

# Surface Scatter<sup>®</sup> 7 sc Turbidimeter

Turbidity and Suspended Solids

## Features and Benefits

### Less Fouling for Easy Maintenance

The Hach Surface Scatter 7 sc Turbidimeter (SS7) is uniquely designed so that the light source and photocell never come in contact with the sample. In fluids with high loads of suspended solids this makes sample cell cleaning and replacement unnecessary.

### Built to Last

All wetted parts of the Hach SS7 turbidimeter are made with corrosion-resistant materials for extended life. The photo-detector and light source assemblies are protected from the effects of corrosive vapors and heated samples. The SS7 turbidimeter is warranted against defects in materials or workmanship for two years from the date of shipment.

### Two Models for Different Applications

**Surface Scatter 7 sc Turbidimeter**—Use the SS7 to establish and maintain optimum process control and for reliable monitoring.

- Drinking water influent
- Wastewater effluent
- Flocculation and sedimentation
- Industrial process water
- Food processing waste containing starch, fat, or oil

**Surface Scatter 7 sc High Sample Temperature (HST) Turbidimeter**—This is an SS7 turbidimeter designed to monitor samples with temperatures of up to 70°C. An innovative moist air removal system is useful where a difference between the sample temperature and the ambient temperature causes condensation and fogging. For use in applications such as:

- Fluids ranging from raw water influent to corrosive white liquor
- High temperature samples—up to 70°C
- Corrosive white, black, and green liquor in paper mills
- Produced water in oil fields containing oil and hydrogen sulfide
- Wherever temperature differences cause condensation and fogging



*Use the Hach Surface Scatter 7 sc Turbidimeter to monitor high range turbidity with greater accuracy and reliability than ever before. The optics never touch the sample in the Hach Surface Scatter 7 Turbidimeter so it's virtually maintenance free.*

DW

WW

IW

### Wide Measurement Range

The SS7 turbidimeter can reliably measure turbidity from 0 to 9999 NTU in samples that vary from clear water to corrosive and high temperature paper mill and oil field samples.

### Backed by a 2-year Warranty

Consistent with its long-standing reputation for quality and customer service, Hach Company warrants all SS7 turbidimeters against defects in materials or workmanship for two years from the date of shipment.

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



Be Right<sup>™</sup>

## Specifications\*

### Range

0 to 9999 Nephelometric Turbidity Units (NTU)

### Accuracy

±5% of reading or ±0.1 NTU (whichever is greater) from 0 to 2000 NTU; ± 10% of reading from 2000 to 9999 NTU

### Resolution

0.01 NTU below 100 NTU  
0.1 NTU between 100 to 9999.9 NTU

### Repeatability

1.0% or ±0.04 NTU, whichever is greater

### Response Time

Initial response in 45 seconds

### Sample Flow Required

1.0 to 2.0 L/min (15 to 30 gal/hr)

### Sample Temperature

SS7: 0 to 50°C (32 to 122°F)

SS7/HST: 0 to 70°C (32 to 158°F), intermittent 70 to 80°C (158 to 176°F) (an optional heat exchanger is available to reduce sample temperature)

### Ambient Temperature

0 to 50°C

### Humidity

5 to 95% non-condensing

### Power Requirements

100/230 VAC, 50/60 Hz, auto selecting; 40 VA

### Installation Category

Category II

### Sample Inlet Fitting

3/4-inch NPT female

### Overflow Drain Fitting

1-inch NPT female

### Body Drain Fitting

3/4-inch NPT female

### Air Purge Fitting

3/4-inch compression fitting; 0-50 SCFH airflow clean instrument air

### Enclosure

Sample unit: NEMA-12 plastic instrument enclosure

### Mounting

Wall mount

### Dimensions

64.2 x 67.5 x 19.0 cm (25.3 x 26.6 x 7.5 in.)

### Weight

SS7: 15.8 kg (35 lbs.)

SS7/HST: 18 kg (40 lbs.)

\*Specifications subject to change without notice.

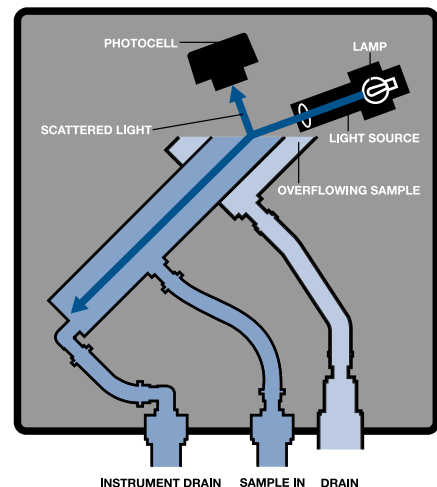
## Principle of Operation

The sample is introduced into the center sample tube of an inclined turbidimeter body at a flow rate of 1 to 2 liters per minute (1/4 to 1/2 gallon per minute). As the fluid spills over the top of the turbidimeter body, a stable, flat surface of liquid forms and becomes the measuring surface.

