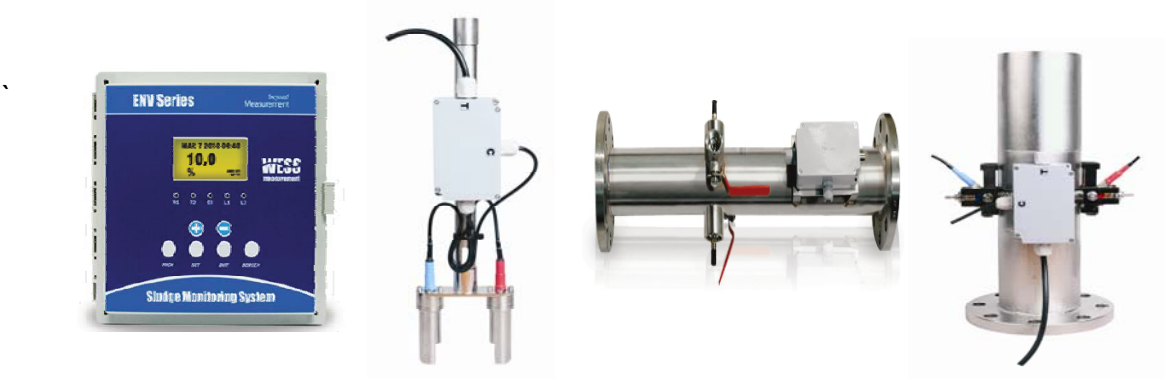
Ultrasonic Sludge Density Monitoring System



The ENV-200 is an ultrasonic instrument that measures the density of suspended solid in liquid. It comprises 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 ENV-200 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. ENV-200 offers three types of sensors, such as spool-piece, tank-mount, and Clamp-on type to accommodate all field demands at installation..

Benefits

Automates sludge discharge

Reduces the amount of polymers used in the dewatering process

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

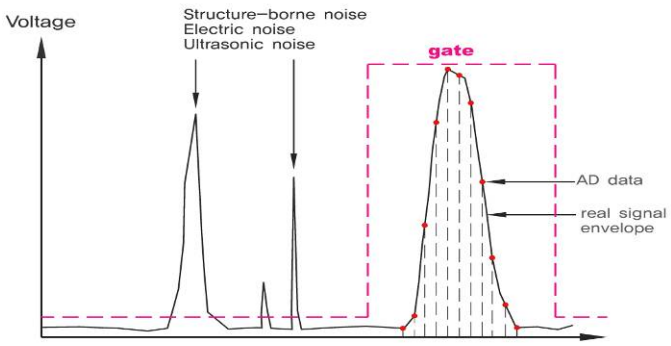
- Water, wastewater treatment
- Pulp and paper
- Food and beverage
- Chemical
- Mining

