

# KWS200

## Ultrasonic Sludge Density Meter



**Suspended Solid  
Monitoring System**

**Sophisticated measurement of sludge density  
with new calculation principles and algorithms**

# KWS200 Ultrasonic Sludge Density Meter

KWS200 is an ultrasonic instrument that measures the density of suspended solid in liquid.

It comprises of sensors, a controller, and a junction box.

KWS200 with PCM (Process Condition Monitoring) algorithm measures not only the size of received signal, which is often measured by conventional ultrasonic density meters but also observes changes in sound velocity and temperatures in the process. As it monitors operational status and water status in pipe and then decides the validity of each measurement, it contributes to increasing stability and reliability of the measurement.

The KWS200 utilizes the EEA (Envelope Energy Average) method that saves reception signal envelope and then calculates its energy, rather than using the reception signal's amplitude change.

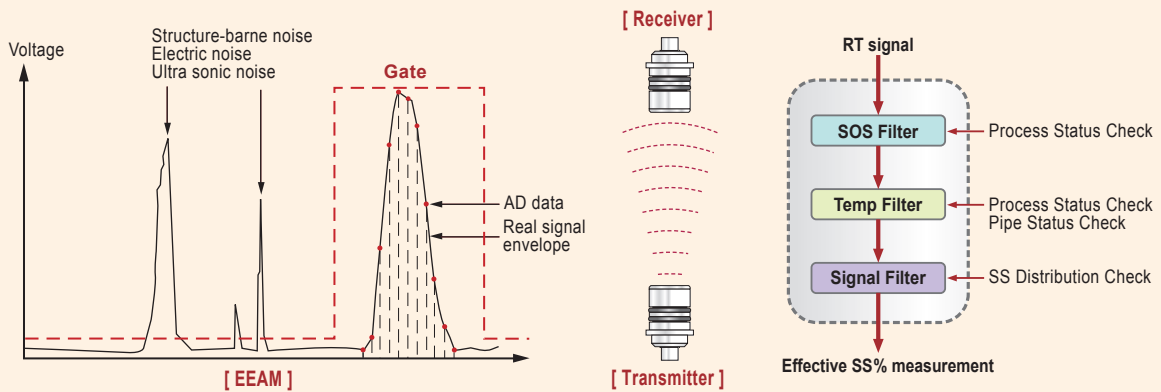
KWS200 offers three types of sensors, such as spool-piece, tank-mount, and insertion type to accommodate all field demands at installation.

## EEAM (Envelope Energy Average Method)

Conventional ultrasonic attenuation density meter just determines density with amplitude of received signals. Unlike this, KWS200 is able to measure changes of concentration in a more sophisticated manner by adopting the patented EEAM (envelope energy averaging method), which measures not only the amplitude of received signals but also observes the shape of signal. It takes all energy as envelope and then convert it into density.

## PCM (Process Condition Monitoring)

PCM algorithm consists of SOS filter that measures sound velocity of measuring fluid (S.S. mixed water); temp filter that measures temperature; and signal filter that monitors quality of received signals. Operational status (process run/stop, pipe full/empty) is determined by the combination of SOS filter and Temp filter. Signal filter helps to decide the valid S.S. distribution. Since the PCM algorithm assimilates many measurements identifying changes of process condition (water status in pipe, and S.S. distribution pattern), its intelligence is designed to measure only valid S.S. concentration. Consequently, the performance is much more reliable and accurate, compare to conventional measurement.



## Product Features

- Continuous measurement
- Process monitoring possible (run, stop, full, empty)
- 10,000 points Data Logging & Trend Mode
- EEAM (Envelope Energy Average Method)
- Various types of sensors
- In-situ measurement and calibration

## Application Industry

- Water, wastewater treatment
- Pulp and paper
- Food and beverage
- Chemical
- Mining



## Benefits

- Automates sludge discharge.
- Reduces the amount of polymers used in the dewatering process.



## Standard Specification

### KWS200 Controller

measuring range	2,000 – 200,000mg/ℓ (0.2 – 20%)	
resolution	100mg/ℓ (0.01%)	
accuracy	±5% or ±2000mg/ℓ whichever is greater	
repeatability	±1% of reading value	
outputs	analog	4 – 20mA 250Ω Resistance load
	relay	3 SPDT (5A, 250VAC), "ER" "R1" "R2"
	digital	RS232C (standard) or RS485
power source	standard	100 – 240VAC 50/60Hz, < 6W
	option	20 – 30VDC
housing material	housing	FRP
	window	polycarbonate
dimension	237(W) × 291(H) × 138(D) mm	
mounting	153(W) × 273(H), Φ8.2 × 4	
operational temperature	–20 to 60°C	
weight	3kg	
protection	IP67	
certification	CE, NRTL (pending)	



### Sensor

Model	S2-S (spool piece)	S2-T (tank mount)	S2-I (insertion)
material	316SS	316SS	316SS
pipe size	50 – 600mm	_____	_____
frequency	1 MHz	1 MHz	1 MHz
max. pressure	10bar	10bar	10bar
cable	10m (100m max.)	10m (100m max.)	10m (100m max.)
operational temperature	–10 to 60°C	–10 to 60°C	–10 to 60°C
protection	IP68	IP68	IP68
cleaning device	optional	_____	_____

