Techcon Systems
TS8100 Series
Positive Displacement PC Pump

User Guide

CONTENTS

12. LIMITED WARRANTY:

Manufacturer warrants this product to the original purchaser for a period of one (1) year from date of purchase to be free from defects in fluid and workmanship, but not against damages by misuse, negligence, accident, faulty installations and instructions. Manufacturer will repair or replace (at factory's option), free of charge, any component of the equipment thus found to be defective, on return of the component, "PREPAID" to the factory during the warranty period. In no event shall any liability or obligation of the Manufacturer arising from this warranty exceed the purchase price of the equipment. This warranty is only valid if the defective product is returned as a complete assembly without physical damage. The Manufacturer's liability, as stated herein, cannot be altered or enlarged except by a written statement signed by an officer of the company. In no event shall the Manufacturer be liable for consequential or incidental damages. A return authorization is required from Techcon Systems prior to shipping a defective unit to the factory.

Manufacturer reserves the right to make engineering product modifications without notice.

All returns must be issued with a Returns Authorization number, prior to return.
Send warranty returns to:

Americas
OK International
10800 Valley View Street
Cypress, CA 90630

Europe
OK International
Eagle Close
Chandler's Ford Ind Est
Eastleigh
Hampshire
SO53 4NF
United Kingdom

Asia
OK International
4th floor East, Electronic Building,
Yanxiang Industrial Zone, High Tech Road,
Guangming New District, Shenzhen P.R.C

www.techconsystems.com

7000-2350_A

11. TROUBLE SHOOTING:

PROBLEM	POSSIBLE CAUSE	CORRECTION
No Fluid Flow	Dispense tip is clogged	Replace tip
	Motor does not receive signal	Make sure all connections are secured
	Motor running in reverse	Reverse motor cable connection
	Barrel of dispense fluid is empty	Replace with new fluid barrel
	Fluid feed pressure is too low	Increase feed pressure.
Inconsistent Shot size	Fluid dried or cured	Replace with new fresh fluid
	Fluid pressure fluctuating	Make sure fluid pressure is constant
	Valve on-time is too short	Increase valve on time
	Excessive motor reverse time	Reduce reverse time or turn off completely.
Inconsistent Shot size	Air trapped in fluid	Purge valve properly
Skipped dots	Intermittent motor signal	Check and replace motor
	Air trapped in fluid	De-air fluid
Fluids drools after valve is turned off	Air trapped in fluid chamber	Purge valve properly
	Air trapped in fluid reservoir	Remove air from reservoir

1. SPECIFICATIONS

SPECIFICATIONS	
Size	8.1” (205mm) L X 1.3” (34mm) W
Weight	13.4 oz. (380g)
Wetted Part	Delrin, PFE, stainless steel, UHMWPE
Dispense volume per rotation	0.012 ml average
Flow rate	0.15 – 1.04 ml/min.
Minimum dispense amount	0.001 ml
Fluid viscosity	1-300K Cps or m.Pa.s
Precision ±, absolute (1)	±1%
Self-sealing (2)	2 bar
Material inlet port	1/8” NPT
Material outlet port	Male Luer lock
Direct mount material reservoir	3 to 55cc

(1) Volumetric dispensing as absolute deviation per complete revolution and also depends on dispensing fluid.

(2) 2 bar self-sealing is for fluid with viscosity of 1000 Cps or lower. The pump can handle up to 5.5 bar for 300K Cps viscosity fluid.

