ALVT

Vortex Flowmeter

Series ALVT

GENERAL

Vortex sensing technology involves, measuring the number of vortex pulses generated by a bluff body induced in the flow stream. The Alia Vortex meters uses dual sensor technology producing two independent vortex signals which allows for the signal amplification and common mode noise reduction. Our sensors never touch the process fluid. Our crystal sensors are bonded behind a stainless steel wall. The electronics pick up the slightest pressure pulsations through the stainless steel wall generated by the vortices. This design allows meters to have an extremely wide down while maintaining an almost unlimited upper end with a high pressure rating. Our model is the thinnest wafer vortex in the market. The meter body the bolt lengths are shorter which allows for a better alignment of flanges and tighter leak free installations. Our insertion models are uniquely designed so as to prevent miss-alignment of the bluff body in the flow stream, which are common with all insertion vortex meters in the market.

FEATURES

- No moving parts, high reliability and durability
- Convenient install and maintenance
- Sensor not contacts with the measured fluids directly, stable performance and long term life
- Output pulse signal is proportional to flow rate, high accuracy and no zero drift
- Wide measuring range, rate of turn-down 1:20
- Low pressure loss, low cost
- Frequency output not affected by the fluid change in physical character and composition, meter factor (K) is only considered with shape and dimensions of the bluff body, not need compensation for volume flowrate, not re-calibration meter factor needed if damaged parts be exchanged
- Wide application for steam, gas, liquid

SPECIFICATION

- Process Connection : flanged(standard),Insertion(fixed and adjustable) type, Wafer style
- Process temperature : -35℃~+ 60℃ (without LCD display)
  -5℃~+60℃ (with LCD display)
- Operating pressure : 1.6MPa (2.5-6.4MPa for special order)
- Velocity Range : Depends on fluid, pressure and temperature
- Liquids : ≤0~12m/s
  Gas & Steam : ≤3.5m/s(gas) ≤70m/s
- Accuracy : 1.0% for liquid, 1.5% for gas, 2.5% for insertion type
- Repeatability : 0.33% for liquid, 0.5% for gas, 0.83% for insertion
- Turn down ratio : 1:10
- Material : SS304 (housing) , CS (standaed flang)
- Signal output : Puls output, Two wire with 4~20mADC, RS485, Hart, ModBus
- RAM Back-up : Lithium Battery, 3.6VDC
- Housing protection : IP65; IP67; IP68
- Ex-protection : Exid ⅡB T4; Exib ⅡC T 4
- Cable: 10 meters free for remote version
- weight (approximate) :
  Wafer : 10 kg~ 13kg (to DN300)
  Insertion: 15 Kg
  Notes:-Flange weight contact factory.
- Signal Interface : RS232 & RS485, HART
- Display units : m3/h
- Keypad : Rate, Total
- Power supply : 110/220 VAC or isolated 14~36 VDC
- NIST traceable : No
- Data storage : EPROM storage up to 5 years
- Data logger : Reading, sampling Times 0.5 S

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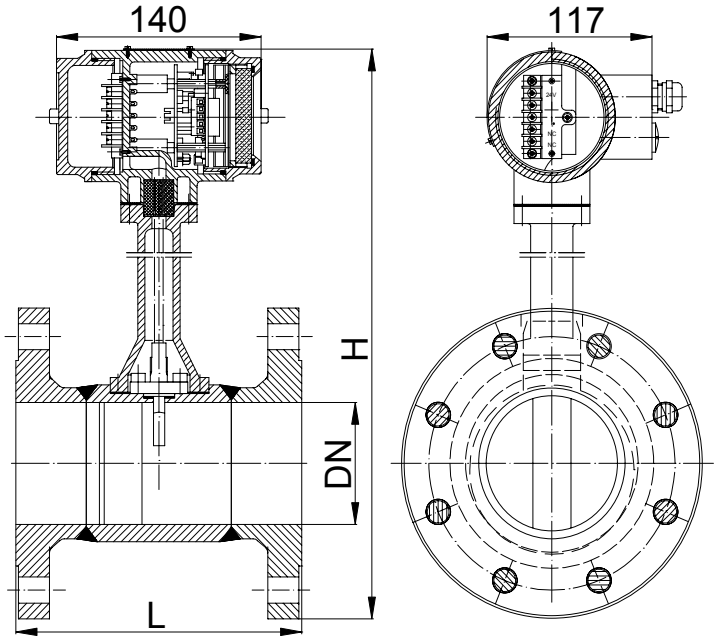
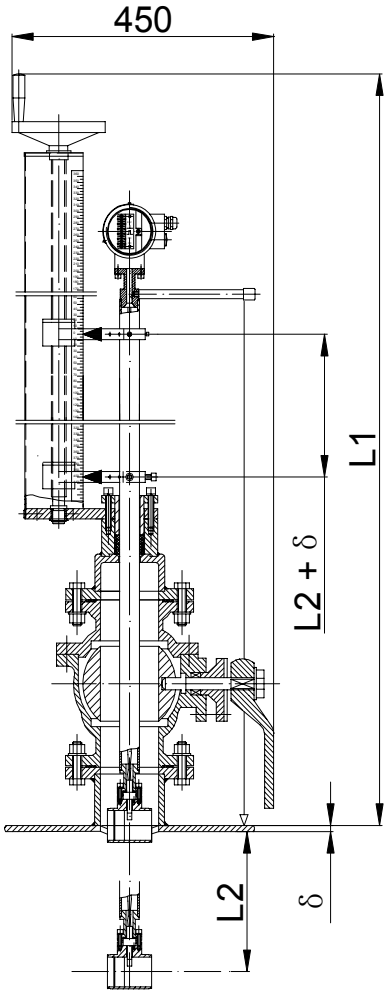
Wafer



