

VORTEX FLOW METER

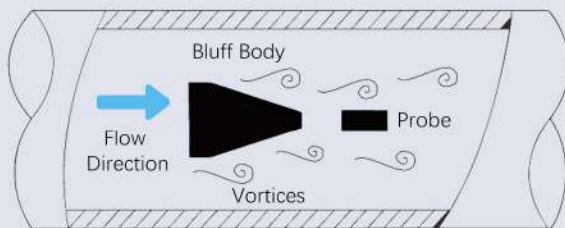
TO WORK WITH INNOVATIVE SPIRIT
TO DEVELOP HIGH QUALITY PRODUCTS
FOR THE MEASUREMENTS OF FLUIDS



VORTEX FLOW METER

01 VORTEX FLOW METER WORKING PRINCIPLE

LUGB & LUCB Vortex flowmeter work on the principle of generated vortex and relation between vortex and flow by theory of Karman and Strouhal, which specialize in measurement of steam, gas and liquid of lower gas and vapor even turbid liquid including micro grain and impurity. Vortex Flowmeter is on the principle of Karman Street, to measure liquid, sides with opposite directions of rotation. Vortices frequency is directly proportional to medium velocity. Through numbers of vortices that is measured by sensor head, medium velocity is calculated, plus flowmeter diameter, final volume flow come out.



02 APPLICATIONS

- Boiler industry(Steam measurement)
- Compressed air industry
- Textile industry
- Paper Industry
- Heating industry
- Metallurgical industry
- Plastics processing



03 FEATURES

- No moving parts inside, any installation and maintenance
- Digital filter amplifier with wider measurement range and better anti-interface performance.
- Wide flow ratio up to 33:1
- High accuracy up to $\pm 0.2\%$ optional
- Max temperature up to $+420^{\circ}\text{C}$
- Inline and insertion type for option
- Integrated and remote transmitter for option
- Power-of record function
- CE and calibration certificate
- The remote type supports pressure and temperature compensation

VORTEX FLOW METER

04 LCD DISPLAY



A: Functional region which consists of battery situation, communication, current, frequency, flow percentage (Temperature could be available on request).

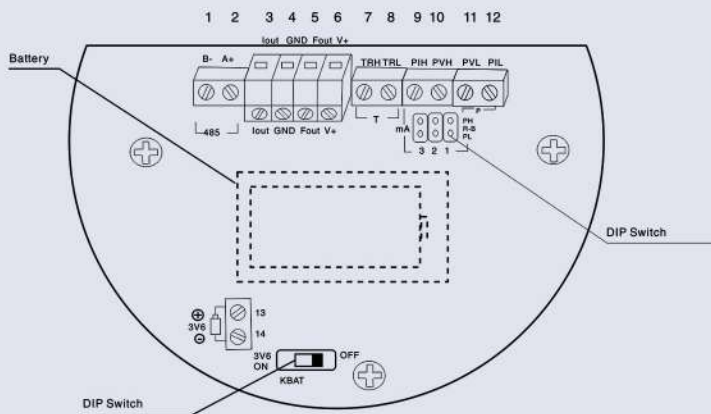
B: Units section which consists of 10 units: m³/h, L/h, L/min, us Gal/min, UK Gal/min, uS Gal/h, UK Gal/h, kg/h, t/h, ft³/h.

C: Flow rate (7 digital figure upperline).

D: Alarm sign which consists of SET prompt and alarm prompt.

E: Total flow (11 digital figure lower line) with two decimal places.

05 WIRE TERMINAL DESCRIPTION



3 wire 4-20mA output terminal board

Terminal No.	Terminal Symbols	Terminal Description	Note
1	B-	RS485-	
2	A+	RS485+	
3	Iout	4-20mA Current Output	
4	GND	24V DC -	
5	Fout	Frequency or scaled pulse output	
6	V+	24V DC+	
7	TRH	Platinum Resistance Input	Connect Pt100 or Pt1000 platinum resistance at both ends
8	TRL		
9	PIH	Pressure Sensor Input	PIH and PIL connect IN + and IN- of pressure sensors; PVH and PVL connect mV output VO + and VO- of pressure sensors
10	PVH		
11	PVL		
12	PIL		
13	3V6+	Battery+	
14	3V6-	Battery -	

