

NIAGARA®

*Positive Displacement
Model HPM
High Performance Meter*

**Installation, Operation
and Maintenance Manual**

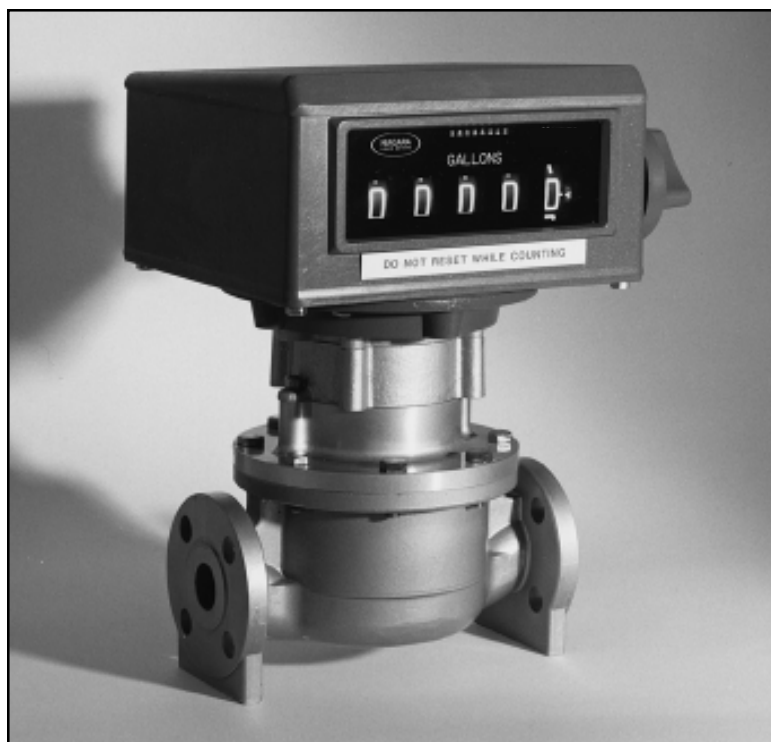


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Installation, Operation & Maintenance

GENERAL

It's not just another piston meter. The HPM meets or beats the competition in quality, specifications, and price — a comparable unit at this price simply cannot be found.

The HPM measures virtually any liquid and handles flow rates from 7 to 150 gpm with excellent repeatability and sustained accuracy. The compact design allows installation in tight places and retrofits easily to existing applications.

We also supply a complete line of registers and accessories to meet your specific requirements.

FEATURES

- Available at a cost which enables you to standardize with stainless steel — at bronze prices.
- Stockable for immediate delivery.
- Better flow range flexibility.
- Insensitive to moderate viscosity changes.
- Designed to provide a long life and trouble-free service.

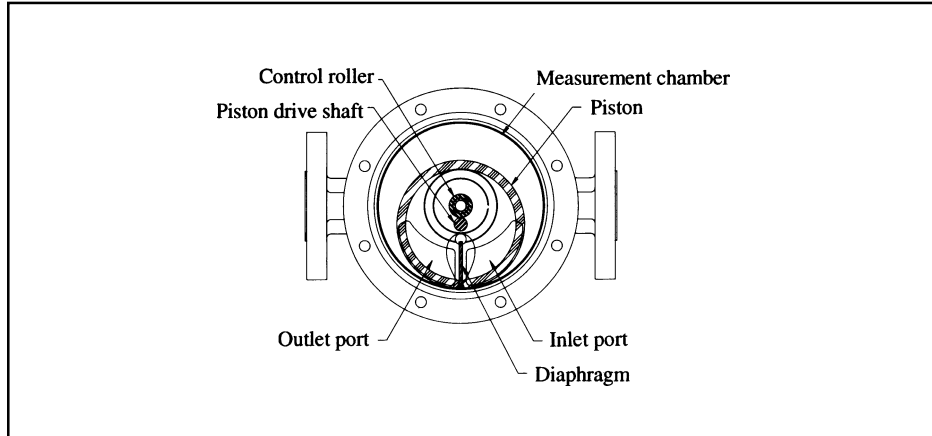
TYPICAL APPLICATIONS

Any industry, with liquids from A to Z:

