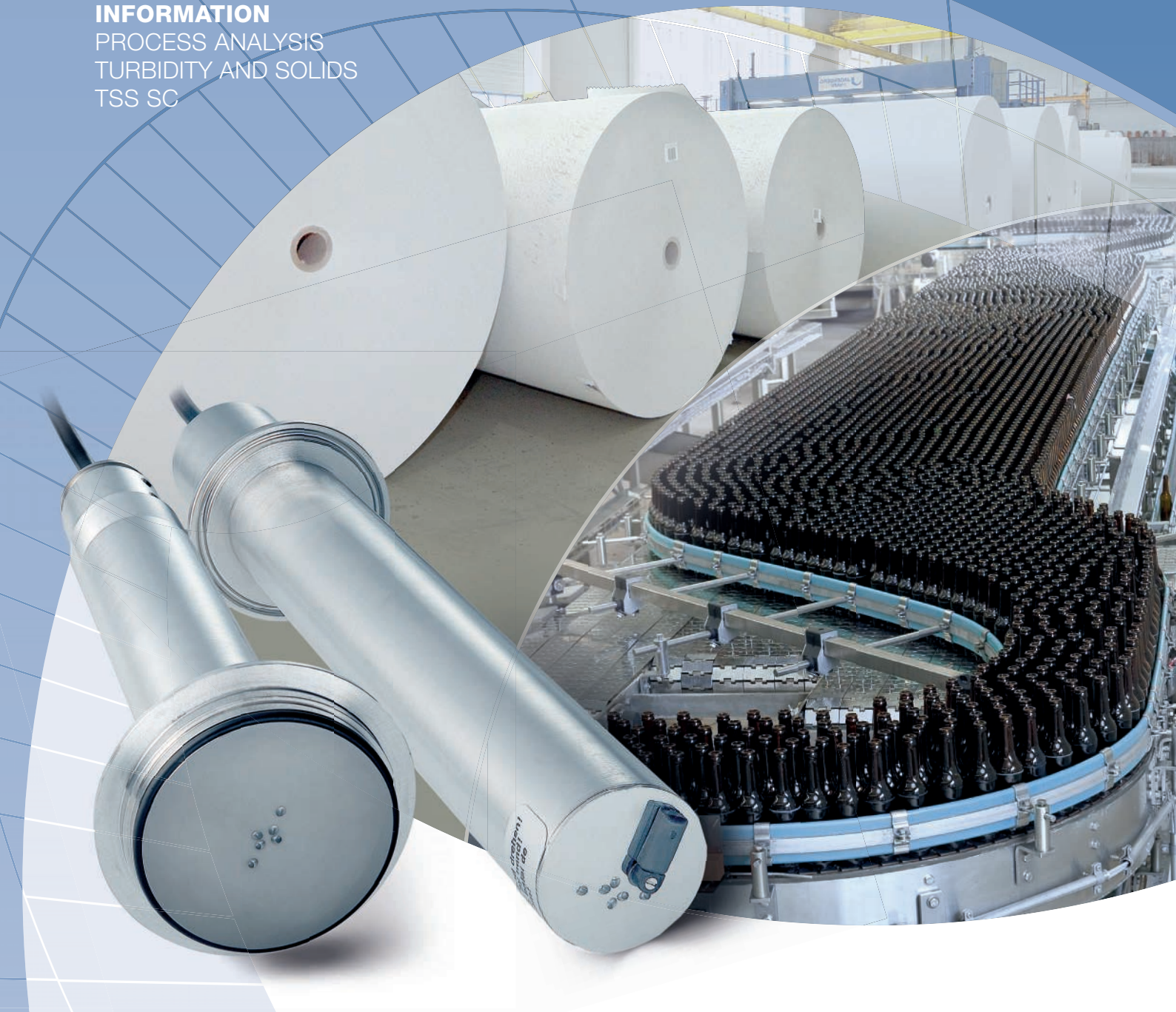
INFORMATION
PROCESS ANALYSIS
TURBIDITY AND SOLIDS
TSS SC



From ultra low turbidity to solids in the industrial sector

Turbidity and suspended solids probes from the TSS sc family

HACH LANGE

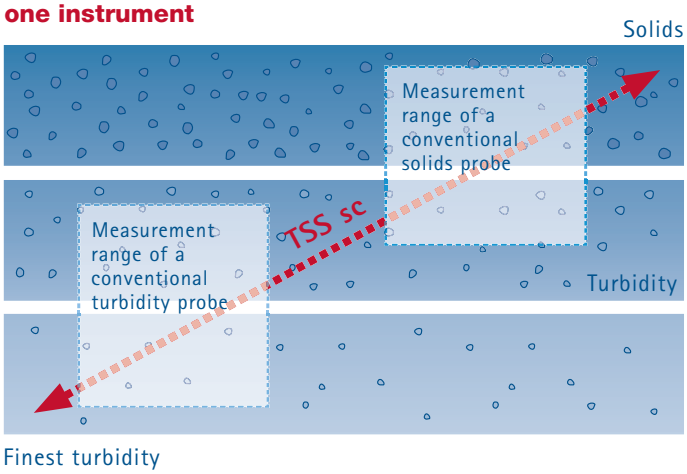
UNITED FOR WATER QUALITY

From spring water to sludge – even under the most difficult conditions

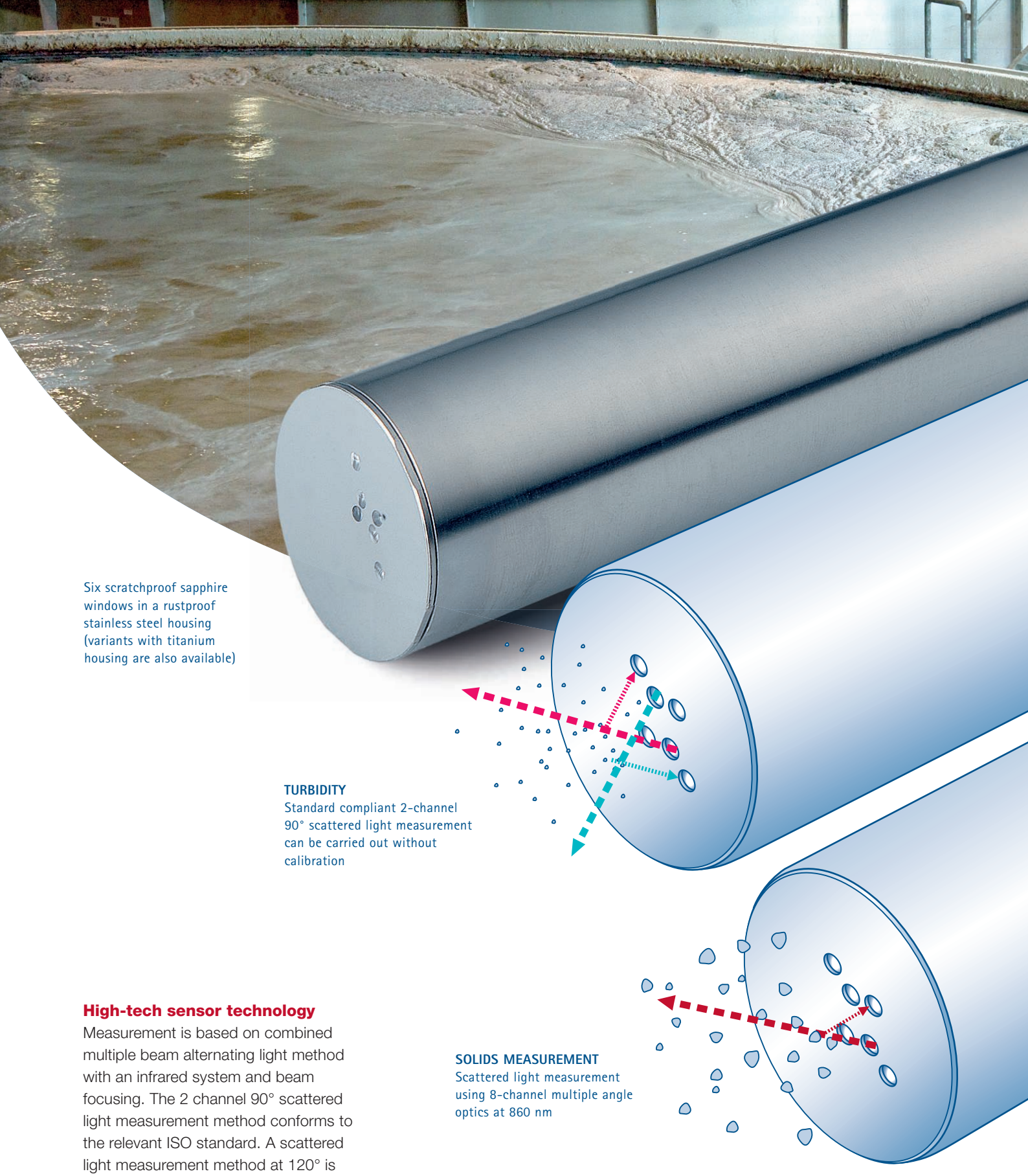
TSS sc probes are the solution for almost all applications that require turbidity and solids to be measured in fluids in the industrial sector. They deliver precise results in spring water as well as in thick sludge and emulsions.
By evaluating eight different signals, it is possible to measure turbidity and solids over a wide range of concentrations with just one sensor.

