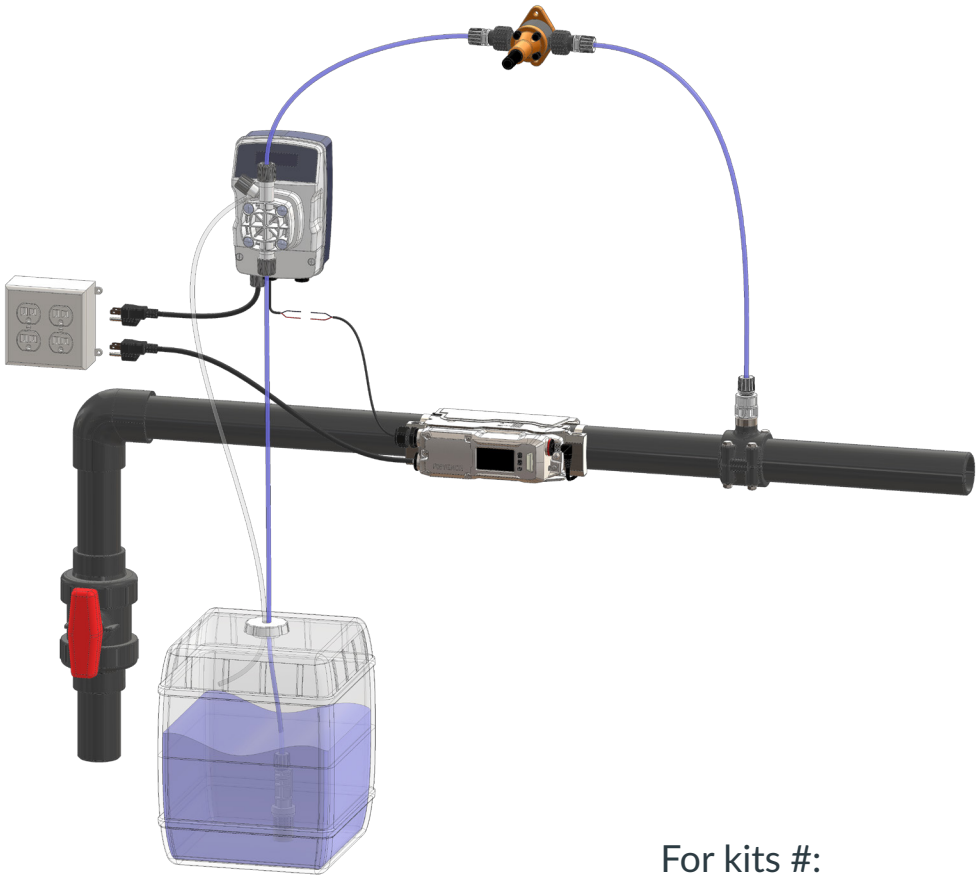
Dilution™
SOLUTIONS
An Ingersoll Rand Business

ETATRON MICRO-DOSER MEGA-FLO SYSTEM

(For systems with a Max of 100 - 400 GPM)

MANUAL



LIT-MDEKITUS-MEGA

For kits #:

MDE0710MF2KITUS
MDE1012MF2.5KITUS
MDE2007MF3KITUS
MDE3005MF4KITUS

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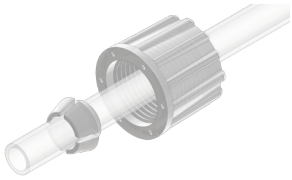
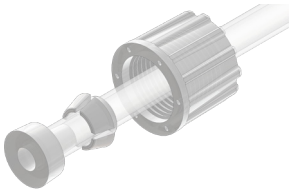
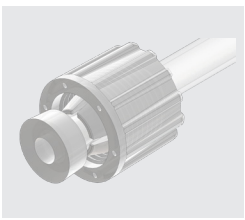
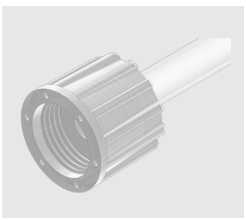
GENERAL SYSTEM NOTES

- It is recommended to install the Ultrasonic Flow Sensor so that the display surface is perpendicular to the ground.
- If installing the Ultrasonic Flow Sensor on a vertical pipe, the water MUST flow upward.
- It is recommended to have straight sections of pipe before and after the Ultrasonic Flow Sensor – 10 x OD Pipe Diameter before, and 5 x OD Pipe Diameter after – for improved measurement accuracy.
- Install the Ultrasonic Flow Sensor on sections of pipe with no seams or rust.
- Make sure the section of pipe selected for installation is clean.
- Your irrigation system will need to be off (or install this system in a bypass) to allow for installation of the Injection Point Saddle.
- It is recommended to install Ball Valves upstream and downstream of the Ultrasonic Flow Sensor. This will allow you to make an Origin Adjustment when installation is complete.

EONE MF TUBING CONNECTIONS

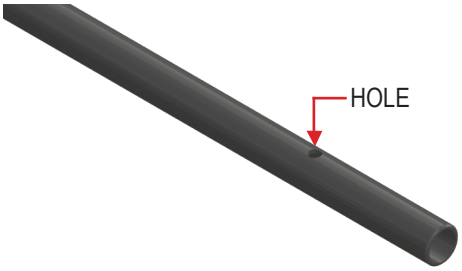
1 Insert the end of the tube through the outside opening of the Tube Nut.	
2 Insert the end of the tube through the Tube Collar. Be mindful of the Tube Collar orientation, the flat end should face the Tube Nut.	
3 Slide the end of the tube over the Tube Nozzle. Push the tube as far into the base as possible.	
4 Slide the collar as close to the nozzle as possible. You may use the nut to draw the collar and nozzle together. **Note:** This takes a little force. Be careful not to bend or kink the tube. Pull and test connection to ensure the tube does not slip out of the Collar and Nozzle.	 

INJECTION SADDLE INSTALLATION

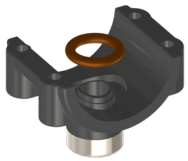
The injection point must be above the level of the fluid in the tank, but it may be above or below the pump and facing any orientation.

5 Select the section of pipe where you intend to install the Injection Saddle. Mark the hole using a hole saw to cut into the pipe. Choose the appropriate hole saw with the corresponding pipe size using the below table.

