

Vortex EX DELTA Flowmeter

Technical Specifications



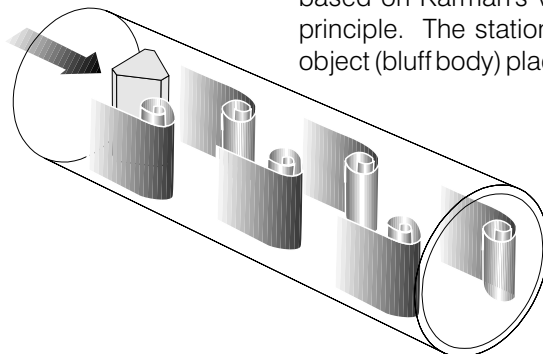
DESCRIPTION

Rugged, yet simple, the Ex-DELTA vortex flowmeter is suitable for a variety of applications in liquid, gas, air and steam flows. Sparling/Oval vortex flowmeters are volumetric flow measuring devices constructed with stainless steel body which provides accurate and reliable measurement for years in industrial service.

The various body styles provide complete flexibility of installation including wafer, flanged and replaceable sensor style which allows servicing of the sensor without shutting down the process flow.

PRINCIPLE OF OPERATION

The Ex-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 piezoelectric sensor detects the vortices and creates electrical impulse signals which is proportional to the fluid flow rate.

APPLICATIONS

The Ex Delta measures liquid gas, or steam flows in one flowmeter throughout your plant. Having a wide flow and temperature range, it can be extensively used in numerous applications.

Common applications include:

- measurement of steam, saturated steam in power plants, chemical plants, refineries and steel plants
- gas flow measurement (natural gas, ammonia, nitrogen, carbon dioxide, methane, methane chloride, etc)
- demineralized and pure water in biotech, semiconductor & pharmaceutical
- air flow measurement (dust control and compressed air consumption)
- oil and crude methanol up to 100 centipoise
- HVAC
- food processing

Sparling/Oval EX DELTA is manufactured by Oval Corporation in Japan.

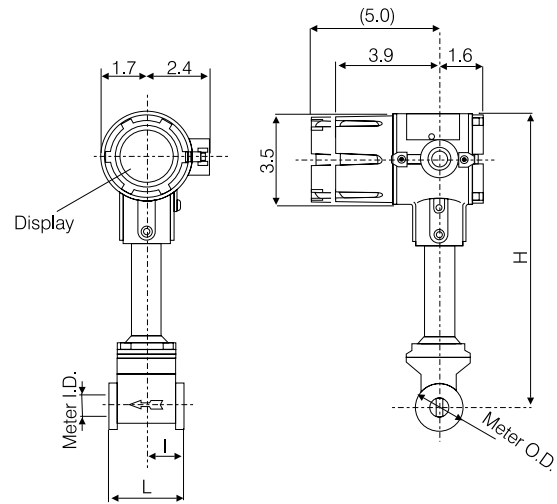
S SPARLING

STANDARD FEATURES

- Accuracy $\pm 1\%$ of rate.
- Available in sizes 1/2" to 12" (wafer & flanged)
- The unique casting design provides simple construction without any moving parts, ease of use and service in the field and long life. The net result is essential savings in initial cost, running expense and total cost.
- SST trapezoidal body and embedded piezoelectric sensor avoids contact with process fluid.
- Fixed and replaceable sensors. The replaceable sensor design allows servicing of the sensor without interrupting the flow and without taking the meter out from the pipeline. This is suitable for long term processes and avoids stocking of the replacement spool pieces.
- High temp sensors to 788°F (420°C) and standard -22°F to 572°F temperature range. The wide range of temperature and pressure allows flow measurement of a variety of fluids.
- Microprocessor based NEMA 4X enclosure.
- User selectable rate and total display - Integral mount transmitter with instantaneous flow rate indicator and totalizer.
- **The EX DELTA is also available as battery powered (without 4-20mA output).** This will eliminate the need of an external power source and saves wiring and installation costs. The meter will display low battery indication when a new battery is required.
- Explosion proof (optional)
- Optional remote mount transmitter allows monitoring of the flow from a remote or central location.
- Battery powered unit is also available on a remote mount transmitter.
- EL2300 laptop interface allows the user to change flow meter range from a remote location.
- Analog or pulse output.

