Co-innovating tomorrow™

YOKOGAWA

OpreX™ Field Instruments

Vortex Flowmeter

digitalYEWFLO series

- Total Insight -

Bulletin 01F06A04-00EN

Vortex Flowmeter

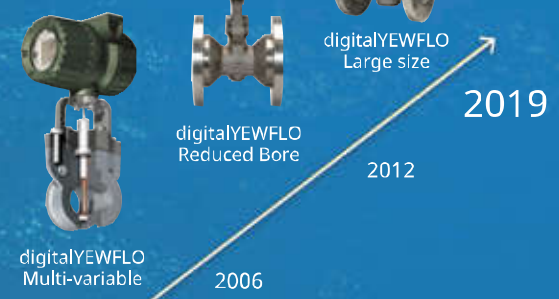
**digitalYEWFLO is Yokogawa's line of vortex flowmeters with excellent reliability and performance.
The stability of digitalYEWFLO's field-proven sensors when combined with its unique signal processing technology results in excellent real-world performance.
digitalYEWFLO offers a wide product range to meet all customer requirements.**

Remote Type Converter

digitalYEWFLO Integral Type

History of Yokogawa Vortex Flow Meters

Sales Start	YEWFLO*C	YEWFLO*E	ULTRA YEWFLO	digitalYEWFLO
1969	1981	1992	1995	2000



digitalYEWFLO Multi-variable	digitalYEWFLO Reduced Bore	digitalYEWFLO Large size	2019
2002	2006	2012	

YOKOGAWA supports the entire lifecycle of products

From 'Sensing' to 'Sensemaking'

Combining reliable technology with superior field knowledge, Yokogawa has insights into the lifecycle of the device that provides added value to the user.

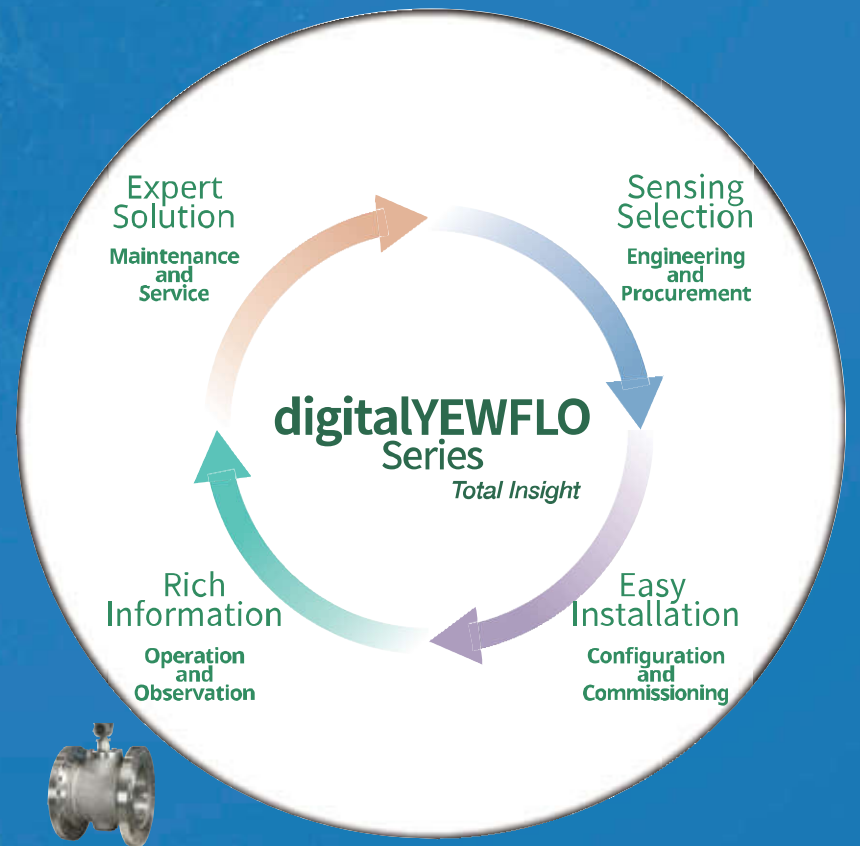
digitalYEWFLO offers valuable information throughout the devices' lifecycle.

Sensing Selection **— Engineering and Procurement —**
Simple lineup and a wide range of international approvals help the customer select the right product.

Easy Installation **— Configuration and Commissioning —**
Various ways of configuring devices contribute to reduced installation and configuration time.