- **TSS sc probes have been specially developed for industrial applications**
- **Turbidity from 0.001 to 4,000 FNU and suspended solids from 0.001 to 500 g/l**
- **8 measurement signals cover the total range and deliver measured values in conformity with the relevant standards**
- **Excellent stability thanks to comprehensive compensation for interference factors**
- **TSS sc has a unique compensation system to overcome the effects of air bubbles**

TSS sc – the total measurement range in one instrument



Standard compliant and precise
The turbidity measurement complies with the standard DIN EN 27027 (ISO 7027). Calibration is not necessary. If the probe is used to measure the solids content, a single calibration point usually suffices. For special applications, curves can be defined using several calibration points. The multiple angle optical system compensates for interference factors and verifies the measured values: reliable and precise results at all times!



Six scratchproof sapphire windows in a rustproof stainless steel housing (variants with titanium housing are also available)

TURBIDITY
Standard compliant 2-channel 90° scattered light measurement can be carried out without calibration

SOLIDS MEASUREMENT
Scattered light measurement using 8-channel multiple angle optics at 860 nm

High-tech sensor technology

Measurement is based on combined multiple beam alternating light method with an infrared system and beam focusing. The 2 channel 90° scattered light measurement method conforms to the relevant ISO standard. A scattered light measurement method at 120° is integrated for determination of solids. 8-channel multiple angle optics make the system rugged and resistant to interference factors such as air bubbles, temperature, colorants, etc.

The industrial probe: TSS sc in a wide range of variants

The TSS sc probes were specially developed for industry. They are available as tank probes and for inline installation. Thanks to special models such as the VARIVENT for maximum hygiene, variants for use in potentially explosive atmospheres, inert titanium probes, etc., the range offers a suitable instrument for almost every application.

- **For use at temperatures up to 90°C: TSS HT sc**
- **Measurements in potentially explosive atmospheres (ATEX Zone 1): TSS EX1 sc**
- **Titanium housing for use in aggressive media and seawater: TSS TITANIUM2 sc and TSS TITANIUM7 sc**
- **Designed for the demanding hygiene requirements in the food and pharmaceutical sectors: TSS VARI sc with VARIVENT installation fittings**
- **Specially developed for the beverage industry: TSS XL sc**