WESS measurement

Measuring Algorithm

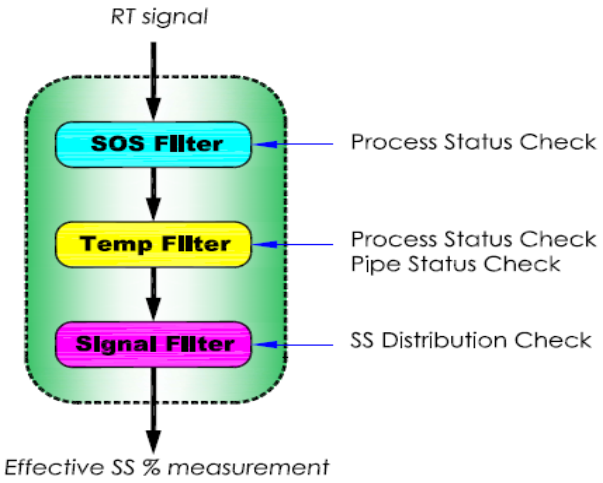
EEAM

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

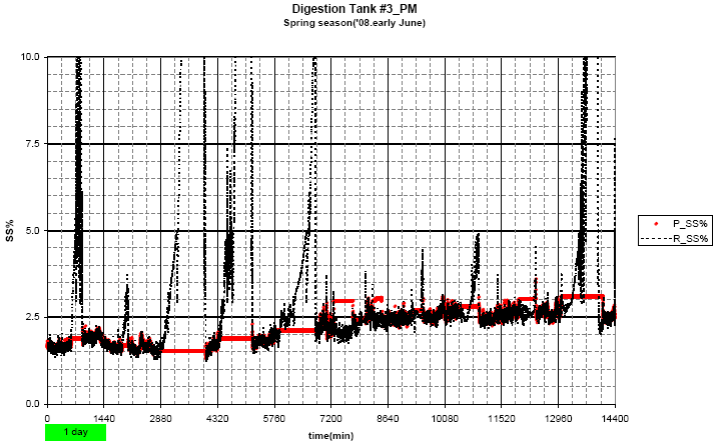


PCM(Process Condition Monitoring)

PCM 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.



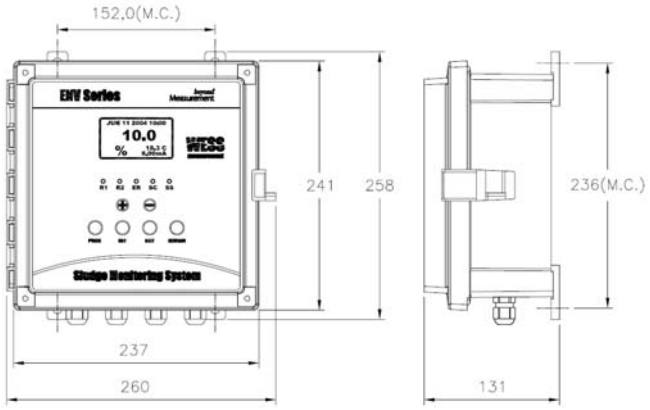
Since the PCM algorithm assimilates many measurements identifying changes of process condition (water status in pipe, and S.S. distribution pattern), its intelligence is designed to measure only valid S.S. concentration. Consequently, the performance is much more reliable and accurate, compare to conventional measurement



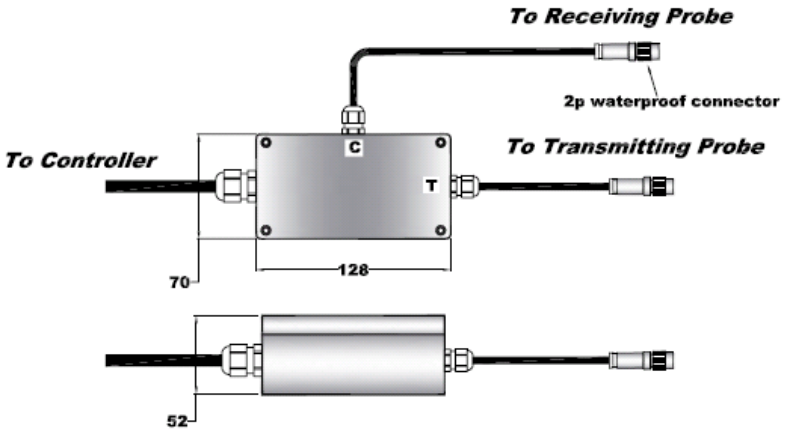
PCM(Red) VS Conventional algorithm(Black)

Product Dimensions

Electronic Device

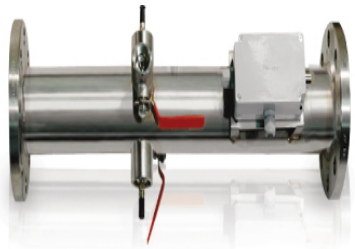


Junction box



Sensor Types

Several sensor types enable field operators to fit their need in application. The sensor size's is different from pipe diameter and density value.

