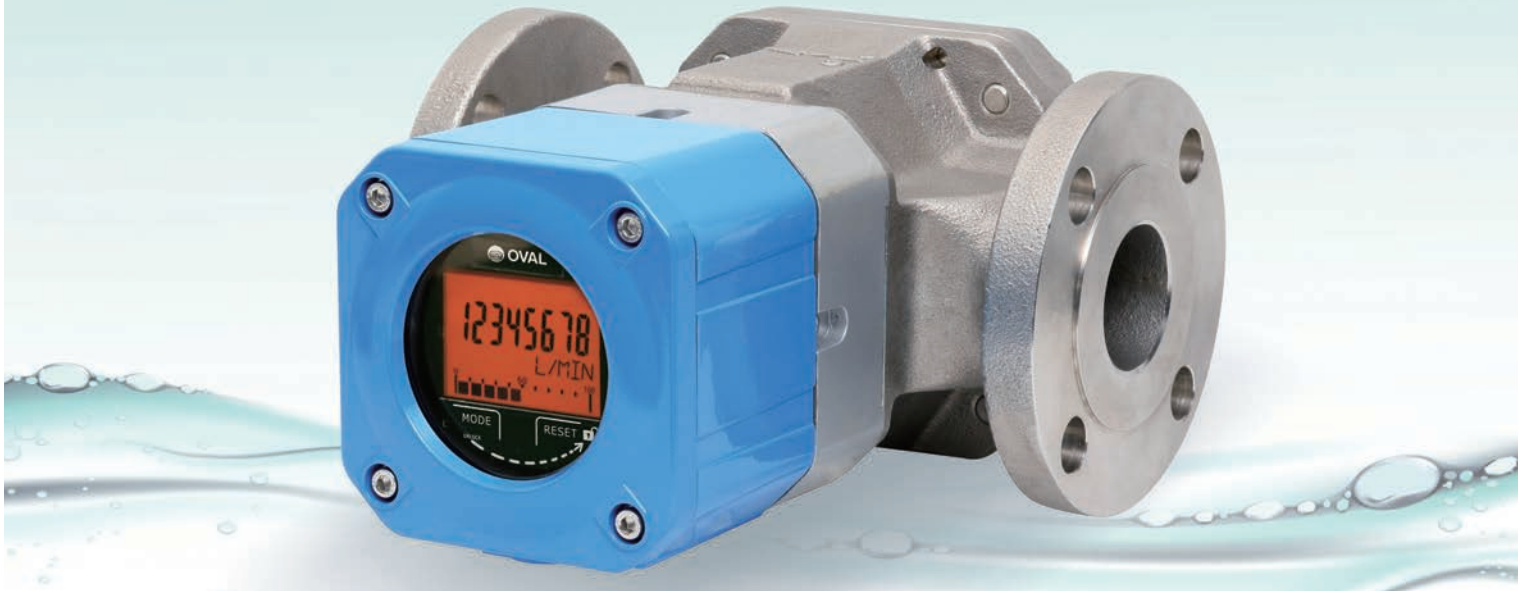
CAT.No.CBB115E-1

OVAL

High Accuracy, Versatile
Positive Displacement Flowmeter

ULTRA OVAL Type S

ULTRA OVAL with established reputation for accuracy and durability took a step forward again!

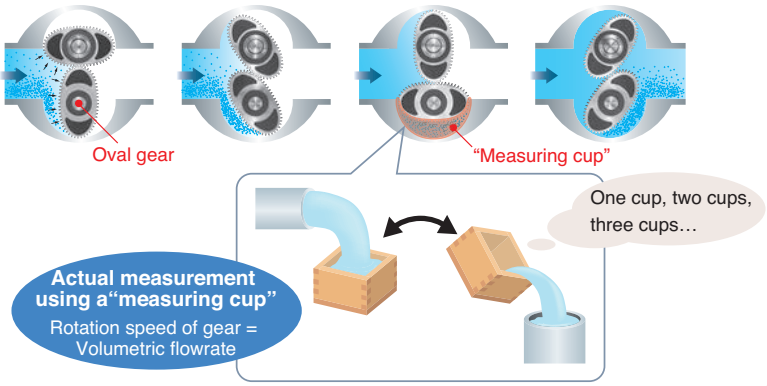


- Bar graph display enables intuitive confirmation of instantaneous flowrate!
- Easily viewable, large unit display!
- High-sensitivity touch sensor has been adopted! Operable with your gloves on, even in the rain!
- Predicts aging deterioration of the flowmeter body and notifies the maintenance timing!
- Detects disconnection of sensor wire and notifies sensor failure!

