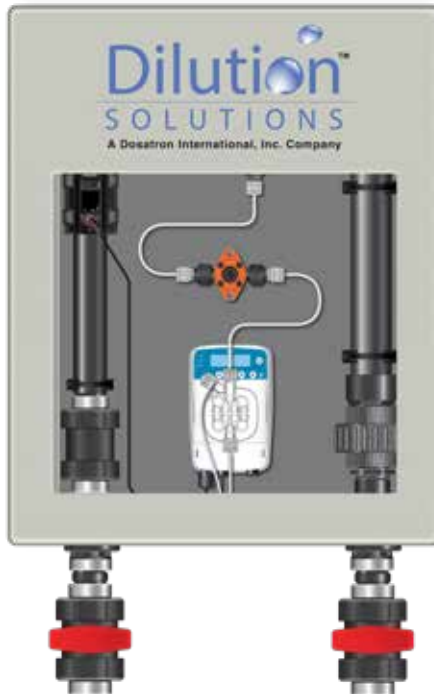


1 1/2"
Ultrasonic Micro-Doser Cabinet
Part #: CN1.5-E0110SPM

COMPLETE GUIDE



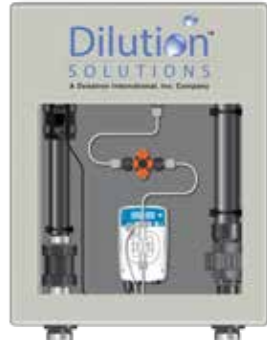
NOTE: Installation illustrations are to be used as a reference guide only.

Set Up Instructions

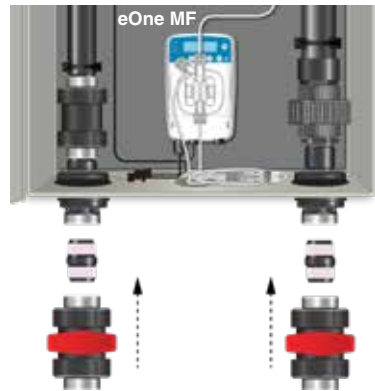
1 Mounting the system

Remove the system from the shipping box. Make sure you have the adequate hardware to attach the Ultrasonic Micro-Doser System to your wall or surface.

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

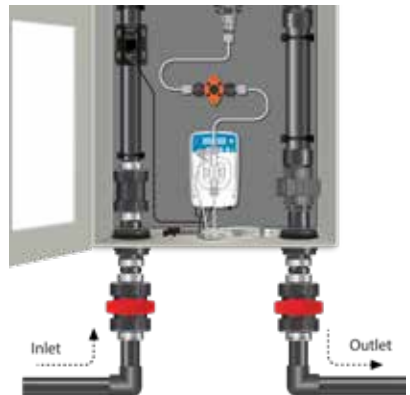


2 Apply seal tape to the threads on the nipples. Connect one nipple to each adaptor, followed by a ball valve.



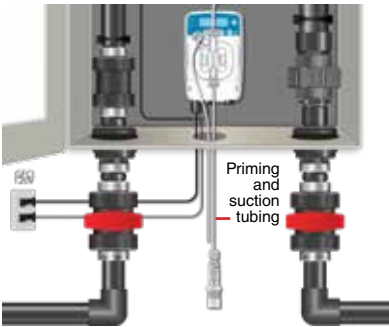
3 Connect the system to the water line. Tighten the ball valves unions. Do not overtighten.

NOTE: The ball valves have 1 1/2" female NPT connections.



- 4 Insert the priming and suction tubing through the bottom opening of the enclosure.

Insert the electrical cables through the same opening, and plug to a power source.

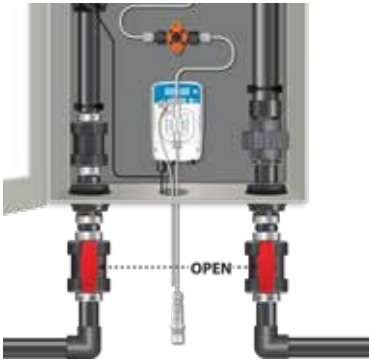


5 **Water test the system**

Slowly turn the ball valves open to run water through the system.

