Signature *Transonic*

PXL-Series & PXN Series

Precision Tubing Flowsensors

TS410 400-Series Flowmeter Module

Signature Gold Standard Ultrasonic Transit Time Flowsensors for tubing.

Measures volume flow in most non-aerated liquids including saline, buffer solutions, blood, water, even diesel fuel, with high resolution and low offset.

Choose **Clamp-on or Inline Sensors** to match your circuit requirements.

ME-PXL Clamp-on Flowsensors *(Sterile Tubing Flowsensors)*

- **Non-contact Clamp-on Sensors do not break circuit sterility**
- **Preclinical and medical extracorporeal use**
- **Small diameter Clamp-on Sensors for industrial use**

Innovative transit-time technology revolutionized blood flow measurement in medical tubing applications with these flowsensors that clip onto the outside of flexible tubing to measure the flow within. They have become the standard for OEM medical and pre-clinical extracorporeal use by providing non-invasive measurement with high accuracy and stability. Measurements are reliable even in electromagnetically challenging medical environments.

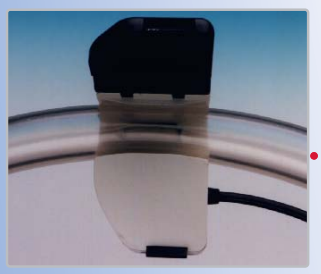
The easy clip-on operation of the PXL flowsensors also make these sensors ideal for industrial flow measurement applications when process testing needs to be quick, repeatable and applied to multiple circuits without flow interruption. Unlike large diameter industrial flow measurement devices, Transonic provides high resolution clamp-on sensors for small diameter tubings down to 1/8” OD.

ME-PXN Inline Flowsensors

- **A completely new Inline Flowsensor for a wide dynamic range**
- **Flexibility for tubing circuits that may vary or are still in the design phase**
- **Highest sensitivity for sizes for 1mm - 25mm diameter tubing**

New PXN Inline Flowsensors utilize a different scheme of ultrasonic illumination that makes it possible to manufacture a flow-through sensor with a smooth, cylindrical interior. No compromises have been made in measurement accuracy. These flowsensors offer more flexibility over Clamp-on Sensors as measurement calibration doesn’t depend on the type and exact size of tubing on which it is being used. The sensors are ETO gas sterilizable. Small diameter PXN Inlines are ideal for low flow isolated heart, or perfused organ studies.

Transonic Systems Inc.
The Flow Measurement Specialists
USA: Tel: 800-353-3569; Fax 607-257-7256; www.transonic.com
Europe: Tel: 31 43 407 7200; email: info@transonic.nl; Fax: 3143 407 7201
Asia: Tel: 886 3399-5806; Fax: 886 3399-5805



Precision Clamp-On Flowsensors
ME-PXL-Series for TS410 Modules

3PXL

9PXL

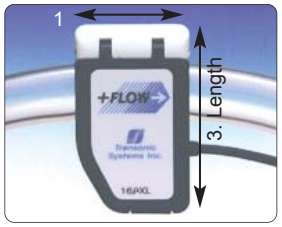
11PXL

20PXL

Reliable Performance for Repeated, Carefree Use in Defined Tubing Applications

- ✔ **Artificial Heart & VAD Performance**
- ✔ **Medical Device & Pump Engineering**
- ✔ **Manufacturing & Compliance Flow Testing**

Transonic Precision PXL-Clamp-on Tubing Flowsensors clip on the outside of flexible laboratory. No physical contact is made with the fluid media. ME-PXL-Series flowsensors can be calibrated and programmed for up to 4 different fluid, temperature, tubing, flow rate combinations. Sensor size is determined by outside diameter of the tubing. Standard MEPXL sensors are sized in 1/16" increments. (Custom sizes are available for metric tubing).