"Actual measurement type" with high reliability and high accuracy

[Measurement principle of OVAL flowmeter]

OVAL flowmeter consists of a body and a pair of oval shaped gears. Volumetric flow measurement is achieved by repeated measurement using a "measuring cup" and counting the continuous scoop of liquid one cup, two cups, three cups...
OVAL flowmeter is called as "Actual measurement type", since it does not "estimate" flowrates by detecting a physical phenomenon having correlation with flow, but actually measures flowrates using a "measuring cup".



ULTRA OVAL uses oval gears at the heart of technology with established reputation for high accuracy and durability. 17 sizes are lined up to cover minute to large flowranges.

Flowmeter Body
The body and rotors are made of stainless steel (types 39-57). Special carbon has been adopted for the bushings as a standard.

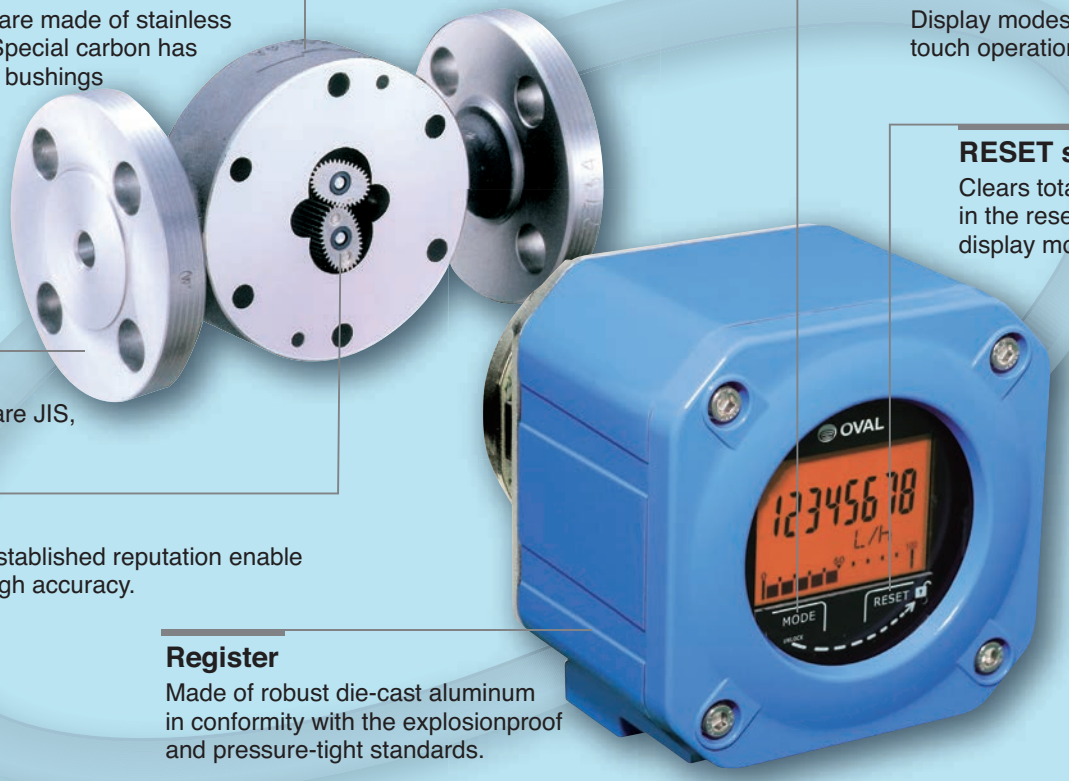
Flange
Flange connections are JIS, ASME or JPI types.

Rotor
Oval gears with an established reputation enable measurement with high accuracy.