Make sure the ultrasonic flow sensor registers a flow.

If there is flow, you can now program the eOne pump.



eOne MF Pump Programming

6 **Start-up**

Once the pump is plugged into a power source the display will read **FW01 VFT**.



- 7 Press the ► arrow, until the display reads **FW07 MF-T**










- 8 Press the **Start/Stop** button. Display reads **MF 300/MF 180** depending on pump.

R 6.3 refers to the software revision.

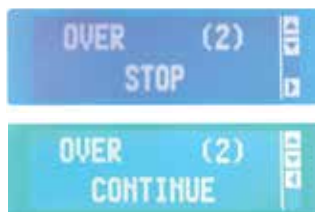


eOne MF Pump Programming

<p>9 Press Start/Stop button again. Display reads OPERATING MODE - MANUAL MODE.</p>	
<p>10 Using the ► arrow, scroll through the functions until you see mA MODE.</p>	
<p>11 Press ▼ to get into the mode, and you will see lower threshold, and ◀▶ will adjust the sensitivity to the threshold amperage. Here we've adjusted to 4.0 mA.</p>	
<p>12 Press ▼ to get to upper threshold and ◀▶ to adjust. Here we've adjusted to 20.0 mA.</p>	
<p>13 Press ▼ to get to low PULSES/MIN. Typically the 4 mA value is 0.</p>	
<p>14 Press ▼ to get to the high PULSES/MIN. This is 20 mA or full flow. It is a calculated value based on pump size/pressure/concentration. The maximum is 180. (NOTE: See Pump Calculations Instructions.)</p>	
<p>15 Press ▼ to get to the BELOW condition. Usually this is STOP.</p>	

eOne MF Pump Programming

- 16** Press ▼ to get to the **OVER** condition.
Usually this is **CONTINUE**.
Press ► to change.



- 17** Press ▼ to get back to **MODE**.
Press **Start/Stop** to run.



- 18** If the loop is wired correctly
this value will be between
3.8 mA and **4.2 mA** at no flow.



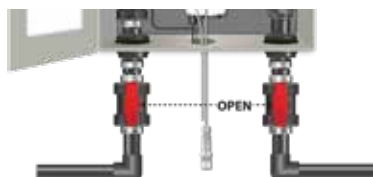
eOne MF Pump Priming



CAUTION: The use of Personal Protective Equipment (PPE) is required when working with hazardous chemicals.

To avoid damage to the equipment, concentrated acids must be discharged into flowing water.

- 19** Open the water INLET and
OUTLET ball valves, to let
water flow through the system
while priming the pump.



- 20** To prime the eOne MF, push
the **START/STOP** button
twice. Screen shows
OPERATING MODE/
MANUAL MODE.



eOne MF Pump Priming

- 21** Open the air bleed valve.

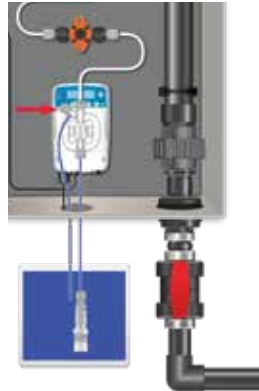
Push the **START/STOP** button to begin the priming functions. The pump will begin to stroke/click.

air
bleed
valve



- 22** Once the liquid travels up the suction tube into the pump's head and out the priming tube, close the air bleed valve.

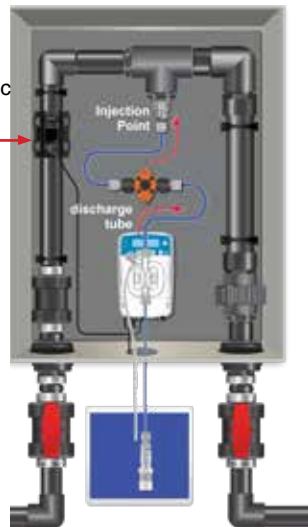
air
bleed
valve



- 23** Once liquid is visible in the discharge tube, the pump is primed.