Physical Specifications*

Sensor Size	1. Dimension Along Tube		2. Height		3. Length	
Catalog #	inch	mm	inch	mm	inch	mm
2PXL, 3PXL	0.82	20.8	0.67	17.0	1.25	31.6
4PXL, 5PXL	0.89	22.7	0.80	20.3	1.39	35.2
6PXL	0.96	24.3	0.88	22.3	1.54	39.1
7PXL	1.01	25.6	0.97	24.5	1.66	42.1
8PXL	1.09	27.7	0.95	24.0	1.74	41.3
9PXL	1.30	32.6	0.97	24.6	1.83	46.5
10PXL	1.24	31.6	1.06	26.9	1.99	50.5
11PXL	1.37	34.8	1.11	28.3	2.19	55.8
12PXL	1.50	38.1	1.21	30.7	2.40	60.9
14PXL	1.63	41.2	1.40	35.5	2.59	65.8
16PXL	1.85	46.9	1.54	39.3	2.95	74.9
20PXL	2.29	58.2	1.79	45.6	3.67	93.4

* Subject to modification

Tubing Sensor	Tubing Specifications						Accuracy Specifications							
	Tubing ID		Wall Thickness		Tubing OD		Bidirectional Flow Outputs				Accuracy[1]			Ultra-sound
Catalog #	inches	mm	inches	mm	inches	mm	Resolution[2] ml/min	Low Flow (1/4 scale) 1 volt = ml/min	Standard Flow (Full Scale) 1 volt = ml/min	Max Flow in Standard Range 5 volt = L/min	Maximum Zero Offset ml/min	Absolute Accuracy %	Relative Accuracy %	Frequency MHz
ME 2PXL	3/32	2.4	1/32[3]	0.8[3]	1/8 - 5/32	3.1 - 4.0	0.5	50	200	1	± 4.0	± 10	± 4	3.6
3PXL	1/8	3.2	1/32[3]	0.8[3]	3/16 - 7/32	4.7 - 5.5	1	100	400	2	± 8.0	± 10	± 4	3.6
4PXL	1/8	3.2	1/16	1.6	1/4	6.4	1	100	400	2	± 8.0	± 10	± 4	2.4
5PXL	3/16	4.7	1/16	1.6	5/16	7.9	1	100	400	2	± 8.0	± 10	± 4	2.4
6PXL	1/4	6.4	1/16	1.6	3/8	9.5	2.5	250	1 L	5	± 15	± 10	± 4	2.4
7PXL	1/4	6.4	3/32	2.4	7/16	11.1	5	500	2 L	10	± 30	± 10	± 4	1.8
8PXL	3/8	9.5	1/16	1.6	1/2	12.7	5	500	2 L	10	± 30	± 10	± 4	1.8
9PXL	3/8	9.5	3/32	2.4	9/16	14.3	5	500	2 L	10	± 30	± 10	± 4	1.8
10PXL	1/2	12.7	1/16	1.6	5/8	15.9	10	1 L	4 L	20	± 60	± 10	± 4	1.2
11PXL	1/2	12.7	3/32	2.4	11/16	17.5	10	1 L	4 L	20	± 60	± 10	± 4	1.2
12PXL	1/2	12.7	1/8	3.2	3/4	19.0	10	1 L	4 L	20	± 60	± 10	± 4	1.2
14PXL	5/8	15.9	1/8	3.2	7/8	22.2	25	2.5 L	10 L	50	± 150	± 10	± 4	1.2
16PXL	3/4	19.0	1/8	3.2	1	25.4	25	2.5 L	10 L	50	± 150	± 10	± 4	1.2
20PXL	1	25.4	1/8	3.2	1 1/4	31.8	50	5 L	20 L	100	± 300	± 10	± 4	0.9

Calibration is dependent on tubing material, wall thickness, ultrasound velocity of liquid flowing through the tube, and temperature.

1a Absolute Accuracy is composed of zero stability, sensitivity and linearity errors. Stated values apply when flow rate is greater than 5% of maximum range and zero offset is nulled.

1b If the sensor is calibrated on-site for the tubing and liquid in use, absolute accuracy is further improved to the value listed as "Relative Accuracy."

1c On-site calibration is recommended if the sensor is routinely used to measure flows less than 5% of the maximum range to account for non-linearities associated with flow profile.

