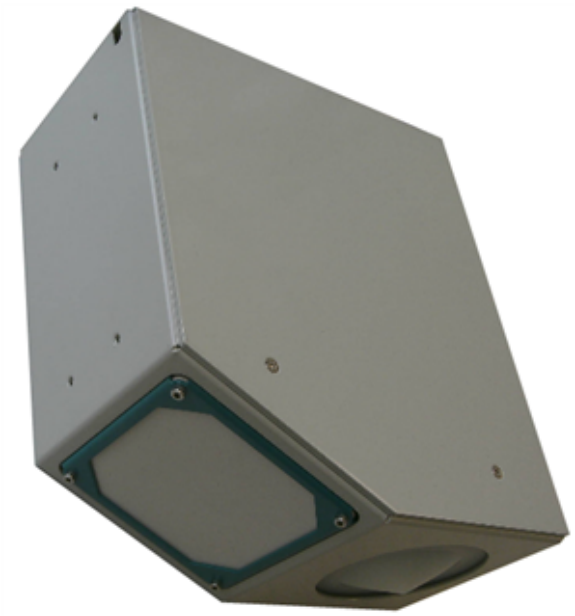
RQ-30, RQ-30a

Discharge Measurement System



The exact and real time knowledge of water discharge is of central importance in the fields of hydrography, water storage management, irrigation and for the early detection of floods. It is essential in hydraulic engineering and water resource management and is the basis for hydrological modelling and simulation.

The RQ-30 sensor is a continuous measurement device for the contact-free determination of the water discharge of open rivers and channels. It combines two sensors in one system. The first determines the water level by measuring the transit time of a radar signal. The second simultaneously measures the flow velocity of the water surface by means of the Doppler frequency shift. These two measurements are internally combined and thus provide the water discharge by using a predefined calibration of the measurement site.

Due to the contact-free measurement method the RQ-30 can be installed on extension arms without costly structural measures in the channel or river. This also has the advantage that the sensor is located outside the danger area of flood events and that it requires little maintenance over many years.

Backwater situations caused by inflows, weirs and downstream standing water bodies show no stable relation between water level and discharge. In many situations hysteresis effects with different relations for rising and falling water levels occur. Therefore, the determination of such relations is affected by substantial uncertainty. Only additional information about flow velocity permits the calculation of discharge under these difficult conditions.

- Automatic discharge calculation based on hydraulic model with multiple k-factors.
- Sensor self check with status and error output.
- AI-based machine learning for compensation of environmental influences and early detection of errors.
- 3-point velocity calibration certificate.
- Discharge calculation inside the RQ-30.

- Water level and velocity sensor combined in one weather and vandalism proof housing.

Versions

Art	Version
17193	RQ-30 System for contact-free discharge measurement 0.1...15 m/s, 0...15 m, aluminium casing
19901	RQ-30 System for contact-free discharge measurement 0.1...15 m/s, 0...15 m, stainless steel casing
17194	RQ-30a System for contact-free discharge measurement 0.1...15 m/s, 0...15 m, analog output
19423	RQ-30 System for contact-free discharge measurement 0.1...15 m/s, 0...35 m
19424	RQ-30a System for contact-free discharge measurement 0.1...15 m/s, 0...35 m, analog output
20709	RQ-30a System for contact-free discharge measurement 0.1...15 m/s, 0...75 m, analog output

Art	Version
21599-CL	SQ-R non-contact flowmeter for sewage and wastewater flow monitoring, with radar level and velocity sensors

Scope of delivery

Qty	Art	Item
1	-	RQ-30 in the required version
1	-	Manual and Commander Software on USB stick

Accessories

Art	Accessory
18711	Data cable for RQ-30 / RG-30, LiYCY 12x0,25mm², 10 m
18712	Data cable for RQ-30 / RG-30, LiYCY 12x0,25mm², 20 m
15833	Data cable for RQ-30 / RG-30 / SQ, 12x0,25 mm², up to 60m
15543	Data cable for configuration and testing of RQ-30 / RG-30 / SQ
20074	RG / RQ standart mouniting set, 2x U-bolt max. ∅60 mm
20572	RQ-30 lightning protection for cable length >50 m
20470	Q-Commander software V1.0

Specifications

Physical and environmental	
Power supply	6...30 VDC; Reverse voltage protection, overvoltage protection
Power consumption at 12 VDC	Standby approx. 1 mA Active measurement approx. 140 mA
Outputs	RS-485 ASCII / Modbus RTU SDI-12 Analog output 4...20 mA (14 bit, max. load 250 Ω) Digital output (low: 0V, high: Vsupply, max. 1.5 A)
Operating temperature	-40...75 °C (-40...167 °F)
Operating temperature	-40...60 °C (-40...140 °F)
Storage temperature	-40...60 °C (-40...140 °F)
Relative humidity	0...100 %
Protection rating	IP 67
Lightning protection	Integrated protection against indirect lightning with a discharge capacity of 0,6 kW Ppp
Housing material	Powder coated aluminum, vandalism-proof Stainless steel option available
Mounting bracket	Ø34...48 mm
Size L x W x H	338 x 154 x 333 mm (13.31 x 6.06 x 13.11 in)
Weight	5.4 kg (11.90 lb)

Velocity	
Detectable measurement range	0.08...16 m/s (depending on waves)
Detectable measurement range	0.08...18 m/s (depending on waves)
Accuracy	± 0.01 m/s
Resolution	1 mm/s
Direction recognition	+/-
Measurement duration	5...240 s
Measurement interval	8 s...5 h
Measurement frequency	24 GHz (K-Band)
Radar opening angle	12°
Distance to water surface	0.50...35 m 0.05...130 m (0.16...426.51 ft)
Vertical inclination	Measured internally

Automatic vertical angle compensation	
Accuracy	± 1 °
Resolution	± 0.1 °

Water level measurement	15 m	35 m	75 m
Measurement range (distance between level sensor and water surface)	0...15 m (0...49.21 ft.)	0...35 m (0...114.83 ft.)	0...75 m (0...246.06 ft.)
Measurement frequency	80 GHz	26 GHz	80 GHz
Resolution	2 mm		
Accuracy	± 0.025 % FS		
Level sensor opening angle	8°	10°	8°