2. DIMENSIONS AND TYPICAL SETUP

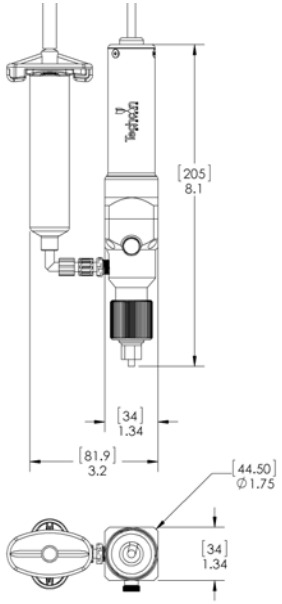

Figure 1.0

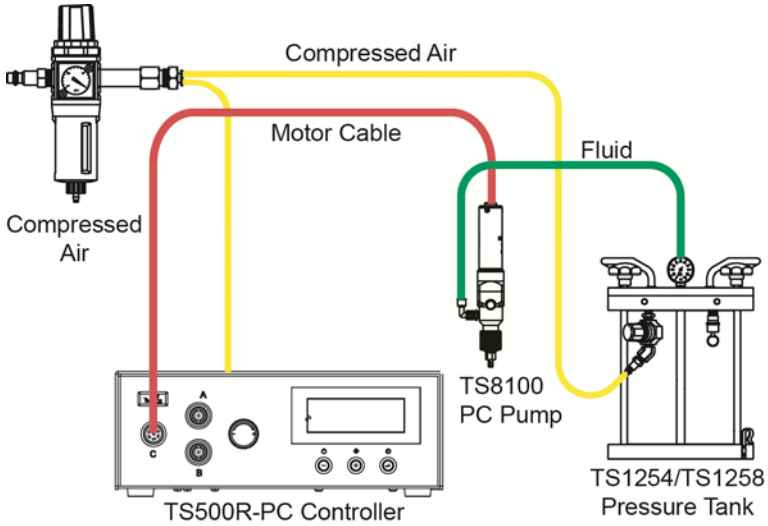

Figure 2.0

9. STANDARD ACCESORIES:

PART NUMBER	DESCRIPTION
8100-CLEANKIT	CLEANING KIT
8100-SYBRACKET	SYRINGE BRACKET KIT
8100-MBRACKET	MOUNTING BRACKET
TSD931-96	FEMALE LUER WITH 1/8 NPT THREAD
TSD931-82B	MALE ADAPTER LUER LOCK, BLACK NYLON
TSD931-81B	ELBOW 90° LUER LOCK, BLACK- NYLON

10. OPTIONAL ACCESORIES:

PART NUMBER	DESCRIPTION
TN00DKIT	Complete Dispensing Tip Kit
9000-000-112	Sample Tip Kit
7105XCON	Conditioning Cream, 10cc
7305XCON	Conditioning Cream, 30cc
71003RHB	10cc Receiver Head, 3ft (0.9M)
73003RHB	30cc Receiver Head, 3ft (0.9M)

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	7509-0070	FLEX, COUPLING	1
2	7509-0120	ROTOR,2.5 PITCH	1
3	7509-0100	MOTOR MOUNT PLATE	1
4	7509-0140	STATOR HOUSING	1
5	2800-0836	SET SCREW, M2.5 X 3MM LG,	1
6	2800-0903	M3 X 6 SS SET SCREW	1
7	7509-0160	STATOR	1
8	3300-0586	SEAL	1
9	3300-0595	DOWEL PIN 1.5 X 5 MM	1
10	2800-0901	M3 X 6MM FLAT HEAD PHILIP	3
11	2800-0897	M2.5 X 14 MM SHC SCREW	4
12	2800-0898	WASHER,SEAL	1
13	2800-0899	THUMB SCREW	1
14	2600-0185	MOTOR	1
15	7509-0340	MOTOR,COVER	1
16	7509-9110	CABLE ASSY,SERIES 100 PC PUMP	1
17	2800-0900	#4 x 1/4 FLT HD SCREW	3
21	2800-0917	WASHER #4	4
22	2800-0295	WASHER, M2.5 LOCK,MEDIUM,SS	4
23	7509-0090	LOCK NUT	1
24	7509-0130	STATOR CAP BOTTOM	1
25	7090-0030	NEEDLE LOCKING CAP	1

3. UNPACKING AND INSPECTION

Carefully unpack the pump and examine the items contained in the carton.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	7509-9030	PC PUMP (without Stator)	1
2	8100-CLEANKIT	Cleaning kit	1
3	8100-SYBRACKET	SYRINGE BRACKET KIT	1
4	8100-MBRACKET	MOUNTING BRACKET	1
5	A0100488-2	700 SERIES,30cc RECEIVER HEAD	1
6	8100-100-002	STATOR	1
7	N/A	FITTING KIT: Includes 3 fittings below	1
	TSD931-96	FEMALE LUER WITH 1/8 NPT THREAD	1
	TSD931-82B	MALE ADAPTER LUER LOCK, BLACK NYLON	1
	TSD931-81B	ELBOW 90° LUER LOCK, BLACK- NYLON	1
8	9000-000-100	SAMPLE NEEDLE KIT FOR VALVES	1
9	N/A	CAP/NUT KIT: Includes 3 nut and caps below	1
	7509-0090	RETAINER NUT	1
	7509-0130	STATOR CAP BOTTOM	1
	7090-0030	NEEDLE CAP	1
10		INSTRUCTION PACKET	

