

Anatomy of a Liquid Loop

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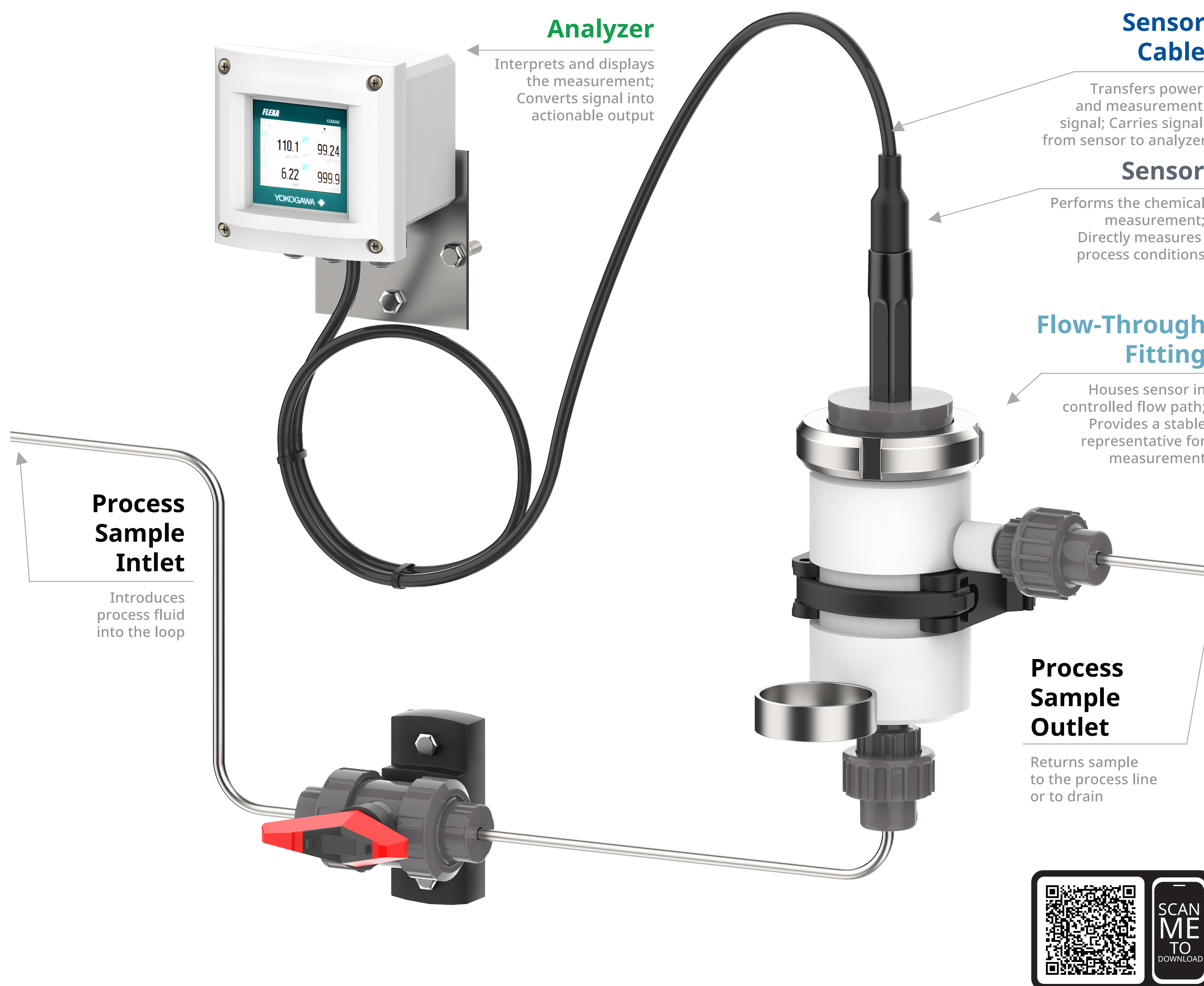
BEFORE YOU SPECIFY A LIQUID LOOP, ASK:

<p>Measurement Type</p> <p>WHAT are you measuring?</p> <ul style="list-style-type: none"> • pH/ORP • Conductivity • Dissolved Oxygen 	<p>Process Conditions</p> <p>WHAT are the process conditions?</p> <ul style="list-style-type: none"> • Temperature • Pressure • Measurement range • Chemical composition 	<p>Installation Style</p> <p>HOW will it be installed?</p> <ul style="list-style-type: none"> • Direct insertion • Bypass flow cell • Immersion • Hot-tap / retractable 	<p>Communication Needs</p> <p>HOW are you connecting this?</p> <ul style="list-style-type: none"> • 2-wire or 4-wire • Analog or digital • Area classification • Number of outputs needed
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HOW THE LOOP WORKS

PROCESS LIQUID → **SENSOR** → **CABLE** → **ANALYZER** → **CONTROL SYSTEM**

Every accurate liquid measurement system depends on four critical components working together as one complete loop.



WHY COMPLETE LOOPS MATTER

Measurement Accuracy

A Loop Is Only as Strong as Its Weakest Component

Common causes of measurement failure:

- Incorrect sensor selection
- Ignoring temperature or pressure limits
- Incompatible wetted materials
- Improper installation
- Incomplete application data

ANALOG vs DIGITAL LOOPS

Comparison

Traditional Analog Loop

- Signal transmitted as mV or current
- Susceptible to interference
- Calibration stored in analyzer

Digital Loop (SENCOM)

- Digital signal transmission
- Reduced noise and signal degradation
- Calibration data stored in sensor
- Plug-and-play replacement

COMPLETE ANALYTICAL LIQUID LOOP

Proper loop design ensures reliability, longevity, and measurement accuracy.

<p>Sensor</p> <p>1 Contacts the process liquid</p> <p>Measures key properties of the process liquid.</p> <p>The sensor performs the actual chemical measurement</p> <ul style="list-style-type: none"> • Measures pH/ORP, Conductivity, or Dissolved Oxygen • Converts chemical activity into electrical signal • Often includes temperature compensation • Directly exposed to process conditions <p>Selection Considerations: Measurement range Temperature Pressure Chemical compatibility Flow conditions</p>	<p>Cable</p> <p>2 Transmits the signal</p> <p>Powers and data travel to the analyzer.</p> <p>The cable transfers power and measurement signal</p> <ul style="list-style-type: none"> • Connects sensor to analyzer • Maintains signal integrity • Available in analog or digital formats • Designed for industrial environments <p>Selection Considerations: Cable length Signal type Environmental exposure Shielding requirements</p>	<p>Analyzer</p> <p>3 Interprets the measurement</p> <p>Applies compensation, diagnostics, and outputs to control systems.</p> <p>The analyzer interprets and communicates the measurement</p> <ul style="list-style-type: none"> • Converts sensor signal into usable value • Displays process measurement • Provides 4–20 mA and/or digital output • Enables calibration and diagnostics <p>Selection Considerations: 2-wire vs 4-wire Analog vs Digital Area classification Inputs/outputs</p>	<p>Fitting</p> <p>4 Ensures proper installation</p> <p>Provides a representative process sample.</p> <p>The fitting installs the sensor to the process</p> <ul style="list-style-type: none"> • Direct insertion • Flow-through (bypass) • Immersion • Retractable (hot-tap) <p>Selection Considerations: Process pressure Maintenance access Cleaning requirements Wetted materials</p>
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