

# BioProTT™ Clamp-On SL



## Range of Ultrasound Flow Sensors

### FEATURES

- non-invasive flow measurement of liquids
- no additional shear stress
- for use on flexible tubing
- fully compatible with the BioProTT™ FlowMCP Series and the BioProTT™ FlowTrack SL



### Technical Specification

	up to OD 5/8"	up to OD 3/4"	up to OD 1-1/8"	up to OD 1-5/8"
<b>Size (H x W x D)</b>	25 x 33 x 45 mm	28 x 38 x 51 mm	35 x 43 x 69 mm	46 x 56 x 84 mm
<b>Weight Transducer Head</b>	52 g	72 g	140 - 160 g	295 - 315 g
<b>Total Weight (incl. cable and plug)</b>	137 g	153 g	225 - 245 g	380 - 400 g
<b>Housing and Lid Material</b>	epoxy resin, aluminium, brass		polymeric compound, aluminum, brass	
<b>Cable Length</b>	2.9 m ±5 cm			
	<b>Please note:</b> It is possible to adjust the cable length as long as the total cable length does not exceed 4 m (incl. the extension cable).			
<b>IP-Code</b>	sensor head and cable: IP67 sensor connector: IP67 in mated condition			
<b>Compatibility</b>	BioProTT™ FlowMCP Series and BioProTT™ FlowTrack SL			
<b>Connector plug</b>	16-pin round plug			
<b>Expected Product Life</b>	10 years			
<b>Cleaning and Disinfection</b>	disinfect easily using alcohol based surface cleaners			

### Accuracy\* (in Combination with a BioProTT™ FlowMCP and/or BioProTT™ FlowTrack SL)

Outer Tubing Diameter (OD)	Accuracy	Resolution
up to OD 3/4"	±2 % of reading ±20 ml/min	The resolution depends on the respective measurement system.
up to OD 7/8"	±2 % of reading ±80 ml/min	
up to OD 1-1/8"	±2 % of reading ±200 ml/min	
up to OD 1-5/8"	±2 % of reading ±400 ml/min	

**\*Please note:**

The accuracy largely depends on the calibration parameters. The specified accuracies were determined under the following conditions: Medium: Water; Medium Temperature: Calibration Temperature; Straight Inlet Section: 15 x Inner Diameter (ID) of the tube; fully developed flow profile (i.e. system was given time to adjust to atmosphere temperature; tube was fully filled with liquid; steady flow); Tubing: tube the sensor was adjusted and calibrated for.

The installation position of the BioProTT™ Clamp-On SL as well as the positioning of pumps and valves within the circuit impact the measurement and must be taken into account when it comes to the accuracy of the BioProTT™ FlowMeasurement System.

## Adjustment and Calibration

<b>Recommended tube type</b>	flexible, non-reinforced tubing, e.g. silicone, PVC
<b>Medium type</b>	liquids including buffer solutions, cell culture media, fermentation media, hydrocarbons, nutrition media, salines solutions, water, blood, blood substitutes
	<b>Please note:</b> Due to safety and hygienic reasons, we can only carry out the adjustment using water or, in some cases, glycerol.
<b>Medium Operating Temperature</b>	4 °C to 45 °C (40 °F to 113 °F)
<b>Calibration Tables</b>	<ul style="list-style-type: none"> <li>up to seven calibration tables can be stored to each sensor plug for different applications</li> <li>on-site calibration is possible, as is the use of a customer-specific calibration factor to enhance accuracy</li> </ul>

## Range of BioProTT™ Clamp-On SLs and Their Flow Measurement Range

Size*	Flow Range 1 [l/min]**		Flow Range 2 [l/min]**		Flow Range 3 [l/min]**		Tube Size***		
	Qmin	Qmax	Qmin	Qmax	Qmin	Qmax	ID [in]	WT [in]	OD [in]
PCT 1/8" x 1/16"	0.017	2.0	—	—	—	—	1/8	1/16	1/4
PCT 11/64" x 3/64"	0.017	2.0	0.100	6	—	—	11/64	3/64	17/64
PCT 3/16" x 1/16"	0.017	2.0	0.100	6	—	—	3/16	1/16	5/16
PCT 1/4" x 1/16"	0.017	2.0	0.100	8	—	—	1/4	1/16	3/8
PCT 1/4" x 3/32"	0.017	2.0	0.100	8	—	—	1/4	1/16	7/16
PCT 3/8" x 1/16"	0.017	2.5	0.100	10	—	—	3/8	1/8	1/2
PCT 3/8" x 3/32"	0.017	2.5	0.100	10	—	—	3/8	3/32	9/16
PCT 3/8" x 1/8"	0.017	2.5	0.100	10	—	—	3/8	1/8	5/8
PCT 1/2" x 3/32"	0.017	2.5	0.100	16.9	2	40	1/2	3/32	11/16
PCT 1/2" x 1/8"	0.017	2.5	0.100	16.9	2	40	1/2	1/8	3/4
PCT 1/2" x 3/16"	0.017	2.5	0.100	16.9	2	40	1/2	3/16	7/8
PCT 3/4" x 1/8"	—	—	2	75	—	—	3/4	1/8	1
PCT 3/4" x 3/16"	—	—	2	75	—	—	3/4	3/16	1-1/8
PCT 1" x 1/8"	—	—	2	100	—	—	1	1/8	1-1/4
PCT 1" x 3/16"	—	—	2	100	—	—	1	3/16	1-3/8
PCT 1-1/4" x 3/16"	—	—	2	100	—	—	1-1/4	3/16	1-5/8

\* Custom sizes are available upon request.

\*\*\* ID = Inner Diameter; WT = Wall Thickness; OD = Outer Diameter

**\*\*Please note:**

Customized flow ranges must be requested and checked regarding their feasibility. While a measurement is possible outside the given flow measurement range, the accuracy indicated above is only valid within that range. The possible flow rate also depends on the tubing.

## Ambient Conditions during Transport, Storage, and Operation

Atmospheric Pressure	70 kPa to 106 kPa
Temperature Range Transport and Storage	-20 °C to 55 °C (-4 °F to 131 °F)
Temperature Range Operation	10 °C to 40 °C (50 °F to 104 °F)
Relative Humidity	10 % to 96 % (non-condensing)

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