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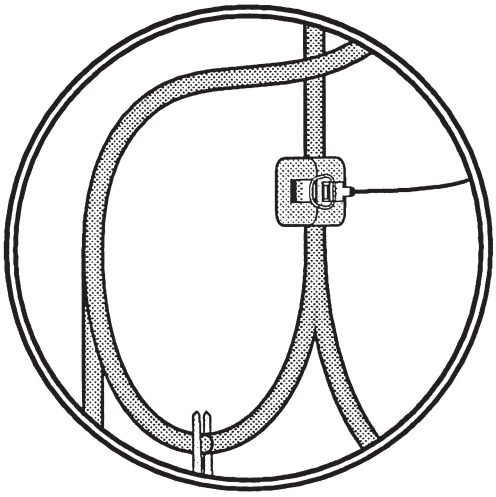
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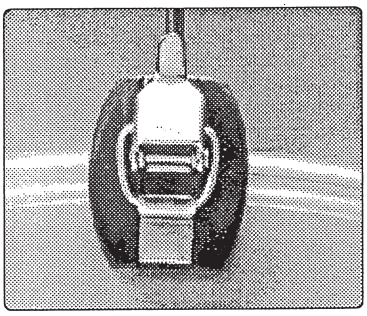
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Find the *Transonic Systems Inc. H5X* at our website: *Click HERE*

Section B: X-Sterile Tubing Flowsensors

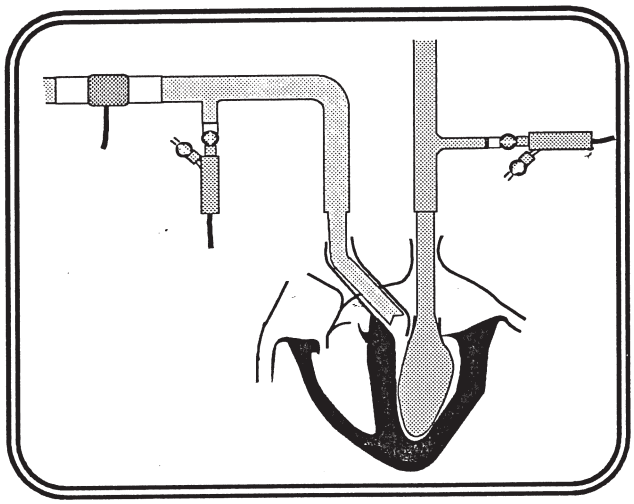




X-Sterile Tubing Flowsensor

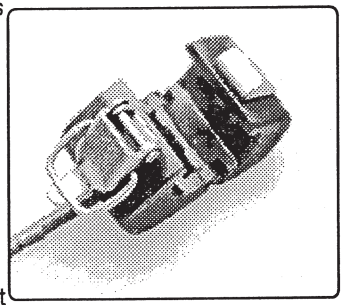
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For extracorporeal applications, X-Series Sterile Tubing Flowsensors with the T110 Lab Tubing Flowmeter offer the highest accuracy.

The sensors clip around the outside of standard flexible tubing and measure the volume flow within. Measurements are bi-directional, largely independent of flow profile, and turbulence and cover a wide dynamic range. Because no physical contact with the liquid under study is necessary, the sensor is ideal for applications where non-thrombogenic surfaces must be maintained or where biohazardous liquids (radioactive, chemotherapeutic and infectious solutions) must be contained within tubing.



Sterile Tubing Flowsensor
opened for tubing insertion

Sensors are pre-calibrated for specific tubing type, fluid and temperature. They may be factory programmed for use on up to 4 tubing choices of the same dimension. Typical tubing brands are listed in the table on the next page; flowsensors for tubing other than listed may be custom built.

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Specifications

Sensors are pre-calibrated for specific tubing type, fluid and temperature. They may be factory programmed for use on up to 4 tubing choices of the same dimension. Typical tubing brands are listed in the table below; flowsensors for tubing other than listed may be custom built.

