



# SL 3488

High Dynamic Response Ultrasonic Flowmeter

## High Dynamic Response Inline Ultrasonic Flowmeter

The model SL3488 inline ultrasonic flowmeter (here in after referred to as SL3488) is a true state-of-the-art transit-time flowmeter designed using PICOFLY technology and 0.01nanosecond (10 picoseconds) resolution; the flow sample rate achieved is 256 discrete flow measurements per second, which provides a true high dynamic response flowmeter. This makes this meter for rapid on/off or pulsating flow applications.

SL3488 is designed using the latest digital technology. This meter features high reliability, low maintenance and no moving parts. Unique digital signal processing and correlation programming from the MPU provide instantaneous meter measurement (no damping needed)

SL3488 has been tested under rigorous field working conditions and has shown steadfast performance, which offers the customer confident worry-free measurement. Compared with other flowmeters and other ultrasonic flowmeters, the SL3488 is characterized by high accuracy, high credibility, superior performance, very rapid response to flow changes, and low cost.

### Applications by Industry

- ◆ Petrochemical
- ◆ Refining
- ◆ Steel
- ◆ Metallurgy
- ◆ Paper
- ◆ Coal
- ◆ Water supply
- ◆ Seawater
- ◆ Industrial process water
- ◆ Irrigation
- ◆ Cooling water
- ◆ Oil
- ◆ Beverage
- ◆ Chemical
- ◆ Many others...

### Features

- ◆ High reliability
- ◆ Long-term stability
- ◆ High dynamic response, real-time flow change tracking
- ◆ Menu driven operation (no instructions needed)
- ◆ High accuracy: 0.5 % of measurement
- ◆ Highly stable zero
- ◆ PC enclosure, (water and corrosion proof)

### Liquid Type

Suitable for single-phase liquids (with low suspended solids/air bubble content) in a full pipe.



### Parameters

- ◆ Dynamic response: 1s
- ◆ Flow measurement acquisition rate 256/s
- ◆ Time resolution 10 picoseconds
- ◆ Cable signal attenuation (1MHz) <-0.9db/100m
- ◆ CPU+FPGA system
- ◆ When the power supply is interrupted battery backup automatically operates
- ◆ Installation validation function



## Technical Specifications

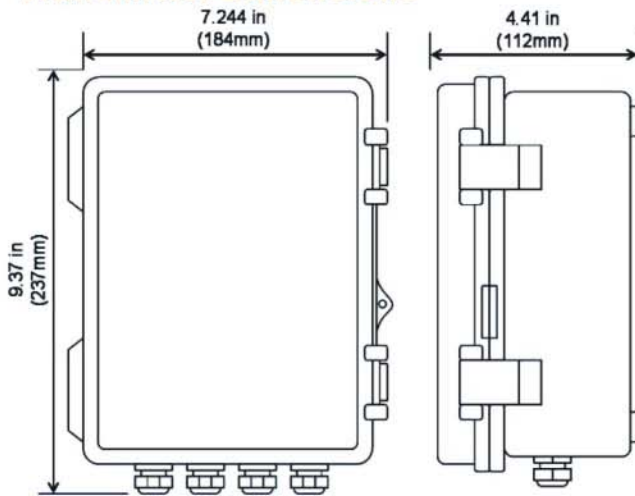
### Transmitter

- Accuracy:  $\pm 0.5\%$  of reading
- Repeatability: 0.2%
- Flow velocity range: 0~7m/s
- Pipe size: DN25-DN250
- Ambient temp. rating:  $-10^{\circ}\text{C} \sim 60^{\circ}\text{C}$  (- 10~140 F)
- Serial interface: RS232 (standard)
- Pulse output: 0~10kHz
- Protection rating: IP66
- Enclosure: PC Plastic

### Carbon steel spool piece with wetted transducers

- Pipe size: DN25~DN250 (1" ~10" )
- Flow tube (spool) materials: carbon steel + corrosion-resistant coating (NON-TOXIC)
- Press rating; PN1.6MPa (232 psig)
- Protection rating: IP68
- Temperature range:  $-40^{\circ}\text{C} \sim 80^{\circ}\text{C}$  (- 40~176 F)
- Flanges: DIN or ANSI type

