

RADAR LEVEL METER



DESCRIPTION

Frequency modulated continuous wave (FMCW) is adopted for radar level instrument (80G).The antenna transmits the high frequency and frequency modulated radar signal. The frequency of the radar signal linearly increases. The transmitted radar signal is reflected by dielectric to be measured and received bv antenna. At the same time, the difference between the frequency of transmitted signal and that of the received signal is proportional to the measured distance Therefore, the distance is calculated by the spectrum derived from the analog-to-digitaconversion frequency difference and the fast Fourier transform (FFT).

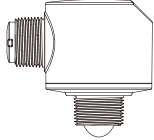

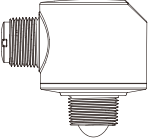

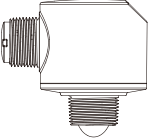
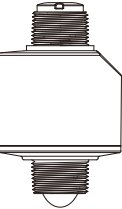
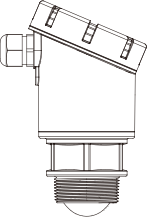
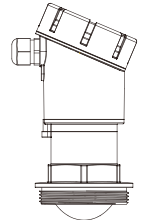
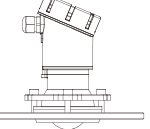
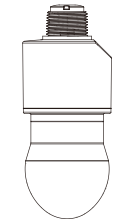
APPLICATIONS

- Chemical
- Metallurgical
- Electricity
- Oil
- Water treatment

FEATURES

- High frequency, small beam angle, and smaller unmeasurable zone which can help to measure the tanks with small diameter and can adapt to the connecting pipe on the tankThe IP 68 (NEMA 6P) design is not affected by any installation environment of the instrument in the pipeline and does not require a filter.
- Centralized energy and stronger anti-jamming capability which have significantly improved themeasurement accuracy and reliability.
- Small antenna size which facilitates the installation.

TECHNICAL DATA

	SR80	SR81	SR82	SR83	SR84	SR85	SR86
Model	 	 	 				
Application	Liquid/Solid	Liquid/Solid	Liquid/Solid	Liquid/Solid	Liquid/Solid	Liquid/Solid	Liquid/Solid
Measurement Range	0-15m(Liquid) 0-5m(Solid)	0-15m(Liquid) 0-5m(Solid)	0-30m(Liquid) 0-15m(Solid)	0-30m(Liquid) 0-15m(Solid)	0-120m(Liquid) 0-60m(Solid)	0-120m(Liquid) 0-60m(Solid)	0-120m(Liquid) 0-60m(Solid)
Accuracy	±2mm	±2mm	±2mm	±2mm	±5mm	±5mm	±5mm
Temp.	-40℃-+80℃	-40℃-+80℃	-40℃-+100℃	-40℃-+100℃	-40℃-+120℃	-40℃-+120℃	-40℃-+80℃
Pressure	-0.1-0.3Mpa	-0.1-0.3Mpa	-0.1-0.3Mpa	-0.1-0.3Mpa	-0.1-0.3Mpa	Atmospheric	Atmospheric
Frequency	80GHZ	80GHZ	80GHZ	80GHZ	80GHZ	80GHZ	80GHZ
Output	4-20mA; HART; RS485; MODBUS Protocol; SDI Protocol	4-20mA; HART; RS485; MODBUS Protocol; SDI Protocol	4-20mA; HART; RS485; MODBUS Protocol; SDI Protocol	4-20mA; HART; RS485; MODBUS Protocol; SDI Protocol	4-20mA; HART; RS485; MODBUS Protocol; SDI Protocol	4-20mA; HART; RS485; MODBUS Protocol; SDI Protocol	4-20mA; HART; RS485; MODBUS Protocol; SDI Protocol
Bluetooth	Yes	Yes	Yes	Yes	Yes	Yes	None
Display/ Programming	None	None	None	Yes	Yes	Yes	None
Housing Material	PVDF	PVDF	PVDF	PBT	PBT	PBT	PVDF
Antenna Material	PVDF	PVDF	PVDF	PVDF	PFA	PFA	PFA
Installation	Thread	Thread	Thread	Thread	Thread	Flange	Thread
Size	G1" up G1" down 1" NPT 1"NPT down	G1" up G1½" down 1" NPT 1½"NPT down	G1" up G1½" down 1" NPT 1½"NPT down	G1½" down 1½"NPT down	M80*3 down	DN80-DN250	G1" up
Protection	IP68	IP68	IP68	IP67	IP67	IP67	IP68

