



ACPC—AC Pump Control

The ACPC is a 110/220 single phase AC Pump Control with Temperature. The operation is configured via the Dip Switch on the PC board.

Operational Modes that may be selected are:

1. Cycles per Minute operation (Default)
2. On Time- Off Time operation
3. Quarts per Day
4. Gallons per Day
5. Remote Control by a 4-20mA loop

Switches 1, 2 and 3 select the mode of operation, the remaining Dip switch selections will set the plunger size, stroke and single/Dual head (needed for Quarts or Gallons per Day operation only). All Dip Switches Off will set the pump control as Cycles per Minute operation. The two POTs are used to set the On-Time and Cycles per Minute that are displayed on the three seven segments displays.

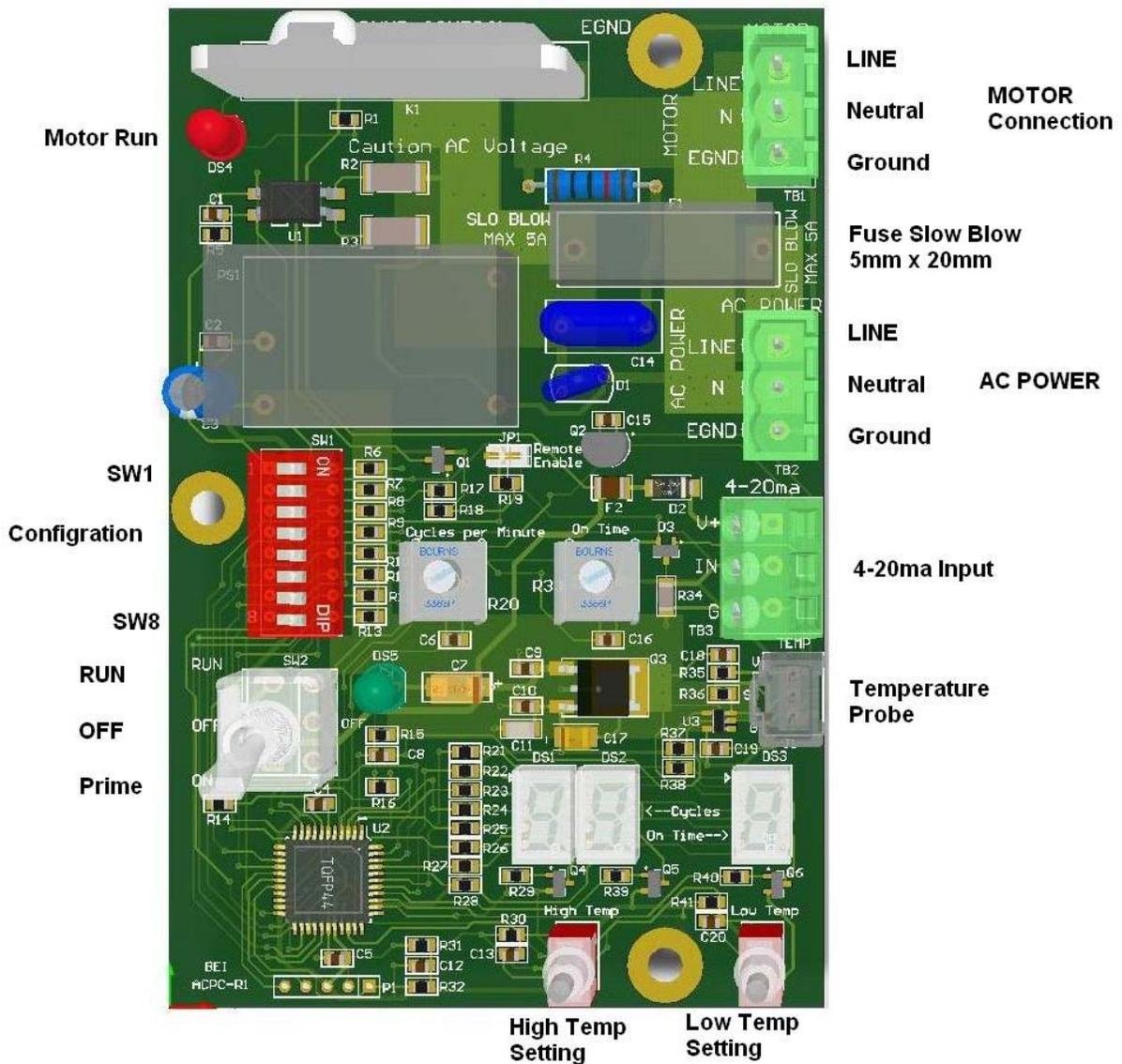
Plugging in the temperature probe will activate temperature controlled operation. The Power switch is a three position switch for selecting Normal Operation--OFF--Prime. Protection is by a 3amp slow blow 5mm x 20mm Fuse (maximum replacement 5 amps). Connections are by pluggable terminal blocks.