- **Chemical processing.** Corrosive liquids like acids, emulsions, and toluene.
- **Industrial manufacturing.** Adhesives, alcohol, coatings, fuel oil, wax emulsion.
- **Paint.** Solvents and turpentine.
- **Pulp and paper.** Acids, alcohols, brighteners, cleaners, coatings, varnishes, zinc, synthetic resins.
- **Food processing.**
- **Concrete batching.**
- **Cosmetic.**
- **Pharmaceutical.**
- **Agrichemical.**
- **Automotive.**

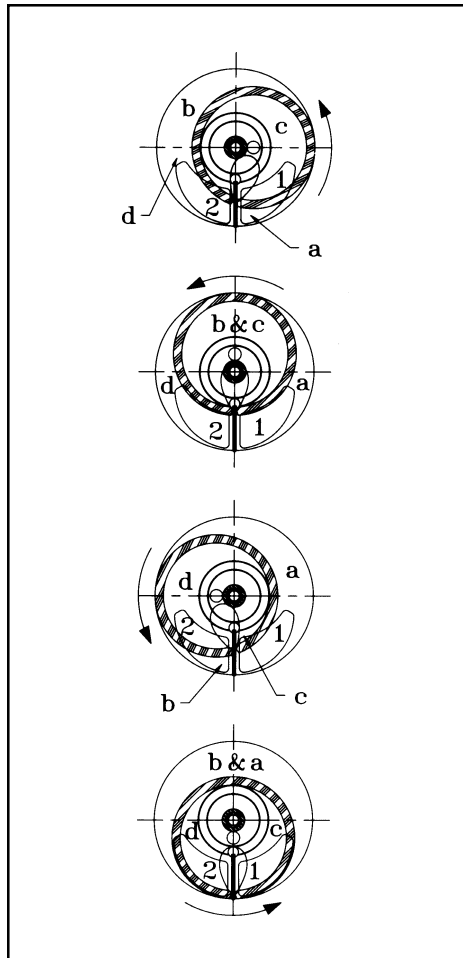
THEORY (Oscillating Piston)

Measuring Chamber



The piston is guided by the fixed diaphragm and rotating spindle. The spindle rotates in the channel between the roller and the inside chamber wall.

“A” and “c” receive liquid from the inlet port “1,” and as the piston moves, “b” and “d” discharge liquid through the outlet port “2.”



Positive Displacement Model HPM High Performance Meter

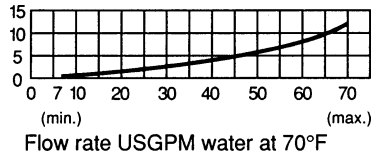
SPECIFICATIONS

Flow range: 1" – 7 to 70 gpm std.
2" – 15 to 150 gpm std.

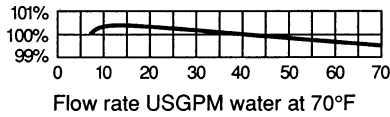
Repeatability: $\pm 0.1\%$

Pressure: 275 psi max.

Head Loss: For 1" meter



Accuracy: $\pm 0.5\%$ *



Temperature: 250°F max.