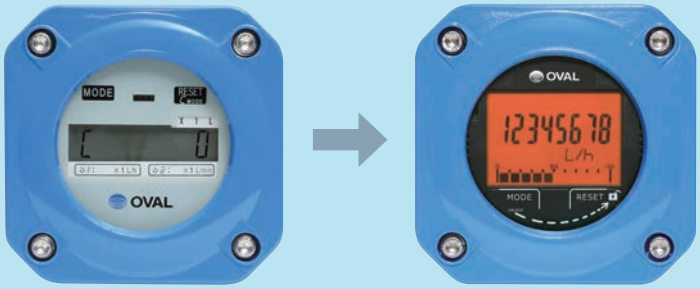
Register
Made of robust die-cast aluminum in conformity with the explosionproof and pressure-tight standards.

MODE switch
Display modes changed by touch operation.

RESET switch
Clears totalized values in the resettable total display mode.



Enlarged display! Easily viewable!



(Old model) **(New model)**

Various functions added to make easier operations.

Newly developed touch switch
Easy operation with gloves on!

Various alarms with self-diagnosis function
Estimates wear status of body and announces maintenance timing.

Alarm in the event of sensor wire disconnection

Specification with wireless printer system
(Under development)

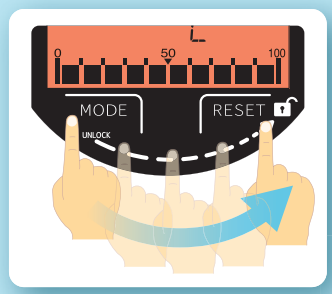
Optimal package system that enables totalized flow log management and printing out vouchers using companion smartphone and mobile printer. Optimum for truck loading and offloading applications.

ULTRA OVAL Type S (Specification with wireless printer system)

Mobile printer

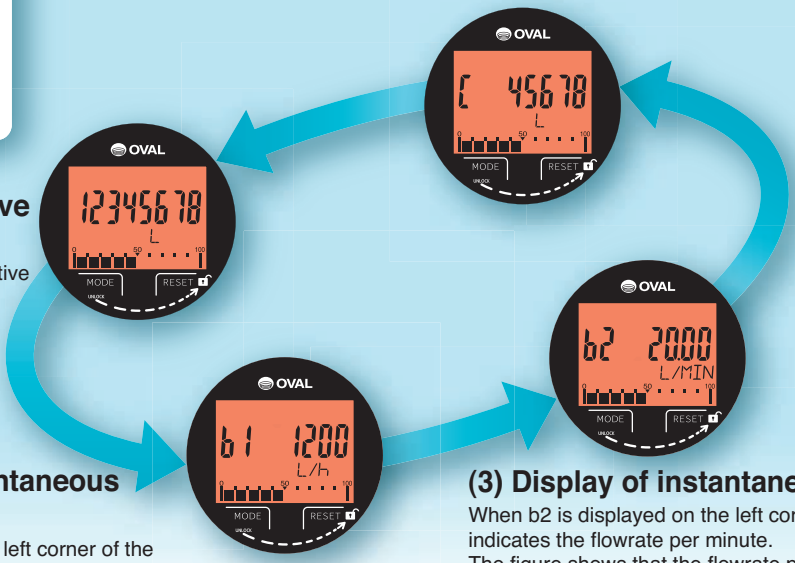
Operation Lock function and its release method / Example of LCD

- When a non-operation state continues for over a minute, the “operation lock” works to prevent erroneous operation.
- Operation Lock is released by sliding your finger slowly from the MODE side to the RESET side as shown with the arrow in the figure below.



(4) Display of resettable total

When C is displayed on the left corner of the LCD, it indicates that it is in the Resettable Total Mode. When you touch “RESET” with your finger, the totalized value is reset and the accumulation starts from zero. However, the cumulative total values are stored independently during this mode. The figure shows that the total flowrate is 45,678 L.



(1) Display of cumulative total

The figure shows that the cumulative total value is 12,345,678 L.

