



ISO-9001:2000 certified

## EA Series Ultrasonic Level Transmitter

*More than just another level measurement company ....*

**A<sup>+</sup>fine**  
Aplus Finetek Sensor, Inc.

# INTRODUCTION

## OPERATING PRINCIPLE

The EA series ultrasonic level transmitter is a noncontact and easy-to-install level measuring device used for measuring the changing level or height of a liquid within an enclosed environment such as a tank, with little to no maintenance required.

During operation the EA level transmitter emits a sonic pulse, or ultrasonic sound wave, at a specific frequency which travels towards the surface of the fluid. When the ultrasonic wave reaches the fluid surface it reflects back to the EA unit. The time interval between transmission and reception of the ultrasonic wave is directly related to the empty space distance.

The EA series ultrasonic level transmitter consists of three models. It is a compact device consisting of an electronic component and a transducer. Based upon the previously described operating principle a 4~20mA output is generated, which can be connected to a PLC, DCS, panel meter or SCADA system. EA transmitters are provided with PULSE and AGC (Auto Gain Control) echo tracking technology to ensure accuracy/precision in the harshest environments.

## FEATURES

- 4~20mA 2 wire output, isolated
- Compact design
- PVDF wetted materials
- False echo detection
- Standard 2" NPT/BSPT process connection
- 6 degree beam angle
- Non-contact measurement, easy installation, not affected by temperature, S.G. and viscosity

## MAIN FUNCTIONS

- Level measurement
- Object distance measurement
- Pump control

## COMPACT DESIGN

The compact design is equipped with 3 pushbuttons and an LCD display.

## EASY SETUP

Can be configured for level or distance. Units can be set for meters, feet or inches. Simple zero and span calibration at any two points.

## RAPID RESPONSE

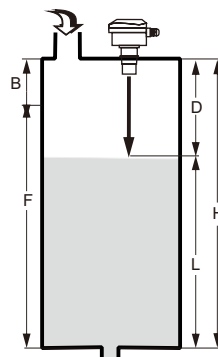
It Conventional loop powered ultrasonic level transmitters have slow response, making the measurement of fast changing fluid levels difficult. The EA series ultrasonic level transmitter can detect changing fluid level that moves up to 10m/min without signal loss.

## EXTENSIVE APPLICATIONS

Hazardous location approved unit is available. The PVDF wetted materials of construction is ideal for use with many corrosive fluids.

## IGNORES FALSE ECHOS

Selectable FER (false echo reduction) function enables the EA series transmitter to identify up to two fixed obstructions within the path of the ultrasonic beam. The EA unit will remember their location and ignore them during the measuring process.



