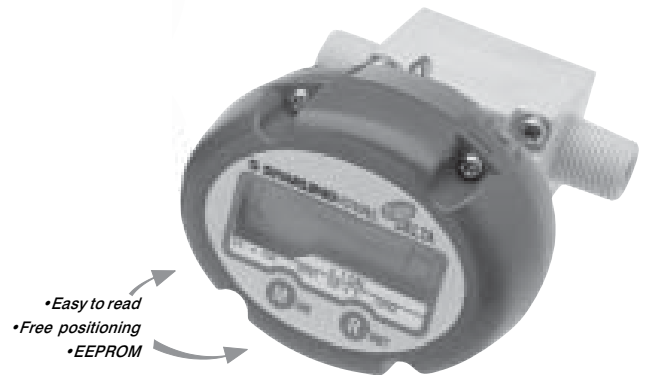


Vortex Eggs Delta Flowmeter Technical Specifications

(Liquid, Gas & Air)

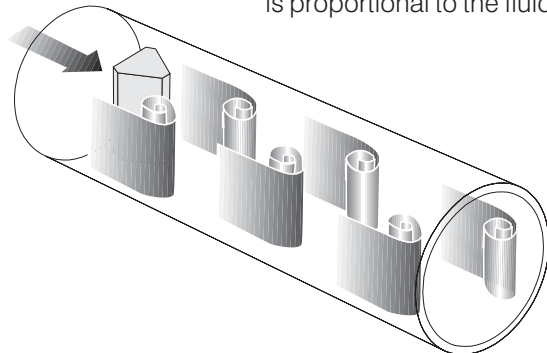


DESCRIPTION

The unique sensor body and transmitter design makes Eggs DELTA one of the most compact, light weight vortex meters in the industry. The injection molded design provides a smooth surface for cleanliness and better chemical compatibility. It is an ideal measurement and monitoring device for most gases, liquids and air applications.

PRINCIPLE OF OPERATION

The Eggs DELTA measures flow rate based on Karman's vortex shedding principle. The stationary trapezoidal object (bluff body) placed into the path of the flow stream sheds vortices downstream at a frequency proportional to the velocity of flowing media. A piezo-electric sensor detects the vortices and creates electrical impulse signals which is proportional to the fluid flow rate.



APPLICATIONS

The simple unique construction without any moving parts enables Eggs DELTA to measure liquid, air and gas flow measurements with very little head loss.

Common applications include:

- deionized water (RO/DI skids)
- ultra pure water distribution in medicare, biotech, semiconductor and pharmaceutical market segment
- chemical feed
- air consumption control in compressed air distribution systems
- gas flow (nitrogen, oxygen, argon, etc) measurements and monitoring.
- sanitary cleaning process flow
- cooling water
- (PPS) polyphenylene sulphide material is compatible with nearly all gases & liquids

STANDARD FEATURES

- Sizes include 1/8", 1/4", 1/2" and 1" with injection molded plastic construction.
- Single molded one-piece meter and bluff body construction with no moving parts.
- Instantaneous flow rate totalizer.
- NEMA-4X enclosure.
- Optional 4-20mA or pulse output with external power.
- Each unit is **battery powered**, which eliminates the need of an external power source and saves wiring and installation cost. The meter will provide a low battery display in case meter needs battery replacement.
- Unique coupling design allows "**Free Positioning**" of the transmitter for ease of reading regardless of meter body orientation.
- Each meter has built in **EEPROM** which stores meter parameters and totalizer reading.
- **Two separate totalizers with one reset switch** keeps the count of individual readings. Two separate indicators display the flow rates in GPM and GPH as required.

HOW TO ORDER EGGS DELTA

Base Model Number	
FLM	Eggs DELTA
Applicable Fluids	
2	Liquid
3	Gas
Size	
S	1/8" (4mm)
0	1/4" (8mm)
1	1/2" (15mm)
2	1" (25mm)
Indicator	
1	with indicator/totalizer
Output	
0	None (battery drive)
1	Factored pulse
2	Analog (4-20mA on full scale)
Construction	
W	NEMA-4X
Accessories	
NPT Threaded Adapters (PVC)	
NPT Threaded Adapters (PPS)	

