GENERAL SPECIFICATIONS

TOKICO GS-F1061E-01

TOKICO FLOWMETER
(Drip-proof Type Totalizing Unit)

Overview

TOKICO FLOWMETER is a positivedisplacement type flowmeter widely used exclusively in the measurement of fuel oil for boiler and diesel engine oil etc.

Features

•Wide Flow Range and High Accuracy
In case of heavy oil, the accuracy is within 0.5% in the wide measurement range of 1:150.
As standard material at pressurized part is FCD400 which has a 12% or more of elongation being regulated in the steel ship rules, it can be used for vessels.

•Visible Totalizing Unit
The totalizing counter, reset counter, and momentary flow rate can be switched and displayed. In addition, the display of momentary flow rate can be switched in the hourly and one minute display.

•Multi-functional Totalizing Unit
The ramified flow display, forward and reverse flow detection, self-diagnosis, and worn battery alarm etc are available. Also, the indicator can be changed to the upward or downward directions at the step of 45 degrees.

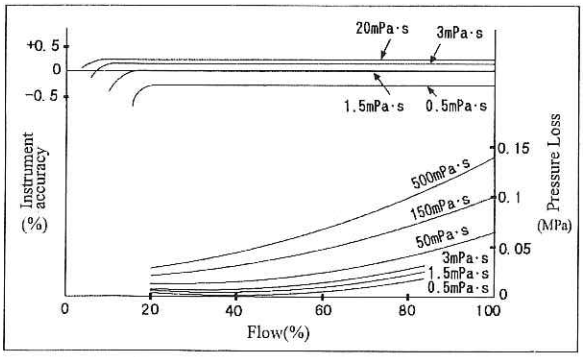
•Excellent Durability
As the rotors without contact, there is no mechanical wear, and have almost no secular change in a long time operation.

•Remote Measurement
It sends output pulsation that propotionate to the rotation number of rotor.

Standard Specification

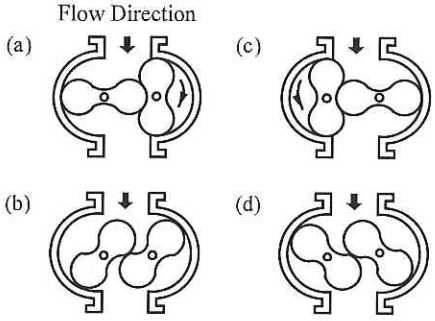
Applicable Fluid		Kerosene, Light oil, Heavy oil, and Lubricant etc.
Accuracy		±0.5%
Flow Rate Range		0.07 ~ 160 m^3/h
Fluid Temperature		-5 ~ 120℃ (Max.50℃ in case of roots material AC7A Max.150℃ in case of FC200)
Max.Working Pressure		Max. 2.5 Mpa
Fluid Viscosity		Max. 150,000 mPa・s
Connection Size		25mm(1B)~100mm(4B)
Flange Rating		FC250 : JIS 10K FF FCD400 : JIS 10K FF SCPH2 : (JIS 10K, 20K RF ASME・JPI 150, 300 RF)
Material	Main Body	FC250 : (Capacity 35-52 type) FCD400 : (Capacity 35-41 type) SCPH2 : (Capacity 35-52 type 80mm of 45 type is excluded.)
	Rotor	FC200, AC7A or ADC
	Rotor Shaft	SUS416 hard chrome plating
	Bearing	C5191, FC, Ball Bearing
	Driving Gear	SUS316
Piping Installation		Horizontal or Vertical Piping
Paint Color		Munsell 2.5 PB 3.5/10

Performance Characteristic



Note) Flow rate in 100% are the maximum values of intermittent flow in each type of capacity.

