TS580D-MM

Micro-Meter Mix Controller User Guide

Accurately Dispense Two Component (2K) Material
with the Dual PC Pump
TS8200D Micro-Meter Mix Dispensing System

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1 Safety

Intended Use:

WARNING: Use of this equipment in ways other than those described in this User Guide may result in injury to persons or damage to property. Use this equipment only as described in this User Guide.

OK International cannot be held responsible for injuries or damages resulting from unintended application of its equipment. Unintended uses may result from taking the following actions:

- Making changes to equipment that has not been recommended in the User Guide
- Using incompatible or damaged replacement parts • Using unapproved accessories or auxiliary equipment

Safety Precautions:

- Do not operate this unit in excess of maximum ratings/settings
- Always wear appropriate personal protective clothing or apparel
- The fluid being dispensed may be toxic and/or hazardous. Refer to the Material Safety Data Sheet for proper handling and safety precautions
- Do not smoke or use open flames when flammable materials are being dispensed
- This equipment is for indoor use only

2 Symbol Definitions

Symbol	Description	Symbol	Description
	Home Screen	P1 + P2	Dispense both pumps
	Settings	P1 Only	Dispense Pump 1 only
	Calibration	P2 Only	Dispense Pump 2 only
	Not logged in / Login Screen	AC	Advanced Calibration
	Logged in / Login Screen	OEM	Factory Reset Settings
	E-Stop	IFO	Information
	Reset Cycle Count	-R-	Robotic Mode
BAR/PSI	Pressure Unit Select		Time/Volume/Weight mode
V/T/Q	Volume/Time/Quantity Select		Interrupt mode
-C-	Controller Mode		Teach mode
	Run		Purge mode
	Run Continuous		Purge Pump 1 mode
	Run Sequence		Purge Pump 2 mode
	Run Sequence Continuously		Ratio
	Continuous/Sequence Mode Select	LOW(0) 100	Low Pressure Calibration
	IOT/RCP/Network Settings	HIGH(100) 4050	High Pressure Calibration
USB	USB firmware upgrade	I/P:	Inlet Pressure
	Forward Dispense	A/B:	Outlet Pressure
	Reverse (suck back)	C1:	Current to Pump 1
1	Selected Program	C2:	Current to Pump 2
9	Completed Dispenses		

3 Specifications

Size	290 mm x 212 mm x 98 mm (11.4” x 8.3” x 3.9”)
Weight	2.8 kg (6.17 lbs)
Input Voltage	24 VDC
Output Voltage Range	0-24 VDC
Rated Power	15 W
Air Input	100 psi (6.9 bar) Max.
Air Output	0-99.9 psi (6.9 bar)
Pollution Degree	II
Installation Category	I
Indoor Use	Altitude up to 2,000 m (6,562 ft)
Operating Temperature	0 ˚C to 50 ˚C (32 ˚F to 122 ˚F)
Storage Temperature	-10 ˚C to 60 ˚C (14 ˚F to 140 ˚F)
Max. Relative Humidity	80% for temperature up to 31 ˚C (87.8 ˚F) Decreasing linearly to 50% relative humidity at 40 ˚C (104˚F)
Timer	0.008-99.99 seconds
Cycle Mode	Timed, By-Weight, By-Volume, Interrupt, Teach, Purge
Timing Repeat Tolerance	+/- 0.001%
Cycle Rate	Up to 600 cycles/min
Display	Touch Screen, Resistive
Meets or exceeds	CE, TUV and NRTL

4 Features

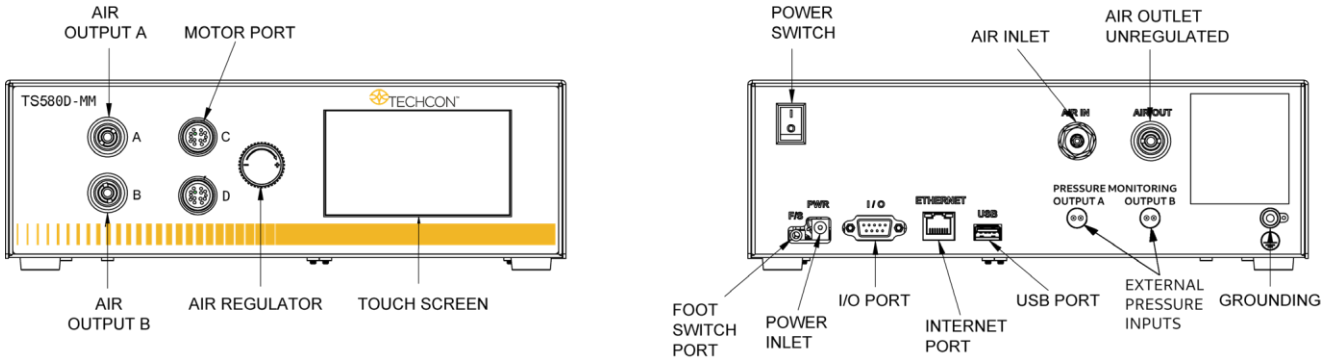
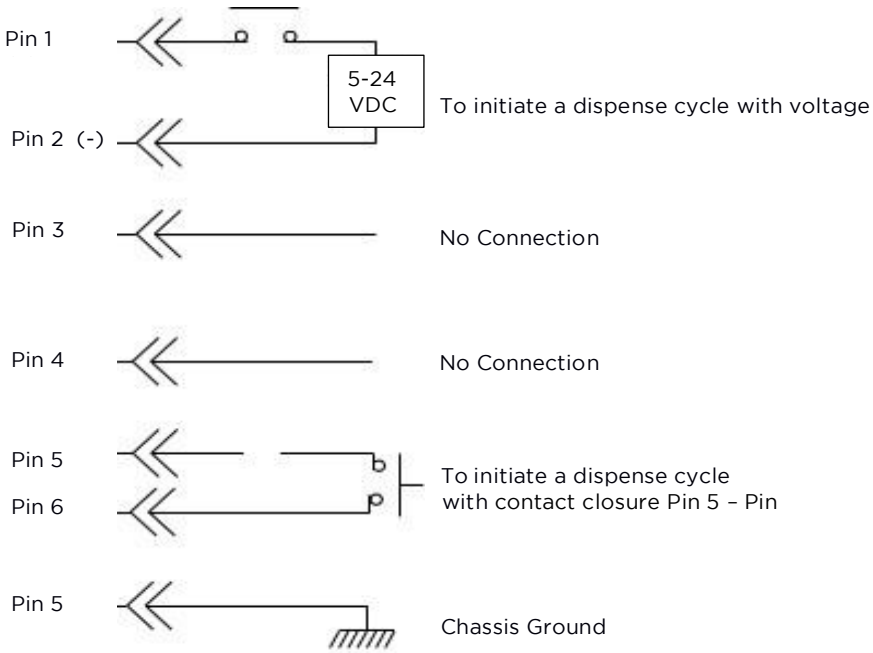


Figure 1: Controller Features

- Air Output A/B – Pressurized air to connect to the material syringes. The ports share a common source.
- Motor Ports C/D – Connected to the motors/pumps, provide drive power to the motors, and read encoder feedback.
- Air Regulator – Reduce inlet air pressure (100 psi typical) to a desired pressure.
- Air Inlet – Connect to pressurized air source (100 psi typical).
- Air Outlet Unregulated – share pressurized air to auxiliary equipment.