Pipe	2”	2-1/2”	3”	4”
Hole	3/4"	1-3/4”	7/8”	1-1/8”



6 Insert the o-ring into the channel on the inside of the top half of the Injection Saddle.

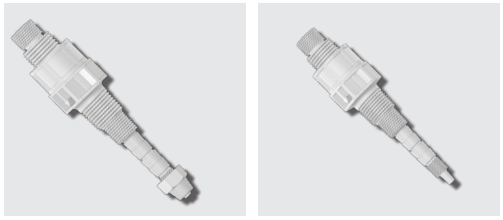


7 Using the included hardware, assemble the two (2) halves of the saddle around the pipe.

a. Bolt Torque – 8 ft-lb
b. Hex Head – 11 mm or 7/16”

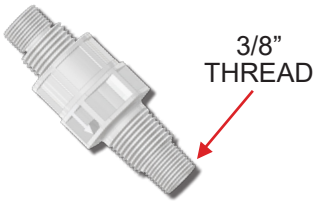
8 Take the Injection Valve from the pump’s box. Remove the tubing connections and set them aside.

Note: Be careful not to lose the o-ring.

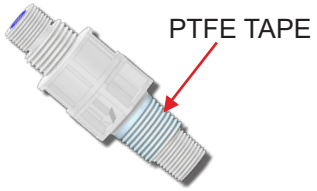


9 There are two (2) thread sizes on the Injection Valve, 3/8” and 1/2”. You may need to cut-away or break-off the lance of the Injection Valve for a proper installation.

Note: Do not go further than the 3/8” threads or you will damage the Injection Valve beyond repair.



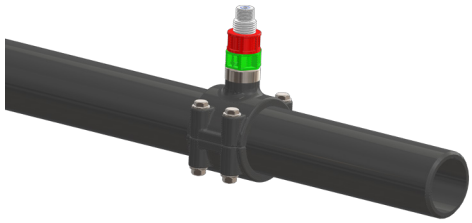
10 Apply 3 to 4 wraps of PTFE tape to the 1/2” threads.



INJECTION SADDLE INSTALLATION

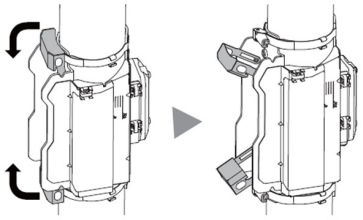
11 Insert the Injection Valve into the injection saddle. Use the section with the arrow (colored in green) to tighten.

Note: Do not use the section above the arrow (colored in red) to tighten, this could damage the Injection Valve.

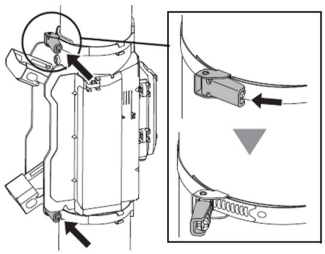


ULTRASONIC FLOW SENSOR INSTALLATION

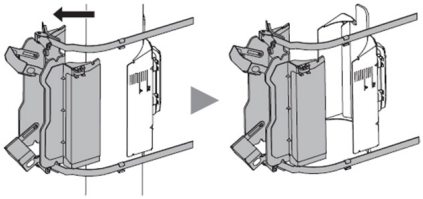
12 Remove and unwrap the bracket assembly of the Ultrasonic Flow Sensor from the box. Open the screw covers.



13 Use a Phillips Screwdriver to loosen the screws of the metal belts. After the screws are loosened, you can raise them and detach the metal belts.



14 Open the metal belts and detach the upper bracket. By deforming the metal belts to the opening orientation, you will attach the unit easily.

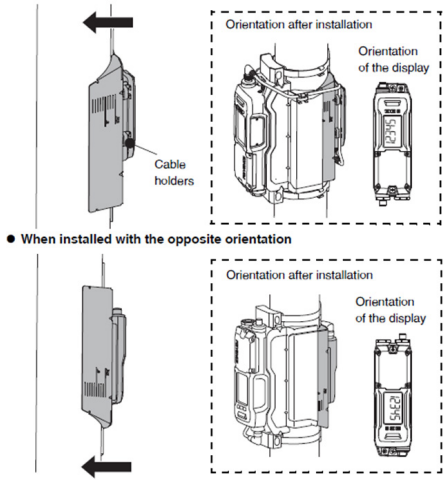


15 Determine the installation orientation of the lower bracket. The orientation of the display unit is determined by the installation orientation of the lower bracket.

Horizontal Installation – Scale on the lower bracket goes toward the bottom of the pipe.

Vertical Installation – Scale on the lower bracket goes upward.

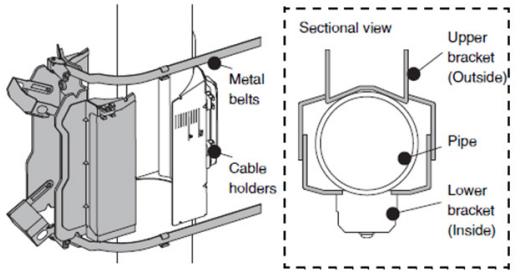
Note: Do not move the lower bracket after it has been attached to the pipe. You risk damaging the rubber pad.



ULTRASONIC FLOW SENSOR INSTALLATION

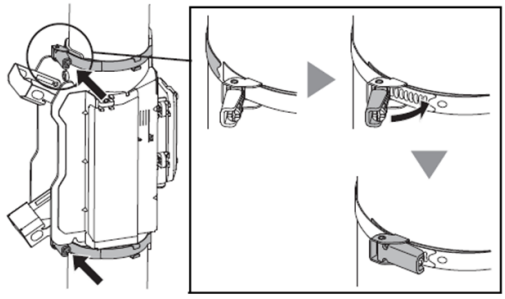
16 Determine the installation orientation of the upper bracket. Make sure the metal belts and cable holders are on the same side of the pipe.

Note: Pay attention to the orientation of the upper bracket when attaching it to the set-up.



17 Attach the lower bracket and upper bracket so that they are pressed against the pipe, then use the metal belts to lightly fix the brackets in place.

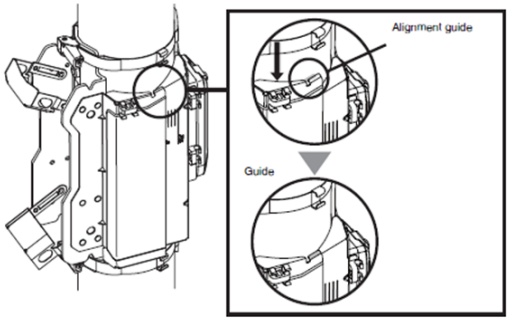
Insert the metal belt as far as it will go into the screw part, then fold down the screw. Tighten the screw while holding down the screw part with your finger.



