

# Ultrasonic Transit-Time Flow Meter

## Features

- Accuracy +/- 0.5% of reading
- Repeatability +/- 0.5% of reading
- Wide operating temperature range  
-40F to 176F (-40C to 80C)
- Available with high temperature clamp-on transducers -40F to 340F (-40C to 170C)
- Available with insertion high temperature transducers -40F to 300F (-40C to 150C)
- Wide bi-directional Flow range of 0 to 40 ft/s (0 to 12 m/s)
- One meter for a wide range of pipe sizes from 1" to 200" (25mm to 5000mm)
- Clamp-on sensors require no pipe cutting, no plant shut-down, are a hygienic measurement leading to lower installation and labor costs
- Available with standard insertion transducers or small (0.75" diameter) insertion transducers for pipes smaller than 16" (DN 400)
- Daily, monthly and yearly totalized flow
- Internally configured batch controller makes batch control convenient
- Measurement is independent of fluid conductivity for a wider applicability than magnetic meters
- 1 gig SD card high memory data logger
- Optional MODBUS
- Energy monitoring standard; accepts two direct-wired RTD's

**SIERRA**  
INSTRUMENTS  
THE MASS FLOW COMPANY



For information online: [www.sierrainstruments.com](http://www.sierrainstruments.com)

# Innova-Sonic® Model 205



## Description

**O**ur Innova-Sonic® ultrasonic flow meter is a state-of-the-art universal transit-time flow meter incorporating the latest developments in digital signal processing. Sophisticated electronics coupled with powerful ultrasonic transducers deliver highly accurate flow measurement for liquids in full pipes. While principally designed for clean liquid applications, the instrument is tolerant of liquids with the small quantity of air bubbles or suspended solids common in most industrial applications.

Innova-Sonic® offers low power consumption, high reliability, and outstanding applicability at an economical price. An easy to read display and clear, user-friendly menu selections make using the instrument simple and convenient. The instrument can be configured via keypad without any additional programming devices, is packaged in a die cast NEMA 4X (IP65) housing, and is available in your choice of non-invasive clamp-on or insertion transducer configurations.

Innova-Sonic® features a self-contained 4-20 mA current loop signal output for instantaneous flow, as well as two independent temperature inputs for thermal energy monitoring. High Temperature clamp-on sensors are available for condensate measurement.

The instrument also features a 7 digit alpha-numeric display, parallel operation of positive, negative and net flow totalizers (with user-selectable scale factors) and configurable pulse and frequency outputs (transmitted via relay and open collector) for totalized flow. SD data logging capability is included and energy monitoring is fully supported at no additional charge.

## Performance Specifications

### Flow Range:

0 to +/- 40 ft/s (0 to +/- 12 m/s)

### Accuracy:

+/- 0.5% of reading

### Repeatability:

+/- 0.5% of reading

### Pipe Size:

1 in to 200 in (25mm to 5000mm)

## Operating Specifications

### Output:

Analog: 0/4 to 20mA (max load 750Ω)  
 Pulse output: 0 to 9999Hz, OCT, (min. and max. frequency is adjustable)  
 Relay output: SPST, max 1Hz, (1A@125VAC or 2A @ 30VDC)  
 Digital output: RS232 or RS485

**Power Supply:** 90 to 250 VAC, 48 to 63 Hz and  
 10 to 36 VDC (both are available on each unit)

**Keypad:** 16 (4x4) key with push buttons

**Display:** 40 character, 2 line (20x2) lattice alphanumeric, backlit LCD

**Temperature:** Transmitter: -40F to 140F (-40C to 60C)  
 Clamp-on transducer: -40F to 176F (-40C to 80C)  
 Insertion transducer: -40F to 176F (-40C to 80C)  
 Clamp-on high-temperature transducer: -40F to 340F (-40C to 170C)  
 Insertion high-temperature transducer: -40F to 300F (-40C to 150C)