Rich Information **— Operation and Observation —**
Valuable diagnostic information leads to improved process efficiency.

Expert Solution — Maintenance and Service —
Providing timely maintenance information contributes to reduced maintenance cost.

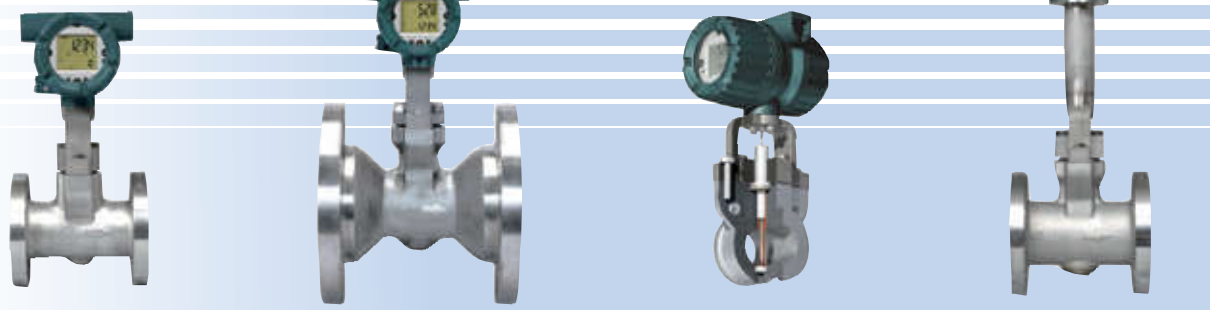


Total Insight

Sensing Selection

— Engineering and Procurement —

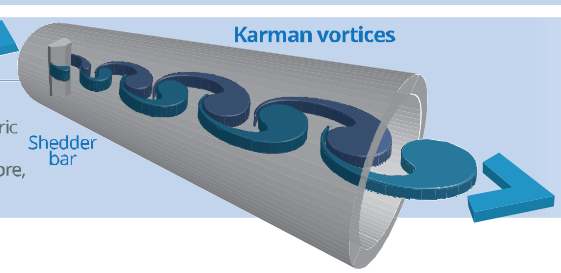
Lineup for various application



Standard Type | Reduced Bore Type | Multi-variable Type | High Process Temperature Cryogenic Version

Measuring principle of Vortex Flowmeter

When a shedder bar is placed in a flow, Karman vortices are generated on the downstream side of the bar. The Karman vortices are detected by two piezoelectric elements installed in the upper part of the shedder bar. The vortex frequency is proportional to the flow velocity in a specific range of Reynolds numbers. Therefore, flow velocity or flow rate can be determined by measuring vortex frequency.



Worldwide Approvals

With the rapid globalization of markets, numerous international standards and approvals are becoming necessary; therefore, Yokogawa instruments have acquired various international certifications including explosion proof, electromagnetic compatibility (EMC), and communication protocols.

