F1001
Coriolis Mass Flow Meter

Principle

F1001 Coriolis Mass Flow Meter uses two parallel arranged pipes which are rotated at their resonant frequency by coils. Any mass flow passing through the tubes will generate coriolis forces which appear whenever a mass moves radially in a rotating system. The forces have opposed effects on the inlet and outlet sides, they slightly deform the pipes. The excursion of the pipes is detected by sensors on the inlet and outlet side.The phase shift between the rotational frequencies of both pipes are proportional to the mass flow rate. The resonant frequency of both pipes changes in accordance with the density of the medium. This effect determines the density. Using one sensor density and temperature can also be measured.The extent of deformation of the pipes depends on temperature.Therefore the temperature is measured for compensation purposes.

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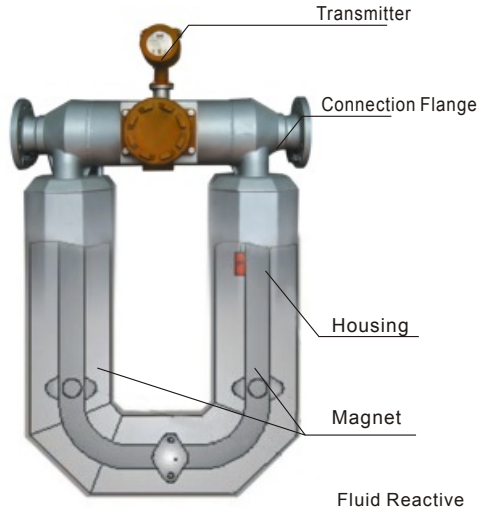

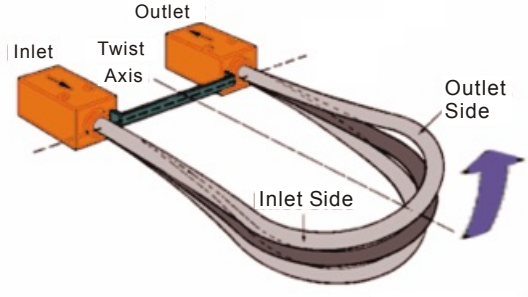

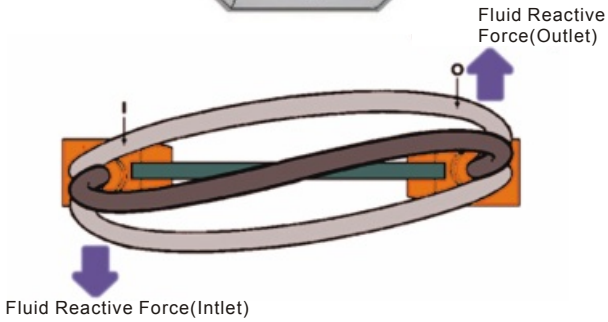

Fluid Reactive Force(Intlet)
Oscillating Flow Tube, Response To Flow

Liquid Flow Range (kg/h)

General Version

Size	Allowable Flow Range	Normal Flow Range for Accuracy ±0.1% & ±0.15%	Normal Flow Range for Accuracy ±0.2% & ±0.5%	Stability of Zero Point (kg/h)
½"	30 to 3,000	150 to 3,000	100 to 3,000	0.12
1"	80 to 10,000	400 to 10,000	300 to 10,000	0.32
1½"	320 to 32,000	2,000 to 32,000	1,500 to 32,000	1.2
2"	500 to 50,000	3,500 to 50,000	2,500 to 50,000	2
3"	1,400 to 140,000	6,000 to 140,000	6,000 to 140,000	6
4"	2,000 to 200,000	15,000 to 200,000	10,000 to 200,000	8
6"	5,000 to 500,000	35,000 to 500,000	25,000 to 500,000	20
8"	10,000 to 1,000,000	70,000 to 1,000,000	50,000 to 1,000,000	40

Micro-bend Version

Size	Allowable Flow Range	Normal Flow Range for Accuracy ±0.1% & ±0.15%	Normal Flow Range for Accuracy ±0.2% & ±0.5%	Stability of Zero Point (kg/h)
½"	20 to 3,000	200 to 3,000	150 to 3,000	0.3
1"	80 to 10,000	600 to 10,000	400 to 10,000	0.8
1½"	240 to 24,000	2,400 to 24,000	1,200 to 32,000	3
2"	500 to 36,000	5,000 to 36,000	2,500 to 36,000	5
3"	800 to 120,000	8,000 to 120,000	6,000 to 140,000	12
4"	1,500 to 200,000	15,000 to 200,000	10,000 to 200,000	20
6"	5,000 to 430,000	50,000 to 400,000	25,000 to 430,000	50
8"	10,000 to 1,000,000	100,000 to 1,000,000	50,000 to 1,000,000	100

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F1001
Coriolis Mass Flow Meter

Description

Coriolis mass flow meter is a major advance in massflow measurement. These meters have got a precedent for accuracy and repeatability under a wide variety of flow conditions. The inherent precision has established it as a standard for numerous industrial applications. The ability of these meters to measure mass flow and density directly has led to their use in applications ranging from metering food products to corrosive chemicals, CNG and LNG. Coriolis meters have proven extremely reliable when metering noncorrosive medium. The same reliability can be achieved in corrosive services if consideration is given to the compatibility of the process fluid with the sensor materials of construction. Coriolis technology appealed to us, after all, coriolis is the most accurate technique available for measuring process mass and volume flow.

Features

- DSP transmitter with superior accuracy ± 0.05%
- 20:1 turndown ratio
- 5 to 8 calibration points
- Mass flow, density, temperature and volume flow can be measured at the same time
- Improved startup and availability with simple commissioning and reduced risk
- No moving parts result in no maintenance
- Install anywhere with no flow conditioning or straight pipe required

Specification

- Flow Range: 16 kg/h to 2,500 t/h
- Connection: Flange/Thread
- Operating Pressure:Customized
- Process Temperature: Up to 482° F (up to +250 ℃)
- Body Material: 304 Stainless Steel
- Measuring Tube Material: 316L Stainless Steel
- Ambient Temperature: -40 to 131° F (-40 to +55 ℃)
- Working Humidity: (5% to 95%) RH@77° F (+25℃)
- Accuracy: Up to ±0.05%
- Repeatability: ±0.05%
- Protection: IP 65 (IP 67 optional)
- Approvals: CE, Exd (ib)II CT4
- RS 485 Output
- Pulse Output: 0 to 10 kHz, ±0.001%F.S/℃
- Current Output: 4 to 20mA, ±0.005%F.S/℃,
  2×4 to 20mA for options
- Power Supply: 85 to 265 VAC, 18 to 36 VDC
- Density Measuring:
  Range: 0.2 to 2.0 kg/l,
  Repeatability: 0.001 kg/l

Application

F1001 Coriolis Mass Flow Meter measures the fluid mass flow directly. The Coriolis measuring principle operates independently of physical fluid properties, such as viscosity and density. It is a proven technology that has been employed in a wide variety of industries such as petroleum, petrochemical industry, pharmaceutical industry, paper mill, food and energy, etc. The typical applications are as follows:

- Batch Control
- Blending
- Process Control
- Filling & Dosing
- Loading and Unloading
- Custody transfer
- Process gas measurement

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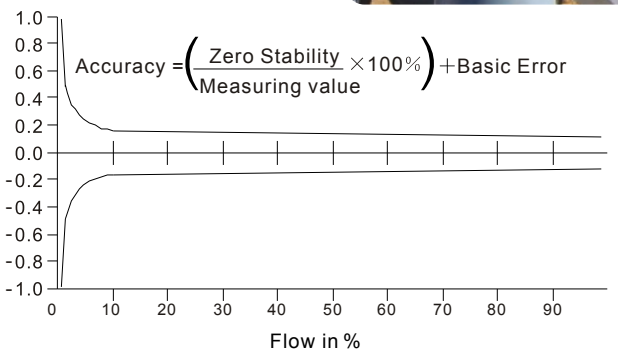
F1001
Coriolis Mass Flow Meter

Accuracy

$$\text{Accuracy} = \left(\frac{\text{Zero Stability}}{\text{Measuring value}} \times 100\%\right) + \text{Basic Error}$$



The diagram shows typical values.
Individual values may be taken from the calibration records supplied with each meter.

Repeatability

Accuracy	± 0.10%	± 0.20%	± 0.50%
Repeatability	± 0.05%	± 0.1%	± 0.25%

Accuracy is calculated based on the water measurement under the condition of +20℃ to 25℃ and 0.1MPa to 0.2MPa.

Density Measuring

Density Range	(0.2 to 2.0) g/cm^3
Basic Error	± 0.002g/cm^3 (Affected by the transducer)
Repeatability	0.001g/cm^3

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F1001
Coriolis Mass Flowmeter

Dimension and Weight

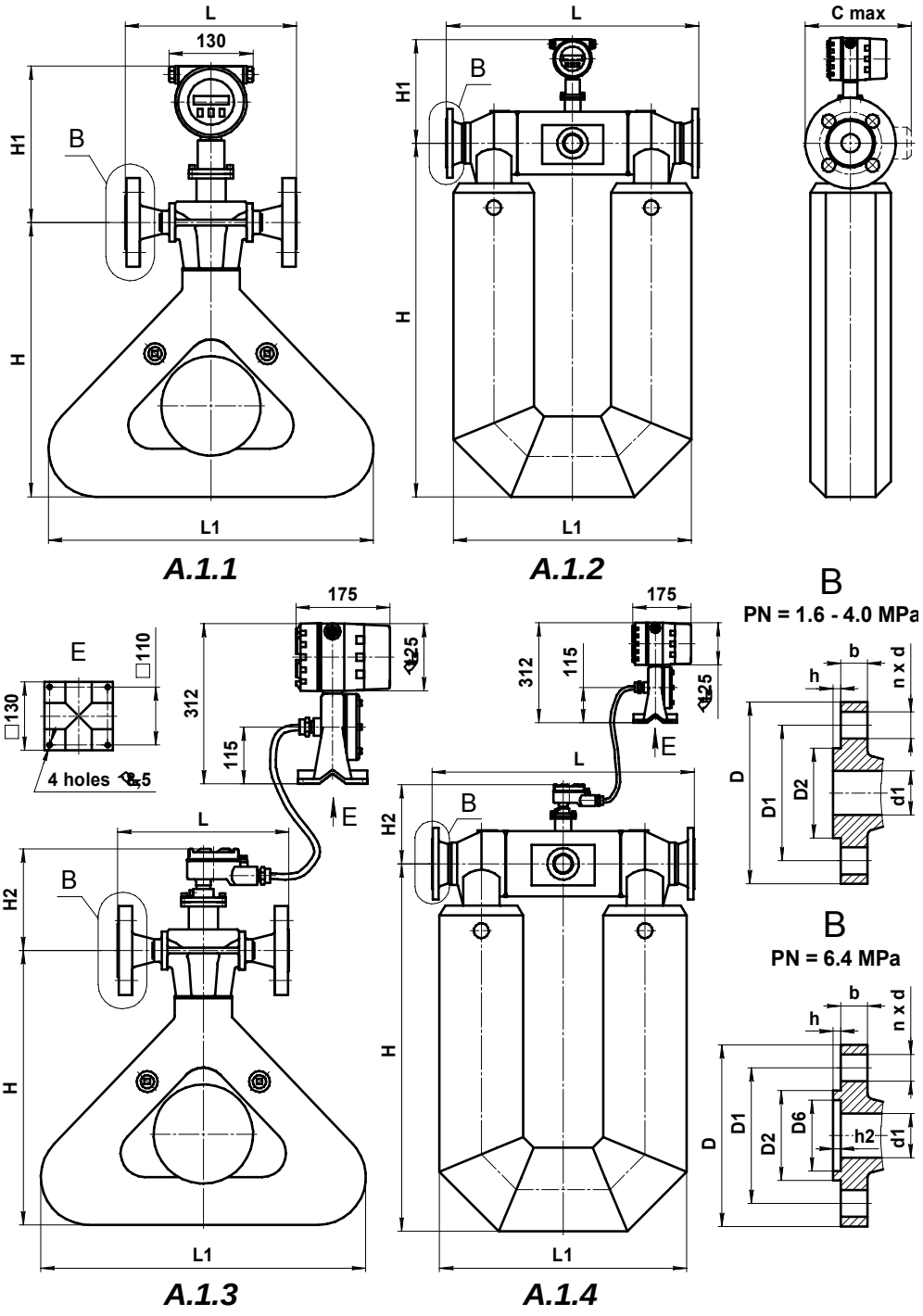

Figure A.1 Outline dimensions
Compact version – Figure A.1.1, A.1.2 (F1001-T and F1001-U series)
Remote version – Figure A.1.3, A.1.4(F1001-T and F1001-U series)

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F1001
Coriolis Mass Flowmeter

Table A.1 – Outline dimensions and weight

Process connection size	Figure	L, mm		L1, mm	H, mm	H1, mm	H2, mm	C max, mm *	Weight, kg	
		1.6-4.0 MPa	6.3 MPa						A.1.1, A.1.2	A.1. 3, A.1.4
DN10,3/8 inch	A.1.1; A.1.3	150	170	350	290	260	190	95	11	14
DN15,1/2 inch	A.1.1; A.1.3	180	194	350	300	260	190	95	11	14
DN25,1 inch	A.1.1; A.1.3	200	248	450	420	280	210	115	15	18
DN40,1 1/2 inch	A.1.2; A.1.4	520	547	470	660	280	210	150	30	33
DN50,2 inch	A.1.2; A.1.4	558	588	550	730	290	220	165	35	38
DN80,3 inch	A.1.2; A.1.4	780	808	710	1040	320	250	205	80	83
DN100,4 inch	A.1.2; A.1.4	920	948	860	1140	350	280	416	185	188
DN150,6 inch	A.1.2; A.1.4	1100	1140	1050	1520	380	310	440	320	323
DN200,8 inch	A.1.2; A.1.4	1364	1410	1160	1655	420	350	535	625	628

** Overall width of the body, excluding transmitter*

Table A.2 – Flowmeter flange dimensions

Process connection size	PN, MPa	d1, mm	D6, mm	D2, mm	D1, mm	D, mm	b, mm	h, mm	h2, mm	n	d, mm
DN10,3/8 inch	1.6; 2.5; 4	10	–	40	60	90	12	2	–	4	14
	6.4	8	35	41	70	100	16	4	3	4	14
DN15,1/2 inch	1.6; 2.5; 4	15	–	46	65	95	12	2	–	4	14
	6.4	11.6	40	46	75	105	16	4	3	4	14
DN25,1 inch	1.6; 2.5; 4	27.3	–	65	85	115	13	3	–	4	14
	6.4	24.8	58	65	100	140	20	4	3	4	18
DN40,1 1/2 inch	1.6; 2.5; 4	41.1	–	85	110	150	15	3	–	4	18
	6.4	37	76	84	125	170	22	4	3	4	22
DN50,2 inch	1.6; 2.5; 4	52.3	–	99	125	165	18	2	–	4	18
	6.4	47	88	99	135	180	22	4	3	4	22
DN80,3 inch	1.6; 2.5; 4	79.5	–	132	160	200	20	2	–	8	18
	6.4	77	121	132	170	215	24	4	3	8	22
DN100,4 inch	1.6; 2.5; 4	101.7	–	156	190	235	21	3	–	8	22
	6.4	94	150	156	200	250	25.5	4.5	3.5	8	26
DN150,6 inch	1.6; 2.5; 4	154	–	211	250	300	26	2	–	8	26
	6.4	142	204	211	280	345	31.5	4.5	3.5	8	33
DN200,8 inch	1.6; 2.5; 4	200	–	285	320	375	35	3	–	12	30
	6.4	198	260	284	345	415	37.5	4.5	3.5	12	36

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F1001
Coriolis Mass Flowmeter

Dimension and Weight

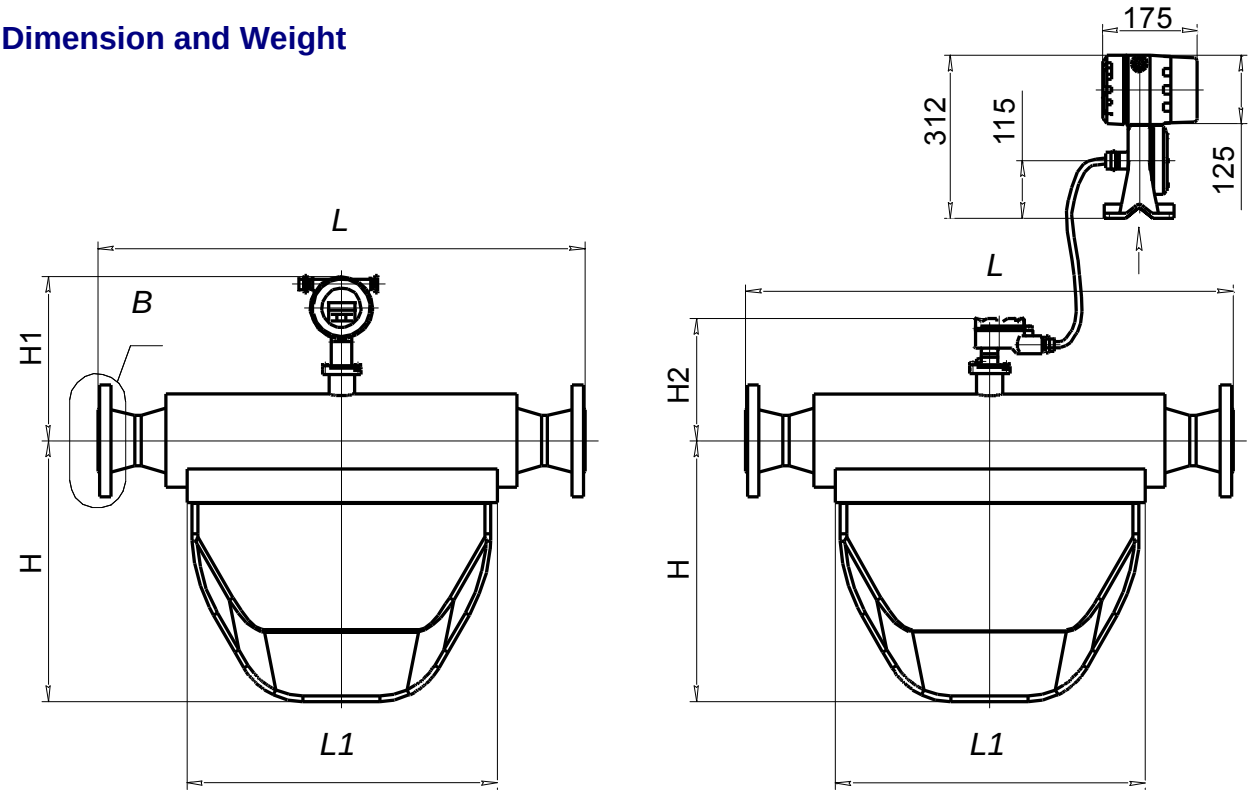

Figure A.2 Outline dimensions (F1001-M series)
Integral type – Figure A.2.1 Separate type – Figure A.2.2

Table A.3 – *Outline dimensions and weight*

Process connection size	Figure	L, mm		L_1, mm	H, mm	H_1, mm	H_2, mm	C max, mm *	Weight, kg	
		1.6-4.0 MPa	6.3 MPa						A.2.1	A.2.2
DN10, 3/8 inch	A.2	360	374	240	180	290	220	95	10	13
DN15, 1/2 inch	A.2	400	414	280	184	290	220	115	11	14
DN25,1 inch	A.2	500	536	360	250	300	230	150	15	18
DN40, 1 1/2 inch	A.2	600	634	460	300	310	240	165	30	33
DN50, 2 inch	A.2	800	828	640	410	320	250	205	35	38
DN80, 3 inch	A.2	900	928	700	490	350	280	416	75	78
DN100, 4 inch	A.2	1130	1156	860	660	370	290	440	132	135
DN150, 6 inch	A.2	1410	1450	1200	900	400	330	535	263	265
DN200, 8 inch	A2	1800	1844	1450	1170	420	350	580	427	430