### Insertion Transducer Pressure:

Max operating pressure 20 barg, 300 psig

**Humidity:** Up to 99%RH, (non-condensing).

## Physical Specifications

**Transmitter:** NEMA 4X (IP65), die-cast aluminum

**Transducer:** Encapsulated design standard/maximum cable length:  
 30ft/1000ft (9m/305m)

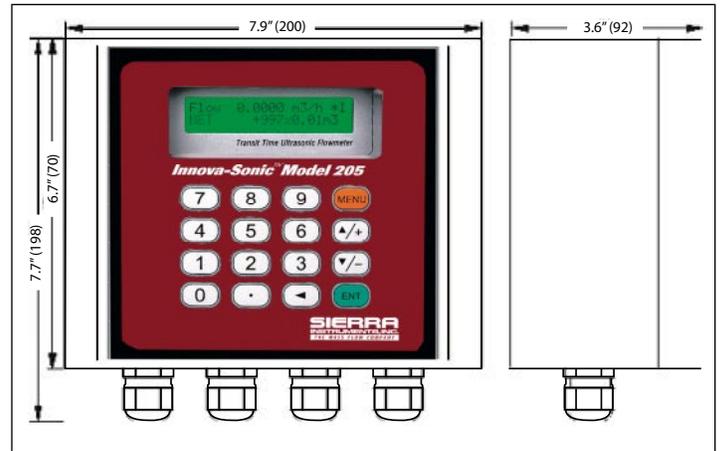
**Weight Transmitter:** Approximately 4.7 lb. (2.15kg)

Transducer: approximately 2.0 lb. (0.9kg) (standard)

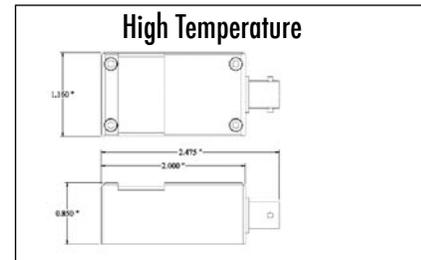
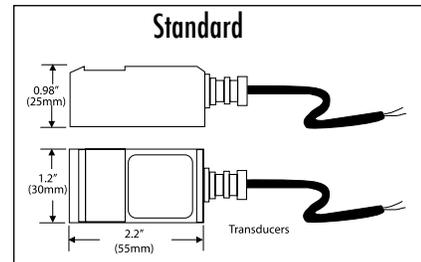
## Typical Clamp-On Installation



## Transmitter Dimensional Specifications



## Clamp-on Transducer Dimensional Specifications



## Typical Insertion Installation

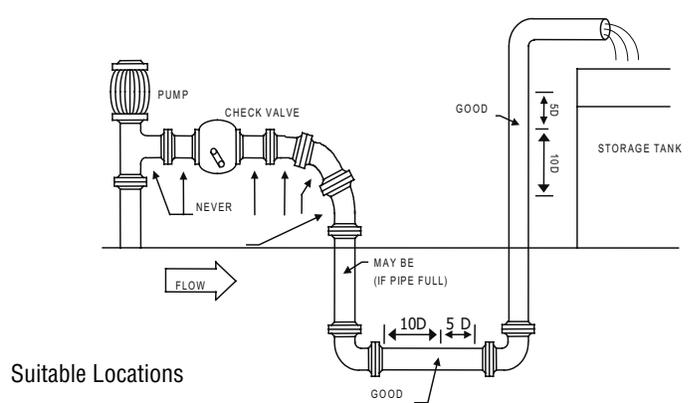
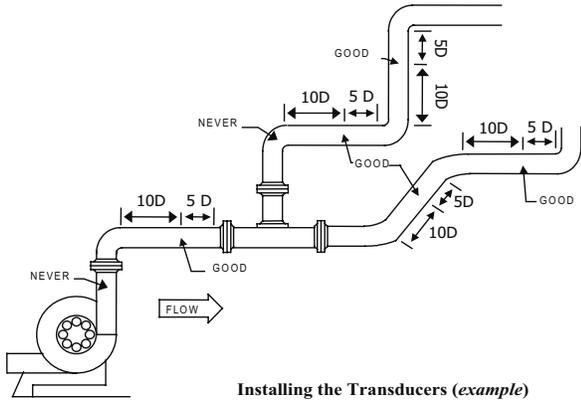


Standard Insertion Transducer

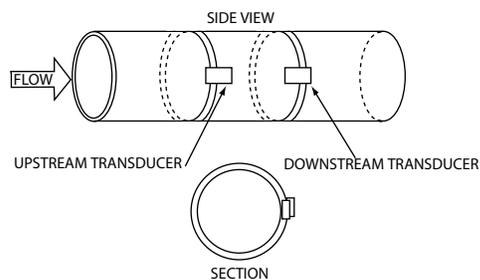
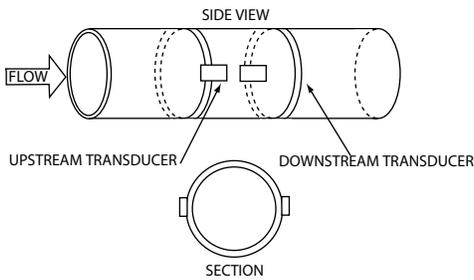