Principle of Operation



Standard Specification (Totalizing Unit)

Display	Totalizing Counter	8 digits LCD(TOTAL mode)	
	Reset Counter	8 digits LCD(R. COUNT mode)	In case of Indication Part is Type 74
	Momentary Flow Rate (L/h)	4 digits LCD(FLOW.Fh mode)	
	Momentary Flow Rate (L/min)	4 digits LCD(FLOW.Fh mode)	
	Ramified Scale	The smallest figure divided into 10 equally in the totalizing counter	
Function	Forward or Reverse Flow Detection	Integration display of forward and reverse flow by addition and subtraction	
	Self-diagnosis	Self-diagnosis when power is turned on	
	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 Pulse	Type	Corrected Pulse	
	Output Signal	Open Collector	
	Capacity	Max. 30V DC 50 mA	
	Pulse Width	0.5 ms, 10 ms, 100 ms, 500 ms	
	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	30 mA
	Lithium Cell Battery	After the manufacturing Approx. 3 years of Life + Approx. 0.5 years of Spare Battery
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 45 degrees)
Ambient Temperature		-10 ~ 60℃
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. Use signal cable of CWS3 Core Sealed Wire (Core wire: 1.25 mm2, Outer diameter: φ11)
3. When using pulse, supply the external power of DC 12 to 24 V

Flow Range (Accuracy: ±0.5%)

Rotor Material: FC200

Unit : m^3/h

Connection Size(mm)	Capacity Model	Use Condition	Fluid Temperature (mPa・s)				
			Gasoline 0.3 ~ 0.9	Kerosene 0.9 ~ 2	Light oil 2 ~ 5	A・B Heavy oil 5 ~ 150	C Heavy oil 150 ~ 500
25	35	Intermittent	1.5 ~ 3.5	1 ~ 3.5	0.6 ~ 4	0.07 ~ 4	0.07 ~ 3.5
		Continuous	1.5 ~ 2.5	1 ~ 2.5	0.6 ~ 3.5	0.07 ~ 3.5	0.07 ~ 2.5
25	38	Intermittent	2 ~ 6	1 ~ 6	0.8 ~ 7	0.1 ~ 7	0.1 ~ 6
40		Continuous	2 ~ 4.5	1 ~ 4.5	0.8 ~ 6	0.1 ~ 6	0.1 ~ 4.5
50	41	Intermittent	3 ~ 13	2 ~ 13	1.5 ~ 15	0.25 ~ 15	0.25 ~ 13
		Continuous	3 ~ 9	2 ~ 9	1.5 ~ 13	0.25 ~ 13	0.25 ~ 9
50	45	Intermittent	8 ~ 35	5 ~ 35	3.5 ~ 40	0.6 ~ 40	0.6 ~ 35
80		Continuous	8 ~ 25	5 ~ 25	3.5 ~ 35	0.6 ~ 35	0.6 ~ 25
80	47	Intermittent	12 ~ 50	8 ~ 50	5 ~ 55	1 ~ 55	1 ~ 50
		Continuous	12 ~ 35	8 ~ 35	5 ~ 50	1 ~ 50	1 ~ 35
100	51	Intermittent	25 ~ 120	16 ~ 120	12 ~ 130	4 ~ 130	4 ~ 120
		Continuous	25 ~ 85	16 ~ 85	12 ~ 120	4 ~ 120	4 ~ 85
100	52	Intermittent	30 ~ 150	20 ~ 150	15 ~ 160	8 ~ 160	—
		Continuous	30 ~ 110	20 ~ 110	15 ~ 140	8 ~ 140	—

