



CG Series Ultrasonic Clamp-on Flow Sensor User Manual



User Manual (V2.8)

XY-TEK

July. 2025

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1. INTRODUCTION

XY-TEK is a technology-driven enterprise specializing in the R&D, production, and sales of ultrasonic flow sensors. We are committed to providing accurate and reliable flow sensors for liquid transmission tubing in medical devices, biopharmaceuticals, new energy, and industrial equipment, enhancing the automation, informatization, and intelligence of liquid flow measurement.

XY-TEK **CG series clamp-on ultrasonic flow sensors** are compact, and can measure flow and output results without external circuitry. The sensors can be directly clamped on flexible plastic tubing to accurately measure the liquid flow rate and detect air bubbles. The sensors are not in direct contact with the liquid in the tubing and will not contaminate the liquid. They are especially suitable for applications where strict hygiene is required, such as medical devices, bioprocessing, new energy, semiconductors, industrial automation, scientific research, and other fields.

Product Features

- High accuracy and stability
- Non-contact measurement, with no direct contact with the liquid, ensuring hygiene and safety
- Bidirectional measurement with fluid volume calculation capability
- Circuit embedded in the sensor and no external circuit required
- No clogging, no flow redirection, and no dead zones, ensuring minimal fluid pressure loss
- Provides standard output methods for seamless integration with customer systems
- Custom calibration for specific plastic tubing material, dimension, temperature, and liquid type

Applications

- Medical Devices: ECMO, Heart-lung machine, Hemodialysis machine, Blood purification equipment, Blood pump, Feeding pump
- Biopharmaceuticals: Chromatography, Upstream and downstream feeding, Filtration
- Industrial Automation: Filling equipment, Spraying equipment, Cooling systems, Lubrication systems, Water treatment and wastewater treatment systems

- Scientific Research: Scientific experiment systems

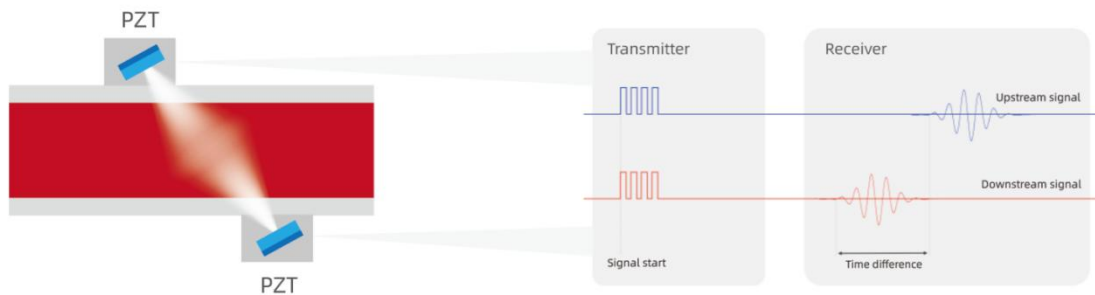
1.1 Symbols and Abbreviations

Symbols	Description
	Warning! This safety symbol precedes critical information that must be strictly followed to prevent injury or fatal hazards.
 Attention	Attention! This safety symbol precedes operational guidelines that must be strictly followed to prevent equipment damage or adverse.

1.2 Working Principle

XY-TEK CG Series Ultrasonic Flow Sensor adopts a non-contact design. By simply clamping it onto the outside of a plastic hose, it enables precise measurement of liquid flow inside the tubing. The sensor utilizes advanced ultrasonic transit time technology, delivering exceptional accuracy and reliability.

During measurement, two piezoelectric (PZT) crystals inside the sensor are positioned downstream and upstream, alternately transmitting and receiving ultrasonic signals. The ultrasonic waves penetrate the tube wall at a certain angle and propagate through the liquid. The flow of the liquid affects the propagation of the ultrasonic waves, causing the transit time in the upstream direction to always be longer than that in the downstream direction. By precisely analyzing the transit time difference between these two directions, and based on its proportional relationship with the liquid flow velocity, the sensor can quickly and accurately calculate the volumetric flow rate of the liquid, providing users with reliable and precise flow data.



