

# GENERAL SPECIFICATIONS

# ELECTRONIC CCG OIL FLOWMETER



GS-FM001E-03



## Overview

CCG OIL FLOWMETER is a oil-specific positive displacement flowmeter broadly used for boiler, diesel engine and fuel oils, and it is particularly suited for small-capacity and / or low-viscosity oil handling instrument.

## Features

### •Wide Flow Range and High Accuracy

In the wide flow range of 5~3,000L/h, the accuracy is within  $\pm 0.5\%$ . (Max. range for heavy oil 1:120.)

### •Small Pressure Loss

Because the pressure loss of the flowmeter is small, it is excellent for fluid measurement with a wide range of viscosity.

### •Easy-to-read Digital Display

The pushbutton-switch allows selection & display by the totalizing counter, reset counter and momentary flow rate as well as selectable display of per-hour & per-minute momentary flow rate.

### •Multi-functional Totalizing Unit

Forward and reverse flow detection, self-diagnosis, and worn battery alarm etc are available. Also, display angle can be adjusted over  $90^\circ$  by each upward or downward directions at the step of 15 degrees.

### •Superb Durability

The rotor adopts high-durable PPS-Resin while the indicator (being an electronic product therefore simple in construction) demonstrates its long service life and so its accuracy drop is least.

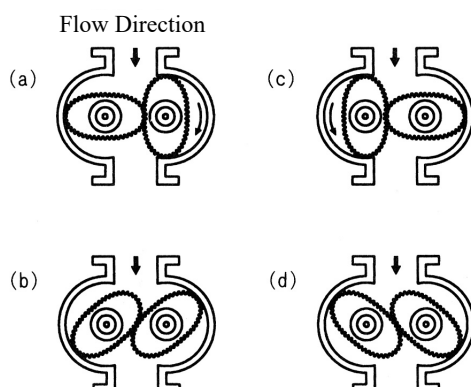
### •Remote-controllable Instrumentation

Output pulse sent proportionally to the rotor rotation, allows flow totalizing & display at remote point in addition to corrected and non-corrected pulse output capability.

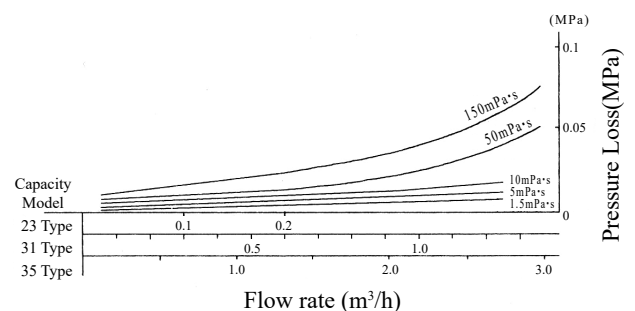
## Standard Specification

		For General Use	For High Temperature
Applicable Fluid		Kerosene, Light oil, Heavy oil, Lubricating oil	
Accuracy		$\pm 0.5\%$	
Flow Rate Range		5~3,000L/h	20~3,000L/h
Fluid Temperature		0~120°C (Conn.size 15mm : 0~50°C)	0~150°C
Max. Working Pressure		Max. 0.98MPa	
Fluid Viscosity		Max. 300mPa·s	
Connection Size		15, 20, 25 mm	20, 25 mm
Flange Rating		JIS 10K FF	
Material	Body	FC250 (Conn. Size 15 mm)	
		FCD400 (Conn. Size 20, 25 mm)	
	Front Cover	AC4A (Conn. Size 15 mm)	
		BC6 (Conn. Size 20, 25 mm)	
	Rotor	PPS Resin	
O-ring	Fluorine Rubber (Viton)		
Piping Installation		Horizontal or Vertical Piping	
Paint Color		Munsell 2.5 PB 3.5/10	

## Principle of Operation



## Pressure Loss Characteristic



Note) The flow rate at 100% indicates the maximum value of the largest flow rate in each capacity.

