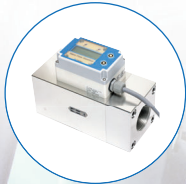




We contribute to the reduction of CO₂ emissions.

Product Lineup for Energy-Saving Management

Compressed air



Saturated steam



City gas



Industrial water/
Cooling water



Fuel oil



OVAL supplies energy-saving sensors for overall utilities.

“To know the amount of energy currently in use” +
“To confirm the amount of reduction”

How much is energy fluid
currently in use?
Is waste present or not?

How much is the effect by
working on energy saving?

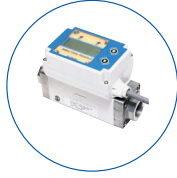


Installation of flowmeters is required.

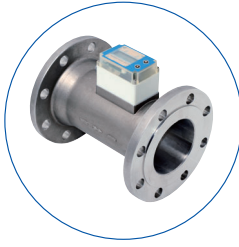
For continuous energy-saving activities, it is essential to control (measure) the energy usage through temperature, pressure, and flow measurement. "Visualizing" the amount of saved energy and appreciating those who engaged in such activities are the keys to successful energy-saving activities. OVAL provides various flow sensors to cover all energy flow measurement needs from main pipes to branch pipes at inexpensive. Our hope is to help users in setting energy-saving targets and controlling specific energy consumptions by visualizing the flows of energy fluids.

Compressed air OVAL offers "visualization" of consumed

Air flowmeter lineup



Small diameter
(15 to 50mm)



Middle diameter
(25 to 150mm)

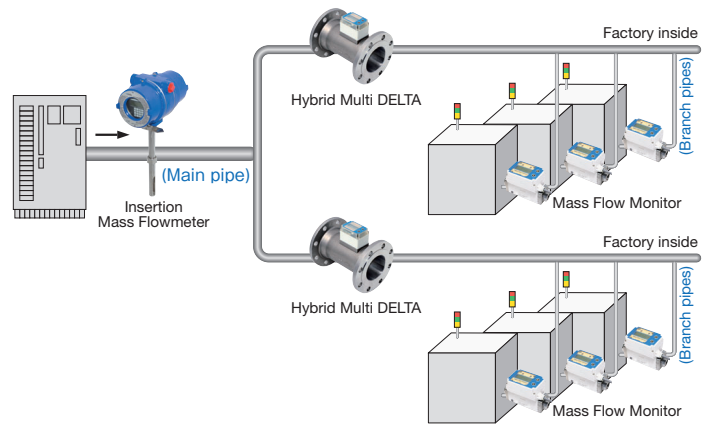


Large diameter
(65 to 500mm)

Features

- With their wide flow ranges, a single meter can measure both the leak amount and maximum flowrate
 - Mass Flow Monitor: 1:50 or wider
 - Hybrid Multi DELTA: maximum 1:900
 - Insertion Mass Flowmeter: 1:1000 or wider
- Pressure loss minimized configuration
- Sensor unsusceptible to mist (oil, water) and dust
- Adaptable to from main pipes (maximum: 500mm) to branch pipes (minimum: 15mm) at inexpensive
- Motivating the sense of energy saving by the currency equivalent display (Yen, \$, and CO₂ amount equivalent also possible)
- Thermal flowmeters directly measure mass flowrate without temperature/pressure compensation

Applications (installations)



Mass Flow Monitor

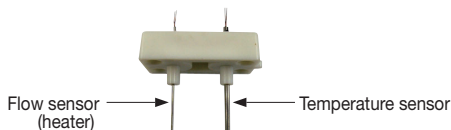


Thermal Wide flow range



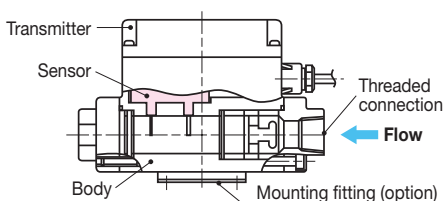
- Measurable from a leak as low as 10NL/min
- Pressure loss minimized

Sturdy sensor structure



*: As the sensor element is protected by stainless sheath pipe, the sensor has a structure resistant to dust, mist, etc.