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

Ultrasonic
Flow
Sensor



eOne MF Priming

- 24** Push the **START/STOP** button to stop the priming function once chemical reaches the injection valve.



- 25** The pump is ready to operate. Push **►** until **mA MODE** appears, then push the **START/STOP** button.



eOne MF Pump Calculations

The following procedure is used to determine the 20 mA setting (number of strokes) when running an Etatron eOne MF pump in mA Mode.

1. Identify the following parameters.

Pump Model Number		(1)
System Operating Pressure (psi)		(2)
Maximum Flow Rate (gpm)		(3)
Nutrient Concentration (mL / gal)		(4)
Stroke Volume in mL (chart value)		(5)
Volume of Nutrient (calculated value)		(6)
Number of Strokes at Max. Flow Rate (calculated value)		(7)

2. Using the table below, determine the Stroke Volume in mL (5) based on the Pump Model Number (1) and the System Operating Pressure (2).

eOne MF Pump Calculations

Etatron eOne MF - Stroke Volume (mL) Chart

Pump Model Number	20 psi	30 psi	40 psi	50 psi	60 psi	70 psi	80 psi	90 psi	100 psi	110 psi
110	0.24	0.23	0.22	0.21	0.19	0.18	0.17	0.16	0.15	0.13
216	0.35	0.34	0.33	0.32	0.31	0.30	0.29	0.27	0.26	0.25
607	0.40	0.39	0.38	0.37	0.36	0.35	0.34	0.33	0.32	N/A
420	0.44	0.41	0.38	0.36	0.35	0.34	0.33	0.32	0.31	0.30
710	0.74	0.65	0.60	0.56	0.53	0.51	0.49	0.47	0.45	0.44
1012	0.92	0.83	0.77	0.73	0.70	0.67	0.65	0.63	0.62	0.60
1505	0.93	0.90	0.87	0.85	0.84	0.83	N/A	N/A	N/A	N/A
2007	1.32	1.25	1.21	1.17	1.14	1.12	1.10	1.09	1.07	N/A
3005	1.88	1.79	1.72	1.67	1.64	1.63	N/A	N/A	N/A	N/A

3. Determine the Volume of Nutrient (6) that needs to be pumped into the system at Maximum Flow Rate (3) using the following equation:

$$\text{Volume of Nutrient (6)} = \text{Maximum Flow Rate (3)} \times \text{Nutrient Concentration (4)}$$

4. Determine the Number of Strokes at Max Flow (7) needed to deliver the proper volume of Nutrient to the system using the following equation:

$$\text{Number of Strokes at Max Flow (7)} = \text{Volume of Nutrient (6)} / \text{Stroke Volume (5)}$$

5. The Number of Strokes at Max Flow (7) is the value needed for programming the Etatron eOne MF pump. See the section, **eOne MF Pump Programming**.

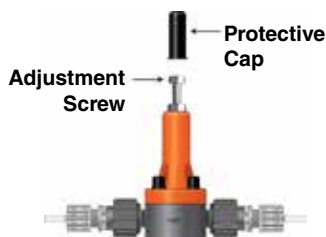
Please note that the maximum number of strokes for eOne MF pumps is 300 strokes per minute, except for the 110 model (180 strokes per minute).

Using the Pressure Relief Valve (PRV)

Etatron **eOne pumps** should be installed with a **Pressure Relief Valve** on the injection line, between the pump and the injection point.

This valve serves two purposes:

- To vacuum relief in a siphon situation.
- To make changes to the single pulse volume.



Using the adjustment screw, the amount of pressure that the eOne MF pump experiences can be increased above line pressure.

Ultrasonic Flow Sensor - 4-20 mA Programming

1 Initial Settings

Push & hold the **MODE** and up arrow (▲) button to select the Flow Unit. For this application we want to select Gallons.

Use the up arrow (▲) and down arrow (▼) buttons to select Gallons. Push the **MODE** button to confirm this selection.



- 2 Use the up arrow (▲) and down arrow (▼) buttons to select the Output – nPn or PnP. In this application we will select nPn. Push the **MODE** button to confirm this selection.



