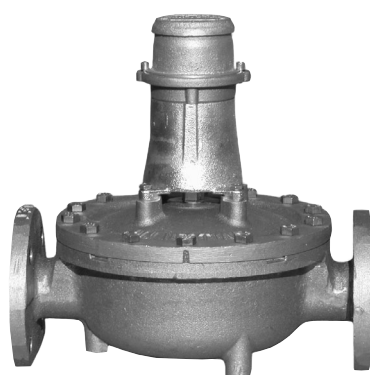


RED SEAL MEASUREMENT

25 mm (1 in), 38 mm (1-1/2 in) & 50 mm (2 in) TYPE S FLOWMETERS WITH MODEL 157 AND 800 SERIES REGISTERS



1-1/2" Type S with
Model 157 Register



1" Type S with
Model 832 Register

- * **Nutating Disc Positive-Displacement Disc Principle**
- * **Ideal for Continuous Operation**
- * **Change Gears for Positive Calibration**
- * **Repeatability $100 \pm 0.1\%$ of Rate**
- * **Minimal Maintenance**
- * **Compatible with Hundreds of Non-Acidic Liquids**

SPECIFICATIONS

DESCRIPTION

The 1", 1-1/2", and 2" Type S flowmeters utilize the nutating disc positive displacement measuring chamber technology. This design results in an extremely accurate flowmeter that is insensitive to small changes in viscosity and flow profile disturbances. Each flowmeter includes a base unit, that houses and protects the measuring chamber, and a gear train. Registers provide reset of delivery and totalization. A wide variety of pulse transmitters permit remote operation and monitoring.

DESIGN FEATURES

SUSTAINED ACCURACY

The Type S nutating disc measuring chamber is both accurate ($100\% \pm 1.0\%$) and dependable, with repeatability of $100 \pm 0.1\%$. For specific flow ranges, accuracies of $100\% \pm 0.5\%$ are easily obtained. In addition, the disc design permits accurate measurement of liquids with non-abrasive, solid particles (up to 0.22 mm/0.009 in.) without major damage or erosion to the measuring chamber for intermittent (i.e., batching) operations.

FLEXIBILITY

The rugged bronze outer body components are compatible with hundreds of non-acidic liquids. Flanged

end connections allow rapid conversion from right to left hand flow. Pulse transmitters, when used with the BATCHMATE (electronic batch control) and a locally acquired solenoid valve, result in an economical and dependable local or remote batching system.

LONG SERVICE LIFE

Rugged construction of Type S flowmeters assure a system that is simple to operate and economical to use. Furthermore, Type S flowmeters have been proven through more than 100 years of manufacturing experience.

EASE OF MAINTENANCE

Type S flowmeters do not require elaborate timing gears or difficult adjustment procedures. Replacement of a worn or damaged measuring chamber, gear train, or register is both simple to accomplish and requires minimal time.

POSITIVE AND ACCURATE REGISTRATION

Positive adjustment through our patented calibration (change) gears allow changes down to 0.15% increments and reduce errors caused by vibration and tampering.

MECHANICAL PRESET VALVES

Single and double-stage mechanical auto-stop valves are available for all 1", 1-1/2", and 2" Type S Flowmeters. They must accompany an appropriate 800 Series mechanical preset register.

Single Trip preset valves are either fully open or fully closed. They may be specified for flow rates up to 190 LPM (50 GPM) where hydraulic shock is not a factor. Single trip valves are also used with larger flowmeters to measure liquids that have viscosities over 10,000 SSU/1400 cPs.

Double Trip preset valves permit controlled valve closing. Controlled valve closing reduces the potential for hydraulic shock on both the dispensing lines and the meter itself. Double trip valves are recommended when measuring liquids with viscosities less than 10,000 SSU/1400 cPs that have either high operating pressures or flow rates exceeding 190 LPM (50 GPM).