Configuration



General specifications

Model code	TF1015-P11G-11□A	TF1020-P11G-11□A	TF1025-A12G-11□A	TF1040-A12G-11□A	TF1050-A12G-11□A
Nominal size	15mm	20mm	25mm	40mm	50mm
Process connection	Rc1/2 (female)	Rc3/4 (female)	Rc 1 (female)	Rc 1·1/2 (female)	Rc 2 (female)
Fluid temperature	0 to 50°C				
Ambient temperature	0 to 50°C (No condensation allowed)				
Pressure range	0 to 0.7MPa				
Accuracy	Flowrate below 40% of full scale		Flowrate 40% of full scale and above		
	Reproducibility	±0.8% max. of full scale.	±2% max. of reading		
	Linearity	±2% max. of full scale.	±5% max. of reading		
	Pressure Characteristics	±0.12% max. of full scale / 0.1 MPa max.	±0.3% of reading / 0.1MPa max.		
	Temperature Characteristics	±0.2% max. of full scale / °C max.	±0.2% of reading / °C max.		
Display	7-segment 8-digit LCD (backlighted with measurement unit indication). Display is rotatable in 90° step.				
	·Instantaneous flowrate: m ³ /h (normal), L/min (normal)				
	·Resettable total, cumulative total m ³ (normal)				
Output (※1)	Flow pulse (open collector output)(pulse width: adjustable in 1 to 240ms)			Factored pulse, L/P (normal) at delivery from factory	
	Flow analog: 4 to 20mA			15mm	20mm
	Alarm (2 points, open collector pulse)			0.1	1
Pressure loss	Within 10kPa (when flowing maximum flow at 0.3MPa or over.)				
Power supply	24VDC±10% 100mA				
Cable	5-conductor shielded cable 3m, 4-conductor shielded cable 3m with connector, no cable				

※1: 2 points are selectable as output (for possible combinations, please refer to the product codes).

Flow range

Nominal size	L/min(normal)				
	15	20	25	40	50
Pressure: MPa					
0.3					
0.4					
0.5	10 to 600	15 to 800	35 to 2200	85 to 5000	135 to 8000
0.6		※1		※2	※3
0.7					

- ※1: line pressure is 0.04MPa and over and maximum flowrate is 800L/min (normal).
- ※2: line pressure is 0.11MPa and over and maximum flowrate is 5000L/min (normal).
- ※3: line pressure is 0.24MPa and over and maximum flowrate is 8000L/min (normal).

■ For details, please refer to the General Specification sheet No. GBF300.

air flows and their leaks at main and branch pipes.

Hybrid Multi DELTA



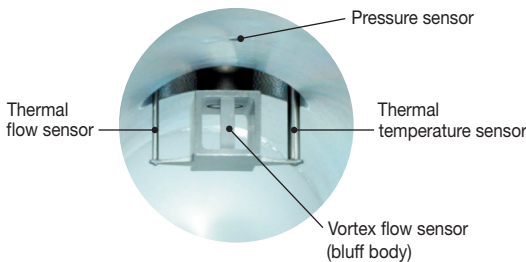
Vortex+Thermal

Super wide flow range



- Super wide flow range of maximum 1: 900
- Can be installed on a line of unknown flowrate

