

# 26GHz Radar Level Meter

## Product Manual

Model: HYRD90X SERIES





# 26GHz Radar Level Meter

## 1. Product Overview

This series of radar level meter adopted 26G high frequency radar sensor, the maximum measurement range can reach up to 80 meters. Antenna 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, solid silo and very complex measurement environment.

### ● Principle

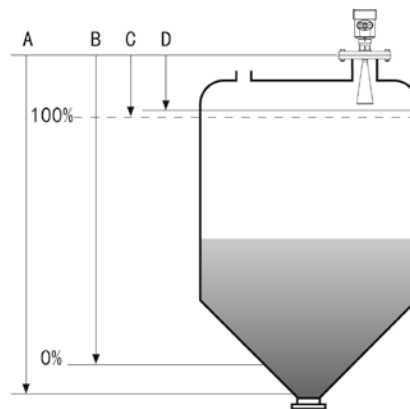
Radar level transmitter antenna microwave pulse is narrow, the downward transmission antenna. Microwave exposure to the medium surface is reflected back again by the antenna system receives, sends the signal to the electronic circuit automatically converted into level signals (because the microwave propagation speed, electromagnetic wave to reach the target and the reflected back to the receiver this time is almost instantaneous).

A Range set

B Low adjustment

C High

D Blind area



**Datum measurement:** Screw thread bottom or the sealing surface of the flange.

**Note:** Make sure the radar level meter the highest level cannot enter the measuring blind area (Figure D shown below).

### ● The characteristics of 26G radar level meter:

- Small antenna size, easy to install; Non-contact radar, no wear, no pollution.
- Almost no corrosion, bubble effect; almost not affected by water vapor in the atmosphere, the temperature and pressure changes.
- Serious dust environment on the high level meter work has little effect.
- A shorter wavelength, the reflection of solid surface inclination is better.
- Beam angle is small, the energy is concentrated, can enhance the ability of echo and to avoid interference.
- The measuring range is smaller, for a measurement will yield good results.
- High signal-to-noise ratio, the level fluctuation state can obtain better performance.
- High frequency, measurement of solid and low dielectric constant of the best choice.

## 2. Product Introduction

### HYRD901



Application: All kinds of corrosive liquid  
Measuring Range: 10 meters  
Process Connection: Thread, Flange  
Process Temperature:  $-40^{\circ}\text{C}\sim 130^{\circ}\text{C}$   
Process Pressure:  $-0.1\sim 0.3\text{ MPa}$   
Accuracy:  $\pm 5\text{mm}$   
Protection Grade: IP67  
Frequency Range: 26GHz  
Supply: 2-wire (DC24V) / 4-wire (DC24V / AC220V)  
Signal Output: 4... 20mA / HART (2-wire / 4-wire)  
RS485/ Modbus  
Outer Covering: Aluminum / Plastic / Stainless steel  
Explosion-proof Grade: Exia II C T6 Ga/ Exd II C T6 Gb

### HYRD902



Application: Slightly corrosive liquid  
Measuring Range: 30 meters  
Process Connection: Thread, Flange  
Process Temperature:  $-40^{\circ}\text{C}\sim 130^{\circ}\text{C}$  (Standard type)  
 $-40^{\circ}\text{C}\sim 230^{\circ}\text{C}$  (High temperature type)  
Process Pressure:  $-0.1\sim 4.0\text{ MPa}$   
Accuracy:  $\pm 3\text{mm}$   
Protection Grade: IP67  
Frequency Range: 26GHz  
Supply: 2-wire (DC24V) / 4-wire (DC24V / AC220V)  
Signal Output: 4... 20mA / HART (2-wire / 4-wire)  
RS485/ Modbus  
Outer Covering: Aluminum / Plastic / Stainless steel  
Explosion-proof Grade: Exia II C T6 Ga/ Exd II C T6 Gb

