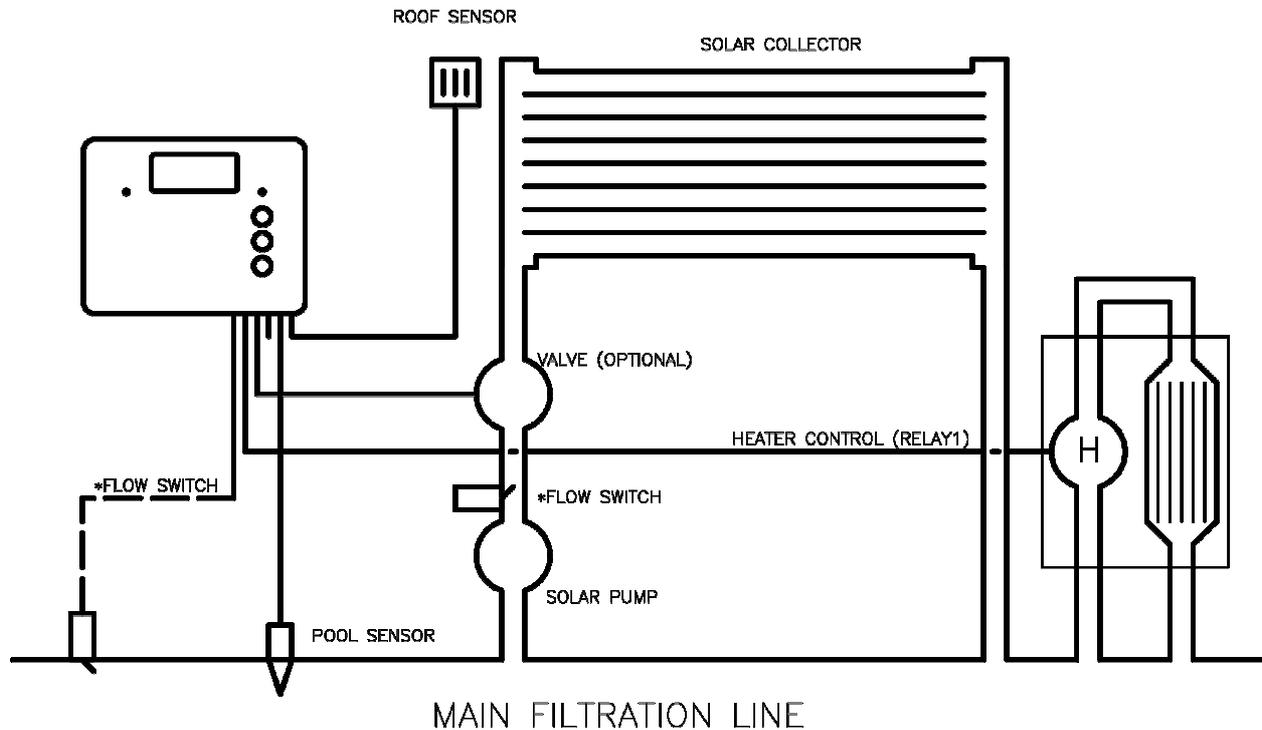


**DESCRIPTION:**

The V7 AS7-CF is a commercial swimming pool controller that heats a swimming pool when solar gain is available. A solar pump (or two pumps) is controlled as well as a heater interlock for an auxiliary heater. The pool is solar heater to a solar temperature limit setting and will be heated by an auxiliary heater to the auxiliary limit setting.

When the pool is below the fallback temperature ( $\frac{1}{2}^{\circ}\text{C}$  below the auxiliary limit) then all heating sources will be allowed to run, once the fallback temperature has been reached then the auxiliary heater will continue to run, although the auxiliary heater will be switched off for high solar gain situations (when the roof temperature reaches  $15^{\circ}\text{C}$  above the auxiliary temperature limit setting). Solar heating and auxiliary heater operation can be restricted by time-clock operation. If the pool temperature exceeds  $40^{\circ}\text{C}$  then all heating will be switched off. A flow switch is used to check the main filtration line or if a 2 way valve is used the flow switch is used to check for blockages.