18 Adjust the position of the upper bracket to align the alignment guide with the lower bracket.

To detect the flow rate stably, adjust the unit position in the longitudinal direction of the pipe.

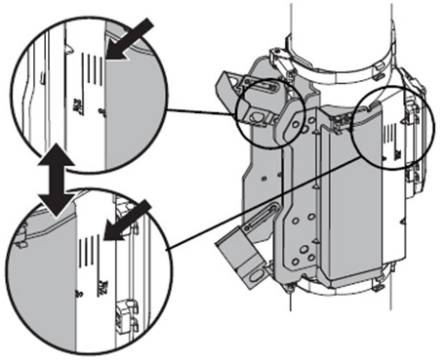
Note: Do not move the lower bracket while it is in contact with the pipe. Doing so may damage the rubber pad on the rear surface of the sub unit.



19 Adjust the position of the upper bracket so that the scale position is the same on the left and right.

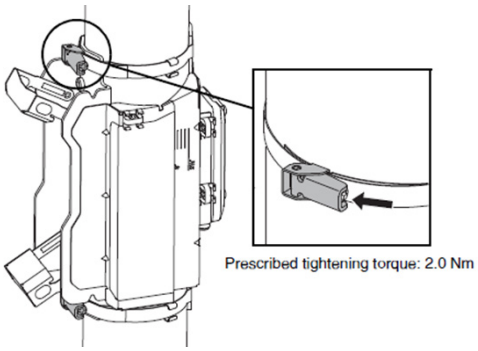
To detect the flow rate stably, adjust the unit position according to the pipe angle.

Note: Do not move the lower bracket while it is in contact with the pipe. Doing so may damage the rubber pad on the rear surface of the sub unit.

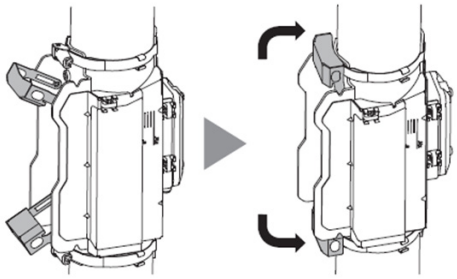


ULTRASONIC FLOW SENSOR INSTALLATION

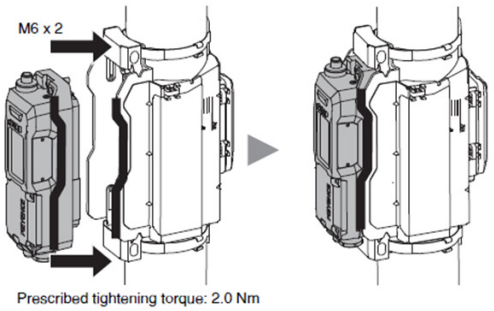
20 Firmly tighten the metal belt screws.



21 Close the screw covers.



22 Fix the main display unit on the upper bracket. Tighten the left and right screws evenly, (alternating) a little bit at a time to secure properly.



23 Remove the rubber guard from the main display unit and the sub unit of the lower bracket and discard.

Remove the unit connection cable from the Ultrasonic Flow Sensor box. Connect the unit connection cable to the main unit and sub unit.

Note: Pay attention to the orientation of the connector when connecting it. Failure to do so may lead to damage such as bent pins.

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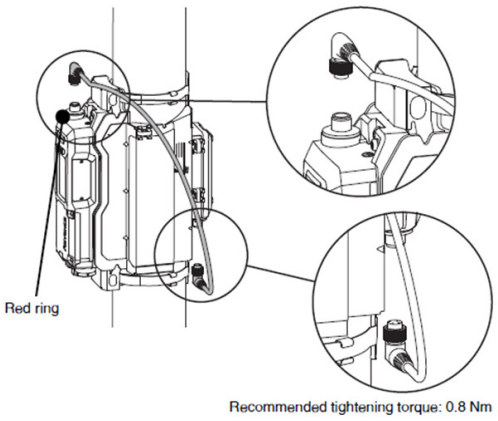
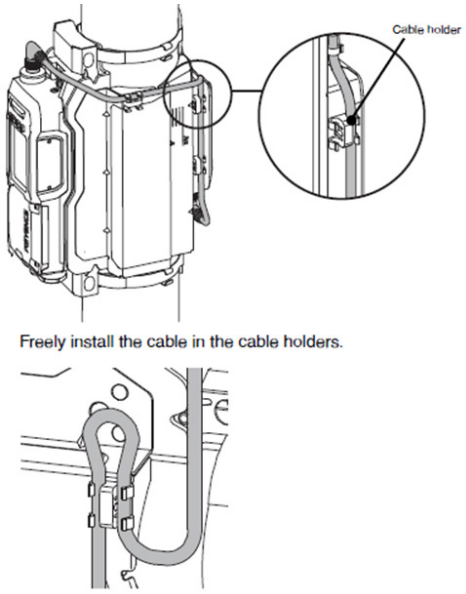


ULTRASONIC FLOW SENSOR INSTALLATION

24 Fix the unit connection cable to the cable holders. Freely install the cable in the cable holders.

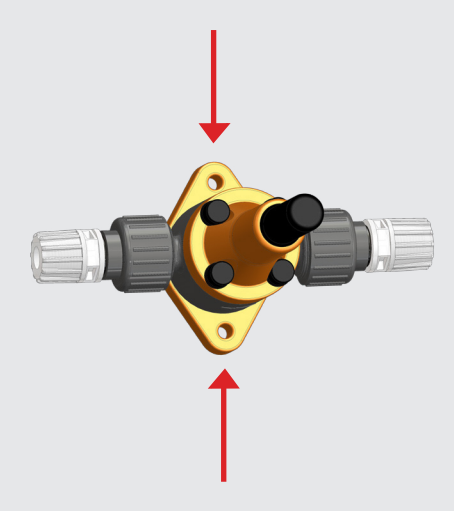


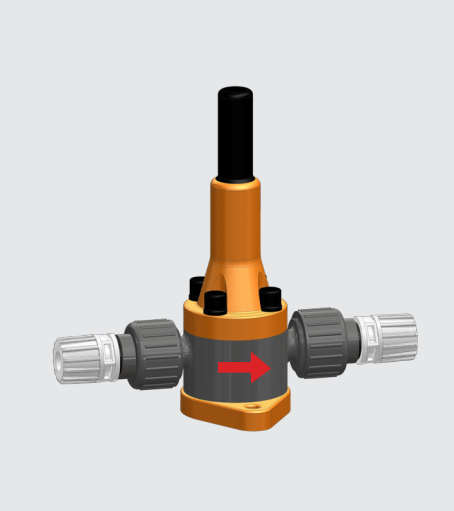
PRV KIT INSTALLATION

25 Remove the PRV Kit from its box. Use the outer holes of the PRV Support Bracket to secure it to the wall.

You want to place it at approximately the midpoint between the eOne MF Pump and the Injection Saddle. If you have the Injection Saddle going down into the pipe then you want to place it at the high point.