There are two LEDs one that flashes each second to indicate operation and one that will be on each time the Motor is running. The seven segment Displays indicate the current setting and will change as you rotate the Blue POTs.

Switch Settings for operational mode and configuration data. (Uses binary decode)

Sw3	Sw2	Sw1	
Off	Off	Off	CPM Cycles per minute
Off	Off	On	ON time Off time Control
Off	On	Off	QPD Quarts per day setting
Off	On	On	GPD Gallons per day setting
On	-	-	4-20 mA remote control

NOTE: if CPM, On/Off or 4-20mA operation is selected switches 4-8 are not ignored.



The standard wiring color code for AC should be:

Line - Black or Brown

Neutral - White or Blue

Ground - Green or Green/Yellow

This unit runs off either 110 or 220 VAC Single Phase.

UNPLUG THE TERMINAL BLOCK TO THE AC LINE AND OR MOTOR WHEN WORKING ON PUMP.

UNPLUG THE TERMINAL BLOCK TO THE AC LINE WHEN CHANGING THE SLOW BLOW FUSE.



If using Quarts per Day or Gallons per Day selection, you must use Slide Switches 4 through 8 to select pump setup information, so calculations can be made correctly.

Switch 4 and 5 are used to select the plunger size

Sw5 Sw4

Off Off 1/4 inch plunger

Off On 3/8 inch plunger

On Off 1/2 inch plunger

On On future -- (will set as 1/2)

Switch 6 and 7 select the stroke

Sw7 Sw6

Off Off stroke length full

Off On stroke length three quarter

On Off stroke length one half

On On future -- (will set as one half stroke)

Switch 8 select single head or Dual head

Off Single Head pump

On Dual Head pump

On board Jumper (center of Board) is used to select Temperature operation

No Jumper installed (default)

Ext Sensor unplugged Temperature control is Disabled

Ext Sensor plugged In Temperature control is Enabled (active)

Jumper Installed - On Board Sensor Temperature Enabled



PUMP PRIME /PUMP TEST OPERATION

The power switch is a three position switch. Center position is OFF, UP position is Normal operation and the Down position is Prime/Test. When you set the power switch to the down position, the pump will run for 30 seconds and then go off. You will note the display will display “On” while the pump is running and then start a countdown of the “On” time remaining, then “OFF” when it shuts off.

Remember to select the mode of operation via the Dip Switch. This is usually done prior to power up.

Once you have selected the mode of operation via the Dip Switch operation is controlled as below.

SET UP – Enable Disable Temperature Control

If the temperature Probe is connected, temperature control is enabled. If temperature probe is disconnected temperature control is disabled. Connection of the temperature probe is always monitored so you may plug or unplug the probe during operation and the ACPC will detect this and change the operation accordingly. If the ACPC has shut down due to the Temperature setting, the display will alternately flash “Sd” and then decimal points to indicate the pump is not running due to temperature Shut down.

SET UP – Temperature Control Point Settings (only required if using temperature Probe)

Temperature Set points maybe set whether or not you have a probe connected. Temperature Control is enabled if probe connected – disabled without probe. The temperature setting range is 30 to 70 degrees Fahrenheit. To set the temperature control, two set points are required, high set point and low set point. The low set point is where the Pump begins operation and the high set point is where operation stops. In order to set the temperature low and high set points you push either of the two pushbuttons at the bottom. (The POTs are used for the Run settings, ie CPM, On-Off time, Etc.)

