

# DELTA-PHASE ELECTRONICS INC.



**ALPHA6000**  
**ULTRASONIC GAS FLOWMETER**  
**FOR GASES**

# ALPHA6000 ULTRASONIC FLOWMETER

## General Purpose Gas Flowmeter

The Alpha6000 ultrasonic flowmeter works according to the acoustic transit time differential method. Ultrasonic transducers mutually send and receive short pulses with and against the gas flow direction which affects their transit time. The volume flow is calculated from the difference of transit times.

## Auto-Correlation Detection Technique

Alpha6000 Ultrasonic Gas Flowmeter employs digital signal auto-correlation method to reduce the interference caused by pipe vibration, valve opening or closing, which greatly improves the measurement reliability. Alpha6000 can be used for flow measurement in harsh industrial fields and conditions.

## Accuracy

Accuracy is up to  $\pm 2\%$  of FS. Wide rangeability with 150 to 1 turndown ratio. The dual channel flowmeter that would improve the accuracy and that also measure the flow in two separate pipes or at two different places in the same pipe is optional. And the flowmeter can measure both bi-directional flows.

## Micro-Processor Design

The transmitter based microprocessor is modular design. The LCD module can display flowrate, total flow, signal strength. Output module: analog 4~20mA, pulse, RS232 or 485.

## No Pressure Drop, Low Maintenance

Since the transducers of Alpha6000 Gas Flowmeter do not obstruct the flow, they generally do not cause any pressure drop as other types of flowmeters do. The Alpha6000 has no parts that foul or collect debris, and no moving parts to wear out. As a result, it requires no lubrication, cleaning or other routine maintenance.

## Enclosure

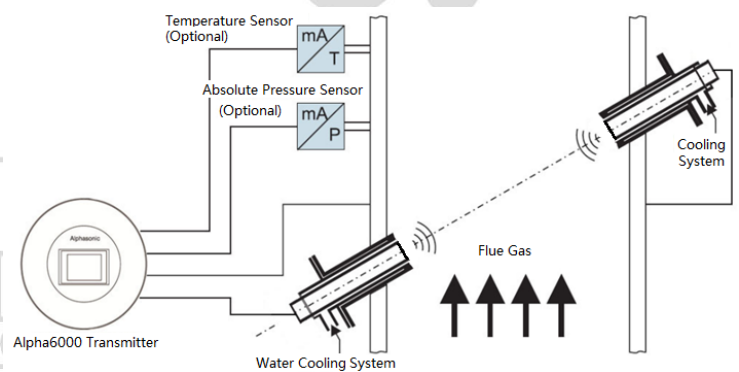
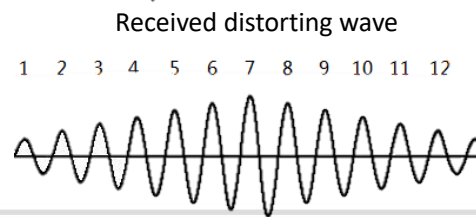
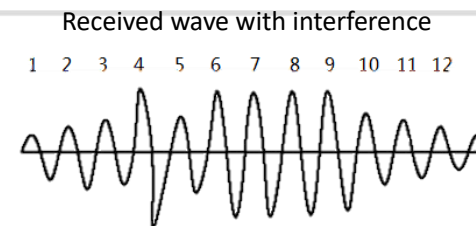
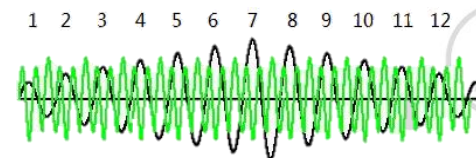
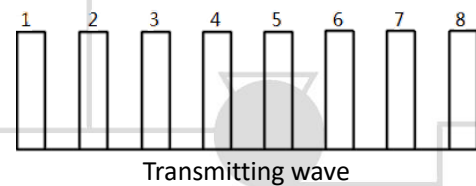
Transmitter is enclosed in a die-casting aluminum housing with FM ex-proof approval. Explosion-Proof: Ex d IIC T6

## Applications

The Alpha6000 series flow meters are designed to work on clean and dirty fluids. Difficult applications include wet gases, mixed gases and custody transfer.