(2) Display of instantaneous flowrate (b1)

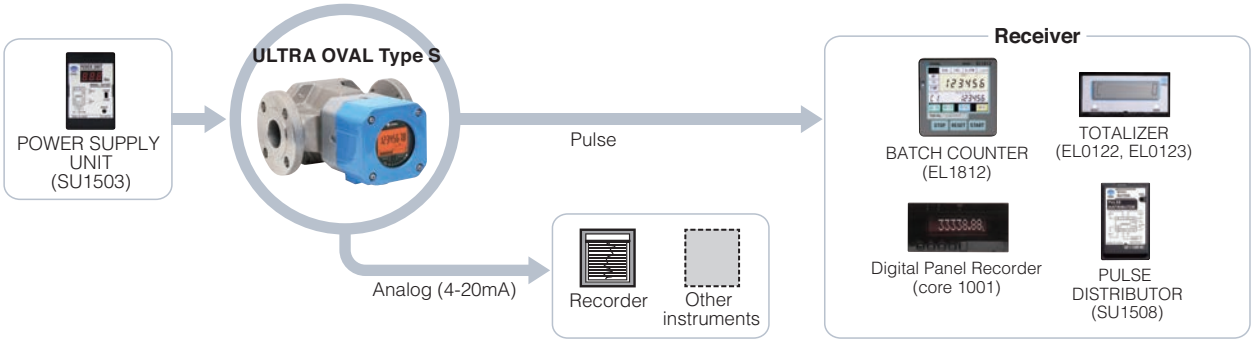
When b1 is displayed on the left corner of the LCD, it indicates the flowrate per hour.
The figure shows that the flowrate per hour is 1,200 L/h.

(3) Display of instantaneous flowrate (b2)

When b2 is displayed on the left corner of the LCD, it indicates the flowrate per minute.
The figure shows that the flowrate per minute is 20.00 L/min.

Connection with receiver

ULTRA OVAL Type S is available in the following types: a battery type (without output) that requires no external power supply and an external power supply type (with pulse output and analog output).



Specifications of main body

Item / Capacity type	Nominal diameter (mm)	Linearity	Flow range (m^3/h) ※1	Material: Body	Material: Rotor	Material: Bushing	Connection	Max operating pressure ※2	Operating temp. range
39	10	±0.35% or ±0.15% of reading	0.2 to 12L/h	Stainless steel	Special carbon	Special carbon • Ceramics	JIS or ASME/JPI Flange type	2.94MPa	Standard: −10 to +120°C
41			1 to 60L/h		Stainless steel				
45			5 to 420L/h						
50	20		0.03 to 2						Low temp.: −60 to +60°C Standard: −10 to +120°C High temp. or jacket: 120 to 260°C
52	25		0.08 to 3.8						
53			0.15 to 6.4						
55	40		0.26 to 14						
56	50		0.6 to 24						
57			1.2 to 44						
28	50	±0.35% or ±0.15% of reading	2 to 50	Integral type: Stainless steel Separated type: Cast iron • Cast steel	Integral type: Stainless steel Separated type: Cast iron • Stainless steel	Integral type: Carbon • Ceramics Separated type: Carbon	JIS or ASME/JPI Flange type	Integral type: 1.96MPa Separated type: 9.51MPa	Integral type −10 to +120°C Separated type Standard: −5 to +120°C High temp. or jacket: 120 to 200°C
29	80		4 to 90						
60	100		5 to 150						
31	100		10 to 230			Carbon			
	150								
32	150		15 to 320						
	200								
33	150		20 to 450						
	200								
34	250		30 to 700	Cast steel	Cast iron • Stainless steel			4.51MPa	
65	300		50 to 1000					1.96MPa	
	300								

※1. Linearity ±0.35%, at 5mPa•s or higher.
※2. Different by a flange standard.

