

TS-106  
Rev. B  
Type S Magnetic Drive Flowmeters  
38.10 mm (1-1/2")  
50.80 mm (2")



## neptune® TYPE S MAGNETIC DRIVE (S/MD) FLOWMETERS



1 1/2" Type S/MD with 600 Series Register

- k **Positive-Displacement Disc Principle**
- k **Ideal for Continuous Operation**
- k **Change Gears for Positive Calibration**
- k **Accuracy  $\pm 1.0\%$  of Rate**
- k **Repeatability  $\pm 0.25\%$  of Rate**
- k **Minimal Maintenance**
- k **Compatible with Hundreds of Non-Acidic Liquids**
- k **No Dynamic Seals, Magnetic Coupled Drive Eliminates Leaks**

## SPECIFICATIONS

### DESCRIPTION

The 1-1/2" and 2" Type S Magnetic Drive (S/MD) flowmeters, with double case construction, utilize the nutating disc positive displacement measuring chamber technology. This design results in an extremely accurate meter which is insensitive to small changes in viscosity and flow profile disturbances. Each meter includes a base unit, which 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 Actaris nutating disc measuring chamber is both accurate and dependable, with repeatability of  $100 \pm 0.25\%$ . The disc design permits accurate measurement of liquids with 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.

### MAGNETIC DRIVE

The magnetic drive feature eliminates the use of a stuffing box and drive shaft gear train. Elimination of the

stuffing box and drive shaft gear train, enables measurement of difficult fluids such as salt brine and sugar, which tend to crystallize. Type S/MD flowmeters are an ideal selection for continuous operation because they substantially reduce leaks and measuring element clogging. Further, the external gear train and register may be serviced without flow interruption.

### 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 BATCH-MATE (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/MD flowmeters, along with continual design improvements, 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. The overall design of the Type S yields a meter with the ability to measure a wide variety of mildly corrosive liquids.

**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 very little time. Because of the magnetic coupling, the gear train can be serviced without removing the cover.

**POSITIVE AND ACCURATE REGISTRATION**

Positive adjustment through patented Neptune calibration (change) gears may allow changes down to 0.15% increments and reduce errors caused by vibration and prevents tampering. Additionally, the rangeability of most configurations exceed  $\pm 30\%$  with a single gear train.

**CONVERSION**

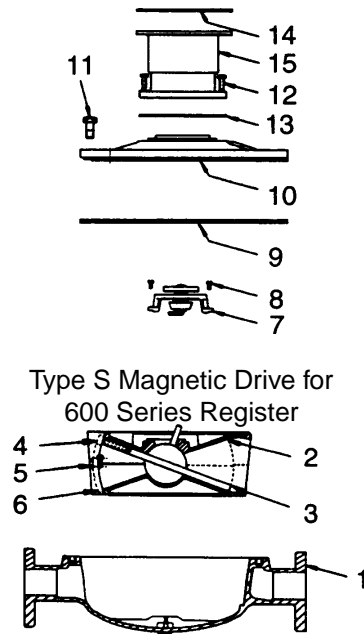
The magnetic drive conversion kit can be retrofitted to all 1-1/2" and 2" Type S flowmeters currently in the field, with either internal or external gear trains. Using only

conventional tools, field conversion is easily accomplished. Consult form P106 for 1-1/2" and 2" Type S Magnetic Drive Part's List

**ACCURACY**

All Actaris Type S/MD (1-1/2" and 2") flowmeters are functionally tested for proper operation, verified for accuracy, and calibrated to an approved unit of measure in accordance with Actaris operating procedures.

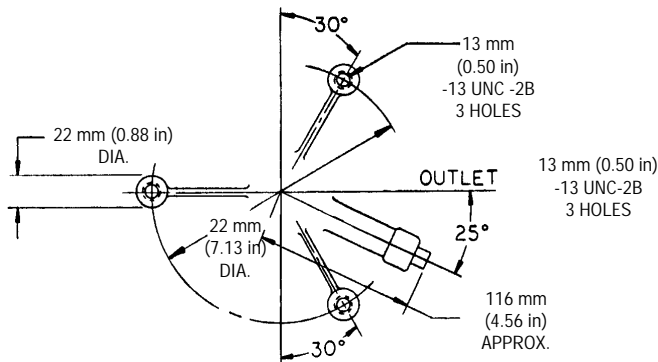
- Maximum error, based on a 10:1 turndown, shall not exceed  $\pm 1.0\%$ , as a percentage of rate for the entire flow range.
- For reduced variables (i.e., flowrange spreads, temperatures, pressures and high viscosities) accuracies of  $\pm 0.5\%$  or better may be obtained. Consult the Sales office with a completed Application Data Sheet (ADS) for each specific application.
- Repeatability is  $\pm 0.25\%$  of rate.



