

# AQUA SOLAR™

## Solar Pool Heating Control



**5 Year Limited Warranty\***

\*Refer to Limited Warranty Statement for Details.

## FIRST NEW SOLAR CONTROL OF THE MILLENNIUM

### Description

Goldline Controls, the world's largest manufacturer of differential solar controls, is pleased to introduce the exciting new Aqua Solar. The field expandable Aqua Solar solar pool controller is the culmination of over 27 years experience in the manufacturing of solar controls. The Aqua Solar is housed in a locking weatherproof enclosure and it's advanced operating features offer selectable high limit, programmable recirculation freeze protection and nocturnal cooling, optional pool sweep interlock and booster pump control. And with the TC model an integral time clock is included for 24 hour control of the pool's filtration pump with a selectable solar override feature.

**Automatic Heating** If the collectors are warmer than the pool water by 4<sup>0</sup> F or more, and the pool is below the selected desired temperature, the valve will rotate allowing heat collection. The heat collection stops when the solar sensor temperature falls to within 1.5<sup>0</sup> F of the pool temperature or the pool temperature exceeds the selected desired temperature.

**Automatic Cooling** (Field selectable option) If the collectors are cooler than the pool water by 8<sup>0</sup> F or more, and the pool is above the desired temperature, the valve rotates allowing cooling via the solar collectors. The heat dissipation continues until the collectors rise to within 3<sup>0</sup> F of the pool temperature or the pool temperature is lowered below the desired temperature.

**Single Setting For Desired Temperature** The Aqua Solar is set by a single dial adjustment with the desired pool temperature clearly indicated. The dial is calibrated with the temperatures from 70<sup>0</sup>F to a high of 104<sup>0</sup>F for quick and easy, user-friendly operation. The temperature set indicates the desired pool temperature. The Aqua Solar will automatically determine if the water should be heated or cooled, thus maximizing the solar system capabilities.

- **Programmable Solar Differential Control**
- **Digital Temperature Displays** of pool water and solar system.
- **Selectable Solar Override** to maximize solar heat gain.
- **Sensor Status Indicator LED's** notify user of complete system status.
- **Booster Pump Control** via plug in 3 HP relay\*.
- **Pool Sweep Interlock Feature** via plug in 3 HP relay\*. \* Order Separately
- **120 VAC or 240 VAC Selectable Input** and 24 VAC output standard.
- **Filter Pump Control** via optional time clock model (see reverse)
- **Aqua Solar™ Combo (ASC)** Control, sensors, valve & actuator packaged together for convenience and affordability.

**Terminal Strip Connections** for input power, and sensor inputs. Controls also have industry standard 3 pin connectors for both forward and reverse valve actuator operation.

**LED Indicators** show the status of the system operation. Seven highly visible LED's show 1) power to the control, 2) power output directing valve and/or pump to collect heat (heating), 3) power output directing valve and/or pump to dissipate heat (cooling), 4) sweep interlock indicating the pool cleaner pump is in the lock-out time allowing for flow to establish previous to turning on, 5) sensor fault indicator shows pool sensor not operating properly, 6) sensor fault indicates open or short circuit, 7) sensor fault for auxiliary sensor.

**Valve Output** on the Aqua Solar is the industry standard 24 VAC. Output is fuse protected.

**Recirculation Freeze Protection** (field selectable option) turns the Aqua Solar output ON, directing warmer pool water through the collectors when near freezing temperatures are noted at the auxiliary sensor. The Aqua Solar allows recirculation when the aux. sensor falls below 34<sup>0</sup>F and will stop circulation when the temperature rises to greater than 36<sup>0</sup>F. Two 10K Ohm sensors are required for operation. One or more freeze snap switch sensors are also recommended if freeze recirculation protection is utilized. *Important-See instructions before using freeze recirculation.*

**System Operation and Test Switch** allows the user to manually override the automatic function of the Aqua Solar to verify the operation.

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### Aqua Solar-TC (AQ-SOL-LV-TC)

The Aqua Solar Time Clock model is the Aqua Solar with a 3 HP double pole relay for time based control of the swimming pools main filter pump. The time clock is programmable in 15 minute increments and can have multiple ON/OFF times. A small switch located on the timer face allows for manual turn ON, automatic operation via the selected ON/OFF times and manual turn OFF.

- **Single Control Operates Solar System and Filter Pump, Automatically**
- **Programmable in 15 Minute Increments**
- **Selectable Multiple ON/OFF Times**
- **One 3 HP Relay (AQ-RELAY) Standard**
- **Selectable Solar Override**
- **Selectable Freeze Recirculation**
- **Selectable Nocturnal Cooling**
- **Expandable to One Additional Relay Output**

### AQUA SOLAR SPECIFICATIONS

#### Input Power

120V (105V to 130V, .5A, 50/60Hz)  
240V (195V to 250V, .25A, 50/60Hz)  
Terminal block connections, varistor protected

#### Inputs

10K thermistor temperature sensors  
Swimming pool / spa temperature  
Solar array temperature  
Aux. temperature (air temperature and/or recirc. freeze)  
Terminal block connections  
Sensors may be connected up to 1000' away

#### Outputs

##### LV

24VAC, 20VA, .85A  
Low voltage diverter valve control  
Dual 3 pin JST connectors (FWD & REV)

##### HV Outputs: 3HP@240VAC, 1.5HP@120VAC

Double pole, single throw, isolated contacts,  
Field expandable via AQ-RELAY, 2 pin JST on PCB  
AQ-SOL-LV: Field expandable to control up to 2, HV  
outputs (HV-1, HV-2, or HV-3)

AQ-SOL-LV-TC: HV-3 factory installed, expandable only  
to one additional relay (HV-1 or HV-2)

##### HV-1

High voltage for booster pump control  
(Turns ON 30 seconds after LV turns ON)

##### HV-2

High voltage for pool sweep interlock  
(ON when filter pump ON, OFF for 6 minutes after LV  
turns ON)

##### HV-3

High voltage for filter pump timer  
OFF/ON w/timer, freeze recirc, solar override

#### Front Panel Controls

Set point adjustable dial 70°-104° F  
Main slide switch (ON-AUTO-OFF)  
Push button to alternate temperature displays  
Multi-position timer (Aqua Sol TC only)

#### LED's

Power	On when power ON
Heat	On when LV output ON for Heat, recirc, or switch ON
Cool	On when LV output ON for cool, recirc, or switch ON
Pool Sweep	On when HV-2 output is OFF
Pool Sensor	On = open circuit, Flashing = short circuit
Solar Sensor	On = open circuit, Flashing = short circuit
Aux. Sensor	Flashing= short circuit (only if recirc. freeze protection enabled)

#### LCD Display

Display range 32°F/ 0°C to 180°F/70°C  
Over temperature-display "HI"  
Under temperature-display "LO"  
Sensor fault-display "Err"

#### Installer Programmable features via PCB jumpers

F/C temperature display (factory set F)  
Recirculate freeze protection (factory set disable)  
Nocturnal cooling (factory set disable)  
Solar override of Off times (factory set disable)

#### Differentials

Solar Heat	ON: 4°F OFF: 1.5°F
Solar Cool	ON: -8°F OFF: -3°F

#### Ordering Information

AQ-SOL-LV	Single differential control w/digital display
AQ-SOL-LV-TC	Aqua Solar with integral time clock
AQ-RELAY	3HP relay for AQ-SOLAR field expansion
ASC	Aqua Solar Combo (control Valve & Actuator, and 2 sensors)

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