IOM
INSTALLATION OPERATION & MAINTENANCE

BATCH CONTROLLER
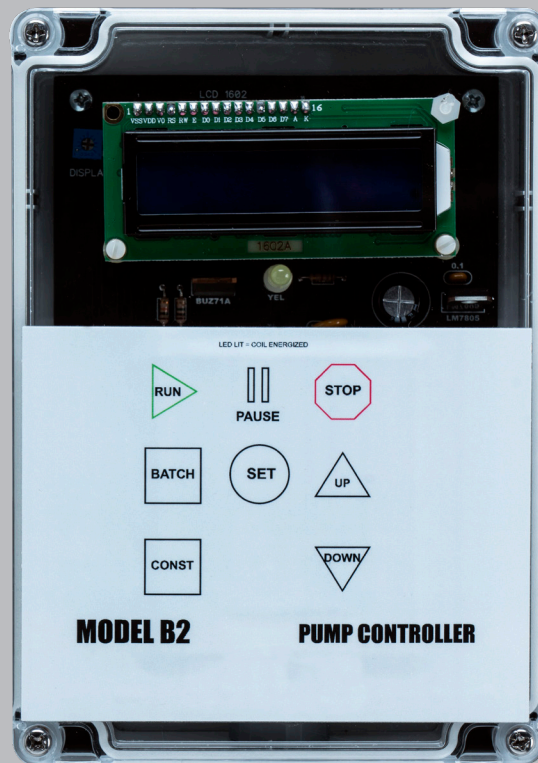72000-00

ALL-FLO

TABLE OF CONTENTS

CAUTIONS — READ FIRST!

READ THESE WARNINGS AND SAFETY PRECAUTIONS PRIOR TO INSTALLATION OR OPERATION. FAILURE TO COMPLY WITH THESE INSTRUCTIONS COULD RESULT IN PERSONAL INJURY AND OR PROPERTY DAMAGE. RETAIN THESE INSTRUCTIONS FOR FUTURE REFERENCE.

⚠ WARNING Prior to servicing the pump and controller, ensure that the air and fluid lines are closed and disconnected. While wearing personal protective equipment, flush, drain and process liquid from the pump in a safe manner.

⚠ WARNING When removing the end cap using compressed air, the air valve end cap may come out with considerable force. Hand protection such as a padded glove or rag should be used to capture the end cap.

⚠ CAUTION Use caution when mounting the cycle counter in areas where wash down occurs.

⚠ CAUTION For the speed controller, do not use zero as a speed and always observe signal polarity and current limits.

⚠ CAUTION Disconnect all power sources before opening control module.

⚠ WARNING This product can expose you to chemicals including Nickel, Chromium, Cadmium, or Cobalt, which are known to the State of California to cause cancer and/or birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.

⚠ WARNING = Hazards or unsafe practices which could result in severe personal injury, death or substantial property damage

⚠ CAUTION = Hazards or unsafe practices which could result in minor personal injury, product or property damage.

PRINCIPLES OF OPERATION

72000-00 BATCH CONTROLLER

The 72000-00 controller is engineered to provide control of the number of times a solenoid pump fully discharges both liquid chambers, referred to as a "cycle", in a batching application. It also controls the speed that the pump cycles, how many "Batches" are in an operation, and the interval of time between batches. This allows for greater control and repeatability of your All-Flo pump. The pump speed can be adjusted using the buttons on the controller's keyboard and preset batch operations can be made to ensure a quick set up.

ALL-FLO'S SOLENOID CONTROLLED PUMPS

All-Flo's solenoid pumps use the compressed air to displace fluid in the same way as a standard Air Operated Double Diaphragm (AODD) pump while using electric pulses to control the pump speed. The use of a solenoid pump allows the user to have more control over the operation.

The solenoid pump uses an electrical pulse to energize the solenoid valve attached to the air end of the pump. These electronic pulses are sent in the form of a square wave (Figure 1).

The energized pulses move the solenoid valve connecting the different ports changing how the air flows. In Figures 2 and 3, port 1 denotes the connection to the air supply, ports 2 and 4 denote the ports leading the air chambers, and ports 3 and 5 denote the ports that are open to the atmosphere.