MODEL SELECTION

SR80

Model	Suffix Code				Description	
SR					Radar Level Meter	
Approvals	P				Standard (non-explosion-proof)	
	I				Intrinsically safe (Exia II CT6-T4 Ga)	
	F				Intrinsically safe+Dust version (Exia III CT80°C-T120°C	
Entry Cable	T				Upper outlet	
	S				Side outlet	
Electronic Building Brick		B			4-20mA/HART 2-wire	
		R			RS485/MODBUS protocol (non-explosion-proof)	
		S			SDI protocol (non-explosion-proof)	
Installation Form & Size			G		G1" up	G1" down
			N		1"NPT up	1"NPT down
Cable Length				D	3m	

SR81

Model	Suffix Code				Description	
SR					Radar Level Meter	
Approvals	P				Standard (non-explosion-proof)	
	I				Intrinsically safe (Exia II CT6-T4 Ga)	
	F				Intrinsically safe+Dust version (Exia III CT80°C-T120°C	
Entry Cable	T				Upper outlet	
	S				Side outlet	
Electronic Building Brick		B			4-20mA/HART 2-wire	
		R			RS485/MODBUS protocol (non-explosion-proof)	
		S			SDI protocol (non-explosion-proof)	
Installation Form & Size			G		G1" up	G1½" down
			N		1"NPT up	1½"NPT down
Cable Length				D	3m	

SR82

Model	Suffix Code				Description	
SR					Radar Level Meter	
Approvals	P				Standard (non-explosion-proof)	
	I				Intrinsically safe (Exia II CT6-T4 Ga)	
	F				Intrinsically safe+Dust version (Exia III CT80°C-T120°C	
Entry Cable	T				Upper outlet	
	S				Side outlet	
Electronic Building Brick		B			4-20mA/HART 2-wire	
		R			RS485/MODBUS protocol (non-explosion-proof)	
		S			SDI protocol (non-explosion-proof)	
Installation Form & Size			G		G1" up	G1½" down
			N		1"NPT up	1½"NPT down
Cable Length				D	3m	

SR83

Model	Suffix Code				Description	
SR					Radar Level Meter	
Display	A				Yes	
	B				None	
Electronic Building Brick		B			4-20mA/HART 2-wire	
		R			RS485/MODBUS protocol (non-explosion-proof)	
		S			SDI protocol (non-explosion-proof)	
Installation Form & Size			G		G1½" down	
			N		1½"NPT down	
Cable Access Interface				M	M20*1.5	
				N	½"NPT	

SR84

Model	Suffix Code				Description	
SR					Radar Level Meter	
Approvals	P				Standard (non-explosion-proof)	
	I				Intrinsically safe (Exia II CT6-T4 Ga)	
	F				Intrinsically safe+Dust version (Exia III CT80°C-T120°C	
Display		A			Yes	
			B		4-20mA/HART 2-wire	
Electronic Building Brick			R		RS485/MODBUS protocol (non-explosion-proof)	
			S		SDI protocol (non-explosion-proof)	
Installation Form & Size			C		M80*3 down	
			N		1"NPT up	1½"NPT down
Cable Length				M	M20*1.5	
				N	½"NPT	

SR85

Model	Suffix Code				Description	
SR					Radar Level Meter	
Approvals	P				Standard (non-explosion-proof)	
	I				Intrinsically safe (Exia II CT6-T4 Ga)	
	F				Intrinsically safe+Dust version (Exia III CT80°C-T120°C	
Display		A			Yes	
			B		4-20mA/HART 2-wire	
Electronic Building Brick			R		RS485/MODBUS protocol (non-explosion-proof)	
			S		SDI protocol (non-explosion-proof)	
Cable Length				M	M20*1.5	
				N	½"NPT	

