GENESIS INSTRUMENTS

SELECT DOSER MAX

Instructions for Use

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DESCRIPTION

The SelectDoser MAX™ is a proportional additive pump for agricultural and industrial operations, accurately dispensing vaccines, medications, vitamins, sanitizers, and other solutions into high pressure watering systems.

By combining a computerized main control unit with a Stenner® Company motor/pump, the SelectDoser MAX accommodates a wide range of dosing ratios. Major components include a main control unit, a motor with one or two pump heads attached, a flow sensor assembly, and connections to drinking lines. *There are no user serviceable parts inside the main control unit or the motor.*

Water Line Pressure

The SelectDoser MAX will pump into water pressures up to 100 psi when using designated pump tubes.

Electrical Supply

The SelectDoser MAX uses two separate electrical connections: the main control unit requires a 12VDC wall mount transformer (included) while the motor/pump head unit requires a 120VAC, 60 Hz supply.

Flow Sensors and Capacities

The SelectDoser MAX comes with one of nine available water flow sensors:

Sensor Size/Type	Flow Range gal/min (gal/hr)
3/4” Turbine	*0.2 - 7.5 (10 - 450)
1-1/4” Turbine	**0.8 - 40 (50 - 2,400)
1.5” Paddle	15 - 150 (900 - 9,000)
2” Paddle	30 - 300 (1,800 - 18,000)
3” Paddle	60 - 600 (3,600 - 36,000)
3/4” Magmeter	0.2 - 20 (12 - 1,200)
1” Magmeter	2.3 - 110 (138 - 6,600)
2” Magmeter	6 - 300 (360 - 18,000)
3” Magmeter	14 - 760 (840 - 40,200)

* Starts reading at 3 gal/hr but accuracy not guaranteed
** Starts reading at 10 gal/hr but accuracy not guaranteed

Pumping Accuracy

The SelectDoser MAX™ is designed to dose accurately. If, during normal operation, the output needs to increase or decrease slightly, the screen command **Adjust%** can be used to change the output accordingly.

Proportional Dosing

By utilizing several different diameters of pump tubes, a full range of dosing ratios is achievable with the SelectDoser MAX. The correct tube number to use with each ratio is displayed on the doser's main control screen. Each pump tube is numbered on the tube's end fitting.

During proportional dosing, the SelectDoser MAX continuously monitors water flow. Every 10 seconds, the doser dispenses an exact amount of solution into the water line, according to a pre-selected dosing ratio.

In a low water flow situation, interruptions in the 10-second dosing intervals can occur. During these incidences, the doser collects water flow information and dispenses a solution whenever the minimum dose can be applied.

Using Multiple Sensors

Additional flow sensor assemblies can be purchased and pre-installed in different drinking lines. The lines can then be individually medicated by moving the SelectDoser MAX from line to line.

Pump Tube Life

The life of the pump tube will depend on many factors including the product being dosed, the back pressures under which the pump is working, and the amount of time the pump needs to run to perform correctly. The life of the pump tubes is estimated to be up to 1 year, but the tube life could be considerably less depending on operating conditions. Ensure that the tube-burst function is correctly fitted and activated to ensure that the SelectDoserMax system stops immediately when a tube fracture is detected. Periodic inspection and replacement of the pump tube will ensure that tube fractures, and damaged to the pump, are avoided.

SelectDoser MAX™ Safety Recommendations

- Normal electrical safety precautions apply. Avoid water contact with any pump parts during normal operation, aside of the pump tube.
- The use of safety circuit breakers is recommended. Seek assistance from a qualified electrician if you have questions about your operation's electrical supply.
- Disconnect from electrical supply before opening main control unit.
- Cover stock solution container at all times.
- Make sure the SelectDoser MAX cannot fall into the stock solution container. Consider extra tethering if necessary. If accidental immersion occurs, isolate the SelectDoser MAX from the electrical supply immediately.
- If possible, place the stock container in a location that is not directly under the doser as corrosive fumes may degrade the operation of the pump and/or electronics.
- **Be careful not to pinch fingers in rollers when changing pump tubes.**

SelectDoser MAX™ Parts List

The SelectDoser MAX includes a motor/pump head unit, main control unit, and pre-fitted pump tube. It also includes the following parts:

1-Replacement Tube
2-Cover Latches
1-Flow Sensor Assembly
1-Injection Port with Non-return Valve
1-Pack of Delivery Tubing
1-12VDC Adapter
3-Plastic Nuts
5-Ferrules
1-End Weight with Strainer
1-Rain Roof

Additional pump heads, tubes, and equipment are available through your dealer.