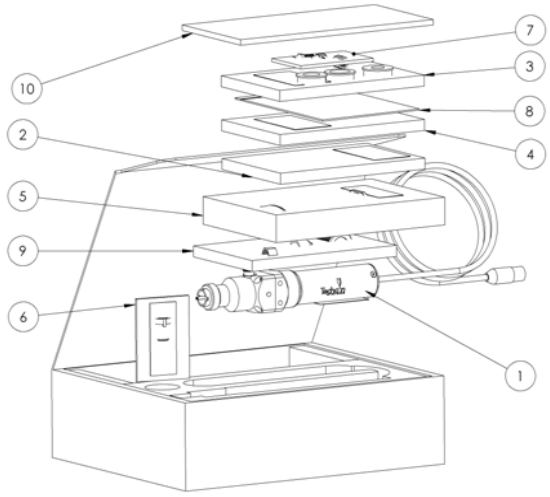

Figure 3.0

Inspect the unit for any damaged which may have occurred in transit. If such damage has occurred, notify the carrier at once. Claim for damage must be made by the consignee to the carrier, and should be reported to the manufacturer.

4. DESCRIPTION

The TS8100 series Positive Displacement Pump is a continuously volumetric dispense pump based on the Progressive Cavity (PC) technology. The pump is designed to dispense a wide range of fluids, from low viscosity coatings to high viscosity greases. The many advantages of PC technology will simplify your dispense process and improve reliability and quality in the long run.

The TS8100 series PC pump provides a consistent dispensing output due to a special design of seal cavities in the fluid chamber which created a volumetric fluid flow. Two main components are the stator and rotor. The metal rotor seals tightly against the flexible rubber stator as it rotates, forming tightly sealed cavities which move toward to the pump outlet, carrying the fluid. The pumped fluid does not change in shape or size during the dispense process. Accuracy and repeatability rate of +/- 1% is achievable.

5. THEORY OF OPERATION

The TS8100 Series Positive Displacement pump dispenses fluid with a positive displacement action using a progressive cavity technology. Fluid is held in a feed reservoir (2) under a positive head of air pressure, up to 30 psi (2.07bar), depending upon the viscosity of the fluid. This positive air pressure, supplied by the air line (1), forces the fluid out of the barrel (2) into the fluid feed path (3) then to the rotor/stator chamber assembly (4). Fluid flows from this point (4) to the dispense tip outlet and is controlled by the rotor rotation in the feed direction. The rotor is driven by the encoder DC motor (5). Applying a voltage signal to the motor (5), will rotate the rotor and the fluid will be forced out the dispense tip. The actual fluid deposited is dependent upon adhesion of the dispensed fluid to the substrate. Shearing of the fluid is achieved by reverse Z-motion (tip retraction). When the motor stops, the unit remains in position for a fraction of a second (dwell) to allow the last drop of fluid to flow out of the dispense tip. After the dwell period, the automation equipment moves the pump to the next position.