* = with R-15 Register

Materials:

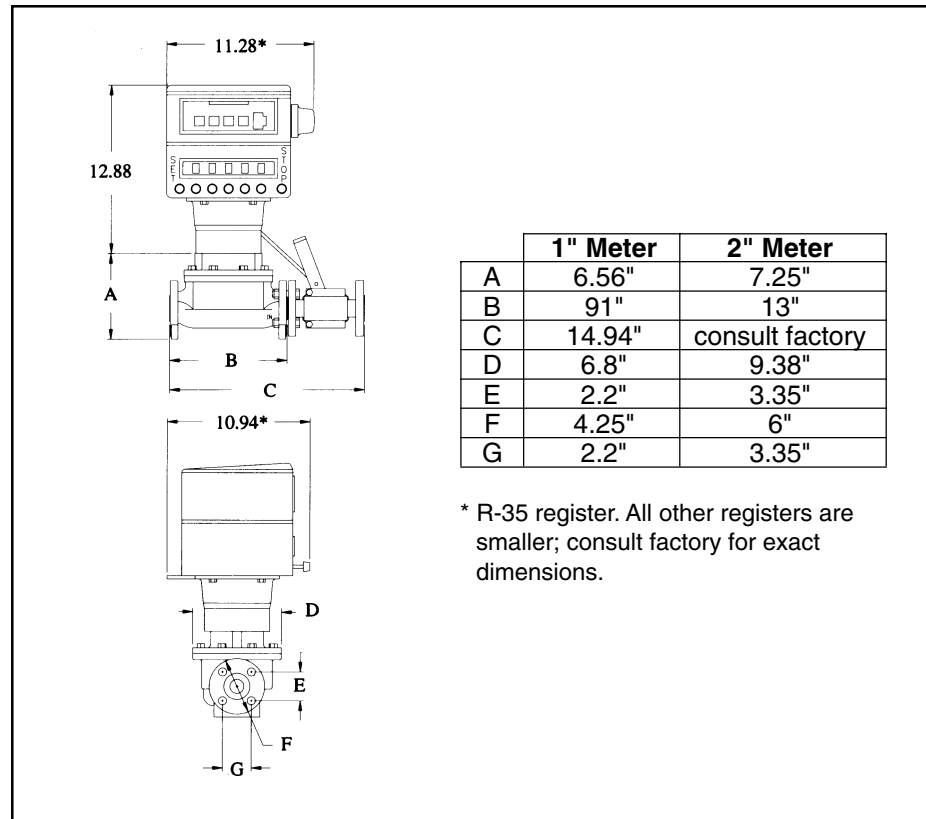
Construction: 316 SST std. Inconel, hastelloy, or monel available.

Seals: Teflon encapsulated silicone rubber

Piston: polyphenylene sulphide (PPS)

End connections: 1" and 2" ANSI flanges

Dimensions:

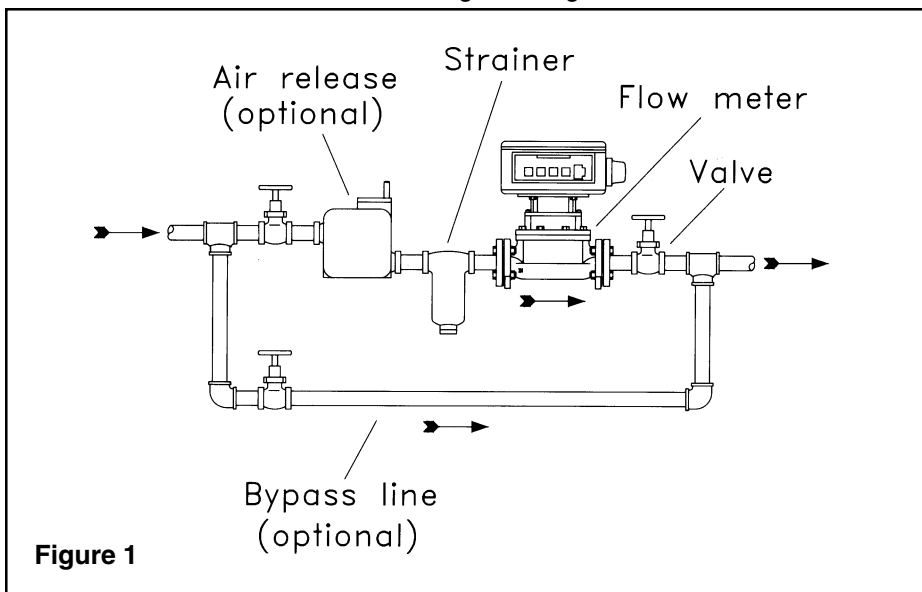


INSTALLATION

Notes:

- Plan the installation location where the meter can be mounted in a horizontal line and allow room for a strainer. An air eliminator is optional.

