



OVERVIEW

1.1. What is the purpose of the controller ?

- To vend uniform quantity of the drink for each customer / vending cycle
- To keep a tab on the number of drinks sold in each flavour - volume wise.

1.2. How does the controller achieve these objectives ?

- The solenoid valves in the machine are capable of delivering the liquids at a uniform rate. So, to have a control on the volume of drinks, it is sufficient to control the time for which the solenoid valves are kept open in each vending cycle. The heart of the controller is a microprocessor. It can accommodate independent time settings for a particular volume of each flavour. Also it has a provision to store 3 different volume settings.

For example, in a particular machine, the drinks may take different times in different valves for a fixed volume of (say) 400 ml. The microprocessor can record these time settings for each valve (the time in which each of the valve will dispense - say 400ml). Apart from this if the processor is fed with the time for valve 1 to dispense two other volumes (say) 300ml & 200ml, then it can dispense 200, 300 or 400 ml in any of the valves.

The processor controls the quantity of drinks dispensed by controlling the time of operation of the corresponding relays. The relays have one contact each which are to be wired to operate the solenoid valves.

In case there is a shortage of drink when the consumer takes it (due to excessive frothing etc.), there is a provision by which the processor can be set to allow a top-up for some of the flavours. The maximum quantity of top-up per glass also can be set. The processor maintains the number of top-ups done (flavour-wise) separately.

- The processor also increments the counts stored in an EEPROM. These counts are maintained flavour wise and volume wise. A maximum of 4 flavours and 3 volumes are possible. So every time a drink is vended through the controller, the sale is automatically recorded. Since the counters are stored in an EEPROM they will not be disturbed by power loss / machine being switched off. If counter readings are noted down every time the operator changes, the number of drinks sold by the particular operator can be easily arrived at by simple subtraction.

INSTALLATION PROCEDURE

2.1. Electrical Connections :

For better maintenance all the connections required are brought out on 2 part connectors. The mating connectors are also provided along with adequate wires crimped to them. Using this the wiring has to be done as per the following scheme.

12 way connector terminal no.	Description	Colour of wire
1.	Selection Common	Red
2.	Selection 1	Blue
3.	Selection 2	Black
4.	Selection 3	Green
5.	Selection 4	Yellow
6.	Valve Common	White
7.	Valve 1	Green
8.	Valve 2	Yellow
9.	Valve 3	Orange/Pink
10	Valve 4	Blue
11	230V AC phase	Red
12	Neutral	Black

2.2. LCD Adjustment:

The visibility of any LCD varies with the viewing angle. At the factory the LCD is set for normal (90°) viewing angle. In case the site condition requires that the viewing angle should be changed, the procedure given below should be followed.

Set the unit in the position where it will be kept during the operation. View the LCD from the user's position and simultaneously adjust the trimpot in the main PCB. Please note that there is no maximum or minimum brightness involved and so pushing the trimpot blindly to one end will not help. It has to be varied and viewed continuously from one extreme position of the trimpot to the other and adjustment has to be stopped when the LCD appears bright in the required angle of view.

2.3. Time (Volume) Adjustments :

To set up the timings of the valves for different flavours and volumes, a technician module has to be inserted in the 'D' connector socket provided in the front panel of the controller. The technician modules are supplied by M/s PULSARS along with the controllers. The technician module is like an electronic key. It prevents unauthorised adjustments of times. So it is very important to keep these electronic keys safely. Once the technician module (T.M) is inserted, the processor goes into SETUP MODE. It also displays this in the LCD screen.

Brix Checking:

Enter the SETUP mode and perform the following.

- make a volume selection
- press the switch of the drink for which brix has to be checked
- as the drink starts flowing collect the drink with the brix cup
- carefully avoid pressing the ACCEPT switch and exit the mode by pressing another volume selection switch or removing the TM

Time (Volume) Setup:

Enter the SETUP mode and select the Maximum volume option. Hold a measuring glass below the valve 1 and press the valve 1 switch. Keep pressing the switch till the required volume of the drink flows out. When nearing the required level, release the switch. The drink will stop flowing. Allow the froth to settle. Again press the switch and fill upto the required level. If the level reached is correct, press the ACCEPT switch (also in the front panel - close to the 'D' Connector). Repeat the process for each of the flavours. If by mistake the volume of the drink overshoots the required level, then to cancel the current timing, simply press the Volume option once and start again for that flavour with an empty measuring glass.

After completing the time set up for the maximum volume, press medium volume and do the time setup for drink 1 only. Time setup for medium volume of all other flavours will be automatically done by the processor. To setup for minimum volume, press the Min option and do the time setup for drink 1 only. Time setup for min. volume of all other flavours will be automatically done by the processor.