INSTALLATION

Mounting the Unit

The SelectDoser MAX is wall-mountable using four drywall or wood screws (not included).

1. Mount the SelectDoser MAX in a vertical position by screwing four screws through the pre-drilled holes on the polypropylene board.

NOTE: *If possible, mount the unit so that it is* ***NOT*** *directly over the stock container as fumes from the product being pump can adversely affect the operation of the doser.*

2. Make sure the main control unit electrical cord reaches from the unit to a standard AC outlet.

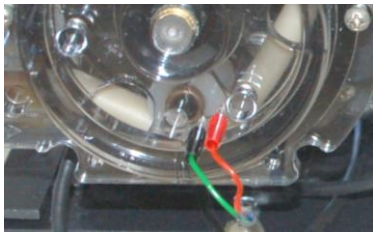
3. Plug the 12VDC adapter into a standard AC outlet. Then plug the adapter's plug into the main control unit jack (lower right side).

4. Install the flow sensor assembly so the arrow on the assembly points in the same direction as the water flow; this ensures the injection site is downstream of the sensor.

NOTE: *If installing a paddle sensor or magmeter, see installation manual (included with sensor) for directions.*

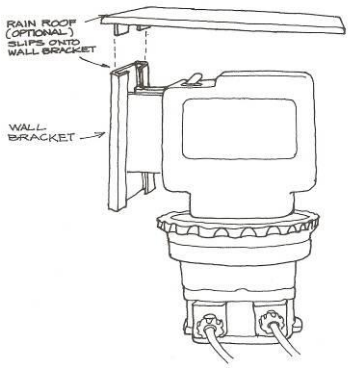
5. Plug the sensor cable into the jack on the lower left side of the main control unit.

6. The SelectDoser MAX comes with Tube Burst Detection to minimize pump head damage in the case of a burst tube. Fit the gold pins into the pump head cover plate holes. If a tube bursts, spilled liquid will conduct energy between the pins, signaling a visible and audible **"Tube Fractured!"** warning on the main control unit.



Tips

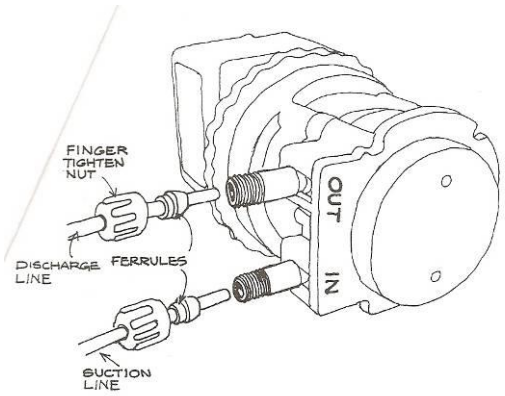
- **DO NOT** mount the SelectDoser MAX over an open-topped stock solution container, as fumes can affect the component parts.
- Keep the rain roof attached to the motor/pump head unit. This protects the motor from dirt and moisture.
- Protect the motor from the ingress of liquids.



Attaching Suction and Discharge Lines to Pump Tube Ends

1. Start a Suction Line by cutting a section of delivery tubing long enough to reach from the bottom of the stock solution container to the input pump tube end **(IN)**.

2. Cut another section to reach from the output pump tube end **(OUT)** to the injection assembly. This tube will be the Discharge Line.



3. Place a plastic nut onto one end of the newly cut Suction Line, followed by a ferrule (a ferrule is a shaped washer that makes a seal between a line and a pump tube end). Push the ferrule 1/4" onto the Line, as shown. Warm ferrule to ease fitting, if necessary.