Pin 3, 4, 7, 8, and 9 = No Connection

- Foot Switch Port – Connect external switch to actuate dispenses.
- I/O Port.
- Internet Port – RJ45 connection to Ethernet.
- USB Port – Software Upgrade.
- External Pressure Inputs – connect to pump to monitor material pressure.

CAUTION: A 5-micron filter (TSD800-6) must be installed with the unit to ensure proper air filtration.

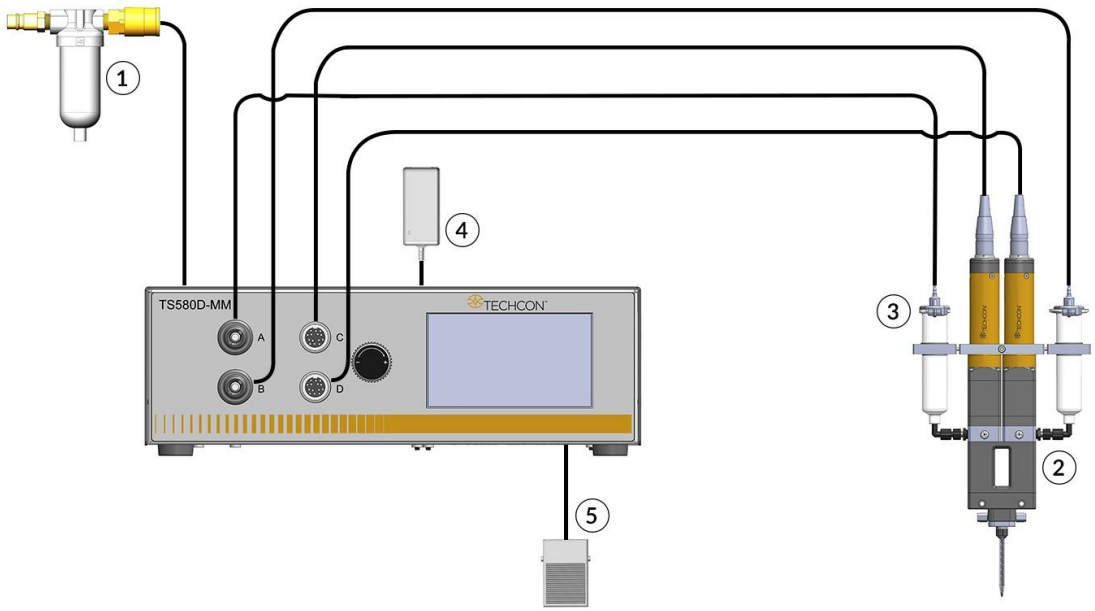


Figure 2: Typical Set Up Diagram

Items	Description
1	Air Filter
2	Pump (not included)
3	Syringes of material (not included)
4	Power Adapter
5	Foot Switch

5 Operation

5.1 Connecting the Unit

1. Connect the power cord and foot switch to the back of the unit.
2. Connect the pumps to Ports C and D. The Left pump is typically connected to Port C and the Right pump is typically connected to Port D.
3. Connect Syringe air hoses to Ports A and B.

Caution: Port A and B share the same regulated air source. If the viscosity of the resin is significantly higher than the hardener, please use an external regulated air source for the resin.

4. Press the Power switch to turn on the unit.

5.1.1 Login

Figure 3

1. From the Home screen, touch the Login icon to enter the Login screen. 
2. Enter “0000” in the Password window (Password window should be highlighted with a green box).
3. Touch green check  to accept.
4. Optionally check “Password Disabled” - no further login will be required.
5. Touch the Home screen button  to return to the Home screen.

Figure 4: Password Screen

Optionally, click the  checkbox. No further login will be required, and lockout will not occur until the box is unchecked explicitly.

To change the password, click on the Gear  then enter the old, then new password.

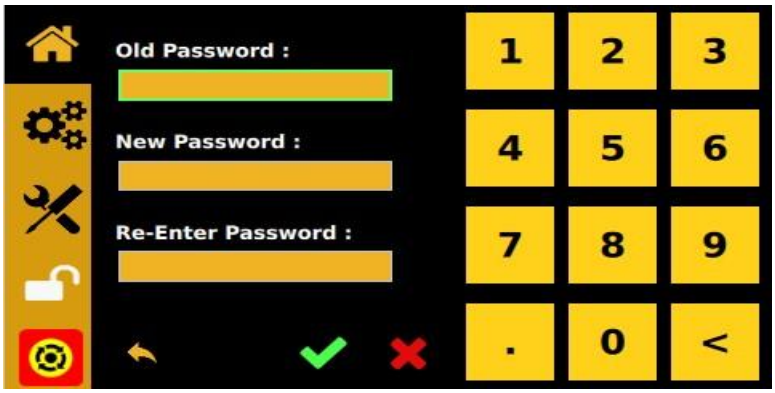


Figure 5: Resetting the Password

5.2 The Calibration Select Screen

From the Home screen button, touch the calibration button  . You will see the Calibration Select screen.

