

# Hach Sigma 910 Portable Area Velocity Flow Meter



*The compact 4.5 x 18 in. design and weight of less than 8 lb. (with battery) makes the Hach Sigma 910 Flow Meter one of your best options for remote environments. Use it to log level and velocity data for more than 60 days without changing the battery. Its sealed design provides superior system protection against surcharge conditions.*

## Features and Benefits

### Simple and Reliable Flow Measurement

The compact and lightweight Hach Sigma 910 Portable Area Velocity Flow Meter measures average velocity directly, without the need for time-consuming and costly flow profiling. Hach's exclusive Submersible Area Velocity Sensor assures accuracy and reliability for unsurpassed versatility, even in the harshest open-channel applications.

### Ideal for Remote Environments

The Noryl housing of the Hach Sigma 910 flow meter is NEMA 6P sealed to withstand submergence and prolonged surcharge conditions. Its compact size makes it easily portable and provides for easy storage and fit in a variety of applications such as sewer and storm water monitoring.

### Advanced Technology for Accuracy

The technology used in the Hach Sigma 910 flow meter automatically corrects the effect of temperature on level measurement for a higher level of accuracy. The patented\* "Drawdown Correction" feature corrects the effects of velocity on accurate level measurement. Advanced, ultrasonic one-MHz Doppler technology avoids signal dropouts and ensures—without the need for on-site calibration—high levels of accuracy in low-flow, full-pipe, or reversed-flow conditions. The hydrodynamic body and side-mounted cable also maintains accuracy by reducing turbulence along the sensor body.

\*Patent pending.

### Easy Installation and Maintenance

The 4.5-inch diameter of the Hach Sigma 910 flow meter means it can install almost anywhere. It has a low profile for reduced maintenance. The low maintenance sensor is detachable and interchangeable for flexibility. An oil-filled probe greatly reduces sensor fouling and need for regular cleaning schedules. Single point calibration (atmospheric) makes calibration quick and accurate.

### Applications

The Sigma 910 Portable Area Velocity Flow Meter is ideal for short-term flow studies and sanitary sewer evaluation studies.



DW = drinking water WW = wastewater municipal PW = pure water / power  
IW = industrial water E = environmental C = collections FB = food and beverage



Be Right™

WW

IW

C

## Specifications\*

### 910 Flow Meter

#### Units of Measurement

Level: m, cm, ft., in.

Flow: gps, gpm, gph, lps, lpm, lph, mgd, afd, cfs, cfm, cfh, cfd, m<sup>3</sup>s, m<sup>3</sup>m, m<sup>3</sup>h, m<sup>3</sup>d

Totalized Flow: L, m<sup>3</sup>, ft.<sup>3</sup>, gal., acre-ft.,

#### Monitoring Intervals

1, 2, 3, 5, 6, 10, 12, 15, 20, 30, and 60 minutes

#### Operating Temperature

-18 to 60°C (0 to 140°F)

#### Storage Temperature

-40 to 60°C (-40 to 140°F)

#### Time-Based Accuracy

±1 second per day

#### User Interface

IBM-compatible PC

#### Program Memory

Non-volatile programmable flash, can be updated via RS-232 port

#### Data Storage

Capacity: 90 days of 1 level and 1 velocity reading at 15-minute recording intervals

Data Types: Level and velocity

Storage Mode: Wrap or slate

RAM Memory: 128 K

#### Communications

Serial connection to IBM-compatible computer with Hach analysis software

#### Enclosure Material

PVC

#### Enclosure Rating

NEMA 6P (IP67)

#### Power Source

One Energizer EN-529 alkaline 6 Vdc battery

#### Battery Life

60 days typical (with 15-minute recording interval, 1 level and 1 velocity, data download once per week, at 10°C (50°F), also affected by site conditions)

#### Dimensions

11.4 cm diameter x 44.8 cm (4.5 in. diameter x 17.625 in.)

