

## **SMART LINE**

### **Radar S-RD 800**

**80G High Frequency Radar Level Meter**



**DATA SHEET**

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## ❖ INTRODUCTION

**S-RD 800**, 76-81GHz frequency modulation wave FMCW radar product (also called millimeter wave radar), it uses a millimeter wave band with a higher frequency than Ku band radar, it can detect smaller targets and achieve more precise positioning than microwave radar with higher resolution and stronger confidentiality. Therefore, it has important applications in long-distance target detection, strong smoke and dust environment, long-distance imaging, multi-spectral imaging, etc.

What is millimeter wave electromagnetic wave: Usually the electromagnetic wave in the frequency domain of 30-300GHz (wavelength is 1-10 mm) is called millimeter wave. It is located in the overlapping wavelength range of microwave and far-infrared wave, so it has the characteristics of two kinds of wave spectrum.

## ❖ PRODUCT FEATURES

### Product Features

#### 1 DESIGN

Based on self-developed millimeter-wave radio frequency chip to achieve a more compact radio frequency architecture;

#### 2 SENSOR

The measurement accuracy is millimeter-level accuracy (1mm), which can be used for metrology-level measurement;

#### 3 CIRCUIT

Higher signal-to-noise ratio, almost unaffected by level fluctuations;

#### 4 MAINTAIN

The measurement blind area is small (3cm), and the effect of measuring the liquid level of small storage tanks is better;

#### 5 SIGNAL

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#### 6 PROBE

The beam angle can reach 3°, and the energy is more focused, effectively avoiding false echo interference;



- (1) Based on self-developed millimeter-wave radio frequency chip to achieve a more compact radio frequency architecture;
- (2) Higher signal-to-noise ratio, almost unaffected by level fluctuations;
- (3) The measurement accuracy is millimeter-level accuracy (1mm), which can be used for metrology-level measurement;
- (4) The measurement blind area is small (3cm), and the effect of measuring the liquid level of small storage tanks is better;
- (5) The beam angle can reach 3°, and the energy is more focused, effectively avoiding false echo interference;
- (6) High frequency signal, can effectively measure the level of medium with low dielectric constant ( $\epsilon \geq 1.5$ );
- (7) Strong anti-interference, almost unaffected by dust, steam, temperature and pressure changes;
- (8) The antenna adopts PTFE lens, which is effective anti-corrosion and anti-hanging material;
- (9) Support remote debugging and remote upgrade, reduce waiting time and improve work efficiency;
- (10) It supports mobile phone Bluetooth debugging, which is convenient for

### ❖ **Application:**

- ◆ The electromagnetic wave emission angle of the product is less than 3° , which is suitable for measurement in narrow spaces or guided wave pipelines
- ◆ The product can reach a measurement range of 120M, which is suitable for the measurement of large storage tanks
- ◆ The blind area of product measurement is in the range of 7-8CM, which is suitable for the measurement of small storage tanks
- ◆ The product has extremely high measurement accuracy and is suitable for high-precision measurement
- ◆ The product has a wealth of echo processing algorithms and empirical data of various working conditions; it is used for extremely harsh working conditions such as strong dust, steam, or special process storage tank applications such as stirring and heating rods, which are not available in other similar products unique advantage.

## ❖ PARAMETERS

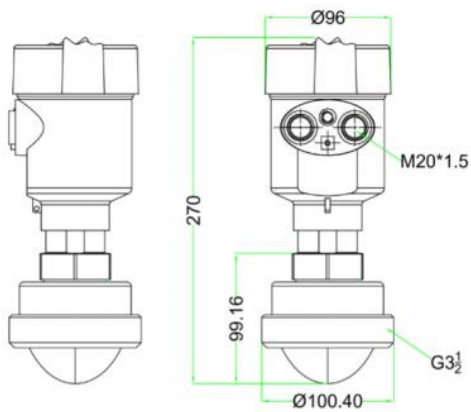
1. 76GHz-81GHz FM wave radar
2. 5GHz ultra-large FM scanning frequency width, wide application
3. Support standard HART, RS485/MODBUS protocol
4. Support operation methods such as PC setting software, tank side meter, etc.
5. 24VDC power supply
6. Simple installation structure, adapt to various installation forms on site

