Liquid | Gas

Excellent Coriolis Flowmeter by OVAL

OVAL Coriolis Flowmeter

Big bore type (150 to 250mm) is added to ALTImass Type U.

High accuracy model
ALTImass Type U

Single, straight-tube model
ALTImass Type S

Low-price, general-purpose model
ALTImass Type B

ALTImass Series

Sufficient self-diagnosis! Density accuracy improved! Large screen! Setting can be changed in the field!

Improved zero point stability. Fast response. Extra low flow measurement. A Coriolis flowmeter capable of highly accurate measurement even for the purpose of short-time filling.

Ease of use, general-purpose use, and reliability. The source of these features stem from OVAL's ever-evolving sophisticated technologies.

High accuracy model

The ultimate "U" shaped flow tube,
a fruitage of our optimized and unified design concept.

ALTImass Type **U**

Top-of-the-line model in OVAL Coriolis flowmeters. The highest performance you can think in every aspect - in accuracy, repeatability, flow range, pressure loss, and safety.

◎ U-shaped flow tubes sense the Coriolis force reasonably and efficiently.
◎ High accuracy, low pressure loss model. A 1:200 flow range is attainable.
◎ Both of sensor integrated and separated transmitters are available.
◎ High-temperature sensor is best suited for flow and density measurements of fluids of max. temperature up to +350℃.
◎ Cryogenic sensor is applicable as an explosionproof instrument for cryogenic fluids such as LNG.

Single, straight-tube model

Vibration resistant, single, straight-tube

ALTImass Type **S**

Ideally suited for clean processes where the metered process fluid tends to build up or solidify, or where fast and positive process fluid replacement or draining of the pipeline is required.

◎ A mass flowmeter built with a single, straight flow tube. Facilitates cleaning job of wetted parts.
◎ Requires minimum installation space, ideally suited for clean processes.
◎ A rangeability of 1:30 is attainable.
◎ The transmitter comes in a variety of types - mounted integrally or separately with the sensor.

(1) Improved zero stability

Conventional model
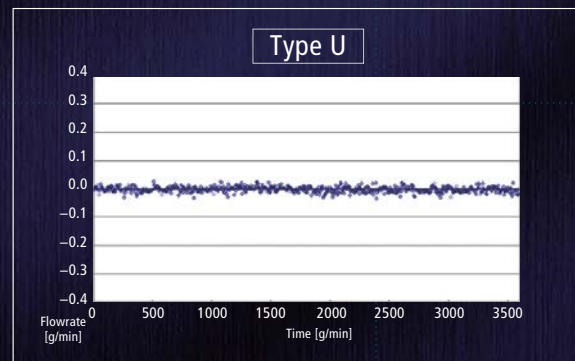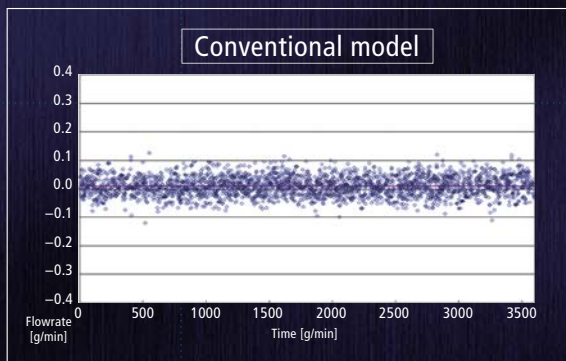
Type U

## (2) Improved liquid density accuracy (Type U)

By the improvement of the density measurement processing, density measurement has become more stable than conventional model, improving the liquid density accuracy.

(3) Improved responsibility

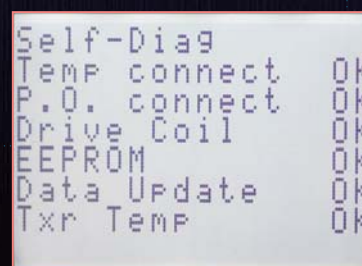By using high speed real-time processing (10 times as fast as OVAL's conventional model), the responsiveness to change of flowrate and short-time batch measurement has been improved.

(4) Large-size display! Settings can be changed in the field!

