

# HACH SUBMERGED AREA VELOCITY FLOW METER

## Applications

- Wastewater
- Collection Systems
- Industrial Water

By pairing Hach's Submerged AV Sensor with our state-of-the-art Hach AV9000 Analyzer Module, you create a powerful Hach Submerged Area Velocity Meter (FL900AV) which provides "cleaner," more precise data than ever before.



*Hach AV9000 Analyzer Module shown with Submerged AV Sensor and Wireless FL900 Series Flow Logger. Logger, analyzer module and sensor are ordered separately.*

Our **Submerged AV Sensor** is a robust, 1 MHz Acoustic Doppler velocity sensor designed to measure wastewater flow with improved accuracy and reliability. This tried-and-true sensor also uses a pressure transducer to measure flow level and incorporates advanced technologies to ensure precision, including automatically correcting for temperature and velocity effects on measurements.

With advanced signal processing and filtering options, the **AV9000 Analyzer Module** expands the applicability of the sensor into more difficult applications. Plus, advanced analyzer diagnostics, including capture and display of the Doppler spectra, allow you to verify that the sensor is working properly even before you leave the site, giving you peace of mind.

## Improved Accuracy

The AV9000 Area Velocity Analyzer module is compensated for temperature, thus eliminating potential velocity errors of 2.7% over a 10°C seasonal swing\*. Its advanced multi-scale digital Doppler analysis provides the optimal combination of resolution and noise immunity. Mirror Image Processing™ eliminates sign errors and the advanced Target Set Processing™ reduces the impact of dominant targets (particles) in the stream to deliver a more representative velocity.

\*Calculated on a baseline temperature 10°C, assuming ±5°C shift between seasons.

NOTE: Mirror Image Processing™ and Target Set Processing™ are patent-pending.

## Less Maintenance and Troubleshooting

Oil-filled Submerged AV sensor models are great solution for monitoring sites that are susceptible to fouling of the pressure transducer. The cavity is filled with high-viscosity silicon oil to reduce the collection of sand, silt and grit on the pressure transducer. Use the non-oil-filled cover plate model in sites where the pipe could run dry. Either way, we've thought about the little details that will reduce your maintenance or lost data hassles.



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## Specifications\*

**Hach FL900 Series Flow Logger Specifications can be found in DOC053.53.35081. Hach FL1500 Series Flow Logger Specifications can be found in DOC053.53.30400. Specifications for the Hach AV9000 Analyzer Module and the Hach Submerged AV Sensor are as follows:**

### Hach AV9000 Analyzer Module

<b>Measurement Method</b>	1 MHz Doppler Ultrasound
<b>Doppler Analysis Type</b>	Digital Spectral Analysis
<b>Doppler Accuracy</b>	±1% of reading or 0.025 fps (with electronically simulated Doppler signal, -25 to +25 fps equivalent velocity)
<b>Operating Temperature</b>	-18 to 60°C (0 to 140°F) at 95% RH GENERAL ATTRIBUTES
<b>Dimensions</b>	5 cm H x 17.5 cm W x 13 cm L (2.0 in. H x 6.875 in. W x 5.0 in. L)
<b>Enclosure</b>	PC/ABS
<b>Environmental Rating</b>	NEMA 6P (IP68)
<b>Warranty</b>	1 year
<b>Compatible Instruments</b>	FL900 and FL1500 Series Flow Loggers and Hach Submerged Area Velocity Sensors. It is also compatible with Hach's AS950 Automatic Sampler.

### Compatible Software

FSDATA Desktop Instrument Manager software is used for programming the FL900 and FL1500 series loggers. It can be used for data management and report generation on all current Hach flow loggers and automatic samplers. It is compatible with both desktop and laptop computers utilizing Windows operating system. Minimum resolution needed is 1024x768.

For wireless enabled FL900 flow loggers, data can also be viewed online via FSDATA Online Data Manager software, a web-based software solution for flow meter programming, data management and report generation for wireless flow meters.

Both programs can be downloaded at [www.hachflow.com](http://www.hachflow.com)

### Hach Submerged Area Velocity Sensor

<b>Velocity Measurement Method</b>	Doppler ultrasonic; twin 1 MHz piezoelectric crystals
<b>Typical Minimum Operating Depth</b>	2 cm (0.8cm)
<b>Recommended Range</b>	-1.52 to 6.10 m/s (-5 to 20 ft/sec)
<b>Velocity Accuracy</b>	±2% of reading or 0.05 fps**  <i>**Uniform velocity profile, known salinity, positive flow. Field performance is site specific.</i>
<b>Level Measurement Method</b>	Differential pressure transducer with stainless steel diaphragm and atmospheric pressure reference
<b>Level Accuracy (static)</b>	±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 158°F)
<b>Velocity-Induced Depth Error</b>	Compensated based on flow velocity
<b>Level Range</b>	Standard: 0–3 m (0–10 ft) Extended: 0–9 m (0–30 ft)
<b>Allowable Level</b>	Standard: 10.5 m (34.5 ft) Extended: 31.5 m (103.5 ft)

