



Water



GWF



Q-Eye PSC

Stationary area velocity flow meter for partially filled or pressurized pipes and open channels

Your benefits

- Best-in-class Doppler profiling technology: **Excellent long-time measurement stability, no need for costly on-site calibration**
- Velocity profiling with logarithmic interpolation: **No blanking zone at bottom of channel or pipe. Highest accuracy in flow measurement for optimized process control**
- Smallest area velocity sensor worldwide: **No disturbance of the flow profile, velocity measurement starts at 2 cm (< 1") water level**
- Platform-independent web interface for configuration, operation and maintenance: **Easy and fast setup with multi-language graphical user interface. Parametrization with any mobile device, no software needed**
- Integrated Wi-Fi access point and LAN interface, optional mobile connection: **Efficient system integration, real-time remote access anytime and anywhere**
- Passive sensor, no electronics inside: **Maximum sensor robustness and lifetime, minimized total cost of ownership**

Application

- Full or partially full pipes 100-2000 mm (4-80") in diameter or open channels with flow depths of 40-2000 mm (1.5-80")
- Ideal for sites with non-uniform or rapidly changing flow behavior. Suitable for applications with low and high water levels
- Continuous flow monitoring in slightly to heavily polluted media:
 - Wastewater treatment plants
 - Wastewater collection systems
 - Urban drainage
 - Industry

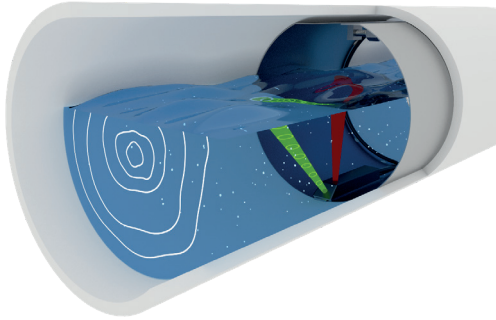
Features

- Compact aluminum housing, IP66 (NEMA 4)
- Smallest area velocity sensor worldwide, IP68
- Insertion sensor which does not protrude into the flow, IP68
- Pulse-Doppler Spectral Correlation technology
- Scanning of the entire velocity profile in up to 18 measuring cells
- Measurement of low velocities down to 0.04 m/s
- Bi-directional measurement over the entire flow range
- Typical accuracy: $\pm 2\%$ of reading for flow
- Integrated Wi-Fi access point
- Graphical user interface in multiple languages
- All units for display and data storage can be customized by the user
- Preselection of typical cross sections or user-definable irregular shapes
- Analog inputs for external sensors (2-wire loop-powered)
- Multiple analog and digital outputs, user programmable
- Communication: Ethernet, Modbus RTU/TCP, optional 4G/3G/2G modem
- Power supply: 100-240 V AC or 9-36 V DC
- ATEX for area velocity sensor available

Application

- Area velocity sensor to be mounted on pipe or channel bottom (up-looking) or wall (side-looking)
- Several velocity sensors in one cross section (up to 3)
- Insertion sensor for pipes only accessible from the outside
- Additional external level sensors (pressure, non-contact ultrasonic or radar)
- Well-established sensor mounting systems for diverse applications

Product description



Q-Eye PSC area velocity sensor

WebUI (Wi-Fi)

The Q-Eye PSC is equipped with an integrated web server running a WebUI. You can display and manage the WebUI using the standard web browser of your smartphone, tablet PC or notebook. There is no need for any additional software or App. Parameter setting and data visualization has never been so easy.