Chemicals

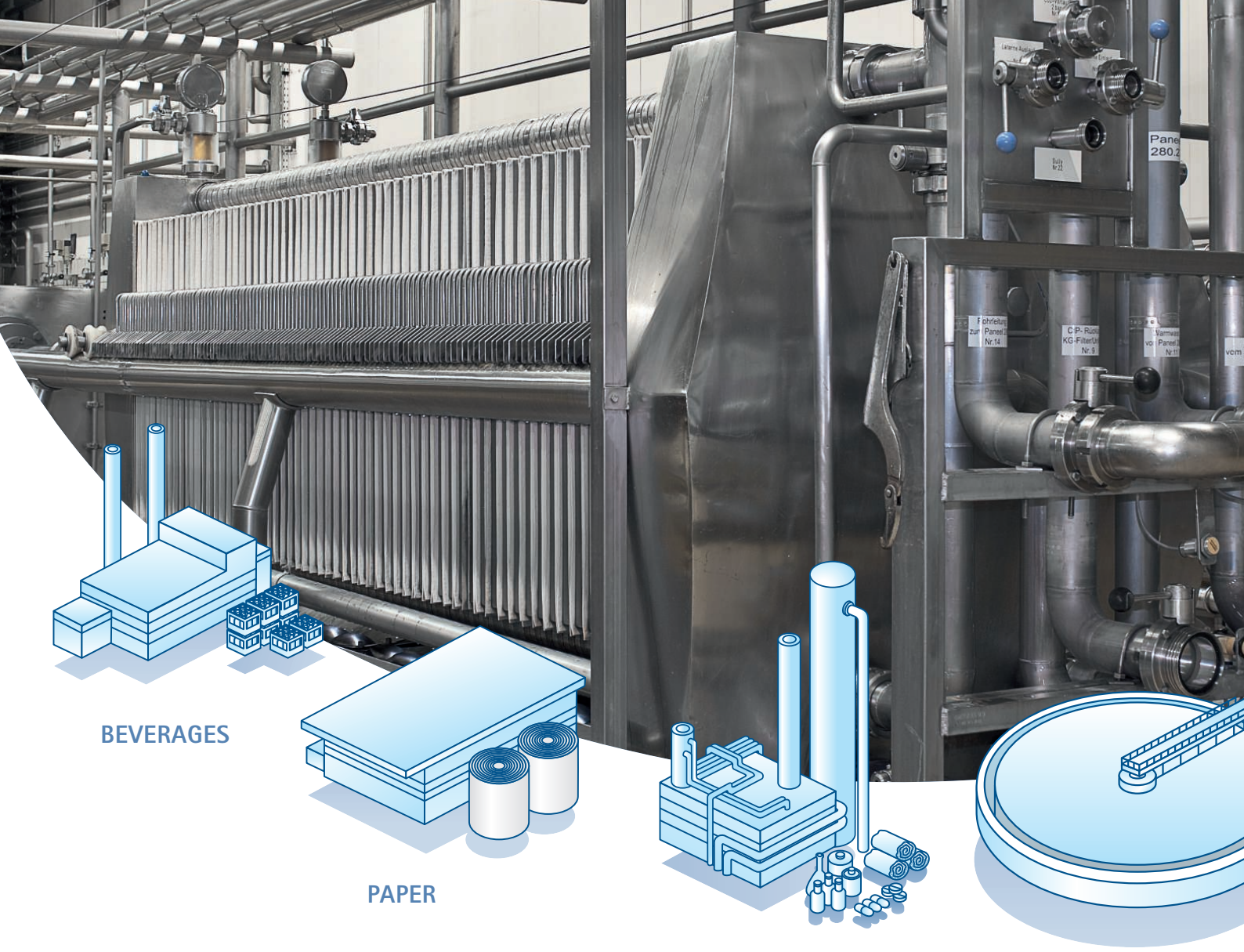
Production processes in the chemical sector make high demands on sensors. TSS EX1 sc is especially suitable for use in potentially explosive atmospheres (ATEX Zone 1). The TSS HT sc probe can be used in media at temperatures of up to 90°C. Two variants in titanium are also available. TSS TITANIUM2 sc is suitable for use in aggressive media.
TSS TITANIUM7 sc is the correct choice for use in water with a high salt content.

Paper production

Water plays a crucial role in the production of paper. Exact determination of the solids content in the white water box and flow box is especially important. This is where the TSS HT sc high-temperature probe excels. Even in hot water, it delivers colour-independent precise results. TSS W sc has a wiper that reliably keeps the beam windows free of fibres.

Food and pharmaceuticals

Very high standards of hygiene are essential in the pharmaceutical, food and beverage industries. TSS VARI sc satisfies this requirement through the special connection for VARIVENT fittings. It is installed flush to the pipe wall and is therefore easy to clean. The TSS XL sc installation fitting was developed specially for the beverage industry.



BEVERAGES

PAPER

CHEMICALS +
PHARMACEUTICALS

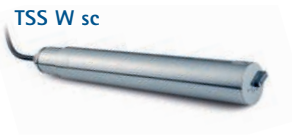
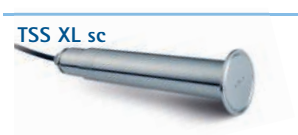
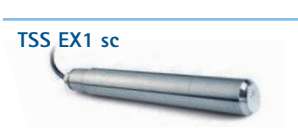
INDUSTRIAL
WASTEWATER
TREATMENT