### Transmitter Dimensions

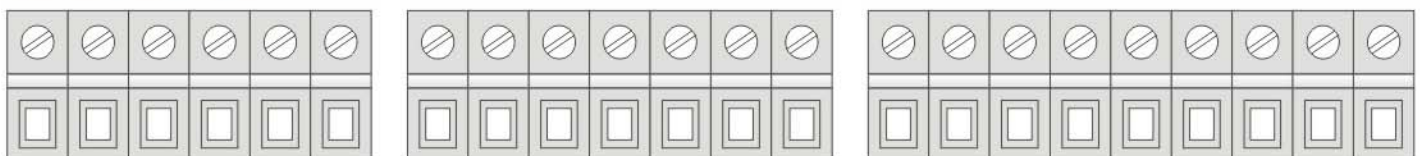


### Carbon Steel (Stainless steel) Spool piece:

Pipe size DN(mm)	Dimensions (mm)		
	L	H	W
25	400	120	180
40	450	135	200
50	500	150	210
65	400	230	165
80	400	245	190
100	400	265	215
150	450	315	280
200	550	365	335
250	600	415	405

Transducer 's Dimensions (DN65~DN250)		Transducer 's Dimensions (DN25~DN50)	

## Wiring diagram



L N PE E	P- P+	I- I+ Fr- Fr+ NC NO COM	GND RX TX	E DN- DN+ E UP- UP+
AC Power (85 ~ 265V)	12~24VAC 12~36VDC	OUTPUT 4~20mADC OUTPUT 0 ~ 10KHz OUTPUT Relay	RS232	TRANSDUCER



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## Measurement Site Selection

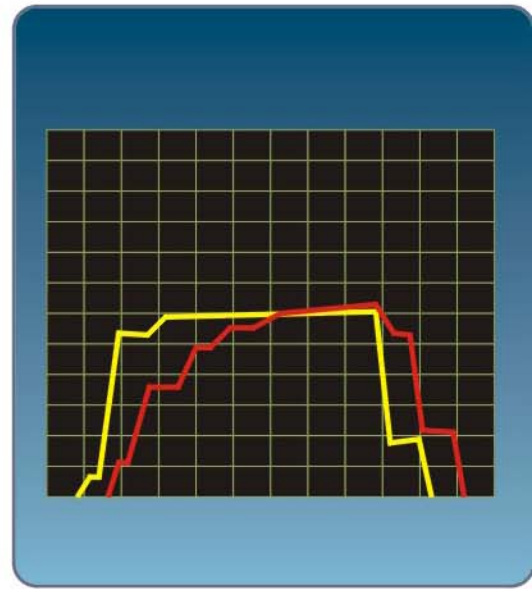
SL3488 inline ultrasonic flowmeter is easy and convenient to install. When the measured pipe size is consistent with the spool piece size, you can select a proper measurement site and install the meter which is ready to use.

When selecting a measurement site, it is important to select an area where the fluid flow profile is fully developed to guarantee a highly accurate measurement. Use the following guidelines to select a proper measurement installation site:

Choose a section of pipe, which is always full of liquid, such as a vertical pipe with flow in the upward direction or a full horizontal pipe.

Generally, it requires at least 10 D (pipe diameters) upstream & 5D (pipe diameters) downstream. If there is a pump, a tee section, control valve, orifice, expansion joint or other element which could cause flow disturbances, the upstream straight pipe required will be greater than 10D.

Ensure that the pipe surface temperature at the measuring point is within the transducer temperature limits.



