



OVAL FLOWMETER

Meter Size: 52, 53, 55, 56, 57
(Double Case Construction
with Powerful Magnetic Coupling)

GENERAL SPECIFICATION

GS.No.GBB125E-7

■ GENERAL

The OVAL flowmeter is a positive displacement type flowmeter comprising a pair of oval gear rotors. It is capable of metering the actual quantity of the material passing through it with a high degree of accuracy over a wide flow range and accepts various kinds of liquids. It's accuracy, reliability and quality has made it a highly valued industrial instrument.



■ FEATURES

1. Simple design makes this meter easy to disassemble and allows for ease in maintenance and inspection.
2. Introduction of a powerful magnetic coupling makes this meter compatible with a variety of direct-reading registers and mechanical temperature compensator.
3. Compatible with a variety of pulse generators that allows a wide selection of remote flow instrumentation.
4. Can accept various kinds of liquids by selecting appropriate meter materials.
5. A complete line of models are available to meet a broad range of pressure and temperature requirements.

■ GENERAL SPECIFICATIONS

Meter Size			52, 53	55	56	57
Item						
Nominal Size, mm (inch)			25 (1")	40 (1·1/2")	50 (2")	50 (2")
Construction			Double case construction			
Transmission System			Magnetic coupling			
Materials	Outer Housing		SCPH2			
	Inner Housing, Rotors		SCS14A	SUS316		FC250, SCS13A
	Bearings		Carbon			
Linearity			±0.35% or ±0.15%			
Repeatability			±0.05% or ± 0.02%			
Operating Temp. Range	Linearity	±0.35%	-5 to +120°C 120°C to +200°C	-5 to +120°C		
		±0.15%	-5 to +60°C			
Liquids to be Metered			Water, petroleums, chemical liquids, etc.			
Finish			Body, Transmission Gear Box & Register, Case: Munsell 2.5G 8/2 Register Frame: Munsell N 1.5			

• Flange Ratings and Max. Operating Pressure: MPa

Pressure Rating	Housing Material	Flange Rating JIS						ANSI		
		10K	16K	20K	30K	40K	63K	150	300	600
30K	SCPH2	1.18	2.45	3.04	4.51	—	—	1.69	4.59	—
▲63K	SCPH2	—	—	—	—	6.08	9.51	—	4.59	9.19

NOTE: Reference temperature; 120°C

▲: Special

OVAL Corporation

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■ FLOW RANGE

● **Table A Flow Range for Liquid in General (Linearity: $\pm 0.35\%$) (Operating temp. range: -5 to $+120^\circ\text{C}$)**

Unit in m^3/h

Meter Size Nominal Bore Size Operating Condition	Type of Liquid Temp., Viscosity Range	Water		Liquids other than water (Unit in $\text{mPa}\cdot\text{s}$)						
		60°C max.	60 to 120°C	Less than 0.3	0.3 to 0.8	0.8 to 2	2 to 5	5 to 1000	1000 to 1500	1500 to 2000
52	25	Continuous	0.3 to 1	0.4 to 0.8	0.7 to 1.2	0.4 to 1.2	0.3 to 1.2	0.15 to 1.6	0.08 to 1.6	0.08 to 1.3
		Intermittent	0.3 to 1.5	0.4 to 1	0.7 to 1.8	0.4 to 1.8	0.3 to 1.8	0.15 to 2	0.08 to 2	0.08 to 1.7
53	25	Continuous	0.55 to 2	0.7 to 1.6	1.1 to 2.4	0.7 to 2.4	0.55 to 2.4	0.28 to 3.2	0.15 to 3.2	0.15 to 2.8
		Intermittent	0.55 to 3	0.7 to 2	1.1 to 3.6	0.7 to 3.6	0.55 to 3.6	0.28 to 4	0.15 to 4	0.15 to 3.5
55	40	Continuous	1 to 5	1.2 to 4	1.8 to 5.5	1.2 to 5.5	1 to 5.5	0.4 to 8	0.26 to 8	0.26 to 6.5
		Intermittent	1 to 7	1.2 to 5	1.8 to 8.5	1.2 to 8.5	1 to 8.5	0.4 to 10	0.26 to 10	0.26 to 8.5
56	50	A.I.F.	9	6	10	10	10	10	8.5	7.5
		Continuous	2 to 10	2.5 to 8	3.5 to 11	2.5 to 11	2 to 11	0.9 to 16	0.6 to 16	0.6 to 13
		Intermittent	2 to 14	2.5 to 10	3.5 to 17	2.5 to 17	2 to 17	0.9 to 20	0.6 to 20	0.6 to 17
		A.I.F.	18	12	20	20	20	20	17	15
57	50	Continuous	4 to 20	5 to 16	8 to 22	5 to 22	4 to 22	2 to 32	1.2 to 32	1.2 to 26
		Intermittent	4 to 30	5 to 20	8 to 35	8 to 35	4 to 35	2 to 40	1.2 to 40	1.2 to 34
57	50	A.I.F.	35	25	40	40	40	40	34	30