A high-intensity light source is directed at the surface of the liquid at an acute angle. Light is scattered by particles in the sample and is detected by a photocell positioned directly over the point where the light enters the liquid. The light is scattered at or near the

surface and very little is absorbed by the liquid. The amount of light scattered changes in direct proportion to turbidity.

Most of the light directed at the surface of the sample is reflected up into the instrument cabinet and absorbed, or refracted down into the turbidimeter body. A small amount of the light is scattered by the particles suspended in the fluid. The photocell assembly detects light scattered at 90° from the incident beam. The electronic signal generated by the photocell is directly related to the concentration of particles suspended in the sample.



## Engineering Specifications

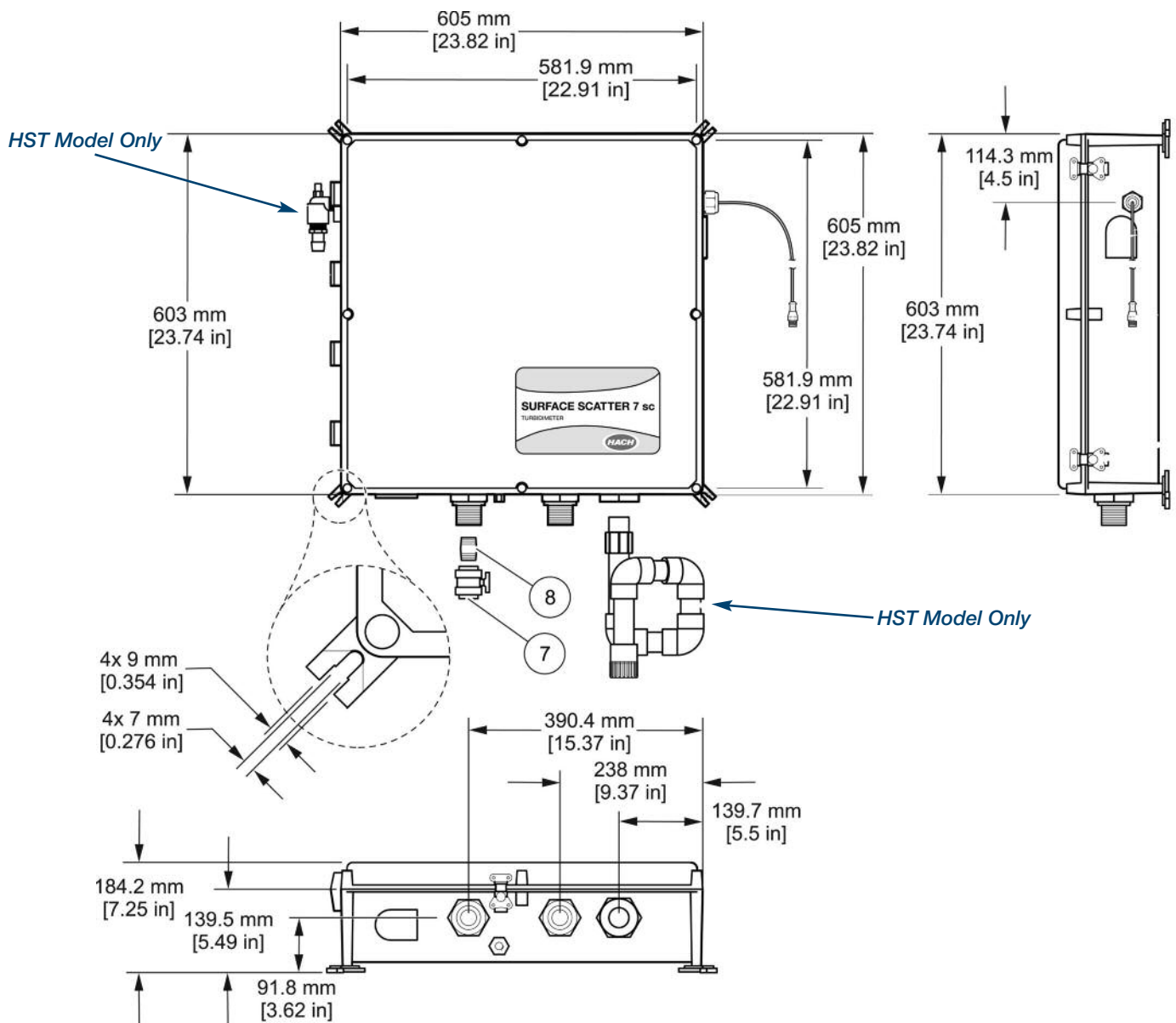
- The turbidimeter shall be a continuous-reading, on-line instrument using the nephelometric method of measurement.
- The turbidimeter shall consist of two main components: a sample unit and a control unit.
- The turbidimeter shall utilize a single silicon photodiode to detect 90 degree scattered light.
- The turbidimeter shall be equipped with a digital display with automatic decimal point placement reading from 0-9999 NTU.
- The accuracy of the turbidimeter shall be better than ±0.1 NTU or ±5% from 0 to 2000 NTU which ever is greater; ±10% from 2000 to 9999 NTU.
- The resolution of the turbidimeter shall be 0.01 NTU.
- Calibration of the turbidimeter shall be based on formazin.
- The turbidimeter shall be sold with a warranty against defects in materials and workmanship for two years from date of shipment.
- All optical and hydraulic components shall be housed in the sample unit.
- The optics of the turbidimeter shall never touch the sample.
- The light source shall be directed to the surface of the water source, eliminating the use of a glass window or flow cell.
- The sampling unit shall be constructed of corrosion-resistant structural plastic.
- The sampling unit shall be powered from the control unit and require no separate power source.
- The sampling unit shall be housed in a NEMA-12 industrial plastic enclosure.