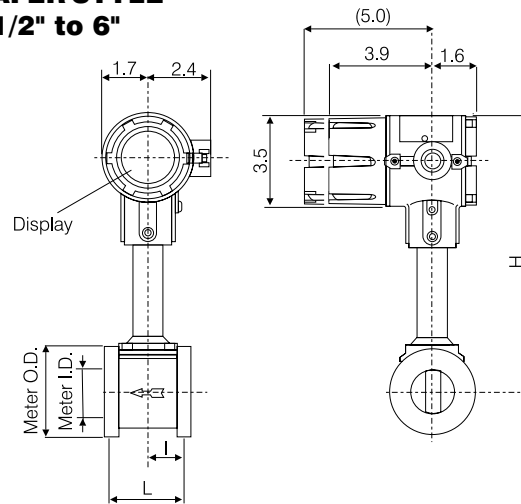
WAFER STYLE

1/2" to 1"

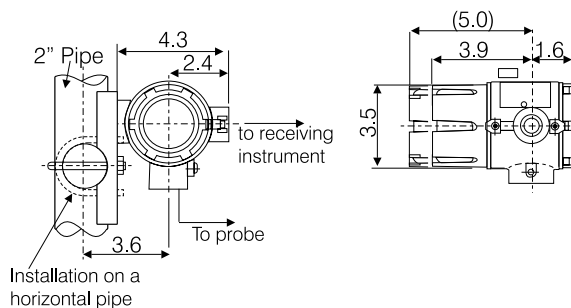


WAFER STYLE

1 1/2" to 6"



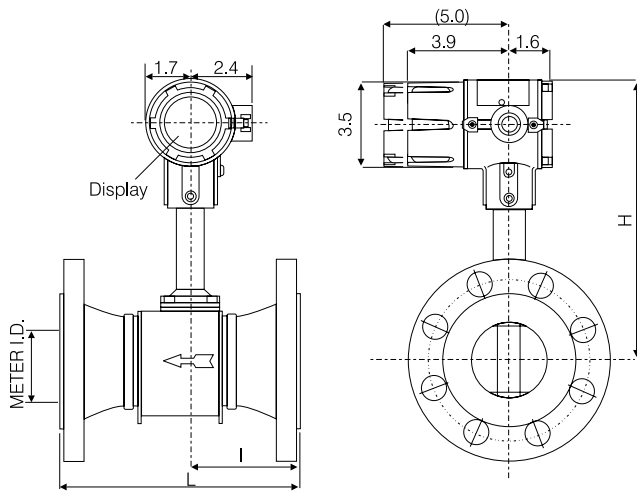
REMOTE TRANSMITTER



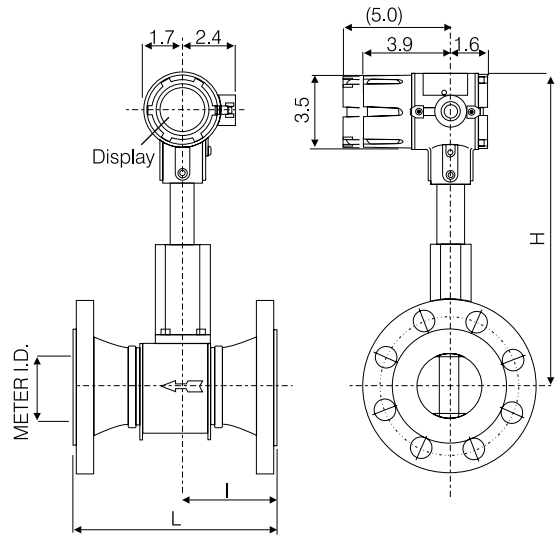
Approx Weight = 4.6 lbs.

Size	L	I	Meter I.D.	Meter O.D.	H	Weight (lbs.)
1/2"	2.6	1.3	.6	1.6	10.9	7
1"	2.6	1.3	1.0	2.6	10.9	8
1 1/2"	3.1	1.6	1.5	3.2	10.3	10
2"	3.1	1.6	1.9	3.6	10.5	10
3"	3.9	1.6	2.9	5.0	11.1	16
4"	4.9	1.9	3.7	6.1	11.9	24
6"	6.5	2.1	5.5	8.5	3.1	46

