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Reliant R501 Guided Wave Radar Level Meter Catalog
File Number: RII202003LM



R501-Guided Wave Radar Level Meter

BEST MEASUREMENT PERFORMANCE

- **Best measurement performance on liquid**
- **Optimum level measurement**
- **Reliable level measurement for the most complicate applications**
- **Excellent design to reduce installation cost and eliminate daily maintenance**

BEST FIT- FOR- APPLICATION

- **Wide range up to 30 meters**
- **Wide application of hygienic, cryogenic, high pressure and high temperature**
- **Wide variety of I/O and expansive communication protocols**

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OVERVIEW

This series of Guided Wave Radar Level meter adopted 500MHz-1.8GHz frequency radar sensor, the maximum measurement range can reach up to 30 meters. Guided rod is optimized further processing, the new fast microprocessors have higher speed and efficiency can be done signal analysis, the instrumentation can be used for reactor and very complex measurement environment.

FEATURES

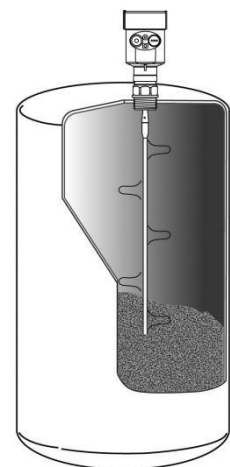
As a result of advanced microprocessor and unique choDiscovery echo processing technology, guided wave radar level meter can be used in a variety of complex conditions.

Because of the type of process connections and detection components, making 70X Series Guided Wave Radar Level Meter is suitable for a variety of complex conditions and applications. Such as: high temperature, high pressure and low dielectric constant media.

Pulsed work, guided wave radar level instruments transmit power is very low, can be installed in a variety of metals, non-metallic container, no harm to humans and the environment.

PRINCIPLE

High-frequency microwave pulses issued by the guided wave radar propagate along detection components (steel cable or steel rod), meet the media to be measured, since the dielectric constant of the mutation, cause reflections, a portion of the pulse energy is reflected back. Transmit pulse and the reflected pulse is proportional to the distance and the time interval measured media.



Guided Wave Radar is a time travel to the principle of measuring instruments, radar run at the speed of light, the running time can be converted into a level signal by electronic components. When the pulse reaches the surface of the material, the pulse is reflected back and is received by the receiving container inside the instrument, the distance the signal is converted to level signals. Reflected pulse signal along the cable or rod probe type transmit to the instrument electronic circuit parts, the microprocessor processes the signal, identify the microwave pulse echo generated in the material surface. Correct identification of the echo signal are completed the implementation by the pulse software, D , the distance from the material surface and the pulse travel time T is proportional:

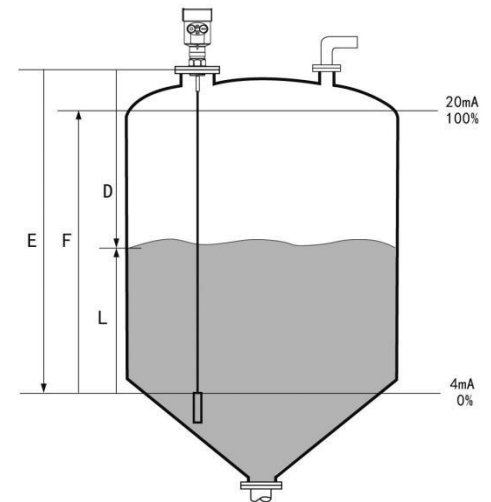
$$D=C \times T/2$$

Where C is the speed of light

Because the empty distance E is known, the level L is:

$$L=E-D$$

By entering the empty height of E (= zero), full tank height F (= hundred) and the application to set some parameters, application parameters will automatically adapt the instrument to measure the environment, corresponding to the 4-20mA output.



MEASURING RANGE

H--- Measuring range

L---Empty distance

B---The top of the blind

E---The minimum distance from the probe to the tank wall

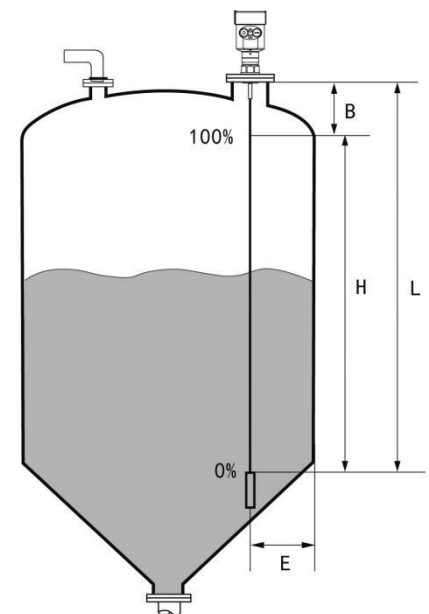
--Blind spot is the minimum distance between the top of the highest material surface materials and measurement reference point.

--The bottom of the blind refers to a distance near the very bottom of the cable can not be accurately measured.

--Between the top and bottom of the blind is blind effective measure distances.

Note:

In order to ensure the accuracy of level measurement, the material should be located between the top and bottom of the blind the blind.