FLM _ _ -- _ _ _ _

GENERAL SPECIFICATIONS

Accuracy:	± 1% full scale on 1/2" & 1" (liquid only) ± 3% full scale
Repeatability:	± .5% full scale
Process Fluid:	-4°F to +176°F
Ambient Temp:	-4°F to +140°F
Max. Operating Pressure:	150 psi
Flow Ranges:	See Tables
Pressure Loss: (PSI)	Water: .05 - 4.56 (1/8"), .018 - 5.04 (1/4" - 1") Air: .02 - 0.103 (1/8"), .009 - 0.22 (1/4" - 1")
Construction Material:	PPS (Polyphenylene sulphide)
Display:	• 8 digit totalizer with two separate 4 digit indicators showing flow rate per hour and minute • 7 digit reset totalizer
Output:	
4-20mA output:	True two wire requiring external power supply - 12-45 VDC (Use 4 conductor shielded cable)
Scaled electronic Pulse:	Three wire system requiring external power supply Pulse width: 30 ms Allowable max. current: 20 mA Max. voltage impressed: 30V
Power:	Battery (3.6V lithium) powered if no output (other than display of rate or totalizer) is required (4 years of life at room temperature, also provide power reduction alarm)
External Power Supply:	12-45 VDC required for 4-20mA or scaled pulse output
Enclosure rating:	NEMA-4X
Process Connections:	NPT threaded adapters: R 3/8 - 19.....1/8" NPT female R 1/2 - 14.....1/4" NPT female R 3/4 - 14.....1/2" NPT female R1 1/4 - 11.....1" NPT female

FLOW RANGES

Table 1 - Liquids (gallons per minute)

Size	Model # Indicator	Flow Rate	Totalizer (scaled pulse output)	Min. Flow (4mA)	Max. Flow (20mA)
1/8" (4mm)	FLM2S	x.01 gpm	x .01 gallons	.105	1.05
1/4" (8mm)	FLM20	x.01 gpm	x .01 gallons	.31	3.96
1/2" (15mm)	FLM21	x 0.1 gpm	x 0.1 gallons	.75	11.44
1" (25mm)	FLM22	x 1 gpm	x 1 gallon	2.20	35.14

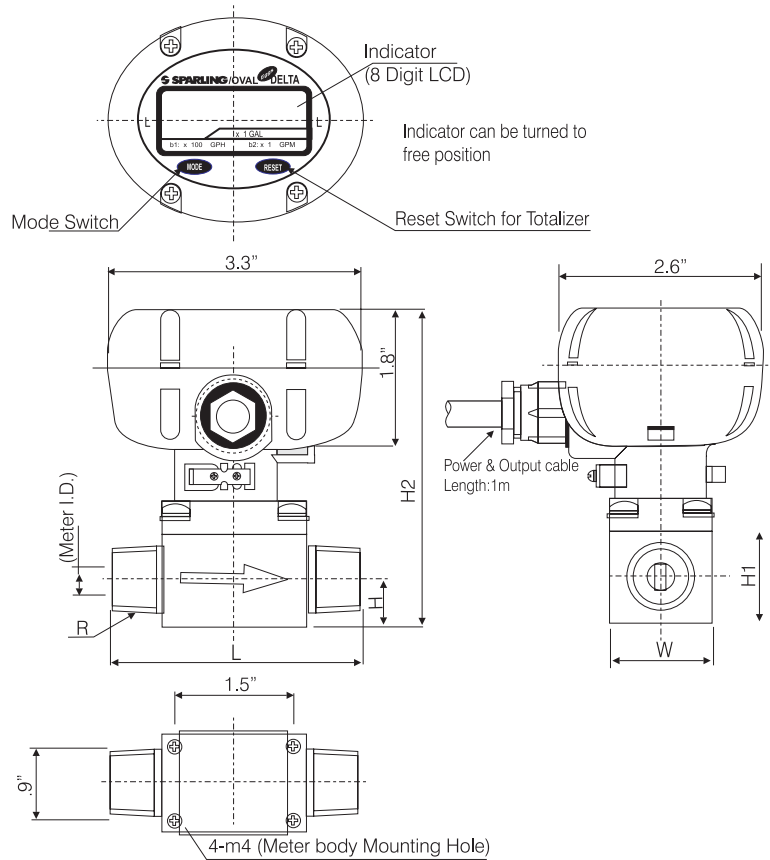
Above table is based on water measurements at 70°F measurement

Table 2 - Air / Gas (standard cubic feet per minute)

Size	Model # Indicator	Flow Rate	Totalizer (scaled pulse output)	Min. Flow (4mA)	Max. Flow (20mA)
1/8" (4mm)	FLM3S	x .01 scfm	x .001 scf	.254	.59
1/4" (8mm)	FLM30	x 0.1 scfm	x .01 scf	.65	3.178
1/2" (15mm)	FLM31	x 1 scfm	x 0.1 scf	1.94	8.994
1" (25mm)	FLM32	x 1 scfm	x 1 scf	5.9	30.176