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06 FEATURES



Explosion Proof



Max temperature up to +420°C



Easy to installation



High Stability & High Reliability

07 HIGH SENSITIVITY, HIGH TEMPERATURE SENSOR



 -40°C

Advanced welding technology, durable structure
welding seams smooth and beautiful



 +420°C

Integrally forged triangular prism
more stable and safe

VORTEX FLOW METER

08 MORE PRODUCTS



FV-COMPACT TYPE



FV-COMPACT TYPE



FV-REMOTE TYPE



INSERTION VORTEX
FLOW METER

09 TECHNICAL DATA

Diameter	DN15- DN700 (DB Type)			
	DN10- DN 500 (DA Type)			
	DN200- DN2000 (Insertion Type)			
Accuracy	Liquid: $\pm 1.0\%$ of rate		Gas and steam: $\pm 1.5\%$ of rate ($\pm 1.0\%$ of rate is only for DA Type optional)	
Body Material	SS304		SS316	
Process Temp.	T1: $-20^{\circ}\text{C} \dots +100^{\circ}\text{C}$	T2: $-20^{\circ}\text{C} \dots +250^{\circ}\text{C}$	T3: $-20^{\circ}\text{C} \dots +300^{\circ}\text{C}$	T4: $-20^{\circ}\text{C} \dots +420^{\circ}\text{C}$
Ambient Temp.	-10...+ 50 °C			
Connection	Flange; wafer; thread; tri-clamp			
Protection	IP65; IP68			
Power supply	24 V DC and battery for option			
Communication	RS485; HART			
Output	4-20mA; Pulse			

VORTEX FLOW METER

010 FLOW RANGE (GAS/AIR)

Gas/ Air Measurement													
Density (kg/m ³)	0.5	0.8	1.2	2.4	3.6	4.8	6	7.2	8.4	9.6	12	20	Qmax
Diameter	Different density fluid, the mini flow rate Qmin (Unit:m ³ /h)												Unit: (m ³ /h)
DN15	5.28	3.85	3.52	3.08	2.97	2.86	2.75	2.64	2.53	2.42	2.31	2.2	38
DN20	9.02	7.26	5.5	5.28	5.17	4.95	4.73	4.4	4.29	4.18	4.07	3.3	67
DN25	11	9.9	8.69	8.36	7.92	7.59	7.26	6.82	6.49	5.94	5.5	4.95	100
DN32	28.6	19.8	15.4	14.52	14.08	13.42	13.2	12.87	12.32	11.99	11.11	9.9	170
DN40	41.8	27.5	22	20.9	19.8	18.7	17.6	16.5	15.4	14.3	13.2	11	300
DN50	52.8	44	34.1	31.9	30.8	28.6	25.3	24.2	23.1	22	19.8	13.2	500
DN65	88	72.6	58.3	49.5	48.4	46.2	44	41.8	38.5	33	28.6	19.8	780
DN80	143	110	88	83.6	77	72.6	68.2	63.8	55	50.6	41.8	30.8	1200
DN100	198	176	132	121	110	99	88	77	68.2	61.6	52.8	38.5	2000
DN125	308	275	209	187	171.6	159.5	148.5	132	110	99	83.6	60.5	2900
DN150	418	341	308	286	264	242	220	198	176	154	121	93.5	4100
DN200	880	660	550	528	473	440	418	396	363	330	297	220	7500
DN250	1100	968	869	803	748	682	649	572	528	462	440	330	12500
DN300	1430	1309	1254	1166	1078	990	902	836	770	682	638	440	16500