2 Resolution represents the smallest detectable flow change at 0.1Hz filter (average flow output).

3 In sizes 2PXL - 3PXL ratio of tubing wall thickness to OD must not exceed 1:5 for PVC; 1:3 for silicone

Ordering ME-PXL Clamp-on Tubing Flowsensors

Catalog # ME ___ PXL ___ - ___ ___ - ___ ___ - ___ ___ - ___ ___

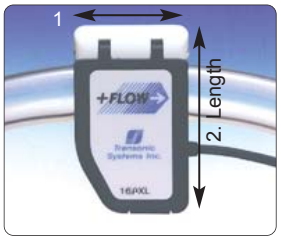
Size; * suffix if OD = mm; Fluid/Temperature + Flow Rate Calibration Codes (up to 4)

Tubing: _____

Example 1: **ME9PXL - BL37 SF – GL23 SF – GL23 LF** calibrated for 3 different uses:
1. Blood at 37ºC at Standard Flow Rate;
2. 40% Glycerine/60%Water at Standard Flow Rate;
3. 40% Glycerine/60%Water at Low Flow Rate.

Example 2: **ME9PXL - M14 – BL37 SF – H2023 LF** for 14 mm OD tubing calibrated for 2 different uses:
1. Blood at 37º C at Standard Flow Rates
2. Water at 23º C at Low Flow Rates

Information Needed to Calibrate Sensor
- Tubing Type
- Fluid (blood, saline, other)
- Operational temperature
- Flow ranges expected



How to Order

- Choose the sensor size that matches your tubing OD;
- Specify tubing type. Supply sample if your tubing is not on our standard tubing list;
- Specify anticipated flow range;
- Specify fluid and temperature for calibration;
- Use the codes below to construct catalog number;
- Contact Customer Service for any non-standard requests.

How to Choose the Most Appropriate Clamp-on Sensor

Flowmeter Compatibility: TS410 400-Series Flowmeter Module

Size: Sensors are scaled to clamp around outer flexible tubing diameter. Transmitting the ultrasound signal through the tubing wall requires a snug fit, so the sensor size is dependent on the tubing of the circuit. PXL sensors are sized in 1/16 inch increments to match the standard tubing diameters used in medical and laboratory settings. PXL sensors may be special ordered for tubing sized in mm.

Tubing: Medical grade and laboratory tubings (PVC, silicone, polyurethane) are generally compatible for use with PXL-Sensors. Rigid PVC and acrylic (Lucite) are not. We stock several standard tubing types. For other tubing types, a 30-60 cm sample is required for sensor calibration.

Expected Flow Rate: All PXL sensors have two dynamic flow ranges: standard flow range (full scale) and low flow range (1/4 scale). PXL sensors are factory calibrated for the highest accuracy in the specified flow range. To meet performance specifications, indicate low or standard flow when ordering. If no flow range is indicated, PXL sensors will be calibrated in the standard flow range. Calibration for accuracy at flows below the lower linear limit may be requested and will be assessed an extra charge.

Fluid / Temperature Calibration: Since fluid density and temperature alter the transit time of the ultrasound signal and affect the acoustic properties of the tubing, we calibrate the sensor specifically for these parameters. Specify up to 4 tubing, fluid, temperature, flow rate combinations for calibration. Fluid samples and MSDS information may be required for custom calibration requests.

Sensor	Tubing (inches) OD	ID	Wall	Stock Tubing
2 PXL	5/32	3/32	x 1/32	Tygon S-50-HL, Tygon R-3603
3 PXL	3/16	1/8	x 1/32	Tygon R-3603
4 PXL	1/4	1/8	x 1/16	Tygon R-3603, Tygon S-50-HL
5 PXL	5/16	3/16	x 1/16	Tygon R-3603
6 PXL	3/8	1/4	x 1/16	MEDIFLEX, Tygon R-3603, Tygon S-50-HL
7 PXL	7/16	1/4	x 3/32	MEDIFLEX, Tygon R-3603, Tygon S-50-HL
8 PXL	1/2	3/8	x 1/16	Tygon R-3603, Tygon S-50-HL
9 PXL	9/16	3/8	x 3/32	BENTLY BYPASS 70, MEDIFLEX, Tygon R-3603, Tygon S-50-HL
10 PXL	5/8	1/2	x 1/16	Tygon R-3603, Tygon S-50-HL
11 PXL	11/16	1/2	x 3/32	BENTLY BYPASS 70, Tygon R-3603 Tygon S-50-HL
12 PXL	3/4	1/2	x 1/8	Tygon R-3603, Tygon S-50-HL
14 PXL	7/8	5/8	x 1/8	Tygon R-3603
16 PXL	1	3/4	x 1/8	Tygon R-3603
20 PXL	1 1/4	1	x 1/8	Tygon R-3603

