



ALSONIC SERIES

Ultrasonic Flow Meter



ALSONIC Series Ultrasonic Flow Meter

SmartMeasurement ALSONIC product matrix

Model	Technology	Normal Diameter	Fluid	Application	Transducer style
ALSONIC DSP	transit-time	15-6000 mm	liquids with <30% particles/bubbles	flowmeter	clamp on, inline
ALSONIC DSPPL	transit-time	20-6000 mm	liquids with <30% particles/bubbles	flowmeter	clamp on
ALSONIC AVM	transit-time	1000-40000mm	liquids with <30% particles/bubbles	open channel	submerged
ALSONIC FX	transit-time	15-6000 mm	clean liquids	flowmeter	clamp on, inline
ALSONIC EG	transit-time	15-6000 mm	clean liquid	flow/energy meter	clamp on, inline
ALSONIC DHL	transit-time	25-1200mm	clean liquid	flowmeter	clamp on
ALSONIC DDPL	doppler	20-6000mm	liquids with >1% particles/bubbles	flowmeter	clamp on
ALSONIC DAVM	doppler	150-10000mm	liquids with >1% particles/bubbles	flowmeter, open channel	submerged
ALSONIC BAWM	transit-time	15-300mm	clean water	water meter	inline
ALSONIC BAEG	transit-time	15-300mm	clean water	water/hot meter	inline

FUNCTIONAL SPECIFICATIONS:

Power Supply:

AC: 85~265V_{AC}, 45~63Hz

DC: 16~30 V_{DC}, draw up to 1 amp of current steady state,
I_{max}=50mA

Switch-on current

AC: Maximum 26 A (<5 ms) at 250 V_{AC}

DC: Maximum 30 A (<5 ms) at 42 V_{DC}

Power consumption: 10W (up to 15W)

Vibration resistance: 10 to 150 Hz (Acceleration up to 1g)

Damping time: 0.2 to 100s (default 6s).

Grounding Resistance: <10 Ω

Output: Pulse (0-10KHz) 4~20mA_{DC}

RS485 (up to 2km at 14400bps)

AMBIENT SPECIFICATIONS:

Vibration limits: Meets IEC 68.2.6, endurance sweep,
10 to 2000 Hz, 50 sweep cycles at 1.0 g.

Ambient Temperature Limits

Operating: -20 °C ~ +55 °C

Storage: -40 °C ~ +70 °C (>35 °C max. 4 weeks)
≤ -40 °C is not recommended for long-term storage

Humidity Limits: 0-90% RH to 150 °F (65 °C)

Protection: IP65 – std
IP68 – opt

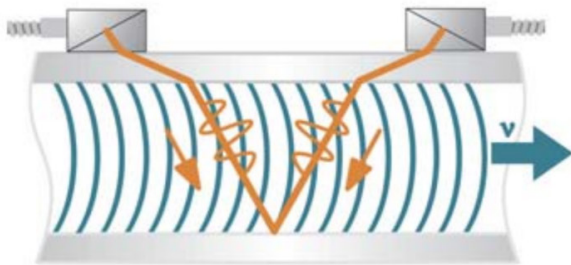
Shock resistance: up to 2g, conforms to IEC60068-2-6

Interference-resistant: conforms to EN61326/A1

ALSONIC Series Ultrasonic Flow Meter

TRANSIT TIME DIFFERENCE PRINCIPLE

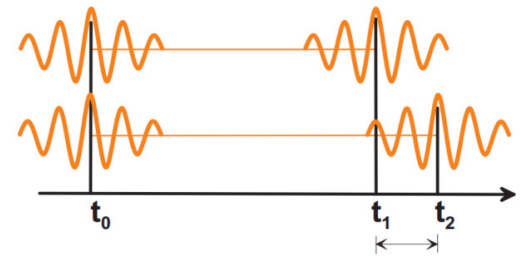
In order to measure the flow of a fluid in a pipe, ultrasonic signals are used, employing the transit time difference principle. Ultrasonic signals are emitted by a transducer installed on the pipe and received by a second transducer. These signals are emitted alternately in the flow direction and against it. As the fluid in which the signals propagate is flowing, the transit time of the ultrasonic signals in the flow direction is shorter than against the flow direction. The transit time difference, Δt , is measured and allows the flowmeter to determine the average flow velocity along the propagation path of the ultrasonic signals. A flow profile correction is then performed in order to obtain the area averaged flow velocity, which is proportional to the volumetric flow rate. Integrated microprocessors removes any external noise from each transducer enabling the transmitter to measure flow accurately.



