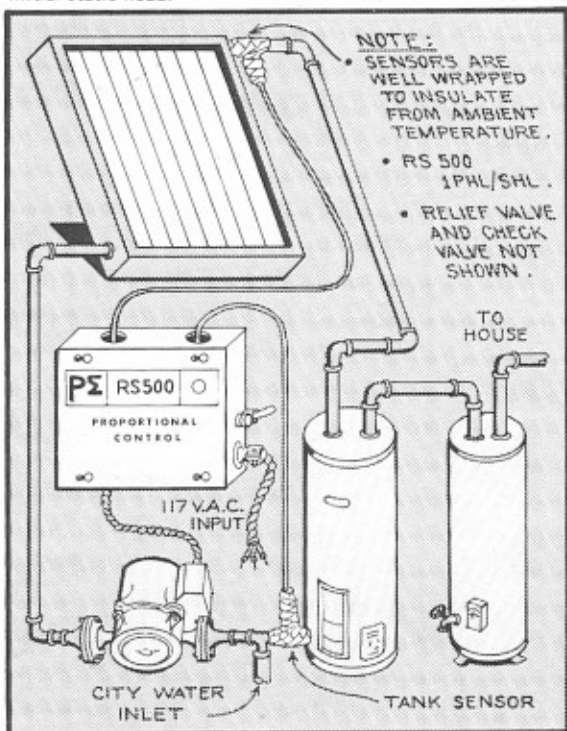
#### RS500-1P

Minimum Flow:  $\Delta T = 3^{\circ} \pm 1^{\circ}F$

Full Flow:  $\Delta T = 12^{\circ} \pm 1^{\circ}F$

#### RS500-1PH

Same proportional flow control characteristics of RS500-1P with additional high temperature detection circuit to shut-off pump when storage tank approaches excessive temperatures. Standard shut-off temperature is 140°F. Other shut-off temperatures may be specified. When specifying other turn-off temperatures, consideration should be given to temperature stratification between the bottom of the tank where sensor is installed and top of tank where delivered water is located.



#### RS500-1PHL

Same characteristics as RS500-1PH with addition of anti-freeze circuit to turn pump full on when collector approaches freezing. Anti-freeze circuit overrides all other control commands and turns pump full on at 37°F until collector temperature reaches 44°F. All Rho Sigma controls operate high temperature cut-off and low temperature start functions from the primary collector and storage sensor. Thus no extra sensors are required, greatly reducing installation time and cost.

The following are some of the permanent capacitor and shaded-pole pumps which have been tested and found to perform well with the RS500: Taco 007, All Grundfos models, March 821BR and 809, Teel 1P761 and 1P760, Sunstrand LA4302.