Metric Tubing OD	Clamp-on # with Suffix
4 mm	ME 2 PXL-M4
5 mm	ME 3 PXL-M5
6 mm	ME 4 PXL-M6
8 mm	ME 5 PXL-M8
9 mm	ME6PXL-M9
10 mm	ME 7 PXL-M10
12 mm	ME 8 PXL-M12
14 mm	ME 9 PXL-M14
16 mm	ME 10 PXL-M16
20 mm	ME 12 PXL-M20
23 mm	ME 14 PXL-M23
25 mm	ME 16 PXL-M25

Clamp-on Flowsensor Calibration Ranges[1]

Sensor Size mm	Low Flow (1/4 Scale)[2] Lower Linear Limit[3,4]	Low Flow (1/4 Scale)[2] Maximum Measurement Range[5]	Standard Flow (Full Scale) Lower Linear Limit[4]	Standard Flow (Full Scale) Maximum Measurement Range[5]
2PXL	50 ml/min	-250 to +250 ml/min	100 ml/min	-1 to +1 L/min
3PXL,4PXL,5PXL	100 ml/min	-500 to +500 ml/min	200 ml/min	-2 to +2 L/min
6PXL	250 ml/min	-1.25 to +1.25 L/min	500 ml/min	-5 to +5 L/min
7PXL,8PXL,9PXL	500 ml/min	-2.50 to +2.50 L/min	1 L/min	-10 to +10 L/min
10PXL,11PXL,12PXL	1 L/min	-5 to +5 L/min	2 L/min	-20 to +20 L/min
14PXL,16PXL	2.5 L/min	-12.5 to +12.5 L/min	5 L/min	-50 to +50 L/min[6]
20PXL	5 L/min	-25 to +25 L/min	10 L/min	-100 to +100 L/min[6]

[1]To meet accuracy specifications, flowsensors should be calibrated for the flow rate range of use.
[2]Flowsensors calibrated for the low flow range should be used with the flowmeter in "1/4 Scale Mode."
[3]Measurements below the Lower Linear Limit may deviate from +/-4% relative accuracy specification.
[4]Custom calibration is available for average flow rates below the lower limit. This may compromise accuracy for the maximum measurement range.
[5]Any flow peaks exceeding the Max Flow Value (-5 volt to + 5 volt flowmeter range) will be clipped.
[6]Standard calibration range is up to 30 L/min; contact factory for availability of higher flow rate calibrations.

TS410 Compatible Connectors

CP16: Plastic 16-pin for TS410
Standard on 1PXN-6PXN

CC16: Metal 16-pin for TS410
Standard on 10PXN - 25PXN;
Standard on all PXL sensors.

TS410 Extension Cables

Tubing sensors are normalized for use without extension cables. Extension cables are available for use with sensors size ME2PXN and larger.
CC16-S-CC16 — Standard 1 meter length
CC16-X-CC16 — Custom length for MRI use (specify; may not apply for all sensor sizes)

1PXN

5PXN

10PXN

19PXN

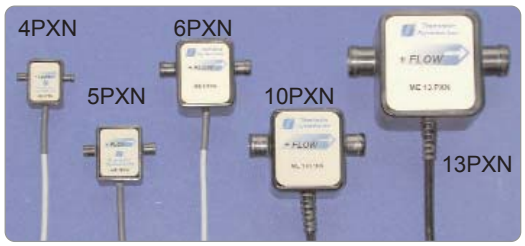
25PXN

Precision Inline Flowsensors

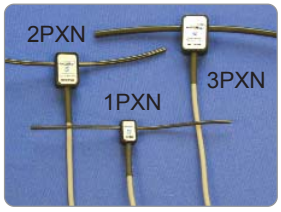
ME-PXN-Series for TS410 Modules

A Completely New Extracorporeal Inline Flowsensor with Enhanced Accuracy over a Wide Dynamic Range