Small (3/4") Insertion Transducer

## Suitable Locations

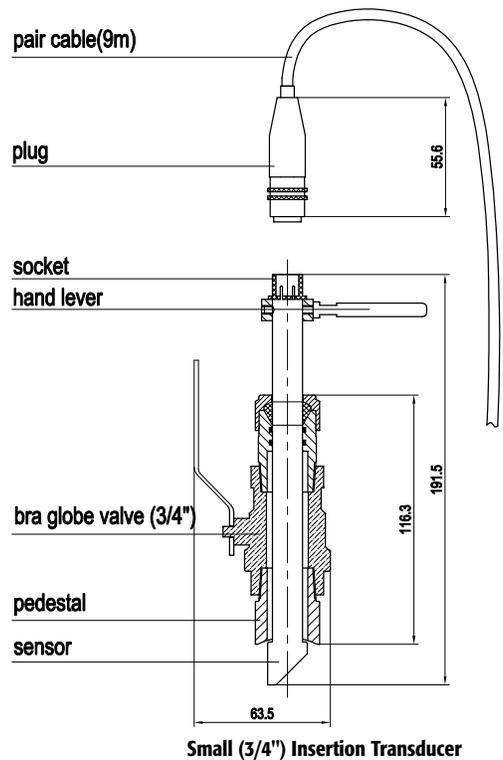
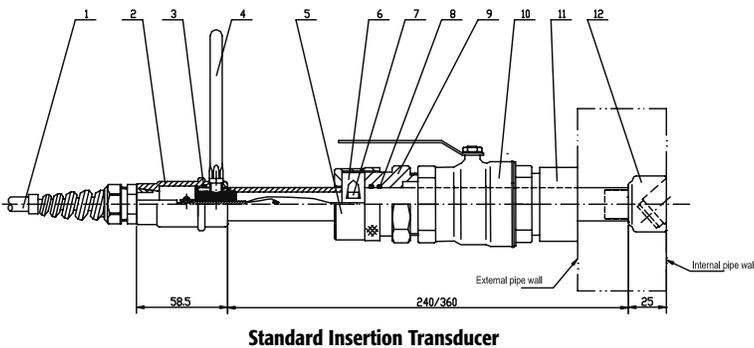