### HYRD902T



Application: Corrosive liquids, vapors, volatile liquids  
Measuring Range: 20 meters  
Process Connection: Flange  
Process Temperature:  $-40^{\circ}\text{C}\sim 130^{\circ}\text{C}$  (Standard type)  
 $-40^{\circ}\text{C}\sim 230^{\circ}\text{C}$  (High temperature type)  
Process Pressure:  $-0.1\sim 2.0\text{ MPa}$   
Protection Grade: IP67  
Accuracy:  $\pm 3\text{mm}$   
Frequency Range: 26GHz  
Supply: 2-wire (DC24V) / 4-wire (DC24V / AC220V)  
Signal Output: 4... 20mA / HART (2-wire / 4-wire)  
RS485/ Modbus  
Outer Covering: Aluminum / Plastic / Stainless steel  
Explosion-proof Grade: Exia II C T6 Ga/ Exd II C T6 Gb

### HYRD903



Application: Solid material, Strong dust  
easy to crystallize, condensation occasion  
Measuring Range: 70 meters  
Process Connection: Universal Flange  
Process Temperature: -40°C~130°C (Standard type)  
-40°C~230°C (High temperature type)  
Process Pressure: -0.1~4.0 MPa (Flat flange)  
-0.1~0.3MPa (Universal flange)  
Protection Grade: IP67  
Accuracy: ±15mm  
Frequency Range: 26GHz  
Supply: 2-wire (DC24V) / 4-wire (DC24V /AC220V)  
Signal Output: 4... 20mA /HART (2-wire / 4-wire)  
RS485/ Modbus  
Outer Covering: Aluminum / Plastic / Stainless steel  
Explosion-proof Grade: Exia II C T6 Ga/ Exd II C T6 Gb

### HYRD904



Application: Solid material, Strong dust,  
easy to crystallize, condensation occasion  
Measuring Range: 80 meters  
Process Connection: Thread, Universal Flange  
Process Temperature: -40°C~130°C (Standard type)  
-40°C~230°C (High temperature type)  
Process Pressure: -0.1 ~ 0.3 MPa  
Measurement Accuracy: ±15mm  
Protection Grade: IP67  
Frequency Range: 26GHz  
Supply: 2-wire (DC24V) / 4-wire (DC24V /AC220V)  
Signal Output: 4... 20mA / HART (2-wire / 4-wire )  
RS485/ Modbus  
Outer Covering: Aluminum / Plastic / Stainless steel  
Explosion-proof Grade: Exia II C T6 Ga /Exd II C T6 Gb

### HYRD905



Application: Solid particles, Powder  
Measuring Range: 30 meters  
Process Connection: Thread, Flange  
Process Temperature: -40°C~130°C (Standard type)  
-40°C~230°C (High temperature type)  
Process Pressure: -0.1 ~ 4.0 MPa (Flat flange)  
-0.1 ~ 0.3 MPa (Universal Flange)  
Accuracy: ±15mm  
Protection Grade: IP67  
Frequency Range: 26GHz  
Supply: 2-wire (DC24V) / 4-wire (DC24V /AC220V)  
Signal Output: 4... 20mA /HART (2-wire / 4-wire )  
RS485/ Modbus  
Outer Covering: Aluminum / Plastic / Stainless steel  
Explosion-proof Grade: Exia II C T6 Ga /Exd II C T6 Gb

## HYRD906



Application: Hygienic liquid storage,  
Corrosive container

Measuring Range: 20 meters

Process Connection: Flange

Medium Temperature:  $-40^{\circ}\text{C}\sim 100^{\circ}\text{C}$

Process Pressure:  $-0.1\sim 1.6\text{ MPa}$

Accuracy:  $\pm 3\text{mm}$

Protection Grade: IP67

Frequency Range: 26GHz

Supply: 2-wire (DC24V) / 4-wire (DC24V / AC220V)

Signal Output: 4... 20mA/HART (2-wire / 4-wire )

RS485/ Modbus

Outer Covering: Aluminum / Plastic / Stainless steel

Explosion-proof Grade: Exia II C T6 Ga / Exd II C T6 Gb

### 3. The Installation Requirements

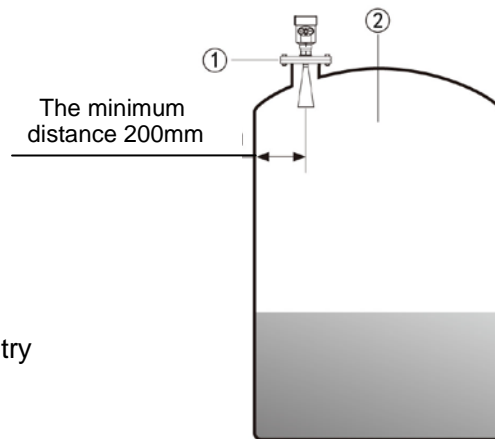
- **Installation guide:**

Be installed in the diameter of the 1/4 or 1/6.