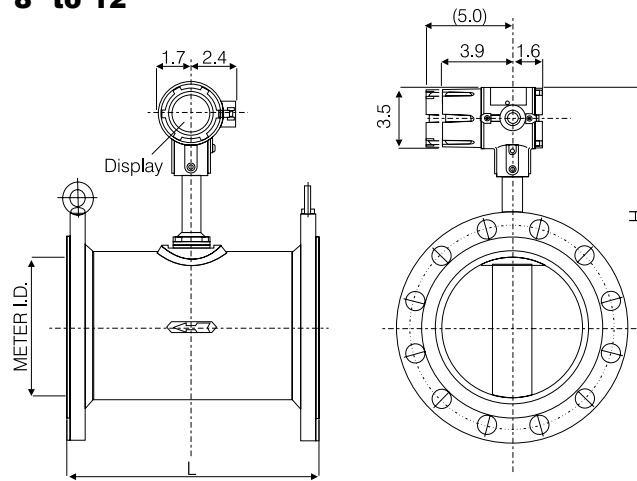
FLANGED STYLE (Fixed Sensor)
2" to 6"



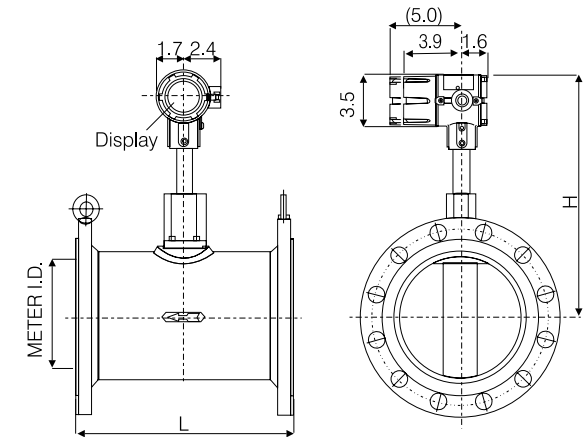
FLANGED STYLE (Replaceable Sensor)
2" to 6"



FLANGED STYLE (Fixed Sensor)
8" to 12"



FLANGED STYLE (Replaceable Sensor)
8" to 12"



Size	Flange Rating	L	I	Meter I.D.	H	Weight (lbs.)
2"	ANSI 150	8.0	4.0	1.9	10.5	24
2"	ANSI 300	8.5	4.3	1.9	10.5	28
3"	ANSI 150	9.3	4.3	2.9	11.1	42
3"	ANSI 300	10.0	4.6	2.9	11.1	52
4"	ANSI 150	10.8	4.8	3.7	11.9	58
4"	ANSI 300	11.6	5.2	3.7	11.9	79
6"	ANSI 150	13.4	5.6	5.5	13.1	105
6"	ANSI 300	14.1	5.9	5.5	13.1	148
8"	-	13.8	-	7.9	13.7	88
10"	-	17.7	-	9.8	14.5	154
12"	-	19.7	-	11.7	15.4	198

Size	Flange Rating	L	I	Meter I.D.	H	Weight (lbs.)
2"	ANSI 150	8.0	4.0	1.9	13.7	23
2"	ANSI 300	8.5	4.3	1.9	13.7	27
3"	ANSI 150	9.3	4.3	2.9	14.3	41
3"	ANSI 300	10.0	4.6	2.9	14.3	51
4"	ANSI 150	10.8	4.8	3.7	15.0	60
4"	ANSI 300	11.6	5.2	3.7	15.0	81
6"	ANSI 150	13.4	5.6	5.5	16.3	104
6"	ANSI 300	14.1	5.9	5.5	16.3	146
8"	-	13.8	-	7.9	16.9	87
10"	-	17.7	-	9.8	17.7	153
12"	-	19.7	-	11.7	18.6	197

TABLE 1 - Liquids

Meter Size		Liquids (GPM)	
Inches	mm	Min Flow	Max Flow
1/2	(15)	3.52	26.42
1	(25)	7.05	88.1
1 1/2	(40)	10.6	211.3
2	(50)	13.21	347.8
3	(80)	20.25	757.3
4	(100)	48.43	1303.3
6	(150)	145.3	2840
8	(200)	211.3	4975
10	(250)	466.7	7705
12	(300)	664.8	11052

Above table is based on typical liquid (water) measurement, sp. gravity 1.0 at 70°F

TABLE 2 - Gas

Meter Size		Gas (ACFM)	
Inches	mm	Min Flow	Max Flow
1/2	(15)	6.74	19.43
1	(25)	12.34	76.51
1 1/2	(40)	18.56	170.67
2	(50)	24.51	288.37
3	(80)	46.21	647.35
4	(100)	80.76	1088.73
6	(150)	174.0	2456.
8	(200)	300.83	4120.
10	(250)	650.16	6180.
12	(300)	928.8	8878.