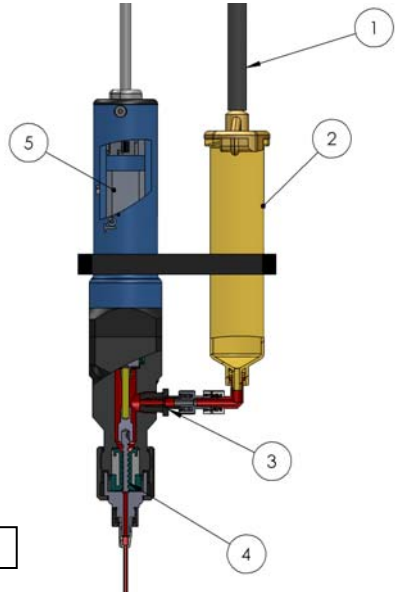

Figure 4.0

8. SPARE PARTS:

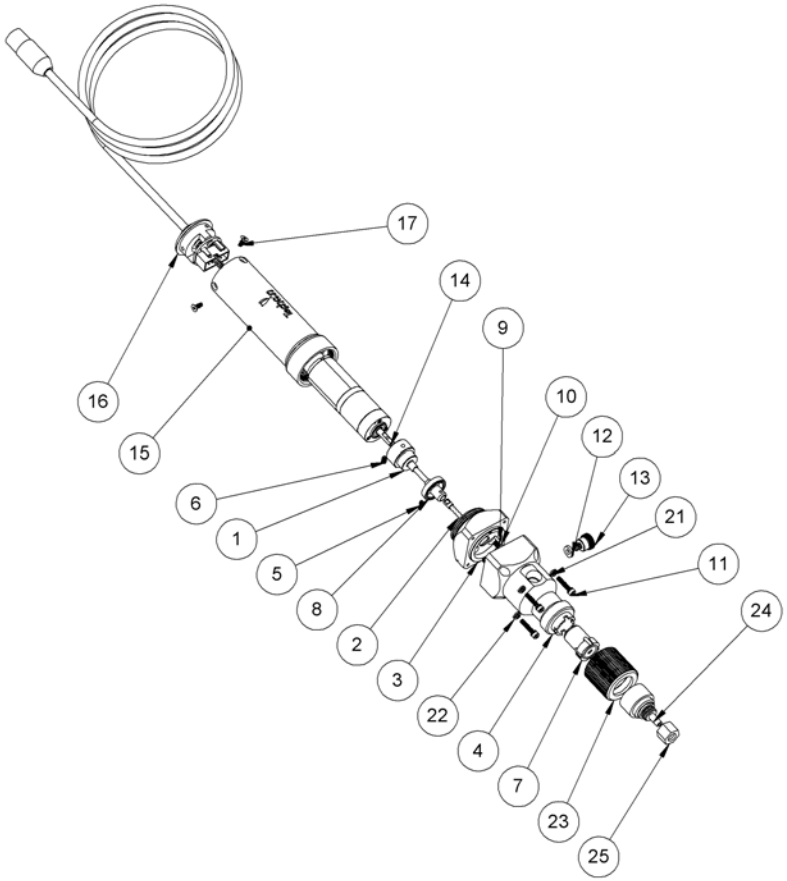

Figure 15.0

5. Remove the stator (10) by rotating it counter clockwise. If necessary, turn on the motor while rotating the stator.
6. Using the 2mm Hex Key to remove 4 mounting screws (13)
7. Pull the stator housing straight out (7); take care not to damage the seal
8. Submerge the stator (10) in a bath of cleaning solvent and use the cleaning brush P/N: TSD2106-1 (includes in the cleaning kit) to clean the stator. Insert the brush in the center of the stator and rotate it until all residues are cleaned out.
9. Use the same cleaning brush to clean the internal chamber of the stator cap.
10. Use the soft cloth to wipe off material residue on the rotor (2) surface
11. Continue to clean the rotor by dip it in a solvent bath then use the TSD2106-1 brush to remove any leftover residues.
12. Use a soft cloth to wipe off material residue on the cup seal (11)
13. Inspect parts for wear or damage and replace if necessary

6. SET-UP INSTRUCTIONS

6.1 Install the Stator:

To prevent permanent set to the inside the stator, the pump is shipped without the stator attached to the motor/rotor assembly. Follow instructions below to install the stator.

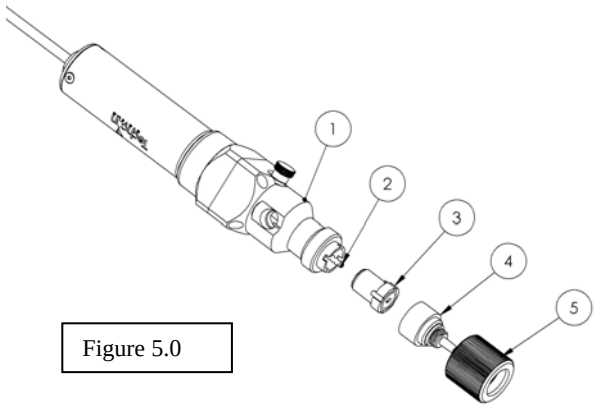

Figure 5.0

1. Wet the rotor (2) by applying the dispensing fluid (or any appropriate lube that is compatible with the dispensing fluid) to the expose portion of the rotor surface.