For flow systems that cannot be shut down, install valves and bypass lines so that it is possible to continue flowing while the strainer is cleaned or the meter or air eliminator are serviced. This is also useful to eliminate the need to drain the entire line before servicing. See Figure 1.



- Gas or air present in the liquid will be registered by the flowmeter as liquid. To resolve this problem, an air eliminator (also known as a gas separator, air separator, and deaerator) may be installed upstream of the flowmeter. Proper sizing should be observed. Placement of the air eliminator should be as close to the flowmeter as possible.
- The HPM is machined to close tolerances for greater accuracy. Because of the close tolerances of the flowmeter, caution must be taken to prevent dirt, particulate, or entrained solids in the fluid from entering the meter.

Step 1: To clean the lines of debris, install a spool-piece (length of pipe) in place of the flowmeter. The meter will be installed in there later. The HPM flowmeter should be mounted in a horizontal line. The flat side of the meter flanges should be facing downward without tilt. There is no upstream or downstream piping requirement. See Figure 1.

Step 2: Install a 60 mesh strainer as close to the inlet side of the meter as possible. Locate the strainer where it can be easily serviced and cleaned at regular intervals. Note: Wear to the measuring chamber or internal parts caused by no strainer or a strainer of improper size will not be covered by the Niagara standard warranty.

Step 3: Flow should be run until it is certain that the lines are cleared of debris. Steam cleaning with the meter in-line will damage the flowmeter due to temperature extremes and by running the meter at a higher volume capacity than it was designed to run.

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Step 4: Install the flowmeter in place of the spool-piece. Make sure that the inlet and outlet of the meter are aligned properly with the flow stream. The flow meter is marked with an "IN" on the body casing.

Step 5: Fill the line slowly to expel air. In new installations, clean the strainer frequently.

MAINTENANCE

Although there is not a maintenance schedule, the HPM flowmeter, like all positive displacement flowmeters, is subject to deterioration due to wear, corrosion, and abrasion that will affect the high tolerance parts. The meter may need to be inspected periodically for worn parts. Replacement parts are available, as is recalibration service.

If the flowmeter becomes plugged, it should be completely disassembled and cleaned thoroughly. It may not be necessary to remove the HPM completely from the line. In many cases, the measuring chamber may be cleaned by simple removal of the lid. When replacing the lid, make sure the gasket is in place and that there are no impurities between the gasket and sealing surfaces.

Cleaning of the strainer should be a regularly scheduled practice to insure clean fluid through the flowmeter.

TROUBLESHOOTING

No Flow Indication When Flow Exists

- Meter bypass lines are not closed.
- Mechanical register may have seized due to freezing.
- Defective register.
- Defective magnetic drive assembly inside meter.

Reduced or Nonexistent Fluid Discharge

- Leaky valves in bypass line.
- Blocked or frozen strainer.
- Debris inside flowmeter causing sticking.
- Worn control roller, diaphragm plate, or piston in flowmeter.
- Damaged/rough interior meter surfaces due to dirt or grit in flow medium.

Leakage at Meter Casing/Lid

- Loose bolts.
- Damaged O-ring due to excessive pressure.
- Debris between O-ring and sealing surfaces.

Inconsistent Over-Registration

- Air or gas in fluid.