** Overall width of the body, excluding transmitter*

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F1001
Coriolis Mass Flowmeter

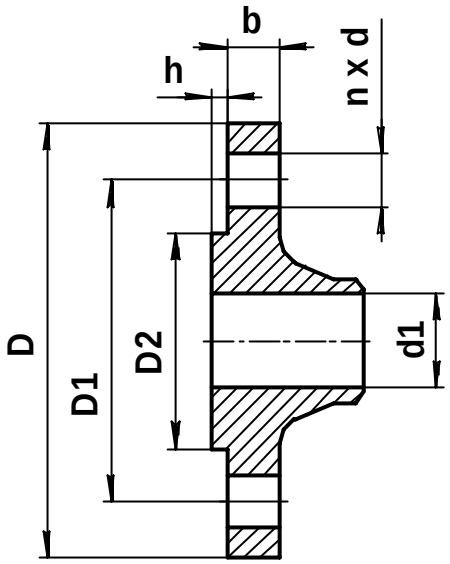

Figure A.2 Outline dimensions of connection kit flanges

Table A.4 – Connection kit flange dimensions and weight

DN(mm), inch	PN, MPa	d1, mm	D2, mm	D1, mm	D, mm	b, mm	h, mm	n	d, mm	Weight, kg
DN10,3/8inch	1.6; 2.5; 4	10	40	60	90	12	2	4	14	0.7
	6.4	8	34	70	100	16	4	4	14	1.0
DN15, 1inch	1.6; 2.5; 4	15	46	65	95	12	2	4	14	0.8
	6.4	11.6	39	75	105	16	4	4	14	1.1
DN25, 1inch	1.6; 2.5; 4	27.3	65	85	115	13	3	4	14	1.2
	6.4	24.8	57	100	140	20	4	4	18	2.3
DN40, 1 1/2inch	1.6; 2.5; 4	41.1	85	110	150	13	3	4	18	2.1
	6.4	37	75	125	170	22	4	4	22	3.7
DN50,2 inch	1.6; 2.5; 4	52.3	99	125	165	18	2	4	18	2.8
	6.4	47	87	135	180	22	4	4	22	4.6
DN80, 3 inch	1.6; 2.5; 4	79.5	132	160	200	20	2	8	18	4.8
	6.4	77	120	170	215	24	4	8	22	7.2
DN100, 4 inch	1.6; 2.5; 4	101.7	156	190	235	21	3	8	22	7.0
	6.4	94	149	200	250	25.5	4.5	8	26	10.7
DN150, 6inch	1.6; 2.5; 4	154	211	250	300	26	2	8	26	13.2
	6.4	142	203	280	345	31.5	4.5	8	33	25.4
DN200, 8inch	1.6; 2.5; 4	200	285	320	375	35	3	12	30	24.0
	6.4	198	259	345	415	37.5	4.5	12	36	38.5

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F1001
Coriolis Mass Flowmeter

Dimension and Weight

Flange connection

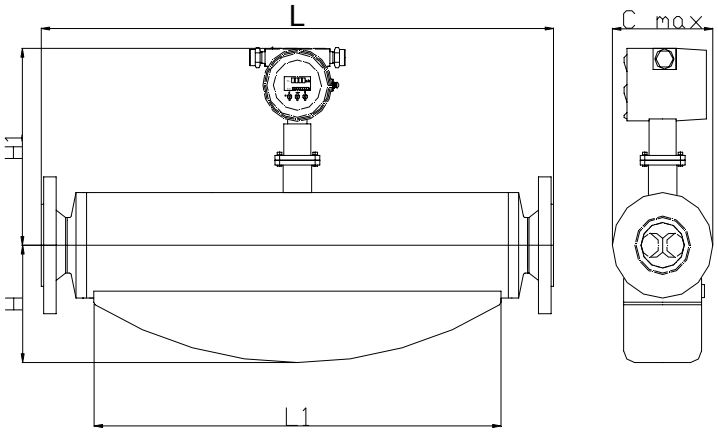

Figure A.3.1 Outline dimensions (F1001-S series)

Table A.3.1 – *Outline dimensions and weight*

Process connection size	Figure	L, mm		L_1, mm	H, mm	H_1, mm	C max, mm *	Weight, kg
		1.6-4.0 MPa	6.3MPa					A.3
DN50, 2 inch	A.3	800	834	450	200	315	205	30
DN80, 3 inch	A.3	935	973	645	200	335	416	60

** Overall width of the body, excluding transmitter*

Tri-clamp connection

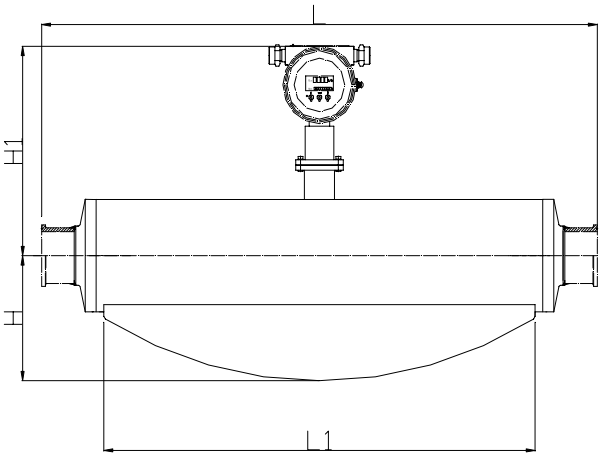

Figure A.3.2 Outline dimensions (F1001-S series)

Table A.3.2 – *Outline dimensions and weight*

Process connection size	Figure	L, mm		L_1, mm	H, mm	H_1, mm	C max, mm *	Weight, kg
		1.6-4.0 MPa	6.3 MPa					A.3
DN50, 2 inch	A.4	800	834	450	200	315	205	30
DN80, 3 inch	A.4	935	973	645	200	335	416	60

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F1001
Coriolis Mass Flow Meter

Model Selection

F1001-Series

Example F1001-025 LAN2COMEX2P1

F1001	Size	Medium	Sensor Version	Connection	PN	Struct.	Ex	Power	Output	Accuracy	Description
½"	015										Size
1"	025										
1½"	040										
2"	050										
3"	080										
4"	100										
6"	150										
8"	200										
Liquid		L									Medium
Gas		G									
Triangle-shaped Version (Size from 1/2" to 1")			T								Meter Body Shape
U-shaped Version (Size from 1 1/2" to 8")			U								
Micro-bend Version(Size from 1 1/2" to 8")			M								
Super Micro-bend Version (Size 3")			S								
ANSI				AN							Flange Standard
DIN				DI							
JIS				JS							
Sanitary fitting(for micro-bend version only)				SF							
Others				OF							
230psi(16bar)					1						Max. Working Pressure
360psi(25bar)					2						
580psi(40bar)					3						
915psi(63bar)					4						
Compact Version (-58 ° F to +257 ° F)						COM					Housing
Remote Version (-58 ° F to +482 ° F)						REM					
Non-Explosion							NX				Approval
Explosion proof							EX				
DC18 to 36V								1			Power Supply
AC85 to 265V								2			
4 to 20mA/Pulse									P		Signal Output
RS485+Pulse+4 to 20mA									R		
Hart+Pulse+4 to 20mA									H		
± 0.05%										0.5	Accuracy
± 0.1%										1	
±0.2%										2	
±0.5%										5	

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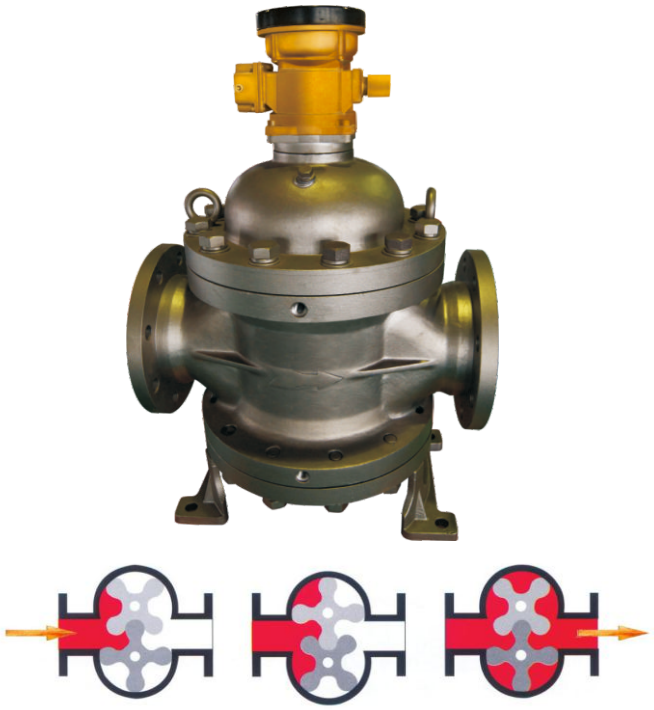
F2001
Bi–Rotator Flowmeter

Description

The F2001 Bi-Rotator Flowmeter is a positive displacement meter utilized in the most demanding applications requiring accuracy, long life and ruggedness. It owns two precise machined helical rotators which share the same size. The two rotators rotate together at the same speed in the measuring chamber and divide the flowing stream into segments with equal volume which is precisely designed, and the segments will join back into one stream on the outlet side of the flowmeter. By counting the segments through the meter, the flow can be calculated. The rotation status is transferred to the totalizing register or the transmitter for recording and calculation. Volume indication is determined by mechanical output gearing leading to mechanical register and F9005 Signal Generator.



Stainless Steel Bi–Rotator Flowmeter

High accuracy is attained by two unique helical rotators which features two finely balanced rotators(Refer to Figure 1). An adjustor, incorporated on the meter, is used to assure maximum accuracy within the meter's flow range.

Features

- Accuracy up to 0.1%, over 10:1 turn-down ratio
- Extremely long service life and easy maintenance
- Self-lubricating, low pressure drop, and low noise and vibration
- Two unique helical rotators with no touch, but synchronized by timing gears in the measuring chamber
- No oscillating, reciprocating or sliding parts or cranks to wear or disturb the balanced rotary action

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F2001
Bi–Rotator Flowmeter

Specification

- Accuracy: ±0.1% of reading accuracy
- Line size : ¼" to 16" (8 to 400mm)
- Repeatability: ±0.02%
- Working Pressure: Customized
- Pulse Output: (18 to 36V, VH=20V,) VL<1V and output load ＜200Ω)
- Process temperature: - 22 to 480° F (-30℃ to 250℃)
- Current Output: 4 to 20mA, (two wire system w/ 600Ω max loop load)
- RS485 Output: communication with Modbus
- Viscosity: 0 to 20,000 cP
- RTU (powered by 18 to 36V and <60mA)
- Protection: IP 65(IP67 for option)
- Display: Instantaneous / Total / Batch flow
- Ambient Temperature: 104 to 176 ° F (40℃ to 80℃)
- Ambient Humidity: 5% to 95% RH @ 75 ° F
- User Parameters: K factors, linear correction coefficient flowrate input signal section points, temperature and pressure compensation, set pulse output range, decimal adjustment, etc.
- Communication Baud Rate: Optional (1200 ,2400, 4800 or 9600)

ATEX **ATEX, UL Approved**

Materials of Construction

Housing: Welded Steel Construction Combining Steel Castings and Drawn Steel Plate
Rotators: Three/Four Lobe Rotator - Cast Iron/SS304/ SS316/ SS420
Measuring Chamber: Cast Iron/SS304/SS316
Rotator Shafts: E.T.D. 150
Rotator Bearings: Stainless Steel (Standard) , other materials (Optional)

Body and End Covers: Cast Iron, Cast Steel,SS304, SS316
Counter Base Plate: Cast Steel
Body: Cast iron, Cast steel, SS304,SS316
O-Ring: Viton (Standard)
Drive Shafts, Drive Gears, and Ball Bearings: Stainless Steel

Registers

MOD. D1	Explosion-proof digital totalizer and flow indicator with optional RS485, pulse output and/or 4 to 20mA output
MOD. M1	Mechanical registers with 6 figures non reset type totalizer(5 on digits plus 1 on dial)
MOD. VR	Mechanical registers with 5 large figures, 8 digits non reset type totalizer, 5 figures resettable through single handle
MOD. D2	ATEX, UL approved; Dot matrix LCD, STN Fluid Simultaneous display of Rate and Total
MOD. VRD	ATEX, UL approved; Currency& Volume delivery modes, Preset delivery.

MOD.D1 

MOD. D2 

MOD.M1 

MOD.VR 

MOD. VRD 

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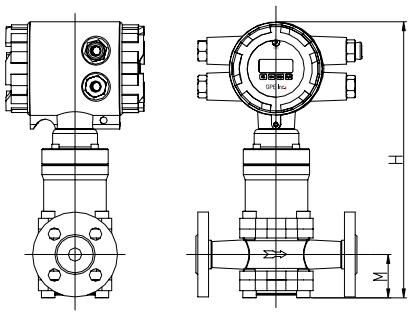
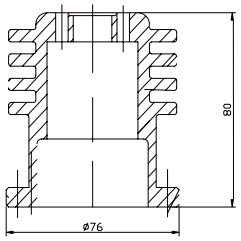
F2001
Bi–Rotator Flowmeter

Dimension and Weight



Graph 1



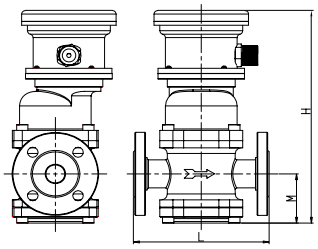
Graph 2

Remarks

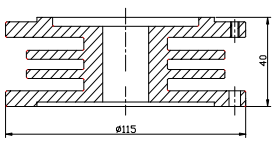
1. M may varies with expanded flange resulted from different flow range.
2. The radiator should be added with the working temperature beyond 125°C. See graph-2

Table 1 Electric register DN8mm- DN25mm(check graph 1 and graph 2)

DN (mm)	Flange Distant (L)	Total Height (H)	Centre Height (M)	Weight Kg
8	82	210	50	5
15	180	305	50	8
25	200	350	68	14



Graph 3



Graph 4

Table 2 Round mechanic register DN15mm-DN25mm (Check graph 3 and graph 4)

DN (mm)	Flange Distant(L)	Total Height (H)	Center Height (M)	Weight(Kg)
15	180	260	50	8
25	200	300	68	14

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GPE Inc.

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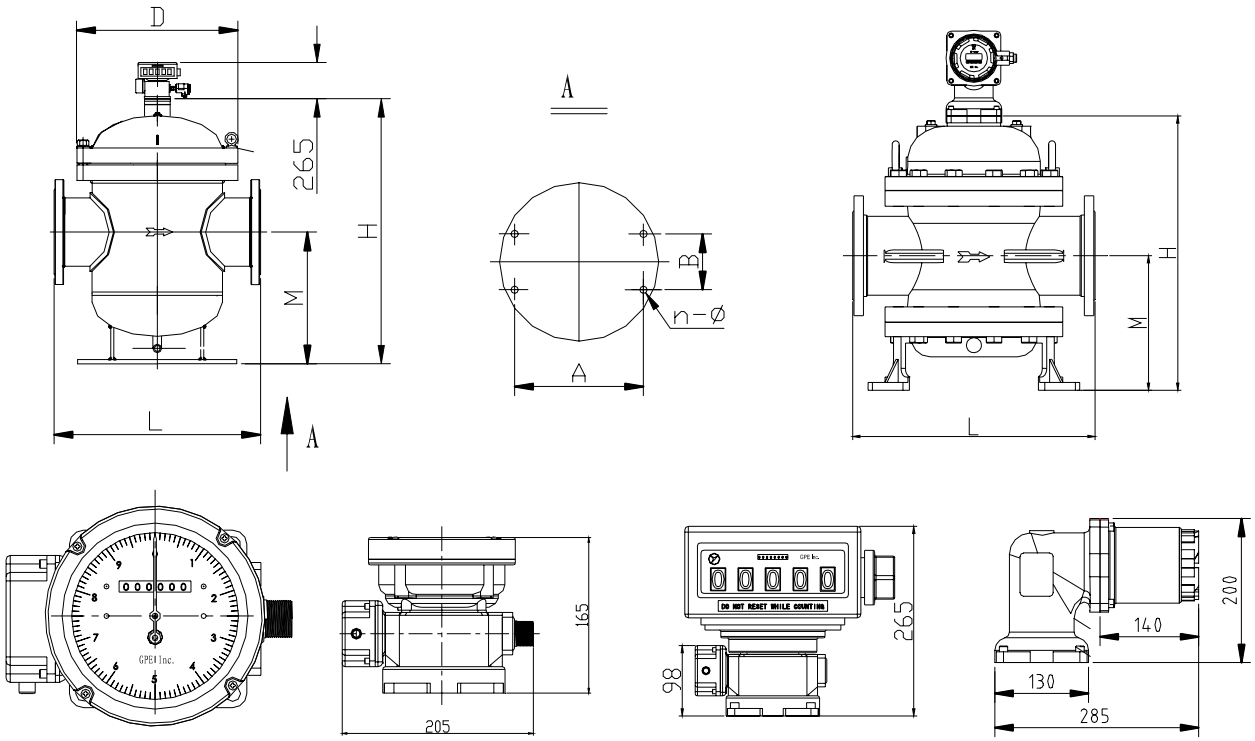
www.gpeus.com sales@gpeus.com

F2001
Bi–Rotator Flowmeter

Vertical installation size



Graph 5

Table 3 vertical installation size for size 1-1/2” to 16” (Check graph 5)

DN (mm)	Flange Distant(L)	Total Height (H)	Center Height (M)	Upper Dia (D)	Install Dim. A × B	Bolt hole size n-Φ	Weight Kg
40	250	335	126	185			38
50	360	410	150	235			56
80A	400	465	178	280			100
80B	400	535	222	305			112
100	450	580	270	310	235×170	4-Φ23	150
150	560	675	318	415	190×190	4-Φ23	315
200	700	945	450	530	445×200	4-Φ23	550
250	1000	1029	500	620	524×250	4-Φ25	990
300	1000	1295	640	780	645×300	4-Φ25	1420
400	1200	1584	750	980	Φ700	6-Φ25	1950

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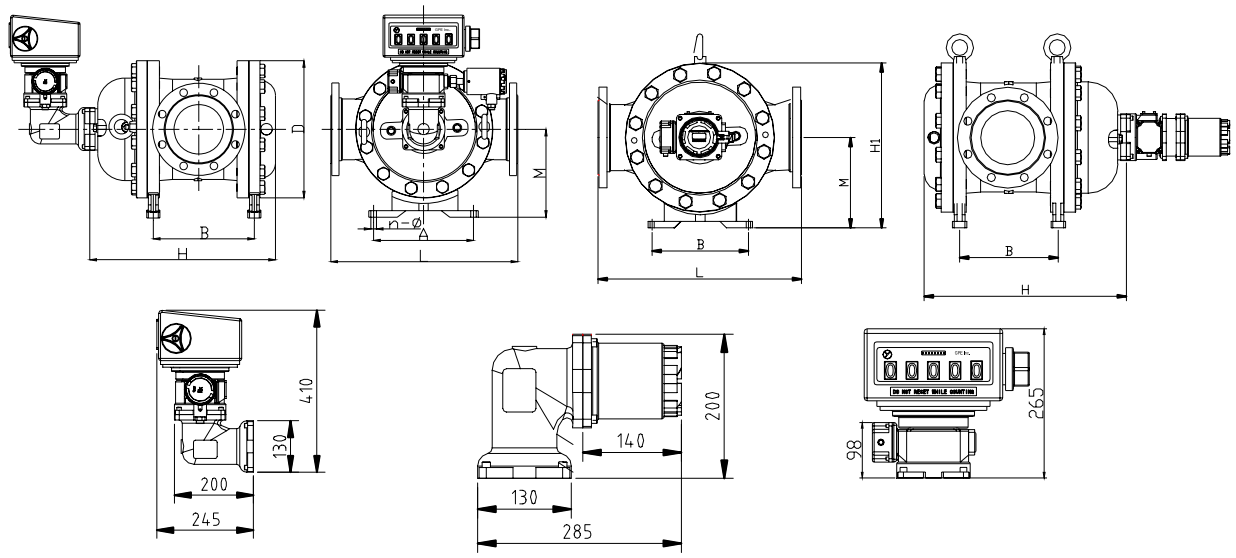
F2001
Bi–Rotator Flowmeter

