Remote Flowmeter-Pulsers

Installation and Operation Manual

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Variable flow rates require a flow proportional dosing system. LMI's Remote Flowmeter-Pulser provides a precise flow proportional dosing system that is simple to install and easy to maintain.

Accessibility

LMI's Remote Flowmeter-Pulsers allow you to install the Flowmeter in your pipeline and to wall mount the Programmable Divider up to 100 ft (30 m) away, where it provides easy user access.

Rugged Construction

The Flowmeter body is constructed of a lead-free brass alloy. A gear train drives the register totalizer dials. The internationally-accepted dry top multi-jet design tolerates low quality water. This isolation eliminates any possibility of contamination. The easty to read dry top register is dustproof and waterproof.

Versatile Features

- Line sizes from 3/4" to 2"
- Flow rates from 0.22 to 132 GPM
- Line pressures to 150psi (10.3 Bar)
- Water temperatures from 32°F to 105°F (0°C to 40°C)
- Lead-Free Flowmeter
  Meets AWWA Class -708 Multi-Jet Meter accuracy specification.

Simple System Requirements

For automatic flow proportioning, all that is required is the LMI Remote Flowmeter-Pulser and an LMI dosing pump sized to fit the additive flow rate. No timers, relays, or control valves are required.

Simple Operation

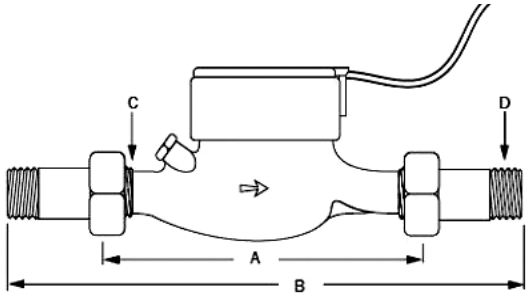
As liquid flows through the Flowmeter, a magnetic pickup external to the flow stream senses each rotation of the register dials. These pulses are transmitted to the Programmable Divider. The divider accumulates the number of pulses and triggers the LMI dosing pump to stroke once for the set number of pulses.

The Programmable Divider permits you to set the ratio of pulses to pump strokes at any ratio between 1:1 and 9999:1. Combined with the 10 to 1 adjustability of the LMI dosing pump's stroke length and alterations to the solution concentration, the additive injection ratios can exceed five hundred million to one. Consult the Page 5 for further details on setting the divider.

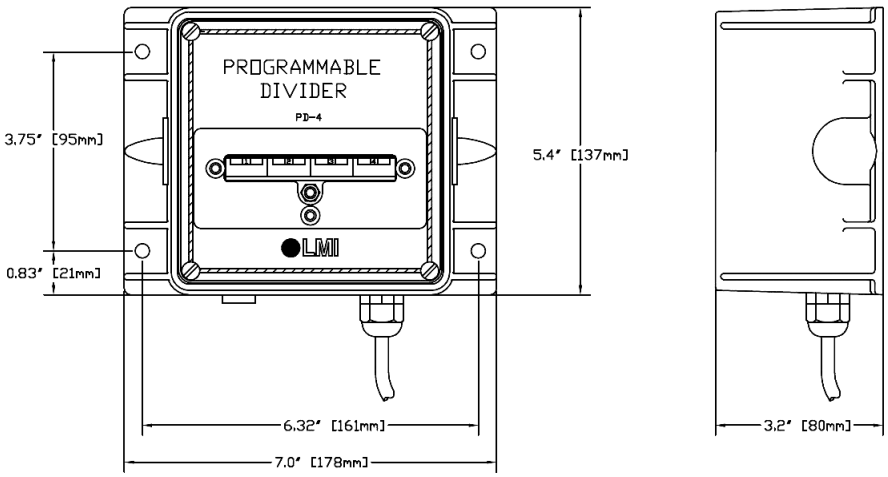
Flowmeter Specifications

Flowmeter only P/Ns		59235	59236	59237	59238
Model – RFP		RFP-075	RFP-100	RFP-150	RFP-200
Meter Type		Multi-Jet Impeller, Magnetic Drive			
Body Material		Lead Free Brass Alloy			
Register Type		Straight Reading U.S. Gallons Dry Register			
Totalizer Digits		7			
Service Temp	°F (°C)	32 - 105 (0 - 40)			
MAX Op. Pressure	psi (Bar)	150 (10.3)			

Model No.	Unit	RFP-75	RFP-100	RFP-150	RFP-200
Nominal Size	inch	3/4	1	1-1/2	2
	mm	20	25	40	50
A (Body)	inch	7.5	10.25	11.75	11.75
	mm	190	260	298	298
B (w/couplings)	inch	12.63	15.63	17.63	17.63
	mm	321	397	448	448
C (IPS thread)	inch	1	1.25	2	2.5
D (NPT thread)	inch	.75	1	1.5	2
Net Weight	lbs	8	10	16	18
	kg	3.6	4.5	7.3	8.2



