RRF series are suitable for external measurement of containers, storage tanks and storage materials with various process conditions, which are not affected by the physical properties of the measured medium. The two-wire system is suitable for explosion-proof applications. The maximum measuring distance is 70m for non-contact and continuous connected pulse object level meters.

**Product series**

- 26G Thread type long horn
- 26G Threaded connections short horn
- 26G Threaded connection type long horn
- 26G Threaded connection paraboloid type
- 26G Universal flange connection type long horn
- 26G Flange connection type composite antenna
- 26G Thread connection type
Product series

- 6.8G Universal flange connection type short horn
- 120G Flange connection high-temp type
- 120G High temperature type
- 26G Anticorrosive lens type
- 26G High frequency radar level gauge
- 26G High frequency radar level gauge
- 26G Drop water type
- 26G Flange connection parabolic
- 26G Planar array type
- 6.8G Guided wave pipe flange connection
- 6.8G Universal flange connection type short horn
- 6.8G High temperature flange connection type short horn
- 6.8G Flange connection type short horn
- 120G Sanitary
There is no blind area at the bottom, high precision, two wire system technology, is differential pressure meter, magnetic system expansion, radio frequency admittance, magnetic plate turning meter good substitute. Not affected by the vacuum, pressure, temperature changes, inert gas, dust, steam and other environmental factors, and it is simple to install, strong and durable, maintenance free HART or PPOFIBUS-PA communication protocol and the protocol, calibration is simple. Through digital LCD display, easy calibration operation, through software RRFPF implement a simple configuration settings and programming measurement sensitivity, fast refresh. Applicable to high temperature conditions, up to 200°C process temperature, when the use of high temperature extension of the antenna can reach 350°C.
Application of medium

RRFI series Radar Level Transmitter is applicable to non-contact continuous measurement of liquid, sizing agent and granule. Adopts microwave pulse measurement and is able to work normally within the range of industrial frequency waveband. The beam energy is very low and it can be mounted inside of various metal or non-metallic vessels or tubes, without harm to human body and the environment.

Working Principle

Extreme short microwave pulse that emits low energy is transmitted and received via antenna system. Radar wave runs at a light speed. The running time can be converted into level signal by the electronic components. One special way to extend time can ensure a steady and accurate measurement within very short time. Even in a very complicated working condition where fault echo exists, the latest micro-process technology and debugging software can precisely analyze out the level echo.

Input

The antenna receives the reflective microwave pulse and transmits it to electronic circuit and the microprocessor processes this signal and identifies the echo produced by the microwave on the object surface. Correct echo signal identification is accomplished by intelligent software and the accuracy can be up to mm grade. Distance surface-D from the object is direct proportion to the time travel of pulse $T$ : $D = \frac{C \times T}{2}$. $C$ is the speed of light. Due to the distance of the empty tank is known, the object level $L$ : $L = E - D$.

Output

Input the height of empty tank-E (=Zero), height of full tank (=Full scale) and some application parameters to do setting. The application parameter will automatically accommodate the measurement to the measuring environment. Corresponding 4-20mA to output.

Remark: This product can take special customization.
### Specification parameters

| Application | Liquid · corrosive liquid · low dielectric constant or surface fluctuation liquid · Solid powder · solid particles · strong dust prone to crystallization · slurry · Process container · exposure situation · sanitary liquid storage container · crude oil storage tank · light oil storage tank · volatile liquid storage tank · high material level and so on
| Measuring range | 6m, 0~20m, 30m, 70m
| Process connection | Thread, Flange, Universal type flange
| Process temperature | -40~120℃, -40~150℃, -40~250℃, -40~400℃
| Process pressure | -0.1~0.3MPa, -0.1~1.6MPa, -0.1~2.0MPa, -0.1~4.0MPa, -0.1~40MPa
| Accuracy | ±3mm, ±5mm, ±10mm, ±15mm
| Frequency range | 120GHz, 26GHz, 6.8GHz, 100MHz~1.8GHz
| Explosion protection grade | Exia IIIC T6/IP68
| Signal output | 4~20mA/HART (two wire / four wire) / RS485 / Modbus

### Debugging

RRF do the debugging through 3 ways:

By displaying the adjustment module GPM.
Through RRFPF debugging software.
Through the handheld programming Hart.