Horizontal installation size

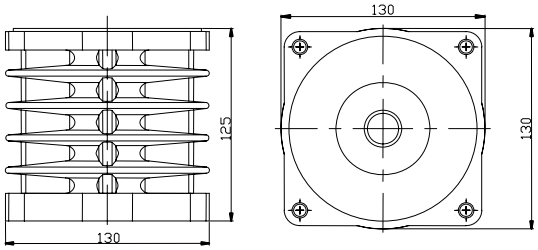


Graph 6

Table 4 Horizontal installation size for size 1-1/2” to 16” (Check graph 6)

DN (mm)	Flange Distant(L)	Total Height (H)	Center Height (M)	Upper Dia (D)	Install Dim. A × B	Bolt hole size n-Φ	Weight Kg
40	250	335	95	185			40
50	360	410	120	235			60
80A	400	465	140	280			100
80B	400	535	153	305			115
100	450	515	210	325	250×220	4-φ20	150
100	450	540	210	310	250×210	4-Φ20	145
150	560	630	255	415	255×250	4-Φ20	315

Remarks: The radiator should be added with the working temperature of 80-150°C or higher without diverter. See graph 7



Graph 7

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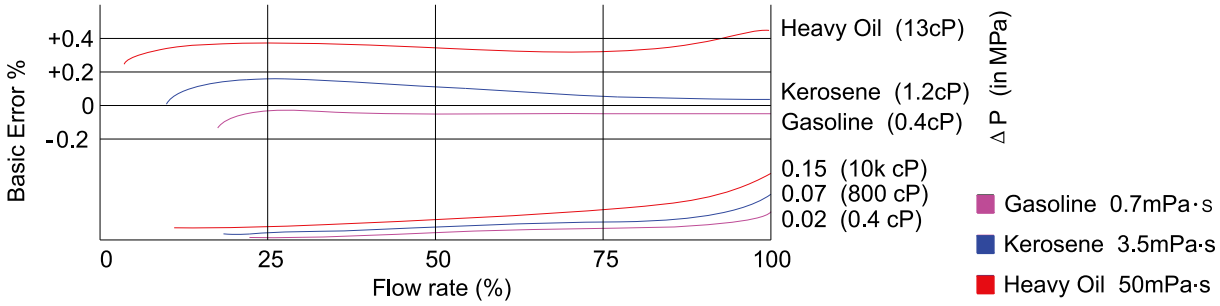
F2001
Bi–Rotator Flowmeter

Flow Range

F2001 Flow Range in GPM								
Nominal Pipe Size	Viscosity (in cP)							Pulse (Gallons Per Pulse)
	0.32-0.8	0.8 to 2	2 to 5	5 to 50	500 to 400	400 to 2k	2k to 20k	
	Gasoline & Liquefied Gas	Kerosene	Light Diesel	Crude Oil	Heavy Oil	High Viscosity Liquid	High Water Content & Supertohigh	
¼"	0.44 to 1.32	0.3 to 1.32	0.26 to 1.32	0.26 to 1.32	0.26 to 1.32	0.26 to 1.19	0.26 to 1.06	0.000264
½"	1.45 to 4.40	1.10 to 4.40	0.88 to 4.40	0.88 to 4.40	0.88 to 4.40	0.88 to 3.96	0.88 to 3.52	
1"	5.28 to 26.4	6.60 to 26.4	5.28 to 26.4	5.28 to 26.4	5.28 to 26.4	5.28 to 23.8	5.28 to 22	
1½"	48.4 to 96.9	39.6 to 96.9	33 to 96.9	33 to 96.9	33 to 96.9	17.6 to 96.9	14.5 to 44	0.00264
2"	79.3 to 158.5	63.4 to 158.5	52.8 to 158.5	52.8 to 158.5	52.8 to 158.5	33 to 96.9	26.4 to123.3	
3"	176.1 to 352.2	140.9 to 352.2	117.6 to 352.2	117.6 to 352.2	117.6 to 440.3	70.4 to 211.3	66 to198.1	0.0264
4"	220.1 to 440.3	176.1 to 440.3	149.7 to 440.3	149.7 to 440.3	149.7 to 440.3	105.7 to 317	88.1 to 264.2	
6"	506.3 to 968.6	396.3 to 968.6	321.4 to 968.6	321.4 to 968.6	321.4 to 968.6	176.1 to 528.3	132.1 to 396.3	
8"	792.5 to 1585	634 to 1585	528.3 to 1585	528.3 to 1585	528.3 to 1585	352.2 to 1057	220.1 to 660.4	
10"	1189 to 2378	951 to 2378	792.5 to 2378	792.5 to 2378	792.5 to 2378	440.3 to 1321	264.2 to 792.5	
12"	1981 to 3963	1585 to 3963	1321 to 3963	1321 to 3963	1321 to 3963	880.6 to 2642	660.4 to 1981	
16"	3522 to 7045	2819 to 7045	2334 to 7045	2334 to 7045	2334 to 7045	1761 to 5283	1321 to 3963	

Pressure Drop Curve



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F2001
Bi–Rotator Flowmeter

Model Selection

F2001- Series

Example F2001-025SDI21CSEXD1RN3

F2001	Size	**	**	**	**	**	**	**	**	**	**	Description
1/4"	008											Size
1/2"	015											
1"	025											
1 ½"	040											
2"	050											
3"	080											
4"	100											
6"	150											
8"	200											
10"	250											
12"	300											
16"	400											
Standard		S										Body Version
Thermal Jacket		J										
ANSI			AN									Flange Standard
DIN			DI									
JIS			JS									
Others			OF									
-20℃ to+80℃				1								Working Temperature
+80℃ to+150℃				2								
+150℃ to+250℃				3								
1.6 MPa					1							Max. Working Pressure
2.5 MPa					2							
4.0 MPa					3							
6.4 Mpa					4							
Cast steel(Iron)						CS						Material
RotatorMaterial SS304						S4						
Rotator Material SS316						S6						
All materials SS304						A4						
All materials SS316						A6						
Special materials						SP						
Non-Explosion							NX					Approval
Explosion proof							EX					
Digital counter								D1				Counter
Round Mechanical counter								M1				
VR 7887 mechanical counter								VR				
No signal output (Local LCD display)									N			Signal output
4 to 20mA/Pulse									I			
Dual Pulse(Backed up with pulse generator)									F			
RS485+ 4 to 20mA+Pulse(For digital counter only)									R			
Stepless calibrator										S		Calibrator type
Gear Calibrator										G		
Without Calibrator										N		
±0.1%											1	Accuracy
±0.2%											2	
±0.5%											3	

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F3001
Ultrasonic Gas Flow Meter

VF3001-002.00-14/03

Description

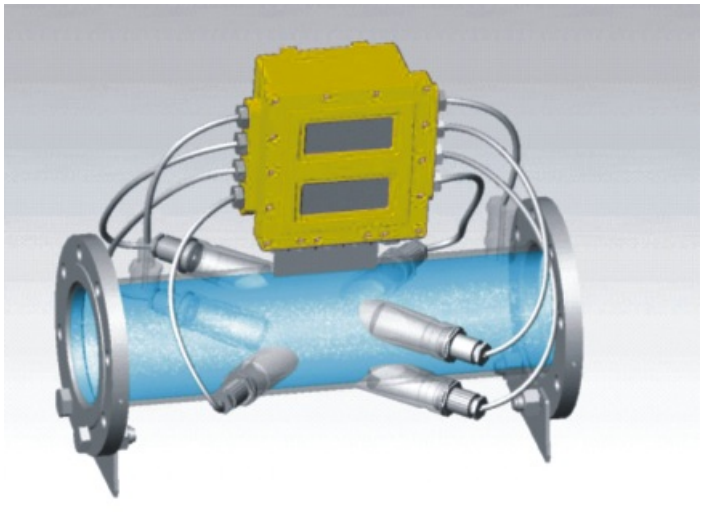
F3001 Ultrasonic Gas Flow Meter is based on the theory of acoustic transit time to calculate the average velocity of gas movement by measure time of the upstream and downstream, in which the ultrasonic waves generated by two bi-directional transducers travel along the path angled with respect to pipe axis.

Features

- No moving parts, low pressure drop, low maintenance
- Bi-directional measurement
- Simple installation, excellent performance
- High accuracy and good reliablility
- Ex-proof: Exd(ib)ⅡBT4(exclude acetylene)
- Temperature and pressure compensation
- Real time LCD display

Specification

- Accuracy :±0.5%, ±1.0%, ±1.5%
- Communication Protocol: Modbus protocol
- Output Signal : Pulse, 4 to 20mA current, RS485
- Working Temperature: -13° F to 131° F(-25℃ to +55℃)
- Humidity: 5% to 95%RH(77° F)
- Working Pressure: 230psi(16bar),360psi(25bar),580psi(40bar)
- Power Supply: DC 18 to 36V, AC 85 to 265V
  50/60Hz



Application

F3001 Ultrasonic Gas Flow Meter can be applied extensively to the supply, transmission, distribution of most dry gas in fields such as underground air storage, power stations, petrochemical industry, aluminum melters etc.
There is a wide range of gas can be measured by F3001 including natural gas, compact gas, compressed air, fuel gas, corrosive gas, poisonous gas, high-purity gas etc.

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www.gpeus.com info@gpeus.com

F3001
Ultrasonic Gas Flow Meter

Model Selection

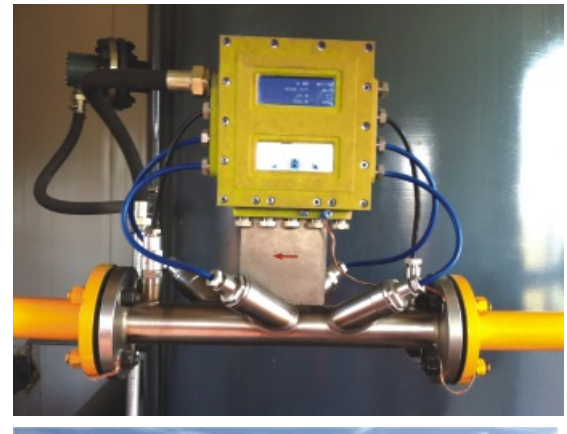
F3001-□□□ □ □ □ □□ □ □ □ □ □□

0 1 2 3 4 5 6 7 8 9 10

0. F3001 Ultrasonic Gas Flow Meter
1. Size : 025-1"(25mm), 040-1 1/2"(40mm),050-2"(50mm),080-3"(80mm),100-4"(100mm),150-6"(150mm),200-8"(200mm),250-10"(250mm),300-12"(300mm)
2. Medium: Q- Gas
3. IP: A- General Version, B- Ex-proof Version Exd(ib)ⅡBT4 (exclude acetylene)
4. Power Supply: 1-DC
5. Modbus Output: R4-RS485, R0-No
6. Structure: 1-Compact version, 2- Remote version
7. Compensation Function: W-with temperature and pressure compensation, N- no compensation
8. Working Pressure : 1-230psi(16bar),2-360psi(25bar),3-580psi(40bar)
9. Output signal: F- pulse output , I-(4 to 20)mA current output
10. Accuracy : 05- ±0.5%, 10- ±1.0%, 15- ±1.5%

e.g. F3001-080 Q B 1 R4 2 W 3 I 05

F3001 Ultrasonic Gas Flow Meter, DN=80mm, medium is gas, explosion-proof version, power supply is DC 18 to 36V, output port is RS485, Remote version, with temperature and pressure compensation, working pressure is 580psi(40bar), output signal is current (4 to 20)mA, accuracy is ±0.5%.



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Hand-held Transit-Time Ultrasonic Flowmeter

Model F3001- Series

GENERAL

F3001 series is a hand-held transit-time ultrasonic flowmeter with clamp-on transducers for non-invasive liquid measurement. Our microprocessor based, user friendly,field programmable flow measurement technique allows no interruption of the process flow and has low installation costs.

FEATURES

- 4 line LCD display with flowrete, totalizer & signal condition.
- The flowmeter is designed for high accuracy +/-1.0%.
- Small sized (210 * 90 * 30mm) and light - weight (500 g)
- Wide range,Velocities (0.3 ~ +/- 32 m/s).
- Ni-MH Battery life for up to 12 hours continuous opeartion.
- Transducers for pipe sizes of 15 to 6000 mm.
- High accuracy of +/-0.5% of reading (or +/-0.2% of reading)
- Transducers include magnet devise,which can install on Metal pipe without mounting belt.
- Data logger which records flowrate, date, total flow, signal condition..Etc.
- Response time less than 1 second

SPECIFICATION

- Measuring Principle : Transit time Ultrasonics
- Transducers : SCS : 15 mm ~ 100 mm (1/2" ~ 4")
  SCM: 50 mm ~ 1000 mm (2" ~ 38")
  SCL: 300 mm ~ 6000 mm (12" ~ 240")
  SHS: 15 mm ~ 100 mm (1/2" ~ 4")
  SHL: 50 mm ~ 1000 mm (2" ~ 38")
- Pipe Material : Cast Iron, Stainless Steel, Ductle Iron Coppor, PVC, Aluminum, Asbestos Fiberglass... etc.
- Liner Material : Tar Epoxy, Rubber, Mortar, Polypropylene, Polystryal, Ploystryene, Polyester, Ebonite, Polyethylene, Teflon... etc.
- Display : 4 Line LCD with illumination.
  - Flowrate : 5 digit with decimal point
  - Totalizer : 8 digit, Forward, Reverse & Net values.
  - Engineer Unit : M3, Liter, US Gallon, Imperial Gallon, Million Gallon, Cubic Feet, US Barrels, Imperial Barrels, Oil Barrel.
  - Time Unit : Second, Minute, Hour, Day.
  - Other : Velocity, Date, Time, Signal condition.
- Accuracy : +/- 1% ~ +/- 2% of reading(0.5 ~ 30 m/s)
  +/- 0.5% of reading (online calibration)
- Repeatability : +/-0.2% of reading
- Keypad : 18 Key with tactile action
- Response Time : Less than 1 second
- Flow velocity : 0.3 ~ +/- 32 m/s
- Resolution : 0.0001 m/s
- Ambient Temperature : -20 ~ +50 °C
- Ambient Humidity : 90% RH or Less
- Built-in battery : Ni-MH Battery
- Operation Time : > 12 Hours
- Charger : 90 ~ 260Vac 50/60 Hz, 8-12 Hr charging
- Data Storage : Operation parameters and totalization data are stored by EEPROM for more than 10 years
- Operation Time : > 10 Hours
- Charger : 90 ~ 260Vac 50/60 Hz, 8-12 Hour charging
- Data Logger : 64 data include flowrate, totalizer, time, date.
- Alarm : High/Low with buzzer
- Power consumption : Less than 2W
- Dimension : 210 * 90 * 30 mm
- Weight : 0.50 Kg
- Enclosure
  - Converter : IP65
  - Sensor : IP68 (Submersible)

GPE Inc.

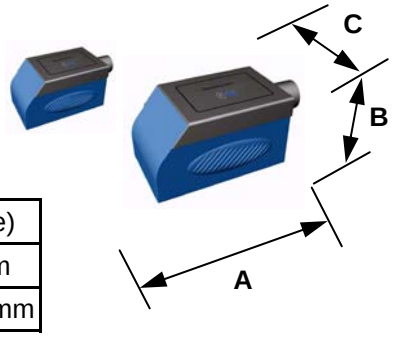
33 West 19th Street, Suite 327, New York, NY 10011, USA.

TEL：+1- (917) 331-2456 FAX：+1- (718) 710-8675

URL: http://www.gpeus.com

E-mail :alex@gpeus.com

TRANSDUCER SPECIFICATION



- **Standard-Transducers**

Fluid Temperature : -40 ~ +110 ℃

Model	SCS (Small Size)	SCM (Medium Size)	SCL (Large Size)
Pipe Size	DN15-100mm	DN50-1000mm	DN300-6000mm
A*B*C	45mm*23mm*25mm	64mm*32mm*35mm	98mm*45mm*49mm

- **High Temperature Transducers**

Fluid Temperature : -40 ~ +160 ℃

Model	SHS (Small Size)	SHL (Medium Size)
Pipe Size	DN15-100mm	DN50-1000mm

ACCESSORY (standard package)

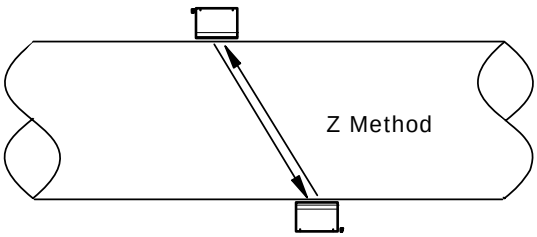
Case

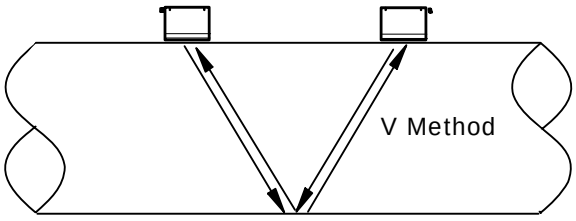
Silicone grease

Mounting Belt

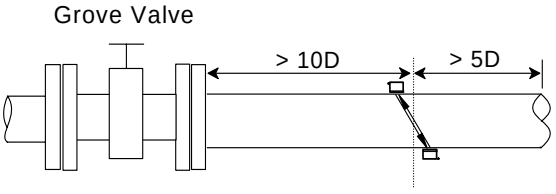
Measuring Tape

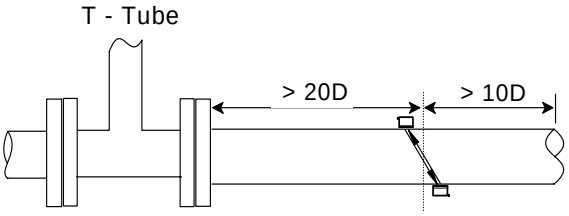
INSTALLATION

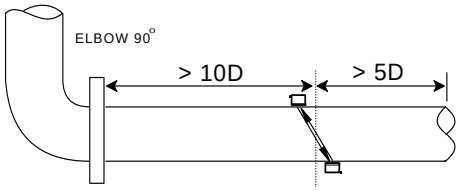


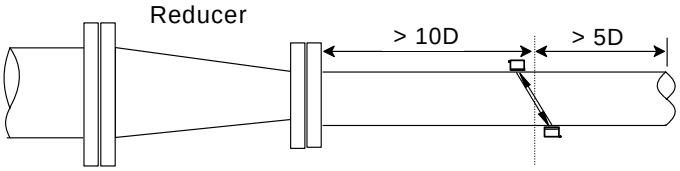


STRAIGHT RUN PIPING REQUIREMENT









COMBINATION FOR ULTRASONIC FLOWMETER

Upstream Cable **Downstream Cable**

Power adaptor

RS232 Communication cable

OTHER ACCESSORY

Waterproof Case

Mounting Belt

Thickness gauge

Measuring Tape

**** Please contact your local GPE application engineer**

You also need to provide the following information:

Type of Fluid	**We need the name of your fluid, including operating density and viscosity**
Line Size	**pipe size and sensor connection type (insertion,clamp, etc..)**
Process Pressure and Temperature	**We calibration your Flowmeter as close to your application as possible**
Type of Electronics	**output and install type (compact, wallmount, panelmount,etc..)**
Pipe Material	**We need the name of your pipe material**

Model Selection Guide

F3001						
Example : F3001-DL-L-XL-C1-TT						
F3001	******	******	******	******		**Description**
Handheld ES Basic Model, Include: F3001 ESL Handheld * 1 set * Power Adaptor (90-264 Vac, 50/60Hz) * 1 set * RS232 communication cable * 1 set * Silicone grease * 1 Box * Waterproof Carrying Case * Measuring Tape	DL					Portable Flowmeter
No transducers required		0				Transducers
Small clamp sensor, 15 ~ 100 mm		SCS				
Middle clamp sensor, 50 ~ 1000 mm		SCM				
Large clamp sensor, 300 ~ 6000 mm		SCL				
High Temperature clamp sensor (-30-160℃), 15 ~ 100 mm		SHS				
High Temperature clamp sensor (-30-160℃), 50 ~ 1000 mm		SHL				
None cable needed			0			Signal Cable Length
5M, 2 Cables			C1			
10M, 2 Cables			C2			
15M, 2 Cables			C3			
None option				0		Accessories
thinkness gague				TT		
Waterproof case				WC		
Extra single cable. 10m * 2				CB		
Mounting Belt. 6m * 2				MS		

Ultrasonic Flowmeter
Model F3001

GENERAL

F3001 series is a fixed mounted,transit-time ultrasonic flowmeter, with clamp-on transducers for non-invasive liquid measurement. Our microprocessor based,user friendly,field programmable flow measurement technique allows no interruption of the process flow and has low instalation costs.