## Standard Specification (Totalizing Unit)

Display	Totalizing Counter	8 digits LCD(TOTAL mode)	
	Reset Counter	8 digits LCD(R. COUNT mode)	
	Momentary Flow Rate (L/h)	6 digits LCD(FLOW.Fh mode)	
	Momentary Flow Rate (L/min)	6 digits LCD(FLOW.Fn mode)	
Indication Part Type 75			
Function	Forward or Reverse Flow Detection	Integration display of forward and reverse flow by addition and subtraction	
	Alarm	Capacity upper and lower limits	
	Battery Wear Alarm	"BATT" is turned on when the battery is worn out	
	Self-submission	Pulsation is submitted when Loop Check is carried out ( Open collector output pulsation 1 or 8 Hz, and Pulsation width is same as the Output pulsation width )	
Output Signal	<ul style="list-style-type: none"> <li>■ Open Drain (Allowable current: 50 mA, Max. Voltage: 30V DC) <ul style="list-style-type: none"> <li>· Factored Pulse (0.5 ms, 10 ms, 100 ms, 500 ms) or Alarm Output</li> <li>· Unfactored Pulse</li> </ul> </li> <li>■ Analogue output: 4~20mA DC</li> </ul>		
	Wiring Connection Port	Ground Connector for the vessels : JIS F8801 15c is attached	
	Transmission Distance	1 km	

Power Source	External Power Source	DC 12 to 24V
	Electric Current Consumption	40 mA
	Lithium Cell Battery	After the manufacturing 10 years (Depends on usage conditions)
Structure		Drip-proof Structure
Display Installation Direction		Faced upward at 45 degrees angle (standard) ( However, it can be changed to upward or downward at the step of 15 degrees )
Ambient Temperature		-20 ~ 60°C
Paint Color		Black (Resin Material Color)

- Note) 1. Indication of totalizing and reset counter is added or subtracted by forward or reverse detection. However, the pulse is not output when the fluids are in the reverse flow. In this case, the pulse for reverse flow is memorized in the microcomputer and when the flow changed to the forward, the reverse flow portion is offset and pulse signal will be sent.
2. With output is signal cable of CWS3 Core Sealed Wire (Core wire: 1.25 mm<sup>2</sup>, Outer diameter: φ 11)
3. When with output pulse and analog output, supply the external power of DC 12 to 24 V

## Flow Rate Range (Accuracy : ± 0.5%) and Pressure Loss Characteristic (Max. Flow Rate)

Conn. Size (mm)	Capacity Model	Flow Rate Range ( L/h )					Pressure Loss ( MPa )	
		For General Use				For High Temperature	Kerosene (1.2mPa·s)	Heavy oil (16mPa·s)
		Kerosene (1.2mPa·s)	Light oil (3mPa·s)	A Heavy oil (10mPa·s~)	B·C Heavy oil (50~ 300mPa·s)	Heavy oil (50~ 300mPa·s)		
15	23	40~ 200	10~ 200	5~ 200	—————	—————	0.002	0.008
20	31	100~1,250	40~1,250	20~1,250	10~1,250	20~1,250	0.008	0.02
25	35	150~3,000	100~3,000	50~3,000	25~3,000	40~3,000	0.008	0.02

## Totalizing Unit and Pulse Unit

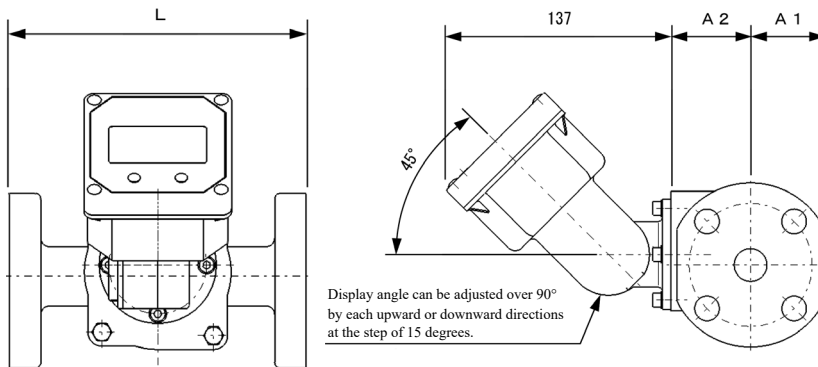
	Conn. Size (mm)	Capacity Model	Indicator				Pulse Transmitter	
			Totalizing Counter (8 digits L)	Reset Counter (8 digits L)	Momentary Flow Rate		Pulse Unit ( L/P )	Pulse Width ( ms )
					( L/h )	( L/min )		
For General Use	15	23	0.01 (Standard)	0.01 (Standard)	200.0	3.333	0.01 (Standard) 0.1	0.5 (Standard) 10 or 100
	20	31	0.1 (Standard)	0.1 (Standard)	1,250	20.83	0.1 (Standard) 0.01 or 1	10 (Standard) 0.5 or 100
	25	35	0.1 (Standard)	0.1 (Standard)	3,000	50.00	0.1 (Standard) 0.01 or 1	10 (Standard) 0.5 or 100
For High Temperature	20	31	0.1 (Standard)	0.1 (Standard)	1,250	20.83	0.1 (Standard) 0.01 or 1	10 (Standard) 0.5 or 100
	25	35	0.1 (Standard)	0.1 (Standard)	3,000	50.00	0.1 (Standard) 1	10 (Standard) 100