## Transducer Spacing Requirements

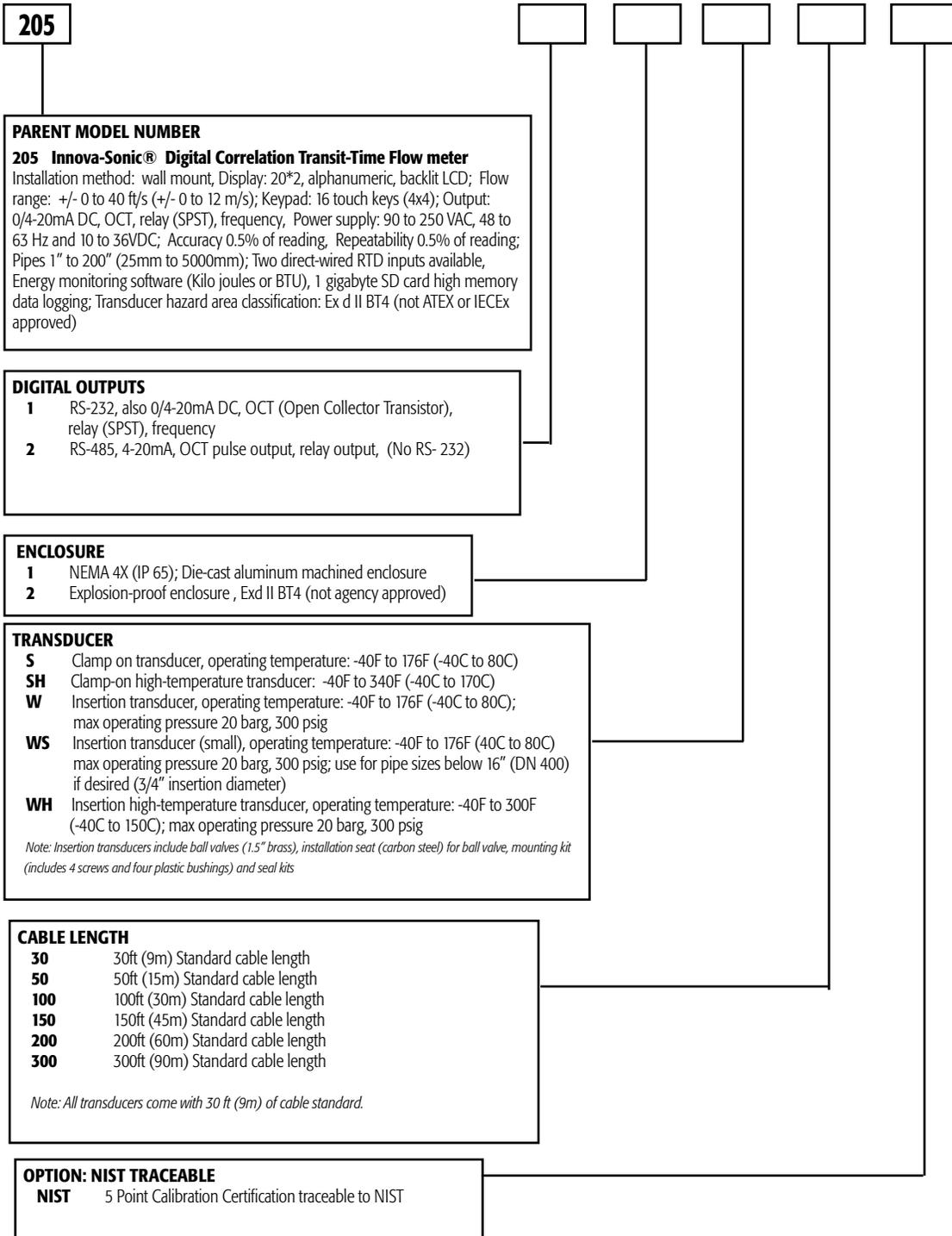


## Insertion Transducer

DIMENSIONAL SPECIFICATIONS-STANDARD INSERTION SENSOR			
No.	Parts	No.	Parts
1	Cable	7	Set Screw
2	End Connector	8	O-Ring
3	O-Ring	9	Nut
4	Alignment Handle	10	Ball Valve
5	Locking Sleeve	11	Mounting Collar
6	Locking Collar	12	Transducer Housing



## Ordering the Model 205



**205**

**PARENT MODEL NUMBER**  
**205 Innova-Sonic® Digital Correlation Transit-Time Flow meter**  
 Installation method: wall mount, Display: 20\*2, alphanumeric, backlit LCD; Flow range: +/- 0 to 40 ft/s (+/- 0 to 12 m/s); Keypad: 16 touch keys (4x4); Output: 0/4-20mA DC, OCT, relay (SPST), frequency, Power supply: 90 to 250 VAC, 48 to 63 Hz and 10 to 36VDC; Accuracy 0.5% of reading, Repeatability 0.5% of reading; Pipes 1" to 200" (25mm to 5000mm); Two direct-wired RTD inputs available, Energy monitoring software (Kilo joules or BTU), 1 gigabyte SD card high memory data logging; Transducer hazard area classification: Ex d II BT4 (not ATEX or IECEx approved)

**DIGITAL OUTPUTS**  
**1** RS-232, also 0/4-20mA DC, OCT (Open Collector Transistor), relay (SPST), frequency  
**2** RS-485, 4-20mA, OCT pulse output, relay output, (No RS- 232)

**ENCLOSURE**  
**1** NEMA 4X (IP 65); Die-cast aluminum machined enclosure  
**2** Explosion-proof enclosure , Exd II BT4 (not agency approved)

**TRANSDUCER**  
**S** Clamp on transducer, operating temperature: -40F to 176F (-40C to 80C)  
**SH** Clamp-on high-temperature transducer: -40F to 340F (-40C to 170C)  
**W** Insertion transducer, operating temperature: -40F to 176F (-40C to 80C); max operating pressure 20 barg, 300 psig  
**WS** Insertion transducer (small), operating temperature: -40F to 176F (40C to 80C) max operating pressure 20 barg, 300 psig; use for pipe sizes below 16" (DN 400) if desired (3/4" insertion diameter)  
**WH** Insertion high-temperature transducer, operating temperature: -40F to 300F (-40C to 150C); max operating pressure 20 barg, 300 psig  
*Note: Insertion transducers include ball valves (1.5" brass), installation seat (carbon steel) for ball valve, mounting kit (includes 4 screws and four plastic bushings) and seal kits*

**CABLE LENGTH**  
**30** 30ft (9m) Standard cable length  
**50** 50ft (15m) Standard cable length  
**100** 100ft (30m) Standard cable length  
**150** 150ft (45m) Standard cable length  
**200** 200ft (60m) Standard cable length  
**300** 300ft (90m) Standard cable length  
*Note: All transducers come with 30 ft (9m) of cable standard.*

**OPTION: NIST TRACEABLE**  
**NIST** 5 Point Calibration Certification traceable to NIST