REMOTE PROGRAMMABLE DIVIDER - ALL MODELS

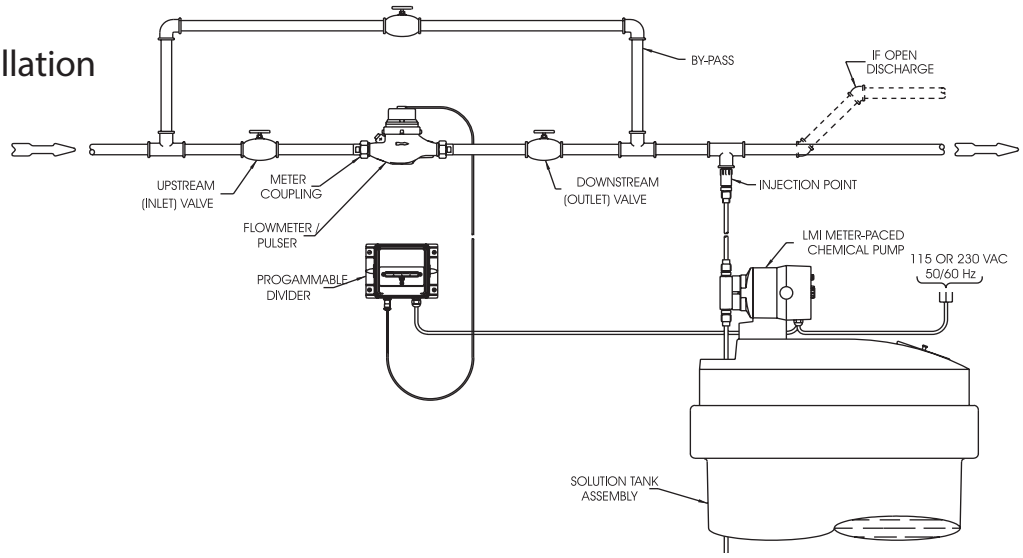


Select Your Flowmeter

- Determine the required pipe size or mounting flange.
- Determine the maximum and minimum flowrate of the flowmeter.
- Select your flowmeter model from the chart below:

Flowmeter Only P/N		Flowmeter Model with PD-4	Pipe Size	Flow-GPM*		Flow-LPM*		Primary Pulses per U.S. Gallon	Primary Pulse per Liter
				MIN	MAX	MIN	MAX		
59235	or	RFP-075	3/4"	0.22	22	.83	83	40	10.6
59236		RFP-100	1"	0.44	52	1.7	196	4	1.1
59237		RFP-150	1-1/2"	0.88	88	3.3	333	4	1.1
59238		RFP-200	2"	1.98	132	7.5	499	4	1.1

Typical Installation



I. UNPACKING

A. Remote Flowmeter (RFP) units are packaged in two separate cartons. One carton contains the Flowmeter and 10 feet of cable for direct hookup to the Remote Programmable Divider. The other carton contains the Remove Programmable Divider complete with 10 feet of cable for direct connection to an LMI pump.

B. Remote Flowmeter units have a pair of union couplings and gaskets included.

C. Because of test water residue, the Remote Flowmeter should be stored in a frost-proof area. If this is not possible, the Remote Flowmeter must be thawed prior to installation.

II. LOCATION

FLOWMETER

1. Remote Flowmeters should be installed in a frost-proof, easily accessible area.

2. To prevent accumulation of air and a resultant error in measurement, the Flowmeter should be installed on the lowest horizontal point of the pipeline.

3. An uninterrupted run of straight pipe with a length at least 10 times the nominal diameter of the Flowmeter both upstream and downstream is needed to ensure accurate readings.

4. If the pipe line downstream from the Flowmeter is open discharge, the pipe must be raised so open

discharge elevation is higher than the top of the Flowmeter (see "Typical Installation" drawing on Page 2).

5. Thoroughly rinse the pipeline by opening the upstream shut-off valve before installing the Flowmeter.

6. The Remote Programmable Divider may be located as far as 100 feet from the Flowmeter location. Extension cables are available. Please consult the factory if the Remote Programmable Divider will be installed more than 100 feet from the Flowmeter.

7. The flowmeter must be installed horizontally and level, with the glass register positioned up (12:00 position - see "Typical Installation" drawing).

8. For ease of installation, install a shut-off valve, with an orifice diameter at least as large as the nominal size of the Flowmeter. Installation of a bypass is also recommended for easy removal or servicing fo the Flowmeter without interrupting the water flow (see "Typical Installation" drawing).

9. Apply Teflon Tape or pipe thread sealant on tapered pipe thread ends of the meter couplings.

10. Air trapped in the Flowmeter should be removed prior to operation. To accomplish this, loosen the meter couplings slightly (for models so equipped) and rotate Flowmeter slowly so that register is upside down. Open upstream (inlet) valve slowly again until the register is upright and tighten meter couplings. The Flowmeter is now ready for cable connection to the Remote Programmable Divider.

REMOTE PROGRAMMABLE DIVIDER

1. The Remote Programmable Divider may be located up to 100 feet from the Flowmeter. The unit has molded-in 4 mounting holes that will accept 1/4" diameter screws for wall mounting.