- 3 Use the up arrow (▲) and down arrow (▼) buttons to select the Channel 2 function. In this application we want to select Control Output + Analog Output Mode. Push the **MODE** button to confirm this selection.



Ultrasonic Flow Sensor - 4-20 mA Programming

- 4 Use the up arrow (▲) and down arrow (▼) buttons to select the Water Flow Direction. Push the **MODE** button to confirm selection.

= **r** Flow is Left to Right
L = Flow is Right to Left



- 5 Use the up arrow (▲) and down arrow (▼) buttons to select the Pipe Size. Push and hold the **MODE** button to access Additional Settings.



- 6 Use the up arrow (▲) and down arrow (▼) buttons to select the Pipe Schedule or thickness. This will improve flow readings. Push the **MODE** button to confirm selection.



- 7 You can select between the following options using the up (▲) and down arrow (▼) buttons.

Sch SGP - SGP Pipe
Sch 80 - Sch. 80 Pipe
Sch 40 - Sch. 40 Pipe
Sch 20 - Sch. 20 Pipe

Push the **MODE** button to confirm your pipe schedule selection (screen will display the word "End").



Ultrasonic Flow Sensor - 4-20 mA Programming

1 Advanced Settings

Push and hold the **MODE** button to access the Advanced Setting Menu.



2 Use the up arrow (▲) and down arrow (▼) buttons to select the Output 1 Detection Mode. In this application, we will select the Instantaneous Flow Rate Mode. Push the **MODE** button to confirm this selection.



3 Use the up arrow (▲) and down arrow (▼) buttons to select the Output 1 Logic. In this application we will select Normally Open.

n.o. – Normally Open
n.C. – Normally Closed



4 Use the up arrow (▲) and down arrow (▼) buttons to select the Analog Current Output. In this application we will select the 4-20 mA Output. Push the **MODE** button to confirm this selection.



5 Use the up arrow (▲) and down arrow (▼) buttons to select the Lower Limit of the Flow Analog Output Range. This is your low flow of your system in Gallons Per Minute (GPM). You can typically leave this at zero (0). Push the **MODE** button to confirm this selection.



6 Use the up (▲) and down arrow (▼) buttons to select the Upper Limit of the Flow Analog Output Range. This is the high flow of your system in Gallons Per Minute (GPM). Push the **MODE** button to confirm this selection.



Ultrasonic Flow Sensor - 4-20 mA Programming

- 7** **SPd** is the time for the Ultrasonic Meter to respond to flow.

Use the up (▲) and down arrow (▼) buttons to adjust the Response Time. You can typically leave this setting alone. Push the **MODE** button to confirm this selection. Please note for the Ultrasonic Micro-Doser this value should be 0.5.

NOTE: For details on SPd, see Ultrasonic Flow Sensor - Addendum on page 14.



for Ultrasonic Micro-Doser the SPd is set at 0.5
SAFETY FEATURE

- 8** Use the up (▲) and down arrow (▼) buttons to adjust the Integrated Flow Unit. You can typically leave this setting alone. Push the **MODE** button to confirm this selection.



- 9** Use the up (▲) and down arrow (▼) buttons to access the Additional Settings menu. Push the **MODE** button to confirm this selection.



- 10** Use the up (▲) and down arrow (▼) buttons to adjust the Display Resolution if necessary. You can typically leave this setting alone. Push the **MODE** button to confirm this selection.



- 11** Use the up (▲) and down arrow (▼) buttons to adjust the Display Averaging if necessary. You can typically leave this setting alone. Push the **MODE** button to confirm this selection.



Ultrasonic Flow Sensor - 4-20 mA Programming

- 12** Use the up (▲) and down arrow (▼) buttons to adjust the Hysteresis if necessary. You can typically leave this setting alone. Push the **MODE** button to confirm this selection.



- 13** Cut is the Zero Cut Flow Rate below this setting, no signal from the sensor is transmitted to the pump. For the Ultrasonic Micro-Doser, the value is set at 10 GPM.