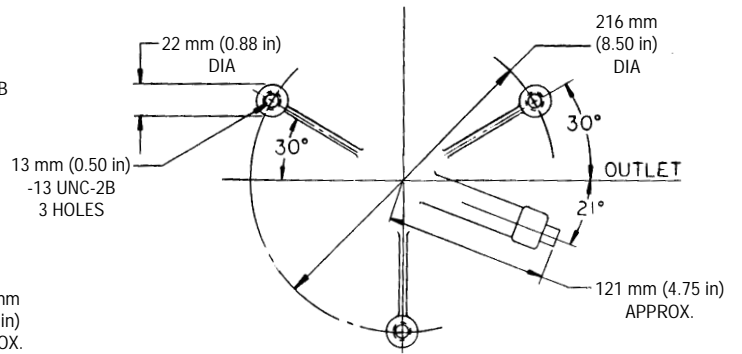
Index	Description	Index	Description
1	Main Case	9	Main case gasket
2	Measuring chamber with disc	10	Main case cover
3	Disc complete	11	Main case bolt
4	Thrust roller	12	Screw for 600 Series Register
5	Chamber assembling screw	13	Lower gasket
6	Thrust roller bearing plate	14	Upper gasket
7	Drive assembly for 600 Series Register	15	600 Series gear train
8	Screw		

## DIMENSIONAL DATA

**Bottom View of 1½" Main Case**



**Bottom View of 2" Main Case**



**DIMENSION A, Millimeters (Inches)**

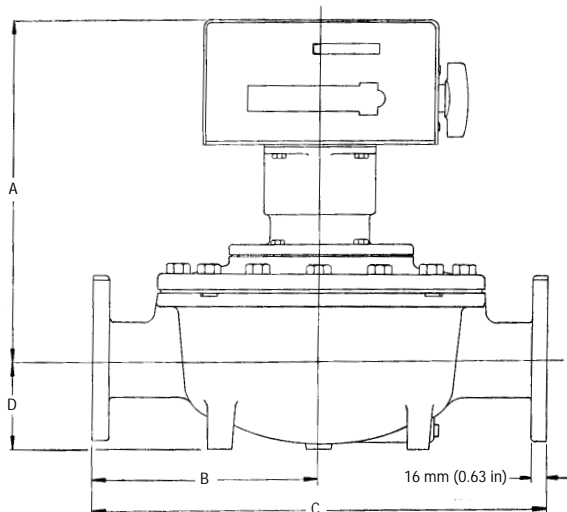
	1-1/2"	2"
<b>600 Series</b>	308 (12.13)	316 (12.44)

**DIMENSIONS B - G**

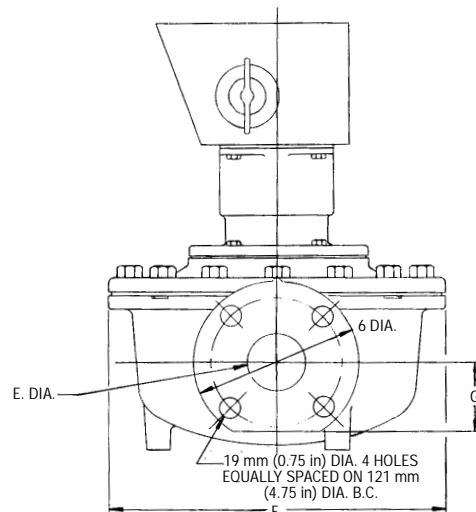
Millimeters (Inches)

	1-1/2"	2"
<b>B</b>	165 (6.50)	216 (8.50)
<b>C</b>	330 (13.00)	432 (17.00)
<b>D</b>	60 (2.38)	92 (3.63)
<b>E</b>	41 (1.63)	54 (2.13)
<b>F</b>	256 (10.06)	311 (12.25)
<b>G</b>	65 (2.56)	59 (2.31)

