

# BioProTT™ Clamp-On Transducer



- Transit-time ultrasound liquid flow measurement
- Non-invasive Clamp-On Transducers for flexible tubing
- Easy to install – no need to splice lines or stop process
- No pressure drop in system
- Does not induce additional shear stress
- Economical – reusable transducers last for years

## 01 Technical Specification

Tubing types	Flexible tubing, e.g. (platinum cured) silicone, thermoplastic elastomers (TPE), PVC, polyurethane
Medium types	Liquids including blood, blood substitutes, buffer solutions, cell culture media, fermentation media, hydrocarbons, nutrition media, saline solutions, water
Medium operating temperature	4 to 50 °C (40 to 122 °F)
Cleaning and disinfection	Disinfect easily using alcohol based surface cleaners
Compatible flow meters	All BioProTT™ FlowTrack flow meters

## 02 Accuracy and Resolution (in Combination with BioProTT™ Flow Meters)

Outer Tubing Diameter (OD)	Accuracy	Resolution
up to OD 3/4"	± 3% of reading ± 20 ml/min	2 ml/min
up to OD 7/8"	± 3% of reading ± 80 ml/min	2 ml/min
up to OD 1-1/8"	± 3% of reading ± 200 ml/min	3 ml/min
up to OD 1-5/8"	± 3% of reading ± 400 ml/min	4 ml/min

## 03 Reference Conditions for above Accuracy Statement

Medium	Water
Medium temperature	Calibration temperature ± 5 °C ( ± 9 °F)
Ambient temperature	25 ± 5 °C (77 ± 9 °F)
Straight inlet section	10 x inner diameter (ID) of tubing, fully developed flow profile
Tubing	Raumedic-ECC-Blood Line™ PVC (3/8" x 3/32") with acoustic couplant applied

Note: As the measurement allows a maximum flexibility with respect to positioning the sensor, the given accuracy is a standard under the reference conditions.

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## 04 Transducer Sizes\* and Flow Measurement Range

Type	Max. Flow Range** <small>(depending on medium, bi-directional)</small>	Tube Size					
		ID (inner diameter), WT (wall thickness), OD (outer diameter)					
BioProTT™ Clamp-On Transducer	[l/min]	ID [in]	WT [in]	OD [in]	ID [mm]	WT [mm]	OD [mm]
BCT 1/8 x 1/16"	up to ± 4	1/8	1/16	1/4	3.18	1.59	6.35
BCT 11/64 x 3/64"	up to ± 6	11/64	3/64	17/64	4.30	1.25	6.80
BCT 3/16 x 1/16"	up to ± 6	3/16	1/16	5/16	4.76	1.59	7.94
BCT 1/4 x 1/16"	up to ± 8	1/4	1/16	3/8	6.35	1.59	9.53
BCT 1/4 x 3/32"	up to ± 8	1/4	3/32	7/16	6.35	2.38	11.11
BCT 3/8 x 1/16"	up to ± 10	3/8	1/16	1/2	9.53	1.59	12.70
BCT 3/8 x 3/32"	up to ± 10	3/8	3/32	9/16	9.53	2.38	14.29
BCT 3/8 x 1/8"	up to ± 10	3/8	1/8	5/8	9.53	3.18	15.88
BCT 1/2 x 3/32"	up to ± 20	1/2	3/32	11/16	12.70	2.38	17.46
BCT 1/2 x 1/8"	up to ± 20	1/2	1/8	3/4	12.70	3.18	19.05
BCT 1/2 x 3/16"	up to ± 20	1/2	3/16	7/8	12.70	4.76	22.23
BCT 3/4 x 1/8"	up to ± 50	3/4	1/8	1	19.05	3.18	25.40
BCT 3/4 x 3/16"	up to ± 50	3/4	3/16	1 - 1/8	19.05	4.76	28.56
BCT 1 x 1/8"	up to ± 100	1	1/8	1 - 1/4	25.40	3.18	31.75
BCT 1 x 3/16"	up to ± 100	1	3/16	1 - 3/8	25.40	4.76	34.93
BCT 1-1/4 x 3/16"	up to ± 100	1 - 1/4	3/16	1 - 5/8	31.75	4.76	41.28

\* Custom sizes available. \*\* Qmax is depending on medium and tube size and can be custom defined per calibration table.

## 05 Calibration

Factory calibrated to customer specific tubing, medium and operating temperature. Up to seven (7) calibration tables can be programmed in each transducer's electronic storage. On-site calibration adjustment with user adaptable calibration factor to enhance accuracy. Factory recalibration services are available on request.

## 06 Physical Specification

Features	up to OD 5/8"	up to OD 3/4"	up to OD 1-1/8"	up to OD 1-5/8"
Size (H x W x L)	25 x 33 x 45 mm	27 x 38 x 51 mm	35 x 43 x 69 mm	46 x 56 x 84 mm
Weight sensor head	52 g	72 g	140 – 160 g	295 – 315 g
Total weight (incl. cable / plug)	137 g	153 g	225 – 245 g	380 – 400 g
Housing / lid material	Epoxy resin, aluminum, stainless steel		Polymeric compound, aluminum, stainless steel	
Cable length	2.9 m		2.9 m	
IP-Code	IP 65		IP 65	

## 07 Ambient Conditions

Air pressure	70 to 106 kPa
Operating altitude	up to 3000 m (9842 feet)
Operating temperature	4 to 50 °C (40 to 122 °F)
Storage temperature range	-20 to 45 °C (-4 to 113 °F)
Transport temperature range	-20 to 55 °C (-4 to 131 °F)
Humidity storage, transport and operation	10 to 96 % (non-condensing)