■ Sensor unit construction



■ General specifications

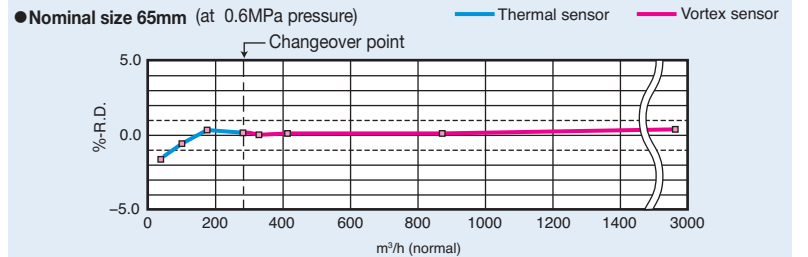
Model code	TV1025	TV1040	TV1050	TV1065	TV1080	TV1100	TV1150
Nominal size	25mm	40mm	50mm	65mm	80mm	100mm	150mm
Process connection	Rc1 (female)	Rc1-1/2 (female)	Rc 2 (female)	JIS 10K RF flange, ASME 150			
Fluid temperature	0 to 50°C						
Ambient temperature	0 to 50°C						
Pressure range	0 to 0.78MPa (Option 0 to 0.98MPa)						
Accuracy(Inclusive of linearity, pressure effects)	±5% of reading ±0.05% of maximum flowrate						
Reproducibility	±2% of reading ±0.05% of maximum flowrate						
Temperature characteristic	±0.2%/°C of reading						
Display	7-segment 8-digit LCD (backlit with measurement unit indication). Display is rotatable in 90° step. ·Instantaneous flow rate: m ³ /h (normal), L/min (normal), m ³ /h, L/min or other ·Resettable total, cumulative total m ³ (normal), m ³ , temperature (°C), pressure (kPa abs) ·LED×2 points (turns on as alarm)						
Output	Flow pulse: open collector output, pulse width: 1ms as standard (adjustable in 1 to 240ms) Flow analog: 4 to 20mADC Flow alarm: 2 points, open collector output 2 points are selectable as output (for possible combinations, please refer to the product codes).						
Factored pulse unit	0.001m ³ (normal)/P		0.01m ³ (normal)/P			0.1m ³ (normal)/P	
Pressure loss	Within 10kPa						
Power supply	24VDC ±10% Maximum 150mA (except for 4 to 20mA for analog output)						
Cable	4-conductor shielded cable 3m						

*1: 150mm size insertion type also available.

■ Flow range

Nominal size: mm	25	40	50	65	80	100	150
Pressure: MPa							
0.3	0.6 to 240	1.2 to 570	1.8 to 960	3 to 1440	4.2 to 1920	7.2 to 3360	16 to 7680
0.4	0.6 to 300	1.2 to 720	1.8 to 1200	3 to 1800	4.2 to 2400	7.2 to 4200	16 to 9600
0.5	0.6 to 360	1.2 to 864	1.8 to 1440	3 to 2160	4.2 to 2880	7.2 to 5040	16 to 11520
0.6	0.6 to 420	1.2 to 1008	1.8 to 1680	3 to 2520	4.2 to 3360	7.2 to 5880	16 to 13440
0.7	0.6 to 480	1.2 to 1150	1.8 to 1920	3 to 2880	4.2 to 3840	7.2 to 6720	16 to 15360

■ Meter error test data (Typical example)



■ For details, please refer to the General Specification sheet No. GBD621.

Insertion Mass Flowmeter



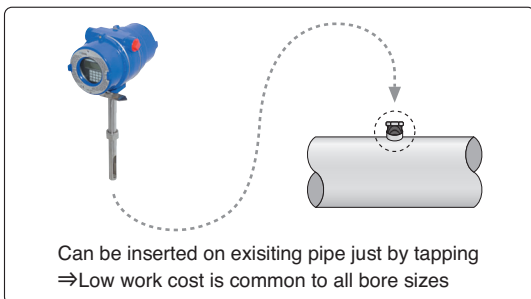
Thermal

Insertion

Wide flow range



- Replacing ultrasonic, mounted on main pipes at inexpensive
- Very low mounting cost helps reducing total cost