B = Blanking distance

D = Distance from transducer to material surface

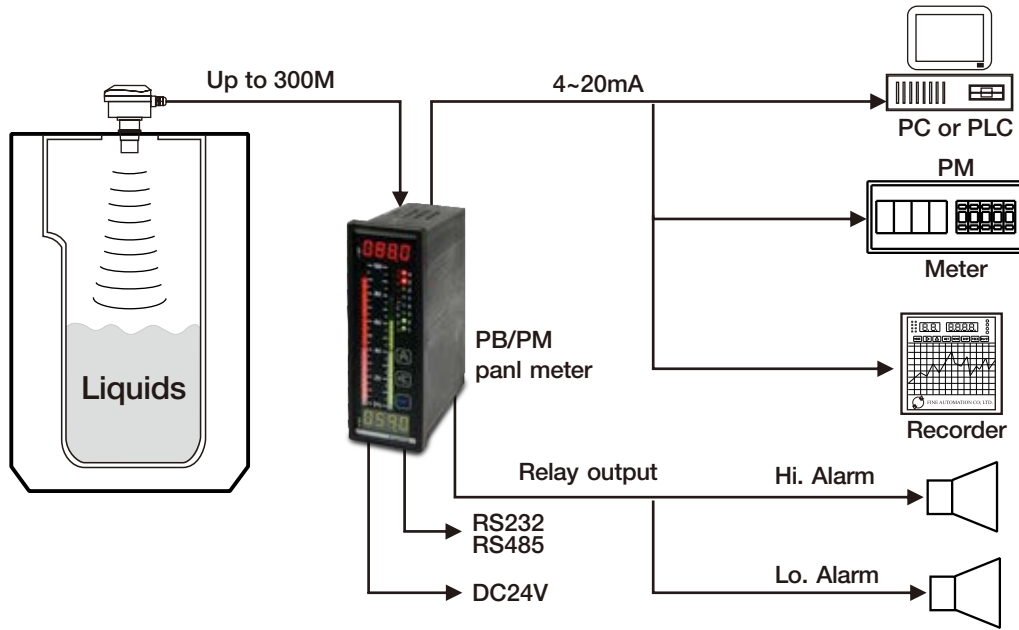
L = Fluid height in tank

## INDUSTRY USE

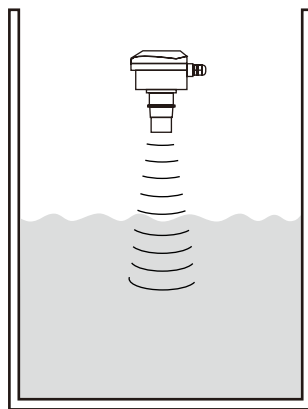
- Water treatment
- Food and beverage
- Chemical
- Liquid processing and storage

# APPLICATIONS

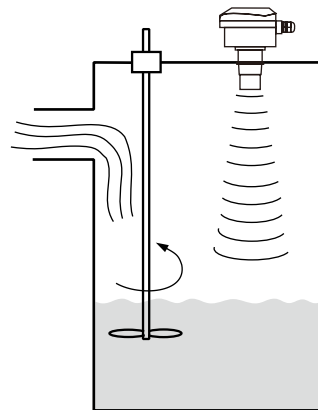
1. Water/wastewater treatment, e.g. pump control, open channel level/flow measurement, dams and wells.
2. Liquid level for edible-oils, sauces and beverages.
3. Chemical/petrochemical storage and processing, e.g. solvent, paints, carbonic acid, crude oil, diesel fuel etc.



Liquid measurement

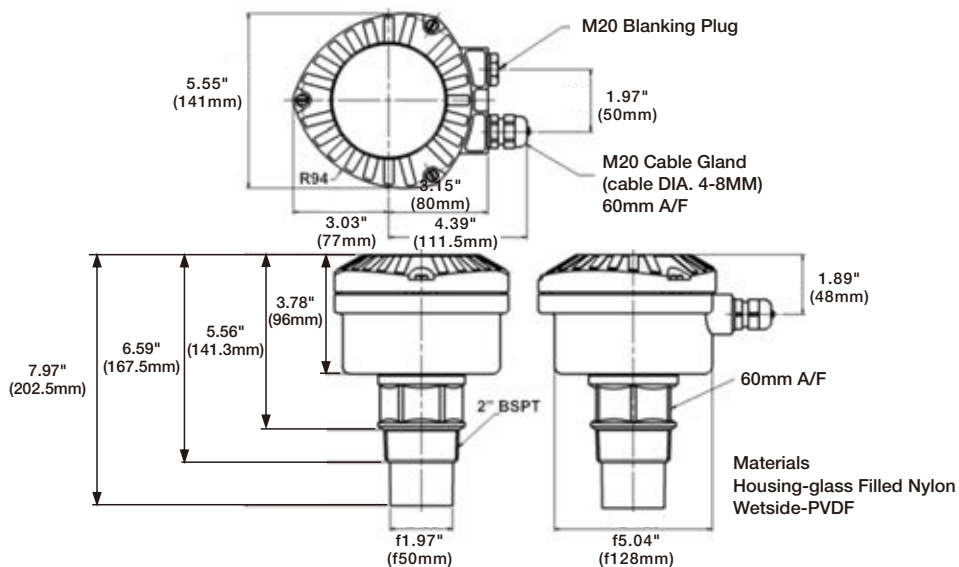


Measuring Liquid in Closed Tank with Mixer (mount away from mixer and inlet, refer to page 6 for further information with turbulent or foam surface)