1.3 Packing List

Standard Item		Description
1		The Flow Sensor
2		Flow Sensor Cable (Standard 1.5m)
3		8-Pin Terminal
Optional		Description
1		USB Data Converter
2		Flow Display
3		Double-ended Cable for Connecting Sensor and Display (Standard 3.0m)
4		USB 2.0 Printing Cable

2. TECHNICAL SPECIFICATIONS

2.1 Measurement Accuracy

Product Model	Flow Range	Measurement Accuracy	Tube Outer Diameter	Tube Inner Diameter
CG016NS	0-2000 mL/min	0-200mL/min: $\pm 6\text{mL/min}$ 200-2000mL/min: $\pm 3\%$ RD*	5/32" (4mm)	1/16" (1.6mm)
			4mm	2mm
CG019NS	0-2000 mL/min	0-200mL/min: $\pm 6\text{mL/min}$ 200-2000mL/min: $\pm 3\%$ RD*	3/16" (4.8mm)	1/16" (1.6mm)
			5mm	3mm
CG025NS	0-3000 mL/min	0-200mL/min: $\pm 6\text{mL/min}$ 200-3000mL/min: $\pm 3\%$ RD*	1/4" (6.4mm)	1/8" (3.2mm)
			7mm	4mm
CG032NS	0-6000 mL/min	0-300mL/min: $\pm 9\text{mL/min}$ 300-6000mL/min: $\pm 3\%$ RD*	5/16" (7.9mm)	3/16" (4.8mm)
			8mm	5mm
CG038NS	0-8000 mL/min	0-500mL/min: $\pm 15\text{mL/min}$ 500-8000mL/min: $\pm 3\%$ RD*	3/8" (9.5mm)	1/4" (6.4mm)
			9mm	6mm
CG044NS	0-9000 mL/min	0-600mL/min: $\pm 18\text{mL/min}$ 600-9000mL/min: $\pm 3\%$ RD*	7/16" (11.1mm)	5/16" (7.9mm)
			11mm	8mm
CG050NS	0-10000 mL/min	0-700mL/min: $\pm 21\text{mL/min}$ 700-10000mL/min: $\pm 3\%$ RD*	1/2" (12.7mm)	3/8" (9.5mm)
			13mm	10mm
CG056NS	0-12000 mL/min	0-800mL/min: $\pm 24\text{mL/min}$ 800-12000mL/min: $\pm 3\%$ RD*	9/16" (14.3mm)	3/8" (9.5mm)
			14mm	10mm
CG063NS	0-14000 mL/min	0-900mL/min: $\pm 27\text{mL/min}$ 900-14000mL/min: $\pm 3\%$ RD*	5/8" (15.9mm)	3/8" (9.5mm)
			16mm	10mm
CG075NS	0-20000 mL/min	0-1200mL/min: $\pm 36\text{mL/min}$ 1200-20000mL/min: $\pm 3\%$ RD*	3/4" (19.1mm)	1/2" (12.7mm)
			19mm	13mm
CG100NS	0-50000 mL/min	0-2000mL/min: $\pm 60\text{mL/min}$ 2000-50000mL/min: $\pm 3\%$ RD*	1" (25.4mm)	3/4" (19.1mm)
			1" (25.4mm)	5/8" (15.9mm)

CG125NS	0-100000 mL/min	0-8000mL/min: ± 240 mL/min 8000-100000mL/min: $\pm 3\%$ RD*	1 1/4" (31.8mm)	3/4" (19.1mm)
			1 1/4" (31.8mm)	1" (25.4mm)
CG138NS	0-100000 mL/min	0-9000mL/min: ± 270 mL/min 9000-100000mL/min: $\pm 3\%$ RD*	1 3/8" (35mm)	7/8" (22.2mm)
			1 3/8" (35mm)	1" (25.4mm)

*RD: Reading, indication accuracy.

Notes:

[1] Measurement Accuracy: $\pm 3\%$ RD (Reading). To achieve this measurement accuracy, the same pipe type, liquid type, liquid temperature, and liquid pressure as used during factory calibration must be adopted during field testing.