DESIGN & BENEFIT

- ◆ Suitable for Medium: Liquid, solid powder
- ◆ Application: Liquid and solid powder measure,
- ◆ complicated process conditions
- ◆ Explosion-proof Grade: Exia IIC T6 Ga/Exd ia IIC T6 Gb

- ◆ Measuring Range: 30m
- ◆ Frequency: 500MHz to 1.8GHz
- ◆ Antenna: Single cable or single rod antenna
- ◆ Accuracy: ±10mm
- ◆ Process Temperature: (-196 to 250) °C
- ◆ Process pressure: (-0.1 to 4) MPa
- ◆ Signal output: (4 to 20) mA/HART
- ◆ The Scene Display: Four LCD/Can be programmed
- ◆ Power Source: 2-wire (DC24V)
- ◆ 4-wire (DC24V/AC220V)
- ◆ Shell: Aluminum /Plastic
- ◆ Connection: Flange (optional) / Thread

APPLICATION

Industries

- ◆ Chemicals
- ◆ Food & Beverages
- ◆ Machinery
- ◆ Minerals & Ming
- ◆ Oil & Gas
- ◆ Pharmaceuticals
- ◆ Power Plant
- ◆ Pulp & Paper
- ◆ Water
- ◆ Waste Water

TECHNICAL PARAMETERS

Probe Material:	
Rod	Stainless Steel 316L/PTFE
Cable	Stainless Steel 316L/PTFE
Coax	Stainless Steel 316L/PTFE
Seal	Viton fluoroelastomer , Kalrez perfluoroelastomer
Process Connection	Stainless Steel 316L
Shell	Stainless Steel 316L, Plastic, Alu-die casting, Powder Coated
Seal ring	Silicone Rubber
Display Window	Polycarbonate
Ground Terminal	Stainless Steel 316L

Power

2-Wire	
Standard Version	(16 to 26)V DC
Intrinsic Safe Version	(21.6 to 26.4)V DC
Power Consumption	max. 22.5mA
Ripple Allowed	- <100Hz U_{ss} < IV - (100~100K)Hz U_{ss} < 10mV
4-Wire	
Intrinsic Safe + Ex-Proof	(22.8 to 26.4)VDC, (198 to 242)V AC
Power Consumption	max. 1VA, 1W
Parameters on Cable	
Cable Entry/Plug	One cable entry of M20x1.5 (cable diameter of 5 to 9mm) One blind stopper M20x1.5
Spring Connection Terminal	Applicable for cables with cross section of 2.5mm
Output	
Output Signal	(4 to 20)mA/HART
Resolution	1.6μA
Failure mode	20.5mA, 22mA, 3.9mA, hold
2-wire load resistance	See the diagram below
4-wire load resistance	Max.500 ohm
Integration Time	(0 to 40)sec, adjustable

MODEL SELECTION

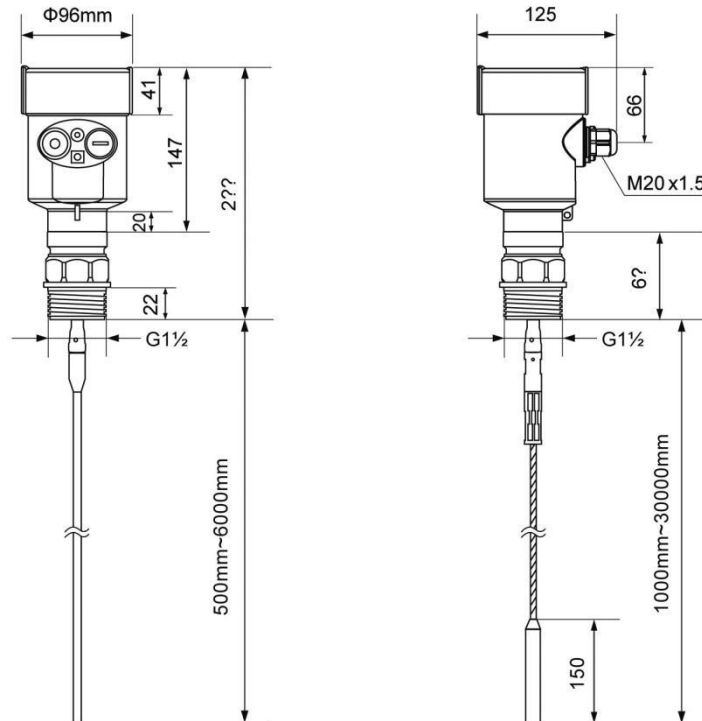
- R501-

Maximum Range / Type of detecting component	
Cxxxx-	30000mm/ Single cable type
Rxxxx-	6000mm / single rod type
Explosion Proof Approval	
P	Standard (Without Approval)
I	Intrinsically Safe (Exia IIC T6 Ga)
G	Intrinsically Safe + Explosion proof (Exd (ia) IIC T6 Gb)
Type of detecting component /Material	
A	cable Φ8mm / Stainless Steel 304
B	cable Φ4mm / Stainless Steel 316L
C	rod Φ10mm / Stainless Steel 304
D	rod Φ10mm / Stainless Steel 316L
Process Connection /Material	



G	Thread	G1½" A		
N	Thread	1½" NPT		
C	Flange	DN50	PN16C / Stainless Steel	
D	Flange	DN80	PN16C / Stainless Steel	
E	Flange	DN100	PN16C / Stainless Steel	
F	Flange	DN150	PN16C / Stainless Steel	
H	Flange	DN200	PN16C / Stainless Steel	
I	Flange	2" 150LBS ANSI	Convex / Stainless Steel	316L
J	Flange	3" 150LBS ANSI	Convex / Stainless Steel	316L
K	Flange	4" 150LBS ANSI	Convex / Stainless Steel	316L
L	Flange	6" 150LBS ANSI	Convex / Stainless Steel	316L
M	Flange	8" 150LBS ANSI	Convex / Stainless Steel	316 L
Seal / Process Temperature				
1. Normal (-40 to 130)°C				
2. High Temperature (-40 to 250)°C				
3. Extra Low Temperature (-196 to 80)°C				
Shell / Protection Class				
L Aluminum /IP67				
Q Plastic /IP65				
Cable Entry				
M M 20 x 1.5				
N ½" NPT				
Display / Programming				
V With				
X Without				

STRUCTURE SIZE (Unit: mm)



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