Above table is based on air measurements at 68°F and atmospheric pressure (14.7 psia)

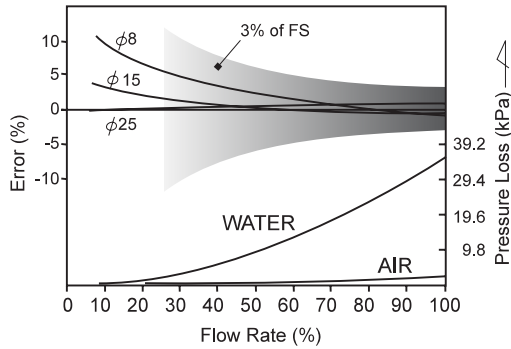
Flow range may vary under different process conditions such as density and viscosity of the process fluid.



Model	Size	Meter I.D.	L in.	W in.	H1 in.	H2 in.	*L in.	H in.
FLM_S	1/8" (4mm)	4mm	3.15	1.26	1.14	4.02	5.12	.57
FLM_0	1/4" (8mm)	8mm	3.15	1.26	1.14	4.02	5.12	.57
FLM_1	1/2" (15mm)	14mm	3.35	1.26	1.14	4.02	5.12	.57
FLM_2	1" (25mm)	24.5mm	4.72	1.81	1.81	4.69	7.48	.906

*L = with adapters

Meter Error & Pressure Loss



REYNOLD'S NUMBER

A Reynolds Number is a dimensionless number used to determine the effects of viscosity, specific gravity and velocity on flow sensor performance. To maintain system accuracy, a Reynold's Number greater than 3,000 is required.

N_R = Reynold's Number:

$$N_R = \frac{V \times D}{S}$$

V - velocity in ft./sec.

D - inside diameter (in ft.)

S - kinematic viscosity in centistoke

EGGS DELTA-PULSE TYPE



- **Applications:** liquid, gas & air
- **Sizes:** 1/8", 1/4", 1/2" and 1"
- **Temp. Range:** -4°F to +140°F
- **Accuracy:** $\pm 3\%$ of full scale
- **Power:** 12-45 VDC

Eggs Delta-Pulse is a light weight, small, low cost flow monitoring vortex meter made out of PPS resin. Its simple design and material makes it suitable for a wide variety of flow applications. It has no moving parts and the injection molded design provides a smooth surface for cleanliness and better chemical compatibility.

(Ask for PDS-FLP for specifications)

EX DELTA SERIES



Smart EX DELTA WAFER OR FLANGED WITH FIXED OR REPLACEABLE SENSOR



- **Applications:** gas, steam, air or liquid
- **Sizes:** 1/2" - 6" (wafer), 2" - 12" (flanged with fixed or replaceable sensor) 150 & 300 psi
- **Temp. Range:** max 788°F
- **Accuracy:** $\pm 1\%$ of rate
- **Power:** battery powered with no outputs or 12-45 VDC with 4-20mA or pulse

Rugged yet simple construction in wafer or flanged end connections with fixed or replaceable sensor. Unique bluff body design with piezo-electric sensor has no moving parts and provides complete isolation of sensor from process fluid. Unit is available as loop powered for different outputs or battery powered with local display of rate or totalization. The EX DELTA DIA is also available for dirty liquid applications where sensor is located apart from the bluff body for isolation from any build up.



Smart EX DELTA INSERTION TYPE

- **Applications:** gas, steam & liquid
- **Sizes:** 8" - 80" (fixed type) & 16" - 80" (hot tap type)
- **Temp. Range:** -14°F to 572°F
- **Accuracy:** $\pm 2\%$ of full scale
- **Power:** battery powered with no outputs or 12-45 VDC with 4-20mA or pulse

Insertion vortex meters are a low cost alternative to in-line flow meters. The probe with a piezo-electric sensor and bluff body is inserted in the pipeline and detects the velocity in the line to obtain a total flow rate. Sparling not only offers fixed type, but hot tap type installation where in-line measurements of a continuous vital process where the flow cannot be interrupted.



4097 N. Temple City Blvd. • P.O. Box 5988 • El Monte, CA USA 91731
Ph (626) 444-0571 • Fx (626) 444-2314

Internet: <http://www.sparlinginstruments.com> • E-mail: sales@sparlinginstruments.com