CAT #	TUBING			BIDIRECTIONAL FLOW			ACCURACY[1]			ULTRA-SOUND
	ID inches	Wall thickness inches	OD inches	Resolution 2 ml/min	Normal Scale ml/min	Maximum Range L/min	Zero Stability ml/min	Sensitivity %	Δ ml/min	Frequency MHz
2X	For these sensor sizes the ratio of tubing wall thickness to outer diameter must not exceed 1:5 for PVC tubes or 1:3 for silicone tubes		1/8-3/16	0.5	200	1	1.5	±5	1.5	3.6
3X			3/16-1/4	1.0	400	2	3	±5	3	3.6
4X			1/4-5/16	1.0	400	2	3	±5	3	3.6
5X			5/16	1.0	400	2	3	±5	3	3.6
6X	1/4	1/16	3/8	2.5	1 L	5	7.5	±5	7.5	2.4
7XA	1/4	3/32	7/16	5	2 L	10	12	±5	15	1.8
7XB	5/16	1/16	7/16	5	2 L	10	12	±5	15	1.8
8X	3/8	1/16	1/2	5	2 L	10	12	±5	15	1.8
9X	3/8	3/32	9/16	5	2 L	10	12	±5	15	1.8
10X	1/2	1/16	5/8	10	4 L	20	20	±5	30	1.2
11X	1/2	3/32	11/16	10	4 L	20	20	±5	30	1.2
12X	1/2	1/8	3/4	10	4 L	20	20	±5	30	1.2
14X	5/8	1/8	7/8	25	10 L	20	50	±5	75	0.9
16X	3/4	1/8	1	25	10 L	50	50	±5	75	0.9
20X	1	1/8	1 1/4	50	20 L	50	100	±5	150	0.6

[1]These values represent the maximum observed error. Total accuracy (error) will be the sum of the zero offset, sensitivity error (percentage of flow reading) and the number "Δ" which affects flows in the low flow region and is positive. Stability is defined as the maximum zero offset drift over an 8 hour period. Sensitivity error can be decreased to < 2% by calibrating sensor directly on the tubing and fluid prior to measurement. Zero offset can be eliminated by zeroing sensor prior to measurement.

[2]Resolution indicated is at .1Hz filter (average flow output).

Flowsensor Selection — Guide to Applications

PROCEDURE	CAT #	TUBING Inner Diameter	TUBING Wall Thickness	STOCK TUBING If using tubing of different diameter or type, please discuss tubing with a customer service representative.
Carotid Shunt	H3X	1/8 Approx	1/32 Approx	No standard tubing stocked
Dialysis	H4X	3/16 Approx	1/32 Approx	No standard tubing stocked
Pediatric CP Bypass, ECMO	H6X	1/4	1/16	dideco XS - class VI BENTLEY BYPASS 70 MEDIFLEX TYGON R-3603 TYGON S-50-HL - class VI
	H7XA	1/4	3/32	TYGON S-50-HL - class VI TYGON R-3603 MEDIFLEX (GISH)
Adult CP Bypass, ECMO	H8X	3/8	1/16	TYGON R-3603 TYGON S-50-HL, class VI
	H9X	3/8	3/32	TYGON S-50-HL - class VI TYGON R-3603 dideco XH - class VI INTERSEPT - class VI MEDIFLEX BENTLEY BYPASS 70
Research	H10X	1/2	1/16	TYGON R-3603
	H11X	1/2	3/32	TYGON R-3603 TYGON S-50-HL - class VI
	H16X	3/4	1/8	TYGON R-3603

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Bubble Detection: H6X Flowsensor *(for 1/4" Tubing)* & the Transonic HT109 Flowmeter

In addition to flow, the HT109 Flowmeter can also monitor for undissolved air bubbles in the tubing line. The flowmeter detects a transient drop in the ultrasound signal when a bubble passes through the flowsensor, triggering an audible alarm. The sensitivity of the alarm is set by the user; a drop in ultrasound signal below the set threshhold setting relates to bubble diameter (see table below).

Bubble Diameter (mm)	Percent (%) Reduction In Received Signal	Bubble Sensitivity Setting
0.5	5	95
1.0	15	85
1.5	20	80
2.0	30	70
2.5	45	55
3.0	60	40
4.0	60	40
5.0	60	40
6.0	60	40

Example: When the bubble sensitivity is set at 95%, a 5% reduction in received signal *(corresponding to the passage of a 0.5 mm diamerter bubble passing through the flowsensor)* will trigger the audible alarm.

These figures represent the minimum values of signal drop and the user should be aware that a bubble may cause 30% more drop in signal than shown in table.

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Bubble Detection: H8X or H9X Flowsensor (for 3/8" Tubing) & the Transonic HT109 Flowmeter

In addition to flow, the HT109 Flowmeter can also monitor for undissolved air bubbles in the tubing line. The flowmeter detects a transient drop in the ultrasound signal when a bubble passes through the flowsensor, triggering an audible alarm. The sensitivity of the alarm is set by the user; a drop in ultrasound signal below the set threshhold setting relates to bubble diameter (see table below).

Bubble Diameter (mm)	Percent (%) Reduction In Received Signal	Bubble Sensitivity Setting
1.0	5	95
1.5	15	85
2.0	20	80
3.0	30	70
4.0	40	60
5.0	50	50
6.0	60	40

Example: When the bubble sensitivity is set at 95%, a 5% reduction in received signal *(corresponding to the passage of a 1.0 mm diamerter bubble passing through the flowsensor)* will trigger the audible alarm.

These figures represent the minimum values of signal drop and the user should be aware that a bubble may cause 30% more drop in signal than shown in table.

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