Display screen is large and easy to view with a backlight facilitating setting in a dark place.
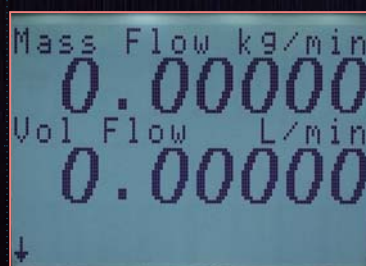
(a) Transmitter

(b) Self-check screen

Display screen of ALTImass Transmitter

Low-price, general-purpose model

OVAL technology pursuing

Rainbow type flow tube

ALTI*mass* *Type B*

New direction of Coriolis flowmeter presented by OVAL. Small-size, stable truly innovative product with high cost performance.

◎ Low priced, general-purpose mass flowmeter.
◎ Rainbow-shaped flow tube design, facilitating self drain, offers ease of cleaning and consistent performance.
◎ A complete set of ferrule fittings are available.
◎ High metering accuracy and low pressure loss. A rangeability of 1:50 is attainable.

(5) Satisfactory self-diagnostic feature

- Status of the flowmeter is presented by two-color backlight (white, orange) and two LEDs (red, green).
- Input signal (sensor) check for disconnection
- Pipeline vibration check

| Error type	Name (Status display)	Description	RED LED	Green LED	Backlight (White,Orange)
Saturated Alarm	Analog Output 1 Saturated	Analog output 1 value exceeds the output range and normal output is not available.	Blink	ON	White
	Analog Output 2 Saturated	Analog output 2 value exceeds the output range and normal output is not available.			
	Pulse Output 1 Saturated	Pulse output 1 value exceeds 11kHz and normal output is not available.			
	Pulse Output 2 Saturated	Pulse output 2 value exceeds 11kHz and normal output is not available.			
Sensor Failure	Drive Input Out of Range	Drive frequency is not within the regular range and normal measurement is not possible.	ON	OFF	Orange
	Scale Over	Mass flowrate exceeds 110% of maximum allowable flowrate and normal measurement may not be possible.			
		Volume flowrate exceeds 110% of maximum allowable flowrate and normal measurement may not be possible.			
	Temperature Out of Range	Temperature is not within the regular range and normal measurement is not possible.			
	Density Outside Limit	Density is not within the regular range and normal measurement is not possible.			
	P.O. Sig Alarm	Pickoff signal voltage is not within the regular range and normal measurement is not possible.			
	Temperature Connect Error	Temperature sensor cannot be checked for normal connection.			
	P.O. Connect Error	Pickoff sensor cannot be checked for normal connection.			
Transmitter Failure	EEPROM Error	Writing to EEPROM is abnormal.	Blink (※1)	OFF	Orange
	Data Update Error	Internal data is abnormal.	ON	OFF	Orange
Parameter Alarm	Analog 1 Span Set Error	Analog output 1 parameter set value is abnormal.	Blink	ON	White
	Analog 2 Span Set Error	Analog output 2 parameter set value is abnormal.			
	H/L Alarm Point Set Error	H/L Alarm parameter set value is abnormal.			
Calibration Failure	Auto Zero Failed	Auto Zero has not been completed normally.	Blink	OFF	White
	Sensor Stability Check Failed	Air density adjustment has not been completed normally.			
Slug Flow Alarm	Slug Flow Alarm	Mixed bubble may possibly have caused abnormal measurement value.	Blink	ON	White
Xmtr Alarm	Xmtr Temperature Error	Transmitter internal temperature is abnormal.	Blink	ON	White
	Xmtr Operating-Time Error	Transmitter operating time exceeds 50000 hours.			

(※1) LED blinking at EEPROM error (100ms interval) is faster than that in other alarm condition (250ms interval)

(6) Satisfactory maintenance function

- Error logging
- Clock (Accumulated time from power on is saved in the transmitter.)
- Data storage at the shipment from the factory

■ Measurement Principle and Construction

The mass flowmeter operates on the principle of Coriolis force. A pair of flow tubes fixed at both ends is excited by an electromagnetic oscillator to maintain oscillation at resonant frequency. A twist of these flow tubes takes place in proportion to the mass flowrate of the process fluid, which is sensed by the right-hand and left-hand electromagnetic pickoffs. The transmitter then sends its output as a mass flow signal.