FEATURES

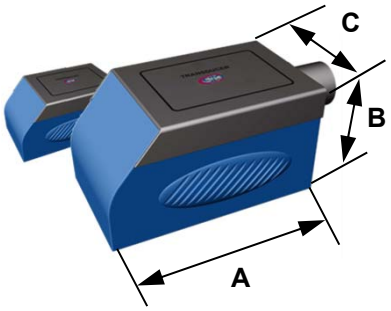
- 2 line LCD display with flowrate, totalizer & signal condition.
- Stores up 64 Day/months Totalzier daily value
- Batch control function
- Wide range velocities of 0.1 ~ +/- 32 m/s.
- Transducers for pipe size form 13 to 6000 mm.
- High accuracy of +/-0.5% of reading.
- Transducers include magnet devise,for installation on metal pipe without mounting belt.
- Data logger function, include date, totalizer, signal condition.. Etc.
- Response time less than 1 second.

SPECIFICATION

- Measuring Principle : Transit time difference
- Pipe Size : S Type : 15 mm ~ 100 mm (1/2" ~ 4")
  : M Type : 50 mm ~ 700 mm (2" ~ 28")
  : L Type : 300 mm ~ 6000 mm (12" ~ 240")
- Pipe Material : Cast Iron, Stainless Steel, Ductle Iron Copper, PVC, Aluminum, Asbestos Fiberglass… etc.
- Liner Material : Tar Epoxy, Rubber, Mortar, Polypropylene, Polystryal, Ploystryene, Polyester, Ebonite, Polyethylene, Teflon… etc.
- Display : 2 Line LCD with illumination.
  Flowrate : 5 digit with decimal point
  Totalizer : 8 digit, Forward, Reverse & Net values.
  Engineer Unit : M3, Liter, US Gallon, Imperial Gallon, Million Gallon, Cubic Feet, US Barrels, Imperial Barrels, Oil Barrel.
  Time Unit : Second, Minute, Hour, Day.
  Other : Velocity, Date, Time, Signal condition.
- Accuracy : +/- 1% ~ +/- 2% of reading(0.5 ~ 30 m/s)
  : +/- 0.5% of reading (online calibration)
- Repeatability : +/-0.2% of reading
- Keypad : 16 Key with tactile action
- Response Time : Less than 1 second
- Flow Velocity : 0.1 ~ +/- 32 m/s
- Resolution : 0.0001 m/s
- Ambient Temperature : -20 ~ +50 °C
- Mounting : wall mounting, panel, local
- Max. Cable Length : 150 M
- Power Consumption : Less than 2W
- Power Supply : 90 ~ 260Vac 50/60 Hz
- Data Storage : Operation parameters and totalization date are stored by EEPROM for more than 10 years
- Output : 4-20 mA or 0-20 mA
- Pulse Output : 1- 9999 Hz
- Data Logger : 64 data include flowrate, totalizer, time, date.
- Alarm : High/Low with buzzer
- Communication : RS-232
- Dimension : 235 * 205 * 95 mm
- Weight : 1.5 Kg
- Protection
  Converter : IP65
  Sensor : IP68(Submersible)

GPE Inc.
33 West 19th St, Suite 327, New York, NY 10011
TEL : +1-646-619-1289
URL : http://www.gpeus.com
E-mail :info@gpeus.com

TRANSDUCER SPECIFICATION



• Standard-Transducers

Fluid Temperature : -30 ~ +90 ℃

Accuracy: 1%

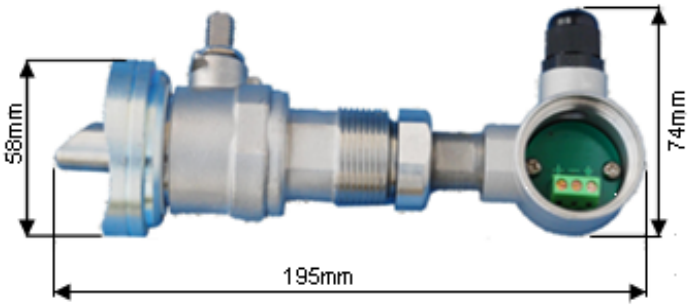
Model	SCS (Small Size)	SCM (Medium Size)	SCL- (Large Size)
Pipe Size	DN15-100mm	DN50-1000mm	DN300-6000mm
A×B×C	45mm*23mm*25mm	64mm*32mm*35mm	98mm*45mm*49mm

• Insertion Transducers

Fluid Temperature : -40 ~ +160 ℃

Accuracy: 1%

Model	SIS (Standard)	SIL (Large Size)
Pipe Size	DN80-1000mm	DN300-6000mm



• High Temperature Transducers

Fluid Temperature : -30~160 ℃

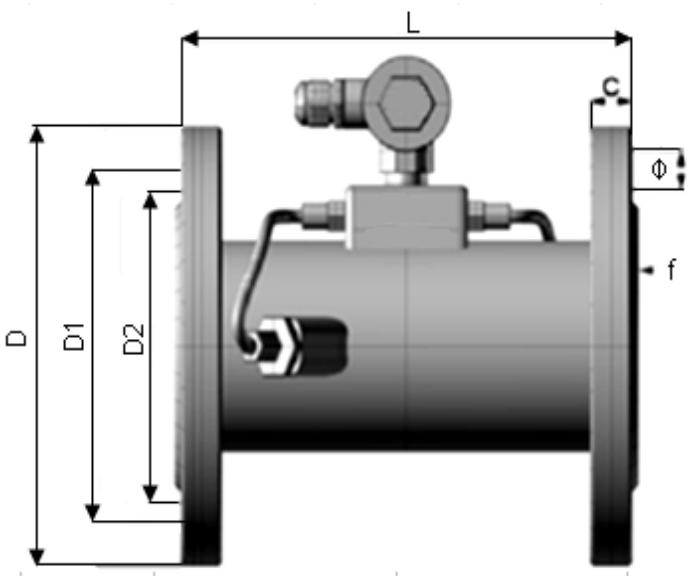
Accuracy: 1%

Model	STS (Small Size)	SHL (Medium Size)
Pipe Size	DN15-100mm	DN50-1000mm

• Inline Type

Fluid Temperature : -40~160 ℃

Accuracy: 0.5%



DN	L	D	D1	φ×n	D2	f	C
50	200	165	125	18×4	99	3	20
65	200	185	145	18×4	118	3	20
80	225	200	160	18×4	132	3	20
100	250	220	180	18×8	156	3	22
125	250	250	210	18×8	184	3	22
150	300	285	240	22×8	211	3	24
200	350	340	295	22×12	266	3	24
250	450	405	355	26×12	319	3	26
300	500	460	410	26×12	370	4	28
350	550	520	470	26×12	429	4	30
400	600	580	525	26×16	480	4	32
450	700	640	585	30×20	548	4	34
500	800	715	650	33×20	609	4	36
600	1000	840	770	36×20	720	5	38
700	1100	910	840	36×24	794	5	40
800	1200	1025	950	39×24	901	5	42
900	1300	1125	1050	39×28	1001	5	44
1000	1400	1255	1170	42×28	1112	5	46

Note:all dimensions are mm unless stated

OTHER ACCESSORY

Measuring Tape

Stretcher

Silicone grease

Thinkness gague

Cable

DIMENSIONS

Wall Mount

cast aluminium
IP65

Size: 180×170×56mm
Setting data: flow unit, zero, clear total flow, K-factor, passwords, date, linearity factor
Input: 3 channel 4-20mA analog input, 2 channel resistance signal input
Output: Isolation RS232/RS485 output, 2 channel isolation OCT output 1 channel isolation 4-20mA output (two-wire)

Panel Mount

Size: 165×160×80mm
Setting data: flow unit, zero, clear total flow, K-factor, passwords, date, linearity factor
Input: 3 channel 4-20mA analog input, 2 channel resistance signal input
Output: Isolation RS232/RS485 output, 2 channel isolation OCT output 1 channel isolation 4-20mA output (two-wire)

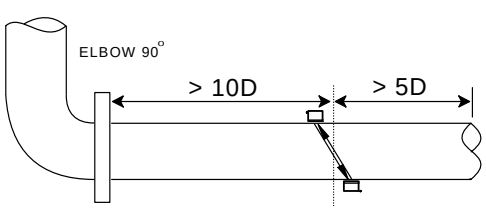
Mini

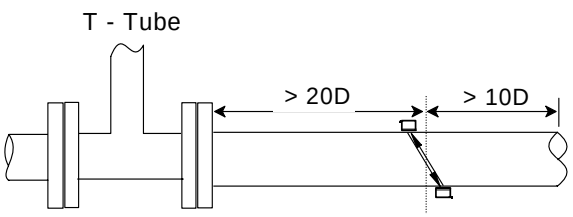
Size: 106×48×34mm
Display: 1. state, 2. error time, 3. temperature different, 4. temperature, 5. energe flow, 6. total flow, 7. flow rate, 8. positive total flow
Output: RS485
Protection: IP68

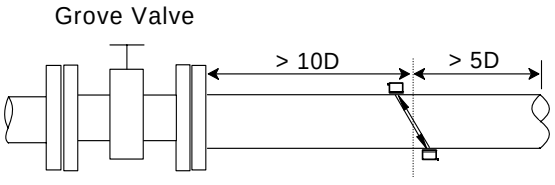
Compact

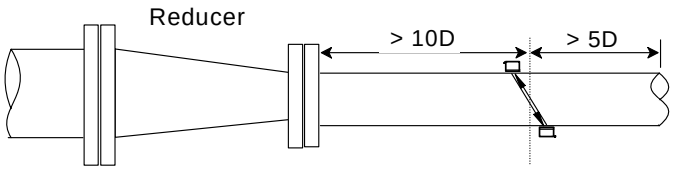
Display: 1. state, 2. error time, 3. temperature different, 4. temperature, 5. energe flow, 6. total flow, 7. flow rate, 8. flow rate
Size: 96×96×129mm
Input: 3 channel 4-20mA analog input, 2 channel resistance signal input
Output: Isolation RS232/RS485 output, 2 channel isolation OCT output 1 channel isolation 4-20mA output (two-wire)
Protection: IP68

STRAIGHT RUN PIPING REQUIREMENT

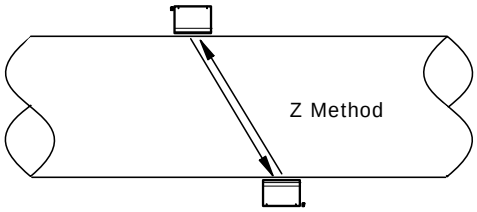


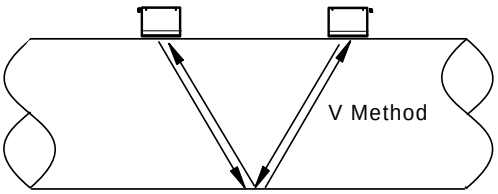






INSTALLATION





**** Please contact your local GPE application engineer**

You also need to provide the following information:

Type of Fluid	**We need the name of your fluid, including operating density and viscosity**
Line Size	**pipe size and sensor connection type (insertion,clamp, etc..)**
Process Pressure and Temperature	**We calibration your Flowmeter as close to your application as possible**
Type of Electronics	**output and install type (compact, wallmount, panelmount,etc..)**
Pipe Material	**We need the name of your pipe material**

Model Selection Guide

F3001

Example 1: F3001-FX-compact-SCS-05-P1

F3001-FX-	**	**	**	**	**		Description
Compact type with display and RS485 	MIF						Flow meter
Compact-multichannel with display,RS232/RS485,OCT output,4-20mA output 	CPF						
Wall mount with display, mulitchanel input/outputs 	WLF						
Panel mount with display, multi-channel input/output 	PMF						
Small clamp sensor, 15 ~ 100 mm		SCS					Transducers
Middle clamp sensor, 50 ~ 1000 mm		SCM					
Large clamp sensor, 300 ~ 6000 mm		SCL					
High Temperature clamp sensor (-30-160℃), 15 ~ 100 mm		SHS					
High Temperature clamp sensor (-30-160℃), 50 ~ 1000 mm		SHL					
Standard insertion sensor		SIS					
Long insertion sensor		SIL					
Inline sensor with pipe size **"		SN-**"					
No Cables			NC				Signal Cable Length
5M, 2 Cables			C1				
10M, 2 Cables			C2				
15M, 2 Cables			C3				
Wall mount transmitter 				TW			Transmitter
Panel mount transmitter 				TP			
None transmitter				NN			
thinkness gague					TT		Options

Vortex Flowmeter
F4001 Series

GENERAL

Vortex flow sensing technology relies on measuring the number of vortex pulses generated by a bluff body immersed in the flow stream. A piezo-electric sensor mounted outside of the fluid flow serves as a transducer to convert the vortex pules into electrical pulses which are then counted and converted into usefull engineering untis by the microprocessor in the meter's display module. By utilizing a design that is free of moving parts and having a transducer that is isolated from the process fluid, the vortex meter offers a number of advantages including low pressure drop, long service life, good particle tolerance, and compatability with a wide array of fluids. Vortex technology is one of the few flow measurement techniques that is capable of measuring liquids, compressed gases, and steam.

GPE's F4001 Series meters are avaialble for line sizes ranging from ½" through 20" and are offered with in-line flanged or wafer style mounting as well as insertion-type with an optional hot-tap ball valve. The F4001 may be calirated for liquid, gas, or steam service and is avaialble with integrated temperature and pressure measurement for performing compensated mass-flow calculations.

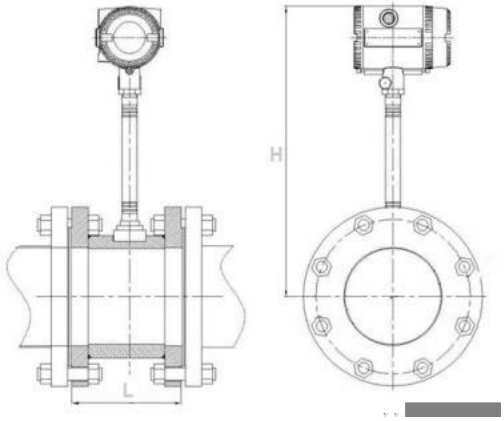
FEATURES

- Suitable for a wide variety of applications with steam, gas, and liquid medias
- No moving parts, high reliability and durability
- Piezo-electric sensor isolated from the process fluid
- Error messages displayed for or erratic flows and flows outside of calibrated ranges
- Field calibration possible with integral or remote electronics and keypad
- True 2-wire 4-20 mA interface
- Wide measuring range, turn-down ratio of 10:1
- Insertion meters can be installed vertically, horizontally or in angled pipelines
- Available and an integrated mass flow vortex
- F4001 (insertion) can be hot-tapped with ball valve and retractable assembly

SPECIFICATION

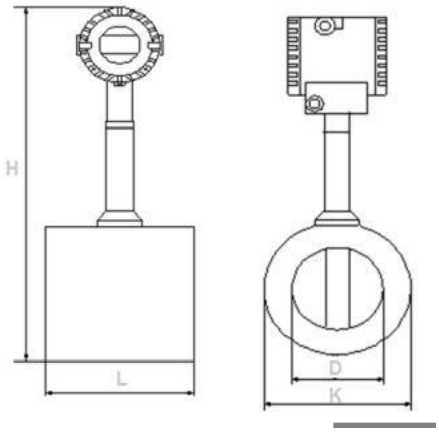
- Process Connections: wafer(standard),Flanged; Insertion;
- Process temperature : 23~482 °F (-5~+250 °C) (with LCD display)
- Operating pressure : 232 psi (1.6MPa) std; up to 928 (6.4 Mpa) optional
- Velocity Range : Depends on fluid, pressure and temperature
- Liquids : 0.6~6 m/s
  Gas & Steam : 7~45 m/s
- Accuracy : 1.0% for liquid, 1.5% for gas and steam
- Repeatability : 0.33% for liquid, 0.5% for gas
- Turn down ratio : 10:1 (liquids)
- Material : SS #304
- Signal output : Pulse output, 2-wire 4~20mA$_{DC}$, RS485, Hart, Modbus
- RAM Back-up : Lithium Battery, 3.6V$_{DC}$
- Housing protection : IP65; IP67
- ExExid Ⅱ B T4; Exib Ⅱ C T 4
- Cable: 30' (10 m) included for remote version
- weight (approximate) : Wafer: 22~29 lbs (10~13kg) to 12" (DN300)
  Flange: Contact factory for flange weight.
  Insertion: 12 lbs (5.5kg) to 20" (*DN500)
- Signal Interface : RS485, HART
- Display units : m^3/h, kg/hr
- Keypad : Rate, Total
- Power supply : 110/220 V$_{AC}$ or isolated 14~36 V$_{DC}$
- NIST traceable : Liquids and gasses only
- Data storage : EPROM storage up to 5 years
- Data logger : Reading, sampling Times 0.5 S

Flange



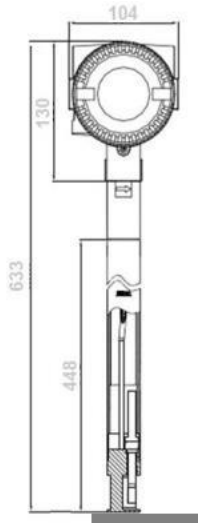
DN	L ± 3		H ± 3		Weight (kg)	
	class 150#	class 300#	class 150#	class 300#	class 150#	class 300#
25	180	180	390	390	4.68	5.68
32	180	180	390	390	5.42	6.82
40	180	180	400	400	5.97	8.36
50	180	200	400	400	7.58	8.84
65	200	200	400	410	10.4	11.96
80	200	200	415	435	12.39	15.75
100	220	220	430	457.5	17.24	23.89
125	220	220	430	481.5	19.29	30.63
150	220	220	505	522	24.82	39.91
200	220	220	550	579.5	35.73	58.79
250	250	250	590	632	51.93	85.16
300	300	300	630	694.5	76.1	122.4

Wafer



DN	L ± 3	D ± 3	K ± 3	H ± 3	Weight
15	65	75	130	331	4.01kg
20				328.5	3.90kg
25				326	3.76kg
32	70	80	145	332.8	4.11kg
40	75	84		337.8	4.35kg
50		94	160	348	4.77kg
65		105	180	361	5.09kg
80	84	120	192	376	6.19kg
100	90	140	230	397	7.61kg
125	100	165	242	423	9.89kg
150	120	190	280	448	13.44kg
200	150	240	335	501	21.89kg
250	160	290	405	549	30.51kg
300	170	340	460	599	40.85kg

Insertion



DN	L ± 3	H ± 3	Weight
80-500	104	633	5.5 kg

Mass flow of saturated steam (kg/hr)