SR86

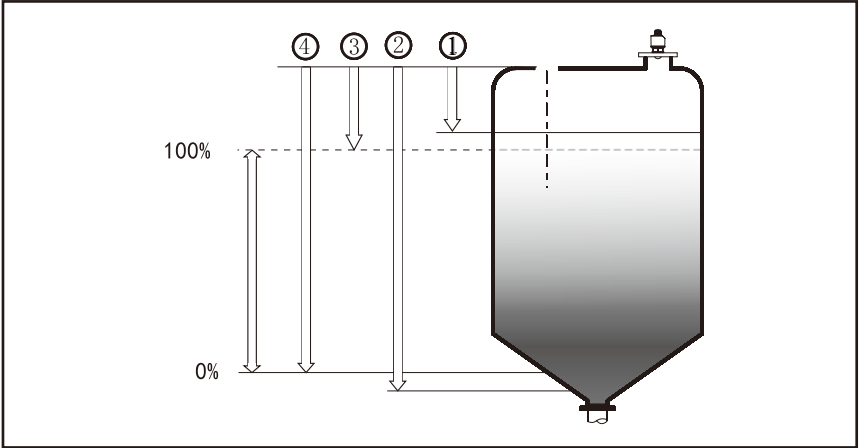
Model	Suffix Code				Description	
SR					Radar Level Meter	
Approvals	P				Standard (non-explosion-proof)	
	I				Intrinsically safe (Exia II CT6-T4 Ga)	
	F				Intrinsically safe+Dust version (Exia III CT80°C-T120°C	
Electronic Building Brick		B			4-20mA/HART 2-wire	
		R			RS485/MODBUS protocol (non-explosion-proof)	
		S			SDI protocol (non-explosion-proof)	
Installation Form & Size			G		G1" up	
Cable Length				D	3m	

INSTALLATION

Basic Requirements

When the antenna transmits the microwave pulse, it has a certain transmitting angle. There shall be no obstacles in the area radiated by the transmitted microwave beam from the lower edge of the antenna to the dielectric surface to be measured. Therefore, it is necessary to avoid the facilities in the tank during installation, for example: human ladder limit switch, heating equipment, supports, etc. If necessary, "Virtual Echo Learning" should be implemented. In addition please note that the microwave beam should not intersect the charging material flow. During the installation of instrument please also note that: the highest material level shall not enter the unmeasurable zone. the instrument shall be kept at a certain distance from the wall of tank: the installation of instrument should enable the transmitting direction of antenna to be perpendicular to the dielectric surface to be measured as much as possible.

Graphic illustration

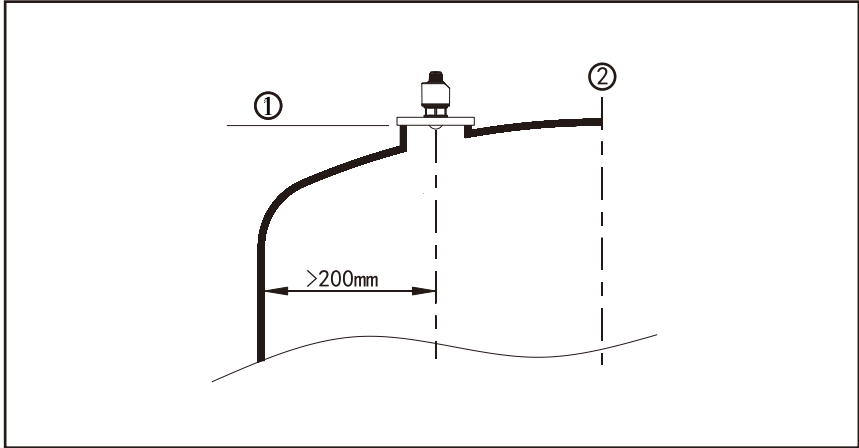


The reference plane for measurement is the sealing surface of threads or flanges.

