SQ-R

Discharge Measurement System

The exact and real time knowledge of water discharge is of central importance for the operation of waste water treatment facilities, cost allocation in sewage networks and management of communal and industrial water resources.

The SQ-R sensor is a continuous measurement device for the contact-free determination of the water discharge of open or closed canals. 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. Following each measurement, the sensor applies an advanced hydraulic model to compute the mean velocity, which in turn is used to calculate the water discharge.

Due to the contact-free measurement method the SQ-R can be installed on extension arms without costly structural measures in the water or sewage treatment canal. This also has the advantage that the sensor is located outside the danger area of floods and that it requires virtually no maintenance over many years.

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

Versions

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

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	-	SQ-R in the required version
1	-	Manual and SQ-Commander Software on USB stick

Accessories

Art	Accessory
20789	MAIN sensor cable SQ/USH-9, 10 m
20791	20791 MAIN sensor cable SQ/USH-9, 20 m
-	Configured data cable for SQ-R up to 60 m available on request
19294	USB to RS485 embedded converter cable, 1.8 m

Specifications

Physical and environmental	
Power supply	9...28 VDC; Reverse voltage protection, overvoltage protection
Power consumption at 12 VDC	1.5 Ah per day Peak current drain 91 mA Inrush current <200 mA (for a measurement interval of 60 s)
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 68
Lightning protection	Integrated protection against indirect lightning with a discharge capacity of 0,6 kW Ppp
Housing material	Zytel 103HSL NC010, resistant to aggressive substances typically found in sewage channels
Mounting bracket	Mounting cube Ø30 mm
Size L x W x H	272 x 152.2 x 185.5 mm (10.71 x 5.99 x 7.30 in), including mounting cube
Weight	1.55 kg (3.42 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	0.05...35 m (0.16...114.83 ft) 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 range (distance between level sensor and water surface)	0.05...8 m (0.16...26.25 ft)
Measurement range (distance between level sensor and water surface)	0.05...5 m (0.16...16.40 ft) (other measurement ranges available on request)
Accuracy	≤ 2 mm
W-band (80 GHz technology)	W-band (80 GHz)
Opening angle	8°