

## Steps for Precise Sensor Calibration

Proper calibration of Transonic flow sensors is critical in order to ensure that the sensor performs accurately for its specified application. Clamp-on tubing flowsensors can be calibrated for up to 4 unique combinations of tubing material, liquid type, flow rate, and liquid temperature.



### Step 1

Determine the appropriate sensor size using the table below:

TUBING DIMENSIONS						
SENSOR SIZE	TUBING ID		WALL THICKNESS		TUBING OD	
	inches	mm	inches	mm	inches	mm
2	3/32	2.38	1/32	0.79	5/32	4
3	1/8	3.18	1/32	0.79	3/16	5
4	1/8	3.18	1/16	1.59	1/4	6
5	3/16	4.76	1/16	1.59	5/16	8
6	1/4	6.35	1/16	1.59	3/8	9
7	1/4	6.35	3/32	2.38	7/16	10
8	3/8	9.53	1/16	1.59	1/2	12
	5/16	7.94	3/32	2.38		
9	3/8	9.53	3/32	2.38	9/16	14
10	1/2	12.70	1/16	1.59	5/8	16
11	1/2	12.70	3/32	2.38	11/16	17
12	1/2	12.70	1/8	3.18	3/4	20
14	5/8	15.88	1/8	3.18	7/8	23
	11/16	17.46	3/32	2.38		
16	3/4	19.05	1/8	3.18	1	25
20	1	25.40	1/8	3.18	1 1/4	32

# Steps for Precise Sensor Calibration (cont.)

## Step 2

Specify the *liquid* that will be used in your tubing circuit, including component concentrations (e.g. % saline). Transonic Transit-time flow measurement (TTFM) supports a wide variety of liquids, including water, saline, blood, Glycerin, and Krebs-Ringer solution. Non-standard liquids may be acceptable but require Material Safety Data Sheet for review.

## Step 3

Provide the liquid temperature range for your application. Transonic's standard temperature calibrations are 37° C ( $\pm 2^\circ$ ) and 23°C ( $\pm 2^\circ$ ). Calibration can also be performed at custom temperature ranges (specify minimum, average, and maximum expected temperature). For ranges greater than  $\pm 2^\circ$ , a custom quotation will be required.

## Step 4

Determine the appropriate scale (i.e. flow range) for your sensor. Use the table below to determine which flow range lines-up best with your expected flow rates. Custom flow ranges can be accommodated for an additional fee.

SENSOR SIZE	LOW FLOW (¼ SCALE)		STANDARD FLOW (FULL SCALE)		ULTRA LOW FLOW	
	LOWER LINEAR LIMIT <sup>1,2</sup>	MAX MEASUREMENT RANGE <sup>3</sup>	LOWER LINEAR LIMIT <sup>1,2</sup>	MAX MEASUREMENT RANGE <sup>3</sup>	LOWER LINEAR LIMIT	MAX MEASUREMENT RANGE <sup>3</sup>
2	50 ml/min	-250 to +250 ml/min	100 ml/min	-1 to +1 L/min	20 ml/min	-200 to +200 ml/min
3, 4, 5	100 ml/min	-500 to +500 ml/min	200 ml/min	-2 to +2 L/min	40 ml/min	-400 to +400 ml/min
6	250 ml/min	-1.25 to +1.25 L/min	500 ml/min	-5 to +5 L/min	100 ml/min	-1 to +1 L/min
7, 8, 9	500 ml/min	-2.5 to +2.5 L/min	1 L/min	-10 to +10 L/min	200 ml/min	-2 to +2 L/min
10, 11, 12	1 L/min	-5 to +5 L/min	2 L/min	-20 to +20 L/min	400 ml/min	-4 to +4 L/min
14, 16	2.5 L/min	-12.5 to +12.5 L/min	5 L/min	-50 to +50 L/min	1 L/min	-10 to +10 L/min
20	5 L/min	-25 to +25 L/min	10 L/min	-100 to +100 L/min	2 L/min	-20 to +20 L/min

1. Measurements below the Lower Linear Limit may deviate from the stated accuracy specification.

2. Custom calibration is available for average flow rates below the lower linear limit. This may compromise accuracy from the maximum measurement range.

3. Range includes zero: any flow peaks exceeding the Max Flow Value (-5 volt to +5 volt range) will be clipped.

## Contact

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