The programming module (GPM)

GPM programmer has six buttons and a liquid crystal display, can adjust the menu display and parameter setting. Its function is equivalent to an analysis.

### RRFPF Software adjust

No matter it is 4~20mA/HART signal output or Profibus Pa signal output, Radar sensor can be adjusted through software. Adopting RRFPF software to adjust, RRF requires an instrument of CONNECTCAT driver. The software and CONNECTCAT driver can be ordered as accessories.

When using software to make adjustment, 24VDC voltage should be given to radar instrument. At the same time, a 250Ω resistor should be added to the front end of HART adaptor. If the voltage supply instrument is integrated HART resistor (internal resistance 250Ω), there is no need to add an extra external resistor. At this time, HART adaptor can be connected with 4-20mA in parallel.
### Product Selection

**RRF1:** 26G high frequency smart radar level transmitter;  
**RRF2:** wave guide radar level transmitter;  
**RRF3:** 6.8G low frequency smart radar level transmitter;  
**RRF4:** UHF frequency modulation;  
**RRF5:** Planar array type

<table>
<thead>
<tr>
<th>01: Horn type</th>
<th>11: Horn level</th>
<th>21: Double amplifier</th>
<th>31: Installation of hydrological and water conservancy support;</th>
</tr>
</thead>
<tbody>
<tr>
<td>02: Composite antenna type</td>
<td>03: Parabolic</td>
<td>04: Rod type</td>
<td>05: Guided wave tube type</td>
</tr>
<tr>
<td>06: Coaxial tube type;</td>
<td>07: Single rod 304;</td>
<td>17: Single rod Teflon;</td>
<td>08: High temperature and high pressure type;</td>
</tr>
<tr>
<td>09: Single cable type 304;</td>
<td>19: Single cable Teflon;</td>
<td>00: Double cable type;</td>
<td>21: Droplet type; 22: Lens row;</td>
</tr>
</tbody>
</table>

**P:** Standard type (non-explosion proof) signal output 4-20mA HART  
**I:** Intrinsically safe explosion-proof type (ExiaIC T6) signal output 4-20mA with HART  
**S:** Intrinsically safe explosion-proof type ExiaIC T6 + marine license signal output 4-20mA with HART

1: Standard integration; 2: Split 3m cable type; 3: Custom made

| A | -40~120°C | B | -40~150°C | C | -40~250°C | D | -40~400°C |

Please select the correct specifications according to below chart

<table>
<thead>
<tr>
<th>Flange/thread type size</th>
<th>Flange/thread specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>E: 1&quot; (40A) 1:4&quot; (100A)</td>
<td>L: 5kg/cm²</td>
</tr>
<tr>
<td>F: 2&quot; (50A) J: 5&quot; (1250A)</td>
<td>M: 10kg/cm²</td>
</tr>
<tr>
<td>G: 2-1/2&quot; (65A) K: 6&quot; (150A)</td>
<td>N: 150Lbs</td>
</tr>
<tr>
<td>H: 3&quot; (80A) S: Custom made</td>
<td>O: 300Lbs</td>
</tr>
<tr>
<td></td>
<td>P: PT</td>
</tr>
<tr>
<td></td>
<td>Q: PF</td>
</tr>
<tr>
<td></td>
<td>F: NPT</td>
</tr>
<tr>
<td></td>
<td>T: GAS</td>
</tr>
</tbody>
</table>

1: 4~20mA two wires; 2: 4~20mA four wires; 3: 4~20mA/Hart two wires; 4: 4~20mA/Hart four wires; 5: RS485/Modbus

<table>
<thead>
<tr>
<th>Y: Anticorrosive; N: Non corrosion protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing/protection level/ Antenna protection level</td>
</tr>
<tr>
<td>S: Plastic/IP66/IP67</td>
</tr>
<tr>
<td>A: Aluminium alloy/IP68</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>M: M20x1.5; N: 1/2NPT;</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: 2x M20x1.5; B: 2x 1/2NPT</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A: With; X: Without</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: With; X: Without</td>
</tr>
</tbody>
</table>

Unit (mm)