Preset valves should be mounted on the meter outlet in order to keep the flowmeter full and to maintain accuracy. A fine mesh line strainer should be installed upstream of the flowmeter and valve combination. The purpose of the strainer is to prevent foreign particles from damaging both the measuring chamber in the flowmeter and the piston/cylinder assembly in the preset valve.



2" Type S with 800 Series Register and Auto-Stop Valve

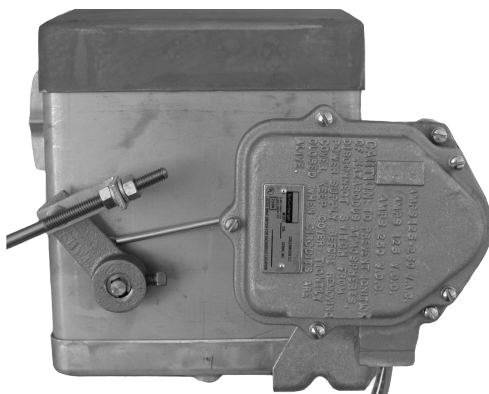
MECHANICAL REGISTER SWITCHES

Model 23 Auto-Switches are micro switch devices that attach to 800 Series Preset Registers. They control pump and/or solenoid valves that are used in place of mechanical auto-stop valves. Upon completion of delivery, the auto-switch provides contact closures to close the valve stages and finally de-energize the pump. This orderly system shutdown reduces wear, saves energy, and alleviates hydraulic shock on the system.

Model 23A switches are Double-Pole Double-Throw (DPDT). They provide two (2) switch closures for 2-stage valve shut down, with the final closure de-energizing.

Model 23B switches are Single-Pole Double Throw. They provide one (1) switch closure for single stage valve shut down and pump de-energizing.

Both Models 23A and 23B switches are U.L. listed for hazardous location usage Class I, Group D; at 15 amps at 125 to 250 VAC; 0.5 amps at 125 VDC; and 0.25 amps at 250 VDC.



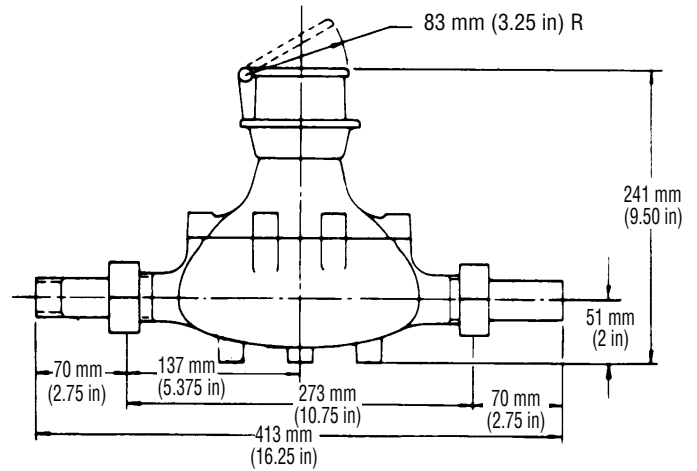
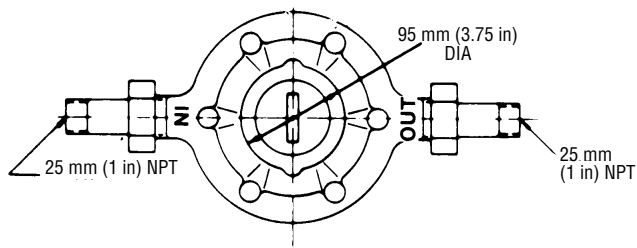
Model 23 Auto-Switch on Back of 800 Series Preset Register