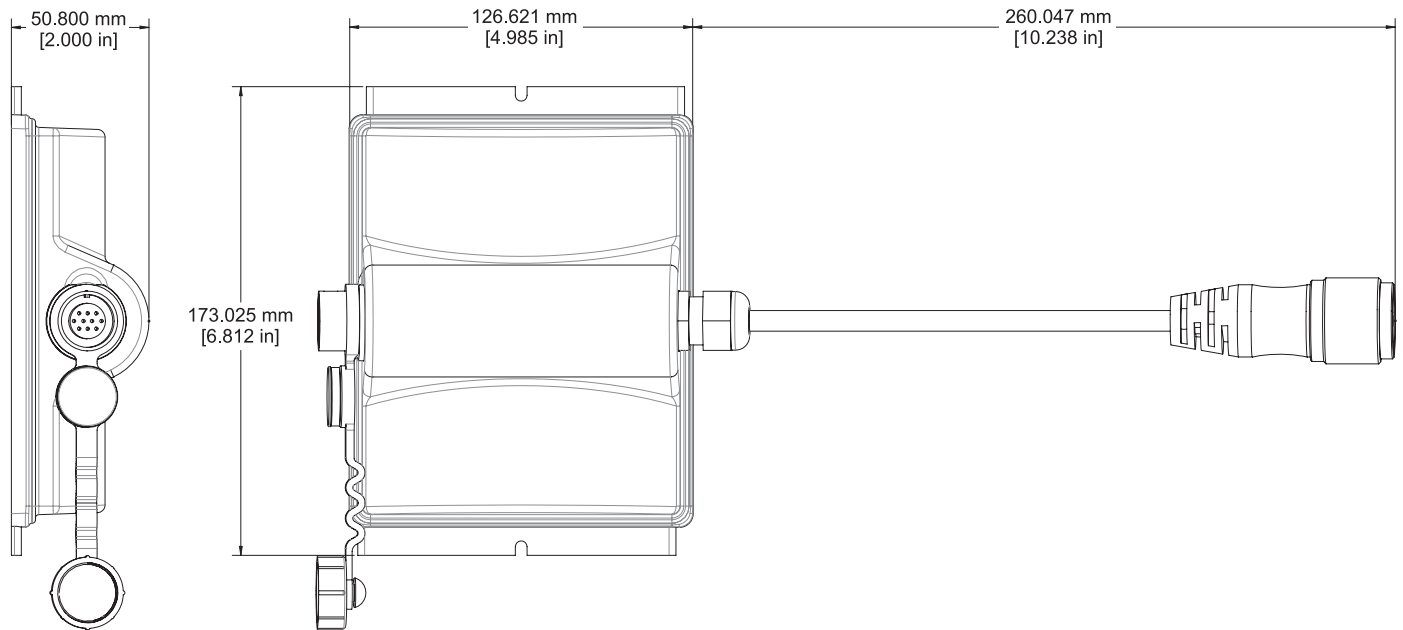
### General Attributes

<b>Air Intake</b>	Atmospheric pressure reference is desiccant protected
<b>Operating Temperature</b>	0 to 70°C (32 to 158°F)
<b>Level Compensated Temperature Range</b>	0 TO 70°C (32 TO 158°F)
<b>Material</b>	Noryl® outer shell with epoxy potting within
<b>Cable</b>	Urethane sensor cable with air vent
<b>Connector</b>	Hard anodized, satisfies Military Spec 5015
<b>Cable Lengths Available</b>	Standard: 9, 15, 23 and 30.5 m (30, 50, 75, 100 ft)  Custom: 30.75 m (101 ft) to 76 m (250 ft) maximum
<b>Cable Diameter</b>	0.91 cm (0.36 in.)
<b>Dimensions</b>	2.3cm H x 3.8 cm W x 13.5 cm L (0.9 in. H x 1.5 in. W x 5.31 in. L)
<b>Compatible Instruments</b>	Hach FL900 and FL1500 Series Flow Loggers; Hach AS950 Automatic Samplers