● **Table B Flow Range for Liquid in General (Linearity: $\pm 0.15\%$) (Operating temp. range: -5 to $+60^\circ\text{C}$)**

Unit in m^3/h

Meter Size Nominal Bore Size Operating Condition	Type of Liquid Temp., Viscosity Range	Water		Liquids other than water (Unit in $\text{mPa}\cdot\text{s}$)					
		60°C max.	Less than 0.3	0.3 to 0.8	0.8 to 2	2 to 5	5 to 1,000	1000 to 1500	1500 to 2000
52	25	Continuous	0.6 to 1	1 to 1.2	0.7 to 1.2	0.5 to 1.2	0.25 to 1.6	0.15 to 1.6	0.15 to 1.3
		Intermittent	0.6 to 1.5	1 to 1.8	0.7 to 1.8	0.5 to 1.8	0.25 to 2	0.15 to 2	0.15 to 1.7
53	25	Continuous	1.1 to 2	1.6 to 2.4	1.1 to 2.4	0.75 to 2.4	0.4 to 3.2	0.22 to 3.2	0.22 to 2.8
		Intermittent	1.1 to 3	1.6 to 3.6	1.1 to 3.6	0.75 to 3.6	0.4 to 4	0.22 to 4	0.22 to 3.5
55	40	Continuous	2 to 5	2.7 to 5.5	1.8 to 5.5	1.5 to 5.5	0.6 to 8	0.4 to 8	0.4 to 6.5
		Intermittent	2 to 7	2.7 to 8.5	1.8 to 8.5	1.5 to 8.5	0.6 to 10	0.4 to 10	0.4 to 8.5
56	50	A.I.F.	9	10	10	10	10	10	8.5
		Continuous	4 to 10	5.2 to 11	3.5 to 11	3 to 11	1.4 to 16	0.9 to 16	0.9 to 13
		Intermittent	4 to 14	5.2 to 17	3.5 to 17	3 to 17	1.4 to 20	0.9 to 20	0.9 to 17
		A.I.F.	18	20	20	20	20	20	17
57	50	Continuous	7 to 20	12 to 22	8 to 22	6 to 22	3 to 32	2 to 32	2 to 26
		Intermittent	7 to 30	12 to 35	8 to 35	6 to 35	3 to 40	2 to 40	2 to 34
57	50	A.I.F.	35	40	40	40	40	40	34

● **High Temp. Liquid Service Flow Range (Linearity: $\pm 0.35\%$) (Operating temp. range: in excess of $+120^\circ\text{C}$ up to $+200^\circ\text{C}$)**

Unit in m^3/h

Meter Size Nominal Bore Size Operating Condition	Type of Liquid Temp., Viscosity Range	Hot Water	High temp. Liquids other than water (Unit in $\text{mPa}\cdot\text{s}$)						
		—	Less than 0.3	0.3 to 0.8	0.8 to 2	2 to 5	5 to 1000	1000 to 1500	1500 to 2000
52	25	Continuous	0.4 to 0.72	1 to 1.2	0.8 to 1.2	0.5 to 1.2	0.25 to 1.2	0.15 to 1.2	0.15 to 1.1
		Intermittent	0.4 to 0.9	1 to 1.8	0.8 to 1.8	0.5 to 1.8	0.25 to 1.8	0.15 to 1.8	0.15 to 1.5
53	25	Continuous	0.7 to 1.4	2 to 2.4	1.4 to 2.4	0.9 to 2.4	0.35 to 2.4	0.28 to 2.4	0.28 to 2.2
		Intermittent	0.7 to 1.8	2 to 3.6	1.4 to 3.6	0.9 to 3.6	0.35 to 3.6	0.28 to 3.6	0.28 to 3.1