Note: Notice the arrow on the base of the PRV. This arrow indicates the direction of flow and should be point toward the injection point.



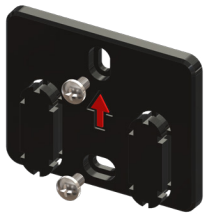


EONE MF PUMP INSTALLATION

- For proper installation both the pump and injection point must be above fluid level in the tank.
- It is recommended to keep the suction height below 5 feet. Contact Dilution Solutions if you are exceeding distances of 15 feet.
- Be sure to only use the PVDF Tubing that is included in this kit. DO NOT use either the Polyethylene or PVC Tubing included with the eOne MF Pump.
- You may use any size tank with the correct amount of tubing.
- The pump and/or injection point may be next to the tank as long as they are above liquid level
- Neither the pump nor injection point may be below the liquid level in the tank. This will lead to siphoning and can be dangerous for the facility.

26 Remove the black support bracket from the pump box.

Attach the bracket to the wall, using either the included hardware or your own. The arrow should be facing up.



27 Slide the eOne MF Pump over the support bracket.

Make sure the pump clicks into the bracket indicating that the pump has correctly been installed.

28 Take the PVDF Tubing from the box.

Use the instructions listed in Steps 1 – 4 to land your Injection Valve Tubing Connections. Hand tight should be sufficient.

Measure the Discharge Tubing to go from the Injection Valve to the outlet of the PRV with no tension. Cut off any extra making sure it is not too short.

If you have the 3” or 4” Hi-Flo Micro-Doser Kit be sure to use the 6x8mm (larger diameter) PVDF Tubing for the Discharge & Suction positions.

EONE MF PUMP INSTALLATION

29 Remove the Tubing Connections from the outlet of the PRV and set them aside. Be careful not to lose them.

Use instructions listed in steps 1 – 4 to make your PRV outlet Tubing Connections on the free end of the Discharge Tubing. Hand tight should be sufficient.

30 Take the PVDF Tubing and use the instructions from steps 1 – 4 to make your Tubing Connections on the inlet of the PRV. Hand tight should be sufficient.

Measure the Discharge Tubing to go from the inlet of the PRV to the Discharge Valve of the pump head with no tension. Cut off any extra making sure it is not too short.

Use instructions listed on steps 1 – 4 to make your Discharge Valve Tubing Connections on the free end of the Discharge Tubing. Hand tight should be sufficient.

If you have the 3” or 4” Hi-Flo Micro-Doser kit be sure to use the 6 x 8mm (larger diameter) PVDF Tubing for the Discharge & Suction positions.

TOO LOOSE

TOO TIGHT

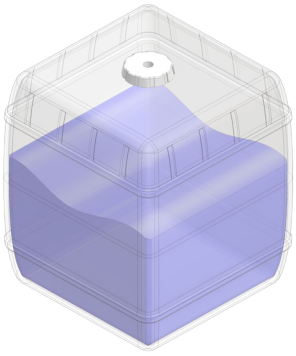
JUST RIGHT

EONE MF PUMP INSTALLATION

31 Drill a hole in the top of the tank for the Suction Tubing and Air Bleed Tubing.

For 6mm Suction Tubing (smaller diameter tubing used on 2” & 2-1/2” Kits) use at least a 1/2” hole.

For 8mm Suction Tubing (larger diameter tubing used on 3” & 4” Kits) use at least a 5/8” hole. The Foot Filter will fit through a 1-1/2” hole.



32 Grab the Foot Filter from the pump’s box and shake it. You should hear the ceramic ball moving freely.

Remove the Tubing Connections from the Foot Filter and set them aside. Be careful not to lose them.

33 Take the PVDF Tubing. Use steps 1 – 4 to make your Foot Filter Tubing Connections. Hand tight only.

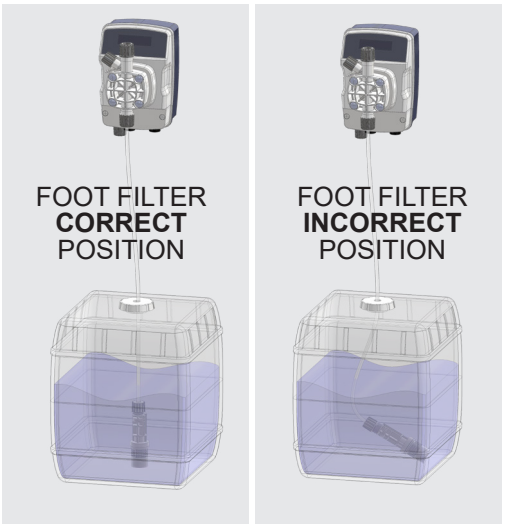
Starting at the Pump Head lower the Foot Filter via the Suction Tubing giving enough tubing length to allow the Foot Filter to stand vertically inside the stock tank. Cut off any extra. Try not to exceed the 5’ in suction height form the liquid level.

If you have the 3” or 4” Hi-Flo Micro-Doser Kit be sure to use the 6 x 8mm (larger diameter) PVDF Tubing for the Discharge & Suction positions.

34 Remove the Tubing Connections from the Suction Valve of the Pump Head (6:00 position).

Use the instructions on steps 1 – 4 to make your Suction Valve Tubing Connections. Hand tight should be sufficient.

Note: Please note the image displayed for the correct and incorrect positioning of the Foot Filter inside the stock tank.

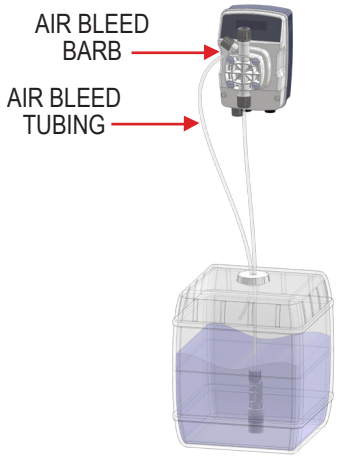


EONE MF PUMP INSTALLATION

35 Using the remaining PVDF Tubing, slide one end over the Air Bleed Barb of the Pump Head (10:00 position).

Lower the PVDF Air Bleed Tubing into your stock tank and cut off any extra. The tubing does not need to meet or go into the chemistry, just allow for the chemistry to go back into the stock tank.