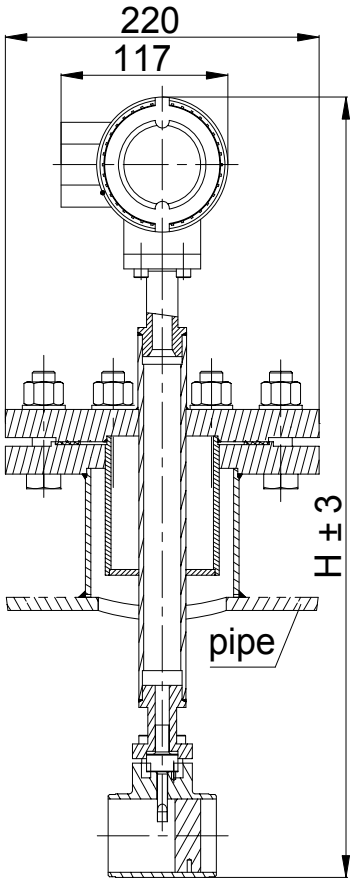
DN	L ± 3			H ± 3			Weight
	class 150	class 300	class 600	class 150	class 300	class 600	
25	150	190	220	402	410	410	10.3 kg
32		200	230	410	417	417	11.0 kg
40		200	240	420	430	430	14.4 kg
50	170	210	250	430	435	435	16.5 kg
65	190	220	270	450	455	455	19.0 kg
80	200	220	270	460	470	470	23.3 kg
100	220	250	320	490	515	512	29.3 kg
125	240	275	360	515	542	554	30.3 kg
150	270	310	390	542	590	580	56.0 kg
200	310	335	450	600	620	640	75.5 kg
250	370	390	510	657	640	710	109 kg
300	400	430	550	723	690	760	131 kg

Insertion - with ball valve



DN	L1 ± 3	L2	Weight
250~700	1570	0.5 d	18 kg
800~1800	1570	0.121 d	36 kg

Insertion - fixed



DN	H ± 3	Weight
250~700	D/2 + 369	18 kg
800~1800	0.121 d + 369 + δ	36 kg

D is outside diameter of pipe.

d is inside diameter of pipe.

δ is thickness of pipe.

Note: all dimensions are mm unless stated.

Mass flow of saturated steam (t/h)