- NOTES: 1. In the Operating Condition column "Continuous" means continuous operation; "Intermittent" means no more than 8 hours operation a day, and "A.I.F." indicates allowable instantaneous flow rate.
 2. Flow range should be selected within the Continuous or Intermittent range specified.
 3. For applications where viscosity exceeds $1000\text{mPa}\cdot\text{s}$ (size 57: $200\text{mPa}\cdot\text{s}$), specially machined rotors are used.
 4. For high viscosity liquid more than $2000\text{Pa}\cdot\text{s}$, the meter is not applicable, ULTRA OVAL series are recommended instead.
 5. Regarding liquid ammonia, consult factory.

■ REGISTERS AND UNIT REGISTRATION

Register Model	Dial and Pointer		Total Counter	
	Volume per Point Rev. (L)	Min. Reading (L)	Max. Readout (L)	LSD Drum (L)
Direct-reading Register (LW11)	1	0.01	999 999	1
	10	0.1	9 999 990	10
	★ 100	1	99 999 900	100
Direct-reading Register w/Reset Counter (LW15)	10	0.1	9 999 998	2
	★ 100	1	99 999 980	20
	(Output Shaft) 10	0.1	99 999 999	1
Resettable Register (LW42, 43)	★ (Output Shaft) 100	1	999 999 990	10

★ : Standard. As to general specifications registers, refer to individual General Specification Sheets.

★ : Small dial scale reading.

(LSD: Least Significant Digit)

● Unit of Factored Pulse Generated

● Unit of Unfactored Pulse Generation

Meter Size	Pulse Unit Generator Signal Unit Volume per Pointer Rev. L/rev.	PG20EP-PG30SEP				PG30EP-PG30DEP				Max. Flow rate m³/h	PG30SEP Nominal Meter Factor (mL/P)	
		1P/rev.		10P/rev.		100P/rev.		1000P/rev.			Less than Full Scale (m³/h)	More than Full Scale (m³/h)
		Pulse Unit (L/P)	Freq. at Max. Flow rate (Hz)	Pulse Unit (L/P)	Freq. at Max. Flow rate (Hz)	Pulse Unit (L/P)	Freq. at Max. Flow rate (Hz)	Pulse Unit (L/P)	Freq. at Max. Flow rate (Hz)			
52	1	1	0.6	0.1	5.6	0.01	55.6	△ 0.001	555.6	2	7.731 (0.5)	15.463 (0.6)
	★10	10	0.06	1	0.6	0.1	5.6	0.01	55.6	2		
53	1	10	0.11	1	1.1	0.1	11.1	0.01	111.1	4	14.01 (1)	28.02 (2)
55	10	—	—	1	2.8	0.1	27.8	0.01	278	10	27.68 (2.3)	55.37 (2.4)
	★100	100	0.03	10	0.3	1	2.8	0.1	27.8			
56	10	—	—	1	5.6	0.1	55.6	0.01	556	20	59.72 (4.7)	119.45 (4.8)
	★100	100	0.06	10	0.6	1	5.6	0.1	55.6			
57	10	—	—	—	—	0.1	111	△ 0.01	1000 (Q=36)	40	156.86 (11)	313.7 (12)
	★100	100	0.11	10	1.1	1	11	0.1	111			