- Vent gas
- Fuel gas
- Coke gas
- Biogas
- Waste gas
- Flue gas

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## Features

- Application for wet or dirty gases
- Continuous measurement of flow volume and gas velocity
- Optional automatic zero point and reference point calibration check
- Optional inputs of temperature and pressure signals for mass flow calculation
- Optional transducer water cooling system for high temperature application

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## Specification

Electrical Specifications	Transducer Specifications	Overall Specifications
<b>Power Supply:</b> 12 to 36 VDC, 5W Optional remote power supply 90-240 VAC, 50/60 Hz, consult factory <b>Operating Temperature:</b> -4°F to 158°F (-20°C to 70°C) <b>Display:</b> LCD with backlight (Flow, Flow rate, Total Flow, switch to Temperature, Pressure, Signal) <b>Inputs:</b> Digital or analogue signals of Temperature and Pressure. <b>Outputs:</b> Analog: 4 to 20 mA, Max 600 Ω; Isolated Pulse; SPDT Relay for limit or system alarm, 0.5A@30VDC <b>Digital Interface:</b> RS485 Modbus <b>Enclosure:</b> Die-casting aluminum housing with FM ex-proof approval, Ex-proof Certificate: Ex d IIC T6, IP66 <b>Dimensions:</b> φ4.6 x 8.1 in. (φ117 x 206 mm)	<b>Process Temperature:</b> 32 to 194°F (0 to 90°C) without water cooling 32 to 392°F (0 to 200°C) with water cooling <b>Process Pressure:</b> 0 to 145 Psi (0 to 1 Mpa) <b>Process Connection:</b> Compression fitting for Threadolets, Flange or Ball-valve assembly <b>Cable &amp; Length:</b> <ul style="list-style-type: none"> <li>• <b>Standard:</b> Length to 10 ft. (3.05 m)</li> <li>• <b>Optional:</b> Length upto 1000 ft. (305 m)</li> </ul> <b>Material:</b> 316SS or POM housing with PVDF face <b>Protection:</b> IP68 <b>Pipe Size:</b> 1" to over 236" (25mm to over 6000mm)	<b>Accuracy:</b> Less than 2% of reading <i>Accuracy depends on pipe size and whether measurement is one-path or two-path. Accuracy to ±0.5% of reading may be achievable with process calibration.</i> <b>Repeatability:</b> ±0.2% to 0.5% of reading <b>Rangeability:</b> 150:1 <b>Velocity Range :</b> 0.1 ft./s to 131 ft./s (0.03 m/s to 40 m/s) <b>Channel Options:</b> <ul style="list-style-type: none"> <li>• <b>Standard:</b> Single channel</li> <li>• <b>Optional:</b> Dual channels</li> </ul>



## Flue Gas Monitoring

**Flue gas** is the gas that eventually exhausted of combustion process. It comes from coal-fired boiler, incinerators, gas and oil fired boiler, blast furnace, coke oven and industrial furnace etc.