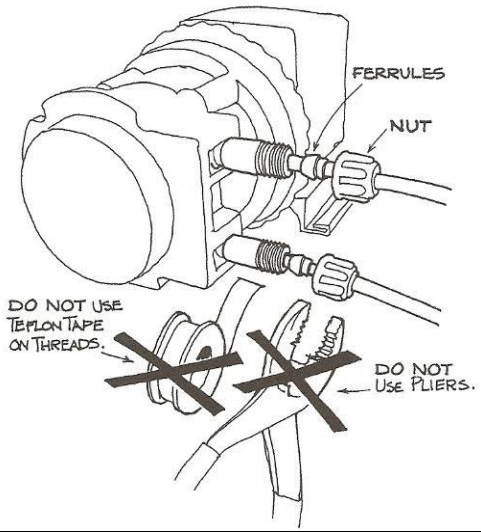
4. Repeat step #3 instructions with a newly cut Discharge Line.

5. Push each Line onto its pump tube end, making sure each Line bottoms out in the tube.

6. **TIGHTEN A PLASTIC NUT ONTO EACH PUMP TUBE END BY HAND ONLY.** Hold the pump tube end fitting with one hand while tightening the nut with the other hand.

Tips

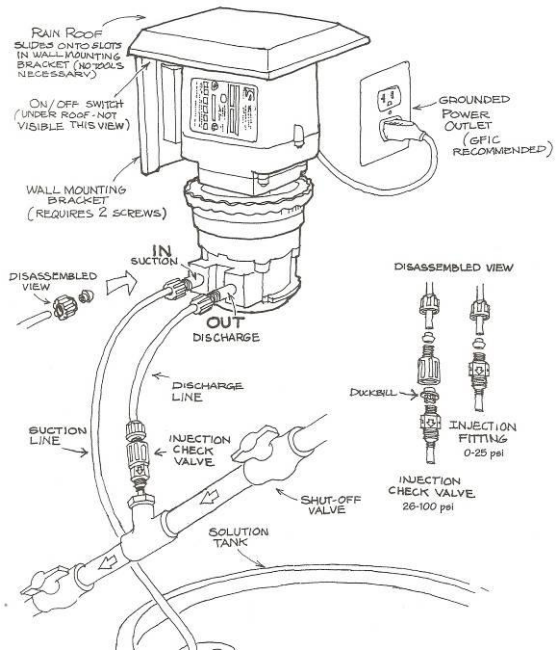
- Make sure that beveled ends of ferrules face pump.
- Use no Teflon or other sealing tape, as tape will prevent ferrules from seating.
- Do not use pliers, as doing so can damage ferrules. Using pliers can also break internal seals and twist the pump tube.



Attaching Discharge Line to Injection Assembly

1. A Discharge Line connects to the injection assembly the same way it fits onto a pump tube end. After attaching a plastic nut and ferrule, push Discharge Line onto the injection assembly fitting. A duckbill type check valve is included in the injection assembly. This check valve will need to be replaced periodically.

2. Make sure the Line bottoms into the injection assembly fitting. **TIGHTEN PLASTIC NUT BY HAND ONLY.**



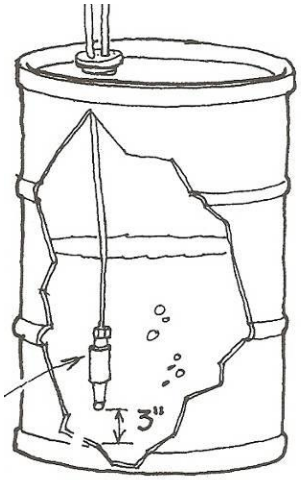
Running Suction Line to Stock Solution Container

The SelectDoser MAX comes with an end weight and strainer to fit the Suction Line. If no strainer is required, use an alternative end weight such as a stainless steel nut.

1. Remove the collet from the end weight and push the Suction Line 3 ½"" through the collet. Then, re-fit the collet to the end weight.

NOTE: DO NOT *push tubing all the way to the bottom of the end weight and strainer. Tubing could become flush with the strainer's nose and the pump may not prime due to blockage.*

2. Run the Suction Line into the stock solution container. Allow at least 3" between the Suction Line and the bottom of the container.



Check all connections by re-pressurizing the water system and running the motor/pump unit as described below. Tighten for re-fit any connections that show leakage.

This is the **Program-Start-Options** screen. If this screen does not appear at start-up, press and hold the **Adjust** button for several seconds.

To view and choose doser options, press **Options (Set)**.

To start dosing or metering, choose **Start (Adjust)**.