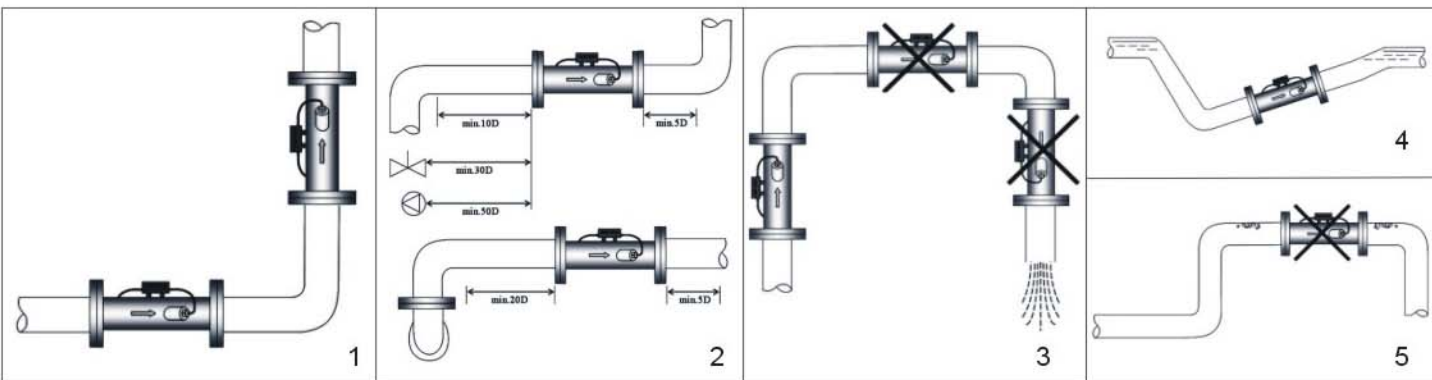
## Dynamic flow response curve

SL3488 flow curve ( yellow line)

Electromagnetic flow curve (red line)

Note: D is the pipe diameter

## Spool Piece Installation Methods



(1): Install the flowmeter on horizontal and vertical pipes  
Note: Make sure the pipe is full of liquid

(2): Install the flowmeter after elbows, valves and pumps  
Note: Ensure the pipe on both sides of the flowmeter is straight.

(3): Install the flowmeter in a pipe that discharges to Atmosphere  
Note: Transducers should not be installed on a pipe that discharges to atmosphere unless it is far enough upstream to be sure the pipe is full at the point of installation

(4): For a partially filled pipe section, ensure the pipe section being measured is full of liquid  
Note: The flowmeter should be installed in a pipeline that is full of fluid. If the pipe is not full or there is only one free horizontal pipe (discharge), connect the transducer in the lower part of the Pipe.

(5): Avoid installing the flowmeter at the upper part of a pipe section like the above  
Note: Air pockets or air locks can collect in this type of pipe sections



## SL3488 Inline Ultrasonic Flowmeter with Remote Electronics

Model	Description
SL 3488	<p>Digital Correlation Transit Time Flowmeter</p> <p>Installation method: inline spool piece with wall mount electronics</p> <p>Flow Range: 0~7 m/s</p> <p>Accuracy: 0.5% of measurement, Repeatability: 0.2%</p> <p>Display: 20×2, alphanumeric, backlit LCD</p> <p>Communications: RS232 terminal</p> <p>Transducer: inline spool piece wetted transducer,</p> <p>Material: Carbon Steel + anti-corrosion coating(NON-TOXIC)</p> <p>Power supply: 85~265VAC@50/60Hz or 12~36VDC or 12~24VAC@50/60Hz</p> <p>Outputs: OCT pulse output, relay output, RS-232</p> <p>Enclosure: IP66, PC/ABS Engineering Plastic enclosure</p> <p>Operation Mode: 4×4 touch keys</p>
Code	Spool piece Dimensions
DN25	PI style, length 400mm, anti-corrosion coating(Epoxy, NON-TOXIC),Stainless Steel no coating
DN40	PI style, length 450mm, same above
DN50	PI style, length 500mm, same above
DN65	Spool piece, length 400mm, same above
DN80	Spool piece, length 400mm, same above
DN100	Spool piece, length 400mm, same above
DN150	Spool piece, length 450mm, same above
DN200	Spool piece, length 550mm, same above
DN250	Spool piece, length 600mm, same above
Code	Flange specifications
ANSI	ANSI 150# Flanges, pressure rating ANSI 150#
DIN	DIN National Flanges, pressure rating PN16
Code	Pipe Material
CS	45 Carbon steel
304 SS	304 Stainless steel
316 SS	316 Stainless steel
<p>Standard Model: SL3488-DN100-ANSI-CS</p> <p>Description: DN100 pipe size, Carbon Steel ANSI flanged ultrasonic flowmeter with wall mount electronics</p>	