#### Weight

3.54 kg (7.8 lbs.) with battery

### Submerged Depth/Velocity (AV) Sensor

#### VELOCITY MEASUREMENT

##### Range

-1.52 to 6.10 m/s (-5 to 20 ft./s)

##### Zero Stability

0.015 m/s (<0.05 ft./s)

##### Accuracy

±2% of reading

##### Operating Temperature

-18 to 60°C (0 to 140°F)

##### Typical Minimum Depth for Velocity

2 cm (0.8 in.)

##### Method

Doppler ultrasonic

##### Transducer Type

Twin 1 MHz piezoelectric crystals

#### LEVEL MEASUREMENT

##### Range

Standard: 0 to 3 m (0 to 10 ft.)

Extended: 0 to 9 m (0 to 30 ft.)

##### Accuracy

±0.16% full scale ±1.5% of reading at constant temp (±2.5°C)

±0.20% full scale ±1.75% of reading from 0 to 30°C (32 to 86°F)

±0.25% full scale ±2.1% of reading from 0 to 70 °C (32 to 160°F)

##### Maximum Allowable Level

Standard: 10.5 m (34.5 ft.)

Extended: 31.5 m (103.5 ft.)

##### Air Intake

Atmospheric pressure reference is desiccant protected

##### Method

Pressure transducer with stainless steel diaphragm

#### GENERAL

##### Material

Noryl® plastic outer shell with epoxy potting

##### Cable

Standard: 9, 15, 23, and 30.5 m (30, 50, 75 and 100 ft.)

Custom: greater than 30.5 m (100 ft.)

Maximum: 76 m (250 ft.)

##### Cable Diameter

0.91 cm (0.36 in.)

##### Sensor Dimensions

2.3 x 3.8 x 13.5 cm (0.9 x 1.5 x 5.3 in.)

## Engineering Specifications

### 910 Flow Meter

1. The flow meter system shall consist of a flow meter and a submerged depth/velocity sensor.
2. The sensor shall be equipped with level drawdown correction to compensate for the effects of velocity in level measurement accuracy.
3. The flow meter housing shall be made of NEMA 6P (IP67) PVC sealed to withstand submergence and prolonged surcharge conditions.
4. The flow meter shall be capable of reporting in the following units:
  - a. Level; m, cm, ft., in.
  - b. Flow; gps, gpm, gph, lps, lpm, lph, mgd, afd, cfs, cfm, cfh, cfd, m<sup>3</sup>s, m<sup>3</sup>m, m<sup>3</sup>h, m<sup>3</sup>d.
  - c. Totalized flow; L, m<sup>3</sup>, ft.<sup>3</sup>, gal., acre-ft.
5. The flow meter shall monitor at 1, 2, 3, 5, 6, 10, 12, 15, 20, 30, and 60-minute intervals.
6. The flow meter shall be capable of storing data in non-volatile, programmable flash memory that can be updated via RS232 port.
  - a. Capacity shall be 90 days of one level and one velocity reading at 15-minute recording intervals.
  - b. Data types shall be level and velocity.
  - c. Storage mode shall be wrap or slate.
7. The flow meter shall have Modbus<sup>®</sup> and GSM wireless communication functionality.
8. Exterior dimensions shall not exceed 4.5 inches diameter and 17.625 inches length.
9. The flow meter shall be the Sigma Model 910 Portable Area Velocity Flow Meter manufactured by Hach Company.

### Submerged Depth/Velocity (AV) Sensor

1. The sensor shall be capable of directly measuring average velocity.
2. The method of velocity measurement shall employ transducer type that is twin 1-MHz piezoelectric crystals.
3. The method of level measurement shall be pressure transducer with stainless steel diaphragm.
4. Velocity range shall be -1.52 to 6.10 m/s (-5 to 20 ft./s)
5. The range of level measurement shall be 0 to 3 m (0 to 10 ft.), standard, and 0 to 9 m (0 to 30 ft.), extended.
6. The body material of the sensor shall be Noryl<sup>®</sup> plastic outer shell with epoxy potting.
7. The connector of the sensor shall be hard anodized and satisfy Military Spec 5015.
8. Power consumption of the sensor shall be less than or equal to 1.2 W at 12 Vdc.
9. The sensor shall be the Sigma AV Sensor Flow Sensor manufactured by Hach Company

## Dimensions

The Hach Sigma 910 Portable Area Velocity Flow Meter should not be used in hazardous locations where combustible gases may be present. Mount the meter so that the connectors face down. When not in use, cover the connectors with their protective caps to prevent corrosion. Always use the appropriate manhole support bracket/spanner bar.