**1½" and 2" Type S/MD with 600 Series Register  
(Front View)**



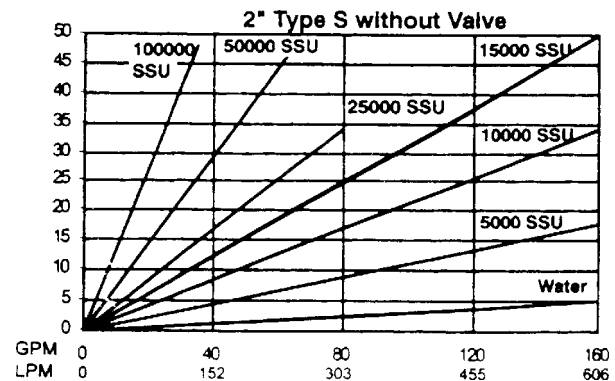
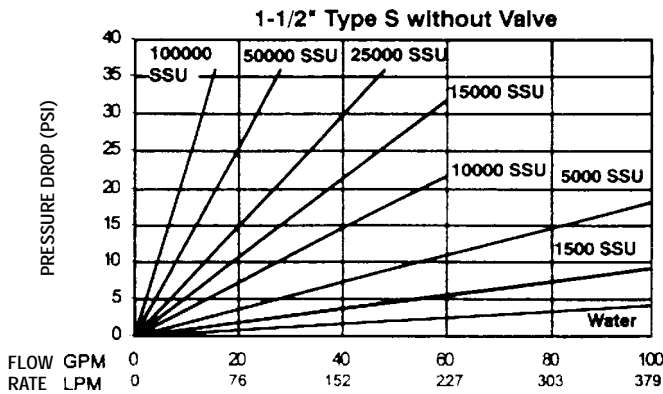
**1½" and 2" Type S/MD with 600 Series Register  
(Side View)**



## FLOWMETER OPERATING SPECIFICATIONS

CATEGORY	1-1/2" TYPE S/MD	2" TYPE S/MD	
METER	<b>Type of Measuring Element</b>		Double Case Nutating Disc
	<b>Measuring Chamber Displacement</b>		80.54 cc (49.1489 in <sup>3</sup> )      148.67 cc (90.2344 in <sup>3</sup> )
	<b>End Connections</b>		1-1/2" ANSI Compatible      2" ANSI Compatible
	<b>Temperature Rating (T Max)</b>		121°C (250°F)
	<b>Pressure Ratings</b>		8.6 bar (125 psi) @ 121°C
	<b>Flow Range (Q Max)</b>		379 LPM (100 GPM)      616 LPM (160 GPM)
	<b>(Q Min)</b>		38 LPM (10 GPM)      62 LPM (16 GPM)
	<b>Totalized Units</b>		10 Litres, 10 Kilograms, 10 Pounds, 1 US Gallon, or 10 US Gallons
	<b>Enclosure Class</b>		Totally mechanical. If interfaced with a pulse transmitter, the rating of the device applies.
	<b>Power Supply</b>		None, unless fitted with a pulse transmitter, then the rating of the installed device applies.
	<b>Main Body Material</b>		Bronze (over 75% Cu)
	<b>Main Body Cover Material</b>		Bronze (over 75% Cu)
	<b>Disc Piston</b>		Ryton
	<b>Shaft Material</b>		Stainless Steel
	<b>Packing Material</b>		None Required
	<b>Gasket Material</b>		Klingersil
<b>Type of Coupling</b>		Mechanical (Magnetic Drive)	
<b>Register Type</b>		Capacity: Totalizer 9999999 600 Series Register: Resettable (5 digit), 8 digit Totalizer Capacity: Totalizer 99999999: Reset 99999	
<b>Transmitter Type</b>		Consult Form TS-510	
<b>Transmitter Output</b>		Consult Form TS-510	
<b>Manufacturer</b>		<b>Actaris U.S. Liquid Measurement Division, Inc.</b>	
<b>Model Number</b>		<b>90004-9XX      90005-9XX</b>	

**PRESSURE LOSS DATA:**



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