FLOWMETER OPERATING SPECIFICATIONS

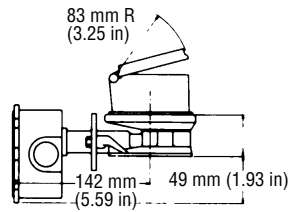
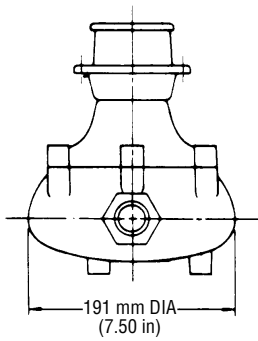
| CATEGORY | | 1" TYPE S | 1-1/2" TYPE S | 2" TYPE S |
|--|-------------------------------|--|---|--|
| METER | Type of Measuring Element | Positive Displacement Double Case Nutating Disc | | |
| | End Connections (Threaded) | 1-1/4" NPT threaded coupling with Model 157 Register | Not Applicable | |
| | End Connections (Flanged) | 1-1/2", 2 bolt oval, 150# w/800 Register | 2", 4 bolt round, 125# | |
| | Temperature Rating (T Max) | 121°C (250°F) | | |
| | Pressure Ratings | 10.34 bar (150 psi) @ 121°C | 8.6 bar (125 psi) @ 121°C | |
| | Flow Range (Q Max) (Q Min) | 189 LPM (50 GPM) 19 LPM (5 GPM) | 379 LPM (100 GPM) 38 LPM (10 GPM) | 616 LPM (160 GPM) 62 LPM (16 GPM) |
| | Totalized Units | 10 Litres, 10 Kilograms, 10 Pounds, 1 US Gallon, or 10 US Gallons | | |
| | Enclosure Class | Totally mechanical. If interfaced with a pulse transmitter, the rating of the device applies. | | |
| | Power Supply | None, unless fitted with a pulse transmitter, then the rating of the installed device applies. | | |
| | Main Body Material | Bronze (over 75% Cu) | | |
| | Main Body Cover Material | Bronze (over 75% Cu) | | |
| | Nutating Disc | 1" Glass Phenolic, 1-1/2" & 2" Ryton | | |
| | Shaft Material | Stainless Steel | | |
| | Packing Gasket Material | Viton, Klingersil | | |
| | Type of Coupling | Mechanical | | |
| | COUNTER AND OPTIONS | Register Type | Model 157 Register: 800 Series Register: | Non-Resettable, 7 digit Totalizer Capacity: Totalizer 9999999 Resettable (5 digit), 8 digit Totalizer Capacity: Totalizer 99999999: Reset 99999 |
| Alternate Units of Measure | | Only with pulse transmitter and BATCHMATE (Batch Control Computer) | | |
| Auto Stop Valve | | Single and Double Trip (Mechanical) | | |
| Switch a. Single Stage b. Double Stage | | Model 23B Model 23A | | |
| Transmitter Type | | Consult Form TS-510 | | |
| Transmitter Output | | Consult Form TS-510 | | |
| Strainer Size and Mesh | | Recommend 20 mesh minimum | | |
| | | | | |
| Manufacturer | | Red Seal Measurement | | |
| Model Number | | TS100 | TS150 | TS200 |