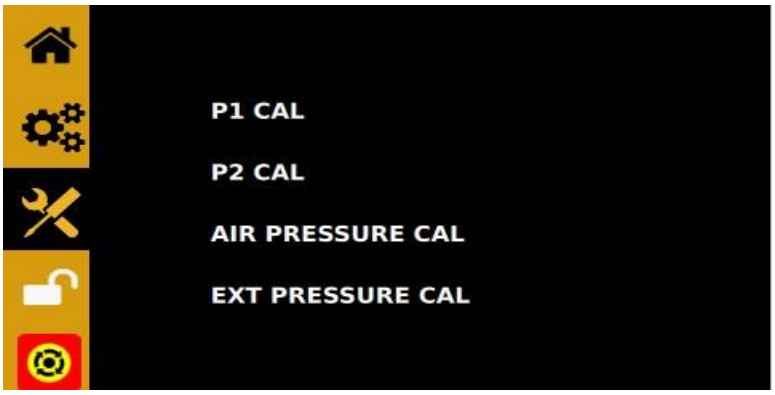


Figure 6: Calibration Select Screen

5.3 Air Pressure Calibration

Note: Pressure calibration must be performed when the unit is activated for the first time.

From the Home screen button, touch the calibration button  then select AIR PRESSURE CAL.

AIR PRESSURE CAL

Figure 7: Air Pressure Calibration Screen

1. Reduce the air pressure at the rear air inlet port to zero (0) PSI. Touch the 'LOW (0)' pressure measurement box. Note: Inside the yellow box is the internal unitless pressure measurement. It will be updated.
2. Increase the air pressure at the rear air inlet port to 100 PSI (6.89 BAR). Touch the 'HIGH (100)' measurement box. The 'HIGH (100)' measurement box on the right will be updated.

3. The calibration is complete. Touch the Home button  to return to the Home screen.

4. Touch the red  to go back to the Calibration Selection screen.

5.4 Pump Calibration

Calibration allows the controller to determine correct volume/weight of the material dispense out of the pumps. Calibration must be performed for the following event:

- New pump installation
- New rotor replacement
- New stator replacement
- A new material is to be dispensed
- After the pump has been used for a period of time

A. PUMP 1 CALIBRATION (P1)

Note: To ensure dispense accuracy, the calibration process must be done at low, mid, and high flow rate.

5.4.1 Calibration at MID Flow Rate:

1. Attach the calibration nozzle to the pump.

2. From the Calibration Select screen, touch 

to calibrate Pump 1.

You will see the following screen with the check mark appear in the MID flow rate box.

Figure 8: MID flow rate box

3. Place a small container under pump 1 outlet
4. Press the Run button  to activate pump 1.
5. Weigh the dispensed material.
6. Touch the Box next to the "Actual wt."

Figure 9: "Actual wt"

7. The screen below will appear. Proceed to enter the weight collected in Step #5 in this screen.

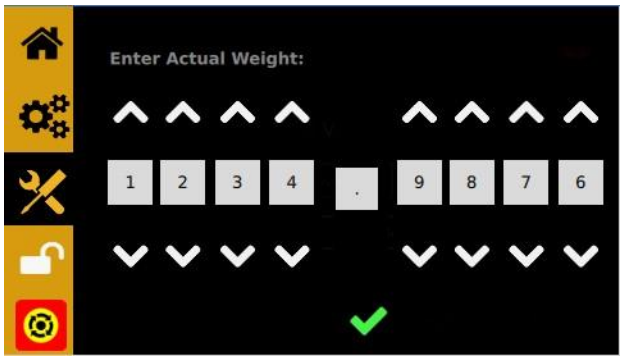


Figure 10: Enter collected weight here

8. Touch the Accept button in the numeric entry screen.

9. Touch the Accept button in the P1 Calibration screen to record the value.

10. Touch the Accept button in the Confirmation popup.

Figure 11: Saving P1 Calibration

11. Verify the value in the grey 'Current Value:' box is the same as the value entered.

5.4.2 Calibration at LOW Flow Rate:

1. Touch the AC (Advanced Calibration) button AC. You will see the advanced calibration screen:

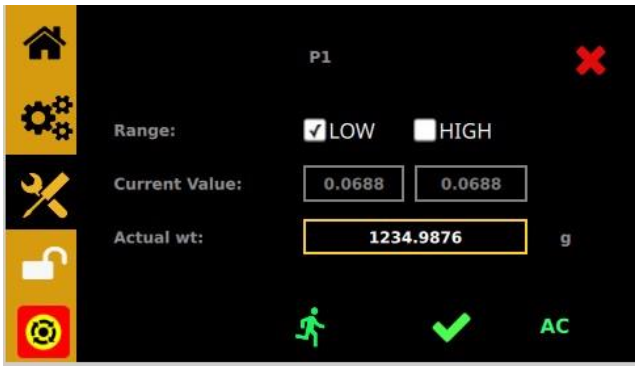


Figure 12: Advanced Calibration Screen (LOW)

2. Verify the 'Low' box is checked. ☑LOW
3. Repeat Step # 2 to 10 in section 5.4.1 above.

5.4.3 Calibration at HIGH Flow Rate:

1. Touch the AC (Advanced Calibration) button **AC**. You will see the advanced calibration screen:

Figure 13: Advanced Calibration Screen (HIGH)

2. Verify the 'HIGH' box is checked.
3. Repeat Step # 3 to 10 in section 5.4.1 above.
4. The Pump 1 calibration is complete.
5. Touch the red 'X' to return to the calibration selection screen.

B. PUMP 2 CALIBRATION (P2)

1. From the calibration select screen select 'P2 CAL' **P2 CAL**
2. Repeat steps in Section 5.4.1, 5.4.2 and 5.4.3 above.
3. Pump 2 Calibration is complete.
4. Touch the Home button to return to the home screen.

5.5 Pressure Sensor Calibration

The pressure sensors are offered as optional accessories to measure the material pressure differential between the two pumps. When the mixing nozzle is restricted and started to clog, the material will flow upstream, causing cross-contamination. When this event occurred, the material pressure differential will increase significantly. The pressure sensors will send the signal to the controller shut down to pump.

Preparation

NOTE: In order for pressure sensing to be operational, the Max. Pressure Differential setting must be non-zero. Please refer to Section 5.10.

- Ensure the Pressure Differential value is set to a non-zero value.
- External pressure sensors should be attached to the pumps and connected to the rear panel.
- The pumps should be prepared to dispense as desired (Rate and Ratio).
- Purge Mode should be selected.

1. From the calibration select screen, click on **EXT PRESSURE CAL**. You will see the External Pressure Calibration Screen.

Figure 14: External Pressure Calibration Screen

2. Press the **RESET** button to clear any existing calibrations.

3. Press and hold the Footswitch or close the contact closure on the rear panel or apply 5-24V on the rear panel input. Do this for approximately 3 seconds. You should see numbers update on the front panel.