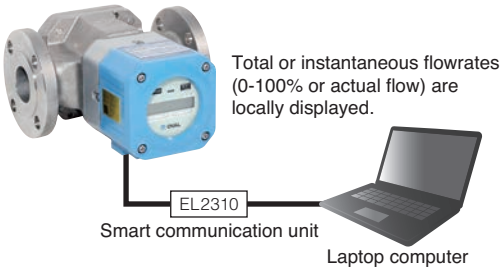
Standard Specifications

Item		Description
LCD		• Flowrate display: 7 segments and 8 digits • Unit display: 16 segments × 3 digits • Battery mark display • Flow indicator (in 10 divisions) • Information mark display • Color of background: Orange (1) Cumulative total: 8 digits (2) Instantaneous flowrate per hour: 5 digits (3) Instantaneous flowrate per min.: 5 digits (4) Resettable total: 7 digits
Output specifications	Without output	Local indication only
	Current analog output	4-20mADC
	Current pulse output	Factored or unfactored OFF: 4mA / ON: 20mA
	Open collector pulse output	Factored or unfactored ON voltage: 1.5V DC or less
	Voltage pulse output	Factored or unfactored OFF: 1V or less / ON: 7V or more
Power supply	Without output	Built-in lithium battery. Battery life: Approximately 8 years
	With output	• External power supply: 12-45V DC • Consumption current: Maximum 30mA • Built-in lithium battery. Battery life: Approximately a year (The battery is not consumed when power is supplied by the external power supply.)
Ambient temperature		−20 to +60 °C (free from dew condensation)
Explosionproof configuration		Flameproof configuration: JPEx explosionproof (Japanese explosionproof certificate), ATEX, NEPSI, KCs, CSA, ITRI
Protection class of container		IP66
Forward/reverse detection function		Included (When reverse flow subtraction function is chosen)
Mode switching, reset operation		Touch sensor (Direct operation using fingers.)

Related products developed according to applications

Smart type register

● More advanced process operation has been achieved with “communication”!
With the smart type register, not only indication of measurement information but also reading out, setting and self-diagnosis of various parameters including instantaneous flowrates, spans and meter coefficients can be performed in a control room away from the field using the smart communication unit (EL2310), while at the same time facilitating maintenance. Furthermore, by utilizing the optional multi-drop function, a maximum of 15 transmitters can be connected to a host computer using two-wire cable, which minimizes wiring.



ULTRA register with batch control function

- Highest-grade positive displacement flowmeter “ULTRA OVAL” comes with a batch control function. Combination with an automatic ON/OFF valve enables simplified construction of a high-performance field-type batch system.
- Fully pneumatic
  (Batch counter is powered by built-in battery.)
- Depending on your application, you can select one-stage opening/closing valve (LW74E) or two-stage opening/closing valve (LW76E) which enables accurate batch operation.

	LW74E	LW76E
Valve control system	Pneumatic one-stage opening and one-stage closing	Pneumatic two-stage opening and two-stage closing (Through setting, it can be changed to one-stage opening.)
Setting method	Push button type (LCD counter: 6 digits)	
Accumulated value (cumulative value)	LCD counter: 8 digits	
Alarm	Battery capacity drop, excessive batch, non-arrival of pulse (LCD)	
Backup	Total values, set values, etc. (Stored in EEPROM)	
Configuration	Intrinsically safe explosionproof (Exia IIB T3) and water-jet proof (IP65) configurations	
Ambient temperature	−10 to +60 °C	
Power supply	Dedicated lithium battery (Battery life: Approximately 4 years. However, it differs depending on use conditions.)	

ULTRA register with automatic temperature correction function

● Automatically converts into volumetric rate of flow with a reference temperature!
This ULTRA register can be used for applications that require flowrate measurement at a prescribed reference temperature, for example, in the case of petroleum trading, having a function to convert into a flowrate at a reference temperature. Available to all types of ULTRA OVAL.

Applicable flowmeter	ULTRA OVAL Types 39 to 65
Temperature input	Platinum resistor (Pt 100Ω)
Temperature range for correction	−10 to +150 °C
Display	8-digit LCD
Output	Two output types can be selected from various pulse signals and analog signals
Calculation	JIS K 2249 standards, JIS K 2240 standards, 3α correction
Conversion accuracy	Within ±0.1%

(Note 1) Bluetooth® word mark and logo are registered trademarks owned by Bluetooth SIG, Inc. OVAL Corporation uses these mark and logo under license from Bluetooth SIG, Inc. Other trademarks and registered trademarks are those of their respective owners.