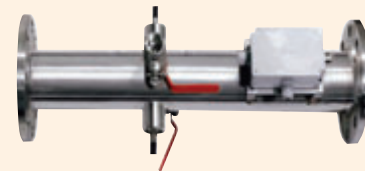
S2-T



### Junction box

Housing	AL	
operational temperature	–10 to 80°C	
weight	450g	
protection	Standard	IP65
	Option	IP68

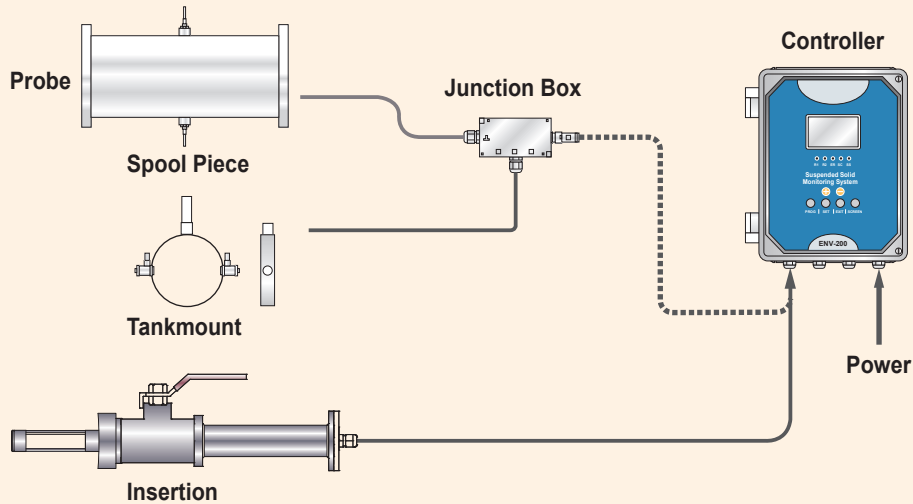
S2-S



S2-I

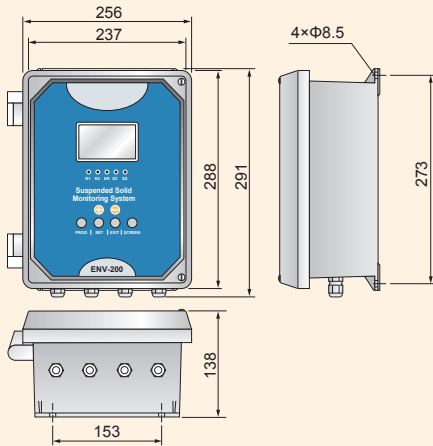


## System Layout

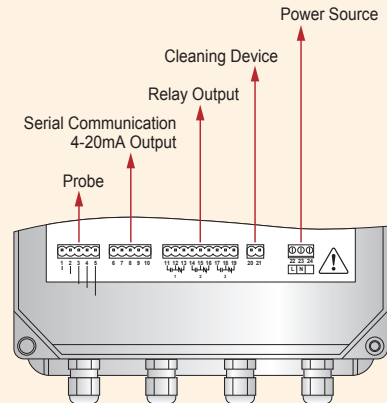


## General Drawings / Controller Crossline Drawing

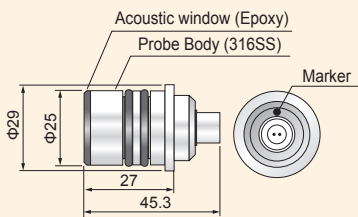
### ● Controller



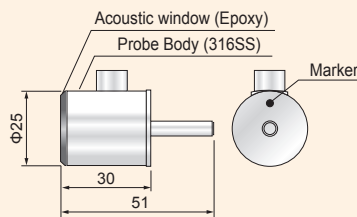
### ● Controller Crossline Drawing



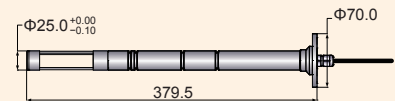
### a Spool Piece type



### b Tank Mount type



### c Insertion type



## Line of business

- Rotary paddle level switch
- Vibration level switch
- Swing level switch
- Acoustic level switch
- Capacitance level switch
- Capacitance proximity sensor
- Capacitance level meter
- Diaphragm level switch
- Tilt level switch
- Leakage level switch
- Microwave level switch
- Sounding level meter
- Flow switch
- Conductance level switch
- Float switch
- Float level meter
- Ultrasonic level meter
- Conveyor peripheral sensor
- Dust monitoring system
- Oxygen analyzer
- LAZAR Level meter
- RADAR Level meter
- Sludge blanket level meter
- Ultrasonic flowmeter

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Design, development and manufacture  
 of level measuring sensors

\*Please be sure to read USER'S GUIDE, Installation & Operation  
 Instructions before using the instrument.

\*The specifications herein may be subject to change without advance notice.

Agent