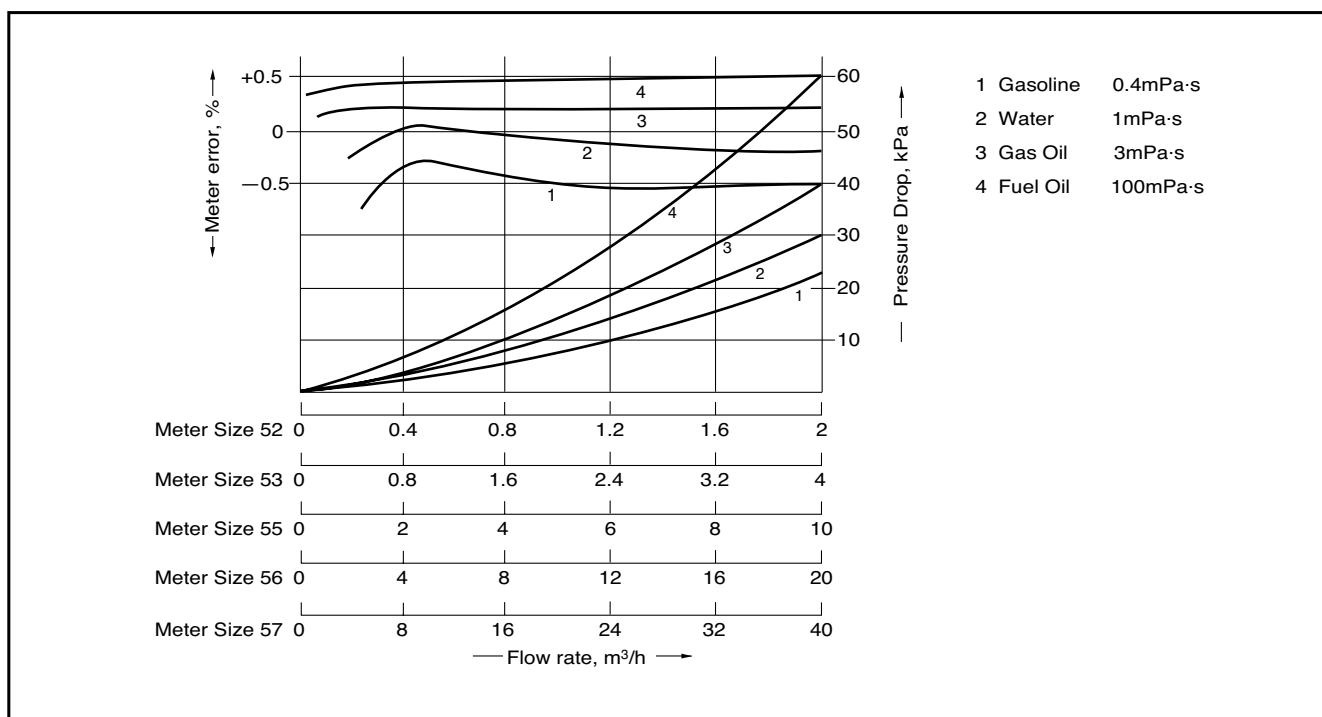
★ : Standard △ : Unacceptable depending on particular specifications.

For detailed pulse generator specifications, see individual General Specification sheets.

