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Find the *Transonic Systems Inc. H9XL* at our website: ***Click HERE***

Section B: HXL-Sterile Tubing Flowsensors

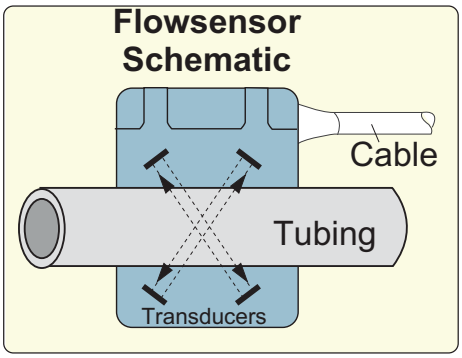
An Independent Measure of Absolute Volume Flow for Enhanced Safety of Extracorporeal Procedures

CP Bypass • ECMO • LVAH • Shunt Flows • Organ Preservation

Transonic sterile tubing flowsensors produce precise, accurate, volume flow measurements with no physical contact between the flowsensor and the liquid, thereby ensuring sterility and avoiding cross-contamination,

- Sterile tubing flowsensors clip around the outside of standard tubings to provide a non-invasive measure of volume flow.
- The integrity of non-thrombogenic surfaces is maintained.
- For use with blood, saline and other non-aerated aqueous solutions.





Transonic Sterile Tubing Flowsensors

- Molded clip-on design for easy care and handling.
- 'X'- pattern of ultrasound insonification to ensure precision measurements.
- Stable low zero offset and accurate under perturbed flow conditions.
- Compatible with a wide range of tubings sizes and materials.

PRINCIPLES OF OPERATION — ULTRASONIC TRANSIT TIME TECHNOLOGY

Ultrasound that Measures Volume Flow, Not Velocity

Using wide-beam illumination, transducers pass ultrasonic signals back and forth, alternately intersecting flowing blood in upstream and downstream directions. The transit time of the ultrasonic beam is decreased when traveling downstream with the blood flow and increased when traveling upstream against the flow.
The difference between the integrated transit times is a measure of volume flow.

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Specifications

Sensors are pre-calibrated for specific tubing type, fluid and temperature. Typical tubing brands are listed in the table below; flowsensors for tubing other than listed may be custom calibrated.

CAT #	TUBING			BIDIRECTIONAL FLOW		ACCURACY[1]			ULTRA-SOUND
	ID inches	Wall thickness inches	OD inches	Resolution [2] ml/min	Maximum Range L/min	Zero Stability ml/min	Sensitivity %	Δ ml/min	Frequency MHz
H2XL	For these sensors the ratio of tubing wall thickness to OD must not exceed 1:5 for PVC tubes or 1:3 for silicone tubes		1/8-3/16	0.5	1	1.5	±5	1.5	3.6
H3XL			3/16-1/4	1.0	2	3	±5	3	3.6
H4XL			1/4-5/16	1.0	2	3	±5	3	3.6
H5XL			5/16	1.0	2	3	±5	3	3.6
H6XL	1/4	1/16	3/8	2.5	5	7.5	±5	7.5	2.4
H7XL	1/4	3/32	7/16	5	10	12	±5	15	1.8
H8XL	3/8	1/16	1/2	5	10	12	±5	15	1.8
H9XL	3/8	3/32	9/16	5	10	12	±5	15	1.8
H10XL	1/2	1/16	5/8	10	20	20	±5	30	1.2
H11XL	1/2	3/32	11/16	10	20	20	±5	30	1.2
H12XL	1/2	1/8	3/4	10	20	20	±5	30	1.2
H14XL	5/8	1/8	7/8	25	20	50	±5	75	1.2
H16XL	3/4	1/8	1	25	50	50	±5	75	1.2
H20XL	1	1/8	1 1/4	50	50	100	±5	150	0.9

[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).

PROCEDURE	CAT #	TUBING (inches) Inner Diameter	Wall Thickness	STOCK TUBING If using tubing of different diameter or type, please discuss tubing with a customer service representative.
Carotid Shunts	H2XL			TYGON S-50-HL, Tygon R-3603
Carotid Shunts	H3XL	1/8 x	1/32	Tygon R-3603
Carotid Shunts	H4XL			none
Carotid Shunts	H5XL	1/8 x	1/16	
Ped CPB, ECMO	H6XL	1/4 x	1/16	MEDIFLEX, Tygon R-3603,TYGON S-50-HL,
Ped CPB, ECMO	H7XL	1/4 x	3/32	TYGON S-50-HL
Ped CPB, ECMO	H8XL	3/8 x	1/16	Tygon R-3603, TYGON S-50-HL
Adult CP Bypass	H9XL	3/8 x	3/32	BENTLEY BYPASS 70, Tygon R-3603, TYGON S-50-HL class VI, MEDIFLEX
Adult CP Bypass	H10XL	1/2 x	1/16	Tygon R-3603, TYGON S-50-HL
Adult CP Bypass	H11XL	1/2 x	3/32	Tygon R-3603, TYGON S-50-HL, BENTLEY BYPASS 70
Custom	H12XL	1/2 x	1/8	TYGON S-50-HL, Tygon R-3603
Custom	H14XL	5/8 x	1/8	Tygon R-3603
Custom	H16XL	3/4 x	1/8	Tygon R-3603
Custom	H20XL	1 x	1/8	Tygon R-3603 *Rev 2/06*

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