Path of the ultrasonic signal

■ High frequency portable type: ALSONIC DSPPL

- Fluid: liquid @ particulates/bubbles<30%
- Line size: DN20~DN6000
- Flow Range: 0.02~12 m/s
- Temperature: -40~+120 deg C
- Accuracy: std $\pm 1.0\%$ of reading
opt $\pm 0.2\%$ of reading
opt $\pm 0.5\%$ of reading
- Transducer: clamp on
- Output: Relay, 4-20mA, RS485



Transit time difference Δt

Calculation of volumetric flow rate

$$V = K_{Re} \cdot A \cdot K_a \cdot \Delta t / (2 \cdot t_{fl})$$

Where

- V = volumetric flow rate
- K_{Re} = fluid mechanics calibration factor
- A = cross-sectional pipe area
- K_a = acoustical calibration factor
- Δt = transit time difference
- t_{fl} = transit time in the fluid



■ High frequency wall mount type: ALSONIC DSP

- Fluid: liquid @ particulates/bubbles<30%
- Line size: DN15~DN6000
- Flow Range: 0.02~12 m/s
- Temperature: -40~+120 deg C
- Accuracy: std $\pm 1.0\%$ of reading
opt $\pm 0.5\%$ of reading
- Transducer: clamp on, inline
- Output: Relay, 4-20mA, RS485
- Application: flow, open Channel

ALSONIC Series Ultrasonic Flow Meter



■ Standard handheld type: ALSONIC DHL

- Fluid: clean liquid
- Line size: DN25~DN1200
- Flow Range: 0.5~12 m/s
- Temperature: -10~+80 deg C
- Accuracy: $\pm 1.0\%$ of reading
- Transducer: clamp on
- Output: 4-20mA, Data logger
- Application: flow meter

■ Standard wall mount type: ALSONIC FX

- Fluid: clean liquid
- Line size: DN15~DN6000
- Flow Range: 0.5~12 m/s
- Temperature: -10~+110 deg C
- Accuracy: std $\pm 1.5\%$ of reading
opt $\pm 1.0\%$ of reading
- Transducer: clamp on, inline
- Output: pulse, 4-20mA, RS485, Data logger
- Application: flow meter, energy meter



■ Building Automation Water Meter: ALSONIC BAWM

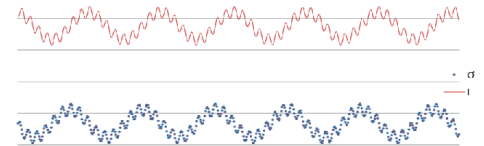
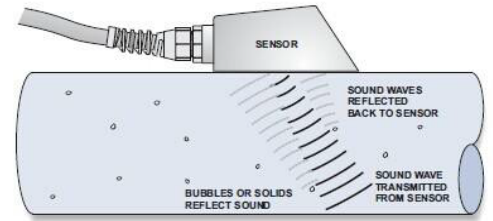
- Fluid: water
- Line size: DN15~DN300
- Flow Range: 0.5~12 m/s
- Temperature: -10~+70 deg C
- Accuracy: std $\pm 2.0\%$ of reading
opt $\pm 1.5\%$ of reading
- Transducer: inline
- Output: pulse, Mbus, RS485
- Application: water meter, BTU meter

** Please refer to Alsonic product matrix for other styles

ALSONIC Series Ultrasonic Doppler Flow Meter

DOPLER PRINCIPLE

Doppler ultrasonic flow meter measures flow velocity by sensing signals from reflective materials within a liquid and measuring the frequency shift due to the motion of these reflective materials. A pair of transducers outside the pipe or one transducer inside the pipe, transmits an ultrasonic signal into the moving fluid, a portion of this signal is reflected by suspended solids, entrained gases or flow turbulence back toward the transducer. Electronic circuitry compares the transmitted frequency with the received frequency. The difference, or frequency shift, is proportional to fluid velocity. If the liquid is not moving (a zero flow condition) the transmitted and received frequencies are identical.



PROGRAM

Program lets you easily communicate the sensor directly, view current and download logged data. Drop-down menus allow even unexperienced users to quickly learn the program. The program communicates via a RS485 connection. Program tools is able to run on Windows computers.