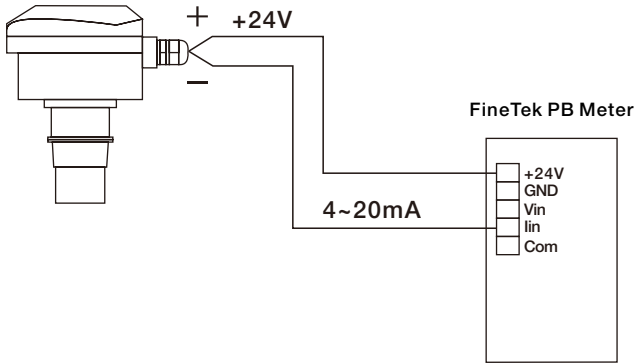
# SPECIFICATIONS

Part#	ZMICROFLEX-C	ZMICROFLEX-CER	ZMICROFLEX-CIS
<b>Specifications</b>			
<b>Measuring distance</b>	26.2ft (8m)	36.1ft (11m)	36.1ft (11m)
<b>Accuracy</b>	< 39" (1.0m) ± 0.197" (5mm) > 39" (1.0m) ± 0.5%	< 39" (1.0m) ± 0.1" (2.5mm) > 39" (1.0m) ± 0.25%	< 39" (1.0m) ± 0.1" (2.5mm) > 39" (1.0m) ± 0.25%
<b>Resolution</b>	0.04" (1mm)	0.04" (1mm)	0.04" (1mm)
<b>Dead band</b>	11.8" (300mm)	17.7" (450mm)	11.8" (300mm)
<b>Ambient temperature</b>	-4°F~158°F (-20°C~70°C)	-4°F~140°F (-20°C~60°C)	-4°F~140°F (-20°C~60°C)
<b>Operating temperature</b>	-4~158°F (-20°C~70°C)		
<b>Operating pressure</b>	-3.63psi~43.5psi (-0.25bar~3bar)		
<b>Power supply</b>	2 wire, 12~30VDC		
<b>Analog output</b>	4~20mA (750 Ohm)		
<b>Relay output</b>	None	Two (2) SPST 1A @ 24VDC	None
<b>Communication protocol</b>	None	HART	HART
<b>Display</b>	4 Characters, 12mm,Digital, LCD		
<b>Electrical entry</b>	2XM20X1.5		
<b>Transducer material</b>	PVDF		
<b>Beam angle</b>	±6° (3dB)		
<b>Casing material</b>	Nylon		
<b>Process connection</b>	2" NPT/BSPT		
<b>Protection rating</b>	IP67		
<b>Explosion rating</b>	None	None	EEx ia II C T4~T6
<b>Weight</b>	1.871b (850g)	2.651b (1200g)	2.651b (1200g)