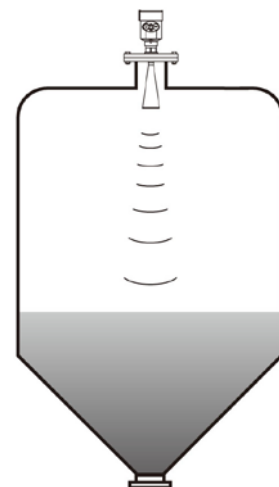
Note: The minimum distance from the tank wall should be 200mm.

Note: ① datum

②The container center or axis of symmetry

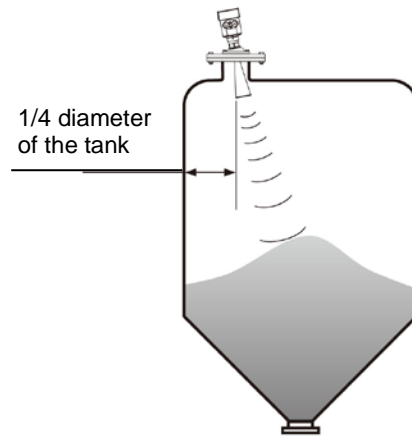


- The top conical tank level, can be installed at the top of the tank is intermediate, can guarantee the measurement to the conical bottom.



- A feed antenna to the vertical alignment surface.  
If the surface is rough, stack angle must be used to adjust the angle of universal flange of the antenna to the alignment surface.

(Due to the solid surface tilt will cause the echo attenuation, even Loss of signal.)



#### 4. The Electrical Connection

- **The power supply voltage:**

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(4~20)mA/HART (Two wire system)	The power supply and the output current signal sharing a two core shield cable. The supply voltage range see technical data. For intrinsically safe type must be a safety barrier between the power supply and the instrument.
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(4~20)mA/HART(Four wire system)	Separate power supply and the current signal, respectively using a two-core shielded cable. The supply voltage range see technical data.
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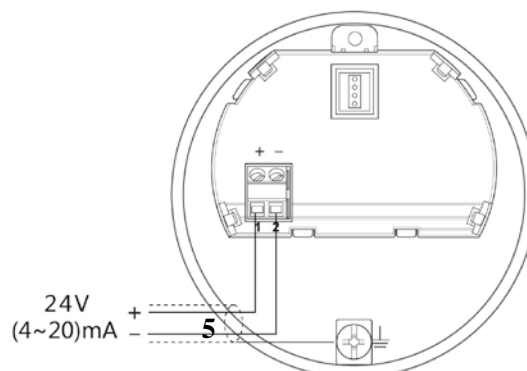
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RS485 / Modbus	Power supply and Modbus signal line separated respectively using a two-core shielded cable, the power supply voltage range see technical data.
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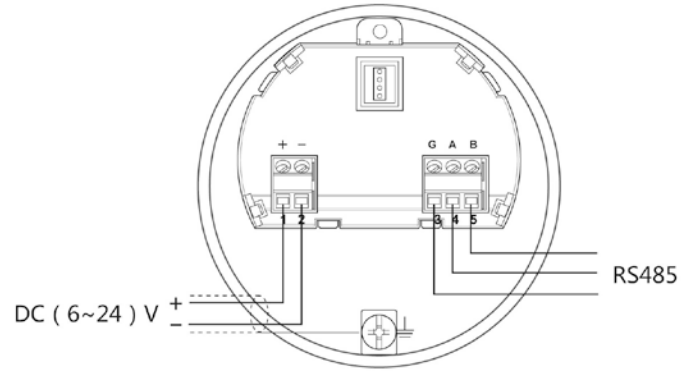
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- **Connection mode:**

- 24V two wire wiring diagram as follows:



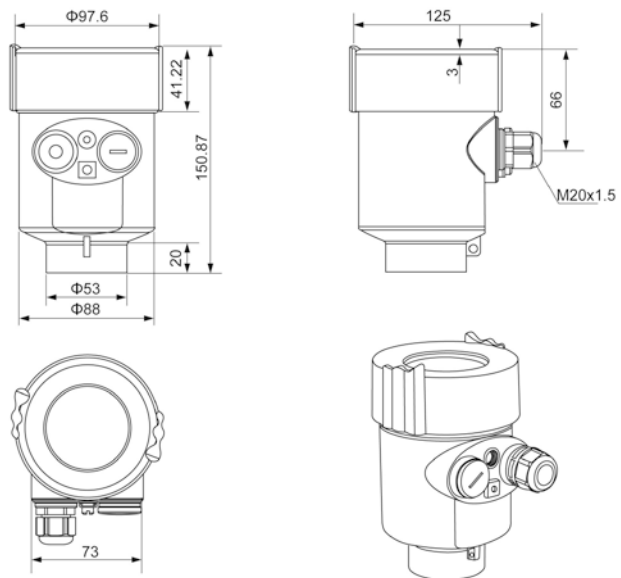
➤ 6~24V RS485/Modbus wiring diagram as follows:





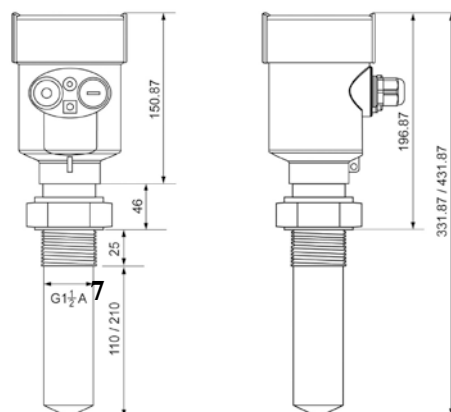
## 5. Structure Size (Unit: mm)

- The outer shell :

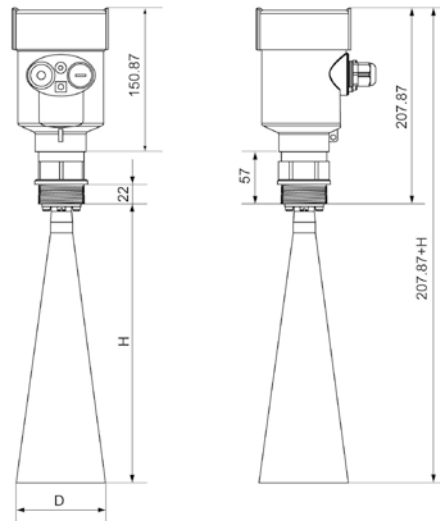


- Appearance size:

**HYRD901**

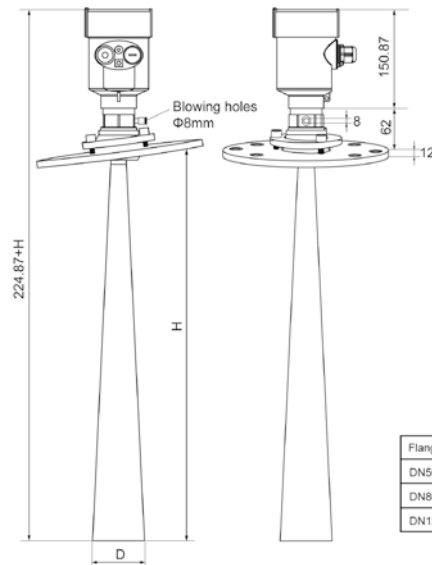


## HYRD902



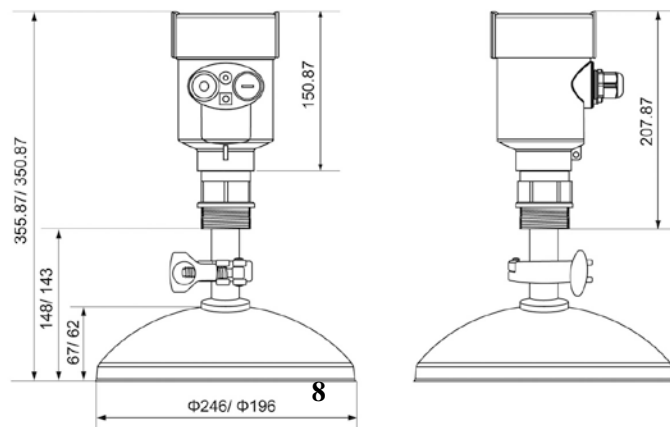
Flange	Trumpet diameter D	Trumpet height H
DN50	Φ46	140
DN80	Φ76	205
DN100	Φ96	290