4. While dispensing, press the **RECALIBRATE** button.

The calibration is complete. The Micro-Meter Mix will now stop dispensing if the pressure differential (or absolute pressure) exceeds the values set on the external pressure page (page 6) of the Program Profile Setup.

5.6 Pressure Adjustment

Note: Pressure on port A and B provides constant regulated pressure. These two pressure outlets can be used to pressurize the fluid reservoir to feed fluid to Pump 1 and Pump 2. Please note that the pressure output is the same on both ports.

If the viscosity of the resin is significantly higher than the hardener, then use external pressure regulator to control the resin.

1. Rotate the pressure regulator knob clockwise to increase the pressure.

2. Rotate the pressure regulator knob counterclockwise to decrease the output pressure. The output pressure will display in the A/B section located on the bottom left-hand corner.

Figure 15: Output Pressure Display

5.7 To Change Pressure Unit Display

Note: The default pressure unit is PSI. To change pressure unit to BAR, follow the instructions below.

1. From the Main screen, touch the Setup Icon to enter Setup screen. 

2. Press “PSI/BAR” Icon to change the pressure unit.

Figure 16: Setup screen

3. Press “Change” Icon to change the pressure units

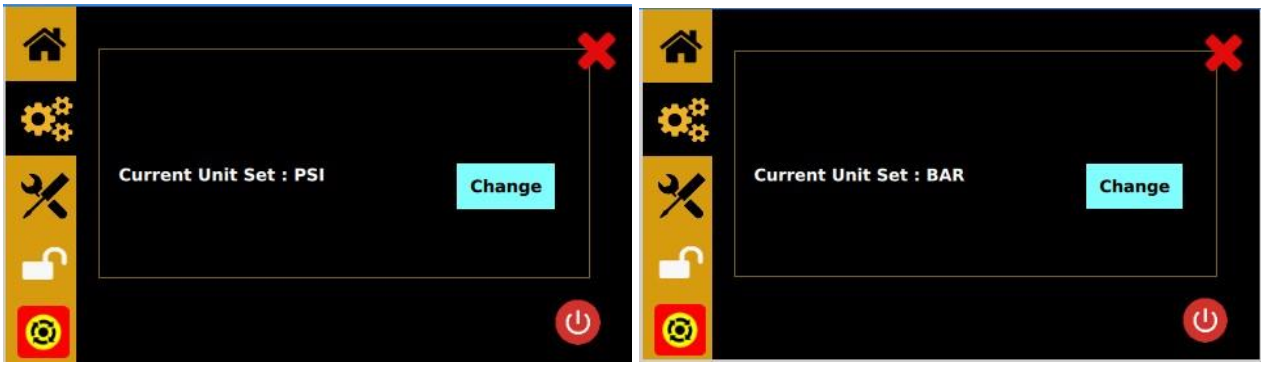


Figure 17: Press “Change” to change the pressure units

5.8 Manual/Purge Mode

There are 3 Purge options:

-  = To purge both pumps
-  = To purge pump 1
-  = To purge pump 2

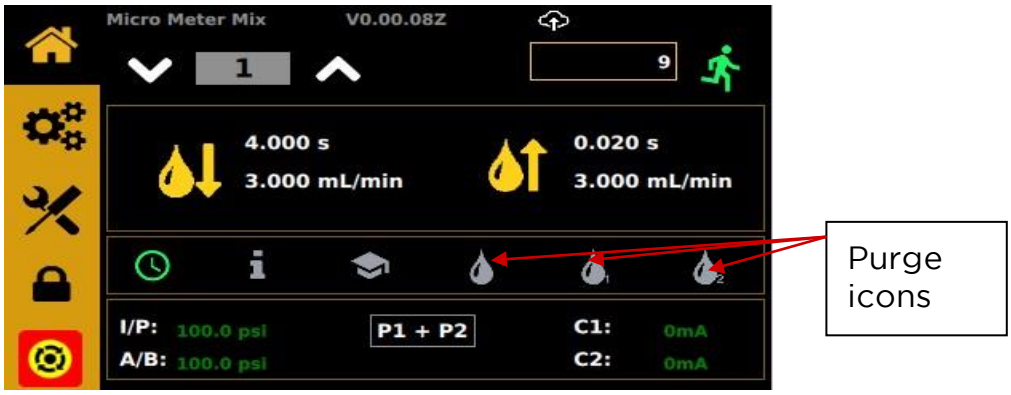


Figure 18: Purge icons

5.9 The Pot Time Timer

The Pot Time timer is used to help avoid material curing within the valve assembly. Set the Pot Time timer based on the "pot life" of your mixed 2K material. Pot life is the amount of time between when the two components are mixed, and the combined material is no longer dispensable.

The timer is set to an amount of time *less than* the pot life of the combined material. When the timer is finished counting down, the pumps will purge, expelling the old material and replacing it with fresh. This process can be set to one (1) cycle or to repeat continuously.

The Potting function will deliver either a second dispense after a user-initiated dispense (Single) or a repeating cycle of dispenses after a user-initiated dispense (Endless).

To enable the Potting feature:

1. Select Shot Type "Single" or "Endless" (Figure 19 & 20)
2. Set a non-zero Potting Time (Figure 21)

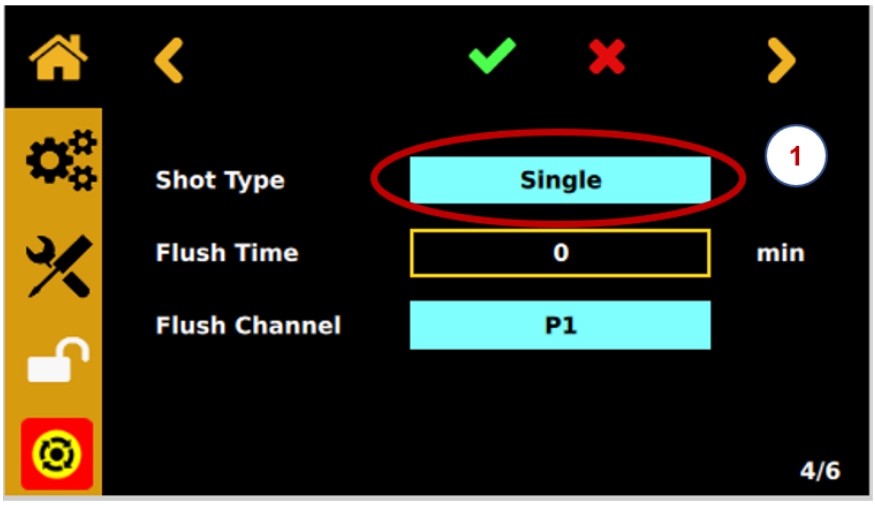


Figure 19

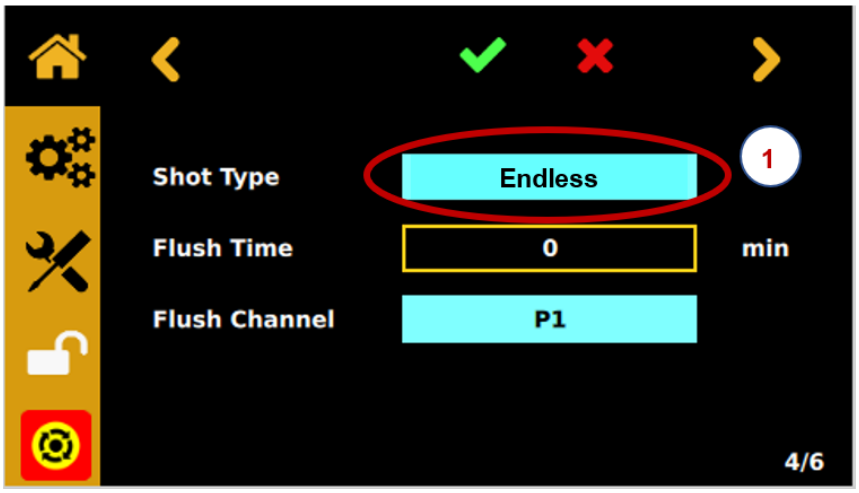


Figure 20

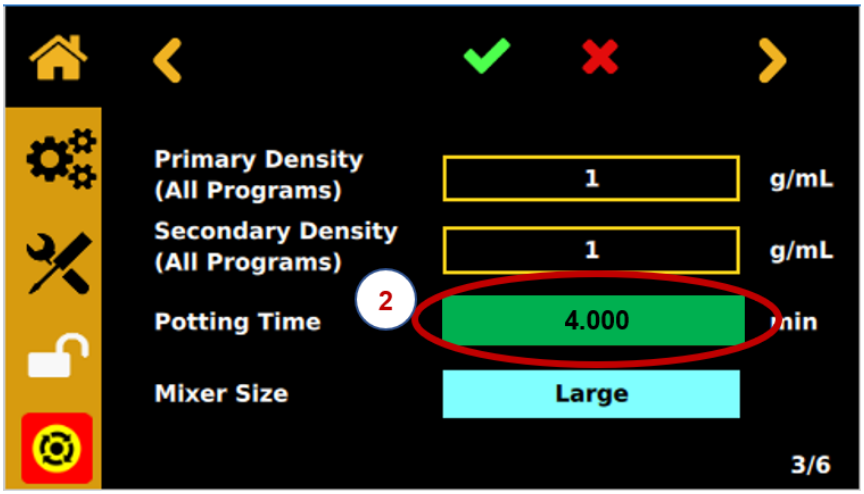


Figure 21

The Potting Time set must be an amount of time less than the pot life of your mixed material.

NOTE: When *Flush* is selected, *Potting* will be disabled, and vice versa.

5.10 Flush Function

The Flush function is used to avoid 2-component material curing in the valve assembly. Material from one (1) of the valves is dispensed to “flush” the 2K mixer from the valve. Since only one component of the 2-component mixer is dispensed, the material in the mixer will not cure.

When Flush is selected, the Potting Timer is disabled.

Flush will dispense based on Flush Time, Selected Channel Pump. Flush Channel, and Mixer Size.

To enable the Flush feature: (Figure 22)

1. Select Shot Type “Flush”
2. Set a non-zero Flush Time
3. Select the Flush Channel
4. Select Mixer Size
5. Click the green Check Mark to accept the changes (Figure 23)

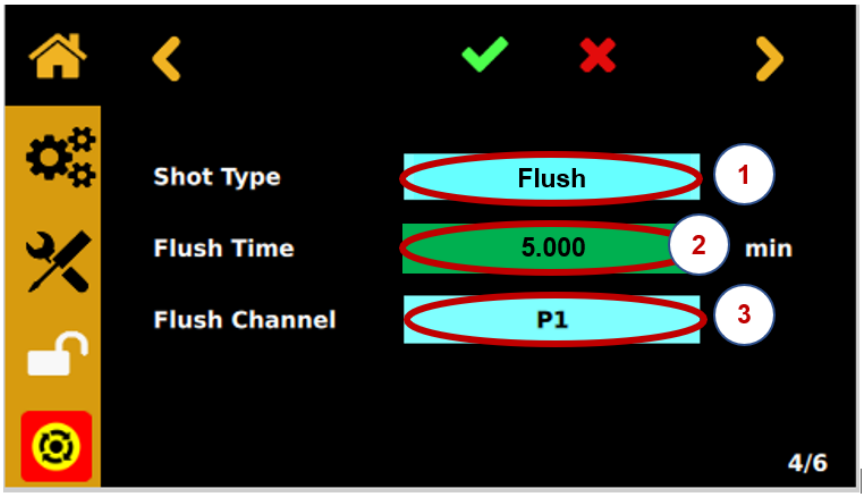


Figure 22

After 5 minutes, Pump 1 will activate filling the mixer.

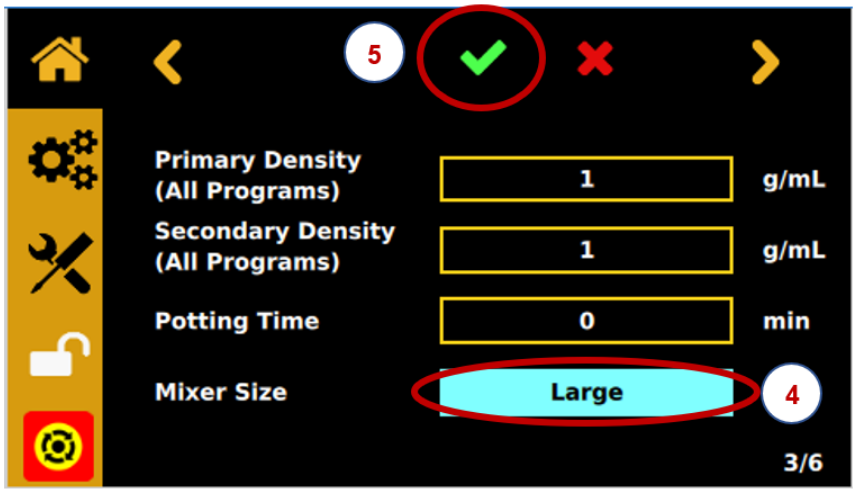


Figure 23

Small, Medium, or Large Flush will occur.