Press and hold the Pushbutton on the bottom center (this is the pushbutton switch with the red cap) to set the HIGH temperature set point. “Hi” will be displayed and then a number will be displayed of the current set point. If you continue to hold the switch down the number will increment until it reaches 70 and then start over at 30. Release the push button at any number and this will be the saved setting.

Press and hold the Pushbutton bottom right (this is the pushbutton switch with the black cap) to set the LOW temperature set point. “Lo” will be displayed and then a number will be displayed of the current set point. If you continue to hold the switch down the number will increment until it reaches 70 and then start over at 30. Release the push button at any number and this will be the saved setting.

You may momentarily press the pushbutton to see the current setting, and then the display reverts back to indicating the operational Run setting. You should set the two temperatures a few degrees apart.



Normal Operation Setting

During normal operation the settings may be changed. You are able to make changes to the operations while the pump is running. You will note that the seven segment displays are indicating the current setting. Also the actual setting change will not take effect until the next pump cycle.

Setting of Cycles per Minute (cYc mode)

The operational Range is 1-10 cycles per minute, and 1 to 5 seconds each cycle. The two digits together (near the center) display the CYCLE setting and the ON time is displayed on the single digit on the right.

Rotate the Blue Pot on the left (closest to the DIP Switch) to set the CYCLES per Minute. The number being displayed is the current setting for the CYCLES, and will take effect on the next pump cycle if you change it. This setting will continue to be displayed. Note: if the CYCLES is set 1 to 9 the display also has a c (ie: c7) to indicate cycles (ten will be displayed as 10).

Rotate the Blue Pot on the right (closest to the Terminal blocks) to set the ON TIME. The number being displayed is the current setting for the ON TIME. This setting will continue to be displayed on the single digit. Rotating the POTs clockwise increases the setting (CCW decreases).

Setting of ON-OFF times (On-off mode)

The On time and Off time are settable in one second increments with a range of 1 to 128 seconds (for both ON and OFF time)

The ACPC displays the ON time with decimal point (least significant digit decimal point on) , OFF time is displayed without the decimal point. The display toggles showing ON time when the Pump is running and OFF time when the pump is OFF. The digits together show the Seconds (such as 35. or 120.)

Setting of Quarts or Gallons (Quarts per Day or Gallons per Day mode)

The Quarts per Day or Gallons per Day are set by rotating the Blue Pot on the left (closest to the DIP Switch, the other Pot has no effect.) Just Rotate the POT clockwise to increase the setting, and counter clockwise to decrease. The settable maximum range will be limited by the calculations based on stroke and plunger selections to make sure that the pump does not run continuously.

Quarts and gallons per day modes configure the pump to run X number of seconds per minute in order to pump the rate set. It is possible to set the rate too low for the pump to run, since the minimum run time is one second per minute.



4 to 20 mA (remote control mode)

The 4 to 20 mA remote mode requires that you connect the 4 to 20mA signal to the fixed terminal block. The 4 to 20mA signal will control the cycles per minute of the Pump and the POT will set the ON time each cycle.

The Pump On Time is SET by using the POT (POT closest to the terminal block). Rotating the POT allows setting of the pump On Time to be set to 1,2,3,4, or 5 seconds. The 4-20mA input sets the pump Off Time (ie: cycle time). The single digit indicates the ON time from the POT and the Cycles per minute is indicated on the two digits based on the 4-20ma control input.

The 4 to 20mA input sets the number of cycles to always off, and from 1 to 10 cycles per second. It gives more cycles over a second as you increase the current. The cycles control is linear with 4 mA being OFF (the pump does not run and remains OFF). There is a 4.25mA minimum current required before the pump begins to operate, anything less than the 4.5mA the pump remains off and does not cycle.

4.5 mA is the lowest current control that activates the pump. This 4.5mA current sets the Cycles to one cycle per minute between each ON Time (On time is 1 to 5 seconds as set by the POT). So this setting will give the least cycles per minute. The input must be 19.5mA or greater to set the cycles to 10 per minute, which gives the fastest cycle time or minimum time delay between cycles. The range 19.5mA to 20mA sets the cycles per minute for the pump run cycles.