Rotor Material:AC7A or ADC

Unit : m^3/h

Connection Size(mm)	Capacity Model	Use Condition	Fluid Temperature (mPa・s)				
			Gasoline 0.3 ~ 0.9	Kerosene 0.9 ~ 2	Light oil 2 ~ 5	A・B Heavy oil 5 ~ 150	C Heavy oil 150 ~ 500
25	35	Intermittent	0.9 ~ 3.5	0.6 ~ 3.5	0.25 ~ 4	0.07 ~ 4	0.07 ~ 3.5
		Continuous	0.9 ~ 2.5	0.6 ~ 2.5	0.25 ~ 3.5	0.07 ~ 3.5	0.07 ~ 2.5
25	38	Intermittent	1 ~ 6	0.8 ~ 6	0.4 ~ 7	0.1 ~ 7	0.1 ~ 6
40		Continuous	1 ~ 4.5	0.8 ~ 4.5	0.4 ~ 6	0.1 ~ 6	0.1 ~ 4.5
50	41	Intermittent	2 ~ 13	1.5 ~ 13	0.8 ~ 15	0.25 ~ 15	0.25 ~ 13
		Continuous	2 ~ 9	1.5 ~ 9	0.8 ~ 13	0.25 ~ 13	0.25 ~ 9
50	45	Intermittent	5 ~ 35	3.5 ~ 35	1.8 ~ 40	0.6 ~ 40	0.6 ~ 35
80		Continuous	5 ~ 25	3.5 ~ 25	1.8 ~ 35	0.6 ~ 35	0.6 ~ 25
80	47	Intermittent	8 ~ 50	5 ~ 50	2.5 ~ 55	1 ~ 55	1 ~ 50
		Continuous	8 ~ 35	5 ~ 35	2.5 ~ 50	1 ~ 50	1 ~ 35
100	51	Intermittent	16 ~ 120	12 ~ 120	8 ~ 130	4 ~ 130	4 ~ 120
		Continuous	16 ~ 85	12 ~ 85	8 ~ 120	4 ~ 120	4 ~ 85
100	52	Intermittent	20 ~ 150	15 ~ 150	10 ~ 160	8 ~ 160	—
		Continuous	20 ~ 110	15 ~ 110	10 ~ 140	8 ~ 140	—

Note) 1. Continuous flow shows the operation for 8-24 hours a day. Intermittent shows for 8 hours or less. Maximum shows a instantaneuos maximum flow.
2. Select the range of the usual flow to become less than 80% of the maximum flow.
3. Minimum flow might be changed by combination of the counter parts.

Basic Model

1	2	3	4	5	6	7	8	9	10	11	Contents
F	R	L									TOKICO FLOWMETER (Electronic Totalizing Unit)
Conn.Size			B	8							25mm(1B)
			0	4							40mm(1 1/2B)
			0	5							50mm(2B)
			0	8							80mm(3B)
			1	0							100mm(4B)
											Intermittent Max. Flow Rate(Applicable Connection Size)
Capacity Model					3	5					4m³/h (25mm)
					3	8					7m³/h (25,40mm)Main body of 25mm : SCPH2 only
					4	1					15m³/h (50mm)
					4	5					40m³/h (50,80mm)Main body of 80mm : FC250 only
					4	7					55m³/h (80mm)
					5	1					130m³/h (100mm)
					5	2					160m³/h (100mm)Non-fluctuation Type

Max.Working Pressure	Max.Working Pressure Hydraulic Test Pressure MPa	Hydraulic Test Pressure MPa	Applicable Flange Rating JIS	Applicable Flange Rating ASME・JPI
B	1.0	2.0	10K	—
E	2.5	5.0	10K, 20K	150, 300

Material	Main Body	Rotors	Applied Pressure	Fluid Temperature
A A	FC250	FC	Pressure Code B (1.0 MPa)	0～120℃
A E		AC or ADC		0～ 50℃
D A	FCD400	FC		0～120℃
D E		AC or ADC		0～ 50℃
N A	SCPH2	FC	Pressure Code E (2.5 MPa)	-5～120℃
N E		AC or ADC		-5～ 50℃

	12	13	14	15	16	Contents		
								Fluid Temperature
Totalizing Unit	7	2				Drip-proof Type	Totalizing Counter	～120℃
	7	4					Totaliging Counter, Reset Counter, Momentary Flow Rate	～120℃
Pulse Transmitter			P			Non-contact Pulse Transmitter		
			X			Without Pulse Transmitter		
				—				
Attachment					X	without Attachment (Fluid Temperature 120℃ or Less)		

1	2	3	4	5	6	7	8	9	10	11	Contents
F	R	Y									TOKICO FLOWMETER (Drip-proof Type Totalizing Unit)
Conn.Size			0	4							40mm(1 1/2B)
			0	5							50mm(2B)
											Intermittent Max. Flow Rate (Applicable Connection Size)
Capacity Model					3	8					7m³/h (40mm)
					4	1					15m³/h (50mm)