## Basic Models

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Contents													
F	G	B																CCG OIL FLOWMETER												
Conn. Size	B 4																	15 mm ( 1/2 B )												
	B 6																	20 mm ( 3/4 B )												
	B 8																	25 mm ( 1 B )												
Capacity Model		2 3																Max. Flow Rate (Conn. Size) : 200 L/h ( 15 mm)												
		3 1																Max. Flow Rate (Conn. Size) : 1,250 L/h ( 20 mm)												
		3 5																	Max. Flow Rate (Conn. Size) : 3,000 L/h ( 25 mm)											
Max. Working Pressure		B																Flange Rating												
																			Max. Working Pressure											
																		Hydraulic Test Pressure												
Material																		Body												
		A L																FC250												
		D L																	AC4A											
																		Rotor												
																		Conn. Size												
																		15 mm												
																		20 , 25 mm												
Totalizing Unit (Drip-proof Type)											7	5																Totalizing Counter, Reset Counter, Momentary Flow Rate		
Output Signal											P	A																	Non-contact Pulse Output + Analogue Output	
											P	X																		Non-contact Pulse Output
											X	A																		Analogue Output
											X	X																		Without Output Signal
Attachment											X																		Without Attachment (Fluid Temperature 120°C or Less)	
											S																			With Heat Radiation Fin (Fluid Temperature ~150°C)

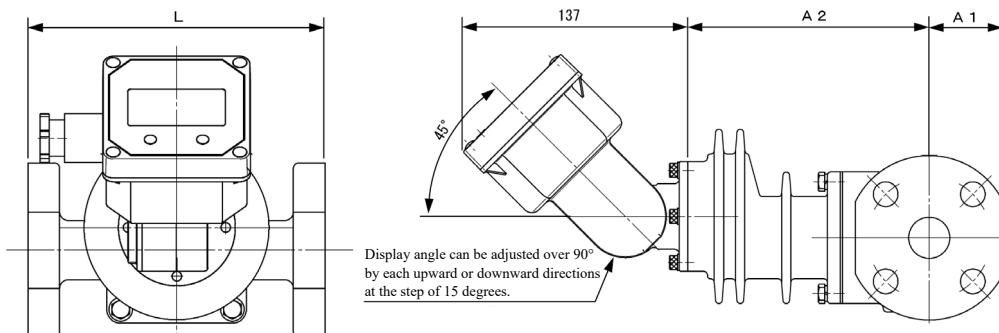
## Dimension Drawing

〈For General Use〉



Conn. Size	Capacity Model	Dimensions (mm)			Approx. Weight (kg)
		L	A1	A2	
15	23	130	42	46	3
20	31	170	45	49	4
25	35	200	55	56	6

〈For High Temperature〉



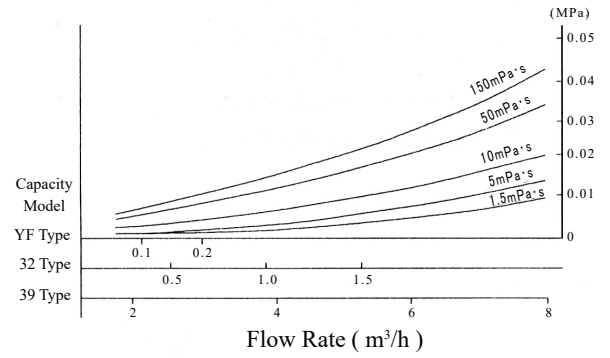
Conn. Size	Capacity Model	Dimensions (mm)			Approx. Weight (kg)
		L	A1	A2	
20	31	170	45	147	6
25	35	200	55	159	8

# Accessories [Strainer]

## Standard Specifications

Connection Size	15 mm	20,25 mm
Structure	Y Type	Bucket Type
Applicable Fluid	Kerosene, Light oil, Heavy oil, Lubricant, etc.	
Fluid Temperature	Max. 150°C	
Max. Working Pressure	Max. 1.0MPa	
Fluid Viscosity	Max. 300mPa·s	
Flange Rating	JIS 10K FF	
Material	Main Body	FC250
	Screen / Frame	SUS304
	Gasket	Non Asbestos
Screen	Mesh	200 Mesh      80 Mesh
	Difference Pressure Strength	Max. 0.3MPa
Paint Color	Silver	Munsell 1.4 PB 3.1/1.2