\*REFER INSTRUCTIONS REGARDING FLOW SWITCH OPERATION

**INSTALLATION:****CONTROLLER MOUNTING:**

The controller enclosure must be firmly attached to a nearby solid fixture by either the two mounting lugs or direct attachment through the controller. If mounting through the controller ensure the power cord is disconnected from the mains supply then remove the enclosure front cover by turning the four corner locks so each arrow points to the 'O' marked on the front cover. Insert two mounting screws diagonally through the oval holes in the enclosure, refit front cover and turn the four corner locks to the 'I' position.

The power cable is 1.8m long and should be plugged directly into a general power outlet, not into an extension lead.

**CIRCULATING PUMP(S):**

The circulating pump plugs into the right hand 240Vac socket marked as SOLAR PUMP. The left hand 240Vac socket marked as AUXILIARY provides power for a second SOLAR PUMP\*. The maximum combined current is 9.98 AMPS 2395W. The pumps start/stop with 1 second delays. (\*If a returned water sensor is required then the auxiliary socket becomes a regular 240Vac outlet.)

**AUXILIARY HEATING (HEAT-PUMP, GAS, HEAT EXCHANGER, BOILER PUMP, ETC.):**

The auxiliary heater is controlled via the RELAY1 output to an external control circuit. The RELAY1 NO/C contacts close when the auxiliary heater to operate. (Maximum relay load is 5 Amps at 32VAC).

**VALVE (\*OPTIONAL):**

The Valve actuator plugs into the socket marked VALVE, if the cabling is to be shortened, then tin the cable ends and wire as per the colour code marked on the label (Red, Black, White). Ensure the valve actuator is switched to the 'ON1' position or 'ON2' for reversed plumbing. \*OPTIONAL ordering codes: Add +V for the controller to drive a valve and add +VA is a valve actuator is to be supplied, specify size if a valve body is to be supplied i.e. +VA50 for the controller to drive a valve actuator to a supplied 50mm Valve body. (If required this relay can be configured to switch dry-contacts for the purpose of controlling external pump or monitoring equipment.)

**FLOW SWITCH (\*OPTIONAL):**

A flow switch should be added if a 2 way valve is used to prevent syphoning, this is to prevent the pump from continuing to operate should the valve fail and create a blockage. A secondary safety system should be installed to ensure the controller cannot operate if the main filtration line fails to provide water flow.

If a 3-way valve (or no valve) is used then a flow switch can be added to the main filtration line to prevent the pump(s) and auxiliary heaters from operating should the main filtration be turned off or fail. A flow switch can be supplied; the model recommended is the Kelco F20-S-BSP. Use the installation instructions supplied with the flow switch.

Note that the flow switch has a software configuration setting, see installer setup instructions.

If a flow switch is not used then a sorting link wire is to be fitted to the terminals to simulate a closed switch.

**TEMPERATURE SENSORS:**

The Pool sensor must be fitted into the main filtration line, as close to the pool as practical, preferably in a position out of direct sunlight. The sensor plug is to be fitted to the plug socket marked POOL.

The Roof sensor must be fitted into a small piece of rubber collector material away from the main collector but on the same aspect. The sensor plug is to be fitted to the plug socket marked ROOF.

**\*OPTIONAL (Only available with RS-232 Option)** A returned water sensor can be fitted to the solar return line. This sensor does not affect controller operation and is purely for data collection; because of this, open circuit errors are not reported on the controller screen. The sensor plug is to be fitted into the far left plug socket. This option removes the ability for the controller to operate the AUXILIARY PUMP socket.