Pressure	0.3 Mpa		0.4 Mpa		0.6 Mpa		0.7 Mpa		0.8 Mpa		1 Mpa		1.2 Mpa		1.5 Mpa	
Temp	133.5 °C		143.6 °C		158.9 °C		165 °C		170.7 °C		179.9 deg C		188 °C		198.4 °C	
Density	1.615 Kg/m^3		2.163 Kg/m^3		3.17 Kg/m^3		3.667 Kg/m^3		4.162 Kg/m^3		5.147 Kg/m^3		6.127 Kg/m^3		7.602 Kg/m^3	
DN15	11	63	12	73	14	88	15	85	16	101	18	112	19	123	23	136
DN20	13	102	15	116	18	141	19	151	20	161	22	179	24	196	27	218
DN25	17	133	19	153	23	185	25	199	27	212	30	236	32	257	36	287
DN32	30	236	34	271	41	328	44	352	47	375	52	417	57	455	63	507
DN40	34	340	39	390	47	470	51	510	54	540	60	600	66	660	73	730
DN50	63	630	73	730	88	880	95	950	101	1,010	112	1,120	122	1,220	136	1,360
DN65	106	1,060	121	1,210	146	1,460	158	1,580	168	1,680	187	1,870	204	2,040	227	2,270
DN80	148	1,480	170	1,700	205	2,050	221	2,210	235	2,350	262	2,620	285	2,850	318	3,180
DN100	222	2,220	242	2,420	293	2,930	315	3,150	336	3,360	374	3,740	408	4,080	454	4,540
DN125	318	3,180	363	3,630	440	4,400	473	4,730	504	5,040	561	5,610	612	6,120	681	6,810
DN150	423	4,230	484	4,840	586	5,860	631	6,310	672	6,720	747	7,470	815	8,150	908	9,080
DN200	847	8,470	969	96,900	1,173	11,730	1,262	12,620	1,344	13,440	1,495	14,950	1,631	16,310	1,815	18,150
DN250	1,270	12,700	1,453	14,530	1,769	17,690	1,892	18,920	2,016	20,160	2,242	22,420	2,446	24,460	2,725	27,250
DN300	2,116	2,160	2,422	24,220	2,932	29,320	3,154	31,540	3,360	33,600	3,737	37,370	4,077	40,770	4,541	45,410

Note: Pressures shown in table are gauge pressure

Mass flow of superheated steam (kg/hr)

ID (mm)	min flow	max flow
15	$8.24\sqrt{\rho}$	$49.5\sqrt{\rho}$
20	$9.88\sqrt{\rho}$	$79\sqrt{\rho}$
25	$13.12\sqrt{\rho}$	$104\sqrt{\rho}$
32	$23\sqrt{\rho}$	$184\sqrt{\rho}$
40	$26.65\sqrt{\rho}$	$265\sqrt{\rho}$
50	$49.41\sqrt{\rho}$	$494\sqrt{\rho}$
65	$82.35\sqrt{\rho}$	$585\sqrt{\rho}$
80	$115.3\sqrt{\rho}$	$823\sqrt{\rho}$
100	$164.7\sqrt{\rho}$	$1,153\sqrt{\rho}$
125	$247.1\sqrt{\rho}$	$1,647\sqrt{\rho}$
150	$329.4\sqrt{\rho}$	$2,471\sqrt{\rho}$
200	$658.8\sqrt{\rho}$	$3,294\sqrt{\rho}$
250	$988.2\sqrt{\rho}$	$6,588\sqrt{\rho}$
300	$1,647\sqrt{\rho}$	$9,882\sqrt{\rho}$

Note:

ρ----density of the superheated steam under operating conditions (Kg/m^3)

Volumetric flow of gas (N m3/hr)

ID (mm)	Flow range	Frequency- Hz
15	5-30	460-3700
20	6-50	220-3400
25	8-60	180-2700
32	14-100	130-1400
40	18-180	90-1550
50	30-300	80-1280
65	50-500	60-900
80	70-700	40-700
100	100-1000	30-570
125	150-1500	23-490
150	200-2000	18-360
200	400-4000	13-325
250	600-6000	11-220
300	1000-10000	9-210

Note: Standard conditions 20 °C, 0.1MPa (absolute pressure), or under atmosphere at 20 °C

Volumetric flow of liquid (m3/hr)

ID (mm)	Flow range	Frequency- Hz
15	1.5-6	90-900
20	1.2-8	40-600
25	2-16	35-400
32	2.2-20	20-250
40	2.5-25	10-240
50	3.5-35	8-190
65	6-60	7-150
80	13-130	6-110
100	2-200	5-90
125	30-300	4.5-76
150	50-500	3.8-60
200	100-1000	3.2-48
250	150-1500	2.5-37.5
300	200-2000	2.2-30.6

**** Please contact your local GPE application engineer**

You also need to provide the following information:

Type of Fluid (liquid/gas or steam)	Please provide 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
Line Size	Please specify your pipe size as well connection type (flange, threaded)
Process Pressure and Temperature	We will calibrate your meter as close to your operating conditions as possible
Type of Electronics	Please indicate if you want integral or remote electronics
Power Requirements	Please specify your power requirements such as 24 V_{DC} or 115 V_{AC} or 230 V_{AC}

Model Selection Guide

F4001 meters													
Example:F4001 -2-3-40-D-1-2-0-N-1-NNN													
F4001-	**	**	_ **	**	_ **	**	**	_ **	**	**	**		Description
Flanged	1												Style
Wafer	2												
Insertion- fixed	3												
Insertion- with ball valve	4												
Liquid		2											Fluid
Gas		3											
Steam		4											
Inline type ½" ~ 12" (DN15~DN300)			**										Line Size
Integral with digital display - standard				D									Display
Remote with 5m cable				R									
13.5~45 V_{DC} - Standard					1								Power Supply
3.6V lithium battery -no output					2								
No output						0							Signal Output
Pulse output						1							
Two wire 4-20mA DC output						2							
No communication							0						Communication
RS-485 Communication without 4-20mA							3						
Hart Communication @ 4-20mA							5						
Standard -40~482 °F (-40 ~ 250 °C)								N					Temperature
High Temp 382~660 °F (250 ~350 °C)								H					
232 psi (1.6MPa)									1				Pressure
363 psi (2.5MPa)									2				
580 psi (4.0MPa)									3				
928 (6.4MPa)									4				
None										N			Explosion Proof
Explosive Isolated										G			
Intrinsically safe										B			
Standard material - SS #304											NN		Options
Special material - SS #316											316		
Mass flow without PT100 RTD and pressure transmitter											MS		
Mass flow with PT100 RTD and pressure transmitter											MT		
Flow computer - 24 V_{DC} power, 4-20mA output, LED display											FC		

F5001
Electromagnetic Flowmeter

GENERAL

F5001-series Eletromagnetic Flowmeter is a flange type electromagnatic flowmeter ideal for conductive liquids. It comes in sizes from 10 to 2000mm flow tubes. F5001-series Eletromagnetic Flowmeter is widely used for tap-water, waste water,food & beveragePulp & Paper and many other applications. F5001-series Eletromagnetic Flowmeter is a stand alone magmeter that could also be used with various configurations, such integral or remote and AC or DC power requirement. HART, RS485 and profibus communications are available

FEATURES

- Variety of lines (see ordering sheet on page4)
- Flow Velocity range:0-15 m/s
- GPRS, CDMA and SRD radio communication
- Designed for clean water > 5 uS/cm
- IP68 enclosure that can be used for underground applications
- FEP Liner suitable in vacuum tube. High accuracy of ±0.5% of reading
- Empty pipe, current excitation and battery capacity alarms
- NIST traceable calibration certificate

SPECIFICATION

- Size: 10-2400mm(3/8” to 96")
- Electrode & Grounding : Stainless Steel 316L
- Measuring Range : Velosity 0-0.25m/s min.
  0-12m/s max.
- Material
- Measuring Tube: Stainless Steel 304
  Flange : Cabon Steel(standard)
  : Stainless Steel 304(Option)
  :Stainless steel 316(Option)
  Coil Housing :Carbon Steel(standard)
- Protection : Protection : IP 65 or IP 68
- IP 68 (Submersible)
- Conductivity : to be more than 5 uS/cm
- Power requirments 110-240VAC or 24 VDC
- Outputs: Analog 4 to 20mA, Prequency, HART, Profibus
- Liner : Polyurethane(25-600 mm)
  FEP(10-300 mm)
  PTFE(10-800 mm)
  Neoprene(50-2000 mm)
- Electrode & Grounding : Stainless Steel 316L
  Hastelloy B
  Hastelloy C
  Titanium
  Tantalum
  Tungsten Carbide
- Process Connection: Flange
- Flange type: ANSI, DIN and JIS flanges
- Grouding Resistance: Must be less than 10 Ohm
- Ambient Temp.: -25 to +65 Deg. C
- Temperature
  -10 ~ +80 Dec C (Polyurethane)
  -20 ~ +70 Dec. C (Neoprene)
  -40 ~ +150 Deg. C (FEP)
- Accuracy :+/-0.5% of reading(Velocity>=0.5 m/s)
  :+/-0.2% of reading

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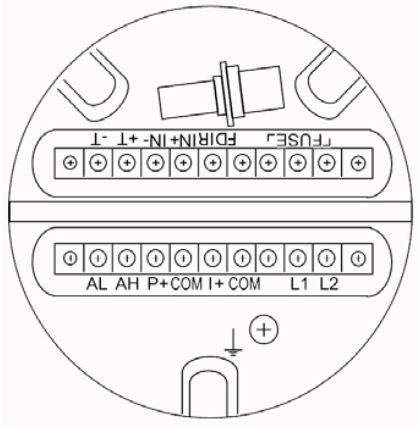
TEL：+1- (917) 331-2456 FAX：+1- (718) 710-8675
URL: http://www.gpeus.com
E-mail: alex@gpeus.com

Flow range

Normal Size		Flow Range & Velocity Table (m3/hr)						
mm	Inch	Min.						Max.
		0 - 0.25M/S	1.0 M/S	2.0 M/S	3.0 M/S	5.0 M/S	10.0 M/S	0 - 12 M/S
10	3/8"	0 to 0.071	0.28	0.57	0.85	1.41	2.83	0 to 3.39
15	1/2"	0 to 0.16	0.64	1.27	1.91	3.18	6.36	0 to 7.63
20	3/4"	0 to 0.28	1.13	2.26	3.39	5.65	11.3	0 to 13.6
25	1"	0 to 0.44	1.77	3.53	5.30	8.84	17.7	0 to 21.2
40	1-1/2"	0 to 1.13	4.52	9.05	13.6	22.6	45.2	0 to 54.3
50	2"	0 to 1.77	7.07	14.1	21.2	35.3	70.7	0 to 84.8
80	3"	0 to 4.52	18.1	36.2	54.3	90.5	181	0 to 217
100	4"	0 to 7.07	28.3	56.5	84.8	141.4	283	0 to 339
125	5"	0 to 11.0	44.2	88.4	133	220.9	442	0 to 530
150	6"	0 to 15.9	63.6	127	191	318.1	636	0 to 763
200	8"	0 to 28.3	113	226	339	565.5	1131	0 to 1357
250	10"	0 to 44.2	177	353	530	883.6	1767	0 to 2121
300	12"	0 to 63.6	254	509	763	1272	2545	0 to 3054
350	14"	0 to 86.6	346	693	1039	1732	3464	0 to 4156
400	16"	0 to 113	452	905	1357	2262	4524	0 to 5429
450	18"	0 to 143	573	1145	1718	2863	5725	0 to 6871
500	20"	0 to 177	707	1414	2121	3534	7068	0 to 8482
600	24"	0 to 254	1018	2036	3054	5089	10179	0 to 12214
700	28"	0 to 346	1385	2771	4156	6927	13854	0 to 16625
800	32"	0 to 452	1810	3619	5429	9048	18095	0 to 21714
900	36"	0 to 573	2290	4580	6871	11451	22902	0 to 27482
1000	40"	0 to 707	2827	5655	8482	14137	28274	0 to 33928
1200	48"	0 to 1018	4071	8143	12214	20357	40714	0 to 48857
1600	64"	0 to 1810	7238	14476	21714	36190	72381	0 to 86857
1800	72"	0 to 2290	9161	18321	27482	45803	91607	0 to 109928
2000	80"	0 to 2827	11309	22619	33928	56547	113095	0 to 135714
2200	88”	0 to 3420	13680	27360	41040	68400	136800	0 to 164160
2400	96”	0 to 4070	16280	32560	39840	81400	162800	0 to 195360

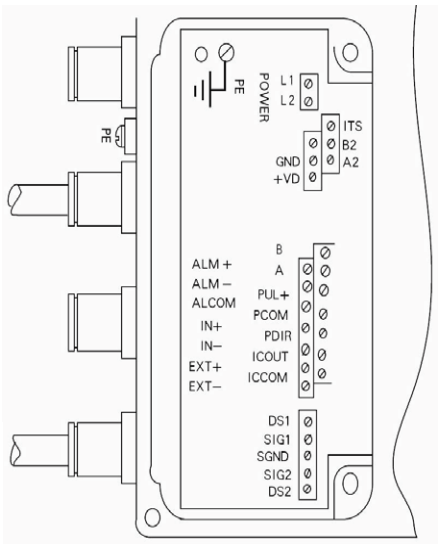
ELECTRICAL CONNECTION

Compact transmitter wiring



Up line: T-, T+; RS485 Communication
FUSE: Power Fuse
Low line: AL, AH; L, H alarm
P+, COM : Pulse Frequency,
COM : be commonly used with AL.AH
1+, COM : 4-20mA
L1, L2 : 220Vac (24Vdc option)

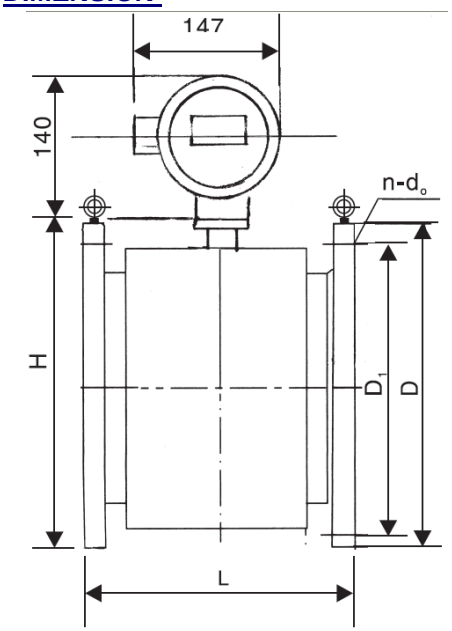
Remote transmitter wiring



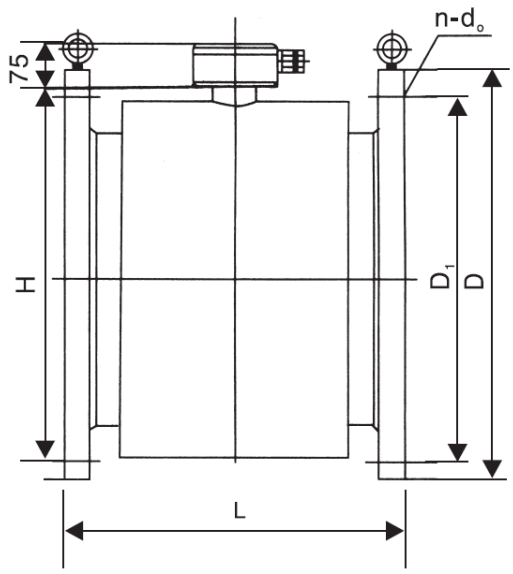
EXT+ : Exciting currency output+
EXT- : Exciting currency output-

DS1 : Signal shield 1
SIG1 : Signal 1
SIG 2 : Signal 2
DS 2 : Signal shield 2
PDIR : Flow direction
ALM+ : H alarm
ALM- : L alarm
A : RS485+
B : RS485-
IN+ : Contact input +
IN- : Contact input-
L1 : AC/DC power
+ L2 : AC/DC power -
A2 : PROFIBUS data line DP – A
B2 : PROFIBUS data line DP – B
ALCOM: State output terminal
RTS : Relay control (direction)
+VD : Isolated power source 5V
GND : Isolated power grounding
IOUT+ : Currency output+
SIG GND: Signal grounding

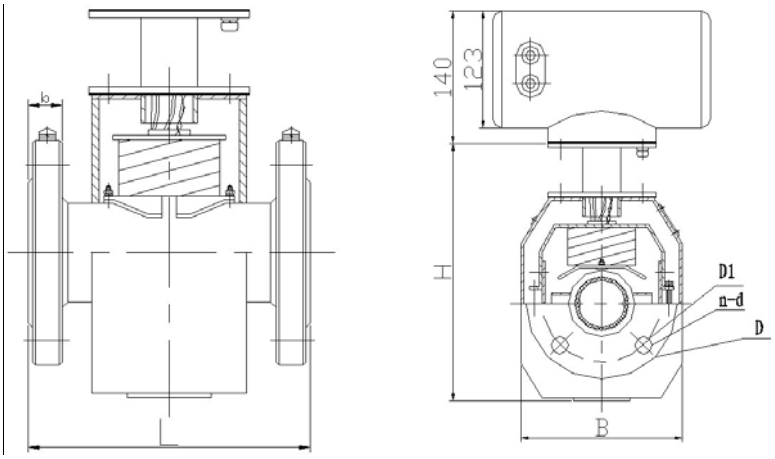
DIMENSION



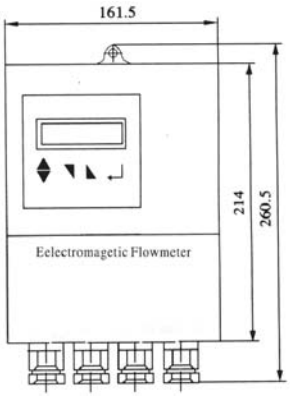
a. Compact version (size≥4”)



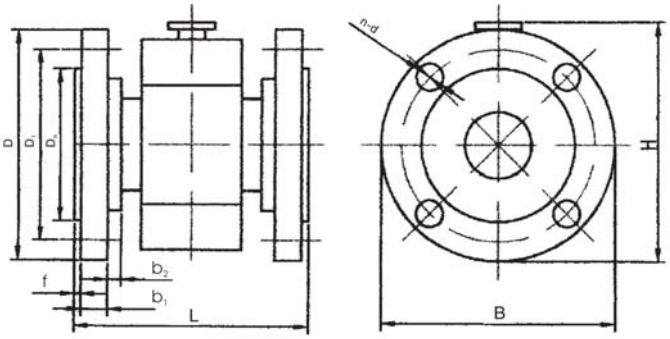
b. Remote version (size≥4”)



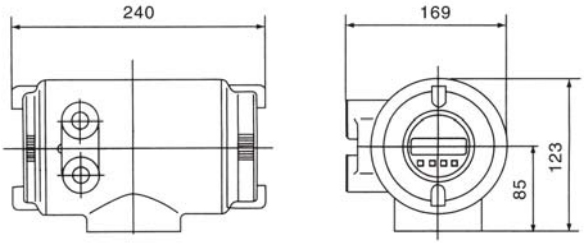
c. size 3/8” to 3”



Remote transmitter



d. Middle-High pressure sensor dimension



Compact transmitter

Notes: Total flange to flange length L_t includes liner

L_t=L+2S±5(allowable error)

S: Grounding ring S=5mm(only for PTFE liner)

L= actual flange to flange length

DN	Nominal Pressure	Dimension(mm)			Flange dimension (mm)					kg
		L	B	H	D	D1	n-d	Th	b	
10	4.0	150	130	220	90	60	4x14	M12	16	7
15		200	130	220	95	65	4x14	M12	16	7.5
20		200	130	220	105	75	4x14	M12	18	8
25		200	142	230	115	85	4x14	M12	18	9
32		200	142	230	140	100	4x18	M16	20	9.5
40		200	158	255	150	110	4x18	M16	22	11.8
50		200	170	260	165	125	4x18	M16	24	13.5
65		200	185	275	185	145	8x18	M16	24	15.5
80		200	200	285	195	160	8x18	M16	26	17.25
100		250	235	290	230	190	8x18	M20	28	22
125		250	270	325	270	220	8x18	M22	30	28.9
150		300	300	350	300	250	8x22	M22	30	35
200	1.6	350	340	385	340	295	8x22	M20	30	47.5
250		400	405	445	405	355	12x22	M22	32	67.8
300		500	460	515	460	410	12x22	M22	32	85
350		500	520	570	520	470	16x22	M22	34	127
400		600	580	630	580	525	16x22	M27	38	127
450		600	640	690	640	585	20x26	M27	42	194.5
500		600	715	760	705	650	20x26	M30	48	210
600		600	840	880	840	770	20x30	M36	50	303
700	1.0	700	895	970	895	840	24x30	M27	46	470
800		800	1015	1080	1015	950	24x33	M30	52	500
900		900	1115	1180	1115	1050	28x33	M30	56	700
1000		1000	1230	1285	1230	1160	28x36	M33	62	921
1200	0.6	1200	1405	1480	1405	1340	32x33	M30	60	1100
1400		1400	1630	1695	1630	1560	36x36	M33	68	1320
1600		1600	1830	1895	1830	1760	40x36	M33	76	1450
1800		1800	2045	2110	2045	1970	44x39	M36	84	1650
2000		2000	2265	2315	2265	2180	48x42	M39	92	1840
2200		2200	2475	2520	2475	2390	52x42	M39	42	1960
2400		2400	2685	2725	2685	2600	56x42	M39	44	3300