[2] Pipe Material: Applicable tubing materials include PVC, Silicone, PTFE, PFA, FEP, TPE, PE, PUR, etc., with smooth inner and outer surfaces.

[3] Pipe Reference and Adaptation Advice: The above list shows common tubing examples; the given outer and inner diameters are for reference only. When selecting a sensor, multiple factors such as pipe dimensions and properties must be considered. If conditions permit, please provide us with a tubing sample (minimum length 50 mm) so that we can offer more accurate adaptation recommendations.

2.2 Calibration Conditions

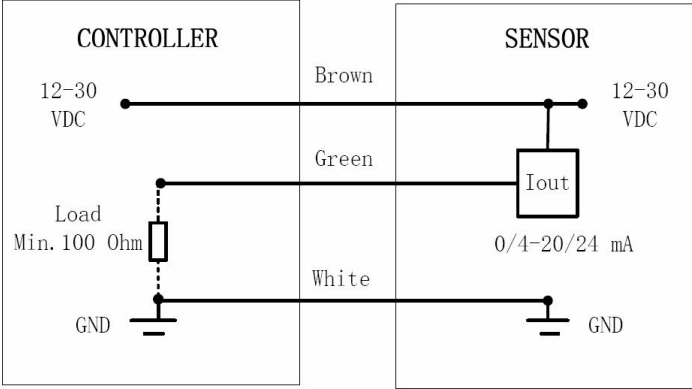
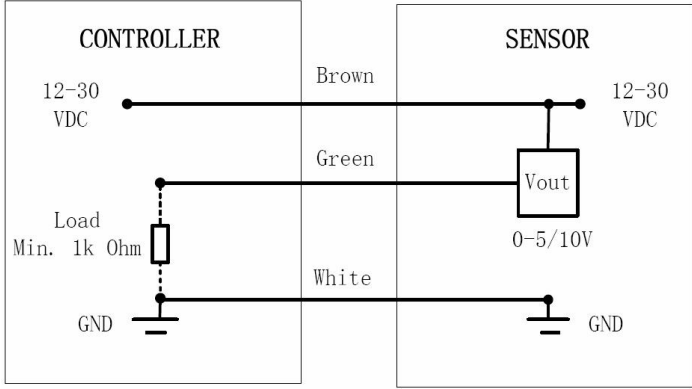
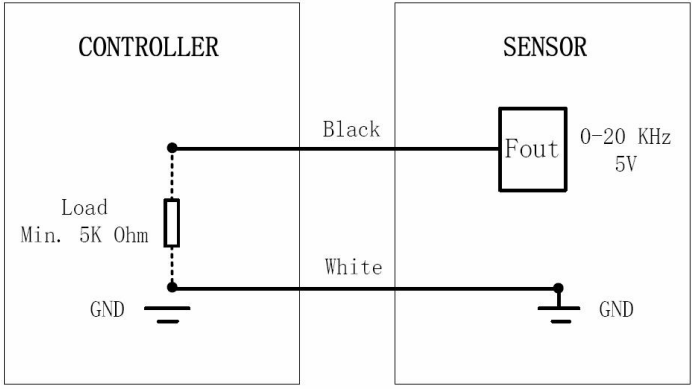
The sensor is calibrated at the factory under the following standard conditions:

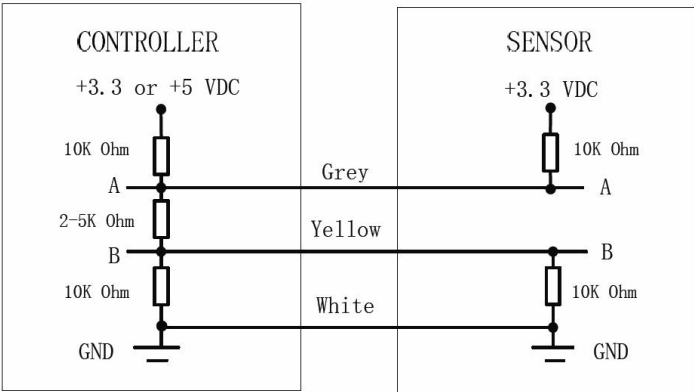
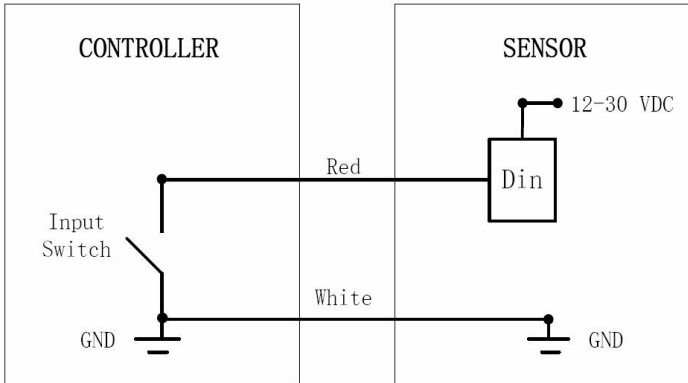
2.2 Calibration Conditions

The sensor is calibrated at the factory under the following standard conditions:

- **Piping:** Typically customer-supplied tubing.
- **Liquid:** Water ($22^{\circ}\text{C} \pm 3^{\circ}\text{C}$) (default).
- **Thermal Equilibrium:** Start measurement 30 minutes after the sensor is clamped onto the plastic hose.
- **Pipe Installation:** After placing the tubing into the measurement channel, close the cover and clamp it tightly, then perform zero-point calibration.

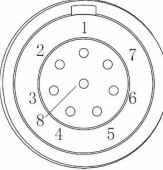
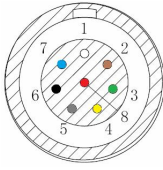
2.3 Sensor Interface

Interface Type	Detailed Specifications
Current Output	Load to GND, and the minimum load is 100 Ω. The maximum load depends on the operating voltage: 12V-250 Ω, 15V-500 Ω, 24V-1000 Ω, 30V-1200 Ω 
Voltage Output	5V and 10V optional. The minimum load is 1000 Ω. 
Frequency Output	5V default (12-30V optional, contact manufacturer). The minimum load is 5000 Ω. 

RS485 Interface	The sensor supports bus operation with maximum 12 subscribers.  The diagram shows the RS485 interface connection between a CONTROLLER and a SENSOR. The CONTROLLER side has a +3.3 or +5 VDC supply, a 10K Ohm pull-up resistor to A, a 2-5K Ohm resistor to B, and a 10K Ohm pull-up resistor to GND. The SENSOR side has a +3.3 VDC supply, a 10K Ohm pull-up resistor to A, and a 10K Ohm pull-up resistor to GND. The wiring is: Grey (A to A), Yellow (B to B), and White (GND to GND).
Digital Output	NPN, PNP, PUSH-PULL, can be configured as flow switch, air detection, dosing or pulse output mode. Maximum 100mA.
Digital Input	Can be configured as zero calibration, volume reset or start dosing. Switch-on time must be larger than 20ms.  The diagram shows the Digital Input connection between a CONTROLLER and a SENSOR. The CONTROLLER side has an Input Switch connected to a Red wire, which is connected to the Din pin on the SENSOR. The White wire is connected to GND on both sides. The SENSOR also has a 12-30 VDC supply connected to the Din pin.

2.4 Electrical Specifications and Connections

Electrical Parameters	Detailed Specifications
Operating Voltage	12-30VDC
Current Consumption	≤ 20 mA (no external load)
Electrical Connection	8-pin push-pull connector

Sensor-to-Cable Connection	Pin	Wire Color	Function
 Female Sensor End	1	White	Ground
	2	Brown	Voltage Input (12 – 30 VDC)
	3	Green	Current Output or Voltage Output
	4	Yellow	RS485B
 Male Cable End	5	Gray	RS485A
	6	Black	Frequency Output (0 – 20 kHz)
	7	Blue	Digital Output (NPN, PNP, PUSH-PULL)
	8	Red	Digital Input (Ground 20 ms)