To setup the timing for Top-up, press top-up option and select the drink which is to be allowed to be topped up. Decide on the maximum volume of topping that may be necessary. Hold an empty measuring glass under the nozzle and press the corresponding switch till the maximum allowed top-up volume is reached. Then press ACCEPT. Repeat the procedure for any other drink for which top-up is to be allowed.

Refer Installation Manual for a more detailed discussion on installation procedures.

OPERATING SEQUENCE

PROCEDURE TO DRAW A DRINK

- All the Volume LEDs Glow
- Press the required Volume Push Button
- All LEDs except the one for the selected volume should be off
- Choose Drink
(by pushing the corresponding lever)
- Drink starts flowing
Continues to flow till the set time is over
- All the Volume LEDs Glow
- Ready for next cycle

PROCEDURE TO VIEW THE COUNTER VALUES (No. of cups sold)

- Switch On the Enable Display Toggle switch
- All the Volume LEDs Glow
- Press the required Volume Push Button
- All the volume LEDs except the one for the selected volume should be off
- Choose Drink
(by pushing the corresponding lever)
- LCD displays the number of drinks dispensed
in that flavour / volume
(Drink does not flow now)
- All the Volume LEDs Glow



TROUBLE SHOOTING

Problem	:	No Display, No action
Check	:	Fuse blown Connectors to/from PS card loose PS card faulty - Change PS card
Problem	:	Display shows "EEPROM NOT FOUND"
Check	:	If function resumes on toggling the Counter display switch twice, then continue operation - It is not a fault. If it does not resume, open the cover & press all ICs firmly to their bases - Switch on the power again.
Problem	:	While inserting the T.M, the display shows "PASSWORD ERROR"
Check	:	Check T.M with another Controller and ensure T.M is ok. Check the internal FRC connectors connecting the PCB to the T.M socket. Check Loose connection at the BRIX/TIME SETUP toggle switch
Problem	:	While attempting to take a drink the display shows "UNABLE TO WRITE" and the drink does not flow out.
Check	:	Note down the counter readings of all the drinks at all volumes. Replace Main PCB and send it for repair.

TOOLS REQUIRED

- a. Multimeter
- b. 25W Soldering iron
- c. Wire cutter and stripper suitable for 0.8 to 1.5 sq. mm.
- d. Nose pliers
- e. Small screw driver (PYE 552 or equiv.)
- f. Medium screw driver (PYE 502 or equiv.)
- g. M3 Nut driver
- h. Technician Module
- i. Consumables like wires, fuses, 70:30 lead and flux
- j. Tiny items like M3 bolts, 3mm Nuts and 3mm spring washers



Recommended Spares

- a. Push button switches
- b. LEDs
- c. Mini toggle switch
- d. Transformer
- e. Power supply card
- f. Main PCB
- g. Molex pins
- h. Fuses



Some Tips to Service Engineers

a. Before concluding that the problem reported by the customer is due to the controller, check all other causes, since certain other factors also can affect performance as below:

- Any disturbance to the brix setting can cause change in volume dispensed.
- Any change in CO₂ pressure can change the volume dispensed.

b. Repairs of the following nature can be done by the service engineer.

- Changing the Volume selection switches
- Replacing the LEDs
- Replacing the power supply PCB
- Replacing the Main PCB
- Replacing the transformer

Correcting any wiring problems like loose connections or bristles at the MOLEX pin points

c. While transporting any PCBs either fresh spares or defective units, take adequate care to pack them. If they are carried without proper packing in the tool kit itself, the possibility of damages to the PCB is very high. This is strongly advised against.

d. DO NOT attempt rectifying / modifying any of the PCBs. PCB rectifications shall be carried out by M/s PULSARS only.

e. Any defective part being returned for rectification or replacement must be accompanied by :

- customer's complaint and
- the service engineer's observations and diagnosis.

Packing Instructions

The following instructions are to be strictly adhered to whenever it is required to transport the controller or its parts. The instructions will apply equally for local as well as city to city transportation.

- a. When the whole controller box is transported, take adequate care to avoid damage to the connector, LCD display and switches
- b. When any PCB is transported, it should be wrapped in a bubble pack and further protected by a hard cardboard or plastic box.
- c. All parts must be packed in shockproof and moisture proof packages.
- d. Further precaution must be observed while sending them unaccompanied (like while sending any part for service to Madras)
- e. Any defective part that is sent back for the service to the factory MUST be accompanied by a detailed report. It must give the

- * Exact nature of the fault reported

- * Service Engineer's diagnosis and

- * The status of the machine after changing the particular defective part.