MODEL SELECTION GUIDE

MODEL SELECTION GUIDE

F5001 Series Electromagnetic Flowmeter												
Example: F5001-25-1-3-S-4.0-L-0-0-C-0-0-1-1-NX-D												
F5001												Description
10 mm	10											Line Size
15mm	15											
25mm	25											
32mm	32											
40mm	40											
50mm	50											
65mm	65											
Other	xx											
Stainless Steel 316L		0										Electrode
Hastelloy B		1										
Hastelloy C		2										
Titanium		3										
Tantalum		4										
Tungsten Carbide		5										
Platinum		6										
Chloroprene Rubber(Neoprene)			1									Liner Material
PTFE			2									
PUNE			3									
F46			4									
DIN				S								Flange connection
ANSI				A								
JIS				J								
Suitable for size from 1”~3"					42							Nominal Pressure (MPa)
Suitable for size from 1”~3"					32							
Suitable for size from 1”~3"					25							
Suitable for size from 1”~3"					16							
Suitable for size from 1”~4"					10							
Suitable for size from 1”~4"					6.3							
Suitable for size from 1/2”~6"					4.0							
Suitable for size from 1”~24"					2.5							
Suitable for size from 1”~40"					1.6							
Suitable for size from 1”~80"					1.0							
Suitable for size from 1”~120"					0.6							
80C or less						L						Working Temperature
150 C or less						H						
Not Needed							0					Grounding Rings
Needed							1					
IP65								0				Protection
IP67								1				
IP68								3				
Compact version(Local display)									C			Transmitter
Remote version									R			
None										0		Communication
4 to 20mA/Pulse										1		
Hart										2		
RS485										3		
GPRS										4		
CDMA										5		
Carbon Steel											0	Housing Material
Stainless Steel 304 SS											1	

Carbon Steel	0			Flange Material
Stainless Steel 304 SS	1			
Not Needed		0		Companion Flange
Needed		1		
None			NX	Explosion proof
Explosion Proof			Ex	
24VDC				D Power supply
80~220VAC				A

Thermal Mass Flowmeter
Series F6001

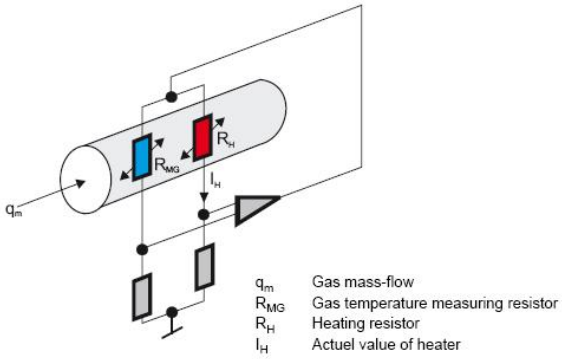
GENERAL

The GPE F6001 insertion mass Flowmeters are thermal dispersion type, utilizing constant temperature difference method of measuring Gas Mass Flow Rate. It contains two reference grade platinum RTD sensors clad in a protective 316 SS sheath. Features direct Mass Flow for gases ,wide rangeability, low pressure drop, very low end sensitivity, and no moving parts. The GPE F6001 series is microprocessor based, does not have any potentiometers. Electronics can be Integral Style, or remote mount with rugged windowed dual compartment enclosure with local or remote display. Four models available from the low cost blind meters to the more exotic featured SP models.

Calibration Self Check: Flow Meter has built in diagnostics - a display of the calibration milliwatts (mw) can be used to check the sensor's operation by being compared to the original reported "zero flow" value noted on meter's Certificate of Conformance (last few lines) and metallic tag. This convenient in-situ field diagnostic procedure verifies that the original factory calibration hasn't drifted, shifted, or changed. This "Sensor Functionality and Zero Self Check" also verifies that the sensor is free from contamination, even without inspection.

Features

- Direct mass flow measurement of any gas with actual gas calibration
- Opto-isolated outputs, with graphic display
- Tracking of overall gas consumption over a turndown ratio of at least 100:1
- Up to four in-dependent switch able flow curves
- high contrast photo-emissive OLED display with rate,total, temperature and graphic display
- Selectable engineering units, dynamically converts the flow rate and total flow
- Can measure higher velocity than any other thermal mass meter - up to 203 m/s
- Display calibration milliwatt (mw) for ongoing diagonostics
- Standard software available multi-curve fit programs
- Low power dissipation under 2W
- Low cost SA option for Air, O2 and N2 ONLY (0.3Nm/s～60Nm/s)



SPECIFICATION

- Process Connection : Threaded, Flanged, Ball valve
- Process temperature : 0 to +150°C
- Operating pressure : 69 barg (1000 PSIG)
- Mass Velocity : 0.07 to 203 normal meters per second
- Flow units : Kg/hr, Kg/mn, Kg/s Lb\hr, Lb/m Lb/s
  NCMH, SCFM, NLPM, SLPM
  Mt/s, F/mn, BTU/Hr, BTU/min
- Gas pressure effect : Minor < ±20% of calibration pressure
- Gas temperature effect : 0.01%/℃
- Accuracy (and linearity) : ±[1.5% of Reading +(0.5% FS)]

  Repeatability : ± 0.25% of Full Scale
- Turn down ratio : Over 100:1
- Response time : Less than one seconds
- Material : 316SS as per DIN 1.4571 (AISI 316 Ti)

- Display units : Flow, Total flow, Switch settings
  Temperature, Elapsed time
- RAM Back-up : Lithium Battery
- Data storage : EPROM storage up to 10 years

- Housing protection : NEMA 4,Class 1, Div 1, Groups B, C, & D
- Ex-protection : Ex d II C T3 Gb (Optional)

- Cable (remote version) : 300 meters
- Wetted materials : 304SS (316L, Hastelloy and Monel for optional)
- weight :
  Integral Ex proof : 4.0 kg
  Remote Ex proof : 7.0 kg
  Integral Non-Ex proof : 1.5 kg
  Remote Non Ex proof : 3.0 kg
- Linear signal output : 0-5 VDC & 4-20 mA
- Pulse output : scalable
- Relays : Two 1-amp, SPDT
  User-selectable alarm functions
- Signal Interface : HART & RS485, MODBUS,etc..
- Power requirements : 115VAC @, 1/8 A 230VAC @ 1/16 A
  24 VDC @ 1/4A, 12 VDC
- Power Consumption : 2.5 Watts (SP), or less 6W other models
- NIST traceable calibration : Standard
- Self diagnostics functions :ADC, DAC,
  Alarm relay for EMI impulse noise

15-17 Libella Cout, Essex County, Newark, NJ 07105, USA
(P)646-619-1289
Website: www.gpeus.com
Email: mass@gpeus.com

Techncial Parameter

Desinged for inexpensive Non-hazordous use

Low power dissipation, under 2.5 Watts (e.g., under 100 ma at 24 VDC)

Accuracy (and linearity) : ±[1.5% of Reading +(.5% FS)]

Integral and remote styles

Digital system allows raw signal validation (milli-watts)

24 VDC or 115VAC/230 VAC

Photo-emissive OLED graphical display (Flow Rate, Totalizer, Temperature)

4 to 20 mA for Rate; 24VDC pulse for Totalized value

Modbus® compliant RS485 RTU communications (optional)
Hart fundation field bus communicdation

Field reconfigurability via optional Addresser software

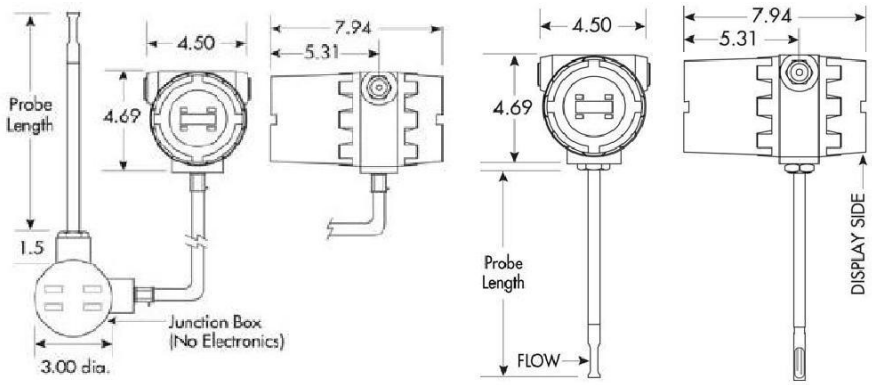
Proprietary digital sensor drive circuit provides enhanced signal stability and is unaffected by process temperature & pressure changes

Standard Volume flow range

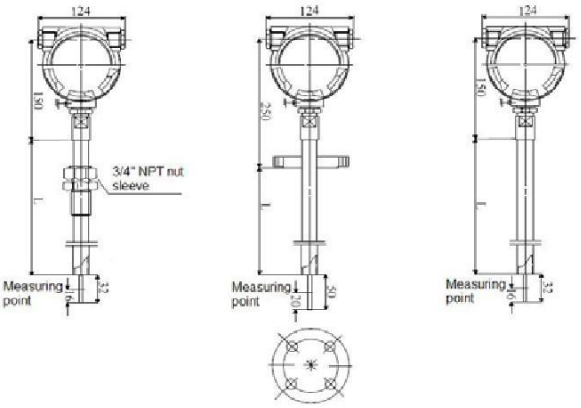
Pipe size (mm)	Pipe size (inch)	Option 1 (0.3~30 Nm/s)		**Standard** (0.6~60 Nm/s)		Option 2 (0.9~90 Nm/s)		Option 3 (1.2~120 Nm/s)	
		Min (Nm3/hr)	Max (Nm3/hr)	Min (Nm3/hr)	Max (Nm3/hr)	Min (Nm3/hr)	Max (Nm3/hr)	Min (Nm3/hr)	Max (Nm3/hr)
25 mm	1“	0.53	53	1.05	105.9	1.58	158.8	2.11	211.8
32 mm	1 1/4"	0.87	86.7	1.73	173.5	2.6	260.3	3.47	347.1
40 mm	1 1/2"	1.36	135.6	2.71	271.1	4.06	406.7	5.42	542.3
50 mm	2"	2.12	211.9	4.23	423.7	6.35	635.5	8.47	847.4
65 mm	2 1/2"	3.58	358.1	7.1	716.1	10.7	1074.1	14.3	1432.2
80 mm	3"	5.42	542.3	10.8	1084.7	16.2	1627.1	21.6	2169.4
100 mm	4"	8.47	847.5	16.9	1694.9	25.4	2542.3	33.8	3389.8
125 mm	5"	13.2	1324.2	26.4	2648.3	39.7	3972.4	52.9	5296.6
150 mm	6"	19.1	1906.8	38.1	3813.5	57.2	5720.3	76.2	7627.1
200 mm	8"	33.9	3389.8	67.7	6779.6	101.6	10169.4	135.5	13559.3
250 mm	10"	53	5296.6	105.9	10593.2	158.8	15889.8	211.8	21186.4
300 mm	12"	76.3	7627.1	152.5	15254.2	228.8	22881.3	305	30508.4

Instrument Drawings

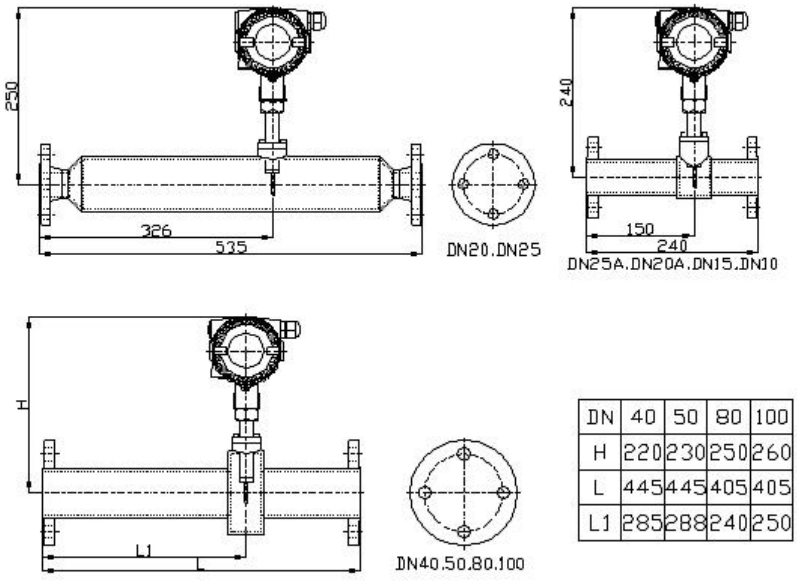
Remote inseration type



Integral insertation type

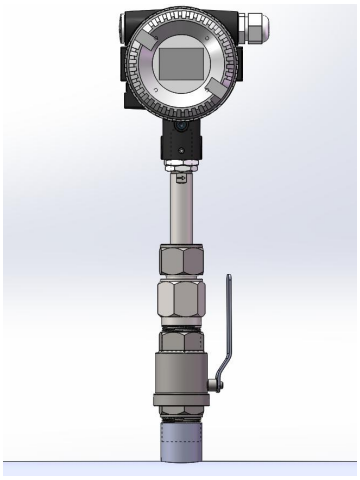


In Line installation



DN	40	50	80	100
H	220	230	250	260
L	445	445	405	405
L1	285	288	240	250

Ball valve installation



Procedures to specify our insertion mass meters

**** Please contact your local GPEapplication engineer****

You also need to provide the following information:

Gas Composition	ISO 17025 certified calibration is done with actual or equivelant gas - gas type or mixture MUST be given
Full Scale Flow	Maximum and minimum flow rates and unites MUST be provided
Line Size	Line size and connection MUST be provided (see selection guide below for options
Gas Pressure and Temperature	Calibration is done at operating or maximum pressure and temperature
Electronics Temperature	Temperature of the environment surrounding the Flowmeters electronics.
Power Requirements	Specify requirements such as 12, 24 VDC or 115 VAC or 230 VAC
Configuration	See below transmitter sytles

Model Selection Guide

F6001F Thermal mass meters

F6001		X	XXX	XXX	XXXXx	XXXXX"	XXXX	XXXXXXX	XXX	XXXX	Description
Flanged in-line	F										Structure
Insertion (NPT)	I										
Inertion (with flange)	G										
Insertion (NPT)（with anti-ejection design）	T										
290mm (DN25~DN150)		1									**Probe Length**
440mm (DN25~DN500)		2									
Integral			I								Style
Remote			R								

1" ANSI 150 #	10A150	Connection
1.5" ANSI 150 #	15A150	
2" ANSI 150 #	20A150	
1" ANSI 300 #	10A300	
1.5" ANSI 300 #	15A300	
2" ANSI 300 #	20A300	
1/2" TUBE X 1/2" COMPRESSION FITTING - SS FERRULE (>650 PSIG or 45BARG)	SSCF05	
3/4" TUBE X 3/4" COMPRESSION FITTING - SS FERRULE (>650 PSIG or 45BARG)	SCF07	
1/2" TUBE X 1/2" COMPRESSION FITTING - TEFLON FERRULE (>125 PSIG or 9 BARG)	STCF05	
3/4" TUBE X 3/4" COMPRESSION FITTING - TEFLON FERRULE (>125 PSIG or 9 BARG)	STCF07	
1/2" TUBE X 3/4" ISOLATION VALVE ASSEMBLY (650 PSGI or 45 barg)	SVL05	
1/2" TUBE X 3/4" ISOLATION VALVE ASSEMBLY (50 PSGI or 3.5 barg)	SVA05LP	
3/4" TUBE X 1" ISOLATION VALVE ASSEMBLY (350PSIG or 24 Barg)	SVA07	

13.5~42VDC	D			Power Supply
85~265VAC 50/60Hz	A			
Put gas type and max velocity		Gas?		Gas
Process Gas (Please indicate, gas type, flow rate, line size, pressure and temperature)			Process Data (T,P	flow, etc)
For larger flanges sizes, probe material (Hasteloy C, Monel) and other options consult factory				

F7001
Tangential Turbine Flowmeter

VF7001-002.00-13/04

Description

F7001 Tangential Turbine Flowmeter is a flowmeter measuring the flow of liquid in the tube. The flowmeter is composed of four parts: body, impeller part, sensor, transmitter. Applied with advanced electron technology and special design, it remains high stability and disturbance proof ability. It can be applied in explosion situation. Fo local display, this flow meter is charged by inner lithium battery, which can work continuously for three years.

Features

- High pressure, various connections
- Compact structure
- Impeller part can be easily taken out from the meter body, thus it is convenient for the periodical maintenance
- Low power consumption
- Long-distance transmission
- Can withstand corrosion
- Local instant flow and total flow LCD display
- Preferred Measured Fluid: Water, wastewater, low viscosity oil, etc.

Specification

- Size: 8, 15, 25, 40, 50, 80, 100, 150, 200, 250, 300mm
- Nominal pressure (PN): 1.6, 2.5, 4.0, 6.3,16, 20, 25, 32 and 42MPa
- Accuracy : ±1%, ±1.5%, ±2.5%
- Working Temperature: -40℃ to +80℃ and 0℃ to +150℃
- Ambient Temperature : -40 to +80℃
- Pressure Drop : For 8mm to 50mm, the pressure drop <0.01MPa
  For 80mm to 300mm, the pressure drop <0.03MPa
- Output Signal: Standard pulse output or 4 to 20mA current output or RS-485 communication output

Application

It is widely used in petroleum, chemistry, metallurgy, and light industry, especially applied in measurement of low-viscosity liquid, such as water, sewage, oil water mixture, processed oil and edible oil.

※ The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacturer that the specifications are currently in effect. Otherwise, the manufacturer assumes no responsibility for the use of specifications which may have been changed and are no longer in effect.

GPE Inc.

