

TSS sc Suspended Solids Family of Sensors



TSS sc probes measure online suspended solids from spring water to corrosive chemicals under the strictest regulatory conditions. With twelve different versions, it is possible to measure Suspended Solids over a wide range of concentrations with just one sensor.

Features and Benefits

One Family for All Applications

With twelve instrument versions and thirty different mounting styles, the Hach TSS sc probes can measure on-line Suspended Solids in virtually all applications under the strictest regulatory conditions.

TSS sc and TSS W sc probes are made of polished stainless steel with a scratch resistant and easy to clean sapphire window design to withstand harsh environments and keep particles from sticking to the surface. For high solids environments, the Hach TSS W sc is equipped with a wiper to maintain accuracy.

TSS HT sc optics and electrical systems are coated with a special material to withstand operating temperatures of 90°C and pressures of up to 10 Bar. The ability to withstand these conditions without the hassle of flow-through cells or cooling lines makes it the probe of choice for process control.

TSS XL sc and TSS VARI sc probes have been specially designed for measurement of Suspended Solids under the high hygienic requirements of the food, beverage, and pharmaceutical industry. An aseptic process connection is achieved with the installation of the Varivent® or XL in-line-housing and the acid, alkali-proof, and high temperature stable materials facilitate the use of the probe under CIP conditions.

TSS TITANIUM sc is the only titanium suspended solids probe in the market designed to provide process control in the most difficult environments. While offering the same high quality measuring properties as the TSS sc, its special titanium body enables it to perform in the most extreme applications.

TSS EX1 sc probes have been designed for measurement in hazardous locations with Class I Div 2 requirements. Depending on the application, it is possible to select either an immersion style or insertion style probe.

Two Parameters in One Instrument

The Hach TSS sc probes can measure both on-line Suspended Solids and Turbidity in one instrument. This flexibility enables the measurement of both parameters under the same application.

Method of Detection

The Hach TSS sc probes have a double optical system with two pulsating infrared LEDs and four receivers. As the transmitted light is scattered, the receivers pick up the incident light at 90° and 120° angles effectively doubling the accuracy of the instrument. This eight channel measurement system, with an integrated bubble and temperature compensating software, enables the instrument to have a wide measuring range that effectively covers most applications, from the darkest pre-treated water to the freshest of spring waters, with one instrument.

IW

FB

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



Be Right™

Stainless Steel

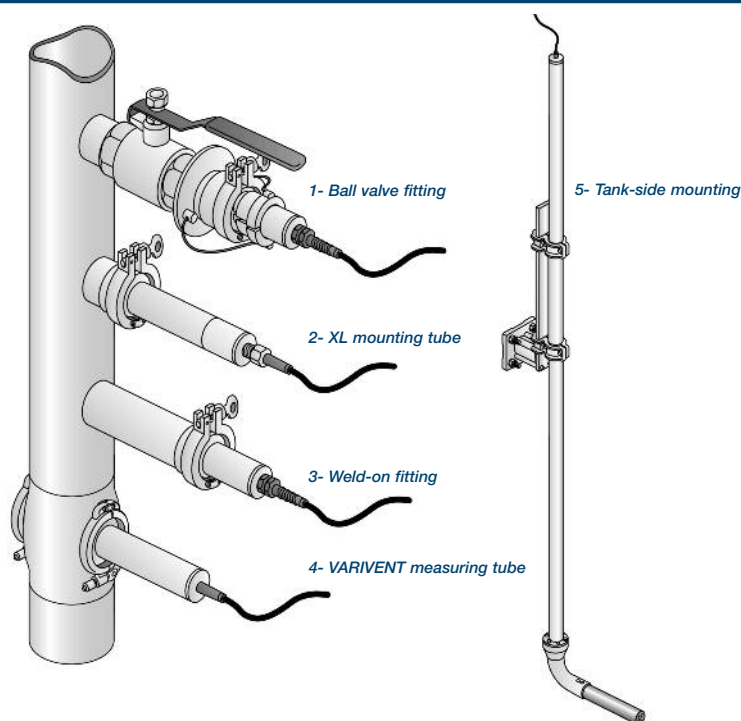
	Description	Type of Mounting
TSS sc	All purpose standard probe for Suspended Solids measurement.	Tank-side mounting - 5
TSS sc TriClamp	All purpose probe with TriClamp.	Weld-on fitting - 3
TSS sc In-line	All purpose probe for simple in-line installation.	Ball valve fitting - 1
TSS W sc	Same performance and functionality as the TSS sc but with a wiper for use in high solids environments.	Tank-side mounting - 5
TSS W sc TriClamp	TSS W probe with TriClamp.	Weld-on fitting - 3
TSS W sc In-line	Standard probe with wiper for simple in-line installation.	Ball valve fitting - 1
TSS HT sc	Suspended Solids probe for use in high temperature environments of up to 90 °C and 95 °C for short intervals.	Tank-side mounting - 5
TSS HT sc TriClamp	High temperature probe with TriClamp.	Weld-on fitting - 3
TSS HT sc In-line	High temperature probe for simple in-line installation.	Ball valve fitting - 1
TSS VARI sc	Suspended Solids probe with flush installation for use in food, pharmaceutical sectors, or in any VARIVENT industrial environment.	VARIVENT measuring tube - 4
TSS XL sc	Suspended Solids probe designed for use in the beverage and food industries.	XL measuring tube - 2
TSS EX1 sc	Suspended Solids and Turbidity probe designed for use in hazardous locations (Class I Div 2).	Tank-side mounting - 5
TSS EX1 sc TriClamp	Suspended Solids and Turbidity probe designed for use in hazardous locations (Class I Div 2).	Weld-on fitting - 3
TSS EX1 sc In-line	Class I Div 2 certified probe for simple in-line installation.	Ball valve fitting - 1