- 1. Scope of unmeasurable zone
- 2. Setting of measurement range
- 3. Adjustment at high level
- 4. Adjustment at low level

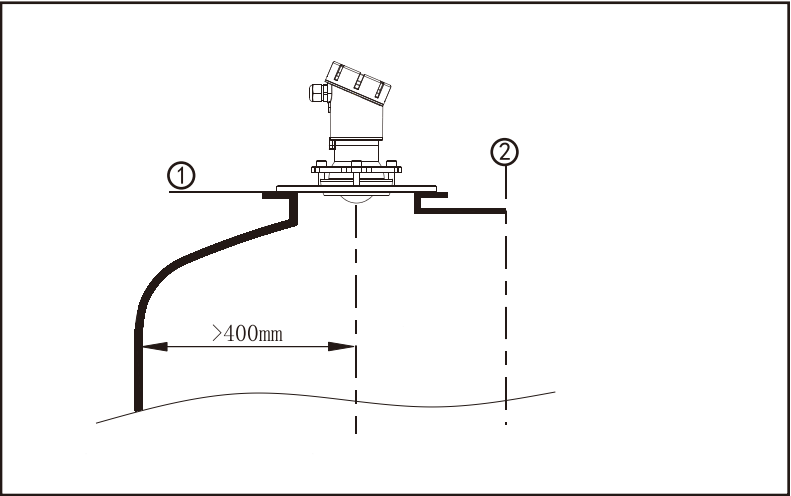
Note: when the radar level instrument is used, please make sure that the highest material level does not enter the unmeasurable zone (No.1 area shown in the figure)

Installation position

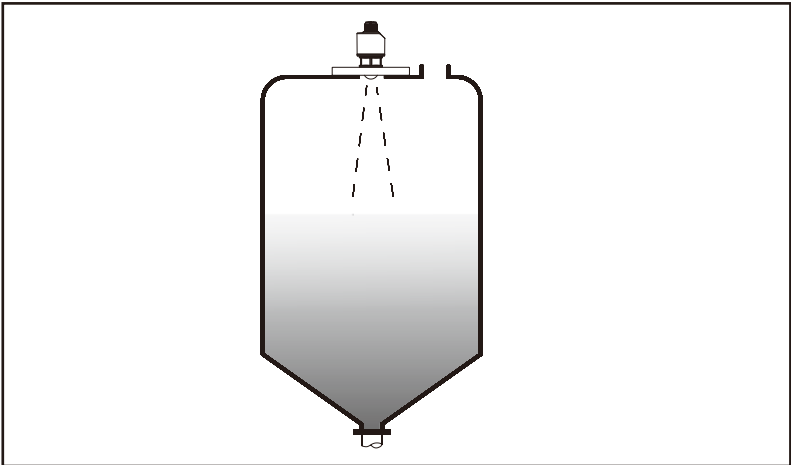


During the installation, please note the the instrument should be kept at a distance of 200mm at least from the vessel wall.

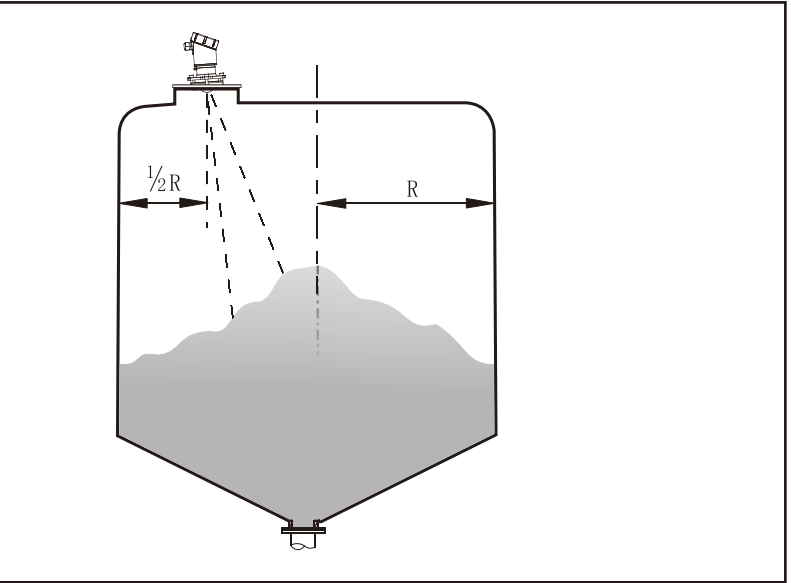
- 1. Reference plane
- 2. Center of the vessel or symmetry axis.