Frequency	76GHz ~ 81GHz, 5GHz FMCW bandwidth
Measuring range	0~ 120m
Measurement accuracy	±1mm
Beam angle	3°/8°
Minimum measured dielectric constant	≥2
Power	15~28VDC
Communication	MODBUS/HART
Signal output	4 ~ 20mA or RS-485
Fault output	3.8mA, 4mA, 20mA, 21mA, hold
Field operation / programming	128 × 64 dot matrix display / 4 buttons PC software Blue-tooth
Humidity	≤95%RH
Enclosure	Aluminum alloy, stainless steel
Antenna type	Lens antenna/anti-corrosive antenna / flange isolated by quartz
Process temperature	T0:-40~85℃; T1:-40~200℃; T2:-40~500℃; T3:-40~1000℃
Process pressure	-0.1~2MPa
Product Size	Ø100*270mm
Cable entry	M20*1.5
Recommended cables	AWG18 or 0.75mm <sup>2</sup>
Protection class	IP67
Explosion-proof grade	ExdialICT6
Installation method	Thread or flange
Weight	2.480Kg/2.995Kg

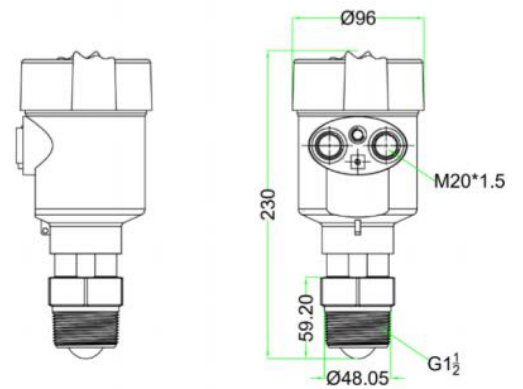
## ❖ Product Appearance

### DIMENSIONS

Unit: mm

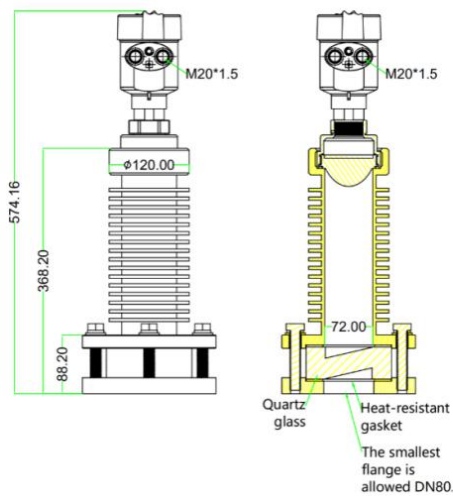


3° antenna beam width

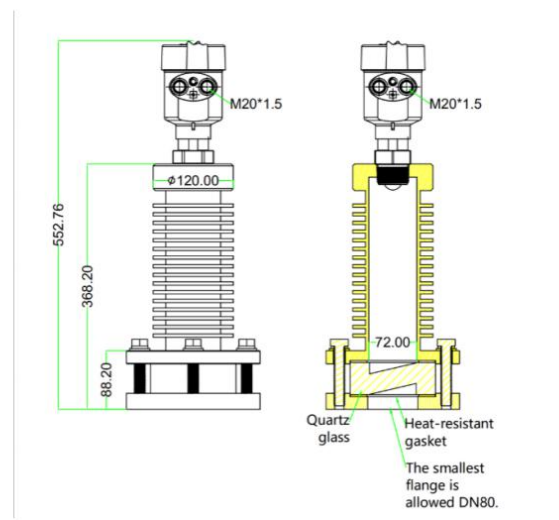


8° antenna beam width

high temperature resistant structure(for T2 and T3)



3° antenna beam width



8° antenna beam width

## ❖ Model Selection Table

### 1) Intelligent Frequency Modulation Radar liquid Level Gauge

Specifications; 80G conventional large lens.