Max.Working Pressure	Max.Working Pressure Hydraulic Test Pressure	Hydraulic Test Pressure	Applicable Flange Rating
B	1.0 MPa	2.0 MPa	JIS 10K

Material	Main Body	Rotors	
D A	FCD400	FC	

	12	13	14	15	16			Contents	
Totalizing Unit	7	2					Drip-proof Type	Totalizing Counter	
	7	4						Totaliging Counter, Reset Counter, Momentary Flow Rate	
Pulse Transmitter			P					Non-contact Pulse Transmitter	
			X					Without Pulse Transmitter	
				—					
Attachment					S			With Heat Radiation Fin (Fluid Temperature ～150℃)	

Note) Check in advance when using the meter of this combination for the flow control etc. There may be output fluctuation by the mechanical characteristics of coupling.

Standard Unit of Totalizing Unit

Capacity Model	Conn.Size (mm)	Max.Flow Rate (m^3/h)	Totalizing Counter (8 digits L)	Reset Counter (8 digits L)	Momentary Flow Rate (4 digits L/h)	Output Pulse Unit (L/P)
35	25	4	1	1	400 (×10)	0.01 , [0.1] , 1
38	40	7	1	1	700 (×10)	0.1 , [1] , 10
41	50	15	1	1	1500 (×10)	0.1 , [1] , 10
45	50/80	40	1	1	4000 (×10)	0.1 , [1] , 10
47	80	55	1	1	5500 (×10)	0.1 , [1] , 10
51	100	130	1	1	13000 (×10)	0.1 , [1] , 10
52	100	160	1	1	16000 (×10)	0.1 , [1] , 10

Note) 1. To be selected from L, m^3 or kL for the unit of the totalizing/reset counter and /min or /h for the unit of instantaneous flow rate.
2. Pulse output: To be selected from open drain, (FET), voltage pulse, or current pulse.
3. 0.1, 1 or 10 L/P can be selected as the output pulse unit (0.01, 0.1 or 1 L/P for the capacity model 35).
4. In the frame [ ] shows standard specification

Flange Rating and Max. Working Pressure

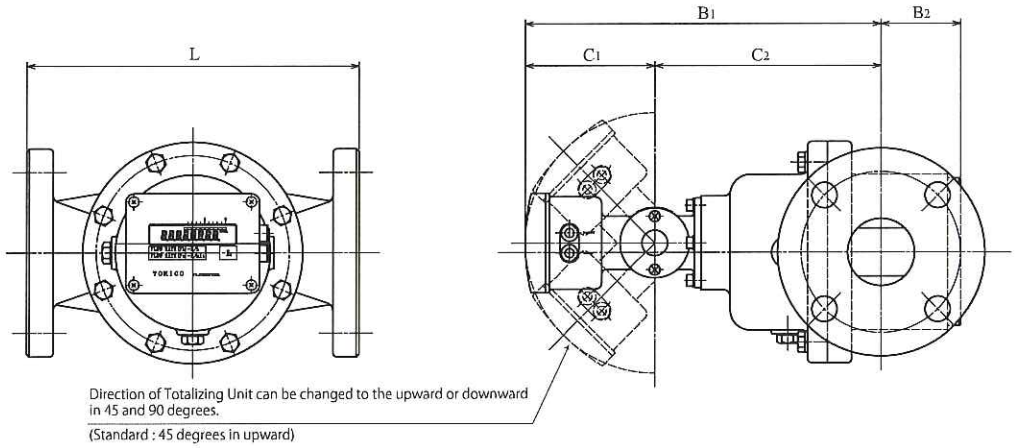
Unit:MPa

Nominal Pressure (MPa)	Material Code	Frange Rating			
		JIS		ASME・JPI	
		10K	20K	150	300
B	AA, AE, DA, DE	1.00	—	—	—
E	NA, NE	1.40	2.50	1.96 *	2.50

Note)* shows that the maximum working pressure can be applied when the temperature of the fluid is under 38℃.