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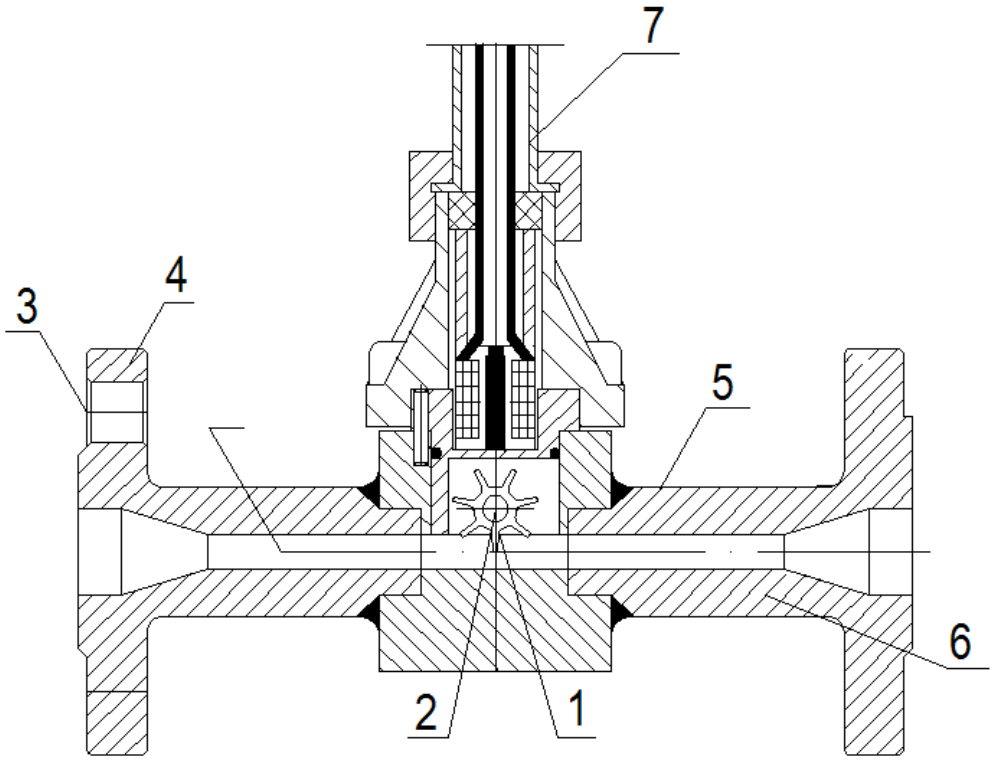
T:+ 1(646)619.1289 F:+1(212)400.7201
www.gpeus.com sales@gpeus.com

F7001
Tangential Turbine Flowmeter

Flow Range

DN(mm)	Standard flow range(m3/h)				
	±0.5% (oil)	±1%(oil)	±1%(water)	±1.5%(water)	±2.5%(water)
8	0.15~0.7	0.1~0.8	0.15~0.75	0.1~0.8	0.08~0.8
15	0.2~1	0.15~1.2	0.2~1	0.15~1.2	0.12~1.5
20	0.3~1.5	0.3~3	0.3~1.5	0.3~3	0.2~4
25	1~5	0.6~6	1~5	0.6~6	0.5~7
40	3~15	2~15	3~15	2~15	1.5~15
50	4~20	2.5~25	4~20	2.5~25	2~25
80			10~80	10~100	6~100
100			30~200	20~200	18~250
150			50~300	40~400	30~400
200			100~500	60~600	70~700
250			200~1000	150~1500	120~1500
300			300~1500	250~2000	150~2000

Cut off drawing



1 to 2: Measuring kis

1: turbine wheel

2: shaft

3: ring nut

4: flange

5: body

6: inlet cone

7: pick up

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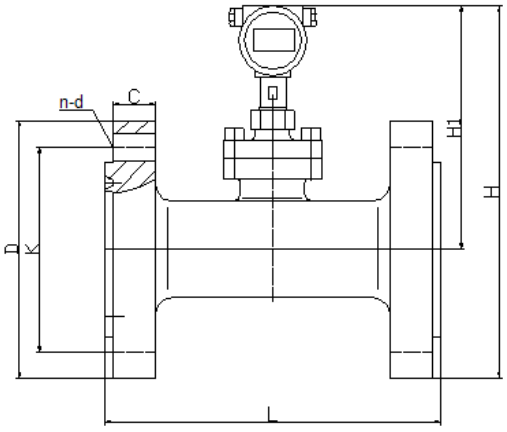
F7001
Tangential Turbine Flowmeter

Dimension



Graph 1 (Straight version)

Table 1 Dimension of straight version (see graph 1 for cast steel material only)

DN(mm)	PN	L	H	H1	D	K	n	d_0	C	Weight(kg)
8	1.6~2.5	180	280	232	95	65	4	14	16	4.5
15	1.6~2.5	180	280	232	95	65	4	14	16	4.5
20	1.6~2.5	225	335	280	105	75	4	14	16	5.5
25	1.6~2.5	270	340	280	115	85	4	14	16	8
	16	270	340	280	140	100	4	23	28	17
40	1.6~4.0	300	350	270	150	110	4	18	18	12
	6.3	300	350	270	170	125	4	23	24	14
	16	350	350	270	175	125	4	27	32	25
	25	350	350	270	180	124	4	30	32	27
	42	350	350	270	205	146	4	33	44.5	30
50	1.6~4.0	378	350	270	165	125	4	18	20	14
	6.3	378	360	270	180	135	4	23	26	16
	16	320	375	270	215	165	8	25	36	30
	25	320	375	270	215	165	8	26	38.5	32
	42	320	375	270	235	171.5	8	30	51	34
80	16	300	370	270	200	160	8	18	20	15
	2.5	300	370	270	200	160	8	18	22	
	4.0	300	285	270	215	160	8	18	24	20
	6.3	300	380	270	220	170	8	23	30	23
100	1.6	350	405	295	220	180	8	18	20	18
	2.5	350	410	295	230	190	8	23	24	
150	1.6	350	468	325	285	240	8	23	22	24
	2.5	350	475	325	300	250	8	26	28	
200	1.6	350	515	345	340	295	12	23	24	50
	2.5	350	525	345	360	310	12	26	30	
250	1.6	400	573	370	405	355	12	26	26	70
	2.5	400	583	370	425	370	12	30	32	
300	1.6	450	630	400	460	410	12	26	28	95
	2.5	450	643	400	485	430	12	30	36	

Notes: customized dimension is available

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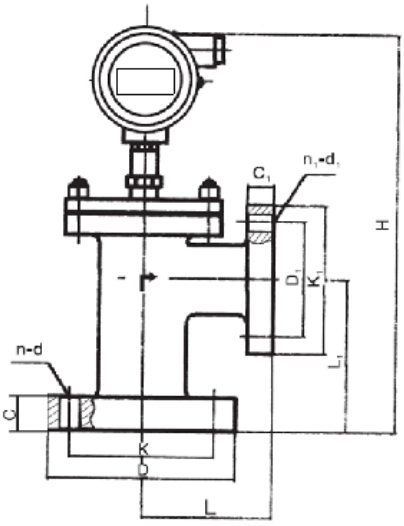
F7001
Tangential Turbine Flowmeter

Dimension



Graph 2(Corner version)

Table 2 Dimension of corner version (see graph 2)

DN(mm)	PN	L	D	K	C	n	d	L1	D1	K1	c1	n1	d1	H	Weight
50	16	150	215	165	36	8	25	176	170	130	28	6	23	456	31
	25	150	215	165	40	8	25	176	170	130	28	6	23	456	
	32	170	210	160	40	8	27	176	190	145	40	6	27	456	
	42	150	235	171.5	51	8	30	176	170	130	28	6	23	456	41
80	16,25	185	255	200	45	8	30	210	240	188	45	6	30	490	50
	32	200	275	220	50	8	30	230	275	220	50	8	30	490	

Notes: customized dimension is available

Table 2 Dimension of straight version (see graph 1 for Stainless steel materials only)

DN(mm)	PN	L	H	H1	D	K	n	d_0	C	Weight(kg)
15	1.6,2.5	150	280	232	95	65	4	14	16	4.5
20		150	335	280	105	75	4	14	16	5.5
25		150	340	280	115	85	4	14	16	8
40		150	350	270	150	110	4	18	18	12
50		230	350	270	165	125	4	18	20	14
80		225	370	270	200	160	8	18	20	15
100	1.6	250	405	295	220	180	8	18	20	18
150		300	468	325	285	240	8	23	22	24
200		350	515	345	340	295	12	23	24	50
250		400	573	370	405	355	12	26	26	70
300		450	630	400	460	410	12	26	28	95

Notes: customized dimension is available

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Turbine Flowmeter
Series F7002

GENERAL

F7002 Turbine Flow Meters

F7002 turbine flow meters (hereinafter referred to as turbines) are used for the precise measurement of instantaneous flow of low-viscosity fluids rates and flow quantities such as; tap and demineralised water, fuels, liquefied gases, Light fuel oil, solvents, Pharmaceutical fluids, etc. Turbine Flowmeters measure volumetric flow, where flow passing through the tube is measured by the mean velocity of the streaming fluid. Flow rectifiers ensure a laminar flow in the axial direction of the wheel. A light-weight turbine wheel carried concentrically in the tube body is rotated by the fluid. The RPM of the turbine wheel is directly proportional to the mean flow velocity within the tube diameter and corresponds to the volume flow over a wide range.

F7002 Display with Frequency and Analog Output

The F7002 turbine is a programmable local display with integral carrier-frequency pickup and amplifier for F7002 meters. Flow rate is indicated in an 8 digit LCD display with 14 segments. A 10 point linearization is included to optimize the accuracy. The pulse output provides a flow-proportional frequency signal or scaled volume pulse in accordance with programming. For electrical connection a 6-pin plug or a junction box with 6 internal terminals is provided

FEATURES

- Fast response time and high resolution within 5 to 50 msec
- Pressures up to 250 bars
- Easily cleaned and designed to flushed particulates through
- the turbine with the medium For food applications with dairy connections as per DIN 11851
- For Pharmaceutical fluids with Tri-Clamp« connections
- For very low flows designed with sapphire bearings

SPECIFICATION

Flow body - F7002 series

- Process Connection : flanges up to 250bar,(ANSI , JIS and DIN), diary or tri-clamp.
- Operating pressure : max. 250 bar
- Process temperature : -40 up to +120°C
- Flow rates : 0.04 to 0.4 m3/hr -smallest size (4mm)
  40 to 800 m3/hr- largest size (200mm)
- Accuracy : ±1% ; ±0.5%; 0.25%
- Viscosities : 1 to 60 cSt
- Material : Stainless steel as per DIN (AISI)
  Body : 1.4305 (1.4571 with flange)-(316 Ti)-specia
  Internal parts : 1.4305 (303)-standard, 1.4571 (316 Ti)
  Wheel : 1.4122 (303)-standard, 1.4460 (329) special
  Bearing : Tungsten carbide or teflon
- Weight : Small sizes : 2 to 16 kg
  Large sizes : 11 to 155 kg
  Electronics : 0.25 to 2.5 kg

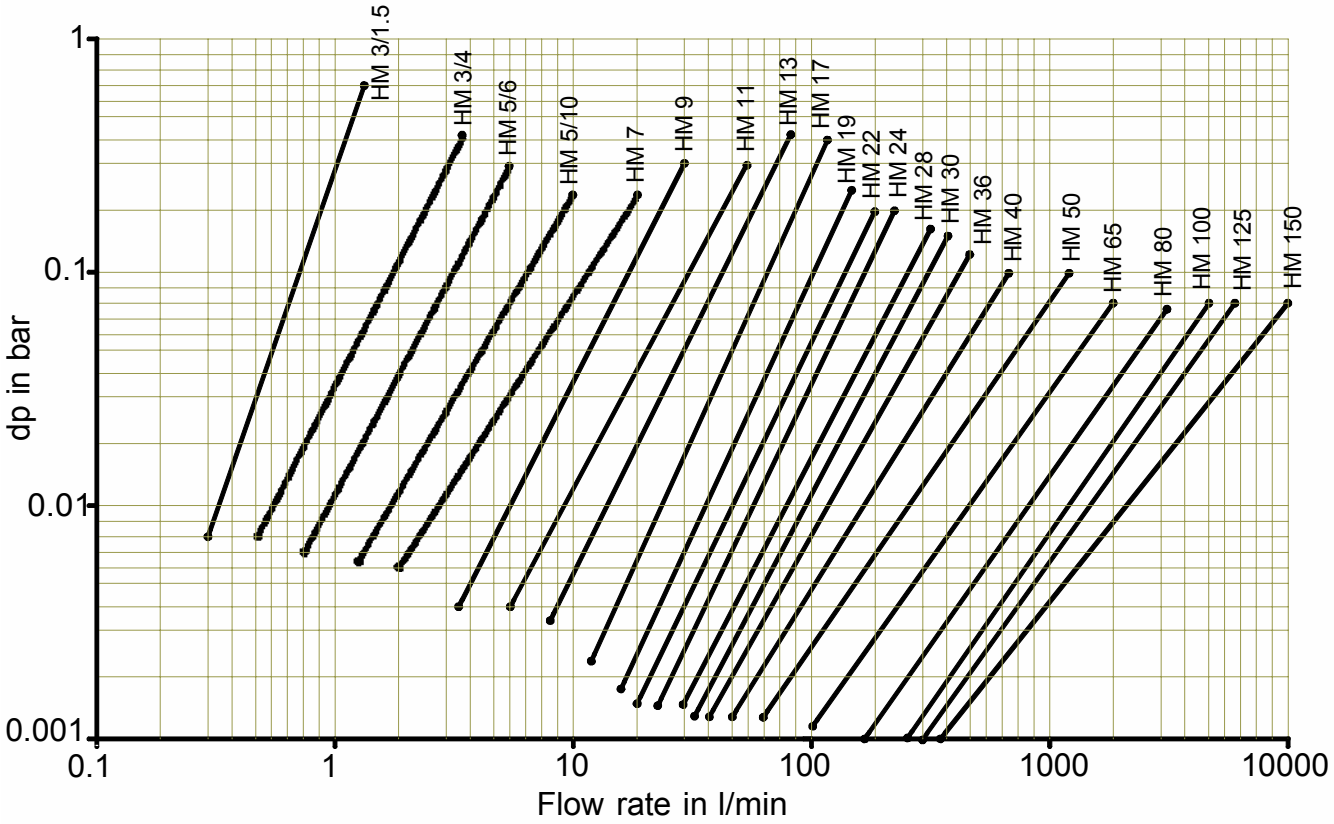
F7002 Carrier Frequency Pulse Amplifier

- Supply Voltage UB : +8.5 up to 29 VDC, controlled
  : 3.2V 10AH battery for option
- Quiescent current : < 5 mA

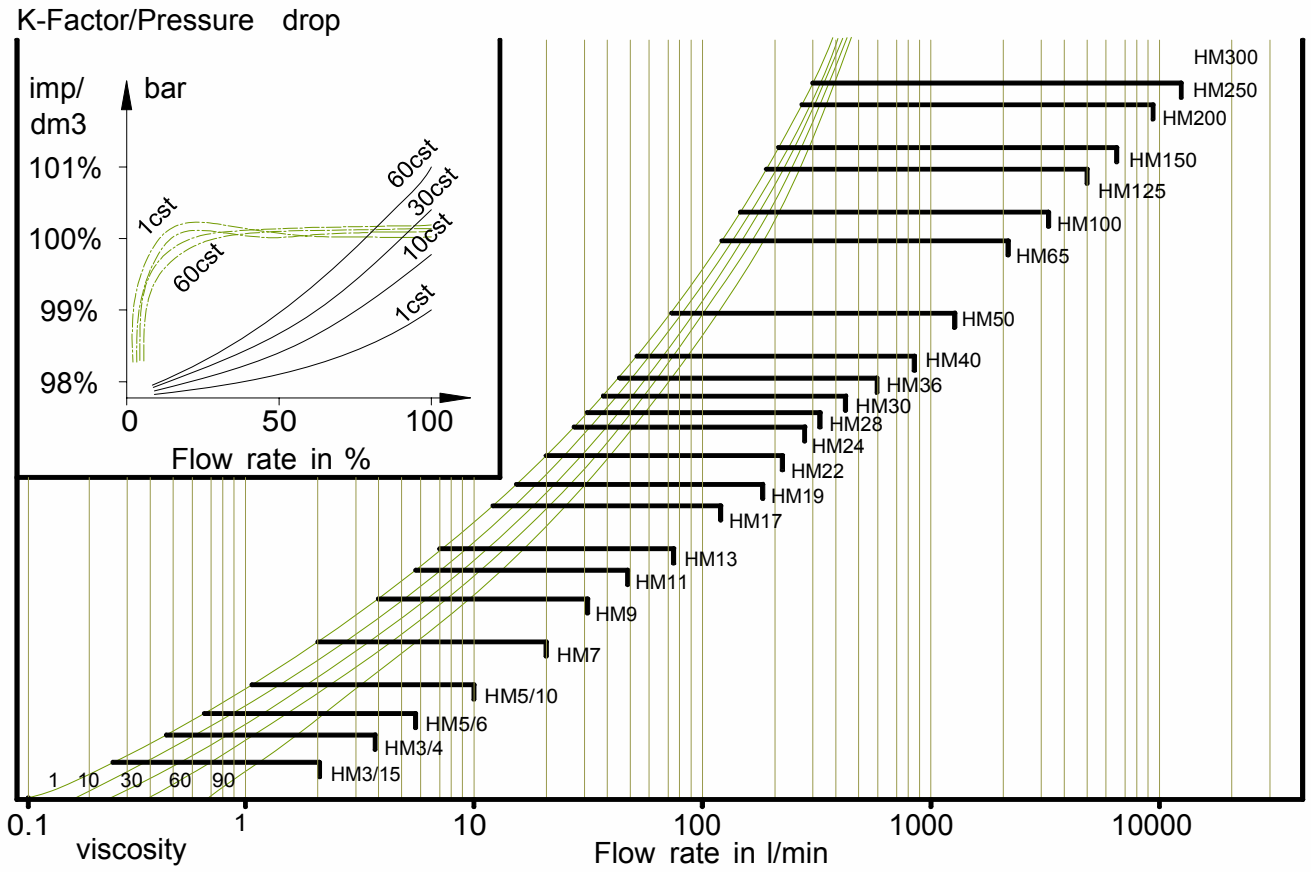
F7002 Electronics

- LCD display : 8 digits(14 segments), digit height 7mm for real-time value, totals and programmable
- Linearization : with 10 points
- Process temperature : -40 up to +120℃ with a distance of at least 25 mm between flow meter and electronic housing
- Ambient temperature : -40 up to +70 °C
- Weight : 700 g
- Frequency output/ : 3-wire, 8-30 VDC controlled,
- Signal output : push, 4 to 20mA
- Frequency output, fmax: 3,000 Hz,duty cycle:approx. 1:1, pulse width: 20MS
- Analog output : 2-wire (4-20mA) for Single analog output
  3-wire(4-20mA) for analog, pulse output both
- Supply voltage : 14-30VDC controlled, UB=(250Ωx 20mA) + 14V
- Load : < 500 ohms
- Resolution : 16 bit (3,9uA)
- Housing : IP 67, aluminum AlMgSiPb, blue anodized
- Ex-protection : Exd II BT6, ExiaII CT4
- Process temperature : 120 °C with a distance of at least 25 mm between flow meter and electronic housing 150℃ at least 65mm

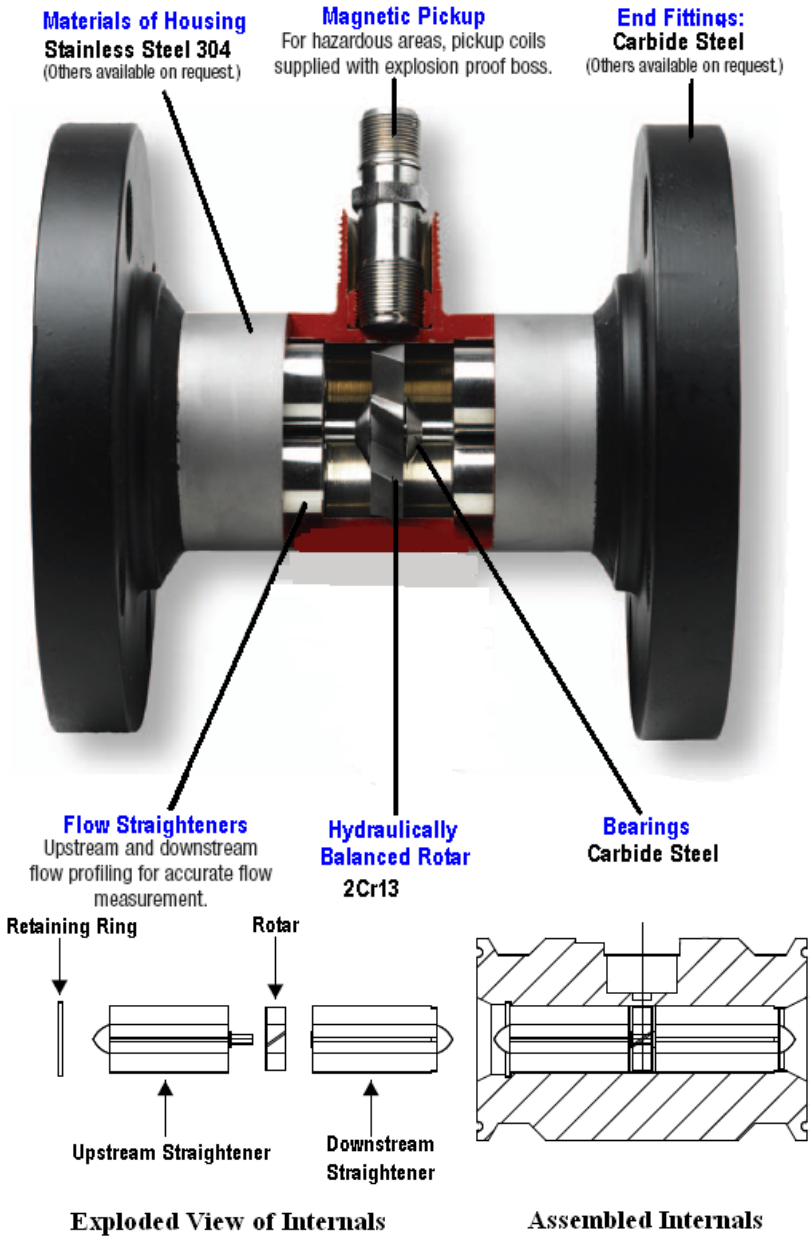
Pressure drop for turbine at different size



