

FlowEdge® Tubing Flowsensors

Non-Invasive Fluid Flow Measurement in Flexible Single-use Tubing

Measure volume flow with precision in real time & totalized flow volume during bioprocess protocols with Transonic's FlowEdge Bioprocess Flowmeter and clamp-on tubing flowsensors.

Applications include:

- Nutrient feed and Cell Media Dosing in Bioreactors
- Tangential Flow Filtration
- Peristaltic Pump Calibration & Monitoring
- Pump Feedback Control Loops
- Fill & Finish Applications



BXL-Series: Reusable Clamp-on Flowsensors

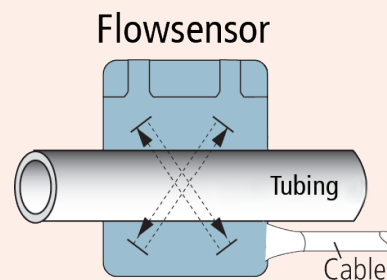
- Easy clip-on flowsensors do not break sterility
- Compatible with standard biopharma tubing: platinum-cured silicone, Pharmed, C-Flex, Advanta-Pure, MasterFlex
- Flow measurement capability scaled to size for high resolution, accuracy & low zero offset
- Detect bubbles, low flow and high flow conditions
- Available for sizes 1/8" – 1 1/4" OD tubing
- Interfaces to FlowEdge T701 Monitor for touch control to display flow parameters or interface to T702 DIN Mountable flowmeter for skid mounted process controllers



Simply place lubricated tubing into the slot and close the lid to attach the Sensor and begin measurements. Enjoy flexibility in measurement location with no compromise in system sterility and no pressure drop.

TRANSIT-TIME ULTRASOUND TECHNOLOGY

MEASURES VOLUME FLOW, NOT VELOCITY



Two pairs of transducers pass ultrasonic signals, alternately intersecting the tubing in upstream and downstream directions. The difference between the two transit times yields a measure of volume flow. Four-crystal design minimizes the impact of turbulent flow for increased accuracy.

Flowsensor Specifications and Calibration

TECHNOLOGY: Ultrasonic Transit-time Volume Flow

CALIBRATION: FlowEdge BnXL-Series Clamp-on Tubing Flowsensors are factory-calibrated to the customer's conditions of use:

- Tubing type & size:
Customer specified tubing; sensors fit snugly.
- Fluid Properties & Temperature:
Specify conditions $\pm 2^{\circ}\text{C}$; range 4 - 50°C
- Anticipated Flow Rate:
Lo/Hi flow calibration settings provided.
- Standard Calibration using WFI or DIW provided in lieu proprietary liquids.

SELECTABLE SETTINGS: Up to 4 pre-programmed factory calibrations:

- 2 fluid / temperature / tubing type combinations at Lo and Hi flow ranges for tightest accuracy.
- 6 additional selections may be added by the customer with on-site calibration protocols.

ACCURACY:

- $\pm 6\%$ of flow reading over full operational range
- $\pm 2\text{-}4\%$ of flow reading possible with on-site calibration

Recommended use to meet best accuracy conditions:

- BnXL Flowsensors should be used with a thin smear of acoustic couplant to help seat the sensor on the tubing
- Position the sensor on a straight segment of tubing away from Y-connections or junctions (10x tubing ID)
- Select the Calibration setting that best matches the process
- Zero the flowsensor under stopped flow conditions
- Use the On-Site Calibration protocol for maximum precision at targeted process flow rate.

SENSOR SIZE	BIOPHARM TUBING SIZE*	TUBING SIZE**			TUBING SIZE (mm)			PHYSICAL SPECIFICATIONS						MAXIMUM FLOW RATE
		ID	OD	WALL	ID	OD	WALL	DIMENSION ALONG TUBE		DEPTH		LENGTH		
		in	in	in	mm	mm	mm	in	mm	in	mm	in	mm	
B2XL		3/32	5/32	1/32	2.4	4.1	0.8	0.8	21	0.7	17	1.3	32	1.25
B3XL		1/8	3/16	1/32	3.2	4.8	0.8	0.8	21	0.7	17	1.3	32	2
B4XL	L/S 16	1/8	1/4	1/16	3.2	6.4	1.6	0.9	23	0.8	20	1.4	35	3
B5XL	L/S 25	3/16	5/16	1/16	4.8	8.0	1.6	0.9	23	0.8	20	1.4	35	3
B6XL	L/S 17, L/S 15	1/4	3/8	1/16	6.4	9.7	1.6	1.0	24	0.9	23	1.5	39	5
B7XL	L/S 24	1/4	7/16	3/32	6.4	11.1	2.4	1.0	26	1.0	25	1.7	42	10
B8XL	L/S 35, I/P 26	3/8	1/2	1/16	9.7	12.7	1.6	1.1	28	1.0	24	1.7	44	10
B9XL	L/S 36	3/8	9/16	3/32	9.7	14.3	2.4	1.3	33	1.0	25	1.8	47	10
B10XL	I/P 73	3/8	5/8	1/8	9.7	15.9	3.2	1.2	32	1.1	27	2.0	51	20
B11XL		1/2	11/16	3/32	12.7	17.5	2.4	1.4	35	1.1	28	2.2	56	20
B12XL	I/P 82	1/2	3/4	1/8	12.7	19.0	3.2	1.5	38	1.2	31	2.4	61	20
B14XL	I/P 88	5/8	7/8	1/8	15.9	22.2	3.2	1.6	41	1.4	36	2.6	66	50
B16XL	I/P 89	3/4	1	1/8	19.0	25.4	3.2	1.9	47	1.5	39	3.0	75	50
B20XL	I/P 91	1	1 1/4	1/8	25.4	31.7	3.2	2.3	58	1.8	46	3.7	93	100

* Masterflex compatible size

** Platinum-cured silicone from Cole-Parmer is available in these stocked sizes

Note: Sensors come with a 2 meter cable. An additional 2 meter extension cable is available if needed.

Note: BnXL Sensors are available for platinum cured silicone tubing, C-flex, Pharmed and other non-reinforced flexible tubings used in bioprocess industry with brand pumps such as Masterflex and Watson-Marlow. Reinforced or double extruded tubings are not compatible. Contact Transonic for compatibility & sizing. A 2 foot sample is required for calibration.