The Flush cycle will start after the next dispense.

5.11 Automatic Dispense Cycle

The Micro-Meter Mix can be setup to run in Timed mode, Volume mode or Quantity (Weigh) mode.

Touch the setup icon to enter the setting screen.

- Select V for Volume mode
- Select T for Timed mode
- Select Q for Quantity (Weight) mode

Figure 24: Setup screen

5.11.1 Volume Mode

1. Touch the Dispense volume box to enter the desired dispense volume.
2. Touch the Suckback Volume box to enter the desired suckback volume.
3. Press the Green check mark to save the data.

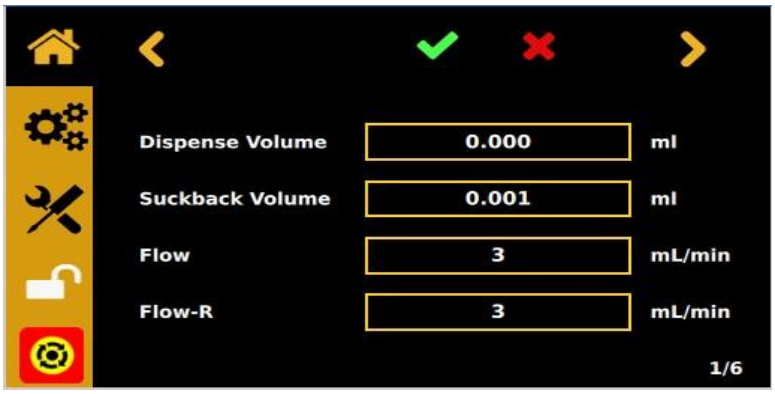


Figure 25: Setting Dispense and Suckback Volumes

5.11.2 Timed Mode

1. Touch the Dispense Time box to enter the desired dispense time in seconds.
2. Touch the Suckback Time box to enter the desired suckback time in seconds.
3. Press the Green check mark to save the data.

Figure 26: Setting Dispense and Suckback Time

5.11.3 Quantity Mode

1. Touch the Dispense Weight box to enter the desired dispense weight in grams

2. Touch the Suck back Weight box to enter the desired Suck back weight in grams
3. Press the Green check mark to save the data

Figure 27: Settings (Weight Mode)

5.11.4 Pause Time

This function is not available at this time. When available, this function will allow the operator to set delay time between dispense and suckback.

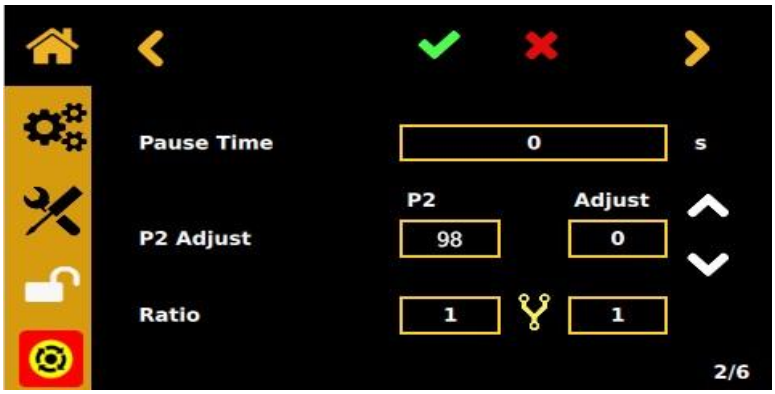


Figure 28: Setting Pause Time (not yet available)

5.11.5 Pump 2 Flow Rate Adjustment (P2 Adjust)

In some cases, after calibration is done, the mix ratio between the 2 pumps is still slightly off. This function allows the operator to manually change the flow rate of Pump 2 to align the mix ratio between the 2 pumps.

1. Enter the Mix Ratio
2. Touch the Up arrow to increase the flowrate of Pump 2
3. Touch the down arrow to decrease the flowrate of Pump 2
4. Touch the green check mark to save the data

Please refer to the Appendix for further discussion of correcting dispense in certain applications

5.11.6 Over Current Protection

This controller is equipped with the over current protection for the motor. When the motor current is higher than the "over current" threshold the unit will be disabled. When this issue happens, check the pump for clogging. Clean the pump thoroughly if needed.

If the over current still occurs after cleaning, it is time to replace the motor.

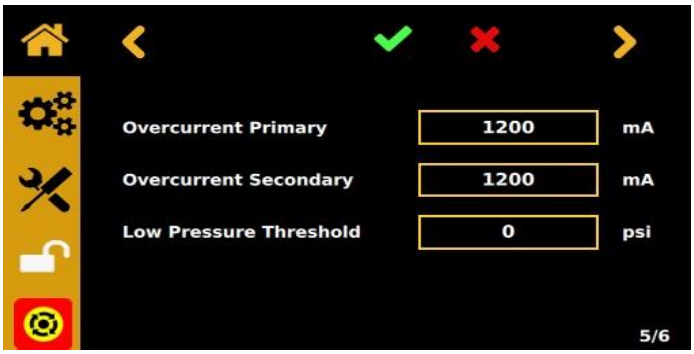


Figure 29: Overcurrent Screen

1. Set the over current threshold for Pump 1 in the Overcurrent Primary box.
2. Set the over current threshold for Pump 2 in the Overcurrent Secondary box.

5.12 Pressure Sensor Setting

The pressure sensors are offered as optional accessories to measure the material pressure differential between the two pumps. When the mixing nozzle is restricted and started to clog, the material will flow upstream, causing cross-contamination. When this event occurred, the material pressure differential will increase significantly. The pressure sensors will send the signal to the controller to shut down the pump.

Figure 30: Pressure Sensor Screen

1. Enter the Maximum Pressure threshold for Pump 1 in the “Max. Pressure Primary” box.
2. Enter the Maximum Pressure threshold for Pump 2 in the “Max. Pressure Secondary” box.
3. Enter the Maximum Pressure difference threshold in the “Max. Pressure Difference” box.

NOTE: Max. Pressure Difference must be non-zero for pressure sensing to be operational.

5.13 Cycle Counter

The cycle counter records the number of automatic dispense cycles being activated. Up to 999,999 cycles can be recorded.