Measuring ranges for turbines at different viscosities



DN(mm)	Sta.Flow (m3/hr)	Full Flow (m3/hr)	Sta. Process Pressure	Max.Procss Pressure
F7002-4	0.04 to 0.25	0.04 to 0.4	63bar	250bar
F7002-6	0.1 to 0.6	0.06 to 0.6	63bar	250bar
F7002-10	0.2 to 1.2	0.15 to 1.5	63bar	250bar
F7002-15	0.6 to 6	0.4 to 8	63bar	250bar
F7002-20	0.8 to 8	0.45 to 9	63bar	250bar
F7002-25	1 to 10	0.5 to 10	63bar	250bar
F7002-32	1.5 to 15	0.75 to 15	63bar	250bar
F7002-40	2 to 20	1 to 20	63bar	250bar
F7002-50	4 to 40	2 to 40	25bar	250bar
F7002-65	7 to 70	4 to 70	25bar	250bar
F7002-80	10 to 100	5 to 100	25bar	250bar
F7002-100	20 to 200	10 to 200	25bar	250bar
F7002-125	25 to 250	13 to 250	25bar	250bar
F7002-150	30 to 300	15 to 300	16bar	160bar
F7002-200	80 to 800	40 to 800	16bar	160bar



Exploded View of Internals Assembled Internals

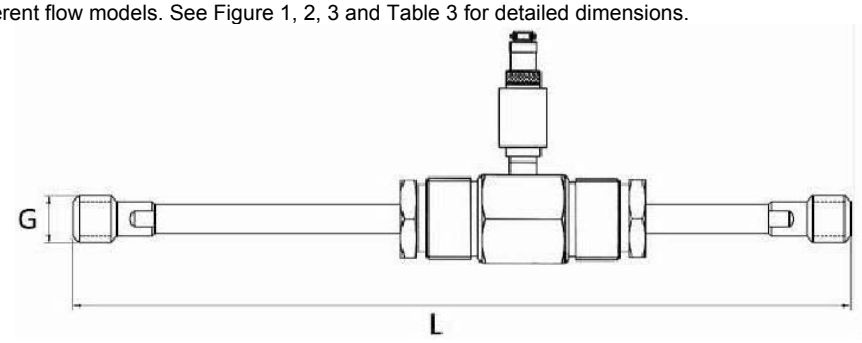
DIMENSION

Thread or flange connection is used according to different flow models. See Figure 1, 2, 3 and Table 3 for detailed dimensions.

Figure 1: DN4-DN10 sensor structure

Figure 2: DN15-DN40 sensor Structure

Figure 3: DN50-DN200 sensor structure



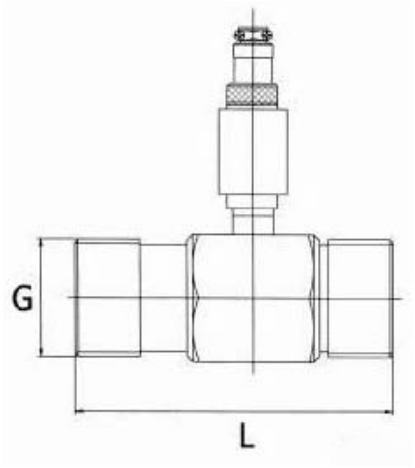


Figure 2

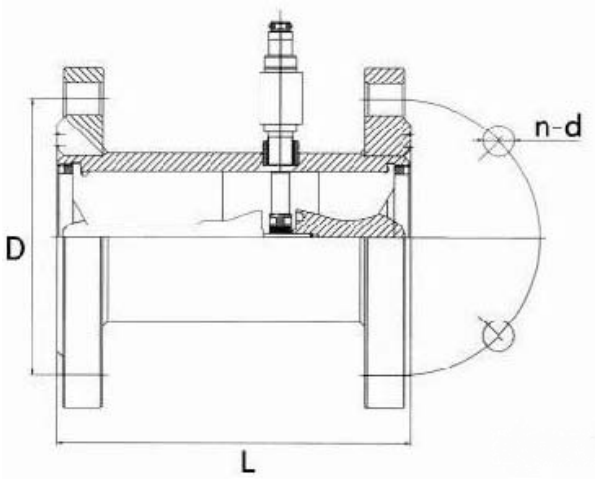


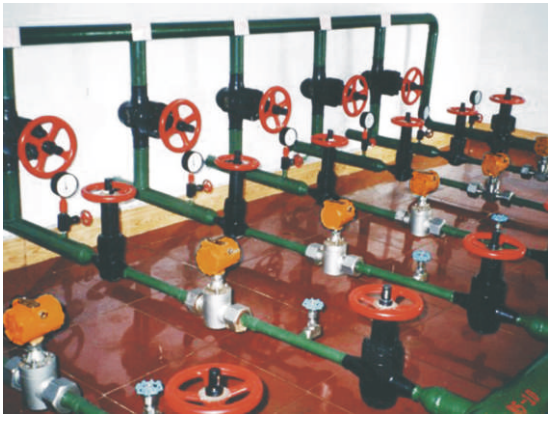
Figure 3

Diameter(mm)	L(mm)	G	D(mm)	d(mm)	N(Bolts)
4	295	G1/2			
6	330	G1/2			
10	450	G1/2			
15	75	G1	Φ65	Φ14	4
20	80	G1	Φ75	Φ14	4
25	100	G5/4	Φ85	Φ14	4
32	140	G2	Φ100	Φ14	4
40	140	G2	Φ110	Φ18	4
50	150	G5/2	Φ125	Φ18	4
65	170		Φ145	Φ18	4
80	200		Φ160	Φ18	8
100	220		Φ180	Φ18	8
125	250		Φ210	Φ28	8
150	300		Φ240	Φ22	8
200	360		Φ295	Φ22	12

MODEL SELECTION GUILD

Example F7002-15F-N-A-EX-16-S4-C-1								
F7002 series （Flanged Connection, other process connection available）								**Description**
Small Size (4mm to 40mm).								
DN 4 (Thread)	4T							Small Sizes (4mm to 40mm) corresponding to flow rates (water)
DN 6 (Thread)	6T							
DN 10 (Thread)	10T							
DN 15 (Thread)	15T							
DN 15 (Flange)	15F							
DN 25 (Thread)	25T							
DN 25 (Flange)	25F							
DN 40 (Thread)	40T							
DN 40 (Flange)	40F							
Large Size (50 mm to 200 mm)								
DN 50 (Flange)	50-F							Large Sizes (15mm to 40mm) corresponding to flow rates
DN 65 (Flange)	65-F							
DN 80 (Flange)	80-F							
DN 100 (Flange)	100-F							
DN 125 (Flange)	125-F							
DN 150 (Flange)	150-F							
DN 200 (Flange)	200-F							
No display.3 wires pulse, 12-24VDC		N						Display and Output
2 wires 4-20mA, remote transmitter, DC24V		A						
No signal output, inner battery powered.		B						
Local display with 2 wires 4-20mA, DC24V		D1						
Local display with 2 wires 4-20mA, RS485, DC24V		D2						
Local display with 3 wires pulse, RS485, DC24V		D3						
ANSI stand. flange			A					Connection
DIN stand. flange			D					
Thread for DN4 to DN40 only			T					
Tri-clamp			C					
Explosion proof				Ex				Protection
Non Explosion proof				NX				
Max. Process pressure 16bar					16			Max. process pressure.
Max. Process pressure 40bar					40			
Max. Process pressure 6.3bar					6.3			
Max. Process Pressure 100bar					10			
Max. Process Pressure xx bar					xx			
Sensor materials SS304						S4		Sensor materials
Sensor materials SS316						S6		
Rotor materials 2Cr13							C	Rotor materials
Rotor materials duplex stainless Steel							D	
Accuracy +/-1% of R								1 Accuracy
Accuracy +/-0.5 of R								0.5
Accuracy +/-0.2 of R								0.2

F7001
Tangential Turbine Flowmeter



Model Selection

Model		1	2	3	4	5	6	7	8	Note
		Size	Structure	PN	Material	Protection	Temperature	Output Signal	Accuracy	
F7001	-									Tangential Turbine Flowmeter
		008								8mm
		015								15mm
		020								20mm
		025								25mm
		040								40mm
		050								50mm
		080								80mm
		100								100mm
		150								150mm
		200								200mm
		250								250mm
		300								300mm
			S							Straight Version
			C							Corner Version
				016						Nominal pressure:1.6MPa
				025						Nominal pressure:2.5MPa
				040						Nominal pressure:4.0MPa
				063						Nominal pressure:6.3MPa
				160						Nominal pressure:16MPa
				250						Nominal pressure:25MPa
				320						Nominal pressure:32MPa
				420						Nominal pressure:42MPa
					CS					Cast Steel
					S4					304 Stainless Steel
					S6					316 Stainless Steel
						A				General Version
						B				Explosion proof Version
							1			-40℃ to +80℃
							2			0℃ to +150℃
								F		Pulse output
								I		4 to 20mA current output
								R		RS-485
									10	Accuracy: ± 1.0%
									15	Accuracy: ± 1.5%
									25	Accuracy: ± 2.5%

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METAL TUBE Flowmeter
F8001 Series

GENERAL

F8001 rugged metal tube variable area meters (rotameters) are ideal for high pressure, high temperature and other demanding flow applications where safety is a concern. Features include: globally-recognized approvals for use in hazardous environments; analog and digital LCD local display options, multiple process connection options; several avaliable materials of construction for metering of aggressive fluids and corrosion resistance; HART enabled 4-20mA output to provide for remote monitoring and control**.** The F8001's excellent repeatability makes it a good choice for batching applications. For versions without electronic output, no power supply is required. The F8001's low-pressure drop provides additional value by allowing for economical pump selection.

FEATURES

- Excellent low-flow performance
- Versatile design may be used for gas, steam, and liquids
- Low pressure loss for gas and steam applications
- Suitable for high pressure and high temperature applications
- Turn-down ratio of 10:1
- Local indication and intelligent remote LCD display
- Easy-to-read analog pointer style indicator
- Intrinsically safe & explosion proof for hazardous area applications

SPECIFICATION

- Size : 15 ~ 100mm
- Measuring Range: Water (20℃) 15 ~ 100,000 l/h; Air (20℃, 0.1013MPa) 0.7 ~ 1000 m^3/h
- Temperature: Standard (E) -40 ~ +200℃, PTFE: -40 ~ 80℃; High temperature (H): +200 ~ +400℃
- Pressure Loss: 6.5 ~ 15.6 KPa
- Pressure: Standard: 1.6MPa (DN65 - DN150); 4.0MPa (DN15 - DN50); High: 2.5MPa (DN65 - DN100); 6.4MPa (DN15 - DN50)
- Viscosity: 15m ~ 20 mm - < 30 CP; 25mm ~ 40 mm - < 250 CP; 50mm ~ 200mm - < 300 CP; Top enter、Top exit
- Wetted parts: SS #304 standard, SS #316; optional Tantalum (flow tube); PTEE (flow tube); PTFE lining
- Flanges: ANSI and DIN-type avaialble
- Accuracy: ±1.5%(Standard); ±2.5%(PTFE liner)
- Repeatability: ±0.5% of reading
- Signal Output: 4-20mA (2-wire)
- Local Display: : Mechanical Indicator (standard)
- Digital Display: : Rate 0 ~ 50000; Total: 0 ~ 99999999 (with decimal)
- Power Supply: : Standard:24VDC,two wire4~20mA(18VDC~30VDC); $3.6V_{DC}$ @ 5.2 AmpHours Lithium
- Approvals: Isolation: Exd Ⅱ CT5; Intrinsic Safety: Exia Ⅱ C
- Alarms: High / Low limit alarm; maximum 1A @ $24V_{DC}$
- Data Storage: EEPROM (up to 10 years)
- Flow Orientation: Top enter/top exit, Standard; Bottom enter/Top exit; Right enter/Left exit; Left enter/Right exit
- Protection: IP 67
- Housing Material : Aluminum
- Cable Connector: M20x1.5 or ½" NPT

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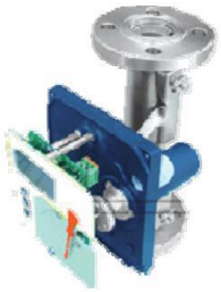
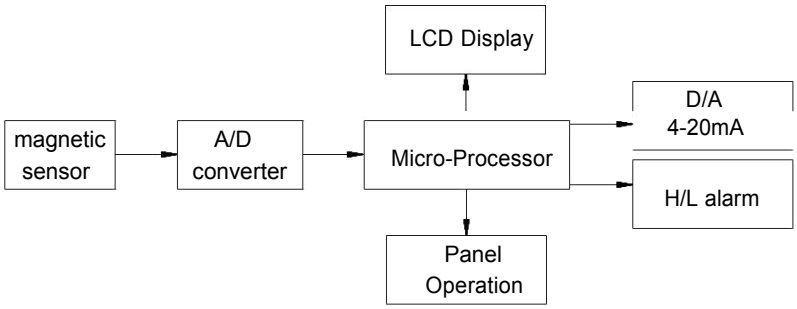
Principle





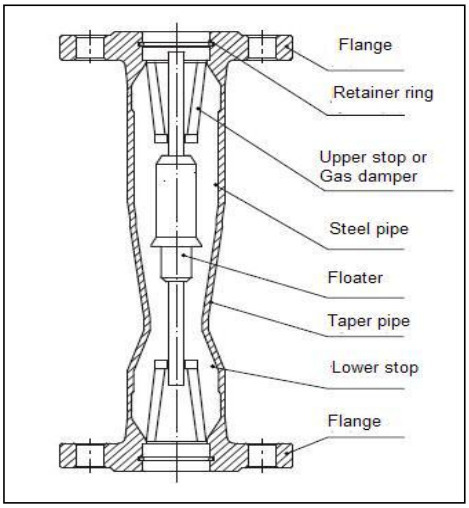
Flow range for various fluids

Meter	Float	Water (LPH)		Air
Bore Size	Model code	Material of measuring tube Metal	Material of measuring tube Metal w/ PTFE liner	in SCMH
DN15	F8001-15.0	2.5~25		0.07~0.7
	F8001-15.1	4.0~40	2.5~25	0.11~1.1
	F8001-15.2	6.0~60	4.0~40	0.18~1.8
	F8001-15.3	10~100	6.0~60	0.28~2.8
	F8001-15.4	16~160	10~100	0.4~4.0
	F8001-15.5	25~250	16~160	0.7~7.0
	F8001-15.6	40~400	25~250	1.0~10
	F8001-15.7	60~600	40~400	1.6~16
DN25	F8001-25.0	100~1,000	60~600	3~30
	F8001-25.1	160~1,600	100~1,000	4.5~45
	F8001-25.2	250~2,500	160~1,600	7~70
	F8001-25.3	400~4,000	250~2,500	11~110
DN50	F8001-50.0	600~6,000	400~4,000	18~180
	F8001-50.1	1,000~10,000	600~6,000	25~250
	F8001-50.2	1,600~16,000	1,000~10,000	40~400
DN80	F8001-80.0	2,500~25,000	1,600~16,000	75~750
	F8001-80.1	4,000~40,000	2,500~25,000	100~1,000
DN100	F8001-100.0	6,000~60,000	4,000~40,000	150~1,500
	F8001-100.1		6,000~60,000	

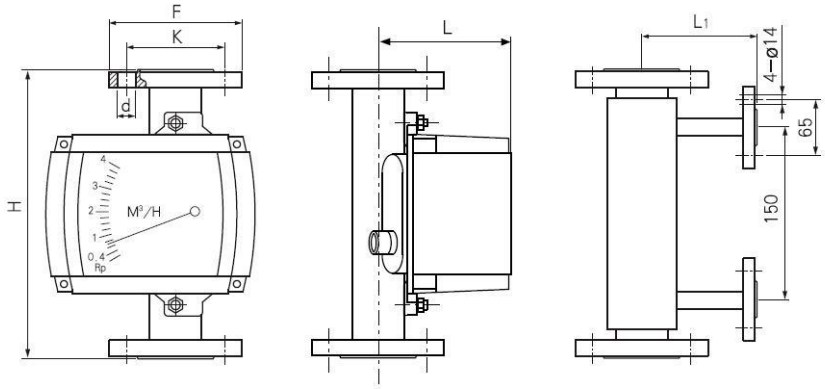
Table 1: Model code for float in different flow range

Bottom enter and top exist

Principle



Dimension



Vertical Installation Size(cm)						
Diameter	F	K	d	H	L	L1
DN15	95	65	4-ø14	250	125	100
DN25	115	85	4-ø14	250	138	100
DN50	165	125	4-ø18	250	168	120
DN80	200	160	8-ø18	250	198	140
DN100	220	180	8-ø18	250	230	150

**** Please contact your local GPE application engineer**

You also need to provide the following information:

Type of Fluid		**Please provide the name of your fluid, including operating density and viscosity**
Full Scale Flow		**Maximum and minimum flow rates, units must be m^3/hr, LPM or GPM**
Line Size		**Please indicate the pipe size as well as connection type (flange, threaded, etc..)**
Pressure and Temperature		**We will calibrate your flowmeter as close to your operating conditions as possible**

Model Selection Guide

F8001-	Z	Local indicator														Indicator
	D	Remote output														
	ZX	Local indicator (Inside & outside taper pipe integration)														
	DX	Remote output (Inside & outside taper pipe integration)														
		xx	15、25、50、80、100 (Refer to table 1)													Model code （Float）
			S4	Stainless steel 304			F	Fluoroplastics lining								Measuring tube material
			S6	Stainless steel 316			Ti	Titanium alloy								
			S6L	Stainless steel 316L			HC	Hastalloy C								
				R	Multifunction indicator,explosion-proof type(Round housing)											Indicator type
				S	Pointer nonlinear indicate instant flow (Square housing)											
				RB	Stainless steel multifunction indicator,explosion-proof type											
				SB	Stainless steel body indicator nonlinear indicate instant flow											
					E2	Indicator ,ESK transmission,LCD display,backlight										Remote transmitter
					E3	Indicator ,ESK transmission										
					E4	Indicator ,ESK transmission,HART										
					E5	Pointer,ESK transmission,LCD display,backlight,HART										
						Exi	Intrinsic safety type									Explosion proof type
						Exd	Explosion-proof (only for M8 & M8B indicator)									
							K0	No alarm								Switch alarm output
							K1	With a upper switch alarm point								
							K2	With a floor switch alarm point								
							K3	With two-switch alarm point								
								B1	Vertical installation							Structure Note:show flow and header direction in order
								B2	Horizontal installation							
								B3	Side inlet side outlet							
								B4	Side inlet side outlet							
								B5	Bottom inlet side outlet							
									T	Clamp type						Accessary
									H	High temp.(special for LZD)						
										S	-40℃~+200℃					Medium temperature
										H	-40℃~+400℃					
										G	-40℃~+80℃ (for PTFE liner)					
												≤6.4MPa				Working pressure
													g/cm3			Medium density
														G	Gas	Medium type
														L	Liquird	
															A ANSI	Process Connection
															J JIS	
															D DIN	
															C Clamp-on	
															N NPT	