## Pressure Loss Characteristics



## Basic Model

< Y Type Strainer >

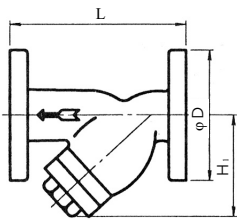
Model	Contents
Y F 15	Y Type Strainer [ Conn. Size:15 mm ]

< Bucket Type Strainer >

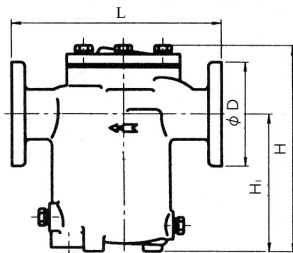
1	2	3	4	5	6	7	8	9	10	Contents	
F S B										Bucket Type Strainer	
Connection Size	B 6									20 mm (3/4 B)	
	B 8									25 mm ( 1 B)	
Capacity Model	32									Max. Flow Rate(Conn.Size) : 2,000 L/h (20mm) [Press.Code:B]	
	39									Max. Flow Rate(Conn.Size) : 10,000 L/h (25mm) [Press.Code:D]	
Max. Working Pressure										Max. Working Pressure	
	B									1.0MPa	
	D									2.0MPa	
Material			A P		Body : FC250 , Screen / Frame : SUS304						

## Dimension Drawing

< Y Type Strainer >



< Bucket Type Strainer >

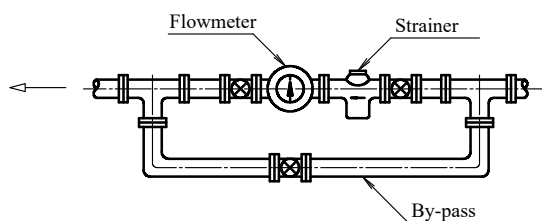


Conn. Size (mm)	Capacity Model	Dimensions (mm)				Approx. Weight (kg)
		φD	L	H	Hi	
15	YF	95	125	—	70	2
20	32	100	180	147	110	7
25	39	125	295	263	163	15

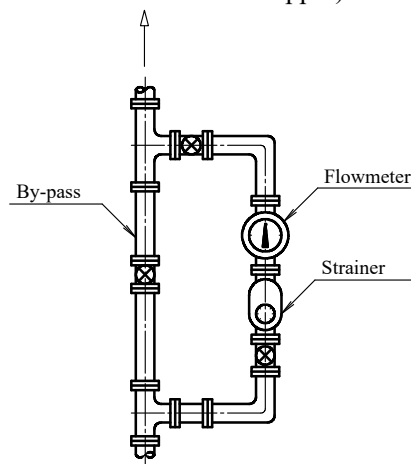
## ⚠ Caution for Flowmeter Piping Installation

- Be sure to operate the flowmeter within the specification stamped on the name plate.
- As shown below, install a strainer at the up-stream of the flowmeter and provide a by-pass for the convenience of flowmeter disassembly and maintenance.
- Install the flowmeter so as to level its rotor shaft pose regardless of the mode (horizontal or vertical) of its associated pipes.
- The flowmeter should be installed on the by-pass side since the dirt in the outlet piping flows back when the flow direction is from bottom to top.
- After the worn battery warning, spare battery can be used for approx. 0.5 year. However, replace the battery as early as possible. If the batteries are worn out completely the totalized value will be cleared to Zero.

Horizontal Arrangement  
(Flow Direction Right → Left)



Vertical Arrangement  
(Flow Direction Lower → Upper)



## Ordering Instructions

	Item	Contents
1	Applications	Production Control, Dealings, Receipt and Shipment etc.
2	Applicable Fluid Name	Name, Compositions, Existence of Admixture and Corrosion
3	Accuracy	± %
4	Flow Rate	Maximum, Normal, Minimum (Time of Use For Each Day)
5	Operating Temperature	Maximum, Normal, Minimum (°C )
6	Operating Pressure	Maximum, Normal, Minimum (MPa)
7	Viscosity	Viscosity (at °C )
8	Connection Standard	Connection Size and Flange Standard, etc.
9	Flow Direction	Horizontal or Vertical piping
10	Transmission Unit	Output Pulse Unit (For Pulse Transmitter)
11	Applied Regulations	Name of Regulation and Standards
12	Attached Equipment	Necessity of Strainer and Valve, etc.
13	Power Supply	For Pulse Transmitter

\*Be sure to read the instruction manual carefully before you use this meter to ensure you use it correctly.

\*Note that the contents may be subject to change without notice.

### ● Contact

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