

PART 1 GENERAL

1.1 Section includes

- A. GS1440 Sensor H₂S
- B. GS2440EX Sensor H₂S EX

1.2 Measurement Procedures

A and B.

The electrochemical microsensors in the sensor measures dissolved hydrogen sulfide (H₂S), which is one of the three forms of dissolved sulfide in equilibrium in the water phase; H₂S, HS⁻, and S²⁻. For all practical purposes in sewer applications, only the first two of these are of interest. The pKa value for deprotonation of H₂S is around pH=7, which is approximately the same as typical domestic wastewater. For this reason, wastewater will typically contain both H₂S and HS⁻, and a separate measurement of the pH-value of the wastewater is necessary to calculate the total amount of dissolved sulfides in the wastewater.

Measuring the concentration of H₂S in the liquid instead of in the gas phase gives a more reliable signal since the measurement is independent of the daily variations in ventilation conditions in the head space of the sewer, and it is independent of the exact mounting position of the sensor (in the liquid, the sulfide concentration is fairly homogeneous, whereas very large differences in gas phase concentration has been seen from top to bottom of sewer head spaces).

1.3 Alternates

A and B.

Other methods of H₂S measurement in liquid or gas phase are not acceptable.

1.4 System Description and Performance Requirements

A and B.

1. Measurement Method	Electrochemical
2. Sample Medium	Water or Air
3. Range	0-5 mg/L (in water) 0-1000 ppm (in air)
4. Accuracy	+/- 5% of full scale*
5. Detection limit	1% of full scale
6. Response Time (t90)	<30 seconds
7. Ingress protection	Depth in water 10 m maximum (IP68)
8. Calibration/Secondary standard	1000 ppm (+/-) 2% gas standard

**discrete measurement accuracy, 90-second purge of 1000 ± 20 ppm H₂S standard following single-point calibration*

1.5 Certifications

A and B:

CE

B:

ATEX and UKEX: II 1G Ex ia IIC T4 Ga

IECEX: Ex ia IIC T4 Ga

Class I Zone 0 AEx ia IIC T4 Ga

Class I Division 1 Groups A-D T4

Ex ia IIC T4 Ga

(-20°C ≤ Ta ≤ +60°C)

1.6 Environmental Requirements

A and B.

1. Storage temperature 0 °C to +60 °C (32 °F to +140 °F)
2. Operating temperature 0 °C to +40 °C (32 °F to +104 °F)
3. Relative humidity 0 - 100%

1.7 Warranty

A and B.

- Global,: The product includes a one-year warranty from the date of shipment.

1.8 Maintenance Service

A and B.

- Regular calibration every 1- 6 months, depending on use, required to maintain accuracy.
- Sensors installed in wastewater environments may require regular cleaning depending on the fouling conditions.

PART 2 PRODUCTS

2.1 Manufacturer

A and B.

Hach Company, Loveland, CO
5600 Lindbergh Drive, Loveland, CO 80538, United States

2.2 Manufactured Unit

A and B.

The GS1440 and GS2440EX Sensor consist stainless steel material - EN 1.4404 (316L).

2.3 Equipment

A and B.

1. The sensor contains multiple individual sensing elements which are all based on microsensor technology and measures H₂S through electrochemical measurement technology.
2. Electrochemical sensors are sensitive to temperature changes, and for this reason each transducer in the sensors head is compensated for temperature effects with reference to an internal temperature measurement in the sensor's sensor head.
3. H₂S sensor is enabled for direct measurement of hydrogen sulfide concentrations in either liquid or gas phase.

B.

4. The GS2440EX Sensor H₂S EX includes hazardous area certifications and is intended to be used in installation locations that are classified as hazardous areas.

2.4 Components

A and B.

1. Standard equipment:
 - Sensor
 - Storage tube
 - User Manual

2. Dimensions
 - Ø: 48.3 mm (1.9 in.)
 - Length: 240 mm (9.4 in.)
3. Weight: 1.36 kg

2.5 Accessories

A and B.

- Field Transmitter
- Digital gateway to controllers (1m digital extension cable included)
- Consumables and spare parts
- Installation accessories
- Sensor cables
- Cellular data subscriptions

PART 3 EXECUTION

3.1 Preparation

A and B.

The sensor can be installed in three different ways:

- In pipe (liquids and gases)
- Free hanging (liquids and gases)
- In flow cell

3.2 Installation

1. Install the sensor in strict accordance with the manufacturer's instructions and recommendation.

END OF SECTION