ID(mm)	0.2MPa		0.4MPa		0.6MPa		0.8MPa		1.0MPa		1.2MPa		1.4MPa		1.6MPa	
15	7.0-46.4Kg/h		8.8-75.0Kg/h		10.4-103.0Kg/h		11.6-130.7Kg/h		12.8-158.3Kg/h		13.7-185.8Kg/h		14.9-213.2Kg/h		15.8-240.6Kg/h	
20	12.8-82.5Kg/h		16.2-133.3Kg/h		19.1-183.1Kg/h		21.5-232.4Kg/h		23.8-281.4Kg/h		26.1-330.3Kg/h		28.2-379.1Kg/h		30.4-427.8Kg/h	
25	16.2-128.8Kg/h		20.5-208.2Kg/h		24.1-286.1Kg/h		27.1-363.1Kg/h		30.0-439.6Kg/h		32.4-516.1Kg/h		34.8-592.3Kg/h		37.2-668.4Kg/h	
32	26.3-211.1Kg/h		33.3-341.2Kg/h		39.2-468.8Kg/h		44.4-594.9Kg/h		38.0-720.3Kg/h		0.05	0.85	0.05	0.97	0.06	1.10
40	32.0-329.8Kg/h		40.6-533.1Kg/h		47.7-732.5Kg/h		0.05	0.93	0.06	1.13	0.06	1.32	0.06	1.52	0.07	1.71
50	0.04	0.52	0.06	0.83	0.07	1.14	0.09	1.45	0.10	1.76	0.11	2.06	0.12	2.37	0.13	2.67
65	0.08	0.87	0.10	1.41	0.12	1.93	0.14	2.45	0.15	2.97	0.15	3.49	0.16	4.00	0.18	4.52
80	0.12	1.32	0.14	2.13	0.16	2.93	0.18	3.72	0.20	4.50	0.22	5.28	0.24	6.07	0.26	6.84
100	0.18	2.06	0.23	3.33	0.27	4.58	0.30	5.81	0.33	7.00	0.36	8.26	0.39	9.48	0.41	10.69
125	0.31	3.22	0.41	5.21	0.51	7.15	0.61	9.08	0.72	11.00	0.85	12.90	0.97	14.81	1.07	16.71
150	0.40	4.46	0.51	7.50	0.60	10.30	0.71	13.07	0.84	15.83	1.08	18.58	1.25	21.32	1.39	24.06
200	0.84	8.25	1.06	13.33	1.25	18.31	1.42	23.24	1.64	28.14	1.87	33.03	2.13	37.91	2.39	42.78
250	1.51	12.88	1.92	20.82	2.26	28.61	2.54	36.31	2.84	44.00	3.23	51.61	3.51	59.23	3.79	66.84
300	2.17	18.55	2.76	29.99	3.23	41.20	3.64	52.28	4.01	63.30	4.49	74.31	4.98	85.29	5.46	96.25
350	2.95	25.25	3.75	40.82	4.39	56.08	4.95	71.16	5.45	86.16	6.11	101.20	6.78	116.10	7.39	131.00
400	3.86	32.98	3.66	53.31	5.73	73.25	6.46	92.95	7.12	112.50	7.98	132.10	8.85	151.60	9.65	171.10
450	4.87	41.74	6.18	67.47	7.25	92.71	8.17	117.60	9.01	142.40	10.00	167.20	11.20	191.90	12.20	216.60
500	6.01	51.50	7.62	83.30	8.95	114.50	10.00	145.20	11.12	175.80	12.30	206.40	13.90	236.90	15.06	267.40

Note: The pressure in table is gauge pressure

Mass flow of superheat steam (t/h)

ID (mm)	min flow	max flow
15	$5.4\sqrt{\rho}$ Kg/h	28.61 ρ Kg/h
20	$9.88\sqrt{\rho}$ Kg/h	50.87 ρ Kg/h
25	$12.49\sqrt{\rho}$ Kg/h	79.48 ρ Kg/h
32	$20.35\sqrt{\rho}$ Kg/h	130.22 ρ Kg/h
40	$24.88\sqrt{\rho}$ Kg/h	203.47 ρ Kg/h
50	$37.1\sqrt{\rho}$ Kg/h	317.93 ρ Kg/h
65	$65.67\sqrt{\rho}$ Kg/h	537.29 ρ Kg/h
80	$99.66\sqrt{\rho}$ Kg/h	813.89 ρ Kg/h
100	$0.14\sqrt{\rho}$	1.27 ρ
125	$0.22\sqrt{\rho}$	2.00 ρ
150	$0.31\sqrt{\rho}$	2.86 ρ
200	$0.65\sqrt{\rho}$	5.07 ρ
250	$1.05\sqrt{\rho}$	7.95 ρ
300	$1.35\sqrt{\rho}$	11.45 ρ
350	$1.84\sqrt{\rho}$	15.58 ρ
400	$2.4\sqrt{\rho}$	20.35 ρ
450	$3.04\sqrt{\rho}$	25.75 ρ
500	$3.77\sqrt{\rho}$	31.79 ρ

Note: ρ----density of the superheat steam under operating condition (Kg/m3)

Volumetric flow of gas (Nm3/min)

