



**3 in 1 Radar water flowrate
water level water flow sensor
40 meters measure range**



Type Model: RD- 600

PRODUCT INTRODUCE

Product brief Introduce

The RD-600 radar flowmeter was independently developed by our company. It is a non-contact and integrated flow monitoring device that can continuously measure flow rate, water level and flow. It uses radar planar microwave technology to measure the velocity and level of water in a non-contact manner. According to the built-in software algorithm, the instantaneous cross-sectional flow and cumulative flow are calculated and output. At the same time, the flow rate and water level can be output, and the telemetry platform can be easily connected, and the measurement information can be viewed on the cloud platform. Support digital (RS485, RS232) or analog (4-20mA) transmission of measurement results, using standard Modbus-RTU protocol. Support 4G technology to realize wireless data transmission. This product can be used for non-contact flow measurement in open channels, rivers, irrigation channels, underground drainage pipeline networks, flood control warnings, etc.; this product has the characteristics of low power consumption, small size, high reliability, simple operation, convenient maintenance, etc.; measurement process It is not affected by environmental factors such as temperature, air pressure, sediment, dust, river pollutants, floating objects on the surface, and air.

Measuring principle

The RD-600 radar flowmeter uses planar microwave technology, uses the Doppler radar principle to measure the surface velocity of water flow, and uses the built-in microstrip radar technology to measure the water level. According to the velocity-area method, the water level is measured to convert the cross-sectional area, and then the average velocity is converted from the surface velocity combined with the cross-sectional parameters. The empirical formulas for the velocity distribution of the open channel cross section such as circular, rectangular and trapezoidal are established, and the hydraulic model algorithm is used to obtain Flow rate is a non-contact flow measuring instrument that accurately measures the flow rate without changing the boundary conditions of channels, rivers, pipes, etc.

Flow rate measurement principle

The radar velocity meter uses the principle of Doppler radar velocity measurement. When measuring the speed of the water surface, the radar velocity sensor emits microwaves to the water surface, and the microwaves will be absorbed and reflected after encountering the water surface. A part of the reflected wave is received by the probe of the flow meter, and then converted into an electrical signal, which is

processed by the measurement circuit and the Doppler frequency shift is measured, and then the flow rate of the water body can be calculated by the signal processing algorithm such as FFT according to the above principle.

Principle of water level measurement

The radar water level probe adopts pulse coherent radar (PCR) technology. The microstrip planar antenna emits very narrow microwave pulses. When it encounters the surface of the material to be measured, part of its energy is reflected back and received by the same antenna. The time interval between the transmitted pulse and the received pulse is proportional to the distance between the antenna and the surface of the measured medium. Due to the extremely high propagation speed of electromagnetic waves, the time interval between the transmitted pulse and the received pulse is very small. Compared with the traditional radar pulse water level gauge, the 60G radar water level gauge uses a special modulation and demodulation technology. Through the pulse coherence method, it can accurately identify the time interval and phase difference between the transmitted pulse and the received pulse, which greatly improves the measurement accuracy. At the same time, the own software's wave cancellation algorithm is used to ensure the measurement accuracy and also have good result stability.

Flow measurement principle

The average flow velocity can be obtained and converted through the radar flow rate probe, and the water depth can be obtained and converted through the radar water level probe. The cross-sectional flow is equal to the (average flow rate) \times (water flow cross-sectional area) \times (bank coefficient). In the open channel of the irrigation area, the common open channel cross-section types are rectangular, trapezoidal or U-shaped; the commonly used slopes are dry and branch canal longitudinal slopes; the two commonly used roughness rates are concrete canal walls and masonry canal walls. For these common open channels, the bottom slope and roughness are determined. In the flow velocity distribution of the cross section, the flow velocity has a strong symmetry, and the straight section of the irrigation section and the downstream are longer, and the cross section is symmetrical. The distribution is characterized by good symmetry. The velocity field distribution is modified according to the cross-sectional form, bottom (longitudinal) slope, and roughness; the turbulence mathematical model used is

mainly the RNG (renormalization group) κ - ϵ model, which has high calculation accuracy, good numerical stability, and calculated data volume Moderate.

Specifications

Features

1. Small size, high reliability, simple operation and convenient maintenance;
2. Not affected by environmental factors such as temperature, sediment, dust, river pollutants, floating objects on the water surface, and air pressure;
3. Used for non-contact flow measurement in open channels, rivers, irrigation canals, underground drainage pipe networks, flood control and other occasions;
4. Non-contact measurement method, convenient measurement, no pollution to the environment;
5. With rain mode to prevent interference caused by rain;
6. The waterproof grade is IP68, which can effectively prevent the internal components from getting damp;
7. Low power consumption, solar power can be used, easy installation and maintenance-free;
8. Ultra-low power consumption sleep mode, 12V power supply current is less than 30uA. (RD-600s-R).

Electrical characteristics

1. 7~32VDC power supply;
2. The working current and standby current are low, it can be powered by solar energy, which is convenient for installation and maintenance-free;
3. Lightning protection circuit, 6KV lightning protection. Thunderstorm days can effectively protect equipment against lightning strikes;
4. High test accuracy and stable data. Effectively guarantee the accuracy of the test;
5. Support RS485, RS232, 4-20MA and other wired communication methods;
6. Support 4G wireless communication.

TECHNICAL PARAMETER

Item	Index
Flow measurement system	
Measuring principle	Planar microstrip array antenna CW + PCR
Operating mode	Manual, automatic, telemetry
Applicable environment	24 hours, rainy day
Operating temperature	-30~80℃
Operating Voltage	7-32V / 5.5-32V (optional) DC power supply
Working current	12VDC input, working mode: ≤120mA; Standby mode: <1mA; Sleep ≤ 30uA
Protection level	IP68
Lightning protection level	6KV
Physical dimension	235.4×100×103.7 (mm)
Weight	< 1.5KG
Radar speed sensor	
Radar power	100mW
Transmission power	< 10mW
Radar frequency	24GHz
Maximum range	40m
Speed range	0m/s~20m/s (related to water flow)
Speed measurement accuracy	±0.5cm/s ;
Speed measurement resolution	0.1cm/s
Radar current meter beam angle	12°
Measuring direction	Automatic recognition of water flow direction, built-in vertical angle correction vertical angle correction
Radar water level gauge	
Radar frequency	24GHz
Radar Ranging range	0.2~40.0m
Radar Ranging accuracy	±3mm
Antenna angle	11°
Data transmission system	
Data transmission type	RS485/ RS232,4~20Ma,4G RTU, LORA/LORAWAN