Figure 31: Setup Screen

To reset the counter, follow the steps below:

1. Touch the setup icon to enter setup screen.
2. Touch the Counter reset icon to reset the counter.
3. Touch the X to exit.

Figure 32: Reset the counter

Figure 33: Counter Reset Confirmation

5.14 Stored Program in Memory Cell

The controller has 50 memory cells to store all dispense parameters. It can activate all memory cells in sequence mode.

5.14.1 To Store Dispense Parameters

1. Touch the up and down arrow to select desired memory cell.
2. Enter all desired dispense parameters in the setup screen.
3. Touch the green check mark to save.

Figure 34: Storing Dispense Parameters

5.14.2 To run in Single Sequence Mode

1. Touch the Setup icon to enter the setup screen.
2. Touch the “Walker” icon  to enter the sequence mode setting.
3. Enter the start and end memory cells to run in sequence (they will be contiguous).
4. Touch the “Sequence Mode” icon. 
5. Touch the green check mark to save.

Figure 35: Sequence Mode Screen

NOTE: If there is no delay time entered in the setting, the operator has to press the foot switch after each memory cell is completed to activate the next memory cell.

If delay time is entered in the setting, the controller will activate the next memory cell in sequence automatically.

This feature is designed to work only in controller 'C' mode.
Controller may misbehave if programs in the sequence do not have the same "Volume/Time mode" in set-up menu.

5.14.3 To run in Continuous Sequence Mode

1. Follow step 1 to 3 above and enter the waiting time "delay time."
2. Touch the "Sequence Mode"  icon.
3. Touch the "Continuous Mode"  icon.
4. Touch the green check mark to save and exit.

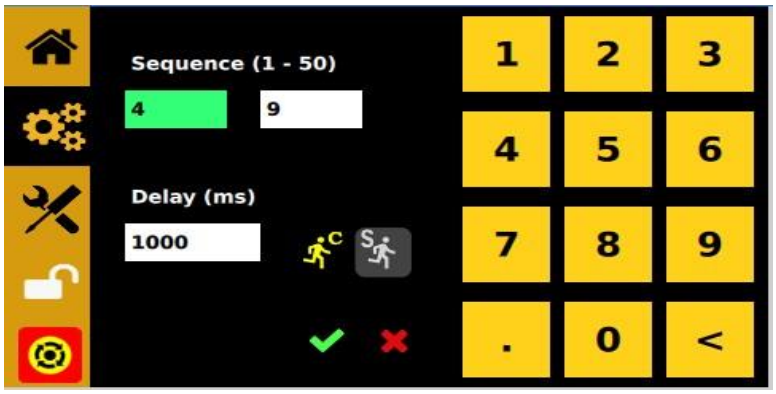


Figure 36: Continuous Sequence Mode Screen

5.15 Controller Mode and Robotic Mode

When the controller is connected to a robot or any automation system, it must be set in the "Robotic Mode." This function is designed for fast-paced communication between the controller and external PLC.
Please reference section 4 for information on available I/O configurations of rear I/O port.

1. Touch the Setup icon to enter the Setup screen.

2. Touch the "Controller Mode" icon -C- to switch the Robotic Mode, icon -R- should appear.

6. Network Settings

On clicking the cloud with UP arrow, you will arrive at the Network/RCP/IOT settings screen. Each row has grey or green buttons. The Green is selected. For the first row, selecting 'Settings' will allow the selection choices located below. Selecting 'Remote' will allow you to adjust the Remote Server Address and Port. Selecting 'Static' will allow you to adjust the static IP address if DHCP is not desired.

Network Settings Selected
Click on RCP to enable RCP control. IOT mode is not implemented. Click on Dynamic to obtain an address through DHCP, or Static to enter an address manually.

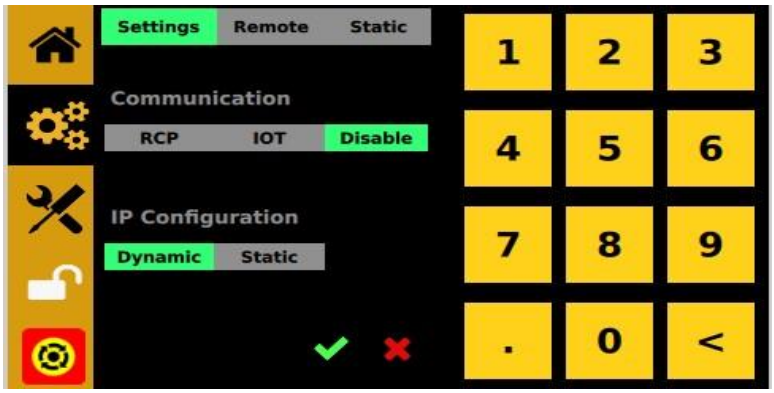


Figure 37: Network Settings Screen

RCP Settings

Click on 'Remote' to set the IP address and port for the RCP server.

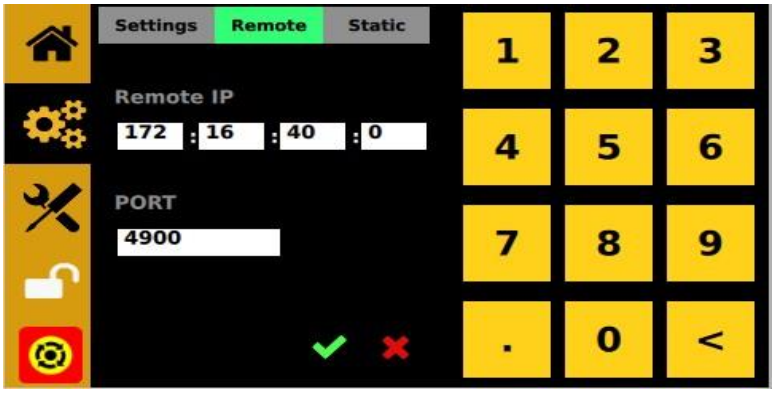


Figure 38: Setting the IP address and port

Static Network Address

Click on ‘Static’ to set this unit’s static IP address if DHCP is not desired.