■ General specifications

Model code	Insertion type (454FTB)
Fixed type	Screw-in or Flange type (JIS 10K, ASME150RF, ASME300RF)
Nominal pipe size	65mm over
Sensor support diameter	3/4" (standard), 1/2", 1"
Fluid temperature	Standard: -40 to +260°C High temperature: -40 to +500°C
Maximum operating pressure	1MPa
Material	Sensor: Hastelloy C276 equivalent, Sensor port: SUS316L or Hastelloy C276 equivalent
Accuracy	±2% FS (±2% RD in case actual flow calibration applied)
Power supply	24VDC or 85 to 265VAC 50/60Hz
Display	2-line 16-digit backlit LCD Instantaneous flowrate (or flow velocity) or total flow
Output	Analog output 2 points (flow, temperature), pulse output, alarm output

■ Flow range

Nominal size	65	80	100	125	150	200
Pressure: MPa						
0.3						
0.4	1.3 to	1.9 to	3.0 to	4.7 to	6.8 to	11.8 to
0.5	1450	2050	3510	5410	7620	13200
0.6						
0.7						
Nominal size	250	300	350	400	450	500
Pressure: MPa						
0.3						
0.4	18.2 to	26.2 to	32.7 to	43.0 to	55.1 to	68.5 to
0.5	20400	29300	36500	48300	61600	76600
0.6						
0.7						

■ For details, please refer to the General Specification sheet No. GBF109. *May not be available in your area.

Saturated steam

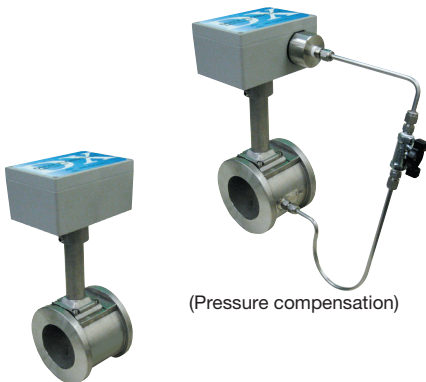
Pressure sensor built-in! High accuracy with pressure compensation! Most suitable for saturated steam with pressure variation!

Features

- Seven sizes from 15mm to 150mm offered
- Simple structure, inexpensive, and waterproof
- Accuracy $\pm 2\%$ of reading
- Calculation not required
 - * No need for steam density calculation using temperature.

DELTA FLOWPET-DX

Steam Vortex Pressure compensation

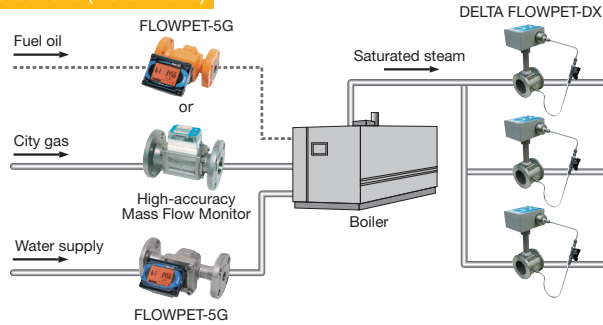


(Fixed factor calculation type)

(Pressure compensation)

- Pressure compensation: Using signal from built-in pressure sensor, converts volume flowrate into mass flowrate.
- Fixed factor calculation type: Using pressure value (fixed) set on the transmitter, converts volume flowrate into mass flowrate.

Applications (installations)



General specifications

Body

Process connection: flange or wafer	Wafer: JIS10, 16, 20, 30K, ASME/JPI 150, 300 *
Maximum operating temperature	200°C
Maximum operating pressure	1.0MPa (with pressure compensation), 1.45MPa (fixed factor calculation)
Physical orientation	Pressure compensation type should be mounted in a posture where the sealant water in the capillary tube pools in it.

*: Only JIS10K or ASME/JPI 150 is applicable if pressure compensation required.

