



Discharge Radar Sensor RQ-30d

Discharge measurement for wide rivers with inhomogeneous distribution of flow velocity

With the system of one master-radar sensor and several slave-radar sensors the velocity is measured at several spots throughout the whole water cross-section. Therefore a very high accuracy of the discharge measurement is guaranteed also for very wide water bodies.

Features and advantages

- Discharge measurement with high accuracy – ideal use for very wide rivers with inhomogeneous velocity distribution
- One water level measurement and multiple, individual velocity measurements
- Well proven RQ-radar technique: non-contact measurement, maintenance free system, flood-proof
- No structural work is necessary in the water
- Recognition of flow direction and hysteresis effects
- Measurement in tidal waters
- Measurement in backwater situations
- Measures even where weed growth prevails and sensor is not affected by turbidity
- Measuring range 0.08 ... 16 m/s (depending on the flow conditions)
- Analogue outputs from 4 to 20 mA (optional)

Fields of application

The main advantage of the RQ-30d is that the discharge can be measured more precisely, especially in rivers and streams where the flow velocity is distributed inhomogeneously over the cross-section. Varying velocities can be observed particularly in very broad streams as well as in situations, where the measuring site is located close to a river bend, an incoming river or watergates. In order to capture the complete flow-profile even more accurately, the RQ-30d system measures multiple individual flow velocities dispersed over the width of the body of water.

Measuring principle

For the RQ-30d (in comparison to the RQ-30) the measuring principle was enhanced: Here the river is split into multiple sections and from each one a partial velocity measurement is taken. One sensor, the master device, additionally measures the water level and distributes this information to all the other devices (= slaves) in the system. Now they are able to

calculate the partial discharge rate per section. Summing up all partial amounts of discharge results in the total discharge at the actual site – continuously, with non-contact to the water and with increased accuracy. The RQ-30d system can be operated with up to seven slave devices at the maximum.

Technical details

General

- **Dimensions** master: 338 mm x 333 mm x 154 mm | slave: 175 mm x 154 mm x 246 mm
- **Total weight** master: 5.4 kg | slave: 2.7 kg
- **Protection class** IP 67
- **Power supply** 6 ... 30 V
- **Power consumption at 12V** standby approx. 1mA; active operation approx. 140mA
- **operating temperature** - 35 ... 60°C
- **Miscellaneous** over voltage protection, reverse power protection, lightning protection

Waterlevel measurement

- **Measuring range** 0 ... 15 m standard version / 0 ... 35 m extended version
- **Resolution** 1 mm
- **Radar frequency** 26 GHz (K-Band)
- **Radar opening angle** 10°

Velocity measurement

- **Measuring range** 0.08 ... 16 m/s (depending on flow conditions)
- **Accuracy** +/- 0.01 m/s; +/- 1 % FS
- **Resolution** 1 mm/s
- **Direction recognition** +/-
- **Measuring duration** 5 ... 240 sec.
- **Measuring interval** 8 sec. ... 5h
- **Measuring frequency** 24 GHz (K-Band)
- **Radar opening angle** 12°
- **Distance to water surface** 0.50 ... 35 m
- **Minimum swell needed** 3 mm

Automatic vertical angle compensation

- **Accuracy** +/- 1°
- **Resolution** +/- 0.1°

Interface

- **Interface** 1x SDI-12 1 x RS 485 or Modbus
- **Transfer rate** 1.2 to 115.2 kBd
- **Protocol** diverse ASCII-protocols
- **Output** discharge rate, flow velocity, waterlevel, quality parameters