011 FLOW RANGE(LIQUID)

Liquid Measurement											
Density (kg/m ³)	500	600	700	800	900	1000	1200	1400	1600	1800	Qmax
Diameter	Different density fluid, the mini flow rate Qmin(Unit:m ³ /h)										(Unit:m ³ /h)
DN15	0.66	0.55	0.52	0.41	0.4	0.39	0.33	0.31	0.29	0.26	4.5
DN20	1.27	1.1	1.08	0.99	0.88	0.66	0.64	0.62	0.59	0.57	8
DN25	1.43	1.32	1.21	1.16	1.1	0.99	0.9	0.84	0.78	0.75	12
DN32	2.09	1.98	1.87	1.78	1.72	1.65	1.6	1.49	1.32	1.1	20
DN40	3.85	3.52	3.3	3.08	2.86	2.51	2.42	2.31	2.2	2.09	32
DN50	5.17	4.73	4.29	4.07	3.96	3.85	3.3	3.08	2.86	2.75	50
DN65	7.81	7.15	6.93	6.82	6.71	6.6	5.5	4.95	4.62	4.4	84
DN80	12.1	11	10.56	10.12	10.01	9.9	8.8	8.36	7.7	6.6	127
DN100	22	19.8	18.7	17.6	16.5	15.4	14.3	13.2	11	9.9	198
DN125	30.8	28.6	27.5	26.4	25.3	24.2	23.1	22	19.8	15.4	310
DN150	57.2	55	49.5	46.2	39.6	35.2	33	30.8	28.6	22	445
DN200	108.9	96.8	85.8	77	68.2	62.7	58.3	55	47.3	38.5	791
DN250	202.4	181.5	165	143	121	97.9	88	79.2	74.8	60.5	1237
DN300	275	242	220	198	176	140.8	132	121	107.8	84.7	1780

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012 FLOW RANGE (STEAM)

Saturated Steam Measurement														
Mpa	0.1	0.2	0.3	0.4	0.5	0.6	0.8	0.9	1	1.2	1.6	2	Unit	
°C	120	134	144	152	159	165	175	180	184	192	204	215		
Kg/m ³	1.12	1.67	2.19	2.68	3.18	3.67	4.62	5.16	5.63	6.67	8.52	10.57		
Diameter (mm)	Different steam density corresponding with flow range													
15	Qmin	3.85	5.67	7.41	9.12	11	12.54	15.95	17.93	19.36	22.55	29.37	36.19	kg/h
	Qmax	35	51.5	67.4	83	100	115	146	163	176	205	268	329	
20	Qmin	6.84	10.07	13.09	16.17	19.58	22.44	28.49	32.01	34.43	40.04	52.25	64.35	
	Qmax	62.2	91.6	120	147	178	204	259	291	313	365	476	586	
25	Qmin	10.68	15.73	20.46	25.3	30.69	34.98	44.55	49.94	53.79	62.59	81.73	100.54	
	Qmax	97.1	143	187	230	279	318	405	454	489	569	743	914	
32	Qmin	17.49	25.63	33.66	41.47	50.27	57.42	72.93	81.95	88.11	102.63	133.1	163.9	
	Qmax	159	234	306	378	457	522	664	745	802	933	1218	1499	
40	Qmin	25.3	36.3	47.3	58.3	70.4	80.3	102.3	110	121	143	187	231	
	Qmax	300	440	575	710	860	980	1250	1400	1500	1750	2280	2810	
50	Qmin	38.5	38.5	57.2	69.3	83.6	96.8	122.1	137.5	143	165	220	275	
	Qmax	550	460	680	845	1020	1170	1480	1670	1800	2100	2730	3360	
65	Qmin	64.9	95.7	125.4	150.7	182.6	209	264	303.6	326.7	379.5	495	605	
	Qmax	790	1160	1520	1835	2222	2540	3230	3620	3970	4620	6030	7422	
80	Qmin	98.45	144.1	189.2	233.2	282.7	319	407	451	495	572	748	924	
	Qmax	1195	1760	2300	2800	3400	3900	4900	5580	6000	6999	9100	11000	
100	Qmin	0.15	0.22	0.3	0.36	0.44	0.51	0.64	0.72	0.77	0.9	1.1	1.43	t/h
	Qmax	1.87	2.75	3.6	4.43	5.36	6.12	7.78	8.73	9.4	11	14.3	17.6	
125	Qmin	0.24	0.35	0.46	0.56	0.68	0.78	1	1.1	1.21	1.41	1.84	2.2	
	Qmax	2.91	4.29	5.62	6.91	8.37	9.56	12	13.6	14.7	17	22.3	27.4	

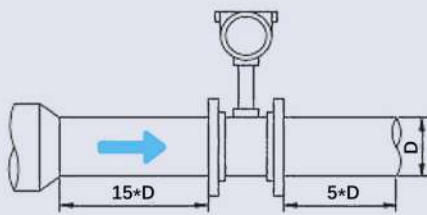
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013 MODEL SELECTION