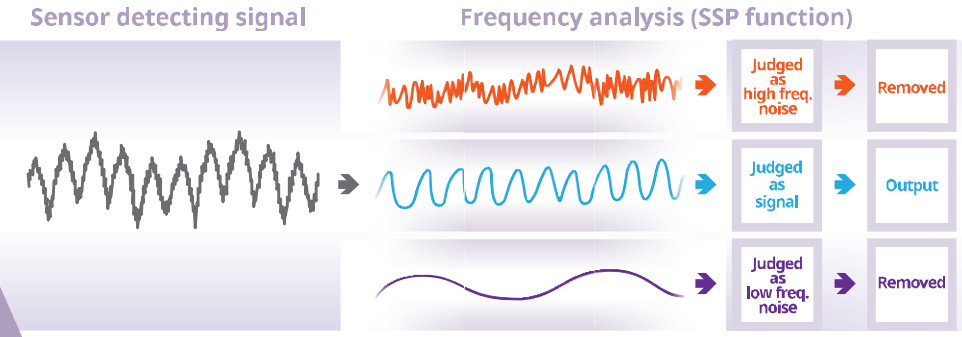
Product Finder

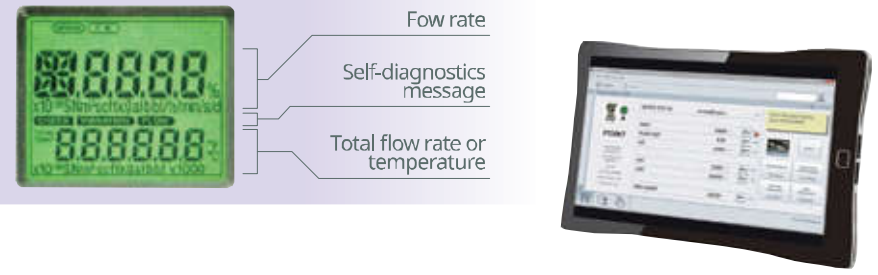
Yokogawa provides a wide range lineup of field instruments. The product finder on the YOKOGAWA Website helps users to select devices. Based on the measuring parameter, accuracy and explosion proof that the user enters, the product finder quickly selects the most suitable instrument.

Signal Processing (SSP: Spectral Signal Processing)

digitalYEWFLO's SSP function provides enhanced vibration immunity and advanced diagnostics

digitalYEWFLO is a maintenance-free flowmeter. It has a circuit for analyzing the frequency of detected signal and allows only vortex frequency to pass through the segmented band-pass-filter, thereby accurately identifying and eliminating noise. The Spectral Signal Processing (SSP) function of digitalYEWFLO only outputs the appropriate vortex frequencies, even under fluctuating flow rate conditions.

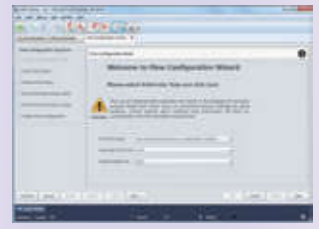




Easy Installation

— Configuration and Commissioning —

- AR function block of Foundation Fieldbus Communication type confi gured by FSA120 FieldMate FlowNavigator...
- FieldMate FlowNavigator realizes high accurate flow measurement of natural gas, general gas and liquid by using built-in temperature sensor or external temperature sensor and pressure sensor."



FlowNavigator

Rich Information

— Operation and Observation —

Dual output for Analog / Pulse

Flow rate /temperature can be output simultaneously with pulse and displayed on LCD.

Flow rate

Total flow rate or temperature

Alarm output, Status output (Flow switch)

An alarm signal output, in case alarm occurs or Status output in case flow rate falls below set point.

Alarm/Diagnostics on LCD

Error message

Alarm information such as sensor failure, or diagnositics such as temperature sensor error or input circuit error are shown on LCD.

Data Log Through PRM

Through linking with Plant Resource Manager (PRM), data is saved from digitalYEWFLO that is used to analyze plant maintenance activities. PRM centralizes asset management and provides intelligent plant-wide diagnostics.

PRM
Plant Resource Manager

Collects data

PRM :
(Plant Resource Manager)

Expert Solution

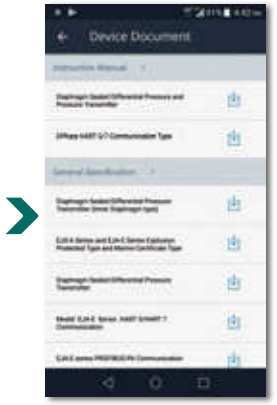
— Maintenance and Service —

Device Lifecycle Management

Mobile application enables easy access to device information necessary for plant maintenance work. You can search for device information and documentation such as General Specifications, User's Manual, Test Certificate by specifying serial number or scanning QR Code on the device. Compatibility check between a failed device and a spare device is also possible. Yokogawa will contribute to improving the efficiency of customer's plant maintenance work by providing instant access to device information.

Mobile application

Serial No. input



View of the device information, Instruction manual and test certificate.

Data Transfer Using FieldMate

Yokogawa's FieldMate - Versatile Device Management Wizard can be used program the same configuration into multiple devices using the data transfer function, that can reduce total device configuration time.

Upload parameters

FieldMate

Versatile Device Management Wizard

Download parameters (Parameters copy)

Product feature

Yokogawa's proprietary filter (SSP) for digital signal processing analyzes vortex signals and automatically selects the optimum settings for the best possible measurement.

Standard Type

Suitable for wide flow application.