## HYRD903

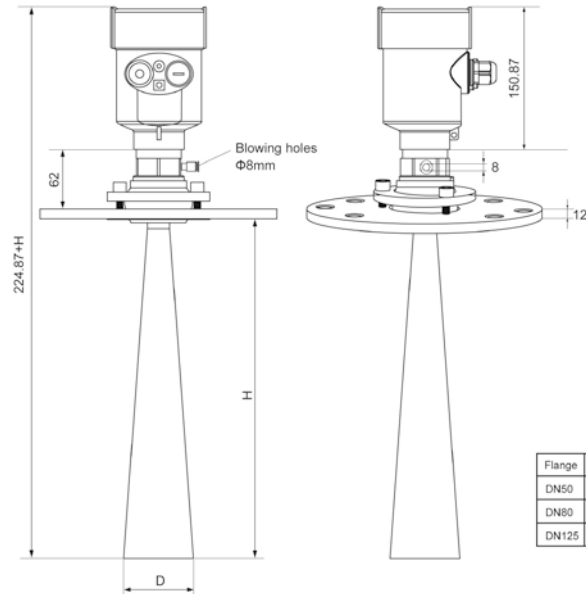


Flange	Trumpet diameter D	Trumpet height H
DN50	Φ76	205
DN80	Φ96	290
DN125	Φ121	610

## HYRD904



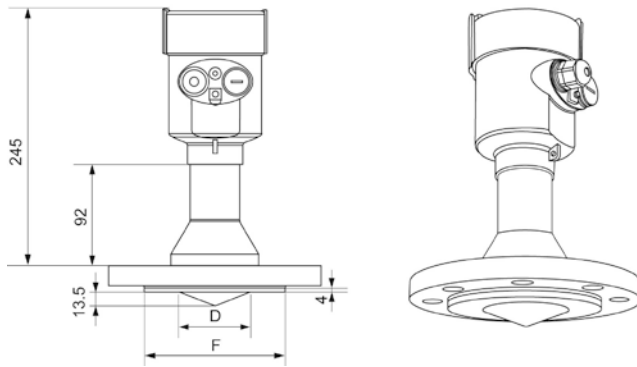
## HYRD905



Flange	Trumpet diameter D	Trumpet height H
DN50	Φ76	205
DN80	Φ96	290
DN125	Φ121	610

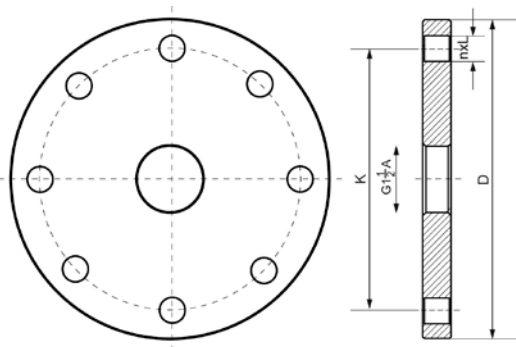
## HYRD906

Standard type



Flange	Trumpet diameter D	Sealing surface diameter F	Number of holes and hole diameter
DN50	Φ46	100	4×Φ18
DN65	Φ46	120	4×Φ18
DN80	Φ76	135	8×Φ18
DN100	Φ76	155	8×Φ18
DN125	Φ76	185	8×Φ18
DN150	Φ76	210	8×Φ23

### ● Flange type:



Flange Selection Tables				
Specification	Outer diameter D	Hole center distance K	Number of Holes n	Hole diameter L
DN50	Φ165	Φ125	4	18
DN80	Φ200	Φ160	8	18
DN100	Φ220	Φ180	8	18
DN125	Φ250	Φ210	8	18
DN150	Φ285	Φ240	8	22
DN200	Φ340	Φ295	12	22
DN250	Φ405	Φ355	12	26