ID (mm)	min flow	max flow
15	$0.088k / \sqrt{\rho}$	0.48k
20	$0.156k / \sqrt{\rho}$	0.85k
25	$0.201k / \sqrt{\rho}$	1.32k
32	$0.328k / \sqrt{\rho}$	2.17k
40	$0.397k / \sqrt{\rho}$	3.4k
50	$0.658k / \sqrt{\rho}$	5.3k
65	$0.995k / \sqrt{\rho}$	8.95k
80	$1.51k / \sqrt{\rho}$	13.56k
100	$2.36k / \sqrt{\rho}$	21.2k
125	$3.68k / \sqrt{\rho}$	33.12k
150	$5.27k / \sqrt{\rho}$	47.7k
200	$9.42k / \sqrt{\rho}$	84.8k
250	$14.73k / \sqrt{\rho}$	132.5k
300	$21.20k / \sqrt{\rho}$	190.8k
350	$28.86k / \sqrt{\rho}$	259.6k
400	$37.7k / \sqrt{\rho}$	339.1k
450	$47.7l / \sqrt{\rho}$	429k
500	$58.9k / \sqrt{\rho}$	529.9k

Note:1. ρ---- density of gas under operating condition (Kg/m3)

2. Standard condition 20℃, 0.1MPa (absolute pressure), or under atmosphere at 20℃

3. $k = \frac{P+0.101325}{0.101325} \times \frac{293.15}{t+273.15}$

Volumetric flow of liquid (m3/h)

ID (mm)	min flow	max flow
15	$12.01 / \sqrt{\rho}$	3.21
20	$21.18 / \sqrt{\rho}$	5.65
25	$33.2 / \sqrt{\rho}$	8.83
32	$106.6 / \sqrt{\rho}$	14.47
40	$133.7 / \sqrt{\rho}$	22.61
50	$167.0 / \sqrt{\rho}$	35.33
65	$226.4 / \sqrt{\rho}$	59.70
80	$343.1 / \sqrt{\rho}$	90.43
100	$536.0 / \sqrt{\rho}$	141.30
125	$837.7 / \sqrt{\rho}$	220.80
150	$1206.4 / \sqrt{\rho}$	317.90
200	$2144.8 / \sqrt{\rho}$	565.20
250	$3351.3 / \sqrt{\rho}$	883.10
300	$4825.9 / \sqrt{\rho}$	1271.70
350	$6568.5 / \sqrt{\rho}$	1730.93
400	$8576.7 / \sqrt{\rho}$	2260.80
450	$10856.8 / \sqrt{\rho}$	2861.30
500	$13405.8 / \sqrt{\rho}$	3532.50

Note: 1. ρ-----density of liquid under operating condition (Kg/m3)

2. Density of water under normal temperature and pressure is 1000Kg/m^3,

3. $\sqrt{\rho}$ = 31.623 Kg/m3

**** Please contact your local SMC application engineer**

You also need to provide the following information:

Type of Fluid (liquid/gas or steam)	**We need the name of your fluid, including operating density and viscosity**
Full Scale Flow	**Maximum and minimum flow rates, units must be Kg/hr, Lb/hr, LPM or gpm, etc..**
Line Size	**we need to know your pipe size as well connection type (flange, threaded, etc..)**
Process Pressure and Temperature	**We calibration your Flowmeter as close to your application as possible**
Type of Electronics	**Indicate if you want integral or remote electronics**
Power Requirements	**Specify your power requirements such as 24 VDC or 115 VAC or 230 VAC**

Model Selection Guide

ALVT meters											
Example:ALVT-23-15D-11N-IN (0-20,000 kg/hr)											
ALVT-	**	**	- **	**	- **	**	**	- **	**		Description
Flanged	1										Style
Wafer	2										
Insertion- fixed	3										
Insertion- with ball valve mounting assembly	4										
Liquid		2									Fluid
Gas		3									
Steam		4									
15mm			015								Line Size
20mm			020								
25mm			02								
32mm			03								
40mm			04								
50mm			05								
65mm			06								
80mm			08								
100mm-1500mm			**								
With digital display (standard only)				D							Display
No display				N							
24VDC					1						Power Supply
3.6V lithium battery					2						
Two power supply (24VDC, 3.6V lithium battery)					3						
No output						0					Signal Output
Pulse output						1					
Two wire 4-20mA DC output						2					
Three wire 4-20mA DC output						3					
RS-485 Communication						4					
Hart Communication						5					
Standard -40℃ ~ +250℃							N				Fluid Temperature
High Temp +250℃ ~ +350℃							H				
1.6MPa								1			Pressure
2.5NPa								2			
4.0MPa								3			
6.4MPa								4			
Non									N		Explosion - Proof
Explosive Isolated									G		
Intrinsically safety									B		
Flow range											Flow rate