

# Application Note

## RFP Flowmeters



The following information is provided to enable you to understand the calculations necessary to properly adjust your RFP flowmeter. In the steps below you will calculate:

- A** — Required pump output
- B** — Maximum output of metering pump
- C** — Percent output required from pump
- D** — Stroke knob setting on pump (strokes per minute)
- E** — Divider number

### 1. SELECT A METERING PUMP

- Be sure the metering pump selected is an LMI A7, B7 or C7 type pump. These pumps are equipped with an external input jack for use with RFP flowmeters.
- When using the A7, B7 or C7 pump with an RFP flowmeter, the speed control knob function is bypassed and taken over by the divider unit. The speed of the pump is controlled automatically, based on the flow of water through the flowmeter. On the LMI A7 pump, external mode is accomplished by turning the speed knob fully counter-clockwise; on B7 and C7 pumps, a switch is provided to place the pump in external mode.
- When selecting your LMI pump, be sure the pump's pressure rating exceeds the system pressure by a minimum of 20%.

*EXAMPLE: If system pressure equals 100 psi, the pump rating should be 120 psi or greater.*

- Use this calculation to determine the proper LMI pump for your application.

	$\frac{\text{Max. flowrate of water through flowmeter (in GPM*)} \times \text{Desired concentration (in PPM*)}}{\text{Percent concentration of pumping solution (expressed as a whole number)}} = \boxed{\phantom{000}} \times .006 = \boxed{\phantom{000}} \text{ (Required pump output in GPH*)}$	<b>A</b>
<b>EXAMPLE A:</b>	$\frac{70 \text{ (GPM*)} \times 4 \text{ (PPM*)}}{5.25 \text{ (\% solution expressed as a whole number)}} = \boxed{53.33} \times .006 = \boxed{.32} \text{ (Required pump output in GPH*)}$	<b>A</b>
<b>EXAMPLE RESULTS:</b>	$\text{Select an A77 pump with } \boxed{.42} \text{ GPH* max. output at 140 psi (Use the Pump Selection Guide).}$	<b>B</b>

### 2. DETERMINE PERCENT OUTPUT REQUIRED FROM PUMP

	$\frac{\text{Required Pump output from } \mathbf{A}}{\text{Max output of metering pump selected (in GPH*)} \mathbf{B}} = \boxed{\phantom{000}} \text{ (Percent output required from pump)}$	<b>C</b>
<b>EXAMPLE B:</b>	$\frac{\boxed{.32} \mathbf{A}}{\boxed{.42} \mathbf{B}} = \boxed{.76} \text{ (Percent output required from pump)}$	<b>C</b>

### 3. DETERMINE STROKE SETTING

$$\sqrt{\frac{\text{Percent output required from pump}}{\text{C}}} = \text{D} \quad (\text{Stroke knob setting on pump and strokes per minute in Step 5})$$

**EXAMPLE C:**

$$\sqrt{\frac{.76}{\text{C}}} = \text{D} \quad (\text{Stroke knob setting on pump and strokes per minute in Step 5})$$

**EXAMPLE RESULT:** Set stroke knob to 87%.

### 4. SELECT FLOWMETER

Using the RFP chart below, determine the size of the flowmeter required based on:

- The required pipe size or mounting flange.
- The maximum and minimum flowrate of the flowmeter.

**NOTE:** the maximum system cannot exceed the maximum flowmeter flow.

Model	Pipe Size	Flow - GPM*		Flow - LPM*		Primary Pulses per U.S. Gallon	Primary Pulse per Liter
		MIN	MAX	MIN	MAX		
RFP-07	3/4"	0.44	20	1.7	76	62.7	16.6
RFP-10	1"	0.8	50	3.0	189	34	9
RFP-15	1-1/2"	1.4	85	5.3	322	13.3	3.5
RFP-20	2"	1.75	130	6.6	492	13.3	3.5
RFP-30	3"	5	350	18.9	1325	7.7	2
RFP-40	4"	5	650	18.9	2460	4.8	1.3
RFP-60	6"	9	1300	34.1	4921	1	0.3

### 5. DETERMINE DIVIDER NUMBER

**NOTE:** If an LMI D7 metering pump is being used, multiply value **D** by 75% to determine correct Divider Number.

$$\frac{\text{Max flowrate of water through flowmeter (in GPM*)} \times \text{Primary pulses per U.S. gallon (from chart)}}{\text{Strokes per minute of pump (expressed as a whole number)}} = \text{E} \quad \text{Divider number}$$

**EXAMPLE D:**

$$\frac{70 \text{ (GPM*)} \times 13.3 \text{ (PPPUSG*)}}{87 \text{ (D)}} = 10.7 \text{ (E)} \quad \text{Divider number (round off to nearest whole number)}$$

**EXAMPLE RESULT:** Round off the divider number to read 0011 on the divider unit. The resulting divider number will cause the pump to run at 87 strokes per minute at the maximum flowrate of water through the flowmeter.

**NOTES:**

- To make small increases or decreases in output, adjust the stroke knob.
- Increasing the divider box number will decrease the pump speed (strokes per minute).
- Decreasing the divider box number will increase the pump speed (strokes per minute).
- Dilute pumping solutions when low PPM concentrations are required. This will allow you to increase the pump feed rate (strokes per minute).
- Refer to the RFP instruction manual for flowmeter installation and plumbing requirement.

\* GPM = Gallons per minute    GPH = Gallons per hour    LPM = Liters per minute    PPM = Parts per million    PPPUSG = Primary pulses per U.S. Gallon

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