Above table is based on air measurement at 70°F & atmosphere pressure of 14.7 psia

TABLE 3 - Saturated Steam (lbs./hr) * = Accuracy ± 1.0% FS () = Accuracy ± 1.5% Reading Accuracy = ± 1.0% of Reading

Pressure psig MPag		1/2" (15mm)	1" (25mm)	1.5" (40mm)	2" (50mm)	3" (80mm)	4" (100mm)	6" (150mm)	8" (200mm)	10" (250mm)	12" (300mm)
7 (.049)	min	12.1* 22	30.8	48.4* 63.8	88	176	308	660	1144	2508	3608
	max	63.8	246.4	550	924	2090 (2618)	3520 (4488)	7942 (9812)	13310 (17204)	19998 (26620)	28380 (38060)
14 (.098)	min	13.2* 22	44	55* 63.8	110	198	352	748	1298	2882	4114
	max	81.4	321.2	717.2	1210	2706 (3410)	4576 (5852)	10340 (12760)	17336 (22220)	25960 (34540)	36960 (49720)
28.4 (.196)	min	17.6* 22	46.2	72.2	132	264	462	968	1694	3762	5390
	max	118.8	466.4	1045	1760	3960 (4950)	6666 (8514)	15048 (18568)	25080 (32560)	37620 (50380)	53900 (72160)
57 (.392)	min	24.2	59.4	99	176	374	616	1342	2332	5148	7392
	max	191.4	752.4	1681	2838	6358 (7986)	10714 (13706)	24200 (29700)	40480 (52360)	60720 (80960)	86900 (116160)
71 (.49)	min	28.6	66	112.2	198	418	704	1496	2618	5786	8272
	max	226.6	893	1993	3366	7546 (9482)	12716 (16280)	28600 (35420)	47960 (62040)	72160 (96140)	103180 (137940)
100 (.686)	min	33	81.4	134	220	484	836	1782	3124	6908	9900
	max	297	1170.4	2596	4400	9900 (12430)	16676 (21340)	37620 (46420)	62920 (81400)	94600 (126060)	135080 (180840)
128 (.883)	min	37.4	92.4	154	264	550	946	2068	3608	7964	11396
	max	367.4	1447.6	3212	5456	12254 (15356)	20592 (26180)	46420 (57420)	77880 (99000)	116820 (155980)	166980 (222200)
157 (1.08)	min	41.8	103.4	171.6	286	616	1078	2310	4048	8954	12826
	max	437.8	1724.8	3828	6490	14586 (18260)	24420 (31240)	55440 (68420)	92840 (119900)	139260 (185680)	198880 (266200)
171 (1.18)	min	44	110	180.4	308	660	1122	2442	4246	9416	13483
	max	473	1861.2	4136	6996	15730 (19756)	26400 (33880)	59840 (73700)	100100 (129360)	150260 (200420)	214720 (286000)
199 (1.37)	min	48.5	118.8	198	330	726	1232	2662	4840	10120	14762
	max	541.2	2131.8	4752	8030	18040 (22440)	30140 (38720)	68420 (84480)	114620 (148060)	172260 (228800)	244200 (327800)
228 (1.57)	min	52.8	129.8	215.6	352	770	1320	2882	5060	11176	15994
	max	611.6	2398	5368	9064	20372 (25520)	34100 (43780)	77220 (95480)	129580 (167200)	183260 (257400)	277200 (369600)
257 (1.77)	min	57.2	138.6	231	396	836	1430	3102	5434	12012	17292
	max	68.2	2684	5984	10120	22660 (28380)	38060 (48840)	86240 (106480)	144540 (186560)	216700 (288200)	308000 (413600)
284 (1.96)	min	59.4	149.6	246.4	418	902	1518	3300	5786	12804	19052
	max	752.4	2948	6600	11154	24860 (31240)	42020 (53900)	95040 (117260)	159280 (205700)	237600 (316800)	341000 (455400)
426.3(2.94)	min	77	191.4	319	528	1144	1980	4268	8470	16566	28160
	max	1104.4	4334	9702	16390	36740 (45980)	61820 (79200)	139700 (172480)	233200 (301400)	349800 (466400)	501600 (671000)
568 (3.92)	min	94.6	233.2	385	638	1386	2376	5170	11242	21692	37400
	max	1467.4	5764	12892	21780	48840 (61160)	82060 (105160)	185680 (228800)	310200 (400400)	466400 (620400)	666600 (891000)
612 (4.22)	min	99	244.2	404.8	660	1452	2486	5412	12100	23320	40040
	max	1577.4	6204	13860	23320	52580 (65780)	88440 (113080)	199760 (246400)	334400 (431200)	501600 (668800)	717200 (959200)