If you have a 3” or 4” Hi-Flo Micro-Doser Kit, you will use the 4x6mm (smaller diameter) PVDF Tubing for the Air Bleed position.



CONNECTING THE EONE MF & ULTRASONIC FLOW SENSOR

36 Connect the Black Wire (with the male connector) from the Ultrasonic Flow Sensor, with the Black Wire (with the female connector) from the eOne MF.

37 Connect the Red Wire (with the female connector) from the Ultrasonic Flow Sensor, with the Red Wire (with the male connector) from the eOne MF.

38 Plug the Power Supply of the Ultrasonic Flow Sensor into a 120V NEMA 5-15R outlet.

ULTRASONIC FLOW SENSOR PROGRAMMING

The Ultrasonic Flow Sensor is equipped with approximately 6’ power cord with NEMA 5-15P Plug.

It has a 3-button interface – up and down arrow buttons to cycle through the menus, and a Mode or “M” Button to enter into each menu and confirm your selections.

There is also a vertical LED to the right of the interface that acts as a visual flow indicator.

If you need to back-up, or return to the previous step, push and hold the M button, and simultaneously push the up arrow button once.

INITIAL SETTINGS

39 Set the current date and time using the up and down arrow buttons to choose the correct value. Push the **M** button to confirm your selection and move to the next value.

You will select the Year, followed by the Month and Day, and finally the Time of Day. **NOTE**: The time is in 24-hour format.

40 Set the Channel 1 Function to Analog using the up and down arrow buttons. Push the **M** button to confirm your selection.

41 Set the Channel 2 Function to OFF using the up and down arrow buttons. Push the **M** button to confirm your selection.

42 Select the Flow Direction that matches your installation.

Note: Vertical installations should be set for Left to Right (=R) as water flow MUST be flowing vertical up for the Ultrasonic Flow Sensor to read properly.

Display	Flow Direction
=R	Left to Right
L=	Right to Left

INITIAL SETTINGS

43 Expand the Measurement Units to include gallons by pressing and holding the **M** and Down Arrow buttons together.

The display will read **GAL F / OFF**. Turn the measurement unit expansion **ON** using the up and down arrow buttons. Push the **M** button to confirm your selection.

44 Select the Flow Unit to gallons using the up and down arrow buttons. Push the **M** button to confirm your selection.

45 Set the Temperature Unit to Fahrenheit using the up and down arrow buttons. Push the **M** button to confirm your selection.

46 Select the Pipe Size to match your Hi-Flow Micro-Doser kit size using the up and down arrow buttons – 2”, 2-1/2”, 3”, or 4”. Push the **M** button to confirm your selection.

47 Push the M button to exit the menu and complete the initial settings.

If you have completed the steps above but made an error in the selection, you will need to perform a hard reset to start over again. See the instructions in steps 103 - 105 for details.

DETAILED SETTINGS

48 Push and hold the **M** button to enter the detailed settings menu.

The display will read **ANLG / 4-20**, with the 4-20 flashing. Set the Output Current to **4-20 mA** using the up and down arrow buttons. Push the **M** button to confirm your selection.

49 Select the Analog Output value to flow using the up and down arrow buttons. Push the **M** button to confirm your selection.

DETAILED SETTINGS

50 Set the Lower Limit of the Flow Analog Output Range to 0 with the up and down arrow buttons. This is the low flow setting. Push the **M** button to confirm your selection.

51 Set the Upper Limit of the Flow Analog Output Range based on the below table using the up and down arrow buttons. This is the high flow setting. Push the **M** button to confirm your selection.

Note: The ultrasonic flow sensor can accommodate higher flows than listed below. However, the eOne MF selected per kit is specific and may not be able to accommodate your chemical injection needs. Please call Dilution Solutions if this is your situation.

Pipe Size	2”	2-1/2”	3”	4”
Max Flow	100 GPM	150 GPM	200 GPM	400 GPM

52 Set the Response time to 5 seconds using the up and down arrow buttons. Push the **M** button to confirm your selection.

53 Select the Additional Functions menu using the up and down arrow buttons. Push the **M** button to confirm your selection.

54 You may set the Display Resolution to show tenths of a gallon (0.1) on the display using the up and down arrow buttons. Push the **M** button to confirm your selection.

Note: The Display Resolution may NOT be lowered on the 4” Hi-Flo Micro-Doser kit. If this is the case push the **M** button to go to the next menu.

55 Set the Display Averaging to 1 second using the up and down arrow buttons. Push the **M** button to confirm your selection.

56 Set the Zero Cut Flow Rate to half the of the value displayed using the up and down arrow buttons. Push the **M** button to confirm your selection.

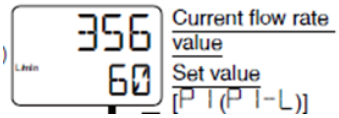
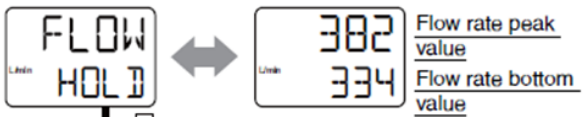
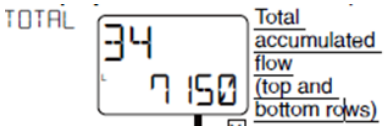
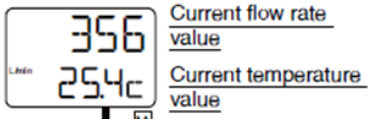
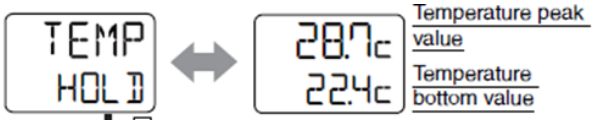
Pipe Size	2”	2-1/2”	3”	4”
Zero Cut Flow	4-1/2 GPM	12 GPM	12 GPM	30 GPM

DETAILED SETTINGS

57 Set the Detection Hold Time to 1 second using the up and down arrow buttons. Push the **M** button to confirm your selection.	
58 Set the Display Indicator Illumination mode to Green using the up and down arrow buttons. Push the **M** button to confirm your selection.	
59 Set the Display Brightness to Standard using the up and down arrow buttons. Push the **M** button to confirm your selection.	
60 Set the Power Saving Mode to Normal using the up and down arrow buttons. Push the **M** button to confirm your selection.	
61 Set the Simulation Mode to OFF using the using the up and down arrow buttons. Push the **M** button to confirm your selection.	
62 Set the Key Lock Method to Normal using the using the up and down arrow buttons. Push the **M** button to confirm your selection.	
63 If the Flow Direction is correct (previous step 42), push the **M** button to move to the next setting.	 
64 If the Pipe Size setting is correct (previous step 46) push the **M** button to move to the next setting.	
65 Set the Flow Rate Value Correction to OFF using the up and down arrow buttons. Push the **M** button to confirm your selection.	
66 Push the **M** button to exit the menu and complete the Detailed Settings.	