Titanium

	Description	Type of Mounting
TSS TITANIUM2 sc	Suspended Solids probe for use in aggressive or corrosive environments.	User defined
TSS TITANIUM2 sc TriClamp	Titanium2 probe with TriClamp for simple inline installation and quick access for maintenance.	User defined
TSS TITANIUM7 sc	Suspended Solids probe for use brine, seawater, or high salinity environments.	User defined
TSS TITANIUM7 sc TriClamp	Titanium7 probe with TriClamp for simple inline installation and quick access for maintenance	User defined

Types of Mounting

Whether tank-side mounting, inline installation, or hygienic fittings are required, the TSS sc family of probes has suitable mounting solution for any situation.



Specifications*

Measurement Method

Combined multiple beam alternating light method with infrared diode system and beam focusing

Turbidity (TRB): 2-channel 90° scattered light measurement in accordance with DIN/EN 27027/ISO 7027, wavelength = 860 nm

Solids (TS): 90° and 120° scattered light measurement, wavelength = 860 nm

Hazardous Locations

TSS EX1 sc Class I Div 2 certified

Measuring Range

Turbidity (TRB): 0.001 to 4,000 FNU

Solids (TS): 0.001 to 500 g/L

With SiO₂ standard solution

Measurement Accuracy

Turbidity (TRB): Up to 1,000 FNU/NTU:
<5% of measured value ±0.01 FNU/NTU

Reproducibility

Turbidity (TRB): <3%

Solids (TS): <4%

Response Time

1 s < T90 < 300 s (adjustable)

Calibration

Turbidity (TRB): Factory calibrated

Solids (TS): To be calibrated by customer on site

Zero point: Permanently calibrated in the factory

Pressure Range

<6 bar: TSS W sc

<10 bar: TSS sc, TSS HT sc, TSS

TITANIUM2 sc, TSS TITANIUM2 sc

<16 bar: TSS VARI sc, TSS XL sc

<=10 bar: TSS EX1 sc

Flow rate

3 m/s maximum

Ambient Temperature

0 to 50°C: TSS W sc

0 to 60°C: TSS sc, TSS TITANIUM2 sc, TSS TITANIUM7 sc

0 to 80°C: TSS VARI sc, TSS XL sc

0 to 90°C: TSS HT sc

0 to 50°C: TSS EX1 sc

Dimensions

Basin Sensor: D×L 40 × 330 mm

TSS EX1 sc: D×L 48.5 mm × 385 mm

Inline Sensor (TriClamp):

D×L 40 × 332 mm

TSS VARI sc, TSS XL sc:

D×L 40 × 232 mm

Weight

Tank Sensor, Inline Sensor (TriClamp):

Approx. 1.6 kg

TSS EX1 sc: Approx. 2.7 kg

TSS VARI sc, TSS XL sc:

Approx. 1.5 kg

*Specifications subject to change without notice.