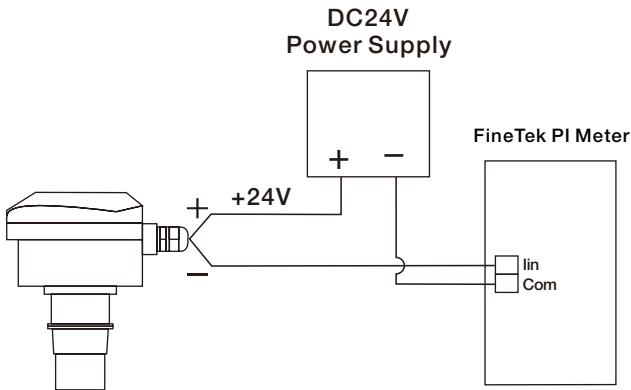


# INSTALLATION

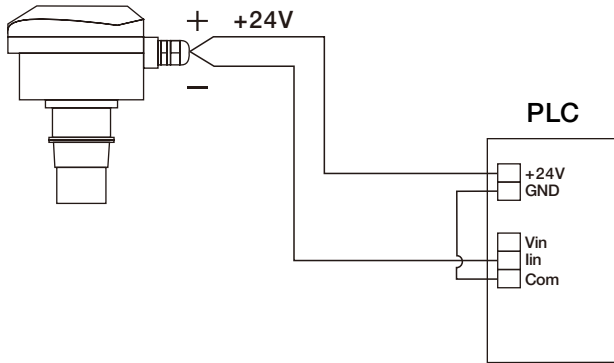
## 2-wire 4-20mA Output (power supplied by receiving device e.g. panel meter)



## 2-wire 4-20mA Output (power supplied by external power supply)



## 2-wire 4-20mA Output (power supplied by PLC)



## Mounting Using Nozzle

The EA series ultrasonic level transmitter can be mounted using a nozzle on top of tank containing the fluid to be measured using an appropriate mounting flange with 2" threaded connection. Refer to the instruction below:

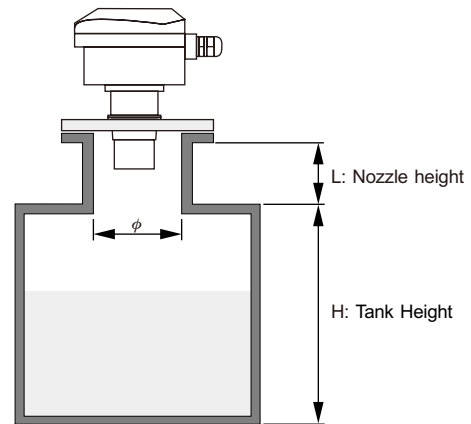
### Length required for dead band:

Dead band must extend at least 5.9" (150mm) beyond the nozzle. Set dead band to be 500mm if the nozzle shorter than 19.7" (500mm).

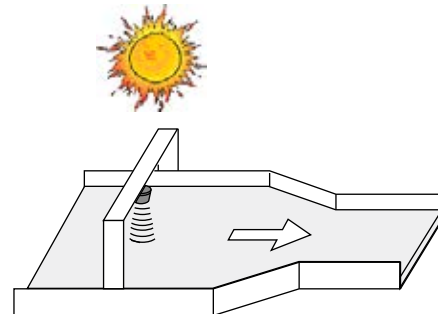
### Nozzle length:

Refer to the below table for suitable nozzle dimensions.

