

TS-106
Rev. A
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

- * Positive-Displacement Disc Principle
- * Ideal for Continuous Operation
- * Change Gears for Positive Calibration
- * Accuracy $\pm 1.0\%$ of Rate
- * Repeatability $\pm 0.25\%$ of Rate
- * Minimal Maintenance
- * Compatible with Hundreds of Non-Acidic Liquids
- * 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 Neptune 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 Actaris 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

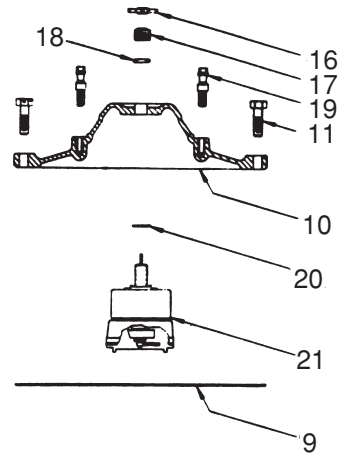
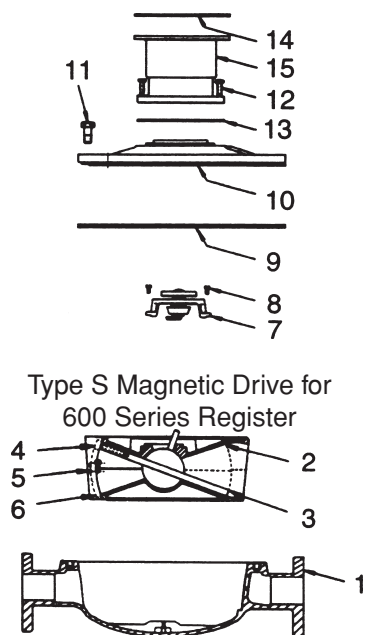
The magnetic drive conversion kit can be retrofitted to all 1-1/2" and 2" Type S flowmeters currently in the field, with either internal or external gear trains. Using only

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 Neptune 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 Neptune operating procedures.

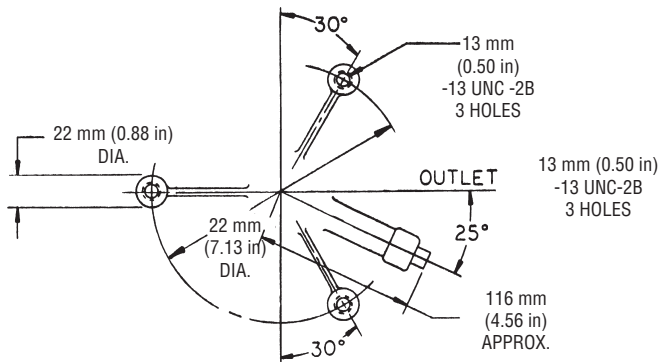
- Maximum error, based on a 10:1 turndown, shall not exceed $\pm 1.0\%$, as a percentage of rate for the entire flow range.
- For reduced variables (i.e., flowrange spreads, temperatures, pressures and high viscosities) accuracies of $\pm 0.5\%$ or better may be obtained. Consult the Sales office with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



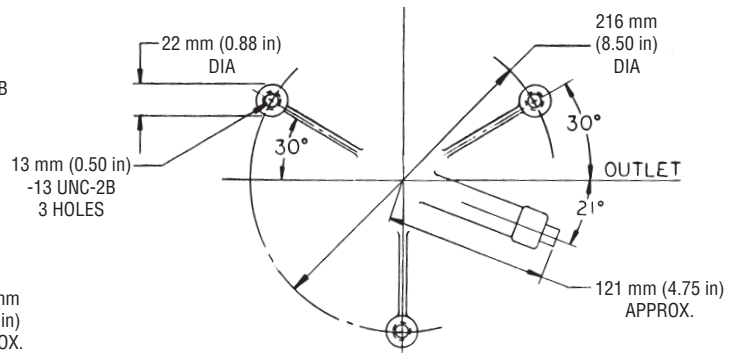
Index	Description	Index	Description
1	Main Case	12	Screw for 600 Series Register
2	Measuring chamber with disc	13	Lower gasket
3	Disc complete	14	Upper gasket
4	Thrust roller	15	600 Series gear train
5	Chamber assembling screw	16	Star connection with set screw
6	Thrust roller bearing plate	17	Stuffing box nut
7	Drive assembly for 600 Series Register	18	Gear train clamp nut
8	Screw	19	Register mounting stud
9	Main case gasket	20	Gear train gasket
10	Main case cover	21	Gear train
11	Main case bolt		

DIMENSIONAL DATA

Bottom View of 1½" Main Case



Bottom View of 2" Main Case



DIMENSION A, Millimeters (Inches)