2. Wet the stator (3) by squeezing a small amount of the dispensing fluid (or any appropriate lube that is compatible with the dispensing fluid) in to the stator opening.

3. Screw the stator (3) onto the rotor in the clockwise direction (2) until the 4 tabs of the stator align with the 4 notches of the stator housing (see figure below)

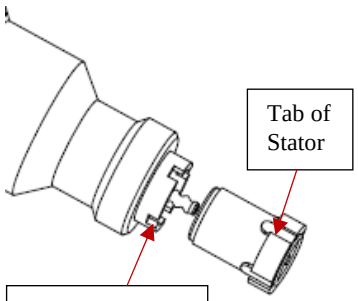

Figure 6.0

4. Apply some pressure on the stator by pushing it against the stator housing to make sure it fully seats into the notches. Check to make sure the rotor tip is flush with the stator.

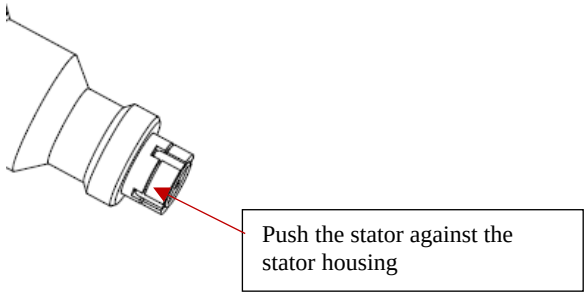

Figure 7.0

5. Place the stator cap (4) into the retaining cap (5)
6. Install the retaining cap (5) (with the stator cap in place) by screw it onto the stator housing (1) in the clockwise direction.

6.2 Mechanical Mounting:

Normally, the TS8100 Series PC Pump is used on an automation system such as a bench-top robot. It is very important that the pump is mounted on the Z-axis gantry, in a secure manner, that will not allow loosening during dispense operation. The Z-axis must move in a precise and repeatable motion for successful dispensing.

The provided mounting bracket must be attached to the Z-axis in a manner that will provide the valve perpendicular travel to the horizontal plane of the surface on which the fluid will be dispensed. The mounting should provide a means of accurately adjusting the distance between the dispense tip and the substrate surface such as a touchdown sensing device or a fixed distance standoff.