## 6. Technical Parameters

<b>Process Connection</b>	Thread G1½" A / Thread 1½" NPT / Flange	
<b>Antenna Material</b>	Stainless Steel / PTFE	
<b>The outer shell</b>		
The seal between the shell and the shell cover	Silicone rubber	
Casing window	Polycarbonate	
The ground terminal	Stainless steel	
<b>The power supply voltage</b>		
<i>Two wire system</i>		
	The standard type	(16 ~ 26) V DC
	Intrinsically safe	(21.6 ~ 26.4) V DC
	Power dissipation	max 22.5mA / 1W
	Allowable ripple	
	- <100Hz	U <sub>ss</sub> <IV
	- (100~100K) Hz	U <sub>ss</sub> <10mV
<i>Flameproof</i>		
	(22.8 ~ 26.4) V DC	2-wire system
	(198 ~242)V AC	4-wire system / 110V AC 4-wire system
<b>The cable parameters</b>		
Cable entrance / plug	1 M20x1.5 cable entrance 1 blind plug	
Terminal	Conductor cross section 2.5mm <sup>2</sup>	
<b>Output parameters</b>		
The output signal	(4 ~ 20) mA/RS485	
Communication protocol	HART	
Resolution	1.6 μ A	
Fault signal	Constant current output; 20. 5mA 22mA 3.9mA	
The integral time	(0 ~ 36) s, adjustable	
<b>Blind area</b>	the ends of the antenna	
<b>The maximum distance measurement</b>		
	901	10 meters (Liquid type)
	902	30 meters (Liquid type)
	902T	20 meters (Liquid type)
	903	70 meters (Solid type)
	904	80 meters (Solid type)
	905	30 meters (Solid type)
	906	20 meters (Liquid type)
<b>Microwave frequency</b>	26GHz	
<b>Communication interface</b>	HART communication protocol	

<b>The measurement interval</b>	about 1 second (depending on the parameter settings)
<b>Adjust the time</b>	about 1 second (depending on the parameter settings)
<b>Display resolution</b>	1 mm
<b>Working storage and transportation temperature</b>	(-40~80)°C
<b>Process temperature</b> (the temperature of the antenna part)	
901	(-40~130)°C
902/902T/903/904/905	(-40~130)°C Standard type / (-40~230)°C High temperature type
906	(-40~100)°C
<b>Pressure</b>	Max.4MPa
<b>Seismic</b>	Mechanical vibration 10m/s <sup>2</sup> , (10 ~ 150) Hz

## 7. Product Model Selection

### ● HYRD901

#### License

- P Standard (Non-explosion-proof)
- I Intrinsically safe (Exia IIC T6 Ga)
- G Flameproof (Exd IIC T6 Gb)

#### Antenna Type / Material / Temperature

- F Sealing horn / PTEE / -40... 130 °C

#### Process Connection / Material

- G Thread G1½" A
- N Thread 1½" NPT
- A Flange DN50 /PP
- B Flange DN80 /PP
- C Flange DN100 /PP
- Y Special custom

#### The Outlet Pipe Length of the Container

- A Outlet pipe 100mm
- B Outlet pipe 200mm

#### The Electronic Unit

- 3 (4~20) mA / 24V DC / HART two wire system
- 4 (4~20) mA / 220V AC / HART four wire system
- 5 RS485 Modbus / 6~24V/ Four wire system

#### Outer Covering / Protection Grade

- L Aluminum / Single chamber / IP67

- H Aluminum / Double chamber / IP67
- G Plastic / Single chamber / IP65
- K Stainless steel / Single chamber / IP67

**Cable Line**

- M M 20x1.5
- N ½" NPT

**Field Display/The Programmer**

- A With
- X Without

● **HYRD902**

**License**

- P Standard (Non-explosion-proof)
- I Intrinsically safe (Exia IIC T6 Ga)
- G Flameproof (Exd IIC T6 Gb)

**Process Connection / Material**

- G Thread G1½"A / Stainless Steel 304
- N Thread 1½" NPT / Stainless Steel 304
- A Flange DN50 / Stainless Steel 304
- B Flange DN80 / Stainless Steel 304
- C Flange DN100 / Stainless Steel 304
- Y Special Custom