2.5 General Data

General Parameters	Detailed Specifications
Measurement Principle	Ultrasonic time-of-flight method
Measurable Liquids	Water or other acoustically transparent liquids
Calibration	Manufacturer default calibration: 22°C ± 3°C (water)
Sensor Housing	Aluminum alloy
Liquid Temperature	0°C - 90°C
Ambient Temperature	0°C - 60°C
Storage Temperature	-20°C - 70°C
Operating Humidity	10% - 90% RH (non-condensing)
Protection Rating	IP65
Installation	Thread mounting or free hanging
Shielding	Cable ground

2.6 Scope of Supply and Accessories

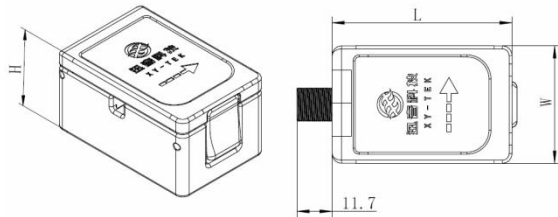
Name	Detailed Specifications
Scope of Supply	CG Series Flow Sensor
	User Manual (quick start guide)
	Factory Calibration Report
Required Accessories	8-core shielded cable (standard length 1.5m)
	Flow Viewer Software
Optional Accessories	USB data converter (for connecting the sensor to the computer)
	Flow display (supports one sensor)
	Data cable (3 m) with push-pull connectors at both ends (for connecting flow display and sensor)
	USB 2.0 printer cable (for connecting the USB data converter to the computer)

2.7 Sensor Dimensions

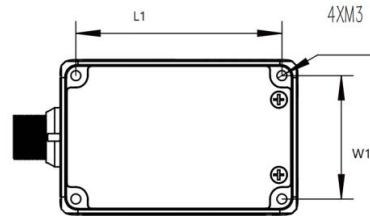
Model	Dimensions (L x W x H)	Mounting Hole	Mounting Hole Spacing L1	Mounting Hole Spacing W1
CG016NS	60 x 39 x 37mm	M3 x 10mm	52mm	31mm
CG019NS	60 x 39 x 37mm	M3 x 10mm	52mm	31mm
CG025NS	60 x 39 x 37mm	M3 x 10mm	52mm	31mm
CG032NS	60 x 39 x 37mm	M3 x 10mm	52mm	31mm
CG038NS	60 x 39 x 37mm	M3 x 10mm	52mm	31mm
CG044NS	60 x 39 x 37mm	M3 x 10mm	52mm	31mm
CG050NS	60 x 39 x 39.5mm	M3 x 10mm	52mm	31mm
CG056NS	60 x 39 x 42.5mm	M3 x 10mm	52mm	31mm
CG063NS	60 x 39 x 42.5mm	M3 x 10mm	52mm	31mm
CG075NS	60 x 39 x 42.5mm	M3 x 10mm	52mm	31mm
CG100NS	67 x 45 x 46.6mm	M3 x 10mm	59mm	37mm

CG125NS	72 x 51 x 49.5mm	M3 x 10mm	64mm	43mm
CG138NS	72 x 51 x 54.9mm	M3 x 10mm	64mm	43mm

Sensor External Dimensions



Sensor Mounting Method



There are four threaded mounting holes on the bottom of the sensor, which can be directly fixed onto a perforated flat plate.

3. SAFETY PRECAUTIONS

Before using the flow sensor and its accessories, please read this user manual carefully.

- Upon first opening the package, check the integrity of the device for any damage and store it safely.
- All environmental conditions must meet the specified requirements for installation and subsequent operation (see "4. Technical Specifications").
- The user will be responsible if the flow sensor is not connected correctly as required.
- Do not drop the flow sensor, as it may crack or become damaged, affecting measurement accuracy.