PXN Inline Flowsensors splice into laboratory tubing and measure absolute volume flow of blood and other fluids. PXN inline sensors offer the most flexibility for flow measurement in circuits where tubing requirements have not been formalized. The new four-transducer sensor design offers precision flow accuracy for < 1 ml/min to 100 liters/min steady state and pulsatile flows. Flow range sensitivity is scaled to sensor size and flow is measured consistently across the sensor's full dynamic range with little effect from turbulence. The sensor's smooth round flow channel is easy to clean and and does not trap air bubbles that can degrade ultrasonic performance. Sizes 4PXN - 25PXN have barbed ultem tubing ends to mate easily with flexible laboratory tubing. Miniature sizes 1PXN - 3PXN sensors are fabricated around flexible Pebax tubing which may be cut to length for insertion into small tubing circuits or perfusion apparati. PXN-inline sensors can be calibrated and preprogrammed for up to 4 fluid, temperature, flow rate combinations for highest accuracy performance in:



- ✔ **Isolated organ studies**
- ✔ **Flow phantoms & circulatory models**
- ✔ **All applications requiring maximum volume flow sensitivity**



PXN Family of Inline Flowsensors

INLINE SENSOR	Physical Specifications						Accuracy Specifications							
	Tubing ID		Barb OD[1]		Dimensions[2]		Bidirectional Flow				Accuracy			Ultra-sound
Catalog #	inches	mm	inches	mm	Total Length w/ tube ends mm	Case Length w/out ends mm	Resolution at 10 Hz ml/min	Low Flow 1 Volt = ml/min	Standard Range 1 Volt = ml/min	Max Flow in Standard Range ml/min	Maximum Zero Offset[3] ml/min	Absolute Accuracy %	Non-Linearity[4] %	Frequency MHz
ME1PXN	3/64	1.2	Pebax		100	8.1	± 0.02	5	20	100	± 0.4	± 8	± 2	9.6
ME2PXN	1/16	1.8	Pebax		100	11.9	± 0.02	10	40	200	± 0.6	± 4	± 2	9.6
ME3PXN	3/32	2.4	Pebax		100	14	± 0.05	25	100	500	± 1	± 4	± 2	7.2
ME4PXN	1/8	3.2	0.16	4.0	24.9	15.7	± 0.1	50	200	1 L	± 2	± 4	± 2	4.8
ME5PXN	3/16	4.8	0.23	5.8	31.5	20.3	± 0.2	100	400	2 L	± 4	± 4	± 2	3.6
ME6PXN	1/4	6.4	0.3	7.6	40.6	25.9	± 0.5	250	1 L	5 L	± 10	± 4	± 2	2.4
ME10PXN	3/8	9.5	0.44	11.1	50.8	32.5	± 1	500	2 L	10 L	± 20	± 4	± 2	1.8
ME13PXN	1/2	12.7	0.58	14.7	69.1	44.7	± 2	1 L	4 L	20 L	± 40	± 4	± 2	1.2
ME16PXN	5/8	15.9	0.72	18.3	83.3	52.3	± 5	2.5 L	10 L	50 L	± 70	± 4	± 2	0.9
ME19PXN	3/4	19.1	0.86	21.9	101.1	64	± 5	2.5 L	10 L	50 L	± 100	± 4	± 2	0.9
ME25PXN	1	25.4	1.14	29.0	128	79.8	± 10	5 L	20 L	100L	± 200	± 4	± 2	0.6

[1]Subject to minor modification
[2]Standard cable length: 1.85 meters.
[3] Zero offset can be eliminated by Zero Adjustment prior to measurement.
[4] Within specified calibration range.