DIMENSIONAL DATA

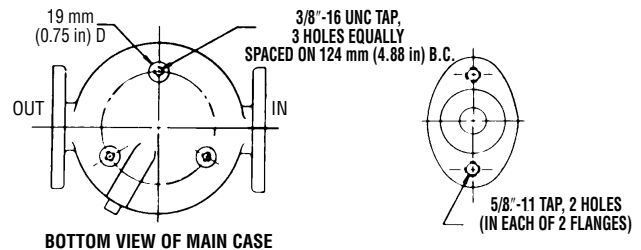
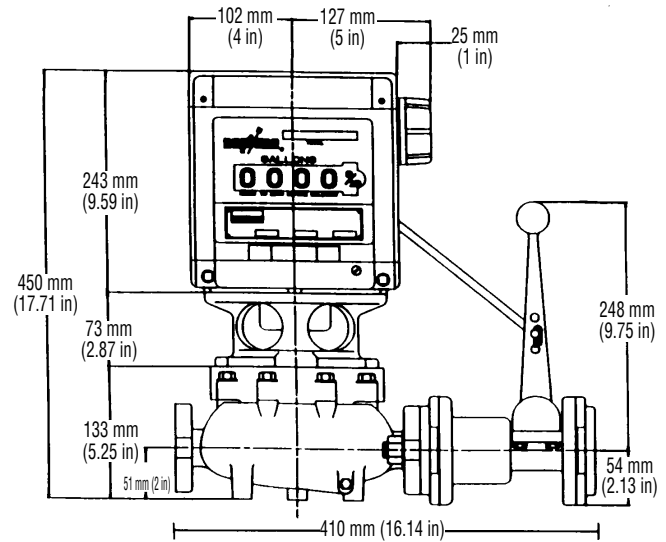
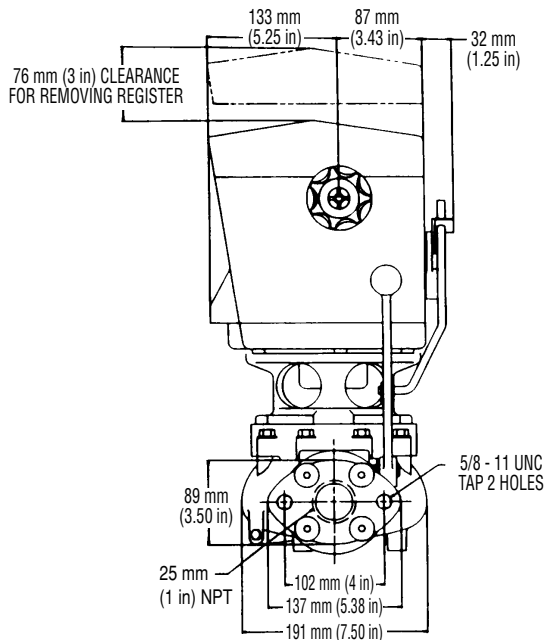
25 mm (1 in) Type S with Model 157 Register



Model 157 Register with Pulse Transmitter



25 mm (1 in) Type S with 800 Series Register

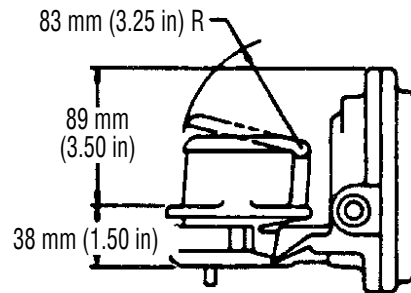
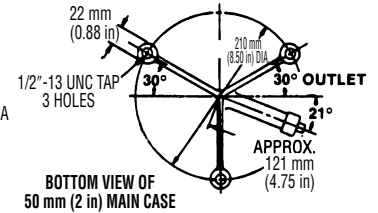
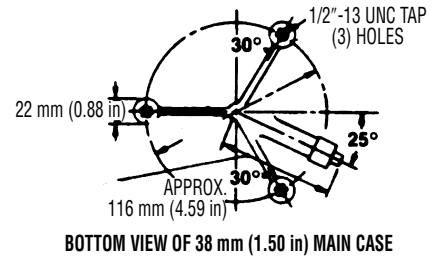
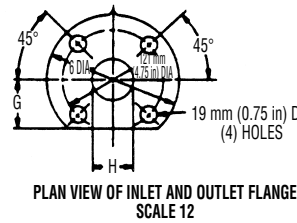
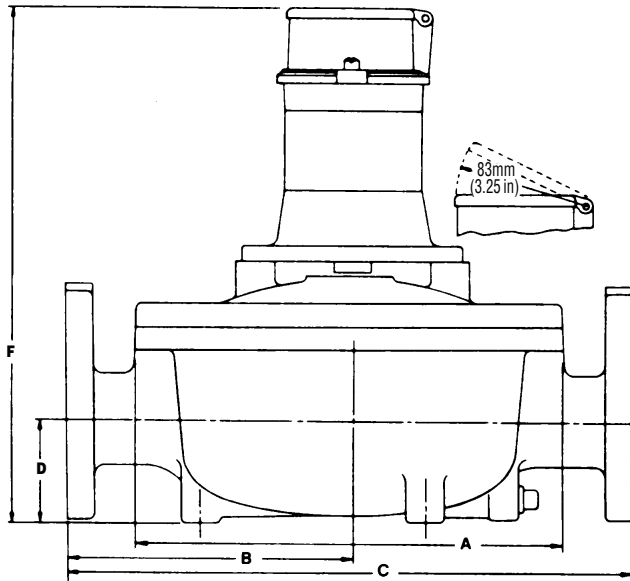