3.1 Operator Requirements

Operators must meet all the following conditions and comply with relevant regulations:

1. Trained and qualified personnel
2. Technicians authorized by the factory
3. Familiarity with and understanding of relevant regulations and documentation

3.2 Intend Usage

1. The clamp-on flow sensor from XY-TEK is designed solely for non-contact flow measurement of liquids.
2. The USB data converter allows the sensor to communicate with a computer via a serial interface. When used with the Flow Viewer flow monitoring software, it helps users adjust sensor parameters to fit specific applications and assists in troubleshooting.
3. All uses unrelated to the above purposes are prohibited, as they may damage the sensor and data converter.

3.3 Workplace Conditions

Before using the sensor equipment

1. Check temperature and pressure conditions to meet the sensor's operational requirements.
2. Ensure that the sensor and other equipment are installed correctly.

The flow sensor is not suitable for the following situations

1. Gas flow measurement
2. Measurement of explosive liquid flow
3. Metering equipment for billing purposes
4. Outdoor environments

3.4 Product Safety

The flow sensors, Flow Viewer software, USB data converters, and other accessories provided by XY-TEK comply with applicable safety regulations. Users must ensure that these hardware and software devices are installed and operated in a manner that does not compromise safety. All devices have been tested at the XY-TEK factory and are delivered in a safe condition.

Note:

- Only users who have read and understood this guide may modify the sensor parameters.
- Before modifying the sensor parameters, users must back up the original sensor configuration.
- Do not disassemble the internal structure of the flow sensor and USB data converter.
- The flow sensor and USB data converter must be protected from moisture.

4. SENSOR USAGE

4.1 Sensor Wiring

There are typically two scenarios for connecting the sensor wires.

1.Connecting the Sensor to Data Acquisition Equipment or PLC with a Separate Power Supply

- Disconnect the power supply.
- Ground the white wire of the sensor cable and connect the brown wire to 12-30Vdc (see "4.5 Electrical Specifications and Connections")
- Connect other necessary output and input wires to the data acquisition equipment or PLC (see "4.5 Electrical Specifications and Connections")
- Turn on the power supply.
- **Cut off any unused exposed wires to avoid short circuits.**



Attention

2.Connecting the Sensor to a Computer via USB Data Converter

- Connect the sensor to the USB data converter.
- Use the provided USB cable to connect the USB data converter to the computer, which will power both the USB data converter and the sensor.
- If necessary, connect the USB data converter to an external controller, such as data acquisition equipment or PLC.

Precautions

- Check and ensure that the connectors used are suitable and compatible with the measurement system.
- When inserting the wires, ensure that the flow sensor's connector is dry.
- When installing the flow sensor, be careful not to damage the functionality of the tubing system.
- Always inspect plugs and pins for damage before connecting the flow sensor.
- Do not use the flow sensor if any part of it is damaged.

4.2 Clamp the Sensor on the Tubing

To measure the flow rate properly, the CG series flow sensor must be clamped onto the tubing.

- Ensure that the tubing is not deformed, damaged, or dirty.

- Make sure the tubing size and material correspond to the specifications of the CG series flow sensor.
- Air in the tubing may cause measurement errors or interrupt ultrasonic coupling.
- Ensure there is no dirt or residue inside the tubing.
- If necessary, clean the CG series flow sensor before inserting the tubing into the measurement channel.

To install the plastic tubing into the sensor, follow these steps:



Step 1:
Press the latch (at the yellow box position) to open the sensor cover.



Step 2:
Place the plastic tubing into the measurement channel of the sensor.



Step 3:
Gently close the sensor top cover until the latch locks securely.

- Do not apply excessive force when closing the sensor cover.
- Ensure the sensor top cover is fully closed to avoid fluctuations in the flow reading.
- The size and material of the plastic tubing must match those of the tubing used during factory calibration.
- The flow sensor should be clamped onto a straight section of the plastic tubing. It is recommended that the straight section before the sensor be at least 10 times the inner diameter of the tubing. The straight section after the sensor should be at least 5 times the inner diameter of the tubing.
- The liquid flow direction must align with the arrow on the sensor top cover.
- If necessary, apply a thin layer of grease or petroleum jelly to lubricate the surface of the plastic tubing for easier installation.