Ordering ME-PXN Inline Flowsensors

Catalog # ME ___ PXN ___ ___ - ___ ___ - ___ ___ - ___ ___
Size Fluid/Temperature + Flow Rate Calibration Codes (up to 4)

Example: ME4PXN - BL37 SF – KR37 SF – FX37 LF is calibrated for 3 different uses:
(Blood at 37ºC at standard flow rate; Krebs at 37ºC at standard flow rate;
custom cell culture at 37ºC at low flow rate)

How to Order

- *Choose the sensor size that will best match the circuit ID and anticipated flow rates;*
- *Specify the anticipated flow range when ordering;*
- *Specify calibration for fluid type and temperature;*
- *Use the codes below to construct catalog number.*
- ***Contact Customer Service for any non-standard requests.***

How to Choose the Most Appropriate Inline Sensor

Flowmeter Compatibility: TS410 400-Series Flowmeter Module

Size: Sizes are scaled to insert into flexible tubing internal diameter.
(See PXN specification table for ID and barb spec.)

Tubing Diameter: The sensor that most closely matches the circuit tubing ID should be used so that perturbations in fluid dynamics are minimized. Narrowing or steps down in tubing diameter can add resistance to flow.

Expected Flow Rate: Transonic flowsensor sizes are scaled to achieve the highest resolution in flow measurement. The smaller the sensor, the higher the sensitivity to low volume flows and the lower the offset at zero flow (see specifications table). All PXN sensors have two dynamic flow ranges: standard (full scale) and low flow (1/4 scale) (see table at right). PXN sensors are factory calibrated for highest accuracy in the specified flow range. To meet performance specifications, indicate low or standard flow range when ordering. If no flow range is indicated, PXN flowsensors will be calibrated for the standard range. Calibration for accuracy at flows below the Lower Linear Limit may be requested and will be assessed an extra charge.

Fluid / Temperature Calibration: Inline sensors for the TS410 may be calibrated for up to 4 fluid, temperature combinations. Fluid samples and a MSDS may be required for custom calibration requests.

Information Needed to Calibrate Sensor
- Fluid (blood, saline, other)

[1]To meet accuracy specifications, flowsensors should be calibrated for the flow rate range of use.
[2]Flowsensors calibrated for the low flow range should be used with the flowmeter in "1/4 Scale Mode."
[3]Measurements below the Lower Linear Limit may deviate from +/-2% linearity specification.
[4]Custom calibration is available for average flow rates below the lower limit. This may compromise accuracy for the maximum measurement range.
[5]Any flow peaks exceeding the Max Flow Value (-5 volt to + 5 volt flowmeter range) will be clipped.

Inline Flowsensor Calibration Ranges[1]

Sensor Size	ID mm	Low Flow (1/4 Scale)[2] Lower Linear Limit[3,4]	Low Flow (1/4 Scale)[2] Maximum Measurement Range[5]	Standard Flow (Full Scale) Lower Linear Limit[4]	Standard Flow (Full Scale) Maximum Measurement Range[5]
1PXN	1.2	5 ml/min	-25 to +25 ml/min	10 ml/min	-100 to +100 ml/min
2PXN	1.8	10 ml/min	-50 to +50 ml/min	20 ml/min	-200 to +200 ml/min
3PXN	2.4	25 ml/min	-125 to +125 ml/min	50 ml/min	-500 to +-500 ml/min
4PXN	3.2	50 ml/min	-250 to +250 ml/min	100 ml/min	-1 to +1 L/min
5PXN	4.8	100 ml/min	-500 to +500 ml/min	200 ml/min	-2 to +2 L/min
6PXN	6.4	250 ml/min	-1.25 to +1.25 L/min	500 ml/min	-5 to +5 L/min
10PXN	9.5	500 ml/min	-2.5 to +2.5 L/min	1 L/min	-10 to +10 L/min
13PXN	12.7	1 L/min	-5 to +5 L/min	2 L/min	-20 to +20 L/min
16PXN	15.9	2.5 L/min	-12.5 to +12.5 L/min	5 L/min	-50 to +50 L/min
19PXN	19.1	2.5 L/min	-12.5 to +12.5 L/min	5 L/min	-50 to +50 L/min[6]
25PXN	25.4	5 L/min	-25 to +25 L/min	10 L/min	-100 to +100 L/min[6]