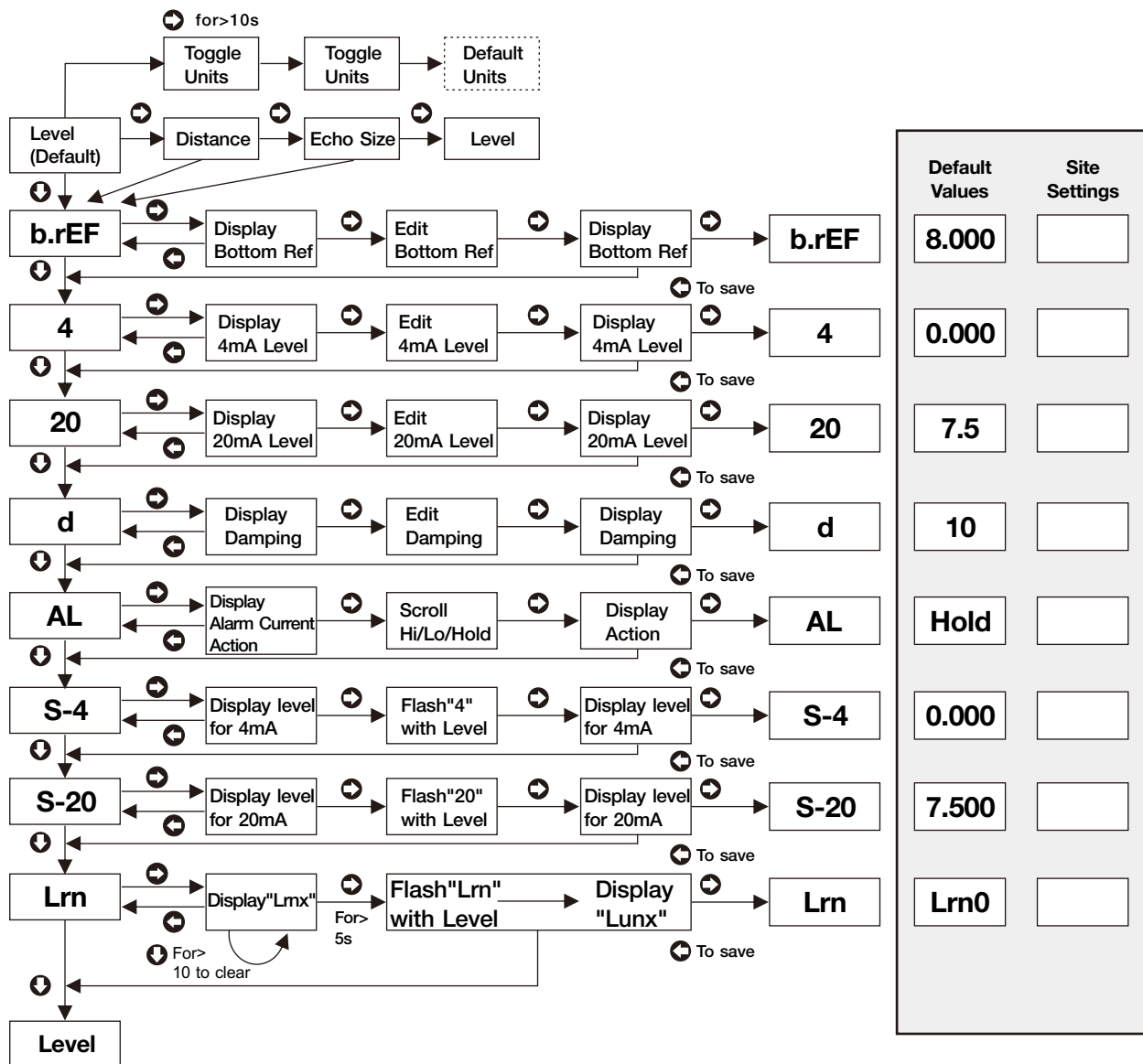
Flange size	Nozzle minimum ID (internal diameter)	Nozzle maximum height
3"	2.95" (75mm)	11.8" (300mm)
4"	3.94" (100mm)	11.8" (300mm)
6"	5.9" (150mm)	15.75" (400mm)
8"	7.9" (200mm)	23.6" (600mm)
12"	11.8" (300mm)	23.6" (600mm)



Protect EA Series unit from direct sunshine in order to maintain acceptable maximum ambient temperature conditions:



# SET UP PROCEDURE

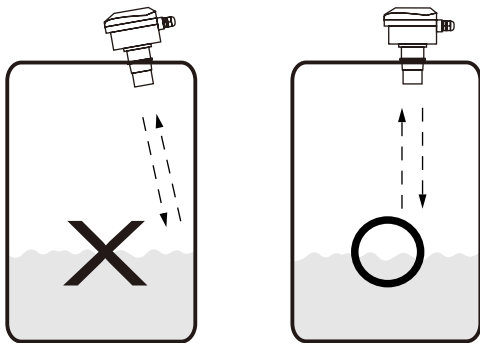


## Parameter Function Description

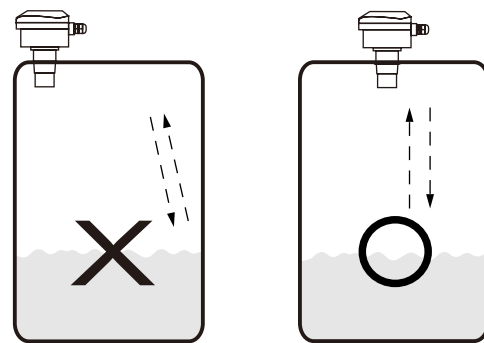
Item	Parameter	Function Description
1	Level	Set main display to show either "Distance", "Echo Size" or "Level"
2	b.rEF	Set maximum measuring height from sensor face
3	4	Set minimum measured Level to represent 4mA (0%) output
4	20	Set maximum measured Level to represent 20mA (100%) output; Note: cannot measure into dead band
5	d	Set damping time for "smoothing" displayed value and 4-20mA output
6	AL	Setting for analog current output action upon alarm; 22mA/Maintain/3.5mA
7	S-4	Not needed if "4" above is set; Press Blue (right arrow) button to enter 4mA (0%) output as level currently being measured (refer to operation manual for more information)
8	S-20	Not needed if "20" above is set; Press Blue (right arrow) button to enter 20mA (100%) output as level currently being measured (refer to operation manual for more information)
9	Lrn	Can be used to filter out noise or block a false echo (refer to operation manual for more information)

# INSTALLATION

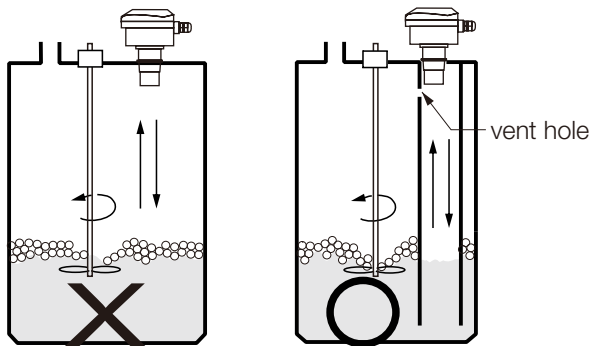
Keep the EA series transmitter face perpendicular to the liquid surface.



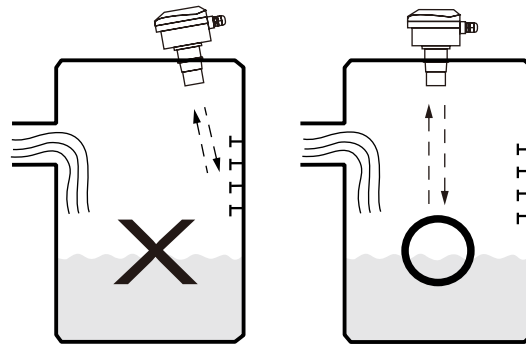
The EA series transmitter should not be mounted too close to the tank wall to avoid interference caused by the tank wall.



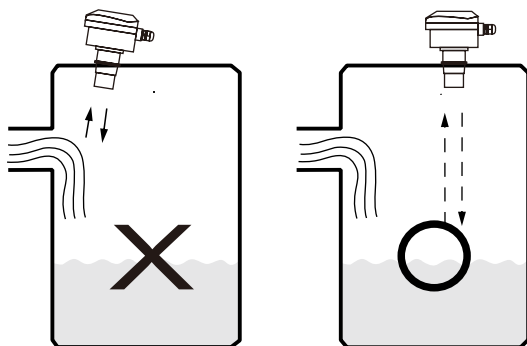
In tanks with foam, heavy turbulence or waves, such as that which can be found in tanks with mixers or other agitators, use of an appropriate diameter pipe or "stilling well" can be used to prevent false signals and echos from the turbulent fluid surface. A vent hole is required to balance pressure between inside and outside of the pipe.