DIMENSIONAL DATA

DIMENSIONS - Millimeters (Inches)

38 mm (1-1/2 in) and 50 mm (2 in) Type S with Model 157 Register

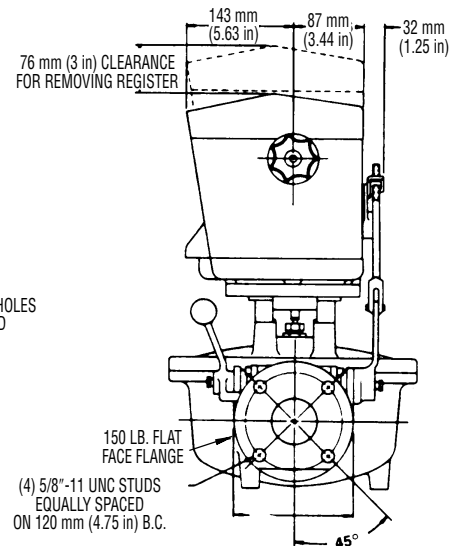
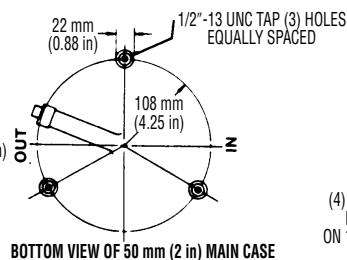
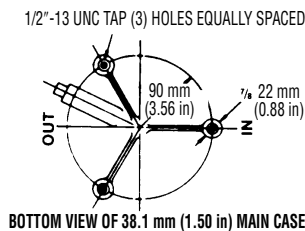
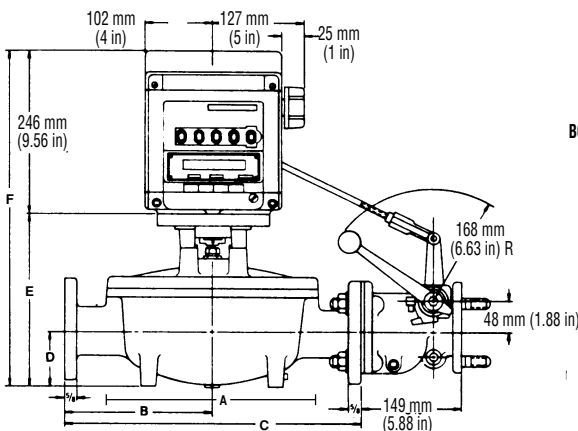
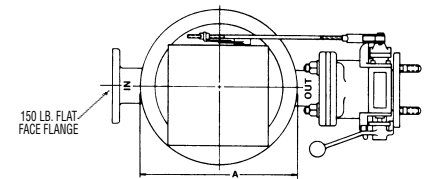
| Flowmeter Size | A | B | C | D | E | F | G | H | Weight kg (lb) |
|-------------------|----------------|---------------|-------------|--------------|---|----------------|--------------|----------------|-------------------|
| 38 (1-1/2) | 256 (10.06) | 165 (6.50) | 330 (13) | 60 (2.38) | — | 442 (17.38) | 65 (2.56) | 44.5 (1.75) | 21.3 (47) |
| 50 (2) | 311 (12.25) | 216 (8.50) | 432 (17) | 91 (3.60) | — | 473 (18.63) | 59 (2.31) | 54 (2.12) | 32.7 (72) |



