LVQ-15 / LVQ-35

Non-Contact Discharge Radar Sensor

WATER FLOW

General Description

HyQuest Solutions' LVQ-15 and LVQ-35 are sensors for **continuous discharge measurement** of rivers, open channels and canals with known cross-section profile. The sensors use **innovative radar technology** to measure velocity, water level and discharge. They enable **reliable, non-contact measurement** without the need for structural work in the water.

Thanks to the non-contact radar technology the LVQ is not susceptible to contamination, debris or driftwood in the water. Furthermore, the non-contact measurement ensures **very low maintenance** and fail-safe operation especially during high water or flooding.

The LVQ can be **simply mounted** on bridges, on the roofs of closed canals or channel superstructures. Depending on the properties of the water surface the device can be installed in a height of 0.5 to 35 m. LVQ is available in two versions:

- LVQ-15: water levels from 0 to 15 meters
- LVQ-35: water levels from 0 to 35 meters

The measurable velocity range is between 0.10 and 15 m/s. Additionally the direction of flow is detected, enabling the operation in tide influenced rivers.

Measuring principle

The non-contact radar technology determines the water surface flow velocity using the **Doppler frequency shift method** and furthermore the water level is established by a travel time measurement. With known cross section profile the discharge Q of the water is calculated.

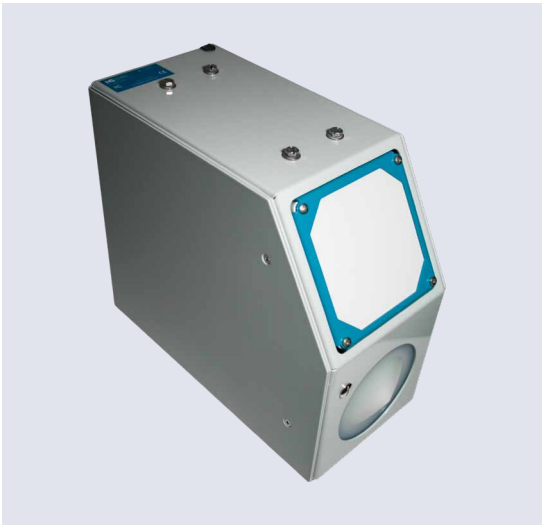
Applications

LVQ enables discharge measurement for rivers, streams, open channels and canals for which continuous monitoring is desired. The bed of the water should be as stable as possible in order to warrant consistent measurement. A visible swell must be evident on the water surface.

- Hydrography
- Water storage management
- Flood detection
- Hydraulic engineering
- Water resource management
- Hydrological modelling and simulation

Features

- Non-contact, maintenance-free measurement system; no structural work needed
- Fully operating even in flood water situations
- Low power consumption enables operation using solar cells
- Detection of flow direction
- Recognition of hysteresis effects
- Measures in backwater situations
- Automatic installation angle correction
- Automatic discharge calculation based on hydraulic model with multiple k-factors
- Sensor self check with status and error output
- 3-point velocity calibration certificate
- Water level and velocity sensor combined in one weather and vandalism proof housing



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Technical Specifications

Protection Class	IP 67
Power	■ Supply: 6 to 30 VDC ■ Consumption at 12 VDC: standby approx. 1 mA, active measurement approx. 140 mA ■ Over voltage protection, reverse voltage protection, lightning protection (integrated protection against indirect lightning with a discharge capacity of 0,6 kW Ppp)
Temperature and Humidity	■ Operating and storage temperature: -40 to 60 °C (-40 to 140 °F) ■ Relative humidity: 0.. to 100 %
Interface	■ Outputs RS-485 ASCII / Modbus RTU, SDI-12 ■ Analog output: 4 to 20 mA (14 bit, max. load 250 Ω) ■ Digital output (low: 0V, high: Vsupply, max. 1.5 A)
Material	Housing material powder-coated aluminum, vandalism-proof (stainless steel option available)
Dimensions and Weight	■ L x H x W: 338 mm x 333 mm x 154 mm (13.31 x 6.06 x 13.11 in), 5.4 kg (11.90 lb) ■ Mounting Bracket (included): Ø 34 to 48 mm
Water Level Measurement	■ Measurement range (distance between level sensor and water surface): - Standard LVQ-15: 0 to 15 m (0 to 49.21 ft) - Extended version LVQ-35: 0 to 35 m (0 to 114.83 ft) ■ Measurement frequency: 80 GHz (standard LVQ-15), 26 GHz (extended version LVQ-35) ■ Resolution 2 mm ■ Accuracy: ± 0.025 % FS ■ Level sensor opening angle: 8° (standard LVQ-15), 10° (extended version LVQ-35)
Velocity Measurement	■ Detectable measurement range: 0.08 to 18 m/s (depending on waves) ■ Accuracy: +/- 0.01 m/s; +/- 1 % FS ■ Resolution: 1 mm/s ■ Direction recognition: +/- ■ Measurement duration: 5 to 240 s, measurement interval: 8 s to 5 h ■ Radar: frequency 24 GHz (K-Band), opening angle 12° ■ Distance to water surface: - 0.50 to 35 m - 0.05 to 130 m (0.16...426.51 ft) ■ Vertical inclination measured internally ■ Necessary minimum wave height: 3 mm
Automatic vertical angle compensation	Accuracy +/- 1°, resolution +/- 0.1°

Accessories

LVQCOMM: Commander software for parameterization and discharge calculation. The software is operated by means of a desktop or laptop that is connected to the LVQ sensor using the RS485/USB adaptor provided.

iRIS dataloggers and data modems:

- Robust housing
- IP over one or two channels of your choice: 4G with 3G fallback / GPRS, satellite, IoT
- I/O: analog, digital, SDI-12, Modbus
- iLink software
- Telemetry or cloud app

Please ask for details.

Specifications are subject to change without notice. Weights and dimensions are indicative. - © HyQuest Solutions | 06.2021

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