Program XXXX

Start Options

Viewing and Choosing Doser Options

After choosing **Options**, the screen forwards to **Doser options**. Here, you can choose settings for the following three functions:

1. **Cont at Hi Flow.** This means "Continue at high flow," or continue to dose in a situation where the water flow is out of range (too high, see explanation on page 12). The default screen choice is **Y (Yes)**, which allows continuous dosing during high water flow. To choose this option, press **Y (Set)**. The doser will then forward to the **Tube Burst En.** screen.

   To stop dosing during high water flow, choose **N (No)**. For this choice to appear, press **Adjust** once. The screen will display **N (No)** on the screen. Press **Set** to confirm selection. The doser forwards to the **Tube Burst En.** screen.

Doser options

Cont at Hi Flo Y

Viewing and Choosing Doser Options-Continued

2. **Tube Burst En.** This option enables or disables the tube burst function. The default screen choice is **Y (Yes)**. This function works only if the gold pins are fitted into the pump head cover plate holes (see photo). After choosing **Y (Set)**, the doser forwards to the **Lang.** screen.

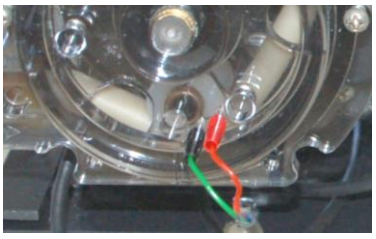
   Choosing **N (No)** will cancel the tube burst function. To choose **N (No)**, press the **Adjust** button once. Then, press **Set**. The doser forwards to the **Lang.** screen.

NOTES: *In a tube burst situation, liquid from a fractured tube conducts between the gold pins of the Tube Burst Detection Kit and forces the on-screen message,* ***"Tube Fractured!"***

   If the Tube Burst Detection pins are not fitted to the SelectDoser MAX, select **N (No)**.

Doser options

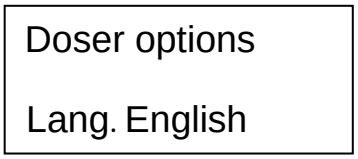
Tube Burst En. Y



3. **Lang.** The third doser option is the operating language selection. English is the default language. Press **Set** to confirm selection.

   Contact Genesis Instruments If you need a language other than English.

   The unit returns to the **Select-Start-Options** screen after all **Doser options** have been set.



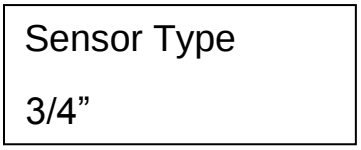
Water Metering (Without Dosing)

If Dosing is required, skip to **Dosing Product** on next page.

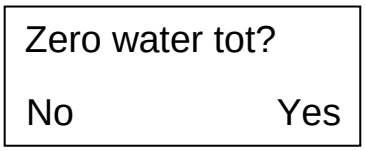
The SelectDoser MAX allows users to check and re-set water flow totals with or without using the dosing features.

1. From the **Select-Start-Options** screen, choose **Start (Adjust)**. The **Select-Meter-Dose** screen appears. Press **Meter (Adjust)**. This forwards you to the **Sensor Type** screen.

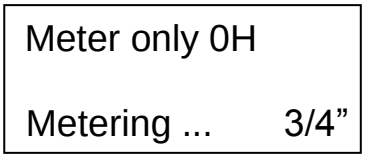
2. Press the **Adjust** button repeatedly, until the displayed sensor number matches the sensor being used. Then press **Set**.



3. The doser forwards to the **Zero water tot** screen. To re-set the water total to zero, choose **Yes (Set)**. To retain the recorded water total, press **No (Adjust)**.



4. Next, the **Metering . . .** screen appears. For 20 seconds, the doser collects operational totals. During this time, the screen says **Metering . . .**

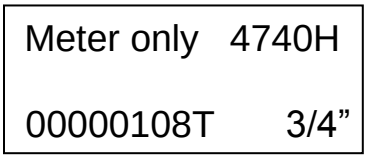


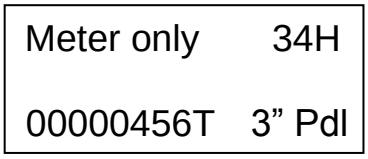
5. After reading totals, the **Meter only** screen appears, showing the flow rate of water, which sensor is selected, and the water meter total.

6. To exit the **Meter only** screen, hold the **Adjust** button for several seconds. This returns you to the **Select-Start-Options** screen.

