



BG Series Ultrasonic Bubble Detectors

User Manual



User Manual (V1.4)

XY-TEK

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BG Series Ultrasonic Bubble Detectors

XY-TEK is a technology innovation enterprise specializing in the research, development, production, and sales of ultrasonic flow sensors. We are committed to providing accurate, stable, and reliable flow sensors for liquid flow rate measurement in medical devices, biopharmaceuticals, new energy, and industrial automation industry, helping enhance the automation, digitalization, and intelligence of liquid flow monitoring systems.

XY-TEK BG series ultrasonic bubble sensors can detect air bubbles in flexible plastic tubing. It can detect the gas/liquid state at certain positions, commonly used in medical devices, bioprocessing, new energy, semiconductors, industrial automation, scientific research, and other fields. The sensors use ultrasonic pulse technology, and their response time and sensitivity can be flexibly modified to adapt to different application requirements.

Features

- High precision, high stability, dry coupling
- Non-invasive measurement, no direct contact with liquid, hygienic and safe
- Detection is not affected by the color of the tubing and liquid
- The circuit is integrated inside the sensor and the size is compact
- Multiple standard sizes to accommodate different tubing diameters

Applications

- **Medical Devices:** such as hemodialysis machines, artificial hearts, organ transplantation systems, heart-lung machines, blood pumps
- **Biopharmaceuticals:** such as single-use bioreactor fermentation tanks, cell culture equipment, vaccine production, tangential flow filtration systems, liquid chromatographs, HPLC
- **Food and Beverage Industry:** food and beverage processing, milk, juice, and beer production processes

- **Industrial Automation:** filling equipment, spraying equipment, cooling systems, lubrication systems, water treatment and wastewater treatment systems
- **Scientific Research:** scientific experiment systems

Specifications

Liquids	Water, blood, saline, drinks, oil, viscous liquids, etc
Tubing Materials	PVC, silicone, PE, PUR and other materials, with smooth inner and outer surfaces and no fiber or metal woven layer inside. Ideally, the wall thickness of the tubing is 10%-20% of the outer diameter. The tubing needs to be pressed to the bottom of the sensor measurement slot to guarantee close contact. Dry coupling between the tubing and sensor does not require the use of grease or other coupling agents.
Housing Material	ABS plastic
Input Voltage	5-30 VDC
Output Signal	Default: Liquid--5-30V, Air--0V. Other options available.
Current Consumption	Less than 50mA
Working Temperature	0°C to 60°C
Storage Temperature	-20°C to 70°C
Relative Humidity	30% to 90% RH (No condensation)
Protection Class	IP65
Atmospheric Environment	No corrosive gases allowed
Self-test	Optional feature. The self-test function provides a status check when the sensor is not connected to a tube. When an external 0V input signal is applied, the sensor indicates gas detection and the LED turns red.

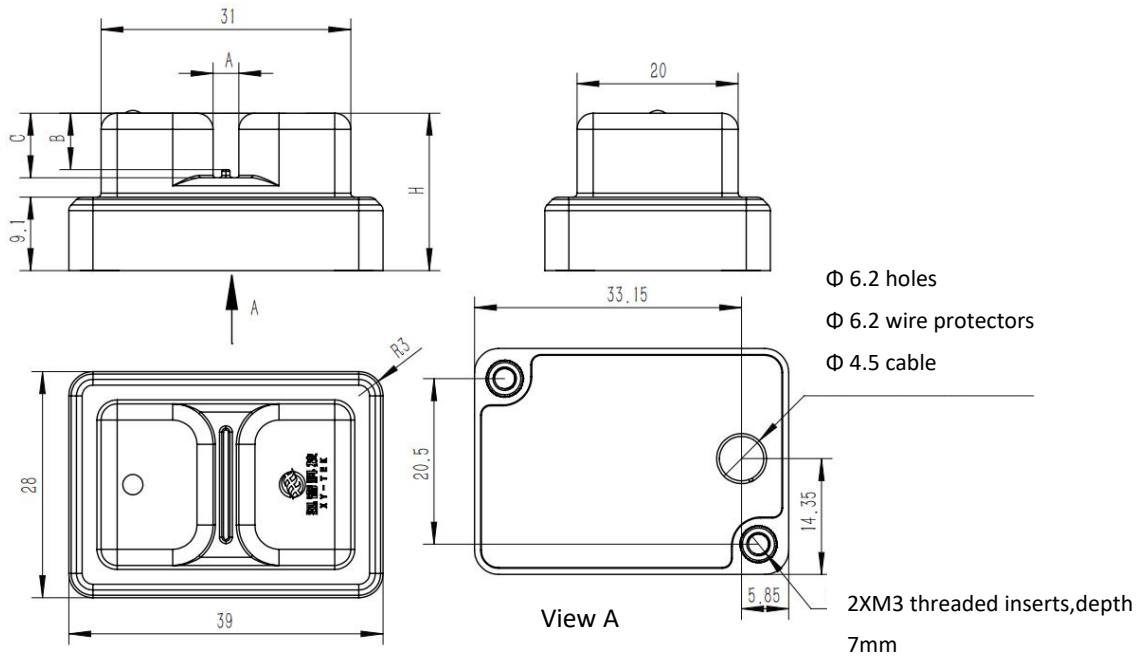
Sensor Wiring: Cable length of 1.5 meters