Model: S-RD 800-CD

Frequency range: 76~81GHZ

Application range; slightly corrosive liquid, stirring, water vapor condensation

Measuring range; 120 meters

Process link; flange, thread

Medium temperature; -40~120°

Process pressure; -0.1~0.3mpa

Measurement accuracy;  $\pm 1$ mm

Protection level; IP67

Launch angle; 3°

Explosion-proof grade; EXib|C T6 Gb

Shell material; aluminum casting/stainless steel

Signal output; 4~20mA/HART (two-wire/four-wire) RS485/Modbus



### 2) Intelligent FM radar level meter (solid)

Specifications: 80G conventional large lens universal

Flange (with air purge)

Model: S-RD 800-CD-W

Frequency range: 76~81GHZ

Application range; strong dust, solid, block, powder

Measuring range; 120 meters

Process link; universal flange

Medium temperature; -40~120°

Process pressure; -0.1~0.6mpa

Measurement accuracy;  $\pm 1$ mm

Protection level; IP67

Launch angle; 3°

Explosion-proof grade; EXib|C T6 Gb

Shell material; aluminum casting/stainless steel

Signal output; 4~20mA/HART (two-wire/four-wire) RS485/Modbus



### 3) Intelligent frequency modulation radar Solid (liquid) level gauge

Specifications: 80G conventional small lens.

Model: S-RD 800-CX

Frequency range: 76~81GHZ

Application range; slightly corrosive liquid, stirring,  
water vapor condensation

Measuring range; 120 meters

Process link; flange, thread

Medium temperature; -40~120°

Process pressure; -0.1~0.3mpa

Measurement accuracy;  $\pm 1\text{mm}$

Launch angle; 5°

Protection level; IP67

Explosion-proof grade; EXib|C T6 Gb

Shell material; aluminum casting/stainless steel

Signal output; 4~20mA/HART (two-wire/four-wire) RS485/Modbus



### 4) Intelligent Frequency modulation radar level Gauge

Specifications: 80G anti-corrosion large lens plane.

Model: S-RD 800-FD-P

Frequency range: 76~81GHZ

Application range; strong corrosive liquid, stirring,  
water vapor condensation

Process pressure; -0.1~0.6mpa

Measurement accuracy;  $\pm 1\text{mm}$

Protection level; IP67

Launch angle; 3°

Explosion-proof grade; EXib|C T6 Gb

Shell material; aluminum casting/stainless steel

Signal output; 4~20mA/HART (two-wire/four-wire) RS485/Modbus



## 5) Intelligent frequency modulation radar level gauge

Specification: 80G anti-corrosion large lens plane

Model: S-RD 800-FD-P

Frequency range: 76~81GHZ

Application scope; high temperature environment, strong corrosive liquid, stirring, water vapor condensation

Measuring range; 120 meters

Process link; flange, thread

Medium temperature;  $-40\sim 220^{\circ}$

Process pressure;  $-0.3\sim 2.0\text{mpa}$

Measurement accuracy;  $\pm 1\text{mm}$

Launch angle;  $3^{\circ}$

Protection level; IP67

Explosion-proof grade; EXib|C T6 Gb

Shell material; aluminum casting/stainless steel

Signal output; 4~20mA/HART (two-wire/four-wire) RS485/Modbus





## 6 Intelligent frequency modulation radar level gauge

Specification: 80G anti-corrosion small lens plane type.  
Model: S-RD 800-FX-P

Frequency range: 76~81GHZ  
Application range; strong corrosive liquid, stirring, water vapor condensation  
Measuring range; 120 meters  
Process link; flange, thread  
Medium temperature; -40~120°  
Process pressure; -0.1~2.0mpa  
Measurement accuracy;  $\pm 1\text{mm}$   
Launch angle; 5°  
Protection level; IP67  
Explosion-proof grade; EXib|C T6 Gb  
Shell material; aluminum casting/stainless steel  
Signal output; 4~20mA/HART (two-wire/four-wire) RS485/Modbus



## 7 Intelligent frequency modulation radar

### Level Gauge

Specification: 80G high temperature and high pressure type  
Model: S-RD 800-DGWGY

Frequency range: 76~81GHZ  
Application range; various high temperature and high pressure vessels (solid, liquid)  
Measuring range; 120 meters  
Process link; flange, thread  
Medium temperature; -40~1000°  
Process pressure; -1~15mpa  
Measurement accuracy;  $\pm 1\text{mm}$   
Launch angle; 3°  
Protection level; IP67  
Explosion-proof grade; EXib|C T6 Gb  
Shell material; aluminum casting/stainless steel  
Signal output; 4~20mA/HART (two-wire/four-wire) RS485/Modbus



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