Engineering Specifications

1. The suspended solids and/or turbidity sensor shall consist of a digital sensor designed to connect to a universal controller.
2. The suspended solids and/or turbidity sensor shall use a double optical system with two pulsating infrared LEDs and four receivers effectively doubling the accuracy of the instrument.
3. As the transmitted light is scattered, the receivers pick up the incident light at 90° and 120° angles for suspended solids and at 90° for turbidity in accordance with DIN/EN 27027/ISO 7027. The wavelength for both parameters is 860nm.
4. The eight channel measurement system, with a integrated bubble and temperature compensating software enables the instrument to have a wide measuring range that effectively cover most applications, from the darkest pre-treated water to the freshest of spring waters, with one instrument.
5. All versions have a high polished head to use the self cleaning effect and scratch-resistant sapphire window to withstand harsh environments
6. All sensors shall be capable of immersion in a tank or insertion into a pipe depending on the sensor selection.
7. The materials of construction shall be stainless steel or titanium, depending on the sensor selection.
8. The sensor shall have an operating range of 0.001 to 400 g/L for suspended solids and 0.001 to 4000 NTU for turbidity depending.
9. The sensor shall have an operating temperature from >0–50°C–90°C depending on the model.
10. The initial response time shall be 1 second and user-adjustable up to 300 seconds.
11. Up to 1000 FNU/NTU the accuracy shall be less than 5% of measurement value reading or ±0.01 FNU/NTU, whichever is greater for turbidity.

Ordering Information

TSSsc Turbidity and Suspended Solids Sensors

Immersion in Open Tanks Applications

LXV323.99.10002	TSS sc	Turbidity and Suspended Solids (0.001-4,000 FNU & 0.001-500 g/L) without wiper
LXV324.99.10002	TSS W sc	Turbidity and Suspended Solids (0.001-4,000 FNU & 0.001-500 g/L) with wiper
LXV325.99.10002	TSS HT sc	Turbidity and Suspended Solids (0.001-4,000 FNU & 0.001-500 g/L) without wiper
LXV329.99.10002	TSS TITANIUM2 sc	Turbidity and Suspended Solids (0.001-4,000 FNU & 0.001-500 g/L) without wiper
LXV330.99.10002	TSS TITANIUM7 sc	Turbidity and Suspended Solids (0.001-4,000 FNU & 0.001-500 g/L) without wiper
LXV328.99.10002	TSS EX1 sc	Turbidity and Suspended Solids for hazardous locations (Class I Div 2)

TriClamp Applications

LXV323.99.20002	TSS sc TriClamp	Turbidity and Suspended Solids (0.001-4,000 FNU & 0.001-500 g/L) without wiper
LXV324.99.20002	TSS W sc TriClamp	Turbidity and Suspended Solids (0.001-4,000 FNU & 0.001-500 g/L) with wiper
LXV325.99.20002	TSS HT sc TriClamp	Turbidity and Suspended Solids (0.001-4,000 FNU & 0.001-500 g/L) without wiper
LXV329.99.20002	TSS TITANIUM2 sc TriClamp	Turbidity and Suspended Solids (0.001-4,000 FNU & 0.001-500 g/L) without wiper
LXV330.99.20002	TSS TITANIUM7 sc TriClamp	Turbidity and Suspended Solids (0.001-4,000 FNU & 0.001-500 g/L) without wiper
LXV328.99.20002	TSS EX1 sc TriClamp	Turbidity and Suspended Solids for hazardous locations (Class I Div 2)
LXV326.99.10002	TSS VARI sc	Turbidity and Suspended Solids (0.001-4,000 FNU & 0.001-500 g/L) without wiper
LXV327.99.10002	TSS XL sc TriClamp	Turbidity and Suspended Solids (0.001-4,000 FNU & 0.001-500 g/L) without wiper

Inline Applications

LXV323.99.30002	TSS sc Inline	Turbidity and Suspended Solids (0.001-4,000 FNU & 0.001-500 g/L) without wiper
LXV324.99.30002	TSS W sc Inline	Turbidity and Suspended Solids (0.001-4,000 FNU & 0.001-500 g/L) with wiper
LXV325.99.30002	TSS HT sc Inline	Turbidity and Suspended Solids (0.001-4,000 FNU & 0.001-500 g/L) without wiper
LXV328.99.30002	TSS EX1 sc Inline	Turbidity and Suspended Solids for hazardous locations (Class I Div 2) without wiper

Continued on next page.