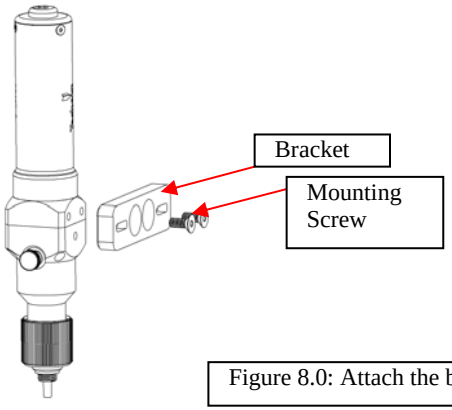

Figure 8.0: Attach the bracket to pump as shown

7.2 Thorough Cleaning: refer to diagram below

Recommended cleaning solvent: IPA or Acetone

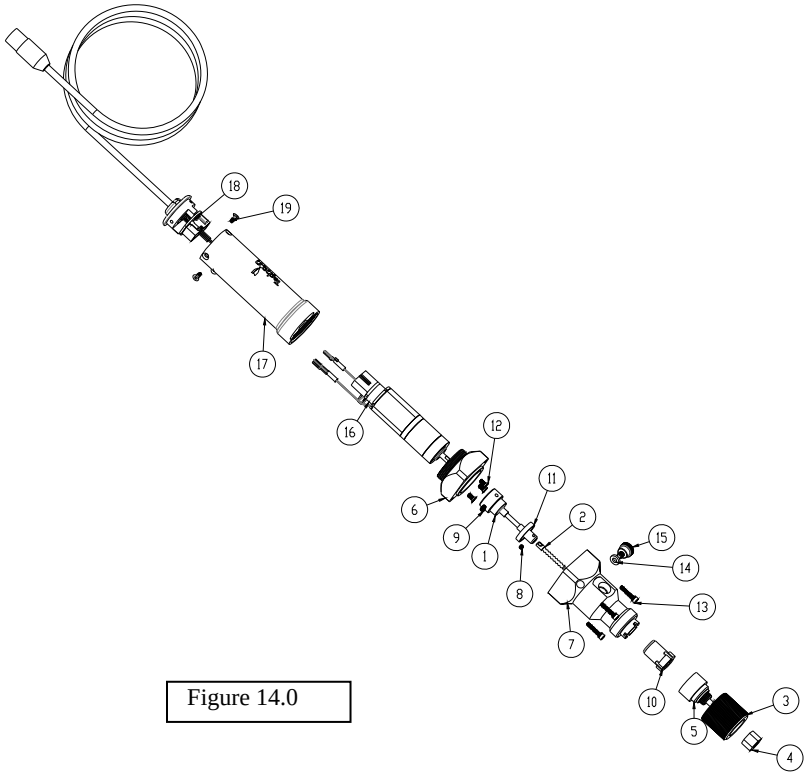

Figure 14.0

Thorough cleaning procedures should be done whenever the following occur:

- When the dispense material is changed to different type
- When the dispense material is started to cure in the pump
- When Pump has been dispensing for one month.
- When the dispense tip clogged frequently

1. Perform Pump purging process by follow steps 1-6 in Section 9.1 “Purging”
2. Remove the Material Inlet Fitting
3. Rotate the retaining cap (3) counter clockwise until it completely detach from the stator housing (7).
4. Pull the retaining cap (3) along with the stator cap (5) and the needle cap (4) straight out from stator housing (7)

Notes: One complete rotor revolution = 2647 encoder count ≈ 0.01068ml. To achieve maximum dispense repeatability it is recommended that pump to be set to dispense at least one complete revolution (2647 counts).

4. Press and hold the Set button for two seconds to move the cursor to the reverse counts.
5. Press the Mode (+) or Power (-) button to set reverse count.
   Notes: Recommended reverse count is 7
6. Press and hold the Set button for two seconds to move the cursor to the output voltage.
7. Press the Mode (+) or Power (-) button to change the voltage value.
   Notes: The recommended voltage setting is 0.65ml/M (10.5V).
8. Press and hold the Set button for two seconds to save the data.
9. Press and release the Foot Switch to activate the dispense cycle

7. MAINTENANCE AND CLEANING:

7.1 Pump Purging:

Purging the pump with dispensing conditioner (7305XCON) after each shifts is recommended. The conditioner removes material residue from the material path and conditions the pump for future use.

1. Release material feed pressure.
2. Remove material from the pump.
3. Remove dispense tip
4. Install a barrel of dispensing conditioner (Part number 7305XCON) to the pump inlet and set air pressure at 10.0 psi.
5. Set the controller to “PURGE” mode
6. Press the foot switch to let the pump run until the conditioner is the only material being dispensed at the pump outlet. If the conditioner is unable to force the dispense material out the pump outlet then proceed to the “Thorough Cleaning” section.
7. Release the foot switch to stop pump
8. Release conditioner feed pressure.

Figure 9.0

6.3 Connect the pump to the controller: refer to setup diaphragm below

The recommended controller for the TS8100 Series PC Pump is the TS500R-PC.

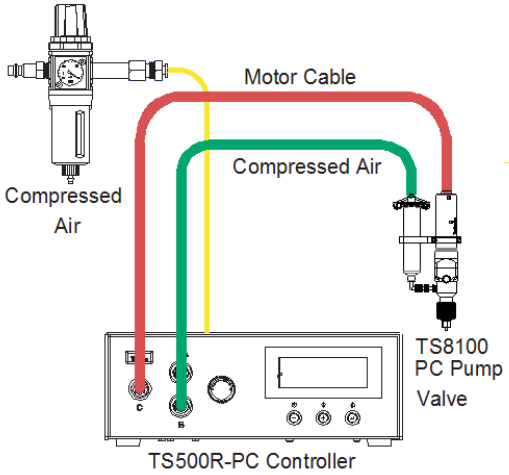

Figure 10.0

1. Connect the power adapter to the TS500R-PC controller
2. Connect air hose to the TS500R-PC controller

3. Connect the motor cable to Port C. Notes: Make sure the controller is turned off when connecting the motor cable to port C
4. Connect syringe air hose to port B
5. Set air pressure to feed the material to the pump
6. Notes: for low viscosity material the pressure setting should be 1 – 9 psi; for medium viscosity material the pressure range setting should be 10-19 psi; for high viscosity material the pressure range should be 20-80 psi
7. Press the Power button to turn on the unit.