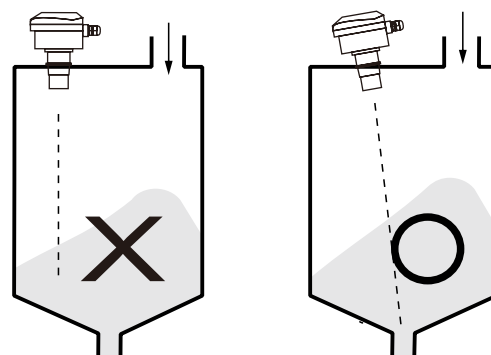
Do not mount the EA series transmitter so that it would be aimed at any internal vessel obstructions, such as an internal ladder, to avoid false echos from these internal devices.



Mount the EA series transmitter to avoid the fluid inlet flow.

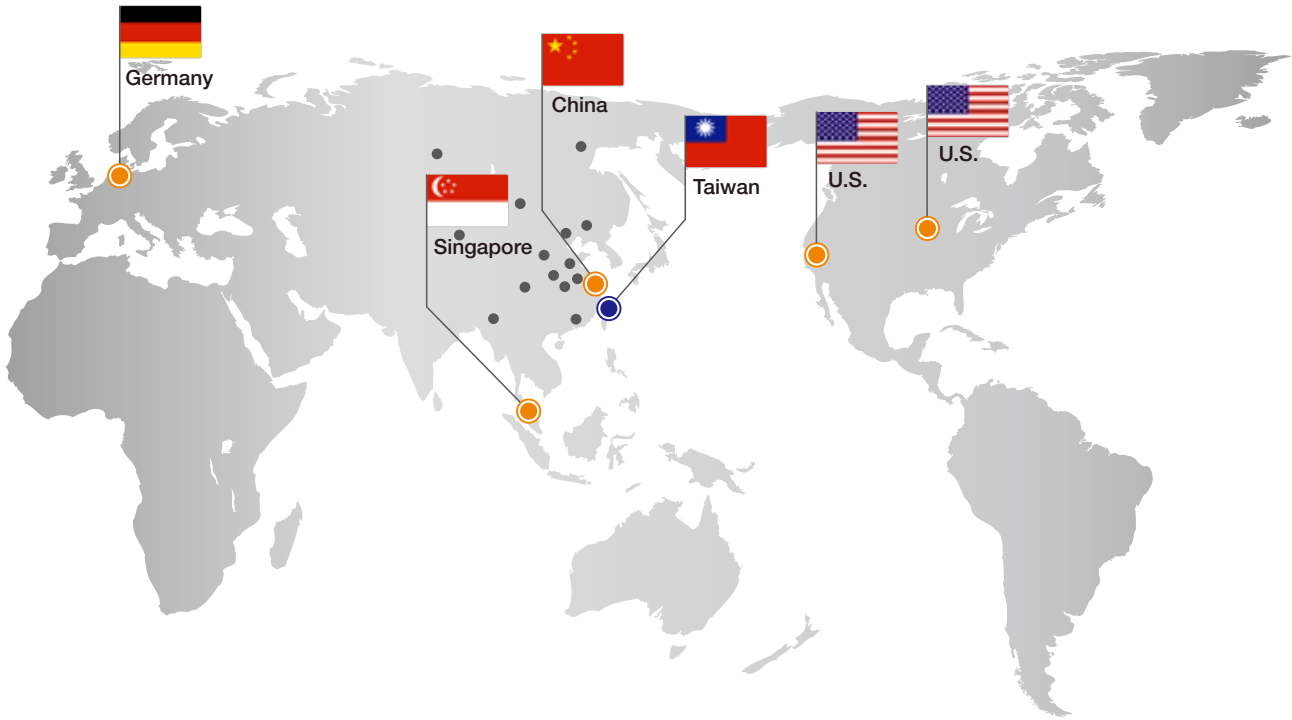


Install EA series transmitter aimed to vessel discharge outlet when using it to measure bulk solids. Consult with Aplus Finetek before using for solids level measurement.





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