**NOTES:**

All sensor wires should be fixed in a manner that they are not under tension. Conduit should be used for underground cable runs. All excess cable must be removed; coils of cable are not permitted under any circumstances and **must not** be tied to 240V wiring. If the cable is to be extended with non genuine cable a size of 14/020 should be used. **Any cable joins must be soldered and this includes where the cable enters the terminal block at the case base.** Heat shrink is to be used over soldered joints to eliminate moisture ingress. If the cable end is to be refitted to the plug sockets then the polarity must be observed as incorrect polarity will show as a short circuit fault on the LCD display. The sensor cable with the thin white trace is the positive and should be fitted to the right hand cable entry when the screws are in a vertical position. Once cables have been correctly fitted the unit can be turned on.

**RS-232 CONNECTOR (\*OPTIONAL):**

This will output controller information and allows for some external control. Refer to the data commands document.

\*OPTIONAL ordering codes: Add +D for the controller to be fitted with an RS-232 D-Sub Connector, if a returned water temperature sensor is required then add +D3 (note that the 3<sup>rd</sup> sensor removes the auxiliary pump function).

**SOFTWARE SETTINGS:**

To enter the SETTINGS MENU press either the *Up* or *Down* buttons and the following will be displayed;

```
SETTINGS MENU:
1) TEMPERATURES
```

All the flashing items in the menu are selectable or changeable items.

Use the *Up* or *Down* buttons to scroll to the menu option you wish to change. Press the *Enter/Manual* button to enter into the selected items sub-menu. Any value that is flashing can be modified by pressing the *Up* or *Down* buttons, To accept the value press the *Enter/Manual* button, repeat until all values are accepted and you will return to the settings menu. All menu items are shown below;

```
SETTINGS MENU:
1) TEMPERATURES
2) AUX. HEATING
3) SOLAR MODE
4) SYSTEM SETUP
5) SAVE & EXIT
```

**1) TEMPERATURES**

When you select this sub-menu the following options are available;

```
SET TEMPERATURE:
SOL. LIMIT XX.Xo
```

```
SET TEMPERATURE:
AUX. LIMIT XX.Xo
```

When you select the TEMPERATURES menu you may change the temperature limit setting for solar heating. If aux. heating is switched on (see below) then you can also set a separate temperature limit for the auxiliary heater. Heating is performed to the temperature limit plus ½°C and once that temperature is achieved heating will no re-occur until the temperature drops below the desired limit by ½°C. Due to rounding the actual total hysteresis is ½°C.

\*\*Default for SOL. LIMIT is 30°C and for AUX. LIMIT is 27°C.

## 2) AUX. HEATING

When you select this sub-menu the following options are available;

No. OF TIMES PER  
DAY TO RUN: XXX

AUX. CYCLE 1  
HH:MM TO HH:MM

AUX. CYCLE 2  
HH:MM TO HH:MM

When you enter the AUX. HEATING sub-menu you will need to select the number of time you wish to run the auxiliary heater per day. If 'OFF' is selected then the heat-pump will not operate and you will be returned to the settings menu. If one or two heating times are selected then you will be prompted for the START and END time(s) for each cycle; auxiliary heating will only occur during these times.

**\*\*Factory default for AUX. HEATING is once per day from 06:00 to 06:00 (24 hours – always run)**

## 3) SOLAR MODE

When you select this sub-menu the following options are available;

SET SOLAR MODE  
SUMMER MODE

SET SOLAR MODE  
WINTER/AWAY MODE

SET SOLAR MODE  
TROPICAL MODE

SET SOLAR MODE  
SOLAR DISABLED

SOLAR DISABLED shuts down solar and the solar pump(s) will not operate, disconnected roof sensor errors are also ignored, note that anti-freeze/boil protection will still operate if switched on.

SUMMER MODE is the normal operation of heating the swimming pool.

TROPICAL MODE is selected if you wish to cool an overheated swimming pool, if the pool temperature is equal to or above the solar limit temperature limit by 1.5°C then tropical mode is activated. The solar pump will run if the roof temperature is colder than the pool until SOL LIMIT is obtained; note that this is most likely to occur at night. Note that tropical mode may be activated by the anti-boil function.