● Full Scale for Flow rate Indicator or Recorder

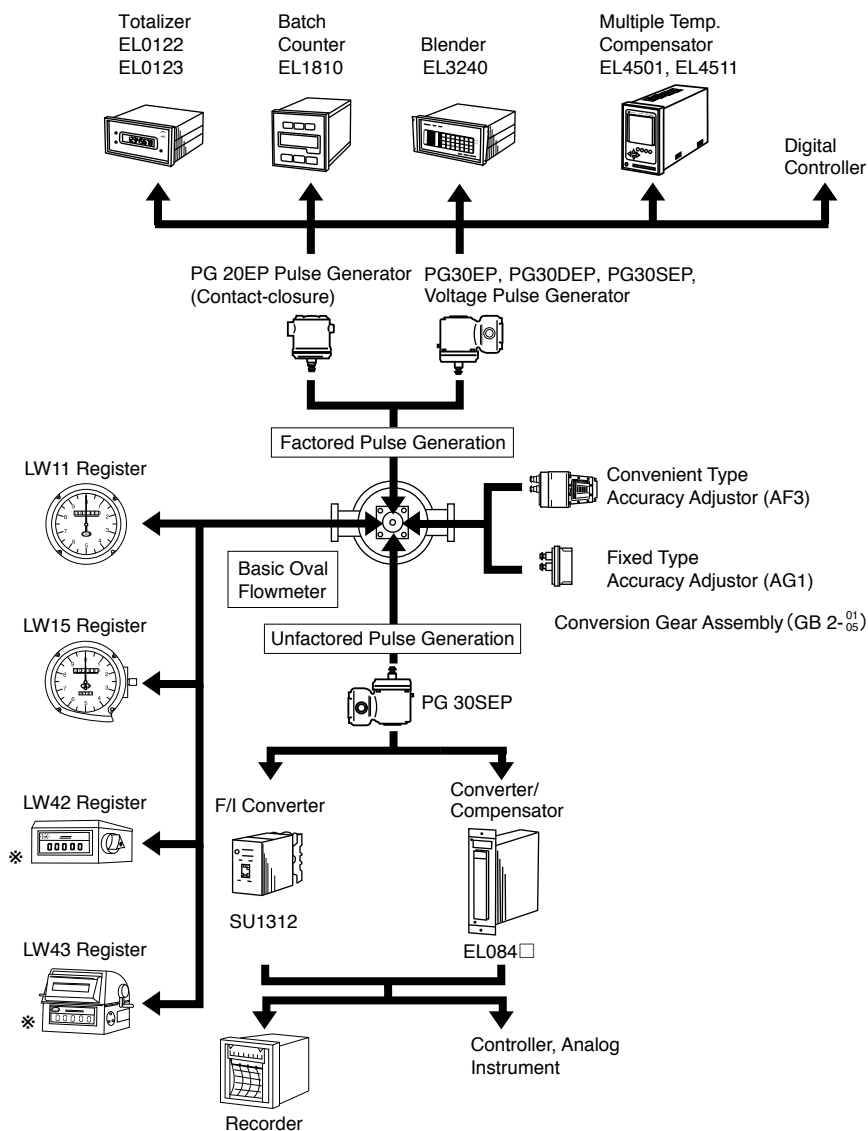
Meter Size	Full Scale m ³ /h						L/min.							
55	1.5	2	3	5	8	10	30	40	50	60	80	100	150	200
56	3	5	8	10	15	20	50	80	100	150	200	300	400	—
57	8	10	15	20	30	50	150	200	300	400	500	800	—	—

■ TYPICAL PERFORMANCE CHARACTERISTICS

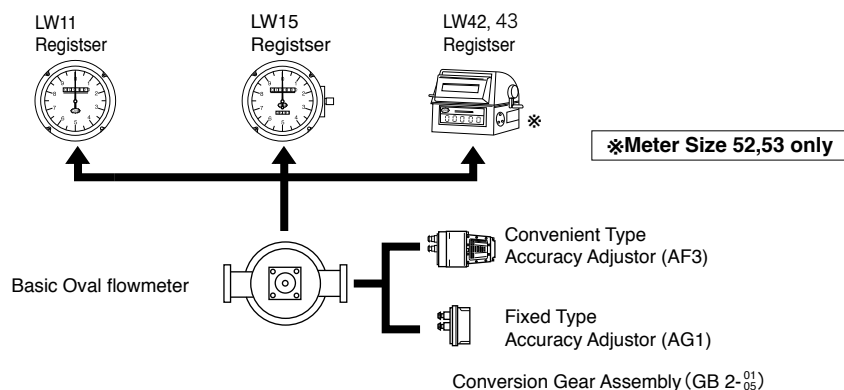


REGISTERS AND REMOTE INSTRUMENTATION SYSTEMS

● Direct-coupled Registers and Remote Instrumentation System with Pulse Generator Equipped



● Direct-coupled Registers without Pulse Generator



NOTES: 1. For details of the direct-coupled registers, pulse generators, receiving instruments, etc., see individual General Specification Sheets.

2. Flame-proof construction of pulse generators are available. For intrinsically safe construction, pulse repeater is provided.