6.4 Prime the Pump

1. Press the Mode button until "PURGE" appears on the Display
2. Press and hold the Foot Switch until a steady stream of material flowing out the pump outlet without air bubbles.
3. Attach a dispense needle to the pump outlet
4. Repeat step #2

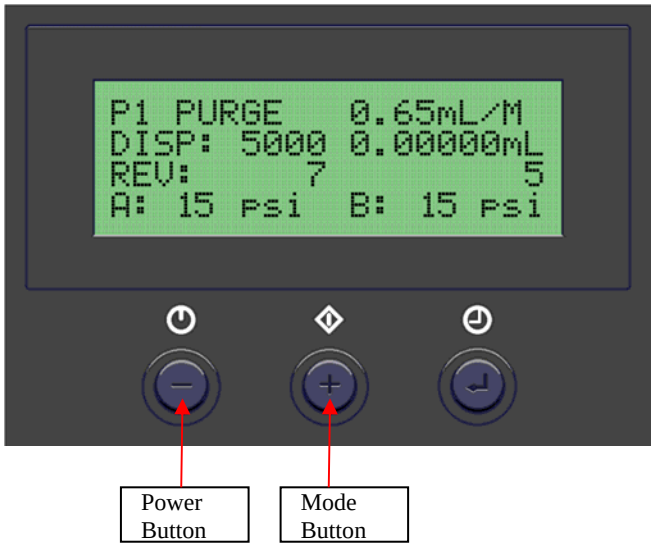

Figure 11.0

5. If air bubbles still appear in the material, open the vent hole by turning the vent screw counter clockwise to allow air bubbles to escape.

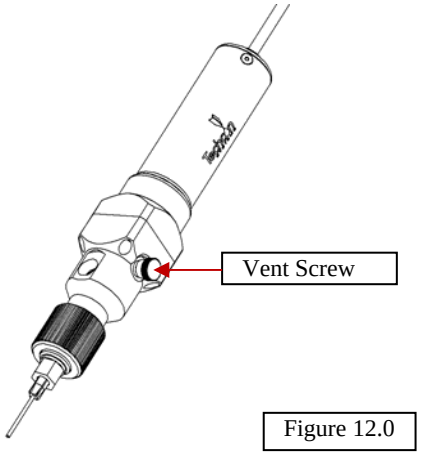

Figure 12.0

6.5 Dispensing:

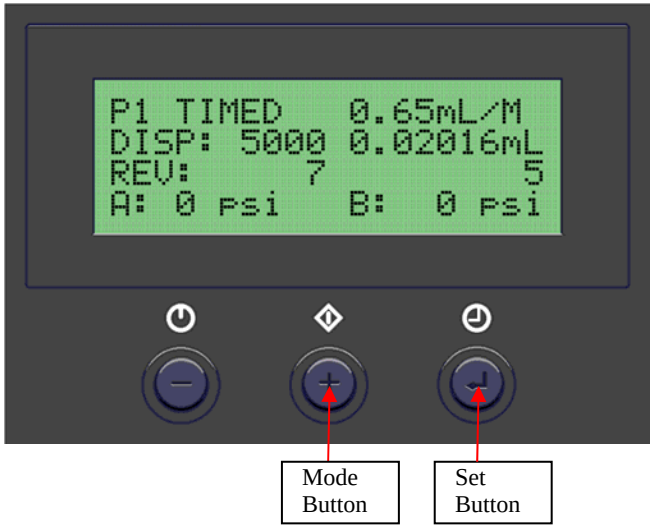

Figure 13.0

1. Push the Mode button to select "TIMED MODE"
2. Press and hold the Set button for two seconds to enter set up screen. The dispense time (DISP) will be highlighted.
3. Press the Mode (+) or Power (-) button to set the motor counts