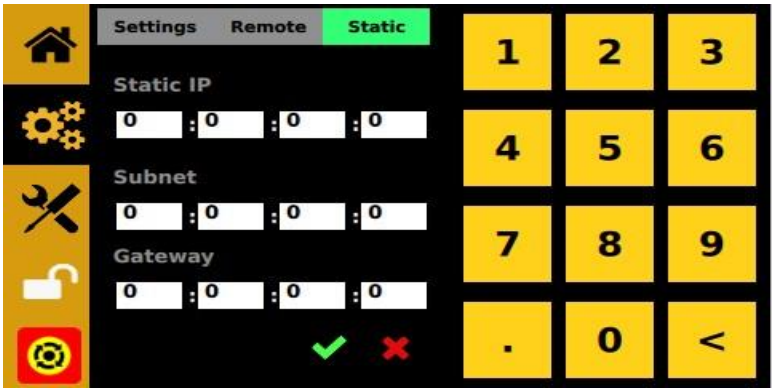


Figure 39: Setting a static IP address

Enter Static IP address, Subnet, and Gateway.

7. USB – Software Upgrade

On clicking the “USB” button on the settings screen, if a USB drive is not inserted, you will see the following:

Figure 40: USB NOT Detected Screen

If a USB drive is inserted, the system will attempt to find the top folder ‘METER_MIX,” then will look for the following: “okvc.ko,” the driver file, and “okivalvecontroller,” the app file under the METER_MIX folder. On successfully loading the files, the system will restart with the new app and/or driver.

Figure 41: USB Detected Screen

7.1 OEM – Factory Reset

On clicking the OEM button, the user will be asked to confirm reset to factory defaults.

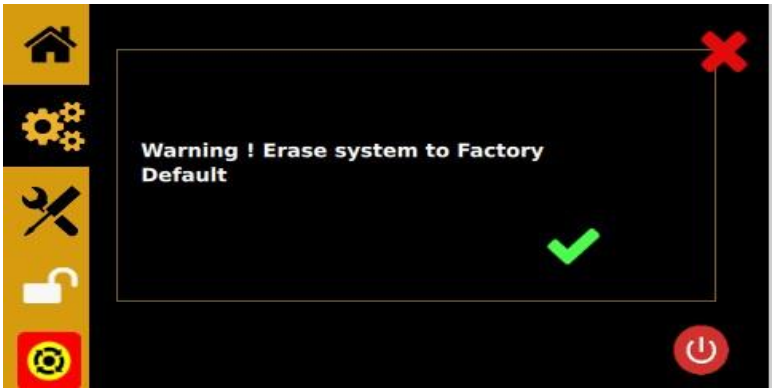


Figure 42: Reset to OEM Settings Screen

7.2 Information Screen

On clicking the IFO button, the user will see an information screen:

Figure 43: Information Screen

8. Troubleshooting

PROBLEM	POSSIBLE CAUSE	CORRECTION
Display does not light up	• No power inputs	• Check power cord connections • Turn on power
System will not actuate	• Supplied pressure dropped below “Low Pressure” setting • Foot switch not plugged in or improperly plugged in • Defective foot switch • Broken wire or loose connection inside unit • Defective solenoid • Defective PC board • The valve motor draws over 400 mA	Increase supplied pressure Check foot switch connection Foot switch needs to be repaired or replaced Unplug power cord and disconnect air supply. Remove cover and check for broken wires or loose connections Replace solenoid Replace PC board Check valve (see section 5.6)
System will not pressurize	• Insufficient air pressure • Air hoses not plugged in • Regulator defective	• Increase air supply pressure • Check connection • Replace regulator
Inconsistent dispense	• Air bubbles in material • Dispense time is too low • Needle clogged • Motor started to burn out	• De-air material • Increase dispense time • Replace needle • Replace motor

9. Maintenance

The controller is designed and built to be relatively maintenance free. To ensure trouble-free operation, please follow the steps below:

- Make certain the air supply is clean and dry.
- Avoid connecting the unit to excessive moisture or solvent saturation.
- Avoid connecting air supply exceeding 100 psi (6.9 bars).
- Use only amyl alcohol to clean the outside surface of the main housing.
- Use only a soft cloth to clean the display screen.

10. Appendix: Dispense Correction in Certain Applications

Sometimes, due to the nature of fluid properties (especially viscosity) and the requirements for dispense time, it may be difficult to achieve correct ratios and/or correct quantities.

Section 5.11.5 identifies a tool to correct ratios, 'P2 Adjust'. It fine-tunes the dispense rate of Pump 2. Pump 2 is most often the smaller of the ratio, so dispenses at a lower rate compared to Pump 1 for many pump mix/matches. The means adjusting its rate has a greater effect on overall dispense.

Please note that in Volume and Quantity mode, the dispense quantity is controlled by pump travel. Motor speeds are calculated and set such that each pump should deliver its own quantity, but that both pumps finish at the same time. Note that the moment one pump has reached its travel, both pumps must stop. Stopping just one pump will create an impurity in the stream of fluids.

Increasing Pump 2 speed will cause it to finish earlier, which will have the effect of stopping pump 1 earlier, and reducing its delivered quantity. Decreasing Pump 2 speed will cause Pump 1 to stop first, so Pump 2 will deliver less.

When the user resorts to using the P2 Adjust feature, it can throw the dispense quantity/volume off. In this case it may be necessary to manually adjust the dispense so that the desired quantity is achieved. This can be achieved by calculating the deficit or overage and increasing or decreasing the setting accordingly.

For example, if the user desires a volume of 3mL, and is getting 2.7 mL (by weighing the components and accounting for density) they might adjust the dispense volume upwared as follows:

3.0 / 2.7 = 1.11

Then:

3.0 * 1.11 = 3.33

Increasing the desired volume to 3.33 should yield a dispensed volume of 3.0 mL as desired.

If the user desires a volume of 3mL, and is getting 3.5 mL (by weighing the components accounting for density) they might adjust the dispense volume downwards as follows:

3.0 / 3.5 = 0.857

Then:

3.0 * 0.857 = 2.57

Decreasing the desired volume to 2.57 should yield a dispensed volume of 3.0 mL as desired.

11. Limited Warranty

OK International warrants this product to the original purchaser for a period of two (2) years from date of purchase to be free from material and workmanship defects but not normal wear-and-tear, abuse, and faulty installation. Defective products or subassemblies and components under warranty will be repaired or replaced (at OK International's option) free of charge. Customers with defective product under warranty must contact the nearest OK International office or distributor to secure a return authorization prior to shipping the product to the assigned OK International authorized service center. For nearest OK International office or distributor contact information, please visit www.techcon.com. OK International reserves the right to make engineering product changes without notice.

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

Send warranty returns to:

Americas
OK International Headquarters
10800 Valley View Street
Cypress, CA 90630
USA

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

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