Transmitter

Accuracy	With pressure compensation	$\pm 2\%$ of reading (at 0.06 to 0.25MPa), $\pm 3\%$ of reading
	Fixed factor calculation	$\pm 1\%$ of reading
Pulse output *	Open collector (capacity: 30VDC, 20mA)	
Analog output *	4 to 20mA at 0 to FS	
Power supply	24VDC $\pm 10\%$	
Ambient temperature	-20 to +60°C	
Transmission distance	Maximum 1km	
Dust/waterproof	IP65	

*: Simultaneous output of both analog and pulse signals is available.

Flow range (saturated steam)

Nominal size	Pressure: MPa				
	0.3	0.4	0.5	0.6	0.7
15	11.4 to 64.4	11.7 to 79.4	12.4 to 94.3	13.6 to 109	14.8 to 123
25	23.5 to 216	27.0 to 267	30.3 to 317	33.4 to 367	36.3 to 416
40	39.4 to 431	45.3 to 532	50.8 to 631	56.0 to 730	60.9 to 829
50	64.5 to 720	74.2 to 888	83.2 to 1050	91.6 to 1210	99.7 to 1380
80	142 to 1600	163 to 1980	183 to 2350	202 to 2720	219 to 3080
100	243 to 2770	280 to 3420	314 to 4060	346 to 4700	376 to 5330
150	530 to 6030	609 to 7430	683 to 8820	752 to 10200	818 to 11500

■ For details, please refer to the General Specification sheet No. GBD625.

City gas

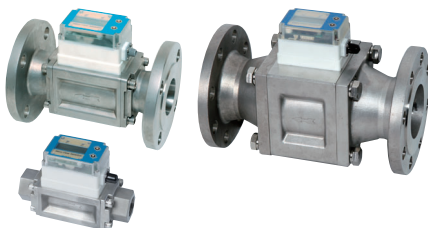
Most suitable to control city gas consumption in furnaces, boilers, and air conditioners.

Features

- Measures gas flow accurately at the standard condition (0°C, 1atm)
- A simple and durable configuration: sensor protected in the sheath pipe; no moving part

High-accuracy Mass Flow Monitor

Thermal Gas



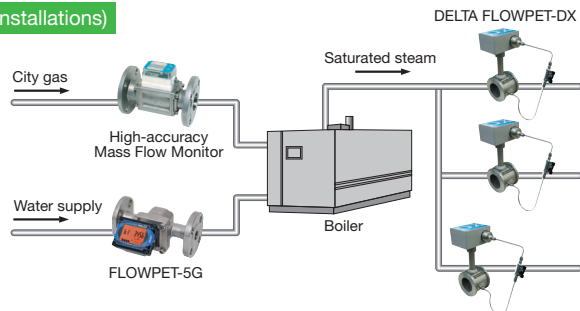
Flow range

L/min(normal)

Nominal size mm	Pressure: MPa				
	0.3	0.4	0.5	0.6	0.7
25	40 to 600				
40, 50	167 to 2500				
80	500 to 7500				

■ For details, please refer to the General Specification sheet No. GBF301.

Applications (installations)