2. Once the Remote Programmable Divider and the Flowmeter have been installed, connect the cable from the Flowmeter to the programmable divider by plugging the connector on the cable into the receptacle on the programmable divider.

3. Should the Remote Programmable Divider need to be hardwired, the white wire connects to Pin 1, the brown wire connects to Pin 2, and the green wire connects to Pin 3.

METERING PUMP

1. Installation of your LMI metering pump should be in accordance with instructions included with the pump. A metering pump with an external pulse input must be selected. LMI Series AA7, B7, or C7 type pump are most commonly used and these pumps are equipped with an external 4-pin input jack for use with RFP flowmeters. Roytronic® Series A7 and Roytronic® Excel AD8 type pump requires 4 Pin to 5 Pin adapter P/N 48488. Note: RFP flowmeters can also be used with AA9, B9, C9 and Roytronic Excel Series AD8, AD9 pumps. Please program in pulse multiply (factor 1) or pulse divide (factor 1).

2. Be sure the pump's pressure rating exceeds the system pressure by a minimum of 20%. For example, if system pressure equals 100 psi (6.9 Bar), the pump rating should be 120 psi
(8.3 Bar) or greater.

3. Plug the connector from the programmable divider into the receptacle located on the bottom of the pump's control panel.

4. To prime the pump, switch to the INTERNAL mode and follow the START-UP/PRIMING procedures in the QUICK START GUIDE.

5. Set divider number on the programmable divider according to instruction in the next section.

6. Check treated water for desired dosage.

7. Adjust stroke length knob until desired dosage is obtained.

IMPORTANT:

PUMP MUST BE IN EXTERNAL MODE FOR METER PACING

III. PROGRAMMABLE DIVIDER AND PUMP CALCULATIONS

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 (SPM)
E - Flowmeter model number
F - Divder number

A. Required Pump Outupt

$$\frac{\text{Max. flowrate of water through flowmeter (in GPM*)} \times \text{Desired concentration (in PPM*)}}{\text{Percent concentration of pumping solution (expressed as a whole number)}} = \square \times .006 = \square\ (A)$$

(Required pump output in GPH*)

Example A: $\frac{100\ (GPM^*) \times 10\ (PPM^*)}{5.25\ (\%\ \text{solution expressed as a whole number})} = 190.48 \times .006 = 1.14\ (A)$ (Required pump output in GPH*)

B. Maximum Output of Metering Pump

Example B: Select a B71 pump with [1.6] (B) GPH* max. output at 150psi.

C. Percent Output Required From Pump

$$\frac{\text{Required pump output from (A)}}{\text{Max output of metering pump selected (in GPH) from (B)}} = \square\ (C)$$

Percent output required from the pump

Example C:

$$\frac{1.14}{1.6} = 0.713\ (C)$$

Percent output required from the pump

D. Stroke Setting

$$\frac{\text{Square Root of}}{\sqrt{\text{Percent output desired from pump (C)}}} = \square\ (D)$$

Stroke knob setting on pump and strokes per minute in Section F

Example D:

$$\sqrt{0.713\ (C)} = 0.844\ (D)$$

E. Flowmeter Specifications

Check the size of the flowmeter selectee based on:

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

Flowmeter Model with PD-4 *(Flowmeter only)*	Pipe Size	Flow-GPM*		Flow-LPM*	
		MIN	MAX	MIN	MAX
RFP-075 *(59235)*	3/4"	0.22	22	.83	83
RFP-100 *(59236)*	1"	0.44	52	1.7	196
RFP-150 *(59237)*	1-1/2"	0.88	88	3.3	333
RFP-200 *(59238)*	2"	1.98	132	7.5	499

Example E: Select RFP-200/59238

F. Divider Number

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

Flowmeter Only P/N		Flowmeter Model	Max Flow GPM	Max Flow LPM	Primary Pulses per U.S. Gallon	Primary Pulses per Liter
59235	or	RFP-075	22	83	40	10.6
59236		RFP-100	52	196	4	1.1
59237		RFP-150	88	333	4	1.1
59238		RFP-200	132	499	4	1.1

Example F:

$$\frac{\text{100 GPM*} \times \text{4 PPPUSG*}}{\text{84 SPM*}} = \text{(F) } \boxed{4.76} \text{ Divide number}$$

Round off the divider number to read (F) 0005 on the divider unit. The resulting divider number will cause the pump to run at 84 strokes per minute at the maximum flowrate of water through the flowmeter.

IV. SET THE DIVIDER NUMBER

A. Remove the clear window on the programmable divider by removing the two black thumb screws.

B. Set thumbwheel numbers to divider number determined above.

Example:
Using the divider number in the previous example (divider number = 0005), the thumbwheels would be set as illustrated below:

0	0	0	5

C. Replace clear window to activate divider.

IMPORTANT: DIVIDER WILL NOT OPERATE UNLESS CLEAR WINDOW IS IN PLACE.

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 an increase in the pump speed (strokes per minute)

*GPM = Gallons per minute *GPH = Gallons per hour *LPM = Liters per minute *PPM = parts per million
*PPPUSG = Primary pulses per US Gallon

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