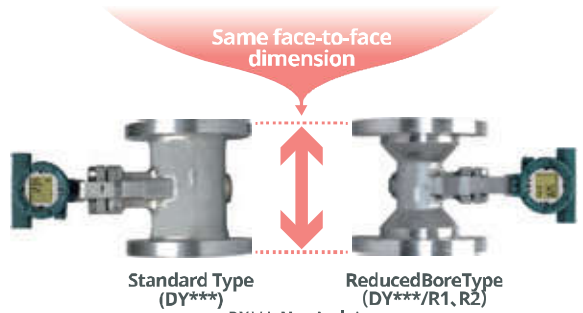
- Liquid, gas and steam can be measured.
- Easy installation, with flange or wafer process connections.
- Zero adjustment is not necessary.
- Total sales units are over 450,000.

Reduced Bore Type

Minimum measurable fl ow up to five times lower than conventional vortex flowmeter.

- Integrated construction with reducers built into the flowmeter.
- No need for reducers/expanders or short pipes to achieve the required straight pipe length! Improves safety and reduces installation costs!

Integrated construction allows for bore size reduction of up to 2 sizes.

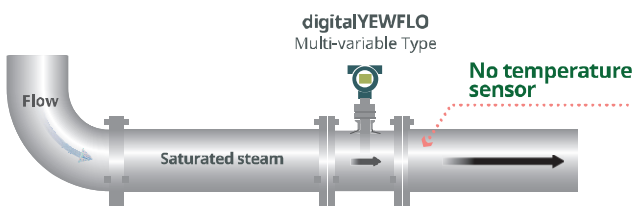


Multi-variable Type

Multi-variable vortex flowmeter (with builtin temperature sensor) can directly output the mass fl ow rate of saturated steam.

Shedder bar with built-in temperature sensor:

- The shedder bar, which is strong enough to be used as a thermo-well, incorporates a RTD sensor (equivalent to Pt1000, Class A) for temperature measurement.
- Mass flow rate is calculated based on measured temperature.
- A combination of the reduced bore and multivariable types is ideal for saturated steam instrumentation when the flow rate fluctuates largely.
- A high level of safety is assured without the expense or installation of a temperature sensor, and additional process connection is not required.



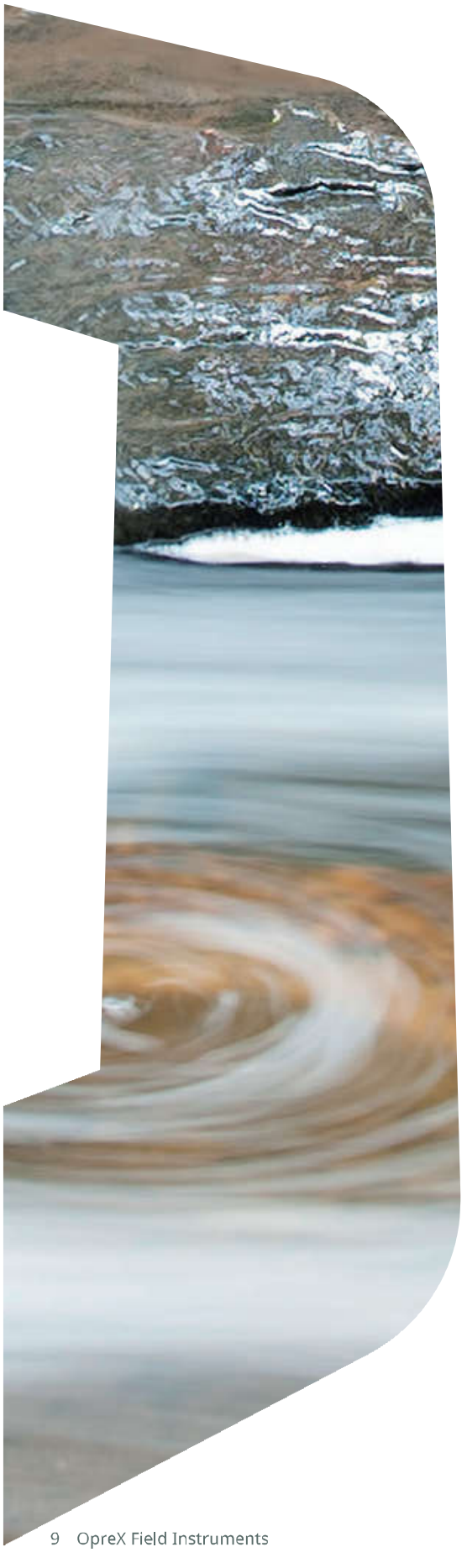
High Process Temperature/ Cryogenic Version

For high temperature or cryogenic flow measurement.