   Note: When any paddle sensor is used, the flow rate and water total is shown in hundreds of gallons, so 34H is 3,400 gal/hr and 456T is 45,600 gallons.

NOTE: *The water total shown on the screen is stored in the computer memory every 5 minutes. Short recording times may omit small amounts of water data. SelectDoser MAX is able to record up to 10 million gallons before automatically re-setting to zero.*

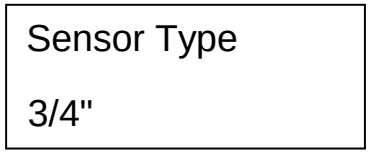




Dosing Product

1. From the **Select-Start-Options** menu, press **Start (Adjust)**. On the **Select-Meter-Dose** screen, press **Dose (Set)** to reach the **Sensor Type** screen.

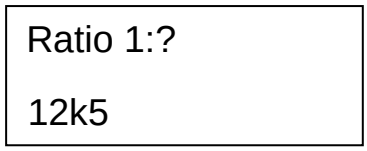
   On the **Sensor Type** screen, select the flow sensor type that matches the unit's flow sensor (flow sensor identity is located on tag near sensor plug). Press **Adjust** to scroll through sensor types and press **Set** when you find the correct one. The doser advances to the **Ratio** screen.



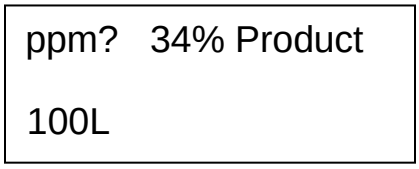
2. On the **Ratio** screen, use the **Adjust** button to scroll through the available ratios. Press **Set** when you reach the desired ratio.

NOTE: *Number above 1,000 will be shown on screen with a K, representing thousands.*

EXAMPLES: Thousands
12K5=12,500
20K=20,000
33K3=33,300

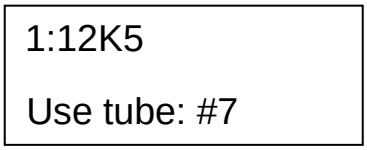


3. If your doser is programmed to deliver Hydrogen Peroxide this screen will appear. In special cases, numbers followed by an L are to be used when a low concentration of hydrogen peroxide (34%) is being pumped and numbers followed by an H are used for the high concentration (50%). In this case, the screen shows that 100ppm of 34% peroxide is ready to be selected. When the desired ppm is shown, press Set.

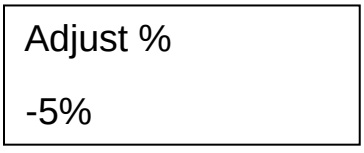


4. Next, a **Use tube:** screen appears, showing the appropriate pump tube to use. Follow the **Stenner Installation and Maintenance Manual** Pg. 26 - 33, if you need to switch out your pump tube.

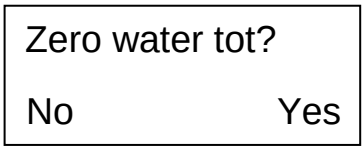
   After fitting a new tube or verifying installed tube, press **Set** to exit the **Use Tube #** screen.



5. The **Adjust %** feature can be used to increase or decrease the amount of product dosed as required by the dosing operation being performed or as determined by downstream testing of water conditions. The range is +/-20%.



6. The unit forwards to **Zero water tot**. Choose **Yes (Set)** to re-set water total or **No (Adjust)** to keep the pre-recorded water total. The water total is updated every 5 minutes. Short recording times may lose a small amount of water data.