[1]To meet accuracy specifications, flowsensors should be calibrated for the flow rate range of use.
[2]Flowsensors calibrated for the low flow range should be used with the flowmeter in "1/4 Scale Mode."
[3]Measurements below the Lower Linear Limit may deviate from +/-2% linearity specification.
[4]Custom calibration is available for average flow rates below the lower limit. This may compromise accuracy for the maximum measurement range.
[5]Any flow peaks exceeding the Max Flow Value (-5 volt to + 5 volt flowmeter range) will be clipped.
[6]Standard calibration range is up to 30 L/min; contact factory for availability of higher flow rate calibrations.

Calibration of Inline and Clamp-on Flowsensors

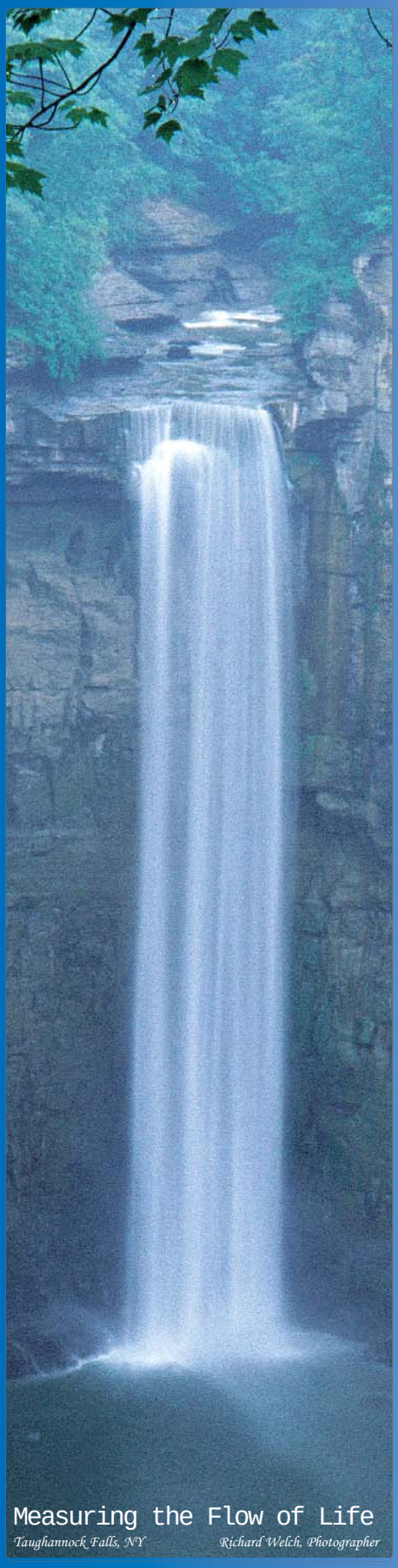
All Transonic flowsensors are supplied with a Certificate of Calibration traceable to NIST standards listing and dating any calibration that was performed. Tubing flowsensors are individually custom calibrated for your use. Calibration is performed for the specified fluid at a specified temperature/flow range. Blood calibrations are performed with an analog that matches the acoustic velocity of blood and a correction for blood is applied. Calibration is valid for 1 year. Recertification can be scheduled as required for GLP studies. The customer supplies any custom tubing or fluid samples.

Fluid/Temperature	23ºC	37ºC	Custom Temp
Water/Saline	$H_2$023	$H_2$037	$H_2$0TX
Blood	BL23	BL37	BLTX
Glycerine 40%, Water 60% (by volume)	GL23	GL37	GLTX
Glycerine Custom Conc	GLX23	GLX37	GLXTX
Krebs Solution	KR23	KR37	KRTX
Custom Fluid	FX23	FX37	FXTX

Calibration Flow Range	Catalog Number Code
Standard Flow	**SF**
Low Flow	**LF**
Custom Lower Flow	**XF**

Glycerine calibration: custom for 1PXN, 2PXN, 3PXN

X = extra charge



Use of Transonic Tubing Flowsensors

ME-PXL Clamp-on Tubing Flowsensors are applied to the outside of the tubing. A thin smear of Vaseline® or petroleum jelly should be applied to the section of tube where the sensor is applied. The Vaseline® provides a good seal between the transducers and the tube for best ultrasonic signal transmission. It also will help seat the tube in the sensor opening and allow the lid to be closed without excessive force.