## Ordering Information

### Flow Meter

**4900** Sigma 910 Flow Meter with 6-volt battery

### Complete Flow Meter Systems

**4900910** Sigma 910 Flow Meter with standard submerged depth/velocity (AV) sensor

**700115** Sigma 910 Wireless Flow Meter Bundle; includes Sigma 910 flow meter, Sigma 1000 remote monitor, manhole lid antenna, and submerged depth/velocity (AV) sensor

**700116** Sigma 910 Flow Wireless Meter Bundle; includes Sigma 910 flow meter, Sigma 1000 remote monitor, in-road antenna, and submerged depth/velocity (AV) sensor

### Flow Meter Accessories

**4920** Suspension Harness for suspending the flow meter

**9542** Manhole Support Bracket/Spanner; 18 in., fits 18- to 28-in. manholes

**9557** Manhole Support Bracket/Spanner; 28 in., fits 28- to 48-in. manholes

**5713000** Manhole Support Bracket; 18 to 27 in.

### Sensors

All sensors are equipped with a connector

*Non-oil Filled Standard Submerged Depth/Velocity (AV) Sensors (0 to 10 ft. range)*

**77065-030** Non-oil Filled Standard Sigma Submerged AV Sensor; 30 ft. cable

**77065-050** Non-oil Filled Standard Sigma Submerged AV Sensor; 50 ft. cable

**77065-075** Non-oil Filled Standard Sigma Submerged AV Sensor; 75 ft. cable

**77065-100** Non-oil Filled Standard Sigma Submerged AV Sensor; 100 ft. cable

*Oil Filled Standard Submerged Depth/Velocity (AV) Sensors (0 to 10 ft. range)*

**77064-030** Oil Filled Standard Sigma Submerged AV Sensor; 30 ft. cable

**77064-050** Oil Filled Standard Sigma Submerged AV Sensor; 50 ft. cable

**77064-075** Oil-Filled Standard Sigma Submerged AV Sensor; 75 ft. cable

**77064-100** Oil-Filled Standard Sigma Submerged AV Sensor; 100 ft. cable

### Sensor Mounting Hardware

**4939** Submerged AV Mounting Plate, for pipe wall installation

**9574** Insertion Tool for Street Level, for use with spring rings only

### Spring Rings

**1361** Spring Ring for 6-in. dia. pipe

**1362** Spring Ring for 8-in. dia. pipe

**1363** Spring Ring for 10-in. dia. pipe

**1364** Spring Ring for 12-in. dia. pipe

### Cables and Interfaces

**3513** DTU-to-PC Cable; 115 Vac

**3580** DTU-to-PC Cable; 230 Vac

**1727** Sampler or Flow Meter to PC Cable

**3358** RS232 Extension Cable

### Accessories

**5254** Insight Software (free of charge)

**7724700** Silicon Oil; dual 50-ml pack (refills 100 sensors)

**7724800** Silicon Oil Refill Kit; includes dispensing tool and oil packs.

**7725600** Oil-Filled Submerged AV Sensor Kit

**7730000** Retrofit Kit (converts non oil-filled to oil-filled); includes kit Silicon Oil Refill Kit

**8713200** Solar Module with 10-Watt panel and Power Regulator Assembly

**8713300** Solar Module with 20-Watt panel and power Regulator Assembly

*At Hach, it's about learning from our customers and providing the right answers. It's more than ensuring the quality of water—it's about ensuring the quality of life. When it comes to the things that touch our lives...*

*Keep it pure.*

*Make it simple.*

*Be right.*

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