Measurable temperature range: Maximum +450 ˚C, Minimum -196 ˚C

- Same face-to-face dimension as the Standard Type
- Simple construction for easy insulation work

Specification



Standard Type

Reduced Bore Type

Multi-Variable Type

High Process Temperature/ Cryogenic Version

		Standard Type	Reduced Bore Type	Multi-Variable Type	High Process Temperature/ Cryogenic Version
Model		digitalYEWFLO Series Vortex Flowmeter (Integral type, Remote type detector, Remote type converter)	Option: Reduced Bore Type /R1, /R2	Option: Multi-Variable Type /MV	Option: High Temperature Version /HT Cryogenic Version/LT
Fluid to be measured		Liquid, Gas, Steam (Avoid multiphase flow and sticky fluids)			
Nominal size	**Wafer**	15 mm to 100 mm	N/A	25 mm to 100 mm	HT: 25 mm to 100 mm LT: 15 mm to 100 mm
	Flange	15 mm to 400 mm	R1: 25 mm to 200 mm R2: 40 mm to 200 mm	25 mm to 200 mm	HT: 25 mm to 400 mm LT: 15 mm to 100 mm
Accuracy	**Liquid**	Liquid: ±1.0% of reading (20000 ≦ Re < 1000*D) Liquid: ±0.75% of reading (1000*D ≦ Re)	Liquid: ±1.0% of reading (20000 ≦ Re)	Liquid: ±1.0% of reading (20000 ≦ Re < 1000* D) Liquid: ±0.75% of reading (1000* D ≦ Re)	Liquid: ±1.0% of reading (20000 ≦ Re < 1000*D) Liquid: ±0.75% of reading (1000*D ≦ Re)
	Gas Steam	Gas, Steam: ±1.0% of reading (Flow velocity less than 35 m/s) Gas, Steam: ±1.5% of reading (Flow velocity 35 m/s to 80 m/s)			
Output signal		Output: Analog Output: 4-20 mA DC, 2-wire system Transistor Contact Output: Open collector, 3-wire system Pulse, Alarm, Status output are selectable Contact rating: 30 V DC, 120 mA DC Low level: 0 to 2 V DC	Indication: Upper: FLOWRATE(%), FLOWRATE, *TEMPERATURE(%) Lower: BLANK, TOTAL, *TEMPERATURE *Available for Multi-variable Type only	Communication: HART 5/7, BRAIN, FOUNDATION Fieldbus	
Process temperature range		-29˚C to +250˚C			-29˚C to +450˚C (option: High Process Temperature version) -196˚C to +100˚C (option: Cryogenic version)
Process pressure limit		-0.1 MPa to flange rating.			
Ambient temperature		-29˚C to +80˚C (Integral type with indicator) -29˚C to +85˚C(Integral type without indicator)	-29˚C to +85˚C (Remote type detector) -30˚C to +85˚C(Remote type converter with indicator) -40˚C to +85˚C(Remote type converter without indicator)		
Mounting		Flange or wafer type JIS 10/20/40K ANSI 150/300/600/900 (1500: Special) DIN PN10/16/25/40/60/100/160	Flange type only JIS 10/20K ANSI 150/300	Flange or wafer type JIS 10/20/40K ANSI 150/300/600/900 DIN PN10/16/25/40	Flange or wafer type JIS 10/20/40K ANSI 150/300/600/900 DIN PN10/16/25/40/60/100/160
Electrical connection		ANSI 1/2NPT Female, ISO M20x1.5 Female, JIS G1/2 Female			
Explosion protected type		FM Ex d/Ex ia、ATEX Ex d/Ex ia、Ex ic、CSA Ex d/Ex ia、	IECEx Ex d/Ex ia, KOSHA Ex d/Ex ia, EAC Ex d/Ex ia, NEPSI Ex d/Ex ia, TIIS Ex d		
Material		Body: Stainless steel. Nickel Alloy and Carbon steel by request	Shedder bar: Duplex stainless steel, stainless steel, Nickel Alloy (option)	Gasket: Stainless steel with polytetrafluoroethylene (Teflon) coating	Converter housing, case and cover: Aluminum alloy, stainless steel (option)

D : Inner diameter of digitalYEWFLO (mm) Re : IReynolds number

Synaptic Business Automation

Synaptic Business Automation creates sustainable value by connecting everything in our customers' organization. To realize this, Yokogawa integrates its business and domain knowledge with digital automation technologies, and co-innovates with customers to drive their business process transformation.

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