03. Ultrasonic Sludge Density Meter

The ENV200 is an ultrasonic instrument that measures the density of suspended solid in liquid. It consists of sensors, a controller, and a junction box.

ENV200 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 ENV200 utilizes the EEA (Envelope Energy Average) method that saves reception signal envelop and then calculates its energy, rather than using the reception signal's amplitude change.

ENV200 offers three types of sensors, such as spool-piece, tank-mount, and clamp-on type to accommodate all field demands at installation.

Product Features

1. Continuous measurement
2. Process monitoring possible (run, stop, full, empty)
3. 10,000 points data logging
4. EEAM(Envelope Energy Average Method)
5. Various types of sensors

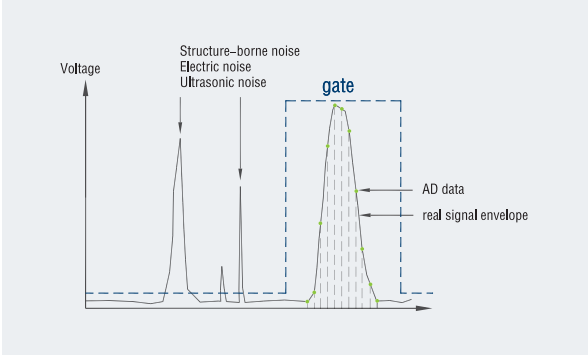
Applications

1. Water, wastewater treatment
2. Food and beverage
3. Chemical
4. Mining
5. Pulp & paper
6. Power plant



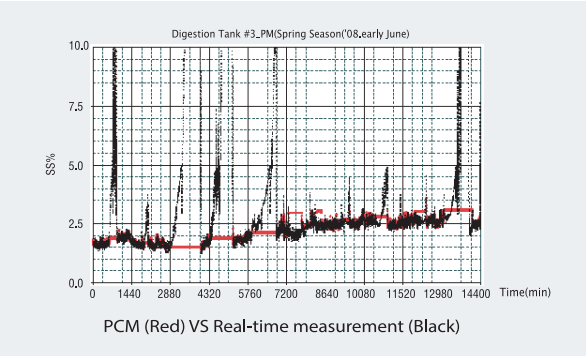
Measuring Algorithm

EEAM (Envelope Energy Averaging Method)



Conventional ultrasonic attenuation density meter just determines density with amplitude of received signals. Unlike this, ENV200 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 (Red) VS Real-time measurement (Black)

PCM algorithm consists of SOS , temperature, and signal filters.
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

Specifications

Controller



C2S1

Model	C2S1
Measuring Principle	Ultrasonic Attenuation and EEAM(Envelope Energy Average Method)
Measuring Ranges	0 ~ 200,000mg/l (0 ~ 20%), 0 ~ 400,000mg/l (Option)
Measuring Mode	Process Mode, Real-time Mode
Self - Diagnosis	Sensor strength, Flow running/stop, Pipe in full/empty
Display	Graphic LCD (Density, Time, Pipe condition, Flow condition, mA etc.)
Resolution	100mg/l (0.01%)
Accuracy	± 1% of F.S. or ±2000mg/l, whichever is greater
Repeatability	± 1% of reading
Operational Temp.	-20 ~ 70°C
Outputs	•mA Output : 4~20mA, nom. Load 250Ω (load range : 100 ~ 750Ω) •Relay Output : 3 SPDT(5A, 250VAC) •Digital Output : RS232C(Standard) or RS485(Option)
Power Supply	•Standard : 100 ~ 240V AC, 50~60Hz, ≤6W •Option : 10~14V DC, 22 ~ 26V DC
Encl. Material	Body/Cover : Polycarbonate
IP Rating	IP67
Saving Memory	10,000 points (Max. 400 days)
Certificate	CE

Sensors



S2S

Model	Spool-piece(S2S)
Material	S.S.304
Pipe size	50A ~ 600A
Frequeny	1.4MHz
Operational Temp.	-10 ~ 60°C
Cable Length	10m(standard)
IP Rating	IP65, IP68(Option)



S2T

Model	Tank-mount (S2T)
Material	S.S.304
Pipe size	〉 200A
Frequeny	1.4MHz
Operational Temp.	-10 ~ 60°C
Cable Length	10m(standard)
IP Rating	IP68