Ordering Information *continued*

Accessories

LZY634	Wiper set TSS sc (for 5 changes with screws and screwdriver)
LZY635	Maintenance set wiper (consisting of wiper, wiper axis 2-parts and gaskets)
LZY653	Gasket Silicon for TriClamp mounting
LZY654	Gasket PTFE for TriClamp mounting
LZY655	Gasket FPM for TriClamp mounting
LZY656	Clamp 2-parts, with screw type clamp for TriClamp mounting
LZY657	Clamp 3-parts, with screw type clamp for TriClamp mounting (to use with PTFE gasket)

Mounting Hardware for All TSS sc InSitu Probes

LZX414.00.10000	Standard mounting hardware for all TSS sc InSitu probes
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Mounting Hardware for All TSS sc InLine Probes

Ball Valves*

LZY630.00.10000	Ball valve armature for TSS sc, TSS W sc and TSS HT sc Inline probes including non-coped stainless steel welding flange LZX660
LZY630.00.11000	Ball valve armature for TSS sc, TSS W sc and TSS HT sc Inline probes including non-coped carbon steel welding flange LZX661
LZY630.00.12000	Ball valve armature for TSS sc, TSS W sc and TSS HT sc Inline probes without welding flange
LZY630.00.20000	Ball valve armature for TSS EX1 sc Inline probe including non-coped stainless steel welding flange LZX660
LZY630.00.21000	Ball valve armature for TSS EX1 sc Inline probe including non-coped carbon steel welding flange LZX661
LZY630.00.22000	Ball valve armature for TSS EX1 sc Inline probe without welding flange
LZX660	Non-coped stainless steel welding flange for ball valve in-line armature
LZX661	Non-coped carbon steel welding flange for ball valve in-line armature
LZY441	Hand wheel for ball valve in-line armature
LZY462	Gasket for mounting flange of ball valve in-line armature

Measuring Tubes

LZU304.99.00010	Measuring tube DN65 for TSS VARI sc
LZU304.99.00020	Measuring tube DN80 for TSS VARI sc
LZU304.99.00030	Measuring tube DN100 for TSS VARI sc
LZU304.99.00040	Measuring tube DN125 for TSS VARI sc
LZU304.99.10010	Measuring tube DN65 for TSS XL sc
LZU304.99.10020	Measuring tube DN80 for TSS XL sc
LZU304.99.10030	Measuring tube DN100 for TSS XL sc
LZU304.99.10040	Measuring tube DN125 for TSS XL sc
LZU304.99.10050	Measuring tube DN150 for TSS XL sc
LZU304.99.10060	Measuring tube DN200 for TSS XL sc
LZU304.99.10070	Measuring tube DN250 for TSS XL sc

Welded Branch Pieces

LZU302.99.00000	Welded branch piece raw for all TSS sc TriClamp probes**
LZU302.99.00010	Welded branch piece DN65 for all TSS sc TriClamp probes**
LZU302.99.00020	Welded branch piece DN80 for all TSS sc TriClamp probes**
LZU302.99.00030	Welded branch piece DN100 for all TSS sc TriClamp probes**
LZU302.99.00040	Welded branch piece DN125 for all TSS sc TriClamp probes**
LZU302.99.00050	Welded branch piece DN150 for all TSS sc TriClamp probes**
LZU302.99.00060	Welded branch piece DN200 for all TSS sc TriClamp probes**
LZU302.99.00070	Welded branch piece DN250 for all TSS sc TriClamp probes**
LZU302.99.10000	Welded branch piece raw for TSS XL sc
LZU302.99.10010	Welded branch piece DN65 for TSS XL sc
LZU302.99.10020	Welded branch piece DN80 for TSS XL sc
LZU302.99.10030	Welded branch piece DN100 for TSS XL sc
LZU302.99.10040	Welded branch piece DN125 for TSS XL sc
LZU302.99.10050	Welded branch piece DN150 for TSS XL sc
LZU302.99.10060	Welded branch piece DN200 for TSS XL sc
LZU302.99.10070	Welded branch piece DN250 for TSS XL sc
LZU303.99.00000	Screwed branch piece for all TSS sc TriClamp probes**

* Maximum operating pressure: 6 bar. ** Beside VARI & XL.

Lit. No. 2657 Rev 3

L11 Printed in U.S.A.

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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.



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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