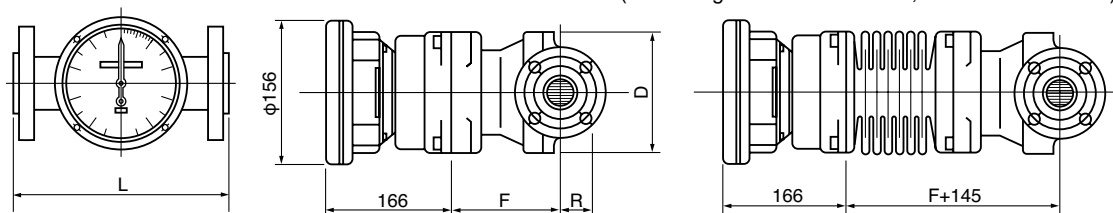
3. *: 52, 53 could not be installed.

DIMENSIONS (Unit in mm)

● Meter Size: 52, 53

Drawings below are with register model LW11 (LW13)

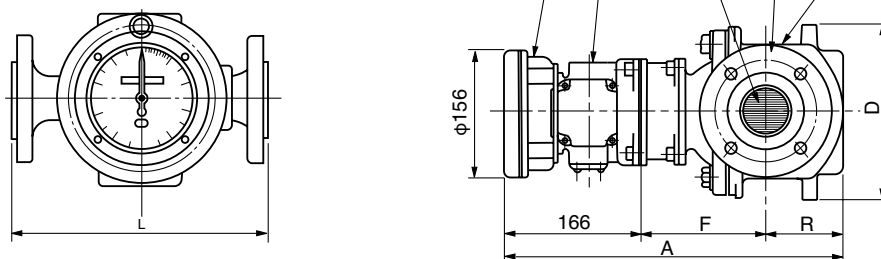
High Temp. Version
Cooling Fin Provided (exceeding 120°C up to 200°C)
(exceeding 80°C for PG30DEP, PG30SEP mounted)



Meter Size	Transmission System	Nominal Size	L		R	F	D	Approx. Weight (kg)
			Flange Rating					
			JIS 30k RF	ANSI 150RF				
52	2	25	250	239	109	65	172	28
53	2	25	250	239	114	85	172	29

● Meter Size: 55, 56, 57

(LW11 Register Installed)



Transmission Gear Box w/External Accuracy Adjustor (GB2-0 $\frac{1}{5}$)

No.	Part Name
1	Outer housing
2	Flange
3	Oval Rotors
4	Conversion Gear Ass'y
5	Register

Meter Size	Pressure ratings	F	R	D	A	Approx. Weight kg
55	30K	201	71	200	438	34.5
	63K	205	83	206	454	45
56	30K	217	86	226	469	41.5
	63K	226	92	247	484	55
57	30K	233	115	297	514	76
	63K	260	127	310	553	90

In case of cooling fin coupled, add 145 mm to "F" above.

● Flange-to-Flange Dimensions (L)

Unit in mm

Meter Size	Pres. Rating	30K	▲63K	Meter Size	Pres. Rating	30K	▲63K	Meter Size	Pres. Rating	30K	▲63K
	Flange ratings	SCPH2	SCPH2		Flange ratings	SCPH2	SCPH2		Flange ratings	SCPH2	SCPH2
55	JIS 30K RF	310	—	56	JIS 30K RF	310	—	57	JIS 30K RF	400	—
	JIS 40K RF	—	314		JIS 40K RF	—	354		JIS 40K RF	—	434
	JIS 63K RF	—	330		JIS 63K RF	—	370		JIS 63K RF	—	450
	ANSI 150 RF	301	—		ANSI 150 RF	304	—		ANSI 150 RF	394	—
	ANSI 300 RF	307	—		ANSI 300 RF	310	—		ANSI 300 RF	400	—
	ANSI 600 RF	—	323		ANSI 600 RF	—	365		ANSI 600 RF	—	446