Inconsistent Under-Registration

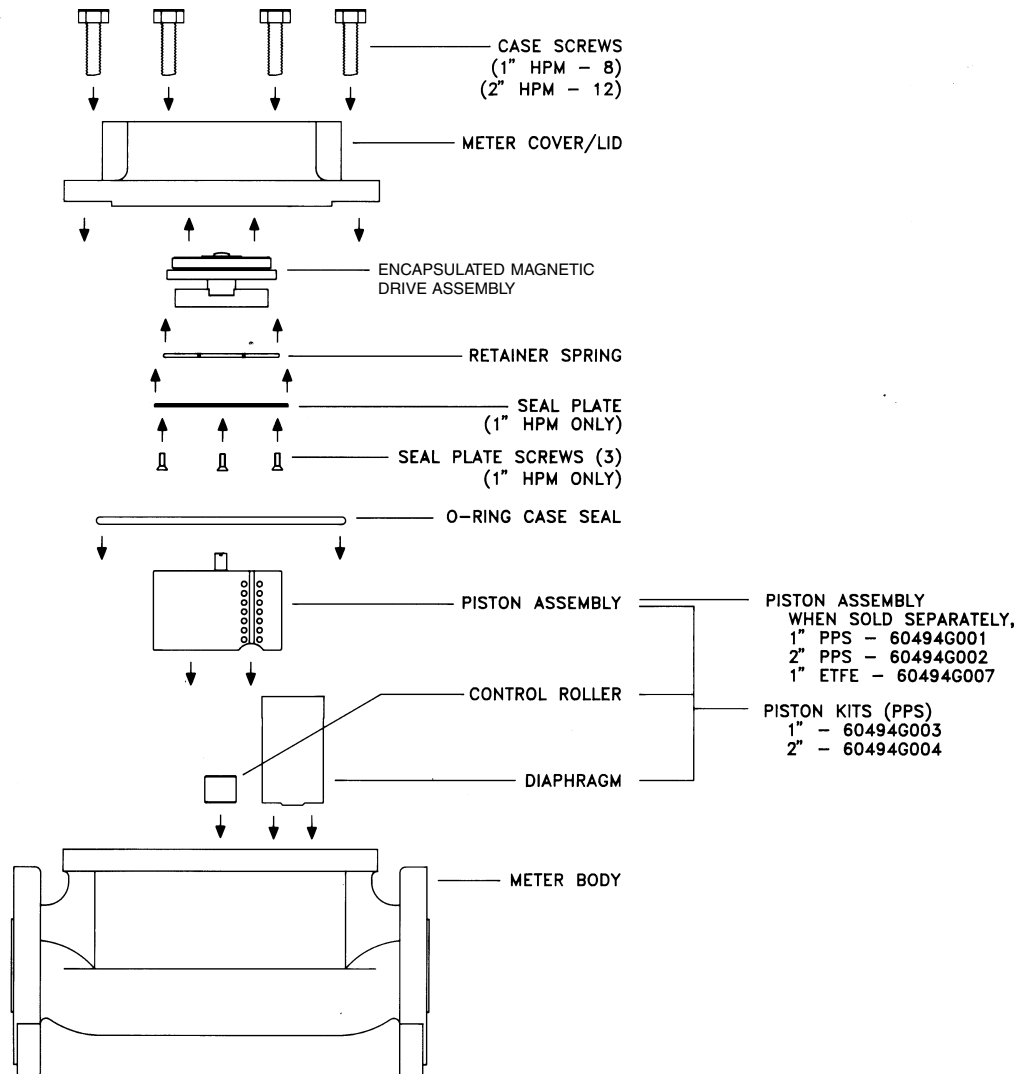
- Leakage around flowmeter due to bypass piping.
- Badly worn flowmeter internals.
- Damaged flowmeter casing.
- Debris in measuring chamber.
- Suspended solids in fluid medium too large.

Consistent Over or Under-Registration

- Flowmeter in need of recalibration.

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REPLACEMENT PARTS



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