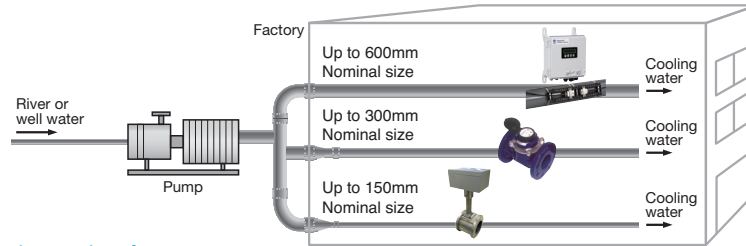
General specifications

Fluid temperature	0 to 60°C
Ambient temperature	0 to 60°C (No condensation allowed)
Pressure range	0 to 0.7MPa (Option: 0.98MPa)
Linearity (inclusive of reproducibility)	Within $\pm 1\%$ of full scale
Pressure loss	Within 1.7kPa (city gas); within 2.1kPa (air, nitrogen)
Connection size	25mm, 40mm, 50mm, 80mm
Display	7-segment 8-digit LCD (backlit with measurement unit indication). Display is rotatable in 90° step. · Instantaneous flow rate (Nm ³ /h), (NL/min) · Resettable total, Cumulative total (Nm ³) · Yen conversion (cumulative total, instantaneous flowrate, resettable total) LED $\times 2$ points (turns on as alarm)
Output *	Flow pulse (open collector output; capacity: 30VDC, 20mA; pulse width: adjustable in 1 to 240ms) Flow analog: 4 to 20 mADC, maximum load resistance 500 Ω , Alarm (2 points open collector output) *: 2 discretionary output points are selectable.
Power supply	24VDC $\pm 10\%$ Maximum 100mA
Cable	4-conductor shielded cable with connector 3m: Supplied with product code showing "With cable".

Industrial water

Best suited for measuring industrial water circulating water, and cooling water

Applications (installations)



No need to cut the existing pipe!

Clamp-on design allows mounting outside of the piping, contributing to installation cost reduction.

Psonic-S1

Liquid Ultrasonic



Flow range

(Reference maximum flowrate at each nominal size where pipe inner diameter = nominal size)

Nom. size (mm)	Max. Flowrate (m ³ /h)	Nom. size (mm)	Max. Flowrate (m ³ /h)	Nom. size (mm)	Max. Flowrate (m ³ /h)
25	17.6	150	636	450	5720
40	45.2	200	1130	500	7060
50	70.6	250	1760	550	8550
80	180	300	2540	600	10100
100	282	350	3460		
125	441	400	4520		

General Specifications

● Sensor Specifications

Applicable fluids	Homogeneous fluids where ultrasonic wave can propagate (clean water, waste water, industrial water, river water, ocean water, purified water, etc.) Turbidity: 10000mg/L (degree) maximum Note) The fluid must not contain bubbles. Note) Cannot measure slurry. Note) For application to fluid other than water, consult OVAL sales office or nearest representative.
Fluid temperature range	-20 to 60°C (fluid and ambient)
Nominal size	25 to 600mm
Piping materials	Steel pipe, SUS pipe, polyvinyl pipe, ductile cast-iron pipe, copper pipe, or other pipe made of material that can transmit ultrasonic wave steadily *1: Maximum applicable bore size may not be satisfied depending on the material or status of piping. *2: In the case of lined pipe, the lining must be adhered to the main pipe. (Lining material is tar epoxy or mortar, or the like.)
Flow metering range	0 to ±10m/s
Number of metering beam	1 beam
Metering principle	Ultrasonic pulse transmission time difference system
25 to 40mm	±2.5% of reading (±0.025m/s at a flow velocity less than 1m/s)
50 to 90mm	±2.0% of reading (±0.020m/s at a flow velocity less than 1m/s)
100 to 250mm	±1.5% of reading (±0.015m/s at a flow velocity less than 1m/s)
300 to 600mm	±1.0% of reading (±0.010m/s at a flow velocity less than 1m/s)
Factory calibration accuracy	Note) Specification at the measurement of volume flow Note) The pipe must be full of liquid and the flow velocity distribution must be ideal. Note) The flow velocity must be 0.3m/s or more with specified length of straight pipe secured.
Sensor material	Resin (PBC, PMMA)
Protection class	Standard: IP65 (Option: IP67)

■ For details, please refer to the General Specification sheet No. GBM006.

Unsusceptible to suspended solids in river or well water

DELTA FLOWPET-DX

Liquid Vortex



General specifications

● Body

Process connection: wafer or flange	Wafer JIS10, 16, 20, 30K ASME/JPI 150, 300
Fluid temperature	-30 to +200 °C
Maximum operating pressure	5MPa (depends on flange rating)

● Transmitter

Accuracy	±1% of reading	Ambient temperature	-20 to +60 °C
Pulse output	Open collector (Capacity: 30VDC, 20mA)	Transmission distance	Maximum 1km
Analog output	4 to 20mA at 0 to F.S.	Power supply	24VDC±10%

*: Simultaneous output of both analog and pulse signals is available.