▲ : Special

MODEL CODE EXPLANATION

		1st Group Basic Meter					2nd Group Register			Description
Item	Code No.	①	②	③	④	⑤	⑥	⑦	⑧	
Application	L									Liquid flowmeter
	K									Reference flowmeter, etc.
Material	B									FC250 (Stainless steel), (SUS316 for rotors of 55 and 56)
	C									SCS13A (Cast stainless steel)
Meter Size	5 2									Nominal size 25mm (1")
	5 3									Nominal size 25mm (1")
	5 5									Nominal size 40mm (1-1/2")
	5 6									Nominal size 50mm (2")
	5 7									Nominal size 50mm (2")
Meter Construction and Flange Bore		2	—							Double-case construction
Direct-coupled Register		1	1							Direct-reading register (LW11)
		1	5							Direct-reading register w/reset counter, reset pointer (LW15)
		4	2							Resettable register (LW42)
		4	3							Resettable register/Printer combination (LW43), Accumulative type
Accuracy Adjustor and Mounting Adaptor		1								Fixed type adjustor AG1 provided.
		2								Convenient type adjustor AF3 provided. (Linearity: ±0.15%)
		3								Angle adaptor + Fixed type adjustor AG1 provided.
		4								Angle adaptor + Convenient type adjustor AF3 provided. (Linearity: ±0.15%)
		5								Cooling fin + Fixed type adjustor AG1 provided.
		6								Cooling fin + Convenient type adjustor AF3 provided. (Linearity: ±0.15%)
		9								Others

		3rd Group Basic Meter					4th Group Generator			Description
Item	Code No.	⑨	⑩	⑪	⑫	—	⑬	⑭	⑮	
Housing Material	F									SCPH2 (steel casting)
Pressure Rating	3									30K
	6									63K (Special)
Bearings	1									Carbon plain bearings
Transmission System	2	—								Magnetic coupling
Unfactored Pulse Generation		0								Where pulse generator is not required.
		7								PG30SEP (Explosionproof) Non-contact pulse (Current pulse) 12VDC, 2-wire
		D								PG30DEP (Explosionproof) Non-contact pulse (Current pulse) 24VDC, 2-wire
		9								Others
Factored Pulse Generation		0								When pulse generator is not required
		5								PG30EP (flameproof configuration) non contact voltage pulse (12 VDC, 3 wires)
		7								PG30SEP(flameproof configuration)non contact current pulse (12 VDC, 2wires)
		B								PG20EP (flameproof configuration) contact pulse (Dry read switch)
		D								PG30DEP (flameproof configuration) non contact current pulse (24 VDC, 2 wires)
		9								Others
		0								Always "0"

■ When making inquiries, Please state following information:

Please fill out the following specifications when making inquiries.

1. Model	L _____
2. Fluid to be measured	Name _____ Viscosity _____ mPa•s Specific gravity _____
3. Flow rate (m ³ /h)	Maximum _____ Normal _____ Minimum _____
4. Fluid temperature (°C)	Maximum _____ Normal _____ Minimum _____
5. Ambient temperature (°C)	Maximum _____ Normal _____ Minimum _____
6. Pressure (MPa)	Maximum _____ Normal _____ Minimum _____
7. Flow direction	Right ⇄ Left, Bottom ⇄ Top
8. Flange connection	Nominal diameter _____ mm, Flange rating _____
9. Required accuracy (Linearity)	± _____ %
10. Explosion-proof construction	<input type="checkbox"/> Required class _____ <input type="checkbox"/> Not required
11. Accessories	<input type="checkbox"/> Strainer, <input type="checkbox"/> Air eliminator, <input type="checkbox"/> Companion flange
12. Quantity	Including accessories _____
13. Receiving device	Type, manufacturer, model, specifications (input, output, power supply, etc.)
14. Distance between the flow meter and the receiving device	_____ m

● Remote Instrumentation

1	Signal type and application (totalizer, indicator, recorder, controller, computer input, data logger input, batch, blend)
2	Pulse generator type and signal unit
3	Full scale and unit
4	Flowmeter to receiving instrument distance
5	Power source, voltage, frequency
6	Receiving instrument

● Automatic Batching

1	Quantity per batch, preset full scale
2	Time required for each batch
3	Daily total number of batch
4	Allowable error in each batch
5	Operating air pressure, power source, voltage, frequency
6	Valve used and accessories

The specification as of May, 2016 is stated in this GS Sheet. Specifications and design are subject to change without notice.

Sales Representative:

GS.No.GBB125E		
初版	改訂	印刷
92.10	16.05	