4.3 Sensor Use

- Install the sensor and fill the tubing with the liquid to be measured.
- Ensure no bubbles in the tubing, and turn on the power.
- Once powered on, the sensor will immediately begin flow measurement and output data.

Before Measurement



Attention

- (1) Ensure that the tubing used meets the requirements of the CG series sensor (refer to "4.3 Tubing Characteristics").
- (2) Before each measurement, the cables, connectors, and pins must be checked for cracks or damage, as this may cause measurement errors. If any damage is found, please contact our after-sales service personnel for a replacement.
- (3) After inserting the plastic tubing into the measurement channel, wait approximately 30 minutes before proceeding with setup, allowing sufficient time for the tubing to return to its original structure.
- (4) Ensure that the temperature of the medium being monitored is the same as the temperature at which the CG flow sensor was adjusted and calibrated.

4.4 Zero Calibration

Zero calibration is recommended before the start of every measurement to eliminate possible offset due to temperature, liquid type, tubing property, or re-clamp position change.

Make sure the flow sensor is clamped properly on the tubing, and the tubing is filled with liquid without any air bubble. Stop the flow completely, and perform the zero calibration using one of the methods below:

- Send a digital input signal (switch to ground for 20ms) to the red wire of the sensor cable to initiate the zero calibration if the digital input is set as zero calibration.
- Use the Flow Viewer PC software to initiate the zero calibration through the USB Data Converter .

4.5 Sensor Adjustment and Calibration

To ensure that customer accuracy requirements are met, all flow sensors are pre-adjusted for relevant parameters based on customers' accuracy requirements before shipment.

Additionally, XY-TEK recommends regular calibration of flow sensors. Ideally, the time between re-calibrations should not exceed 24 months.

Besides factory calibration, customers can also perform on-site calibration. For more information about this process, please contact the XY-TEK after-sales service team.

4.6 Factors that Affect Accuracy

(1) Proper Calibration

Clamp-on flow sensors can be calibrated for a variety of tubing, temperatures and liquid types. It is recommended to use the sensor with the same tubing, temperature and liquid type as in the factory calibration, otherwise the accuracy may decrease.

(2) Temperature

Since fluctuations in temperature will affect both the acoustic properties of the tubing and of the liquid, it is important to use the flow sensor at the temperature it has been calibrated. We recommend that the sensor be allowed to equilibrate on the tubing before measurement and a temperature variation of $\pm 5^{\circ}\text{C}$ is acceptable. If the actual temperature of operation differs by more than $\pm 5^{\circ}\text{C}$, the user can adjust calibration factor (K-factor) to ensure optimal accuracy.

(3) Liquid Type

Default factory calibration is usually performed using water at 23°C . Some factors affect the acoustic velocity of the liquid, such as temperature, concentration of solvents, presence of air bubbles or solid particles. To achieve optimal accuracy, the factory calibration should be performed using the actual liquid. Since sometimes it is impossible for the customer to send certain types of liquids to the factory, a calibration can first be performed using water and an on-site calibration can be performed using the actual liquid. After comparing the results, the calibration factor (K-factor) of the sensor can be adjusted using the XY-TEK Flow Viewer software.

(4) **Tubing Size and Material**

Tubing size is a very important factor for proper operation of the flow sensor. Tubing that is too large for the sensor will not allow the lid to close, which may reduce acoustic coupling and interrupt the signal. Tubing that is too small for the sensor will create air gaps which will reduce the ultrasound signal strength.

Tubing made of different materials will have different physical properties, which will affect the ultrasound propagation speed. The factory calibration will take this into account, and generate the sensor settings for the particular tubing type.

(5) **Sensor Installation**

To ensure the best accuracy it is recommended that the flow sensor is clamped on a straight section of tubing. Sharp bends in the tubing will affect the flow profile of the liquid and cause uncertainties in the measurement results. A straight section of 10 times inner tubing diameter (10xID) before and 5 times (5xID) after the sensor is recommended. Make sure to clamp the sensor on the tubing with the arrow pointing in the positive direction of flow. Make sure to close the lid on the sensor. Make sure there is no dirt or build-up of coupling material such as Vaseline in the measurement channel of the sensor. Any foreign material should be carefully cleaned with mild detergents or alcohol based surface disinfectants.