Spool-piece Type	Tank-mount Type	Clamp-on Type
S2-S	S2-T	S2-C
		

WESS measurement

Product Specifications

Controller

C2-S

Measuring Principle	Ultrasonic Attenuation and EEAM(Envelope Energy Average Method)
Measuring Ranges	0 ~200,000mg/l (0~20%) Option : 0 ~ 400,000mg/l(0~40%)
Measuring Mod	Process Mode, Real-time Mode
Display	Density, Time, Pipe condition, Flow condition, mA , etc.
Resolution	0.1% or 0.01%(selectable)
Accuracy	± 1% of F.S. or ± 2,000mg/l, whichever is greater
Repeatability	± 1% of reading
Operational Temp.	-20 ~ 70°C
Data Saving	Maximum 400 days Data logging & Trend
Screen	Numeric, Process, Date Trend, Diagnosis
Outputs	Current Output : 4~20mA, nom. Load 250Ω (load range : 100 ~ 750Ω)Relay Relay Output : 3 SPDT(5A, 250VAC) – “ER” “R1” “R2” Digital Output : RS232C(Standard) or RS485(Option)
Power Supply	Standard : 100 ~ 240V AC, 50~60Hz, ≤6W Option : 20~30V DC
Encl. Material	Polycarbonate
Dimension	260(W) x 258(H) x 131(D)mm
Mounting	Hole center 153(W) x 273(H) mm(Ø 8.2 x 4ea)
Weight	3 kg
IP Rating	IP67
Certificate	CE

Sensor

S2-S(Spool-piece type)

Material	Body : S.S.316, Ultrasonic Head : Epoxy
Pipe size	50A~600A
Pressure	Max. 145psig(10bar)
Frequency	1MHz ~1.5MHz (Auto frequency)
Cable Length	10m(33ft), Max. 100m extensible (Junction to Controller)
Operational Temp.	-10 ~ 60°C
Weight	Depends on pipe diameter
IP Rating	IP68

S2-T(Tank-mount type)

Material	Body : S.S.316, Ultrasonic Head : Epoxy
Pressure	Max. 145psig(10bar)
Frequency	1MHz ~1.5MHz (Auto frequency)
Cable Length	10m(33ft), Max. 100m extensible (Junction to Controller)
Operational Temp.	-10 ~ 60°C
IP Rating	IP68

S2-C(Clamp-on type)

Material	Body : S.S.316 and aluminum, Ultrasonic Head : Epoxy
Pipe Size	50A ~ 200A
Frequency	1MHz ~1.5MHz (Auto frequency)
Operational Temp.	-20 ~ 60°C

Junction Box

Material	ABS
Oper. Temp.	-40 ~ 85°C(-40~185°F)
Dimension	125(W) x 75(H) x 44(D)mm
Weight	450g
IP Rating	IP68
Mounting	Center hole 115(W) x 65(H) (M5 x 2pcs)
Electric Connection	
Probe	2-pin waterproof connector(30cm, 1ft)
Controller	5-core cable(10m, 30ft)

Ordering Code

ENV200 Ultrasonic Sludge Density Meter

ENV200 Series	Code	Description
Controller	C2-S	ENV200-S Controller - AC100~240V (standard)
	C2-D	ENV200-S Controller - DC20~30V
Sensor	S2-S	Spool-piece type 2sensor with junction box
	S2-T	Tank-Mount type sensor
	S2-C	Clamp-on type sensor
Pipe	D_XXX	Din Standard, XXX mm = Diameter
	J_XXX	JIS Standard, XXX mm = Diameter
	A_XXX	ANSI Standard, XXX mm = Diameter
Option	PIEV	Process insertion and extraction valve (spool-piece type only)
	PIEVD	Process insertion and extraction valve - dual (spool-piece type only)
	JT8	IP68 Junction box (standard - IP65)
	PRO	Profibus
	RS-4	RS-485 (RS-232 is provided as standard)
	RS-C	Data Download cable
	C_XXm	Additional cable extension in meters (from junction box to controller)
	MOD	Modbus protocol
Notes*	Ex) C2-S + S2-S + D_100+JT8 Standard AC Power controller with spool-piece type sensor, Pipe diameter DIN100 and junction box IP68	

WESS measurement