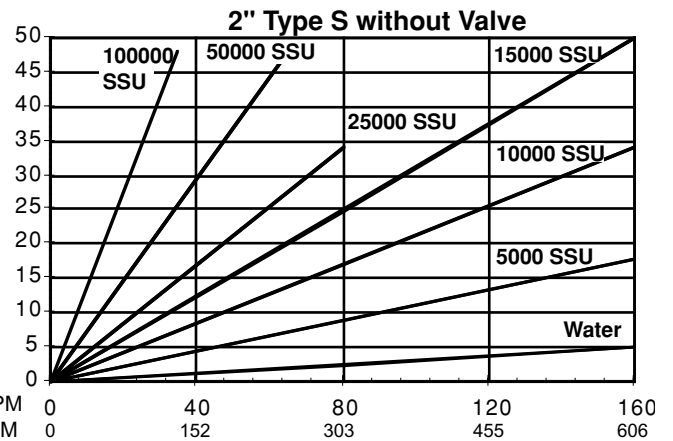
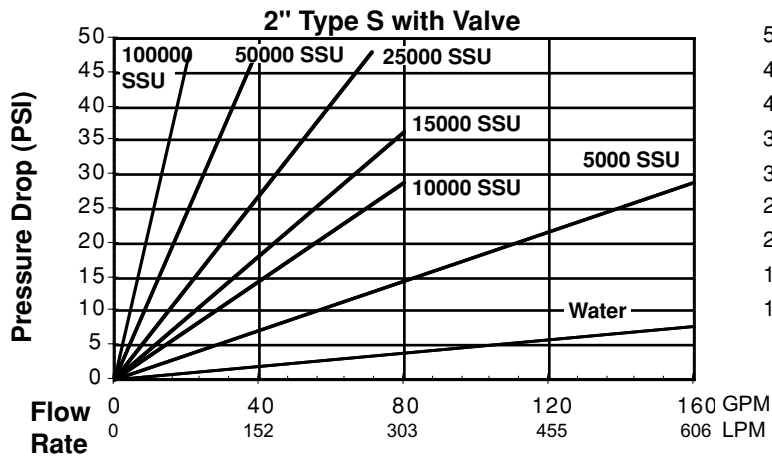
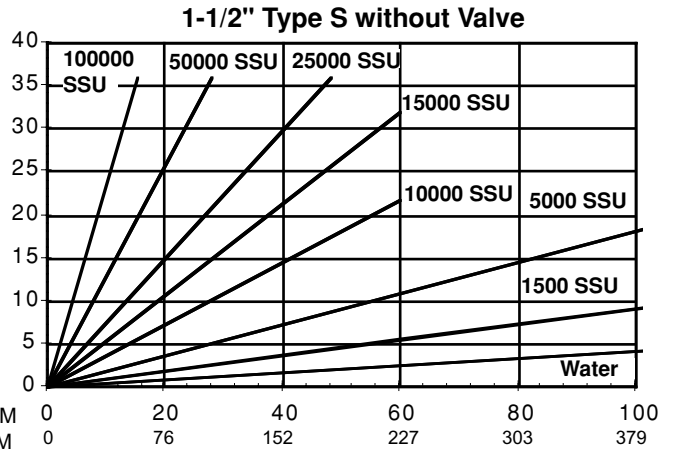
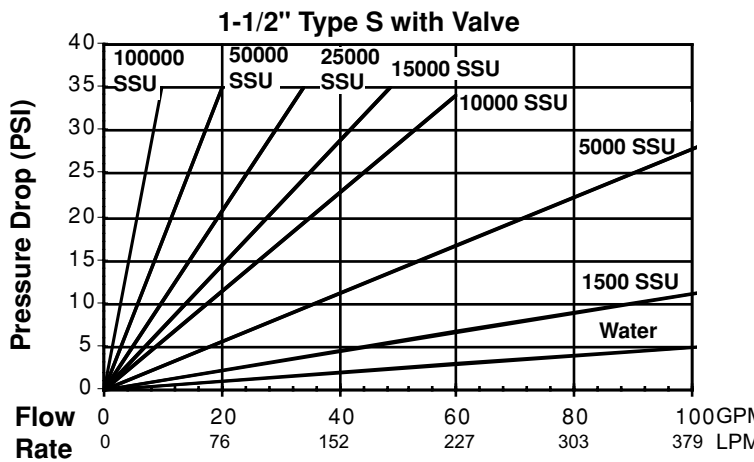
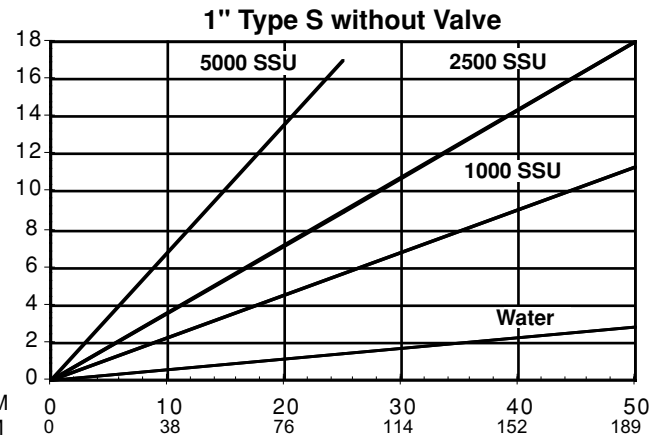
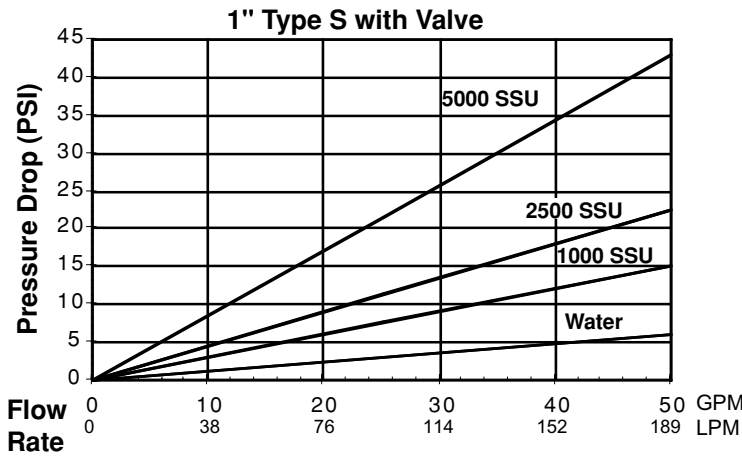
MODEL 157 WITH IMPULSE SWITCH

38 mm (1-1/2 in) and 50 mm (2 in) Type S with 800 Series Register

| Flowmeter Size | A | B | C | D | E | F | G | H | Weight kg (lb) |
|-------------------|----------------|---------------|-------------|--------------|---------------|----------------|--------------|--------------|-------------------|
| 38 (1-1/2) | 256 (10.06) | 165 (6.50) | 330 (13) | 60 (2.38) | 200 (7.88) | 441 (17.38) | 65 (2.56) | 44 (1.75) | 42.2 (93) |
| 50 (2) | 311 (12.25) | 216 (8.50) | 432 (17) | 91 (3.60) | 232 (9.13) | 480 (18.88) | 59 (2.31) | 54 (2.12) | 55.3 (122) |



Pressure Drop Versus Flow Rate



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MEASUREMENT**