**Antenna Type / Material**

- A Horn Antenna Φ46mm / Stainless Steel 316L
- B Horn Antenna Φ76mm / Stainless Steel 316L
- C Horn Antenna Φ96mm / Stainless Steel 316L
- Y Special Custom

**Seal Up / Process Temperature**

- V Viton / (-40~130) °C
- K Kalrez / (-40~230) °C

**The Electronic Unit**

- 3 (4~20) mA / 24V DC / HART two wire system
- 4 (4~20) mA / 220V AC / HART four wire system
- 5 RS485 Modbus / 6~24V/ Four wire system

**Outer Covering / Protection Grade**

- L Aluminum / Single chamber / IP67

H Aluminum / Double chamber / IP67

G Plastic / Single chamber / IP65

K Stainless steel / Single chamber / IP67

**Cable Line**

M M 20x1.5

N ½" NPT

**Field Display /The Programmer**

A With

X Without

● **HYRD902T**

**License**

- P Standard (Non-explosion-proof)
- I Intrinsically safe (Exia IIC T6 Ga)
- G Flameproof Type (Exd IIC T6 Gb)

**Process Connection / Material**

- A Flange DN80 / Stainless Steel 304
- B Flange DN100 / Stainless Steel 304
- C Flange DN150 / Stainless Steel 304
- Y Special Custom

**Antenna Type / Material**

- A Internal tapered rod antenna PVDF / 78mm
- B Internal tapered rod antenna PFA / 78mm
- C Internal tapered rod antenna PVDF / 1468mm

**Seal Up / Process Temperature**

- V Viton / (-40~130) °C
- P PFA / (-40~230) °C

**The Electronic Unit**

- 3 (4~20) mA / 24V DC / HART 2-wire system
- 4 (4~20) mA / 220V AC / HART 4-wire system
- 5 RS485 Modbus / 6~24V / Four wire system

**Outer Covering / Protection Grade**

- L Aluminum / Single chamber / IP67
- H Aluminum / Double chamber / IP67
- G Plastic / Single chamber / IP65
- K Stainless steel / Single chamber / IP67

**Cable Line**

- M M 20x1.5
- N ½" NPT

**Field Display/The Programmer**

- A With
- X Without



● **HYRD903**

**License**

- P Standard (Non-explosion-proof)
- I Intrinsically safe (Exia IIC T6 Ga)
- G Flameproof (Exd IIC T6 Gb)

**Process Connection / Material**

- G Thread G1½"A / Stainless Steel 304
- N Thread 1½" NPT / Stainless Steel 304
- B Flange DN80 / Stainless Steel 304
- C Flange DN100 / Stainless Steel 304
- D Flange DN125 / Stainless Steel 304
- E Flange DN150 / Stainless Steel 304
- M Flange DN80 / Universal joint
- K Flange DN100 / Universal joint
- T Flange DN125 / Universal joint
- Z Flange DN150 / Universal joint
- Y Special Custom

**Antenna Type / Material**

- B Horn Antenna Φ76mm / Stainless Steel 316L (With blow holes or dust cover)
- C Horn Antenna Φ96mm / Stainless Steel 316L (With blow holes or dust cover)
- D Horn Antenna Φ121mm / Stainless Steel 316L (With blow holes or dust cover)
- Y Special Custom

**Seal Up / Process Temperature**

- V Viton / (-40~130) °C
- K Kalrez / (-40~230) °C

**The Electronic Unit**

- 3 (4~20) mA / 24V DC / HART two wire system
- 4 (4~20) mA / 220V AC / HART four wire system
- 5 RS485 Modbus / 6~24V / Four wire system

**Outer Covering / Protection Grade**

- L Aluminum / Single chamber / IP67
- H Aluminum / Double chamber / IP67
- G Plastic / Single chamber / IP65
- K Stainless steel / Single chamber / IP67

**Cable Line**

- M M 20x1.5
- N ½" NPT

**Field Display/The Programmer**

- A With
- X Without

● **HYRD904**

**License**

- P Standard (Non-explosion-proof)
- I Intrinsically safe (Exia IIC T6 Ga)
- G Flameproof (Exd IIC T6 Gb)

