Vortex Flowmeter
digitalYEWFLO series
- Total Insight -
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.

digitalYEWFLO offers valuable information throughout the devices’ lifecycle. 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.

**YOKOGAWA supports the entire lifecycle of products**

**From 'Sensing' to 'Sensemaking'**

- **Sensing Selection**
- **Easy Installation**
- **Rich Information**
- **Expert Solution**

**History of Yokogawa Vortex Flow Meters**

- 1969
- 1981
- 1992
- 1995
- 2000

**digitalYEWFLO Series**

- Multi-variable
- Reduced Bore
- Large size
Sensor detecting signal
Judged as high freq.
Judged as signal
Judged as low freq.
Removed
Output
Removed

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.

**Lineup for various application**

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

**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.

**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.

**Easy Installation**

- Engineering and Procurement -
- Configuration and Commissioning -

**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.

**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.

**Easy Installation**

-  All function block of Foundation Fieldbus Communication type configured 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.
**Rich Information**  
— Operation and Observation —

**Dual output for Analog / Pulse**
Flow rate/temperature can be output simultaneously with pulse and displayed on LCD.

**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**
Alarm information such as sensor failure, or diagnostics 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.

**Alarm/Diagnostics on LCD**

![Alarm/Diagnostics on LCD](image)

**Error message**

**Flow rate / Total flow rate or temperature**

**Rich Information**  
— 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.

**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.
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 flow 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.

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

Multi-variable Type

- Minimum measurable flow 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.

- High level of safety is assured without the expense or installation of a temperature sensor, and additional process connection is not required.

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

Temperature Sensor

Built-in temperature sensor housed inside the shedder bar. Based on signals from the temperature sensor, which is protected by the shedder bar acting as a protector tube, the mass flow rate of saturated steam is calculated.

Temperature Sensor

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

<table>
<thead>
<tr>
<th>Model</th>
<th>Fluid to be measured</th>
<th>Nominal size</th>
<th>Fluid to be measured</th>
<th>Accuracy</th>
<th>Output signal</th>
<th>Process temperature range</th>
<th>Process pressure limit</th>
<th>Ambient temperature</th>
<th>Mounting</th>
<th>Electrical connection</th>
<th>Explosion protected type</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Type</td>
<td>digitalYEWFLO Series Vortex Flowmeter (Integral type, Remote type detector, Remote type converter)</td>
<td>Liquid, Gas, Steam (Avoid multiphase flow and sticky fluids)</td>
<td>15 mm to 100 mm</td>
<td>Liquid: ±1.0% of reading (20000 ≤ Re &lt; 1000*D)</td>
<td>Indication: Analog Output: 4-20 mA DC, 2-wire system</td>
<td>-25°C to +250°C</td>
<td>-0.1 MPa to flange rating (flange type only)</td>
<td>-29°C to +80°C (Integral type with indicator)</td>
<td>Flange type only</td>
<td>ANS 150/300/600/900 (1500: Special)</td>
<td>FM Ex d/T4x ia, ATEX Ex d/T4x ia, Ex ic, CSA Ex d/T4x ia,</td>
<td>Stainless steel, Nickel Alloy and Carbon steel by request</td>
</tr>
<tr>
<td>Reduced Bore Type</td>
<td>Option: Reduced Bore Type /R1, /R2</td>
<td>Wafer: 15 mm to 400 mm</td>
<td>Liquid: ±0.75% of reading (1000*D ≤ Re)</td>
<td>Gas, Steam: ±1.0% of reading (Flow velocity less than 35 m/s)</td>
<td>Analog Output: 4-20 mA DC, 2-wire system</td>
<td>-29°C to +450°C (option: High Process Temperature version)</td>
<td>-0.1 MPa to flange rating (flange type only)</td>
<td>-29°C to +80°C (Integral type with indicator)</td>
<td>Flange type only</td>
<td>ANSI 150/300/600/900</td>
<td>IECEx Ex d/T4x ia, KOSHA Ex d/T4x ia, EAC Ex d/T4x ia,</td>
<td>Shredder bar: Duplex stainless steel, stainless steel, Nickel Alloy (option)</td>
</tr>
<tr>
<td>Multi-Variable Type</td>
<td>Option: Multi-Variable Type /MV</td>
<td>Flange: 15 mm to 100 mm</td>
<td>Liquid: ±1.0% of reading (20000 ≤ Re &lt; 1000*D)</td>
<td>Gas, Steam: ±1.5% of reading (Flow velocity 35 m/s to 80 m/s)</td>
<td>Contact rating: 30 V DC, 120 mA DC Low level: 0 to 2 V DC</td>
<td>-29°C to +85°C (Integral type without indicator)</td>
<td>-0.1 MPa to flange rating (flange type only)</td>
<td>-29°C to +85°C (Remote type detector)</td>
<td>Flange only</td>
<td>ANSI 150/300/600/900</td>
<td>IECEx Ex d/T4x ia, KOSHA Ex d/T4x ia, EAC Ex d/T4x ia,</td>
<td>Gasket: Stainless steel with polytetrafluoroethylene (Teflon) coating</td>
</tr>
<tr>
<td>High Process Temperature/ Cryogenic Version</td>
<td>Option: High Temperature Version HT</td>
<td>Remote type converter LT: 15 mm to 100 mm</td>
<td>Liquid: ±1.0% of reading (20000 ≤ Re &lt; 1000*D)</td>
<td>Gas, Steam: ±1.5% of reading (Flow velocity 35 m/s to 80 m/s)</td>
<td>Communication: HART 5/7, BRAIN, FOUNDATION Fieldbus</td>
<td>-29°C to +450°C (option: High Process Temperature version)</td>
<td>-0.1 MPa to flange rating (flange type only)</td>
<td>-30°C to +85°C (Remote type converter with indicator)</td>
<td>Range or wafer type</td>
<td>ANSI 150/300/600/900</td>
<td>ATEXEx d/T4x ia, IECEx Ex d/T4x ia,</td>
<td>Converter housing, case and cover: Aluminum alloy, stainless steel (option)</td>
</tr>
</tbody>
</table>

| D | Inner diameter of digitalYEWFLO (mm) | Re | Reynolds number |
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.