ME-PXN Inline Flowsensors are applied into the ends of flexible tubing. Sizes 4PXN – 25PXN are manufactured with barbed rigid tubing ends to insert securely into the tubing circuit. For tubing circuits that are under high pressure, plastic clamps may be applied to the outside for added security to keep the tubing from popping off. Thick walled tubing that is difficult to install on the sensor tubing ends may be softened with warm water before installation.

Small ME1PXN, ME2PXN and ME3PXN have 50 mm long flexible PEBAX tubing ends. These may be cut to the appropriate length for the circuit. However, the tubing segment is not replaceable and care should be taken to retain an adequate tubing length for attachment. Metal or plastic tubing fittings may be used to mate the sensor with similar diameter tubes. Pebax tubing ends may be carefully expanded with heat application to fit over larger tubing OD (see TN# 31). Do not stretch, pull or crush the Pebax tubing.

Cleaning and Sterilization

Transonic Tubing Flowsensors may be cleaned with a solution of mild soap and warm water (<55ºC) and wiped or flushed with ethyl alcohol to promote drying. The channel of PXN flowsensors may be cleaned with a soft brush. Care should be taken to avoid scratching the inside surface of the tube. Common mild cleaning agents such as gluteraldehyde are acceptable to use; harsh disinfectants are not. Both PXL Clamp-on and PXN Inline Tubing Sensors may be sterilized by ETO gas sterilization.

Customer Service

Contact your local distributor for quotations, proforma invoices including shipping charges, delivery times and payment terms. Transonic Systems' distributes its products through a network of knowledgeable distributors. Please feel free to contact us if you have questions or visit our website www.transonic.com for the most up-to-date product offerings, applications and technical support, and reference materials.

Limited Warranty

Transonic Systems Inc. warrants that tubing flowsensors are free from defects which are the result of faulty material or workmanship by Transonic Systems, Inc. for a period of six (6) months from their date of shipment. The warranty of Transonic Systems shall not apply to: defects caused by abuse, neglect or misuse; damage due to accident or casualty; or un-authorized alterations or repairs made by anyone other than Transonic Systems, Inc.

Transonic Systems Inc. will, at no charge to the user, either repair or replace a defective flowsensor during its warranty period. The Buyer pays shipping charges to Transonic Systems Inc. plant. Transonic will pay for the return shipping charges. No other warranty oral or written, expressed or implied. Transonic Systems is not liable for incidental or consequential damages. Warranty is valid only if equipment is purchased through Transonic Systems or a duly appointed distributor or licensed representative.

Calibration Certification & Repair Service

Transonic Systems Precision Tubing Flowsensors are precalibrated at the factory with equipment that has been calibrated traceable to the standards of National Institute of Standards and Technology and to Transonic Systems Inc. equipment performance standards. At purchase, Flowsensors are issued a Certificate of Calibration valid for one year. Sensors may be returned to Transonic Systems for recalibration if Calibration Certification is required for GLP studies.

Transonic Systems will also perform repairs on flowsensors which have been damaged or cut. Contact Transonic Systems or your local distributor for an RMA # (Return Materials Authorization).

For more information contact:

USA

Transonic Systems USA
34 Dutch Mill Rd.
Ithaca, NY 14850
Tel: 607-257-5300
Fax: 607-257-7256
www.transonic.com
support@transonic.com

Europe

Transonic Systems Europe B.V.
Punterweg 31
6222 NW Maastricht
The Netherlands
Tel: 31-43-407-7200
Fax: 31-43-407-7201
info@transonic.nl

Asia/Pacific

Transonic Systems Asia Inc.
6F-3, No. 5
Hangsiang Road
Dayuan, Taoyuan County
33758 Taiwan, R.O.C.
Tel: 886-3399-5806
Fax: 886-3399-5805
support@Transonicasia.com

or your local Transonic® distributor/representative