While the solenoid is de-energized, the valve sits at its standard position, allowing pressurized air from the air supply (port 1) into one of the air chambers of the pump (port 2). The other air chamber (port 4) is connected the exhaust (port 5), discharging any pressurized air in that chamber.

When the pulse is received, the solenoid energizes and moves the valve to its energized position (Figure 3).

While the solenoid is energized, the pressurized air from the air supply (port 1) flows into the air chamber of the pump (port 4). The other air chamber (port 2) is connected the exhaust (port 3), discharging any pressurized air in that chamber.

This pulsating energized and de-energized states mimics the air flow cycle cause by the pilot sleeve in the standard pump. The faster these pulses are applied, the quicker the pump operates.
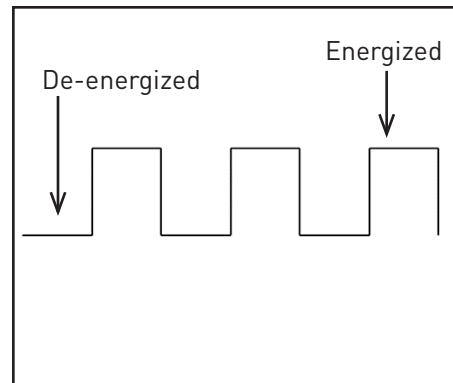
FIGURE 1
SQUARE WAVE
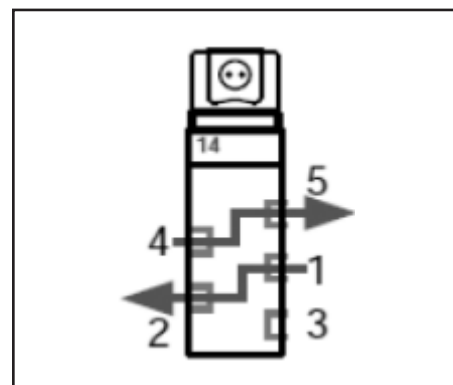
FIGURE 2
DE-ENERGIZED
SOLENOID POSITION

FIGURE 3
ENERGIZED
SOLENOID POSITION

INSTALLATION

72000-00 BATCH CONTROLLER

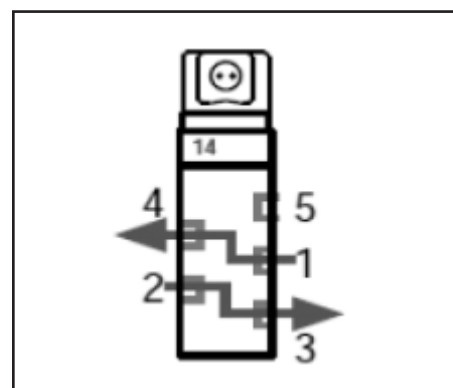The 72000-00 controller requires 100 volts AC (220 volts AC is also available) to power. It delivers 12 volts DC to the pump. The appropriate 12-volt DC solenoid pump is needed to be used with this controller. This system is programmed using the keypad on the cover and can be remotely paused or stopped using dry contact via a Switch terminal on the circuit bord. This controller should be mounted close to pump in a dry and safe place. The enclosure is NEMA 4X, but All-Flo advises to avoid hosing the unit.

KEYPAD FUNCTIONS

1. Selection Indicator: The LCD screen shows the current batch or program you are running. This will change based on which preprogrammed batch is selected for your operation.

2. Speed: The LCD readout shows the time interval between strokes. The stroke interval is shown in strokes per seconds. The range for this cycle counter is 0.1 to 3,600 Seconds/Stroke.

3. Run: This button will give the signal to the solenoid on the pump to start the application you have selected.

4. Batch: This button cycles through the preset batch operations saved on the cycle counter. Hitting this button should change the readout of the LCD screen shown at point 1.

5. Constant: This button is used to set the pump to run constantly. To achieve this, press this button and then the run button shown as point 3.

6. Pause: This button will momentarily stop the operation that is being run. This will not remove the current count of the batch operation.

7. Set: This button is used to program the batch operations that are to be saved on the cycle counter. Hitting this button multiple times will cycle through the batch's programable information like speed, duration, and time between batches.