*\*Subject to change without notice.*

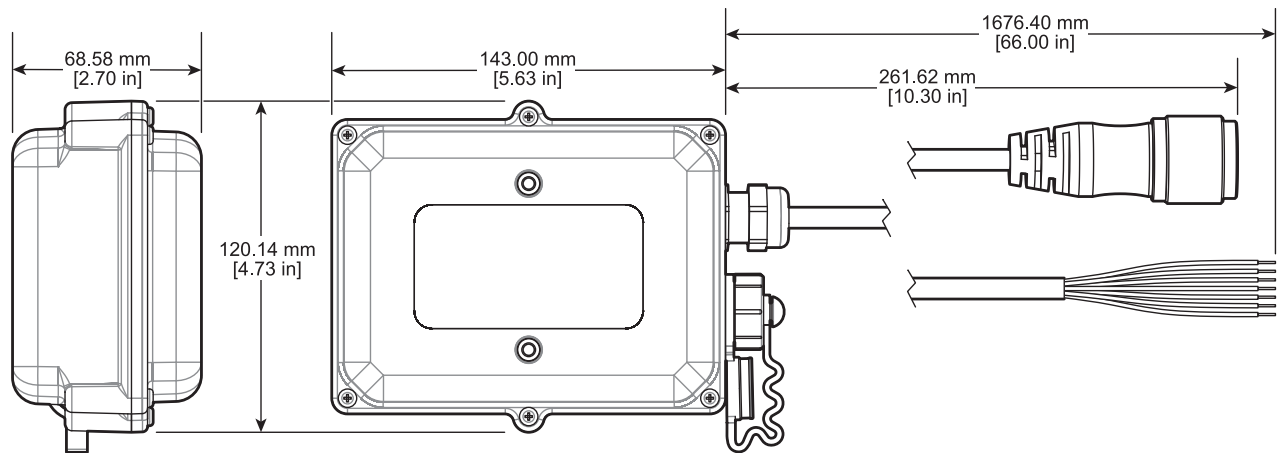
### Hach AV9000 Analyzer Module Dimensions

For FL900 (PN 8531300)

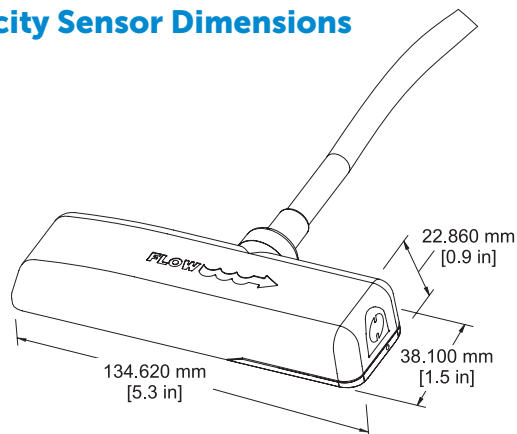


### Hach AV9000S Analyzer Module Dimensions

Bare wire for FL1500 (PN 9504601) or with connector for AS950 (PN 9504600)



### Hach Submerged Area Velocity Sensor Dimensions



## Ordering Information

Ordering information for the Hach AV9000 Analyzer Module and the Hach Submerged AV Sensor are as follows:

### Hach AV9000 Analyzer Module

<b>8531300</b>	AV9000 with connector for use with FL900 Flow Meter
<b>9504601</b>	AV9000S with bare wires for use with FL1500 Flow Meter
<b>9504600</b>	AV9000S with Connector for use with AS950 Sampler

### Hach Submerged Area Velocity Sensor

<b>77065-030</b>	Non-oil filled with connector, 0 to 10 ft range, 30 ft cable
<b>77065-050</b>	Non-oil filled with connector, 0 to 10 ft range, 50 ft cable
<b>77065-075</b>	Non-oil filled with connector, 0 to 10 ft range, 75 ft cable
<b>77065-100</b>	Non-oil filled with connector, 0 to 10 ft range, 100 ft cable
<b>77075-030</b>	Non-oil filled with connector, 0 to 30 ft range, 30 ft cable
<b>77075-050</b>	Non-oil filled with connector, 0 to 30 ft range, 50 ft cable
<b>77075-075</b>	Non-oil filled with connector, 0 to 30 ft range, 75 ft cable
<b>77075-100</b>	Non-oil filled with connector, 0 to 30 ft range, 100 ft cable
<b>77064-030</b>	Oil filled with connector, 0 to 10 ft range, 30 ft cable
<b>77064-050</b>	Oil filled with connector, 0 to 10 ft range, 50 ft cable
<b>77064-075</b>	Oil filled with connector, 0 to 10 ft range, 75 ft cable
<b>77064-100</b>	Oil filled with connector, 0 to 10 ft range, 100 ft cable
<b>77074-030</b>	Oil filled with connector, 0 to 30 ft range, 30 ft cable
<b>77074-050</b>	Oil filled with connector, 0 to 30 ft range, 50 ft cable
<b>77074-075</b>	Oil filled with connector, 0 to 30 ft range, 75 ft cable
<b>77074-100</b>	Oil filled with connector, 0 to 30 ft range, 100 ft cable
<b>7724800</b>	Silicone oil refill kit, includes dispensing gun, dual 50 mL oil pack & hardware 7715300
<b>7715300</b>	Silicone oil/gel dispensing gun for oil-filled sensors
<b>8755500</b>	Desiccant refill beads, 1.5 pound bulk

Contact Hach Technical Support at 800-368-2723 if custom cables longer than 100 feet are required and for mounting hardware information.

**For additional information on products mentioned in this data sheet, download the following data sheets at: [www.hachflow.com](http://www.hachflow.com)**

Hach FL900 Series Flow Logger (DOC053.53.35081)

Hach FL1500 Series Flow Logger (DOC053.53.30400)

FSDATA Desktop Instrument Manager (LIT2832)

FSDATA Online Data Manager (LIT2707)

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