- 1. Reference plane
- 2. Center of the vessel or symmetry axis

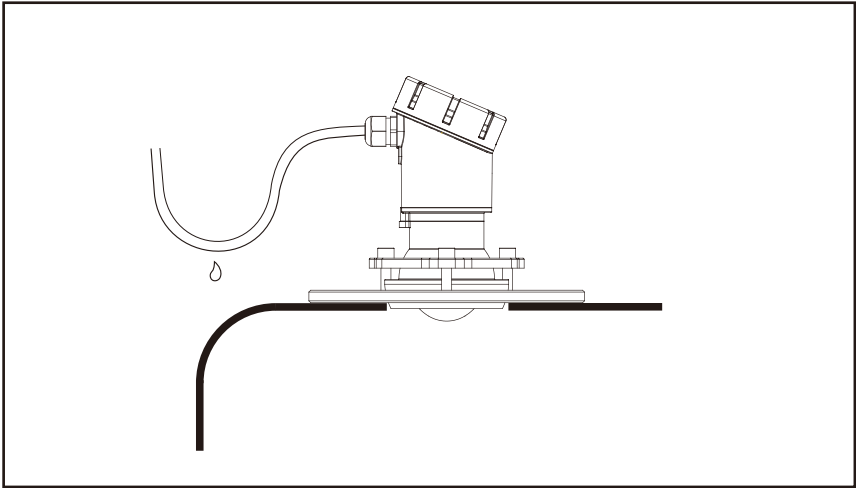


As for the conical vessel with flat tank top, the best installation position of instrument is the top center of the vessel, which ensures that the bottom of the container is measured.



Installation with gimbal installation.

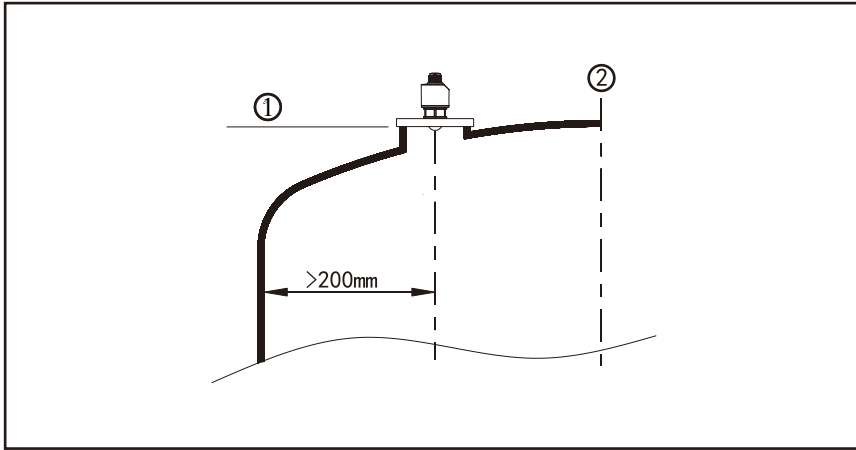
Moisture-proof



As for the instrument installed in outside or wet indoor environment and cooling or heating tanks, the cable gland should be tightened and the cable at the cable entry should be bend downward for preventing moisture. As shown in the figure:

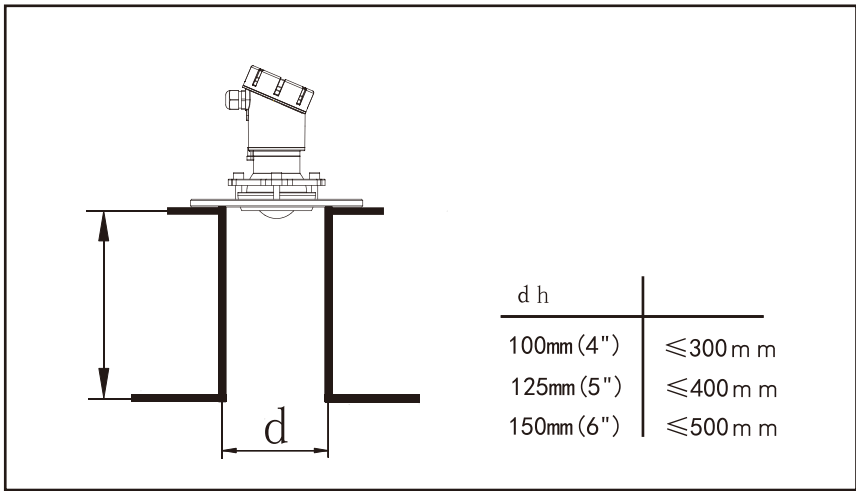
Antenna extension

SR80~SR83 Connecting pipe diagram

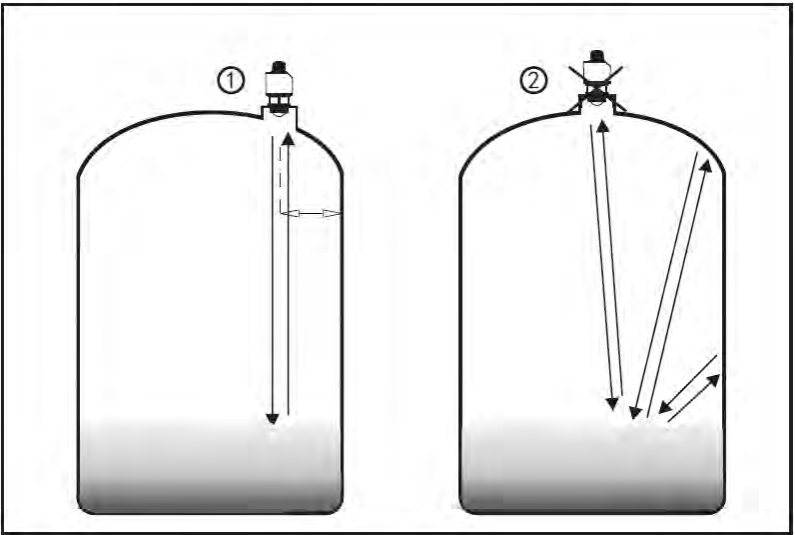


If the reflection property of the dielectric to be measured is good, the antenna extension can also be longer than the enngth of antenna. See the following table for the standard length in such case. The standard length in such case The ends must be ground without the bulges, for example, burrs. If necessary Virtual echo learning” function should be used. Eliminating the reflection on the ends of smaller connecting pipe also can achieve better measurement results.