8. Stop: This button will stop the operation that is being run. Hitting this button during the batch process will not allow the batching process to be continued from the point the stop button was hit. The batch operation would need to start from the beginning.

9. Up/Down: These buttons are used when setting the preset batch information.
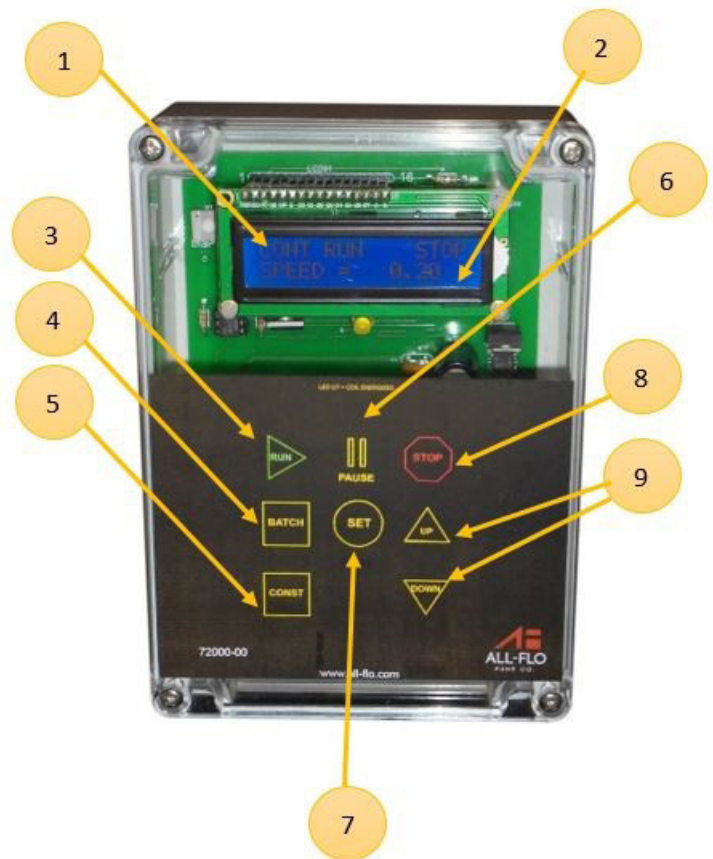
INTERNALS

A. The Display control changes the contrast on the LCD display. You will probably never touch it unless the temperature around the unit is unusually high or low. If there is no information on the display, someone probably fiddled with the control. Bring it full counterclockwise and then back off until you have the desired contrast.

B. The Solenoid output provides 12 volts DC for the pump's integral solenoid. You must use the correct pump solenoid for the pump to operate properly.

C. The Switch terminal connects the control switches to the system. You can remotely Run, Pause and Stop the system by connecting remote momentary dry contacts to the propriate terminals.

D. The 110 VAC (also available in a 220 volt version) input is the only way to power the unit. Make sure the connections are neat and that for safety reasons no conductor is exposed. This is the only location on the circuit board where more than 12 volts is present.
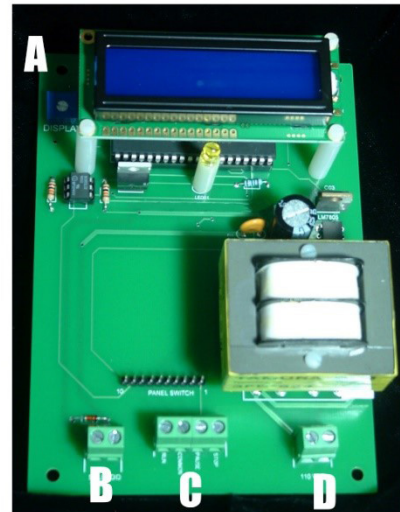
BATCH SET UP

1. Enter the Batch you wish to program (Batch 1, Batch 2 or Batch 3) by hitting the Set button (7) to enter Setup mode and display the number of Cycles per batch.

   A PUMP STROKE IS ONE CHAMBER
   A PUMP CYCLE IS BOTH CHAMBERS

2. Hit Set again and set the pump speed in Sec/Stroke.

3. Hit the Set button again display the number of batches in this program (zero makes the batch run an infinite number of times).