Flow range (water)

Nominal size (mm)	15	25	40	50	80	100	150
Flow range (m ³ /h)	0.3 to 6	0.7 to 20	1.3 to 48	2.0 to 79	4.6 to 172	11 to 296	33 to 645
Standard pulse unit	0.001 m ³ /P (1L/P)						

■ For details, please refer to the General Specification sheet No. GDB625.

Capable of measuring both cold water and hot water (for heat management)

ME METER

Liquid Turbine



General specifications

Item	Acceptable Fluid	Cold Water	Hot Water
Nominal Size		40, 50, 65, 80, 100, 125, 150, 200, 250, 300mm	
Flange Rating		JIS 10 K RF or ASME 150 RF	
Maximum Operating Pressure		1MPa	
Operating Temperature Range		0 to 50°C	0 to 130°C
Materials	Cover	Polyacetal resin	
	Case	Cast iron (Powder coated finish all over)	
Internal Elements		Plastics, Stainless Steel	Heat-resistant resin, Stainless Steel
Register		Counter drum + Pointer	
Finish		Blue	Red
Accuracy		Within ±2%. Within ±5% at lower measuring limit.	
Physical Orientation		Free except downward	

Flow range

● Cold Water Service

Nom. Size (mm)	40	50	65	80	100	125	150	200	250	300
Flow range (m ³ /h)	0.30 to 60	0.30 to 90	0.40 to 120	0.50 to 200	0.80 to 300	1.8 to 350	2.0 to 600	4.0 to 1200	6.0 to 1600	12.0 to 2000

● Hot Water Service

Nom. Size (mm)	40	50	65	80	100	125	150	200	250	300
Flow range (m ³ /h)	0.60 to 20	0.60 to 30	1.0 to 60	1.4 to 90	2.0 to 140	3.5 to 200	4.5 to 300	8.0 to 500	15.0 to 1000	25.0 to 1200

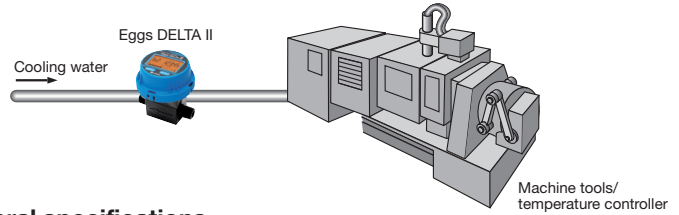
■ For details, please refer to the General Specification sheet No. GBT203.

Dirt-resistant! No moving part! Reasonably priced! For monitoring flows in machine tools and temperature controllers

Features

- Suited for various tests and utility purposes
- High visibility achieved by orange LCD, bar-graph indicator, and large unit display
- Digital display of instantaneous flow rate (/min, /h) and total flow (L)
- Output selectable from 4-20mA analog, pulse, or simultaneous output of both
- Battery-powered type available (battery replaceable)

Applications (installations)



General specifications

Type	Standard	Metal Joint
Nominal size	4, 8, 15, 25mm	
Process connection	Resin R male thread or Resin NPT male thread	Metal Rc female thread
Accuracy	±2% of full scale	
Fluid temperature	-10 to +80°C	
Maximum operating pressure	0.98MPa	
Wetted parts material	PPS resin	PPS + Stainless Steel
Display	Instantaneous flow, total	
Power supply	Battery or external power source	
Output *1	Flow pulse, flow analog, alarm	

*1: Simultaneous output of [Pulse + Alarm] or [Pulse + Analog + Alarm] is available.

Flow range

- Standard type

Nominal size: mm	4	8	15	25
Flow range (L/min)	0.4 to 4	1.1 to 15	2.8 to 45	8.3 to 133

■ For details, please refer to the General Specification sheet No. CBD130.

