

Ultrasonic flowmeter

USF300C Series

- New PFA construction for use with ultra-pure liquids
- No moving components in flow path
- Flow ranges of 20 and 50 L/min
- 4 – 20 mA and frequency outputs for instantaneous flow rate and integrated flow volume
- RS-485 communication links to PC or other controllers for collection of flow data and parameter selection
- Useable to 50°C, 60 psi



USF300C	TYPE	LIQUID	UNITS	FLOW	OPTION	
						Specify optional requirements after the Model Number
				MAX	Show maximum flow rate here. 20 for G15 50 for G20	
				A	mL/min	
				B	L/min	
				Z	For liquids other than water state required range at end of Model Number	
				1	Pure water	
				2	State liquid type at end of Model Number	
Type	Flow Range			Pipe Size (OD x ID mm)		Material
G15	0.5 ~ 20 L/min			TV 1/2 (Φ 12.7 x 9.53)		NEW PFA
G20	2 ~ 50 L/min			TV 3/4 (Φ 19 x 15.8)		

Example of Model Number

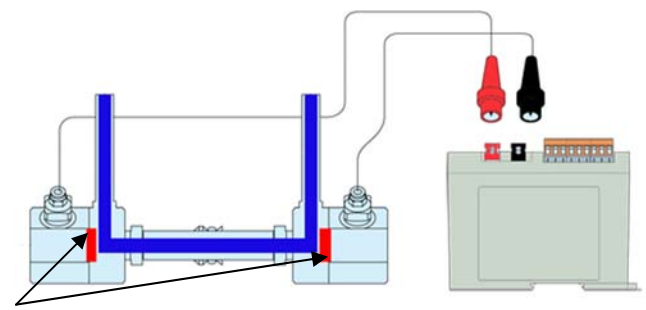
USF300C - G15 - 1 - B 20 - Display Option - Fluid characteristics if not water

Performance Specifications

Model Numbers	USF300C-G15	USF300C-G20
Applicable Liquids	Ultra-pure water and chemicals	
Measuring Flow Range	0.5 ~ 20 L/min	2 ~ 50 L/min
Measuring Flow Accuracy	±1% at Full Scale	±1% at Full Scale
Max. Operating Pressure	60 psi (0.4MPa)	
Operating Temperature	Maximum 50°C	
Ambient Temperature	0 ~ 50°C , non dewing	

How it works

- An ultrasonic transmitter/receiving element is mounted behind the PFA seal at each end of the flow tube.
- The electronics unit sends pulses of ultrasonic energy along the flow tube and measures the transit time taken for each pulse to arrive.
- The transit time of pulses traveling downstream are compared with that of pulses traveling upstream. Their difference is proportional to the actual flow rate.
- The electronics unit provides 4-20 mA output and two configurable outputs to communicate instantaneous flow rate and total integrated flow to displays and other controllers.