## Engineering Specifications *continued*

15. The control unit shall be equipped with linear output signal that can be programmed to span all or any portion of the 0-9999 NTU range.
16. The control unit shall be equipped with two turbidity alarm set points adjustable over the entire range of the instrument with a SPDT relay with unpowered contacts rated for 6 A.
17. A bubble rejection algorithm shall be provided to eliminate spikes in measurement due to transient sample conditions.
18. The control unit shall be housed in a NEMA-4X industrial enclosure.
19. The turbidimeter shall be the Model Surface Scatter 7 sc Turbidimeter manufactured by Hach Company.

## Dimensions

The Hach Surface Scatter 7 sc Turbidimeter should be located as close to the sampling point as possible. The control unit and sample unit can be bench- or wall-mounted away from direct sunlight. Best performance will result if the ambient temperature does not change rapidly. Equipped with an 4-conductor 6-foot (2 m) sensor cable expandable up to 30 feet (10m).



## Ordering Information

All Surface Scatter 7 Turbidimeters are shipped with calibration cup, 4000 NTU Formazin calibration standard, installation accessories, and instruction manual (power cords must be ordered separately).

2978500	Surface Scatter 7 sc Turbidimeter; with Hach sc200 CH 1 Controller*
2978600	Surface Scatter 7 sc High Sample Temperature (HST) Turbidimeter; with Hach sc200 CH 1 Controller*
2977200	Surface Scatter 7 sc Turbidimeter; with Hach sc200 Controller*
2977300	Surface Scatter 7 sc High Temperature Turbidimeter; with sc200 Controller*

\*Refer to Hach lit #2665 for more information about the sc200 Controller.

### Sensor Only

LPV431.99.00002	Surface Scatter 7 sc Turbidimeter
LPV432.99.00002	Surface Scatter 7 sc High Sample Temperature (HST) Turbidimeter

### Sample Conditioning Options

4669212	Auto Flush Kit; 120 Vac
4669222	Auto Flush Kit; 220 Vac
4668000	Bubble Trap, Head Regulator
4028400	Flow Meter; 100 to 1600 mL/minute

### Calibration Standards

7121649	400 NTU StablCal; 500 mL
246149	4000 NTU Formazin; 500 mL

### Cables

5796000	Sensor Cable Extension; 7.7 m (25 ft.)
4630600	Power Cord; 125 Vac, 10 A, 1.83 m (6 ft.)
4630800	Power Cord; 250 Vac, 10 A, 1.83 m (6 ft.)

### Optional Accessories

68700	Cylinder Brush; size 2
4502100	Calibration Cup
2351300	Verification Plates
9220500	Sun Shield, sc200 controller
2351300	Standardization Plate Kit, uncalibrated

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In the interest of improving and updating its equipment, Hach Company reserves the right to alter specifications to equipment at any time.

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**Keep it pure.**

**Make it simple.**

**Be right.**

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