Eggs DELTA II



Vortex

Battery

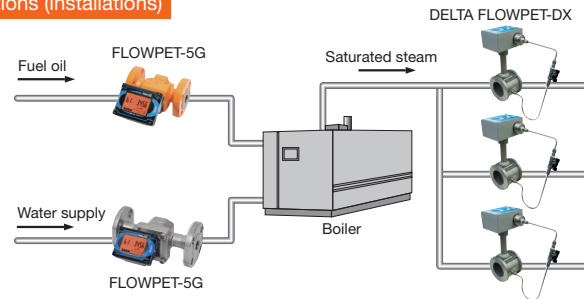


Fuel oil Just the flowmeter for fuel oil measurement!

Features

- High durability
- Display's angle adjustable vertically in 165°
- Battery-powered type available (battery replaceable)

Applications (installations)



General specifications ● Register

LCD display	7-segment 8-digit; letter height 14mm; flow unit indication and low battery alarm		
Power supply	Lithium battery or external power source ● Lithium battery: 3.6VDC; duration: 8 years (depends on operating conditions) ● External power source: 12 to 50VDC±10% (minimum 10mA required as capacity)		
Display item	Total flow or instantaneous flow (/min, /h), resettable total		
Output signal (With pulse generator)	Open drain (equivalent of Open collector) allowable current: 20mA; maximum impressed voltage: 30V		
	Factored pulse	Unfactored pulse	
	Pulse width: 1ms, 50ms, 100ms, 250ms	Pulse width: 2ms (fixed)	
Alarm output	Open drain (equivalent of open collector) 2 points		
Analog output	4 to 20mADC		
Ambient temperature	-10 to +60°C		

Flow range ● Flow range: oil

Model code	Nominal size: mm	Flow range: L/h			Pressure loss (kPa) at max. flowrate	
		Kerosene	Light oil (A heavy oil)	Heavy oil (5 to 200 mPa·s)	Kerosene 1.2 mPa·s	Heavy oil 19 mPa·s
LS4976	20	10 to 800	7 to 800	5 to 800	32	47
LS5076	20	150 to 1600	80 to 2000	50 to 2000	14	40
LS5276	25	300 to 3000	150 to 3800	80 to 3800	13	56
LS5376	40	600 to 5000	300 to 6400	150 to 6400	13	30
LS5576	40	1200 to 11000	600 to 14000	400 to 14000	25	54
LS5676	50	2000 to 20000	1400 to 24000	900 to 24000	27	55

- Body

Fluid temperature	0 to +120°C
Maximum operating pressure	1.18MPa (flange standard: JIS10KRF)
Accuracy	Within ±0.5% of reading

■ For details, please refer to the General Specification sheet No. GBB324.

FLOWPET-5G



PD

Battery



■ PLEASE SUPPLY THE FOLLOWING INFORMATION WHEN YOU INQUIRE ABOUT FLOWMETERS.

1. Process fluid (*1)	Name: _____ SP.gr: _____ Viscosity: _____
2. Flow range	Max. _____ Normal _____
3. Fluid temperature	Max. _____ °C Normal _____ °C Min. _____ °C
4. Operating pressure	Max. _____ MPa Normal _____ MPa Min. _____ MPa
5. Ambient temperature	Max. _____ °C Min. _____ °C
6. Nominal size	_____ mm
7. Required accuracy	± _____ % of reading ± _____ % of full scale
8. Process connection	<input type="checkbox"/> Flanged connection _____ <input type="checkbox"/> Ferrule connection <input type="checkbox"/> Screw connection
9. Explosionproof	
10. Power supply	_____ V <input type="checkbox"/> AC <input type="checkbox"/> DC
11. Output, Other	

*1: Special fluids, such as of high viscosity or slurries, should be stated precisely and in detail.

■ For technical questions about products, inquiries for quotation, data sheet requests or the like, contact by e-mail is also most welcomed.

The specification as of October, 2023 is stated in this catalog. Specifications and design are subject to change without notice.



OVAL Corporation

<https://www.oval.co.jp/en/>

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