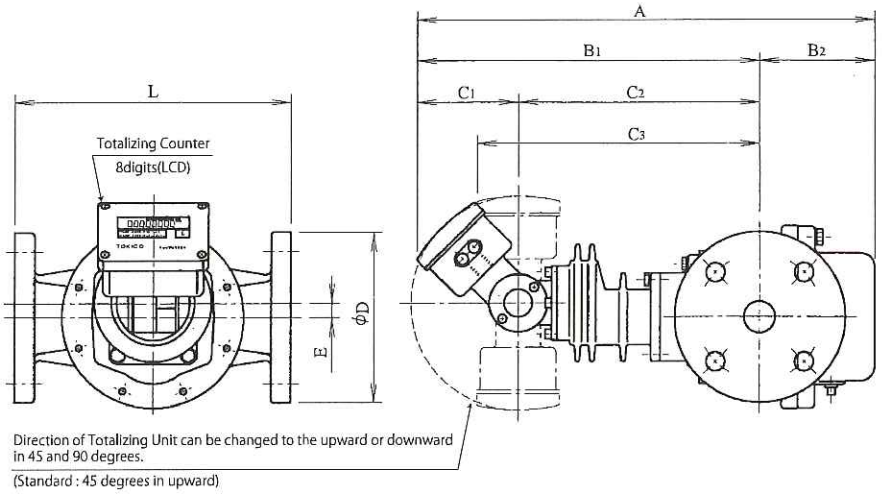
Dimension Drawing

FRL Type (This drawing shows 74P type totalizing unit.)



Capacity Model	Conn.Size (mm)	Main Body Material	Dimensions (mm)					Approx. Weight (kg)
			L	B1	B2	C1	C2	
35	25	FC250, FCD400 SCPH2	200	238	35	97	141	11
38	40	FC250, FCD400 SCPH2	200	248	45	97	151	13
41	50	FC250, FCD400 SCPH2	250	267	60	97	170	15.5
45	50	FC250	320	295	89	97	198	42
		SCPH2	360					
45	80	FC250	300	295	89	97	198	42
47	80	FC250	320	325	119	97	228	45
		SCPH2	360					
51	100	FC250, SCPH2	450	400	180	97	303	100
52	100	FC250, SCPH2	450	400	206	97	303	100

FRY Type (This drawing shows 74X type totalizing unit (with the attachment).)

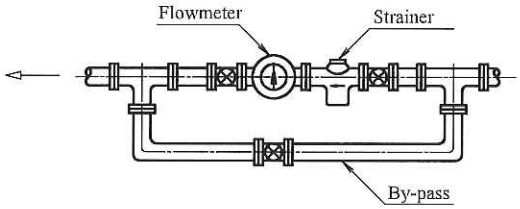


Capacity Model	Conn.Size (mm)	Dimensions (mm)									Approx. Weight (kg)
		L	A	B1	B2	C1	C2	C3	φD	E	
38	40	200	377	296	81	97	199	236	140	13	16.5
41	50	250	420	311	109	97	214	251	155	13	18.5

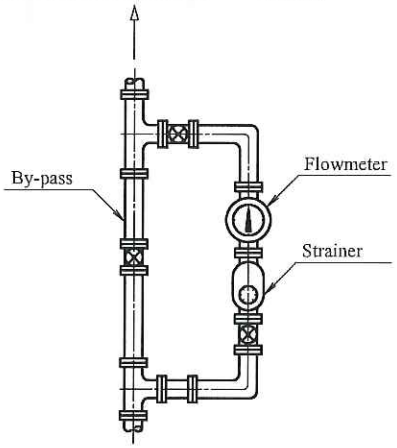
⚠ Caution for Flowmeter Piping Installation

- 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 (℃)
6	Operating Pressure	Maximum, Normal, Minimum (MPa)
7	Viscosity and Specific Gravity	Viscosity (at ℃), Specific Gravity (at ℃)
8	Connection Standard	Connection Size and Flange Standard, etc.
9	Flow Direction	Horizontal or Vertical piping
10	Applied Regulations	Name of Regulation and Standards
11	Attached Equipment	Necessity of Strainer and Valve, etc.
12	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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