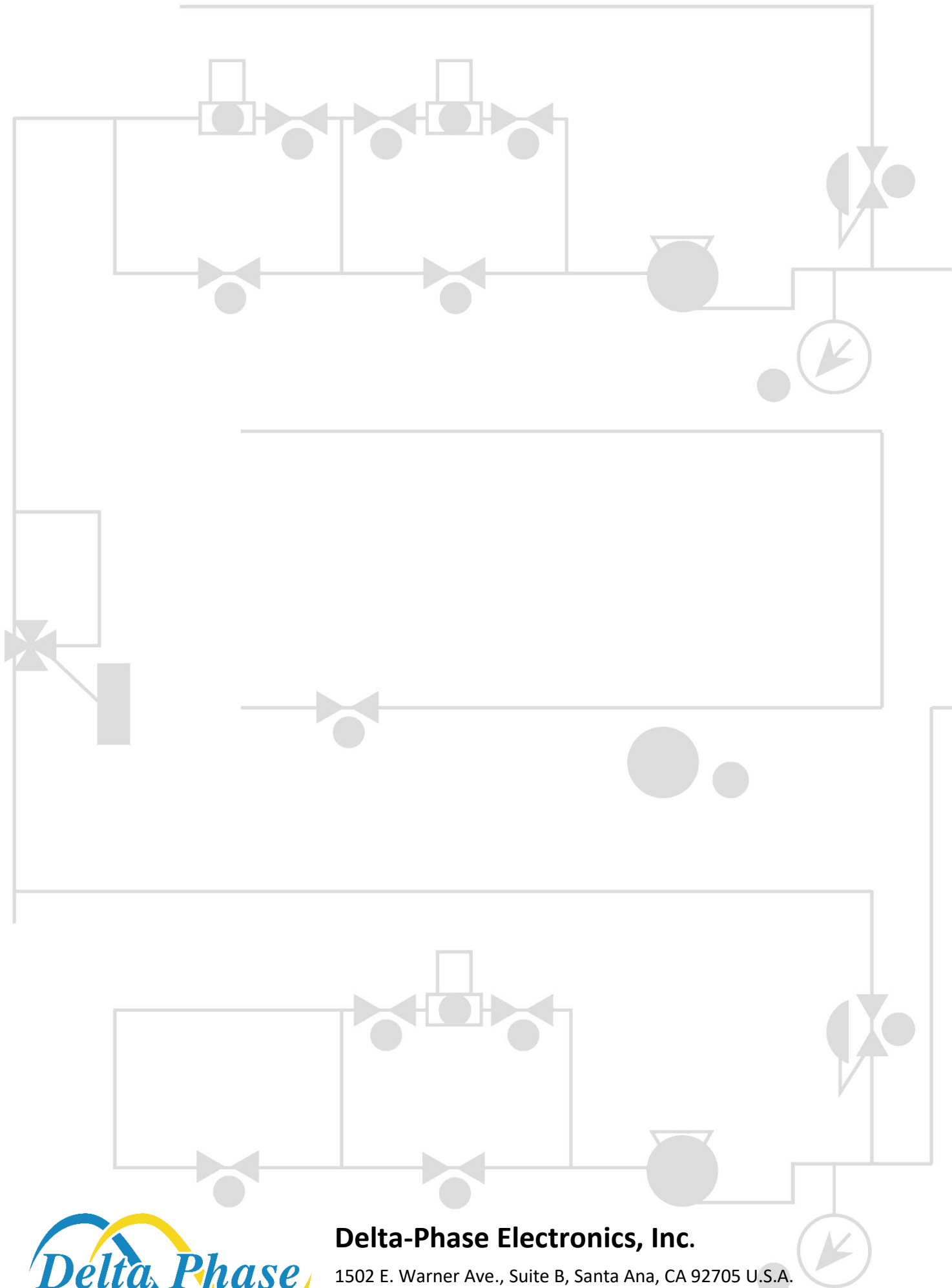
There are more problems for other flowmeters in application, such as: large diameter flue, low pressure, dust, moisture and other impurities, which will make troubles on measurement and daily maintenance.

Alpha6000 Ultrasonic gas flow meters have demonstrated their ability to measure the gas of flue conditions that contain such problems.

## Ordering Information

Alpha6000 Ultrasonic Gas Flowmeter Transmitter			
Explosion	-	None	
	-E	Explosion model (Ex d IIC T6)	
Channels		-S	Single Channel
		-D	Dual Channels
Power		-AC	90VAC to 260VAC
		-DC	12 to 36 VDC
<b>Alpha6000</b>	<b>-</b>	<b>-S</b>	<b>-AC</b>

Alpha6000 Ultrasonic Gas Flowmeter Sensor			
Sensor style	-F1	π pipe style for 1" to 3" (25mm to 80mm) pipe	
	-F2	Insertion style for pipe size between 4" to 20" (100mm to 500mm)	
	-F3	Insertion style for pipe/duct size between 14" to 80" (350mm to 2000mm)	
	-F4	Insertion style for pipe/duct size between 40" to 236" (1000mm to 6000mm)	
	-F5	Insertion style for pipe/duct size over 236" (6000mm)	
Flange Standard		-	None
		-I	ISO
		-A	ANSI
		-D	DIN
Cable Length		-C10	10' about 3.1m
		-C25	25' about 7.6m
			Longer contact factory
<b>GF7</b>	<b>-F4</b>	<b>-A</b>	<b>-Cxx</b>



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