4. Hit Set again to display the hours, minutes and seconds between batches using the Set button between each segment.

5. Lastly, hit the Set one more time to get out of the programming mode.

6. To program the other batches, press the batch button until the desired batch is displayed and repeat the process.

7. To set the Constant speed, press the Set button when the unit is displaying that it is in the "Constant" mode.

8. Use the Up and Down buttons (9) to set the speed, and then press the Set button (7) to escape the programming mode.

9. To run the system when the batch mode is selected, momentarily press the Run button (3). To stop the pump, momentarily push the Stop button (8).

10. To stop the unit but be able to pick up where you left off, press the Pause button (6). You can then press either the Pause (6) or Run (3) buttons to start back up.

11. To run the pump constantly, first press the Const button (5) to get into the proper mode and then press the Run (3), Pause (6), and Stop (8) buttons in the same way as the Batch mode.
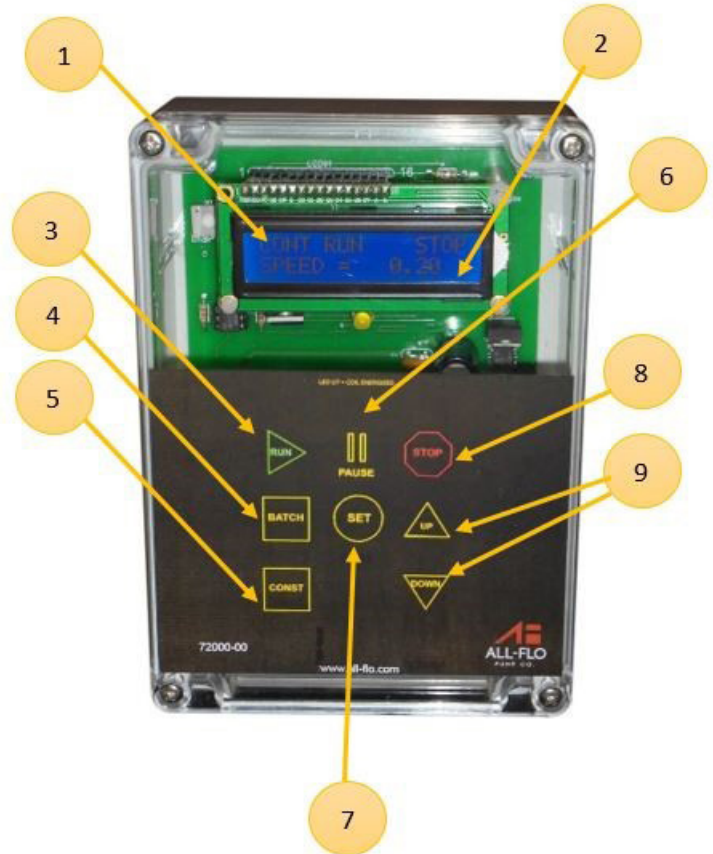
SPECIFICATIONS

72000-00 BATCH CONTROLLER

Dimensions:	6-2/4″ Height x 4-3/4″ Width x 2-1/4″ Depth
Weight:	1-1/2 lbs
Enclosure Construction:	NEMA 4x with Sealing Gland for Cable and Boot for Switch
Power Consumption:	12 Watts
Voltage Requirement:	120VAC
Voltage Output (to Solenoid):	12VDC 750ma Maximum (the pump's solenoid must operate on 12VDC)
Operating Temperature Range:	40°F to 100°F
Speed Range:	0.1 to 3,600 Seconds/Strokes
Number of Batches:	Three separate, plus a "Constant Run" preset

All-Flo is committed to the pursuit of designing and manufacturing the highest quality product available to industry. Since the beginning in 1986, All-Flo engineers have used their extensive knowledge of today's engineered materials, advanced air system logic and manufacturing techniques to develop the superior group of lube-free, air-operated diaphragm pumps found in this catalog. Every pump is performance engineered and quality built to provide trouble-free service under the toughest conditions.

PSG
a DOVER company

Where Innovation Flows