It is not recommended to install the flow sensor after a dosing-valve where it may run empty and cause a measurement gap on the next batch. The flow sensor should be installed on the pressurized side of a pump or a location where the tubing will be filled with liquid at all times since air bubbles can generate errors in measurement.

(6) **Acoustic Coupling**

Since the ultrasonic wave will not travel through air, it is important to avoid small air gaps between the transducer and the tubing. A thin layer of acoustic couplant, such as Vaseline, is recommended to be applied on the tubing outer surface. Water-based gels will dry out and can build up on the sensor to contribute extra offset and error.

Some tubing materials can achieve good acoustic coupling even without couplant (dry coupling). It recommended the specific tubing to be evaluated by the factory on its dry coupling performance.

(7) Zero Calibration

To eliminate the small offset associated with the sensor over time, a zero calibration can be performed for the flow sensor when the flow is completely stopped. Failure to stop the flow during zero calibration will result in measurement errors.

4.7 Sensor Disassembly and Storage

If you need to disassemble and store the sensor after the measurement process is complete, please follow these steps:

- (1) Press the latch to open the sensor top cover.
- (2) Remove the plastic tubing from the measurement channel.
- (3) Close the cover, and carefully unplug the connector from the sensor interface on the device to avoid damaging the sensor or the connector.

After removing the flow sensor, check for any medium residue or any other type of dirt or dust, and clean the sensor if necessary. Store the sensor according to the storage specifications. Ensure it is stored in a safe place where it will not fall, and make sure the connector remains dry.

4.8 Sensor Cleaning and Disinfection

Ensure that no cleaning agents or disinfectants leak into the sensor plug. For cleaning the sensor, we recommend using commonly used cleaning agents and/or recommended disinfectants listed below. To prevent stains and dirt from drying, all residue should be cleaned after each use.

To clean the flow sensor, use a lint-free cloth. Be sure to remove any dirt from the clamping area as well. Additionally, adhere to the applicable laws and regulations in your country/region and specific hygiene regulations for your application.

Note: Attention

- The sensor should not be immersed in cleaning or disinfecting solutions.
- The sensor is not suitable for cleaning using machinery.
- The sensor should not undergo sterilization processes, especially steam sterilization or high-pressure sterilization.

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The contents described in this manual are subject to change without notice

APPENDIX

Update Records

Date	Action	Operator	Version
2020/01/23	Initial creation	K.L.	V1.0
2020/05/18	Modification	K.L.	V 1.1
2020/11/10	Product image update	K.L.	V1.2
2021/05/20	Update of product application examples and applicable flexible tubing types	X.L.L.	V1.3
2021/07/06	Addition/deletion of standard products and update of product number names	X.L.L.	V1.4
2021/08/03	Update of accessory list and names	X.L.L.	V1.5
2021/11/10	Added information on 2 non-standard products	X.L.L.	V1.6
2022/05/16	Modification of standard and non-standard product information	X.L.L.	V1.7
2023/02/12	Modification of standard and non-standard product information	L.L.	V1.8
2023/02/24	Company contact information	S.S.	V1.9
2024/04/23	Added 1 product dimension	TZ.W.	V2.0
2024/05/24	Changed cover, overview, and dimension drawings to Chinese	CM.L.	V2.1
2024/06/19	Ordering numbers, CG075NS accuracy	CM.L.	V2.2
2024/07/18	Updated dimensional drawing table	TZ.W.	V2.3
2024/07/20	CG019NS maximum flow rate	CM.L.	V2.4
2024/10/17	Liquid type, added protection rating, removed tool kit parameters	CM.L.	V2.5
2025/01/21	Full document revision and update	CM.L.	V2.6

2025/04/08	Modified flow range, removed repeat accuracy	CM.L.	V2.7
2025/07/31	Added ambient temperature parameter and product accuracy RD description	HY.C.	V 2.8