HOME SCREENS

There are five (5) home screens available. Push **M** button to cycle through the various screens.

67 Instantaneous Flow Rate Display – your real-time flow in Gallons per Minute. This is the typical screen you leave up after completion of all programming.	
68 Instantaneous Flow Rate Hold Values – your peak and bottom flow values since programming. The upper display is the peak and the lower display is the bottom.	
69 Total Accumulated Flow – the total accumulated flow since programming. The maximum display is 9 characters and will reset to 0 if the display range is exceeded.	
70 Flow / Temperature Display – shows the current real-time flow in Gallons per Minute and temperature Fahrenheit.	
71 Temperature Hold Display – shows the peak and bottom temperature values since programming. The upper display is the peak and the lower display is the bottom. The Hold values are reset if the unit is powered off.	

STABILITY INDICATOR

The Stability Indicator is located on the lower left portion of the display. This indicates the approximate stability of ultrasonic detection.

The idea of this indicator is similar to your cell phone signal, you want this to be as high as possible. If you have a single bar flashing for your stability reading you need to go back and check your installation, specifically in steps 18 and 19.

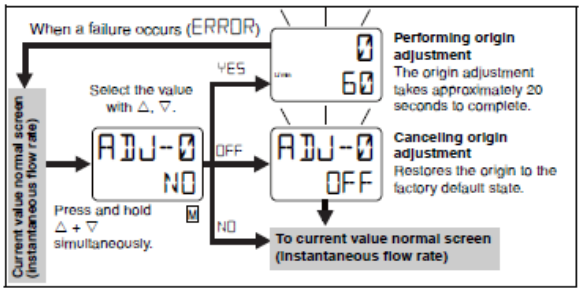
ORIGIN ADJUSTMENT

With all programming of the Ultrasonic Flow Sensor complete and you have water turned on again you should perform an Origin Adjustment.

This adjusts the Instantaneous Flow Value to 0 to ensure accuracy in reading. Perform the Origin Adjustment when the pipe is charged with water, i.e., the pipe is filled with water and the water is not moving.

72 Push and hold the up and down arrow buttons together. Change the NO to a YES using the up and down arrow buttons. Push the **M** button to confirm your selection.

The process should take approximately 20 to 30 seconds. The display will return to the last home screen upon completion.



EONE MF PUMP SET-UP

The eOne MF Pump is rated for 90-260V, 50-60Hz. It is equipped with an approximately 5' (1.5 meter) power cord with NEMA 5-15P Plug. It has a 5-button interface – **Left** and **Right** arrow buttons to cycle through the programs, **Up** and **Down** arrow buttons to enter or exit the programs, and a **Start** / **Stop** button to switch between Standby and Operating Modes.

There are also three (3) LEDs to the left of the display. The top LED indicates the mode the pump is in – Red for Standby, and Green for Operating Mode. The middle LED indicates the pump stroking and flashes in Red. The lower LED is an Alarm LED that indicates various alarms in conjunction with the display.

73 Energize the eOne MF Pump by plugging it into a 120V NEMA 5-15R outlet. The display should read **Set-Up / FW01 VFT**.

Note: If the display does not read this you will want to perform a hard reset. See step 106 - 112 for details.

74 Push the right arrow button until the display reads **Set-Up / FW03 MF.**

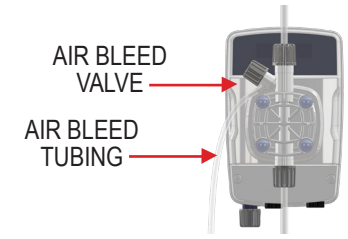
75 Push the Start / Stop button to confirm your selection. The display will read **MF 300 / R. 6.3** (or another number representing firmware revision).

76 Push the Start / Stop button to confirm this selection. The display will read **Operating Mode / Manual Mode.** You are now ready to prime and program the pump.

EONE MF PUMP PRIMING

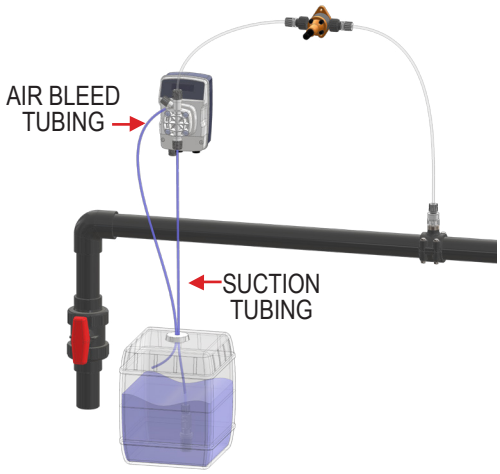
It is recommended to use water to prime the pump unless you are injecting Sulfuric Acid. If you are injecting Sulfuric Acid use the chemistry for pump priming.

77 Open the Air Bleed Valve on the pump head located at the end of the 10:00 position. Be careful no to go too far, you will hear an audible click.



78 Push the Start / Stop Button. The pump will stroke repeatedly at a rate of 300 times per minute. The chemistry should be going up the suction tube and back down the air bleed tubing.

You can shake the suction tubing to increase the speed for priming. If there is no movement of chemistry through the suction tube within 15 to 30 seconds, push the Start / Stop button and check installation of your tubing connections.

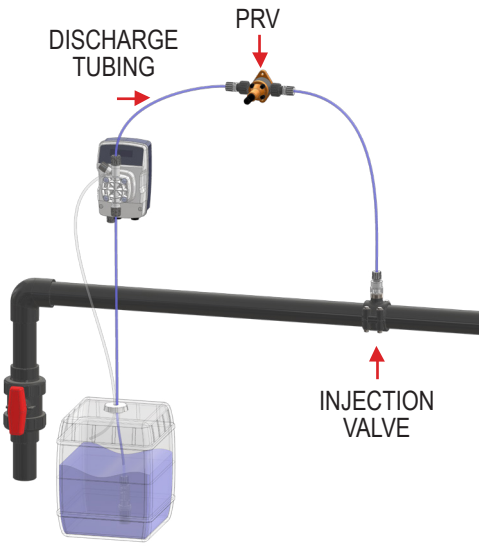


79 Once this is consistent, close the Air Bleed Valve all the way. This will force the chemistry up the Discharge Tubing through the PRV and toward the Injection Valve.