WINTER/AWAY MODE, when selected you will be prompted to select the start month of winter and the start month of summer. Winter/Away Mode assists in the systems off-season maintenance and save energy as solar gain may be available but swimming temperature cannot be achieved or solar heating is not desired. A 3 minute flush of the solar collector occurs between the solar start time and the end time, providing the roof temperature is equal or greater than the pool, but if that condition does not occur before 1pm (13:00) then a solar system flush will be forced to occur. Selecting winter mode does not turn off auxiliary heating. A start month of 'always' can be selected which permanently sets the unit into winter mode, you can also start winter mode in August and finish in March if required (i.e. for Northern Hemisphere).

**\*\*The factory default for SOLAR MODE is SUMMER MODE**

## 4) SYSTEM SETUP

When you select this sub-menu the following options are available;

### SYSTEM SETUP/SET CLOCK:

This option is for setting the clock and calendar the current time of day/date.

### SYSTEM SETUP/INSTALLER SETUP:

When you select INSTALLER SETUP all the pumps/heaters/valve are switched off and a warning appears to refer to these instructions. Then the following is displayed;

PUMP ON TO FLOW  
SW. DLY xx Secs

Pump ON to flow switch delay determines how the flow switch is to be used, if set to 00 Seconds then the flow switch is used to detect flow in the main filtration line, if there is no water flow detected then pumps and heaters are not allowed to operate. The controller will display the fault NO FLOW IN MAIN FILTRATION LINE.

If flow returns then the controller will resume normal heating operations.

If the delay is used (15 to 90 Seconds) then the solar pump is allowed to start and the flow switch will not operate until the delay has expired, if after the delay there is no flow then the solar pump(s) will be stopped and will not be started again (even after a power failure). The fault will display the fault NO SOLAR FLOW! CHECK SOLAR PATH.

**The only way to restart is to rectify the flow fault then enter the settings menu and selecting 5) SAVE & EXIT**

The controller will also display when there is flow when the valve should be closed FLOW WITH VALVE CLOSED, CHECK! Note that this is a warning only and will not stop the controller.

In this mode of flow switch operation the auxiliary heater ignores the flow switch.

USE SOLAR VALVE?  
YES or NO

This option is for setting the delay between valve and solar pump, if NO is selected then the valve turns at the same time as the solar pump, if YES is selected then the valve turns before the solar pump is switched on or off.

ALLOW SOLAR FROM  
00:00 TO 00:00

Allows the lockout of solar based on time \*\*Default is 00:00 to 00:00 (always run)

USE LIVE SENSOR?  
YES or NO

Select YES for a commercial pool, however if the pool temperature sensor cannot be located in a pipe with constant water flow then select NO to turn on the water sampling feature. Note that you cannot select NO, if auxiliary heating is used *unless* the auxiliary heater is in the same water flow circuit as the solar pump.

ROOF TEMPERATURE  
START DIFF XX.X°

Sets the differential for the pump to start (On @ roof° => pool°+start°) (\*\*Default = 8°C)

ROOF TEMPERATURE  
STOP DIFF XX.X°

Sets the differential for the pump to stop (Off @ roof° < pool°+stop°) (\*\*Default = 4°C)

FREEZE PROTECT?  
OFF or ON (2.0°C to 6.0°C)

Turns off/on the anti freeze feature, when the set temperature is reached the pump runs for 3 minutes followed by a 30 minute lockout period. (\*\*Default=Off)

BOIL PROTECT?  
OFF or ON (60.0°C to 99.0°C)

ANTI BOIL RUNS  
PUMP FOR XX MINS

Turns off/on the anti boil feature, when the set solar temperature limit is reached and the roof temperature gets to the anti boil temperature limit then the pump runs for xx minutes, after this run period the controller can go straight back into anti boil run, this will occur until the roof temperature drops below the anti boil set point or if the pool temperature exceeds 38°C, when the pool gets to 38°C then this will also permanently set the controller into tropical mode to act as a warning that something has failed. (\*\*Default=Off)

### SYSTEM SETUP/FACTORY DEFAULTS

By pressing ENTER when this is displayed the controller selects all the default values as described by the notation “\*\*Default” in this manual.