Use the up (▲) and down arrow (▼) buttons to adjust the Zero Cut Flow Rate. In this application we will set it to half of the value from the factory settings. Push the **MODE** button to confirm this selection.



- 14** Use the up (▲) and down arrow (▼) buttons to adjust the Display Indicator Illumination Mode. In this application we will leave it as Green. Push the **MODE** button to confirm this selection.



- 15** Use the up (▲) and down arrow (▼) buttons to adjust the Power Saving Mode. You can typically leave this setting alone. Push the **MODE** button to confirm this selection.



- 16** Use the up (▲) and down arrow (▼) buttons to perform a simulation. In this application we will leave it as Off. Push the **MODE** button to confirm this selection



- 17** Use the up (▲) and down arrow (▼) buttons to set an access Password. You can typically leave this setting alone. Push the **MODE** button to confirm this selection.



Ultrasonic Flow Sensor - 4-20 mA Programming

- 18** Use the up (▲) and down arrow (▼) buttons to select or confirm the Water Flow Direction from **Initial Settings – Step # 4**. Push the **MODE** button to confirm this selection.

= r Flow is Left to Right
L = Flow is Right to Left



- 19** Use the up (▲) and down arrow (▼) buttons to select or confirm the Pipe Size from **Initial Settings – Step # 5**.



- 20** Push the **MODE** button to enter the menu to select the Pipe Schedule or thickness from **Initial Settings – Step # 6**. Push the **MODE** button to complete set-up.



Ultrasonic Flow Sensor - Addendum

There are two settings on the Ultrasonic Flow Sensor that build in extra safety by minimizing the potential for chemical additions to the system when water is not flowing. These two settings are explained in further detail below.

Response Time

This is the time for the Ultrasonic Sensor to respond to changes in flow. The output from the Flow Sensor averages the flow over that time period.

Setting the parameter at a high value causes the sensor to delay its response to changes in flow, both when the flow is increasing or decreasing. This will, in turn, affect the response from the pump. By setting the Response Time at a high value, the sensor smooths variations in flow providing for a more stable output.

By setting the Response Time at a low value, responses to changes in flow are more immediate, and it may seem that the system is “noisy.”

Ultrasonic Flow Sensor - Addendum

With the **Ultrasonic Micro-Doser**, it is preferred to avoid situations where chemical is added when no flow is present. For this reason, the Response Time is set at a low value to minimize the potential for additions to the system when no flow is present.

To reach this setting, enter the **MENU** mode by pressing and holding the **MODE** button. Continually press the **MODE** key to accept settings already programmed into the device. When “**SPd**” is displayed, you’ve reached the Response Time setting. Pressing the **UP** or **DOWN** key will adjust the setting. Click **MODE** to continue to the **End** to accept and implement the change.

Zero Cut Flow Rate

This parameter defines the system flow rate below which no signal is transmitted to the pump. In other words, it assures that there is a minimum flow present before a signal is sent to the pump to make additions to the system being treated.

With the Ultrasonic Micro-Doser, utilizing this function prevents concentrates from being added to the system in the presence of very low flow rates. In situations where chemical mixing releases heat, it is vital to have water flowing to dissipate the heat that is generated.

This parameter should be set in concert with the range of flows the system is likely to see to assure proper dilution of chemistry during normal operating periods. For instance, if the normal flow rate of a given system varies between 3 and 10 gallons per minute, setting the Zero Cut Flow Rate to 2.5 gpm assures that chemical additions begin when the flow reaches 2.5 GPM or higher.

Conversely, setting the Zero Cut Flow Rate to 4.0 gpm assures that under normal operations (between 3 and 10 gpm) there will be periods where no additions are made. To reach this setting, enter the **MENU** mode by pressing and holding the **MODE** button. Continually press the **MODE** key to accept settings already programmed into the device.

When “cut” is displayed, you have reached the Zero Cut Flow Rate setting. Adjust **UP** or **DOWN**, then press **MODE** until End is reached. Press **MODE** to accept the change. Please note that if you reach **End** without seeing the “cut” screen, press the **UP** or **DOWN** key when reaching “End” to display “**FuLL**” before pressing **MODE** to continue.



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