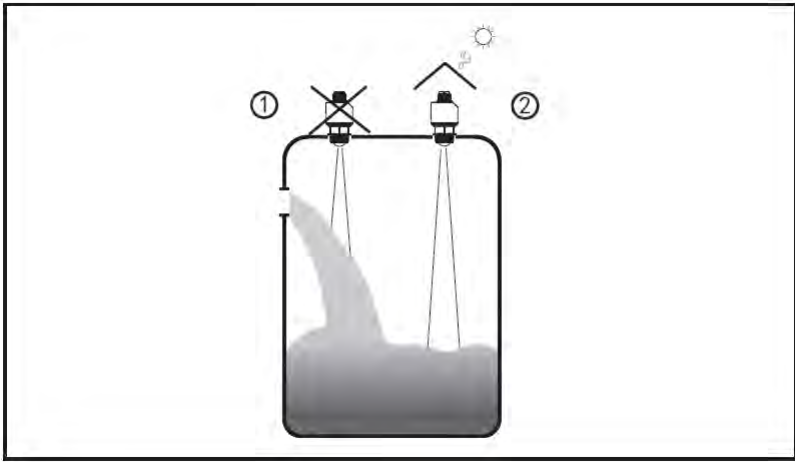
SR84~SR86Connecting pipe diagram



Rights and wrongs of installation position

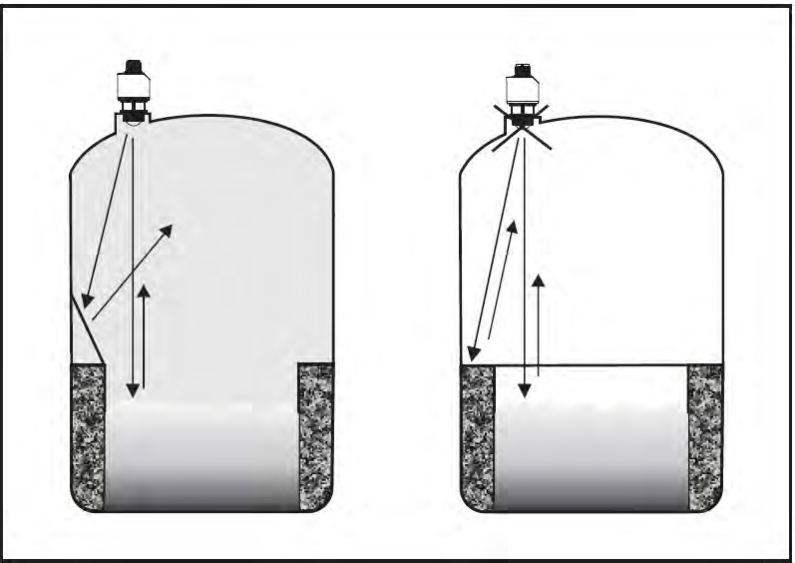


1 Correct2 Error: Instruments are instelled in the arched or round top of tenk, which will result in multiple echoes So it should be avoided as much as possible during the installation.

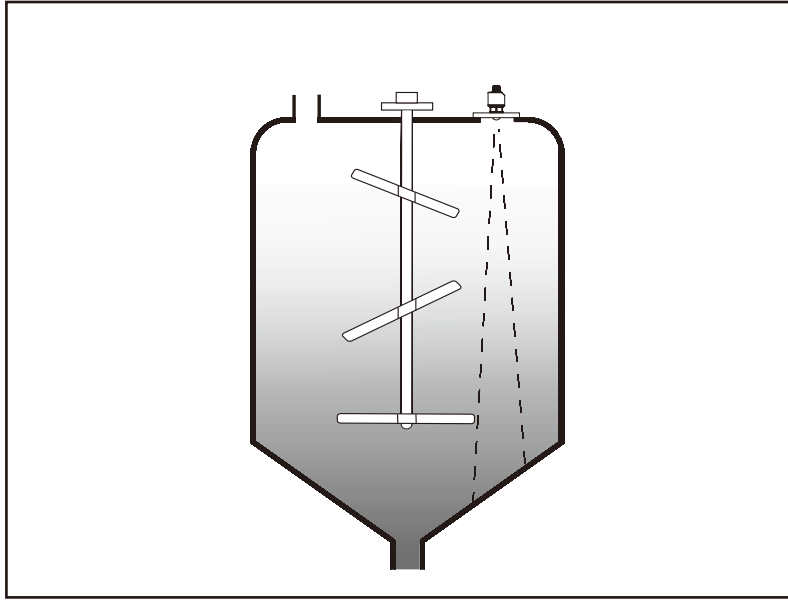


1. Error: Instruments should not be installed above the charging material flow, in order to ensure that the dielectric surface is to be measured, rather than the charging materiel fkow2 Correct Note: Sun-shading and rein-proof measures. shoud be adopled for the outdoor installation.

Installation of reflecting plate



If there are barriers in the tank the reflecting plate can be installed to reflect the reflected wave of barriers out. If necessary"virtual echo learning"ban be implemented.



If there are agitation in the tank, the instruments should be installed as far away from agitators as possible. Once the installation is completed the "virtual echo learning should be carried out while agitators are running, to eliminate the influence of fraud echo generated by mixing blades. If foam or wave is generated due to the agitation, the waveguide installation method should be adopted.