7. If a new tube is to be fitted or an old tube removed, press Yes to start the rotor turning 0.3 seconds On, and 1.0 seconds Off. This facilitates the fitting and removal of tubes.	Load Tube? No Yes
8. Next, the **Prime pump** screen appears. To fill delivery tube with product, choose **Yes (Set)**. The pump will run continuously and fill the delivery tube. Press **No (Adjust)** if priming is not required.	Prime pump? No Yes
9. The **Priming** screen appears while the pump runs and fills the delivery tube. Press **Stop (Set)** when tube is filled up to the injection assembly.	Priming… Stop
10. Before actual dosing begins, a **Dosing. . .** screen appears for 20 seconds. During this time, the unit collects water flow information.	100 #7 -5 0H Dosing… 3/4”
11. This is the normal dosing screen. Every 10 seconds, the pump runs and doses a precise product amount according to the pre-set dosing ratio.	100 #7 -5 420H 00000106T 3/4”
12. **NOTE:** When any paddle sensor is used, the flow rate and water total is shown in hundreds of gallons. In this example 13H is 1,300 gal/hr and 456T is 45,600 gallons. This screen also shows that 100ppm of 34% solution has been selected, the tube being used is the #1 tube and the output has been adjusted by -5%.	100 #1 –5 13H 00000456T 3"Pdl
High Flow Warning If water flow is too high, incorrect dosing results. A “**High Flow!”** screen appears every 20 seconds, alternating with the normal **Dosing** screen. An audible warning accompanies this screen (see explanation of High Flow on page 10-11). If you’ve set the unit to continue dosing during high water flow, the product doses at inconsistent levels. However, when water flow returns to a manageable level, normal dosing resumes. If the unit has not been set to continue at high flow, the pump will alarm and stop pumping until the unit is reset. To clear the **High Flow** message and stop the audible warning, hold the **Adjust** button for several seconds. This returns you to the **Select-Start-Options** screen.	50 Red -5 1420H High Flow! 3/4"

Tube Fractured Warning	
If the unit's Tube Burst Detection has been activated (see page 3, #6), visible and audible warning signals will occur during a tube burst situation. After solution from a fractured tube connects with the kit's gold pins, a "**Tube fractured!"** message appears on-screen and dosing ceases. Press **OK** to stop the warning signals. Replace the fractured tube. Clean and dry the pump head and gold pins before dosing again.	Tube fractured! OK

To make any adjustments to the settings, return to the Welcome Screen and advance through the options. To return to the Welcome Screen from normal operation, press and hold Adjust.

PUMP TUBES, PRIMING AND WATER FLOW

About Pump Tubes

SelectDoser MAX pump tubes are available in two pressure ranges with three sizes in each range. Tubes #3, #4 and #5 are used where line pressure does not exceed 25psi. Tubes #1, #2 and #7 can be used up to 100psi.

The correct tube to use for any specific ratio is displayed on the control screen. The tube numbers are printed on the side of the tubing and also stamped on the grey end fittings.

NOTE: *If you have a lower pressure water line or need to pump higher volumes, contact your dealer for details on the Select Doser640, our low pressure/high volume pump.*

A pump tube's life depends on many factors, including the product being dosed, the back pressure under which the pump is working, and the amount of running time the pump sees. An average pump tube life is approximately one year but can be considerably less depending on operating conditions. Make sure the Tube Burst Detection pins are fitted and activated so the doser stops immediately if a tube bursts. Periodic inspection and scheduled pump tube replacements will ensure that tube bursts are avoided.

Changing Pump Tubes

Please refer to the Stenner ***Classic Series Installation and Maintenance Manual*** pages 26-33 for step-by-step instructions on how to change tubes.

Priming Option

If you select the **Prime pump** option from the doser control screen menu, (see page 9, #8), the pump rollers will turn continuously regardless of the flow in the drinking line. This is useful for filling the Suction and Discharge Lines prior to proportional dosing. The **Prime pump** option **Yes** is also useful for dosing a product quickly, within a given time period. The amount pumped during priming is determined by tube choice.

NOTE: *Operating more than 2 hours at a time in the priming mode is not recommended as tube and motor life will be reduced.*

Calculating Maximum Water Flow

Maximum water flow is the highest rate of flow in the water line that the pump can keep up with. This rate depends on the ratio that's been selected, and the pump tube being used.

The formula for Maximum water flow is:
(Priming rate) x (Ratio) =Maximum water flow

Priming rate is the rate of product being pumped as the motor turns continuously and is relative to the pump tube's diameter.

Ratio is a number representing the product-to-water mix.
A ratio of 1:128 indicates 1 part product to 128 parts of water.

The following chart shows available SelectDoser MAX tubes and their priming rates:

Maximum Pressure	Tube Number	Priming Rate (Gal/hr)
25psi	#3	1.67
	#4	2.50
	#5	3.54
100psi	#1	0.21
	#2	0.71
	#7	1.67

EXAMPLE: Calculating Maximum water flow
If Tube #7 is fitted and the system is dosing at a ratio of 1: 128, then the **Maximum water flow** is determined as follows:

(Priming rate) x (Ratio) =Maximum water flow
1.67 x 128 = 214 gal/hr

Any water flow higher than this will generate a **"High Flow!"** warning (see page 12).