Your eOne MF is fully primed when the chemistry reaches the Injection Valve. Push the Start / Stop button to halt operation.

Note: If you are having issues priming the pump, check to make sure all Tubing Connections are secure and there are no tight bends or kinks in the tubing.

If problems persist, see the **Pump Priming with Syringe** section at the end of this document.



EONE MF PUMP PROGRAMMING

When the pump is in Operating Mode there is a clock that will be shown in the lower right hand corner of the display.

If you wish to have an accurate time of day continue to step 80.
If you do not want to set the Time and Date go ahead and skip to step 85.

80 Push the right arrow button until the display reads **Operating Mode / Settings.**	
81 Push the down arrow button to enter the Settings Menu. The display reads **Settings / Remote/Level.**	
82 Push the right arrow button until the display reads **Settings / Time/Date.**	
83 Push the down arrow button to enter the Time & Date Menu. The display reads Day and Date on the upper portion, and Time in the lower portion. The Day is flashing as a selectable value. Use the left & right arrow buttons to choose the Day of the week. Push the down arrow button to move to the next value. Set the Date (DD-MM-YYYY). Use the left & right arrow buttons to choose the Day of the Month. Push the down arrow button to go to the next selectable value. Set the Month of the Year using the left & right arrow buttons. Push the down arrow button to go to the next selectable value. Set the Year using the left & right arrow buttons. Push the down arrow button to go to the next selectable value. Set the Time of Day, it is in 24-Hour format. Use the left & right arrow buttons to set the correct time. Push the down arrow button to confirm your Time & Date Settings.	
84 Once time and date settings are complete the pump automatically returns to the settings menu. The display will read **Settings / Time/Date.**	

EONE MF PUMP PROGRAMMING

85 Push the up arrow button to return to Standby Mode. The display will read **Operating Mode Settings**. **Note**: If you didn't set the Time and Date your display will still read Operating Mode / Manual Mode.	
86 Push the left arrow button (or the right arrow button if you didn't set the Time & Date) until the display reads **Operating Mode / mA Mode.**	
87 Push the down arrow button to enter the program. The display reads **Set THold (1) / 4.0 mA**. Push the right arrow button to change the Lower Threshold to 4.2. The display reads **Set THold (1) / 4.2 mA.**	 
88 Push the down arrow button to confirm your selection. The display reads **Set THold (2) / 20.0**. Push the left arrow button to change the Upper Threshold to 19.8. The display reads **Set THold (2) / 19.8 mA.**	 
89 Push the down arrow button to confirm your selection. The display reads **Pulses/Min (1) / Pulses/Min: 0**.	
90 Push the down arrow button to confirm your selection. The display reads **Pulses/Min (2) / Pulses/Min: 300**. Use theleft arrow button to change the number of strokes performed at high flow, based on your calculations. See the **eOne MF Pump Calculations** section in this document.	 
91 Push the down arrow button to confirm your selection. The display reads **Below (1) / Stop**. **Note**: This means that if the input signal from the ultrasonic flow sensor is below 4.2 mA (as programmed above) the pump will not stroke.	
92 Push the down arrow button to confirm your selection. The display reads **Over (2) / Stop**.	

EONE MF PUMP PROGRAMMING

93 Push the right arrow button to change this selection to continue. The display reads **Over (2) / Continue**.

Note: This means that the if the input signal is above 19.8 mA (as programmed above) the pump will continue to stroke.

94 Push the down arrow button to confirm your selection. The pump will return to Standby Mode and the display reads **Operating Mode / mA Mode**.

95 Test your communication between the Ultrasonic Flow Sensor and eOne MF by pushing the **Start / Stop** button and entering the program. The display will read around **mA 3.9mA / 00:00.**

Note: Time will be accurate if you programmed Time and Date.

EONE MF PUMP CALCULATIONS

You will need to make calculations based on the eOne MF Stroke Volume, Line Pressure, and Max Flow Rate. These calculations are theoretical but should put you within a few strokes of where you need to be for your application.

Below are the tables to find the stroke volume of your eOne MF Metering Pump based on the operating pressure of your system.

System Size	eOne MF Model	Pressure (bar)	Pressure (PSI)	Stroke Volume
2"	0710	2	29	0.65
		2.5	36	0.63
		3	43	0.61
		3.5	50	0.58
		4	58	0.56
		4.5	65	0.53
		5	72	0.50

EONE MF PUMP CALCULATIONS

System Size	eOne MF Model	Pressure (bar)	Pressure (PSI)	Stroke Volume
2-1/2"	1012	2	29	0.83
		2.5	36	0.79
		3	43	0.75
		3.5	50	0.73
		4	58	0.71
		4.5	65	0.70
		5	72	0.69

System Size	eOne MF Model	Pressure (bar)	Pressure (PSI)	Stroke Volume
3"	2007	2	29	1.18
		2.5	36	1.18
		3	43	1.17
		3.5	50	1.16
		4	58	1.16
		4.5	65	1.16
		5	72	1.16

System Size	eOne MF Model	Pressure (bar)	Pressure (PSI)	Stroke Volume
4"	3005	2	29	1.71
		2.5	36	1.70
		3	43	1.70
		3.5	50	1.69
		4	58	1.68
		4.5	65	1.67
		5	72	1.67

EONE MF PUMP CALCULATIONS

Next, you will need to solve two (2) math problems to determine the number of strokes at 20 mA input.

96 Identify the operating pressure of your system.

97 Identify the stroke volume of your eOne MF Metering Pump.

98 Specify the volume of chemistry or concentrate to be injected per gallon of water.

Multiply the Volume of Chemistry per Gallon by the high flow of your system.

Example
I want to inject **1 mL** of chemistry per gallon of water.
My high flow is **400 GPM**
My operating pressure is **72 psi**
I'm using an **eOne MF 3005**

First math problem:
1 x 400 = 400

Second math problem:
Divide the Volume of Chemistry per Gallon by the eOne MF Stroke Volume at the corresponding operating pressure.

As mentioned above, my operating pressure is **72 psi**, so the stroke volume of my **eOne MF 3005** is **1.67 mL**. So, my second math problem is:

400 / 1.67 ~ 239.