### SYSTEM SETUP /TEST FUNCTION

By selecting this menu the solar pump(s) will have turned on. (Note: flow errors will be cleared.)

SOLAR PUMP ON  
ENTER = NEXT/END

Press ENTER and the AUX HEATER is switched on.

AUX HEATER ON  
ENTER = NEXT/END

Press ENTER and the AUX HEATER is switched off and the VALVE is opened (If fitted).

VALVE OPEN  
ENTER = NEXT/END

Press ENTER and the flow switch status is displayed;

NO FLOW SW OPEN  
ENTER = NEXT/END

FLOW SW CLOSED  
ENTER = NEXT/END

Press ENTER and everything is turned off and you'll return to the settings menu.

### SYSTEM SETUP/TEMPERATURE LOGS

This option shows the minimum and maximum temperatures and the time of the day at which the minimum or maximum occurred, P-L = pool low, P-H = pool high, R-L = roof low, R-H = roof high, each temperature is displayed until the Enter button is pressed, after the temperatures are displayed the auxiliary pump time (A PMP), solar pump time (S PMP) and the auxiliary heater (A HTR) accumulated run times are displayed. Once all logs have been displayed an option to clear the log is offered, Up/Down will select yes or no press the *Enter/Manual* button to accept.

### SYSTEM SETUP/EXIT

Selecting this returns you to the main menu “4) SYSTEM SETUP” without changes to system setup.

## 5) SAVE & EXIT

When this menu is selected, press the *Enter/Manual* button to save ALL settings, the unit will return to normal operation automatically. Note: If any of the menu items are left unattended for 3 minutes the menu will time out and automatically save all settings and return to automatic operation.

**ENTER/MANUAL BUTTON**

FOR MANUAL MODE  
PRESS ENTER NOW

Pressing the *ENTER/MANUAL* button once will display the above message for ~3 seconds, simply wait and the controller will return to normal operation. Any delays active will be cancelled by this action.

If the *ENTER/MANUAL* button is pressed for a second time within a 3 second period, the display will indicate you have entered manual solar pump mode, the pump will be on and the heaters will be switched, timeout is set to a default 4 hours before it returns to automatic mode. Press the *Up* or *Down* buttons to adjust the timeout period from 1-4 hours, when attempting to go above 4 or below 1 the pump state will toggle between on and off. Press the *ENTER/MANUAL* button to return to automatic mode.

**NOTES:**

1. If a sensor fault is detected the V7 will display which sensor and what the fault is.
2. Should power be interrupted for any reason, the V7 will resume normal operation when power is restored, all information will have been kept.
3. Temperature sensors used with this unit are Digital and are accurate to 0.5 Deg. C, no calibration is required.
4. The sensor cable with the thin trace is the positive and is usually fitted to the right hand side of the green plug, incorrect polarity will be displayed.
5. Maximum rated output load for both 240V sockets is 10 Amps combined.

## WARRANTY

This product is covered by a limited 12 month warranty against component failure or faulty workmanship from the installation date.

A faulty unit should be returned in the first instance to the dealer from which the unit was purchased.

Valves and actuators (if supplied) are covered by a twelve month warranty at the discretion of their manufacturer.

Damage to the unit due to misuse, power surges, lightning strikes or installation that is not in accordance with the manufacturer's instruction may void the warranty.

Warranty does not cover travel costs to or from installation site. Unit must be returned to manufacturer for repairs.

If the power cord is damaged, do not use the controller; return the unit to the supplier for repair.

Customer Record. (To be retained by the customer);

Dealer/Installer Name \_\_\_\_\_

Serial Number \_\_\_\_\_

Date Installed \_\_\_\_\_

For service assistance phone 1300 130 693



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