Transmitter
Flow Tube
Temperature sensor
Electromagnetic Pickoff
Electromagnetic Oscillator
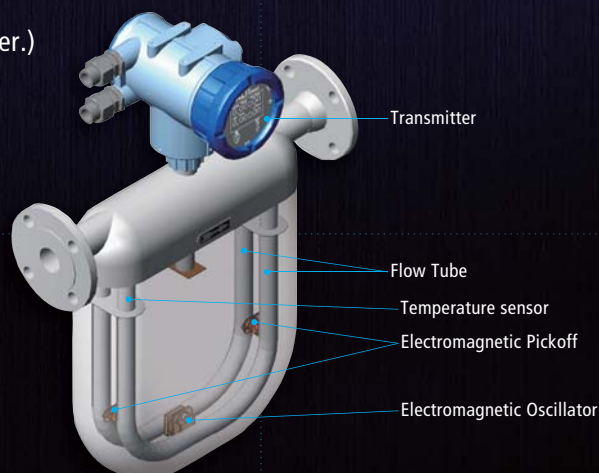
Coriolis Mass Flowmeters

※: For details, please refer to general specification sheets.

Type U

Item			Description
Model			CA00A, CA001, CA003, CA006, CA010, CA015, CA025, CA040, CA050, CA080 CA100, CA150, CA15H, CA200, CA20H, CA250
Nominal size			1/4", 10mm, 15mm, 25mm, 40mm, 50mm, 80mm, 100mm, 150mm, 200mm, 250mm
Process Connection			JIS 10, 20, 30, 40, 63K RF ASME 150, 300, 600 RF, JPI 150, 300, 600 RF DIN PN 10, 16, 25, 40RF, Ferrule, Screw
Acceptable fluids			Liquids, Gases
Flow range			0 to 2800000kg/h (16 models)
Accuracy	Flow	Liquids	±0.1％RD (CA003 to CA150) ±0.1％RD±Zero stability error (CA15H to CA250, High temperature service model) ±0.2％RD±Zero stability error (CA00A, CA001, High pressure service model)
		Gases	±0.5％RD±Zero stability error
	Density	Liquids	±0.0005g/mL (CA003 to CA250) ±0.003g/mL (CA00A, CA001, High temperature service model) ±0.004g/mL (High pressure service model)
Temperature range (Differs by explosionproof specification)			Standard model : −200 to ＋200℃ (Applicable to all models)
			High temperature service model : −40 to ＋350℃ (CA025 to CA150)
			Low temperature service model : −200 to ＋50℃ (CA025 to CA250) (Explosionproof model)
Max. operating pressure			Depends on flange rating
Wetted materials			SUS 316L, SUS 316L＋Alloy C, Alloy C
Explosionproof specification			TIIS, ATEX, IECEx, KOSHA/KTL, CSA, GOST, NEPSI
Maritime certification			DNV GL

Type S

Item	Description
Model	CS010, CS015, CS025, CS040, CS050, CSR50, CS080
Nominal size	10mm, 15mm, 25mm, 40mm, 50mm, 80mm
Process Connection	JIS 10, 20K RF ASME150 RF, JPI 150 RF Ferrule
Acceptable fluids	Liquids
Flow range	0 to 108000kg/h (6 models)
Accuracy	±0.15％RD±Zero stability error (Titanium alloy) ±0.2％RD±Zero stability error (SUS 316L)
Temperature range (Differs by explosionproof specification)	−40 to ＋130℃
Max. operating press.	2.45MPa (Depends on flange rating)
Wetted materials	Titanium alloy, SUS 316L
Explosionproof specification	TIIS, ATEX, IECEx, KOSHA/KTL, CSA, GOST, NEPSI
Maritime certification	DNV GL

※ In case of non-explosionproof type, the maximum measurement temperature of integral type is 130℃.

Type B

Item		Description
Model		CB006, CB010, CB015, CB025, CB040, CB050
Nominal size		10mm, 15mm, 25mm, 40mm, 50mm
Process Connection		JIS 10, 20, 30K RF ASME 150, 300, 600 RF, JPI 150, 300, 600 RF Ferrule
Acceptable fluids		Liquids
Flow range		0 to 96000kg/h (6 models)
Accuracy	Flowrate	±0.2％RD±Zero stability error
	Density	±0.003g/mL
Temperature range (Differs by explosionproof specification)		−40 to ＋125℃
Max. operating press.		7.9MPa (Depends on flange rating)
Wetted materials		SUS 316L
Explosionproof specification		TIIS, ATEX, IECEx, KOSHA/KTL, CSA, GOST, NEPSI
Maritime certification		DNV GL

The specification as of February, 2017 is stated in this catalog. Specifications and design are subject to change without notice.