HOW TO ORDER SMART EX DELTA

Base Model Number

VX EXDELTA

- W Wafer type body style (1/2" to 6") Fixed sensor**
- F Flange type body style (2" and larger) Fixed sensor
- R Flanged replaceable sensor (2" larger)

Table 2 - Application

1 Standard

Table 3 - Size

015	1/2"
025	1"
040	1-1/2"
050	2"
080	3"
100	4"
150	6"
200	8"
250	10"
300	12"

Table 4 - Meter Body Material

- N Stainless Steel Casting (applicable to 1/2" to 6")**
- C 316 stainless steel or equivalent (applicable to 8" & 10")
- Z Other than above

Table 5 - Pressure Rating

5	150 psi
6	300 psi
9	Other

Table 6 - Sensor Construction

- 1 1-1/2" and larger**
- 2 1" and smaller (separate sensor type)

Table 7 - Fluids (applications)

- G Gases (below 572°F)**
- L Liquids (below 572°F)**
- S Gases or steam (to 788°F) – Replaceable sensor only
- H Liquids (to 788°F) – Replaceable sensor only

Table 8 - Pre-amplifier Construction

- 1 Integral mount**
- 2 Remote mount

Table 9 - Explosionproof Construction

- 0 None (non explosion proof)
- 1 Explosion Proof**

Table 10 - Display

- 0 None
- 1 Totalizer or digital indicator**

Table 11 - Output Signal

- 5 Scaled Pulse
- 6 Analog 4-20mA**
- 0 Battery powered

HART option available
Fieldbus option available

VX 1 - - - - -

Meter configuration in bold is in stock and readily available. Other options may increase leadtimes. Consult factory for actual lead time and stock availability.

GENERAL SPECIFICATIONS - SMART EX DELTA

Accuracy:	+/- 1% of rate.	High Temp. Construction:	788°F
Repeatability:	+/- .2% or better	Display:	User selectable Single line, 8 digit totalizer 7 digit flow rate % of full scale 8 section bar graph
Flow Ranges:	See tables	Output:	4-20mA (0-100s) or scaled pulse, unscaled pulse-pulse levels - "0"-4mA, "1"-20mA
Process Fluids:	gas, air, steam, super heated steam, saturated steam, dirty liquids (EX DELTA DIA)	Power Requirements:	12-45 VDC or battery powered
Material of construction:	Meter body - Series 300SST or 316SST Bluff body - 316SST Enclosure - NEMA 4X aluminum alloy with baked melamine finish	End Connections:	Wafer or flanged
Pressure rating:	<ul style="list-style-type: none"> • Wafer style design pressure is rated up to 725 psi. • Check the connecting flange rating for flange style meters (150 psi, 300 psi). 	Rating:	NEMA 4X Explosion proof (optional)
Operating Temp. Range:	-22°F min -- 572°F max	Approvals:	Cenelec, CSA, FM

EGGS DELTA



Applications: air, gas & liquid

Sizes: 1/8", 1/4", 1/2", 1"

Process Fluid Temp.: -4°F to 176°F

Ambient (Electronics): -4°F to 140°F

Accuracy: ±3% of full scale

Power: battery powered with no outputs or 12-45 VDC with 4-20mA or pulse

Plastic injection molded body design provides simple construction without any moving parts with very little head loss. The plastic construction with smooth surface is an ideal measurement & monitoring device for sanitary, cooling water, deionized or ultra pure water in biotech, semiconductor and pharmaceutical markets. It can also be used in air consumption control and gas flow monitoring in different industrial markets.

EX DELTA DIA



Applications: gas, steam, air or liquid

Sizes: 1/2"-3" wafer, 2" & 3" flanged

Temp. Range: max 788°F

Accuracy: ±1% of rate

Power: battery powered with no outputs or 12-45 VDC with 4-20mA or pulse

EX DELTA DIA is available in wafer or flanged end connections with fixed or replaceable sensor. Unit is available as loop powered for different outputs or battery powered with local display or rate and totalization. The EX DELTA DIA is available for dirty liquid applications where sensor is located apart from the bluff body for isolation from any build up.

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: ±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.



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