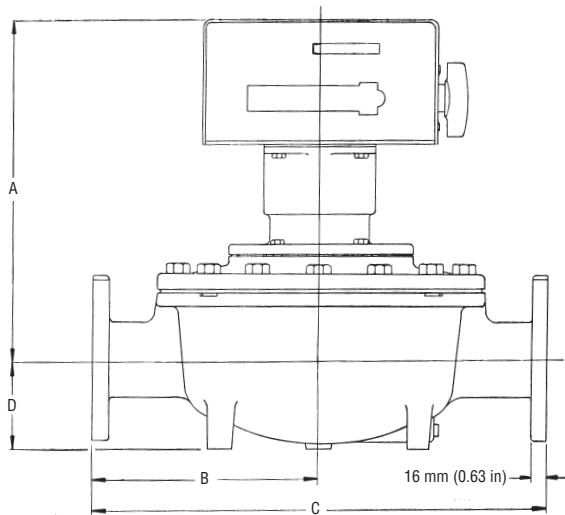
	1-1/2"	2"
600 Series	308 (12.13)	316 (12.44)

DIMENSIONS B - G

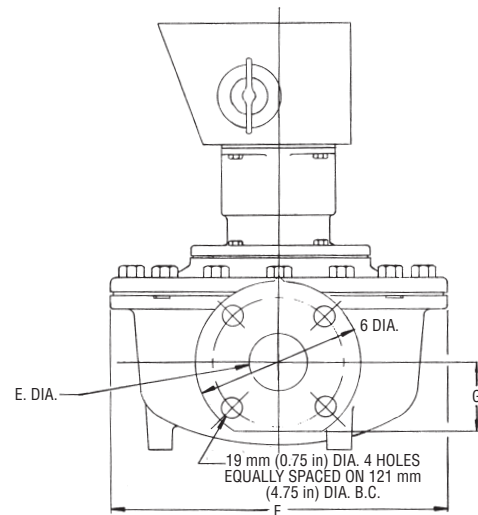
Millimeters (Inches)

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

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



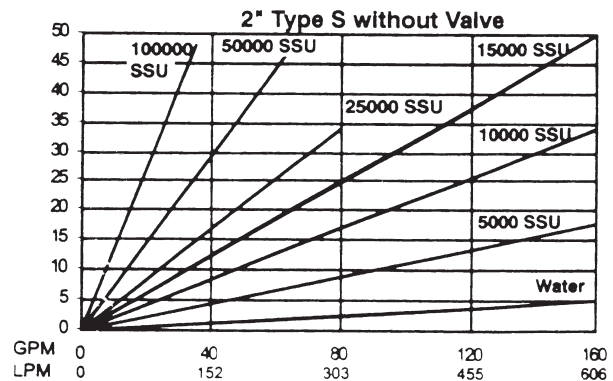
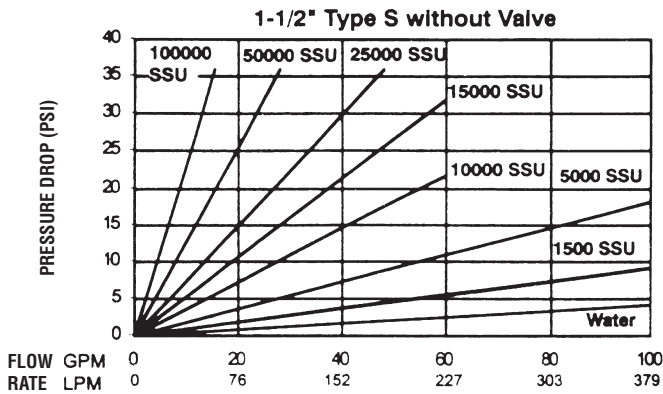
**1½" and 2" Type S/MD with 600 Series Register
(Side View)**



FLOWMETER OPERATING SPECIFICATIONS

	1-1/2" TYPE S/MD	2" TYPE S/MD	
METER	CATEGORY		
	Type of Measuring Element		
	Double Case Nutating Disc		
	Measuring Chamber Displacement	80.54 cc (49.1489 in ³)	148.67 cc (90.2344 in ³)
	End Connections	1-1/2" ANSI Compatible	2" ANSI Compatible
	Temperature Rating (T Max)	121°C (250°F)	
	Pressure Ratings	8.6 bar (125 psi) @ 121°C	
	Flow Range (Q Max)	379 LPM (100 GPM)	616 LPM (160 GPM)
	(Q Min)	38 LPM (10 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)	
	Disc Piston	Ryton	
	Shaft Material	Stainless Steel	
	Packing Material	None Required	
	Gasket Material	Klingersil	
Type of Coupling	Mechanical (Magnetic Drive)		
Register Type	Capacity: Totalizer 9999999 600 Series Register: Resettable (5 digit), 8 digit Totalizer Capacity: Totalizer 99999999: Reset 99999		
Transmitter Type	Consult Form TS-510		
Transmitter Output	Consult Form TS-510		
Manufacturer			
Actaris Neptune Liquid Measurement Division			
Model Number			
	90004-9XX	90005-9XX	

PRESSURE LOSS DATA:



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