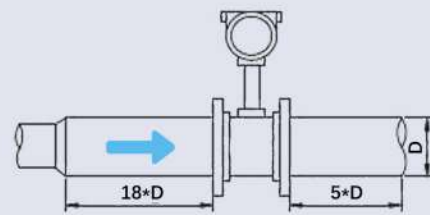
Model	Suffix Code								Description	
FV	⑦	⑦	⑤	④	⑤	⑤	⑥	⑦	⑧	Vortex Flow Meter
Fluid	L									Liquid
	G									Gas / Air
	V									Steam
Diameter	XXX									Stand for diameter 015: DN15; 050: DN50 100: DN100; 300: DN300
Structure	C									Compact type
	R									Remote type
Converter Type	C									Fluid: liquid; 24V DC; 4-20mA / Pulse output; Digital display; Ex
	V									24V DC; 4-20mA / Pulse output (V type is only for Gas/ Steam application) No compensation
	D									24V DC; 4-20mA output/ Pulse; Temperature & Pressure Compensation; 3 wires for option
	DB									24V DC; 4-20mA output/ pulse; Temperature & Pressure Compensation; Digital display; ±1.0% accuracy; max 420°C ; Ex;3 wires for option
	Notice:									1) Modbus RS485 is optional for V, D series 2) Dual power (24V DC+Battery) is optional for C, V , D series
Body Material				14						SS304
				16						SS316
Explosion Proof					BT					ExdIIBT6
					CT					ExiaII CT1- CT6
					NA					No explosion proof
Connection					WAF					Wafer connection
					DXX					D16: DIN PN16 Flange; D25: DIN PN25 Flange...
					AXX					A15: ANSI 150# Flange; A30: ANSI 300 # Flange...
					JXX					J10: JIS 10K Flange; J20: JIS 20K Flange...
Temperature					XXX					Insertion; Thread; Tri- clamp
					T1					-20...+100°C
					T2					-20...+250°C
					T3					-20...+300°C
					T4					-20°C...+420 °C (only for DA type)

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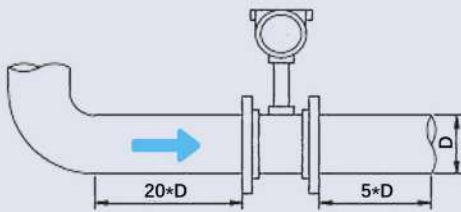
014 INSTALLATION



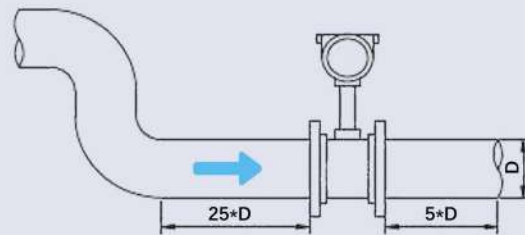
1. Pipe reducing



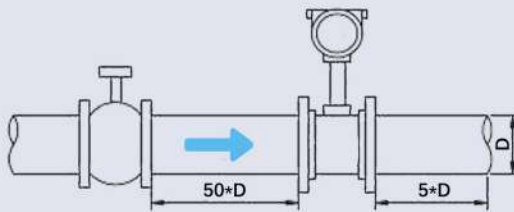
2. Pipe expanding



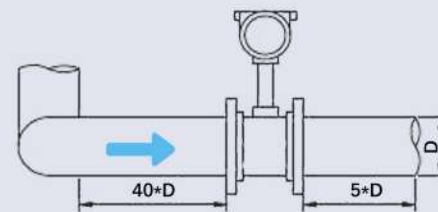
3. 1x90 elbow pipe



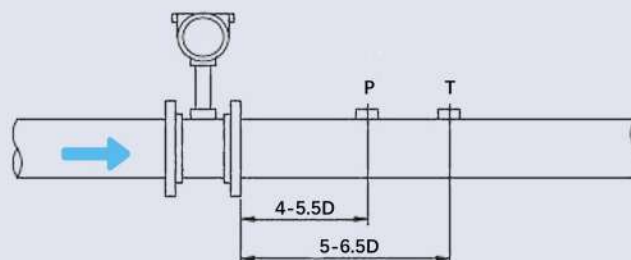
4. 2x90 elbow pipe in same plane



5. Stop valve



6. 2x90 elbow pipe in different planes



7. Pressure & temperature measuring point
(For the vortex meter integrated with pressure & temperature sensor)