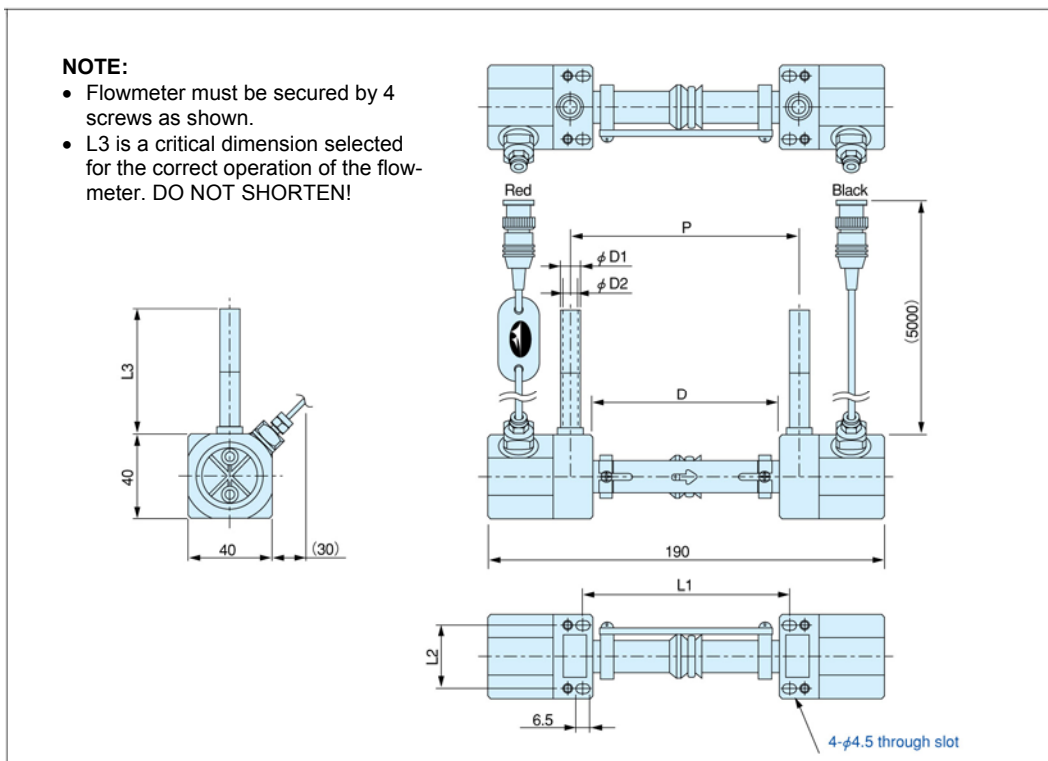


Transmitter/receiver elements are mounted behind the PFA ends of the flow tube.

Technical Details

Detecting Method	Measurement of propagation time difference between sending and receiving ultrasonic pulse.
Flow Indication	Instantaneous flow rate in mL/min and L/min Integrated total flow volume in mL and L
Input Signals	Resetting of integration signal <ul style="list-style-type: none"> TTL level of 5V CMOS LOW pulse of 20 msec or more External connection of a 0 volt contact closure or transistor open collector
Output Signals	4 – 20 mA for selected mode. Max. load resistance: 800Ω Instantaneous flowrate mode: Resolution ~ 1/3000 Integrated flow mode: Upper limit can be set up to 32000 mL
	Configurable Output 1 – Selectable from frequency, integrating pulse, or comparative output Frequency – selectable from 100 to 3000 Hz Integrating pulse – selectable from 1 to 200 mL./pulse Comparative output – selectable to represent either upper or lower limit of instantaneous or integrated flow rate. Selectable from 0 to 3200 L/min. Open collector rating: Max 100 mA sink current at up to + 35 VDC
	Configurable Output 2 – Selectable for Fault Indication or comparative output Fault Indication – indicates presence of air in the flow tube preventing flow measurement Comparative output – selectable to represent either upper or lower limit of instantaneous or integrated flow rate. Selectable from 0 to 3200 L/min. Open collector rating: Max 100 mA sink current at up to + 35 VDC.
Communication	RS-485
Power Supply	24 VDC ± 10%
Power Consumption	100 mA under normal conditions (600mA on startup)
Cable lengths	5m coaxial cable shielded with PTFE

Sensor Dimensions



Meter Type	Flow Range	Dimensions – mm						
		D	L1	L2	L3	P	ΦD1	ΦD2
G15	0.5 ~ 20 L/min	86	100	30	80	105	12.7	9.53
G20	2 ~ 50 L/min	72	84	32	100	100	19.0	15.8

Installation Positions

- Positions (a) and (b) are recommended.
- Position (d) does not present measurement difficulties, but liquid may be trapped in the flow tube.
- Positions (c) and (e) must NOT be used as they allow air to be trapped in the measuring tubes.
- It is recommended that the flowmeter be filled with liquid at all times.

Electronics Module: Dimensions and Wiring Diagram

Pin	Connection
1	DC power supply (+)
2	DC power supply (-)
3	4 – 20 mA current output (+)
4	4 – 20 mA current output (-)
5	Configurable output 1
6	Configurable output 2
7	COM for configurable outputs
8	RS – 485 output (+)
9	RS – 485 output (-)

RS-485 Communication

Connecting the USF300C to a PC with a RS-485/RS232 converter and running USFTERM software allows:

- Display of flow rate and signal frequency
- Selection of measurement modes for the 4-20 mA output
- Selection of modes of configurable outputs 1 and 2
- Selection of signal averaging and signal sampling times
- Calibration scaling and curve fitting
- Trouble-shooting

Clean production methods, meticulous care

Specialized production methods have been used to ensure that Tofco Ultrasonic Flowmeters are fully qualified to be used for ultra-clean applications in semiconductor, medical and pharmaceutical applications.	Process Step	Method
	Molding	Oil-free processing
	Cleaning	Ultrasonic cleaning with solvents, rinsing with ultra-pure water
	Assembly	Assembled in Class 10,000 Clean Room (Packaged in Class 100)
	Inspection	Flow rates calibration with ultra-pure water. Dry air pressurized leak testing.

Exceptional flowmeters by **TOFCO**

World-class support by **Proteus**

Information in this document was correct at the time of printing; however, specifications are subject to alteration as continuous improvement processes establish new capabilities



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