DOSING WITH TWO PUMP HEADS

The SelectDoser MAX can be fitted with either one or two pump heads, depending on operational requirements. It's possible, using two pump heads, to dose two different products into a water line at the same time.

***NOTE**: Two #7 tubes will not work in a double-headed pump, so it is not possible to increase the pump's output in this way.*

***NOTE:** Dosing with two pump heads requires an extended motor shaft, special pump heads, and an additional injection port. Contact Genesis Instruments for more information about pumping with two pump heads.*

WARRANTY

Genesis Instruments warrants the SelectDoser MAX to be free of defects due to parts or workmanship for one year from the date of purchase. Since we cannot control water conditions, Genesis Instruments will not warrant any flow sensors that are damaged due to mineral deposits or any other water borne contaminants. Genesis Instruments will not warrant any pumps that are damaged due to leaking pump tubes.

MAINTENANCE

Weekly

- Flush out filters protecting the flow sensor.
- Flush inlet filter on the Suction Line end weight.
- Inspect the pump tube for signs of wear.
- Check doser output. Adjust, as necessary, via the control screen.

Monthly

Replace pump tube if any of the following occur:

- Rate of dosing increases or decreases sharply.
- The tube splits.

Every 6 Months

- After disconnecting from electrical supply, remove cover from SelectDoser MAX and inspect interior of control box.
- Ensure no ingress of moisture or other contaminant.
- In case of inspection difficulty, contact your dealer.

TROUBLESHOOTING

If the SelectDoser MAX fails to operate correctly, check the following:

Problem	Solution
Rotor jamming against the pump tube	This is most likely to happen with Tube #7. Run the pump on **Prime** for 10 minutes; this will break the tube in before dosing begins.
Error message **"High Flow!"** showing on screen	1. Problem may have passed; check if **Maximum water flow** is being exceeded (see page 11). 2. Ensure that the roller assembly is installed so that the magnets are toward the motor. 3. Consider using a more concentrated stock solution at a higher ratio. 4. Check Ratio and Sensor selection is correct. 5. Possible pump fault. Contact your dealer.

Problem	Solution
Unexpected **"Tube Fractured!"** message	1. Check for a pump tube fracture or liquid in the pump head between the two gold pins. 2. If Tube Burst Detection is not being used, make sure the **Tube Fracture En.** option is set at **N (No)**.
Incorrect dosing-Dose too low	1. Is the correct tube fitted, as shown on-screen? 2. Is water line pressure too high? 3. Is non-return valve blocked? 4. Is injection point blocked? 5. Is inlet filter blocked? 6. Has the doser been running on **High Flow** and unable to keep up with water flow? 7. Has water flow periodically been lower than the sensor rating (see **Flow Sensors and Capacities**, page 1)? 8. Check inlet tube joints for leaks, as air may be getting sucked in.
Incorrect dosing-Dose too high	1. Is the correct tube fitted, as shown on-screen? 2. Are the three magnets on the roller assembly in place? 3. Is the doser near high tension power cables? If so, move the doser to avoid interference.
Medication not being pumped from stock solution container	1. Make sure all tube connections are firmly in place. 2. Check for blockages anywhere in the delivery lines, up to the injection point.
Sudden loss of pumping pressure (with possible return of fluid into stock solution container)	1. Check for lateral movement in the rotor. 2. Inspect for physical damage to pump head from fixing screws. If the pump head is loose, pressure will be lost. 3. Make sure that the injection check valve is fitted in the Discharge Line. 4. Make sure that pump tube is not fractured.
Error message, "**Pump error!"**	A failure of the motor or data encoder is indicated. Check that connections to circuit board from motor are in place. **Contact your dealer.**
Proportional dosing not occurring	1. Check for a flow sensor connection. 2. Is the water flowing? 3. Check the turbine in the flow sensor. Is it turning freely, or is it snagged? 4. Is main electrical supply connected to the pump? 5. Is the **ON/OFF** switch on the rear of the motor in the **ON (Up)** position?

Contact your dealer if you can't resolve the problem.