**Process Connection / Material**

- G Thread G1½"A / Stainless Steel 304
- N Thread 1½" NPT / Stainless Steel 304
- B Flange DN80 / Stainless Steel 304
- C Flange DN100 / Stainless Steel 304
- D Flange DN125 / Stainless Steel 304
- E Flange DN150 / Stainless Steel 304
- F Flange DN200 / Stainless Steel 304
- H Flange DN250 / Stainless Steel 304
- M Flange DN80 / Universal joint
- K Flange DN100 / Universal joint
- T Flange DN125 / Universal joint
- Z Flange DN150 / Universal joint
- W Flange DN200 / Universal joint
- V Flange DN250 / Universal joint
- Y Special Custom

**Antenna Type / Material**

- B Parabolic antenna Φ196mm / Stainless Steel 316L
- C Parabolic antenna Φ242mm / Stainless Steel 316L

**Seal Up / Process Temperature**

- V Viton / (-40~130) °C
- K Kalrez / (-40~230) °C

**The Electronic Unit**

- 3 (4~20) mA / 24V DC / HART two wire system
- 4 (4~20) mA / 220V AC / HART four wire system
- 5 RS485 Modbus / 6~24V/ Four wire system

**Outer Covering / Protection Grade**

- L Aluminum / Single chamber / IP67
- H Aluminum / Double chamber / IP67
- G Plastic / Single chamber / IP65
- K Stainless steel / Single chamber / IP67

**Cable Line**

- M M 20x1.5
- N ½" NPT

**Field Display/The Programmer**

- A With
- X Without

● **HYRD905**

**License**

- P Standard (Non-explosion-proof)
- I Intrinsically safe (Exia IIC T6 Ga)
- G Flameproof (Exd IIC T6 Gb)

**Process Connection / Material**

- G Thread G1½"A / Stainless Steel 304
- N Thread 1½" NPT / Stainless Steel 304
- B Flange DN80 / Stainless Steel 304
- C Flange DN100 / Stainless Steel 304
- D Flange DN125 / Stainless Steel 304
- E Flange DN150 / Stainless Steel 304
- M Flange DN80 / Universal joint
- K Flange DN100 / Universal joint
- T Flange DN125 / Universal joint
- Z Flange DN150 / Universal joint
- Y Special Custom

**Antenna Type / Material**

- B Horn Antenna Φ76mm / Stainless Steel 316L (With blow holes or dust cover)
- C Horn Antenna Φ96mm / Stainless Steel 316L (With blow holes or dust cover)
- D Horn Antenna Φ121mm / Stainless Steel 316L (With blow holes or dust cover)
- Y Special Custom

**Seal Up / Process Temperature**

- V Viton / (-40~130) °C
- K Kalrez / (-40~230) °C

**The Electronic Unit**

- 3 (4~20) mA / 24V DC / HART two wire system
- 4 (4~20) mA / 220V AC / HART four wire system
- 5 RS485 Modbus / 6~24V / Four wire system

**Outer Covering / Protection Grade**

- L Aluminum / Single chamber / IP67
- H Aluminum / Double chamber / IP67
- G Plastic / Single chamber / IP65
- K Stainless steel / Single chamber / IP67

**Cable Line**

- M M 20x1.5
- N ½" NPT

**Field Display/The Programmer**

- A With
- X Without

● **HYRD906**

**License**

- P Standard (Non-explosion-proof)
- I Intrinsically safe (Exia IIC T6 Ga)
- G Flameproof (Exd IIC T6 Gb)

**Process Connection / Material**

- B Flange DN80 / PTFE
- C Flange DN100 / PTFE
- D Flange DN150 / PTFE
- E Flange DN80 / Stainless Steel 304
- F Flange DN100 / Stainless Steel 304
- G Flange DN150 / Stainless Steel 304
- Y Special Custom

**Seal Up / Process Temperature**

- V Viton / (-40~100) °C

**The Electronic Unit**

- 3 (4~20) mA / 24V DC / HART two wire system
- 4 (4~20) mA / 220V AC / HART four wire system
- 5 RS485 Modbus / 6~24V/ Four wire system

**Outer Covering / Protection Grade**

- L Aluminum / Single chamber / IP67
- H Aluminum / Double chamber / IP67
- G Plastic / Single chamber / IP65
- K Stainless steel / Single chamber / IP67

**Cable Line**

- M M 20x1.5
- N ½" NPT

**Field Display/The Programmer**

- A With
- X Without