■ Doppler flow meter: ALSONIC DDPL

- Fluid: dirty liquid @ particulates bubbles <30%
liquids MUST have particles present
- Line size: DN15~DN6000
- Flow Range: 0.02~12 m/s
- Temperature: -40~+120 deg C
- Accuracy: std $\pm 1.0\%$ of reading
- Transducer: clamp on
- Output: Relay, 4-20mA, RS485
- Application: flow meter

■ Doppler open channel: ALSONIC DAVM

- Fluid: dirty liquid @ particulates/bubbles <30%
liquids MUST have particles present
- Line size: DN150~DN6000
- Flow Range: 0.02~12 m/s
- Temperature: -40~+120 deg C
- Accuracy: std $\pm 1.0\%$ of reading
- Transducer: clamp on
- Output: Relay, 4-20mA, RS485
- Application: open Channel, portable and fixed sewer systems, Area Velocity system



** please refer to Alsonic product matrix for other styles

ALSONIC Series Doppler Open Channel Flow Meter

ALSONIC DAVM				
Transmitter				
Portable ①	P			
Wall Mount ②	W			
No Transmitter ③	N			
Power supply				
10-24VDC ②③	DC			
85-265V, 45~63Hz ①②	AC			
Output				
Standard - display ①②	S			
No output ①③	N			
Pulse ①②	P			
4-20mA ①②	I			
RS485 ①②③	C			
Data logger - 16GB ①②	D			
GPRS ①②	G			
SDI-12 ③	E			
Transducer				
None ①②	N			
Standard sensor - 0.2-1.6m/s bi-direction ①②③	S			
Extend sensor - 0.2-13m/s bi-direction ①②③	L			
Singal Cable				
Standard 15m	N			
To be advise **m	**			
Options				
Program to read sensor by SDI-12/RS485 ③	SF			
Installation part	IS			

ALSONIC Series Standard Handheld Flow Meter

ALSONIC HL			
Flowmeter type			
Handheld - numeric pad	HL		
Handheld numeric pad and data logger	DHL		
Portable with printer	PL		
Transducers			
DHL clamp sensor, 25~1200 mm	DTS		
Small clamp sensor, 15~100 mm	SCS		
Middle clamp sensor, 50~600 mm	SCM		
Large clamp sensor, 300~6000 mm	SCL		
High Temperature clamp sensor (-30-140℃), 15~100 mm	SHS		
High Temperature clamp sensor (-30-140℃), 50~700 mm	SHL		
Mounting track Small clamp sensor, 15~100 mm	MCS		
Mounting track Middle clamp sensor, 50~300 mm	MCM		
Mounting track High Temperature clamp sensor, 15~100 mm	MHS		
Mounting track High Temperature clamp sensor, 50~300 mm	MHL		
Signal Cable Length			
5M x 2 Cables	C1		
10M x 2 Cables	C2		
15M x 2 Cables	C3		
Options			
None option	NN		
thickness gauge	TT		
Extra single cable. 10m * 2	Cable		
Mounting Belt. 6m * 2	ST		

ALSONIC Series Standard Fixed Flow Meter

ALSONIC FX				
Flowmeter type				
Remote Mini Module	MUF			
Remote Wall mount	WLF			
Remote Panel mount	PMF			
Transducers				
Small clamp sensor (-30-80?), 15~100 mm	SCS			
Middle clamp sensor (-30-80?), 50~600 mm	SCM			
Large clamp sensor (-30-80?), 300~6000 mm	SCL			
High Temperature clamp sensor (-30-140?), 15~100 mm	SHS			
High Temperature clamp sensor (-30-140?), 50~700 mm	SHL			
Standard insertion sensor (-30-140?), 80~6000 mm	SIS			
Long insertion sensor (-30-140?), 80~6000 mm	SIL			
DN6 - Polypropylene inline pipe, 0.01-9 LPM, up to 60 C	UC6P			
304SS inline sensor (-30-140?) with pipe size ***	DN			
Signal Cable Length				
No Cables	NC			
5M x 2 Cables	C1			
10M x 2 Cables	C2			
15M x 2 Cables	C3			
Secondary Instrument				
None transmitter	NN			
Options				
None option	NN			
thickness gauge	TT			
Extra single cable. 10m * 2	Cable			
Mounting Belt. 6m * 2	ST			

ALSONIC Series Standard Energy Flow Meter

ALSONIC EG				
Flowmeter type				
Remote Wall mount	WLE			
Remote module	MUE			
Portable Type with printer	PLE			
RTD				
None RTD	NRTD			
Insertion Pt100 RTDs - 2m cable	100			
Clamped Pt100 RTDs - 2m cable	C100			
Transducers				
Small clamp sensor (-30-80℃), 15~100 mm	SCS			
Middle clamp sensor (-30-80℃), 50~600 mm	SCM			
Large clamp sensor (-30-80℃), 300~6000 mm	SCL			
High Temperature clamp sensor (-30-140℃), 15~100 mm	SHS			
High Temperature clamp sensor (-30-140℃), 50~700 mm	SHL			
Standard insertion sensor (-30-140℃), 80~6000 mm	SIS			
Long insertion sensor (-30-140℃), 80~6000 mm	SIL			
304SS inline sensor (-30-140℃) with pipe size **"	DN			
Signal Cable Length				
No Cables	NC			
5M x 2 Cables	C1			
10M x 2 Cables	C2			
15M x 2 Cables	C3			
Secondary Instrument				
None transmitter	NN			
Secondary Instrument				
None option	NN			
thinkness gague	TT			
Extra single cable. 10m * 2	C10			
Mounting Belt. 6m * 2	ST			
Extra RTD cable **m	RC**			
Data logger for wall mount	DL			