PRV KIT FUNCTION & USE

The Pressure Relief Valve or PRV should be installed on the discharge side of the eOne MF Metering Pump, between the discharge valve and the injection valve. It is imperative that you identify the arrow on the body and make sure the flow direction matches. The PRV has an operating range of 7 to 145 psi (0.5 to 10 bar).

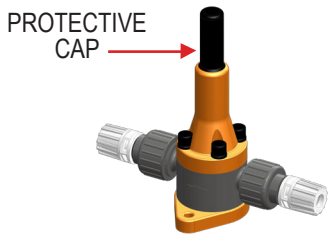
The PRV serves two (2) primary functions.

1. Anti-Siphon Valve in the event of negative pressure in the system.
2. Ability to adjust the stroke volume by using the adjustment screw, located underneath the protective black cap.

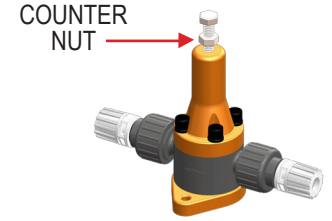
PRV KIT FUNCTION & USE

In most cases the factory setting is sufficient for day-to-day operations. If adjustment must be made follow these instructions.

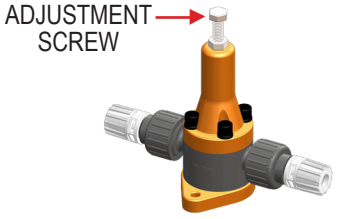
99 Remove the black Protective Cap.



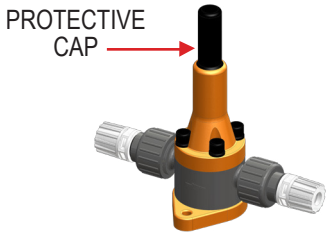
100 Loosen the counter nut located at the top of the orange body.



101 Turn the adjustment screw clockwise to increase the pressure. Be careful no to overtighten and damaging the PRV.



102 Once complete, tighten the counter nut back and replace the protective cap.



RESETTING THE INTEGRATED FLOW DISPLAY

Over time you may exceed the Integrated Flow Display. This has occurred when the display reads FFFFF on the Instantaneous Flow Rate Hold Values screen. You can reset this by pressing and holding the up & down arrow buttons for approximately 3 seconds.

RESETTING THE ULTRASONIC FLOW SENSOR

If you have made an error in programming and cannot get back to a screen you recognize then you may want to perform a hard reset and restore the unit to factory settings.

103 Push the Mode button until the display reads **END**. Push the Mode button one more time to confirm your selection.

104 From any home screen push and hold the Mode button, then simultaneously push the up arrow button five (5) times. The display will read **RESET / NO**.

Note: If you don't push the up arrow button in time you will go into the Detailed Settings Menu. If this happens repeat step 103.

105 Push the up or down arrow button to change the "NO" to "YES". The display will read **RESET / YES**. Push the Mode Button to confirm your selection.

The Ultrasonic Flow Sensor will reload the factory settings and will return to the original screen from when you first energized the unit. The display will read **YEAR / 2023**.

Begin your programming from step 39 in the Initial Settings portion of this document.

RESETTING THE EONE MF PUMP

Similar to the Ultrasonic Flow Sensor you have the capability to perform a hard reset on the eOne MF and put it back to factory settings.

106 Push the Start / Stop button to put the pump back into Standby Mode. The display reads **Operating Mode** on the upper portion of the display.

Note: If you are already in Standby Mode skip to step 107.

107 Push the right arrow button until the display reads **Operating Mode / Settings**.

108 Push the down arrow button to enter the Settings Menu. The display reads **Settings / Remove/Level**.

109 Push the right arrow button until the display reads **Settings / Reset.**

RESETTING THE EONE MF PUMP

110 Push the down arrow button to enter the Reset Menu. The display reads **Reset / Soft**.

111 Push the right arrow button to change from “Soft” to “Hard”. The display reads **Reset / Hard**.

112 Push the down arrow button to confirm your selection. The display reads **Set-Up / FW01 VFT**.

The eOne MF will reload the factory settings and will return to the original screen from when you first energized the unit. Begin your programming from step 73 in the **eOne MF Pump Set-Up** section of this document.

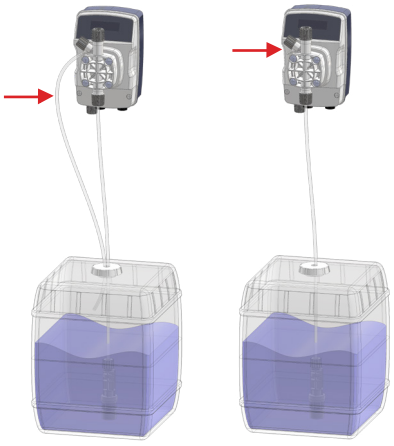
PUMP PRIMING WITH SYRINGE

If you are having difficulties priming the pump through normal operations, steps 77 – 79 and you’ve exhausted your inspection points, checking all tubing connections. If there are no tight bends or kinks in the tubing, then you may use a syringe to prime the pump.

Please, make sure that you DO NOT run the pump with the syringe at any point.

113 Take the syringe and small tube adapter from the packaging. You will not need the large tube adapter.

114 Remove the Air Bleed Tubing from the Air Bleed Barb and set aside.



PUMP PRIMING WITH SYRINGE

115 Attach the small adapter to the syringe and slide the tubing from the adapter over the air bleed barb.

116 Pull back on the plunger to draw the chemistry through the suction tubing, pump head, and into the syringe.

Disconnect the syringe, push the plunger back in, and repeat the steps until the chemistry is drawn into the barrel of the syringe.

117 Remove the syringe, tubing, and adapter from the air bleed barb and drain the chemistry back into the tank.

118 Reattach the air bleed tubing onto the air bleed barb.

Once the air bleed tubing is back on, return to the **eOne MF Pump Priming** section, steps 77 – 79 of this document, and retry the priming process.

You want the eOne MF Pump to be able to prime on it's own without assistance from the syringe.

Etatron Hi-Flow Micro-Doser System includes		
Part	**Qty**	**Part Image**
eOne MF Metering Pump	1	
30 feet PVDF Tubing	1	
Pressure Relief Anti-Siphon Valve (PRV) Kit	1	
Ultrasonic Flow Sensor	1	
Injection Point Saddle	1	

Note: Parts ordered, or pictured, may look slightly different than the image displayed, but the fit and function will be the same.

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