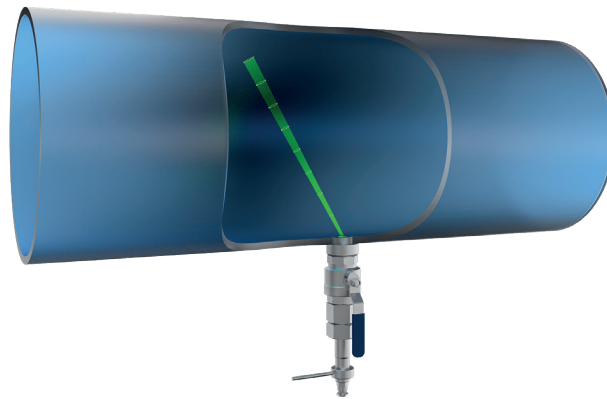
Data storage and transmission

Combine the Q-Eye PSC with a 4G/3G/2G cellular modem for automatic data transmission. The logged data can be sent to any host computer (FTP server) or to the GWF web-based cloud solution at a user-selectable interval (e.g. 4 times a day, once a day or once a week). Alternatively, wireless LAN and Ethernet connections are available.

Information on level, velocity, flow and signal strength can be taken at regular intervals between 1 minute and 60 minutes. In case of a flood event, the logging can be set automatically to one minute (event mode). The Q-Eye PSC is equipped with internal storage capacity (16 GB) and will store data for up to 18 months.

The Q-Eye PSC area velocity flow meter is designed for stationary flow monitoring of slightly to heavily polluted media in full or partially full pipes or open channels.

It uses advanced Pulsed-Doppler technology to directly evaluate velocity profiles, making it the best choice for sites with non-uniform or rapidly changing flow conditions. Additionally, the Q-Eye PSC measures bi-directional flow over the entire measurement range and near zero flow velocities down to 0.04 m/s. This profiling capacity eliminates the need for on-site calibration, thereby significantly reducing the cost of installation.



Q-Eye PSC insertion velocity sensor

Measuring principle

The Q-Eye PSC is a major improvement in open channel flow measurement. It's the latest entry in the GWF family of high-accuracy metering products. In contrast to the older Continuous Wave Doppler method, the Q-Eye PSC transmits acoustic pulses into the flow. These sound pulses are echoed back from particles in the medium. By time-gating the returned signals, velocity is measured in multiple cells, enabling a stepwise scanning of the entire velocity profile. Detailed velocity data in relation to the sensor location is used to calculate a highly accurate flow profile.

When compared to the Cross-Correlation method (evaluation of specific patterns in the flow), the Spectral-Correlation technology (PSC) allows for measurements in considerably more cells with a cell size of only a few millimeters. Thus the velocity profile can be measured with a much higher resolution.

By means of the PSC technology, it is possible to measure flow velocity profiles very close to the sensor as well as in greater distances. This makes the Q-Eye PSC suitable for both shallow and high water level applications.

Component description

The Q-Eye PSC system can be composed of a wall-mounted transmitter and several sensor options. The submersible area velocity sensor offers combined velocity and water level measurement for direct flow calculation with one sensor. The insertion velocity sensor can be used directly for pressurized pipes or combined with any additional level sensor for partially filled pipes.

Transmitter



Wall-mounted transmitter

The Q-Eye PSC transmitter incorporates all the required algorithms and software to ensure measurement accuracy and repeatability. The IP66 (NEMA 4X) compact housing features a 4 x 20 alphanumeric LCD display and a 4 button keypad.

All configuration data as well as measured and calculated data are stored inside a 16 GB Micro-SD card. The transmitter controls the measurements, calculates the flow rate and provides freely programmable current outputs, status alarms, frequency outputs and totalizer readings.

Sensors



Insertion velocity sensor



Low-profile area velocity sensor

The submersible area velocity sensor measures only 15 x 25 x 108 mm, making it the smallest sensor of this type currently available. Its low profile means less interference, which results in more accurate velocity measurements, especially in low-flow situations.

The insertion sensor is used when the pipe is accessible from the outside only. This sensor is for use in full pipes or partially full pipes in combination with an external level sensor (e.g. pressure or ultrasonic). These sensors can be installed into existing pipework through a 5 cm / 2" ball valve.