ALSONIC Series High Frequency Fixed Flow Meter

ALSONIC DSP				
Transmitter				
Compact type, up to 2 path/channel, IP64, DC power, 4-20mA, RS-232C/485	10L			
Explosion proof, up to 2 path/channel, IP64, DC power, 4-20mA, RS-232C/485	10LX			
NEMA 4 with keyboard, up to 2 path/channel, IP64, AC power, Two 4-20mA, Two Relays, One RS-232C/485	100L			
Transducers				
Clamp-On, DN20~80, up to 120 C, Intrinsically Safe. 0.02 to 12 m/s	XLB			
Clamp-On, DN50~300, up to 120 C, Intrinsically Safe. 0.02 to 12 m/s	XLC			
Clamp-On, DN300~900, up to 120 C, Intrinsically Safe. 0.02 to 12 m/s	XLD			
Clamp-On, DN500~3000, up to 120 C, Intrinsically Safe. 0.02 to 12 m/s	XLE			
Clamp-On, DN2000~6000, up to 120 C, Intrinsically Safe. 0.02 to 12 m/s	XLF			
Inline, 1/2" flow tube, 200 mm length, 316SS, 0.5~10 LPM	XIL1			
Inline, 1/2" flow tube, 400 mm length, 316SS, 0.25~5 LPM	XIL2			
Inline, 3/4" flow tube, 200 mm length, 316SS, 1.0~20 LPM	XIL3			
Inline, 3/4" flow tube, 400 mm length, 316SS, 0.5~10 LPM	XIL4			
Insertion DN50~500, up to -40~120 C	XIS			
Insertion DN500~6000, up to -40~120 C	XIL			
Signal Cable				
None cable	NC			
10m cable (standard).	C10			
cable length is **(<200m)	C**			
Options				
None option	NN			
Mounting track for transducer XLB	MTB			
Mounting track for transducer XLC	MTC			
Mounting track for transducer XLD	MTD			
Mounting track for transducer XLE/XLF	MTE			
Portalbe easy mounting track for XLC,XLD	ETP			
Portalbe magnetic mounting track for XLC,XLD,XLE	MTP			
Remote control for 10L	RC			

ALSONIC Series High Frequency Portable Flow Meter

ALSONIC DSP - PL			
Transmitter			
Portable type, up to 2 path/channel, IP66, AC power Two 4-20mA, Two Relays, One RS-232C/485	PL		
Transducers			
Clamp-On, DN6~30, up to 120 C, Intrinsically Safe. 0.02 to 12 m/s	XLA		
Clamp-On, DN20~80, up to 120 C, Intrinsically Safe. 0.02 to 12 m/s	XLB		
Clamp-On, DN50~300, up to 120 C, Intrinsically Safe. 0.02 to 12 m/s	XLC		
Clamp-On, DN300~900, up to 120 C, Intrinsically Safe. 0.02 to 12 m/s	XLD		
Clamp-On, DN500~3000, up to 120 C, Intrinsically Safe. 0.02 to 12 m/s	XLE		
Clamp-On, DN2000~6000, up to 120 C, Intrinsically Safe. 0.02 to 12 m/s	XLF		
Signal Cable			
None cable	NC		
10m cable (standard).	C10		
cable length is **(<200m)	C**		
Options			
None option	NN		
Mounting track for transducer XLA	MTA		
Mounting track for transducer XLB	MTB		
Mounting track for transducer XLC	MTC		
Mounting track for transducer XLD	MTD		
Mounting track for transducer XLE/XLF	MTE		
Portalbe easy mounting track for XLC, XLD	ETP		
Portalbe magnetic mounting track for XLC, XLD, XLE	MTP		
Remote control	RC		

ALSONIC Series High Frequency Open Channel Flow Meter

ALSONIC DSP - AVM			
Transmitter			
NEMA 4 with keyboard, up to 4 path/channel, IP64, AC power, Two 4-20mA, Two Relays, One RS-232C/485	100LM		
Transducers			
Open channel, width 1-3 m	XOD		
Open channel, width 3-40 m	XOE		
Signal Cable			
None cable	NC		
10m cable (standard).	C10		
cable length is **(<200m)	C**		
Options			
None option	NN		
Laser Alignment Tool	LAT		
Mounting track open channel, 1 pairs	MTO		
Other option1	P1		
Other option2	P2		