Color	Definition	Details
Red	Power supply	5-30VDC
Black	Ground	GND
Yellow	Output	5-30V

Bi-color LED Indicator

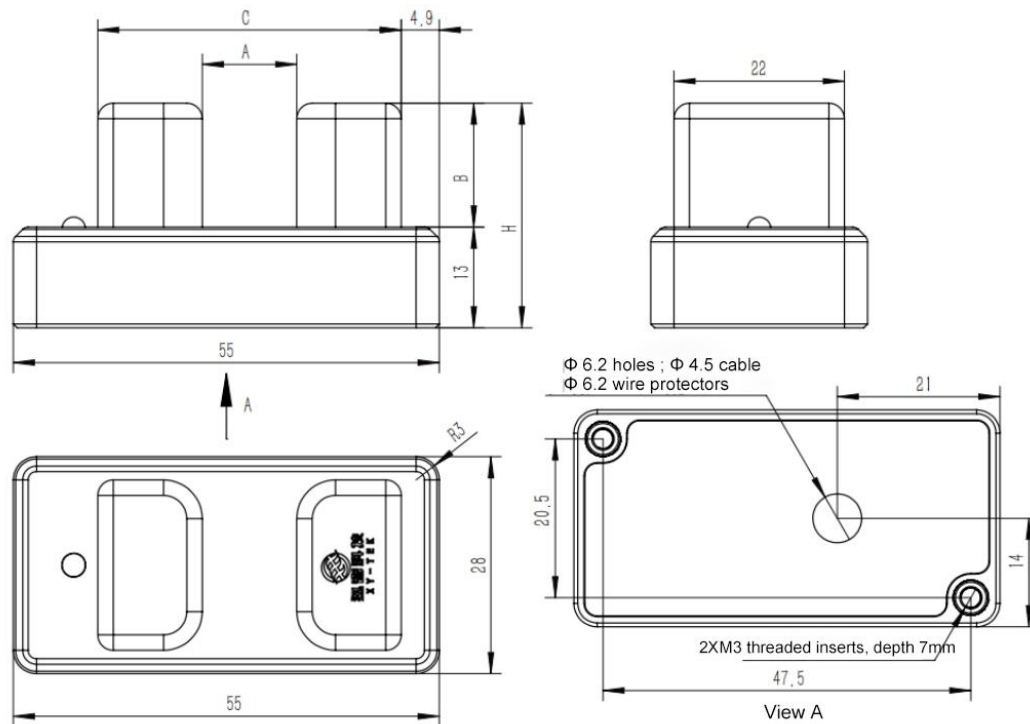
Status	LED Indicator (Default)
Air	Red
Liquid	Green

Sensor Sizes (BG013N-BG038N):



Part #	A	B	C	H	Tubing OD
BG013N	2.5mm	7mm	8mm	19.5mm	1/8"(3.2mm)
BG016N	3.2mm	7mm	8mm	19.5mm	5/32"(4mm)
BG019N	3.8mm	8mm	9mm	20.5mm	3/16"(4.8mm)
BG025N	5.1mm	/	10mm	21.5mm	1/4"(6.4mm)
BG031N	6.4mm	/	12mm	23.5mm	5/16"(7.9mm)
BG038N	7.6mm	/	13.5mm	25mm	3/8"(9.5mm)

Sensor Sizes (BG050N-BG075N):



Part #	A	B	C	H	Common Tubing OD
BG050N	10.8	16	34.2	29	1/2" (12.7mm)
BG056N	12.2	16	39.2	29	9/16" (14.3mm)
BG075N	16.2	22.5	45.6	35.5	3/4" (19mm)

Update Records

Date	Action	Operator	Version
2022/1/02	Initial creation	L.L	1.0
2023/2/24	Company contact info update	S.S	1.1
2023/6/30	Lead wire color change	L.L.	1.2
2023/6/30	Added BG016 075 size	TZ.W	1.3
2023/8/9	Output definition modification	L.L.	1.4
2024/3/11	Added output signal default definition	L.L.	1.5
2024/5/8	Name change	L.L.	1.6
2024/5/24	Added cover, modified file name, product description, images, parameters, cable length, indicators, etc., telephone	M.L.	1.7
2024/5/29	Updated product dimension chart	TZ.W	1.8
2024/7/31	Updated sensor cable	CM.L	1.9
2024/7/31	Updated cover, description, parameters	CM.L	2.0
2024/11/5	Updated company profile, product dimensions, end-of-document adjustments	CM.L	2.1
2025/3/18	Modified output voltage	CM.L	2.2
2025/3/18	Modified BG013–BG038 drawings	CM.L	2.3
2026/04/23	Changed output type from TTL to Push-pull, and synchronously updated output signal definition (liquid: 5-30V, bubble: 0V)	HY.C.	2.4

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