Mounting systems



Mounting plate, spring ring and scissors rings

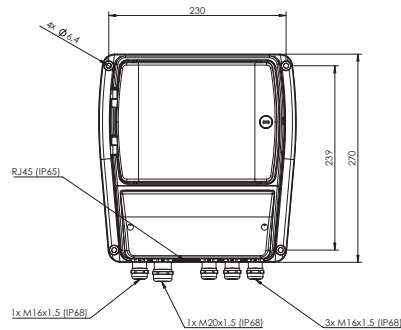
Standardized accessories including mounting plates, spring and scissors rings are available. Thus, the sensors can be installed within minutes, reducing time in the manhole. The sensor is first attached to a carrier and can then be fixed onto any of the compatible mounting systems. To install the sensors in rectangular, trapezoidal or earthen channels, we recommend the sensor mounting plate. Stainless steel spring rings simplify sensor installation in cylindrical pipes. 6 standard diameters from 200 mm (8") to 600 mm (24") are available.

You can install the sensor and fix the cable to a mounting ring before entering the manhole. In this way, the time spent in the sewer is significantly reduced. The rings can be expanded with a screw mechanism against the wall of the sewer. The expanding pressure makes undesired shifting of the ring impossible.

The adjustable scissors ring is installed in large pipes from 500 mm (20") to 1450 mm (57") in diameter. It consists of a base element with a scissors mechanism and one or more pairs of extensions to fit the size of the pipe.

Technical data

Transmitter



Q-Eye PSC

Display	4 lines, 20 characters
Keyboard	4 keys
Datalogger	16 GB Micro SD card
Communication	RS-485, Modbus (RS-232 or RS-485), Wireless LAN, 4G (LTE) / 3G (HSPA+) / 2G, Ethernet 10/100 Mbps
Inputs	max. 4 x 4-20 mA, 2 x digital
Outputs	max. 4 x 4-20 mA, 4 x relay, 2 x digital
Power supply	9-36 V DC or 100-240 V AC (50/60 Hz)
Approval	IP66 (NEMA 4)
Enclosure	Aluminum
Operating temperature	-20 °C to +60 °C
Storage temperature	-20 °C to +70 °C
Dimensions	270 x 256 x 139 mm (L x W x H)

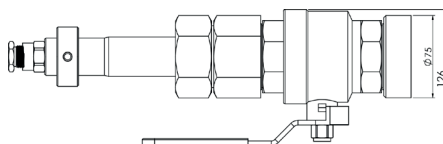
Sensor



Area velocity sensor

Sensor	1 x velocity 1 x water level
Frequency	1 MHz
Range	Velocity ± 5.3 m/s Water level 0.04 - 1.3 m expandable with external 4-20 mA level sensor
Accuracy	Velocity: ± 0.03 m/s from -1.5 m/s to +1.5 m/s $\pm 1\%$ of reading from -5.2 to -1.5 m/s and +1.5 to +5.2 m/s Level: $\pm 0.5\%$ FS (1.5 m) Flow: typically $\pm 2\%$, depending on site conditions
Cable length	10 m incl. (max. 80 m)
Particle concentration	> 50 ppm
Material	Epoxy
Protection class	IP68 (48 h at 50 kPa, NEMA 6P)
Approval	ATEX (option)
Dimensions	108 x 25 x 15 mm (L x W x H)

Sensor



Insertion sensor

Sensor	1D velocity sensor for partially and fully filled pipes incl. 50 mm (2") ball valve
Frequency	1 MHz
Range	± 5.3 m/s (velocity)
Accuracy Velocity	± 0.03 m/s from -1.5 m/s to +1.5 m/s $\pm 1\%$ of reading from -5.2 to -1.5 m/s and +1.5 to +5.2 m/s
Cable length	10 m incl. (max. 80 m)
Material	Stainless steel 1.4301 (AISI 304)
Dimensions	Diameter: 50 mm (2")

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