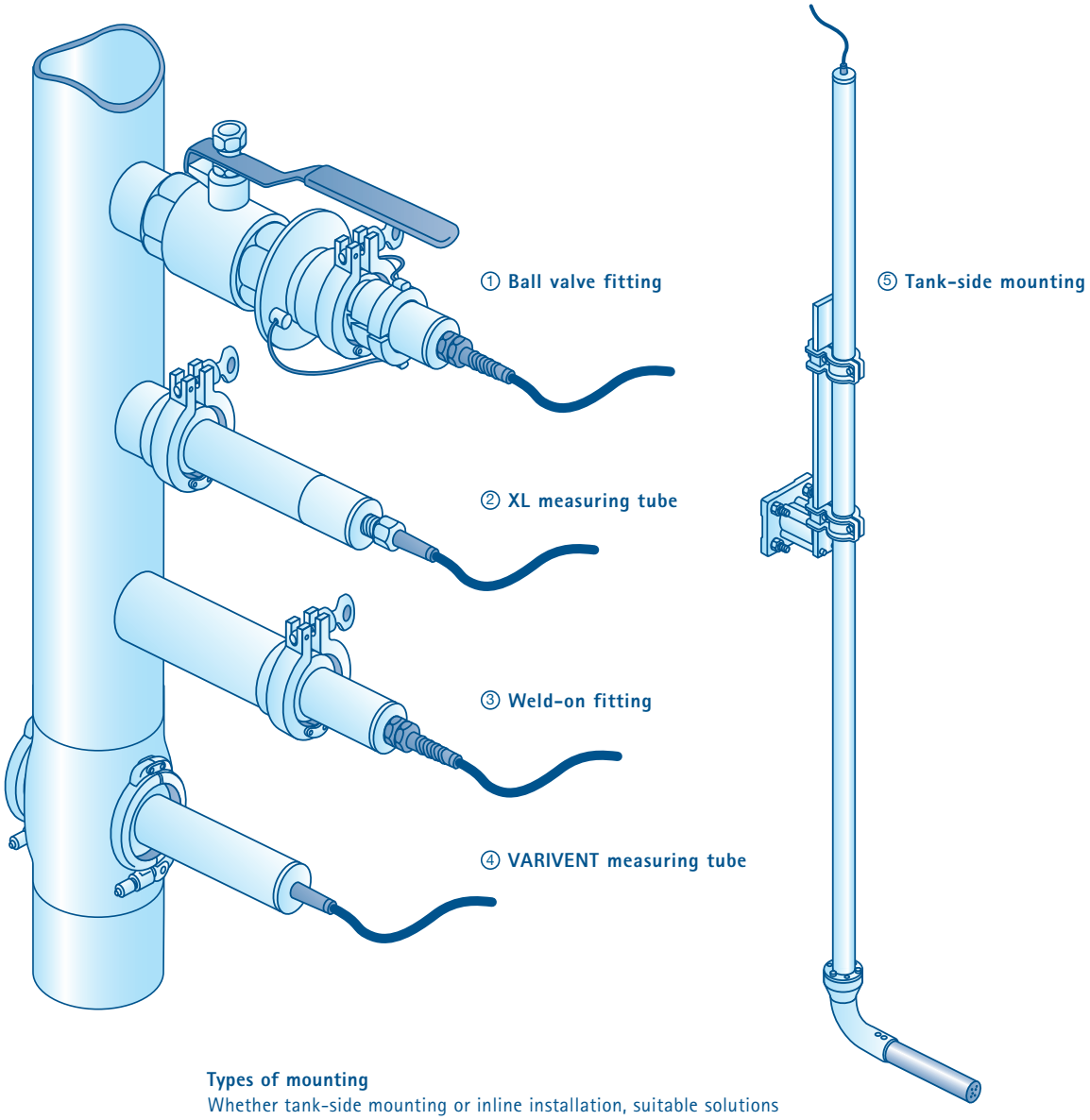
Special fields of application

TSS sc titanium probes are used for all applications in which aggressive media can attack stainless steel.
TSS TITANIUM2 sc is resistant to many organic and inorganic acids, lyes and chloride-containing solutions.
TSS TITANIUM7 sc is especially suitable for seawater. The probe is used in seawater desalination plants or in measuring stations that come into contact with seawater.

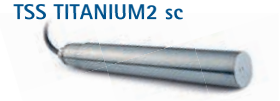
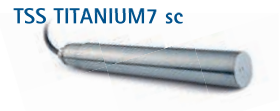
Product overview and type of mounting

Overview of all TSS sc probes

Standard TSS		Description	Type of mounting
TSS sc 		All rounder for turbidity and solids measurement. Version for tank-side mounting	Tank-side mounting ⑤
TSS sc TriClamp 		All rounder with TriClamp for simple inline installation with quick-acting clamp	Ball valve fitting ① Weld-on fitting ③
TSS W sc 		All rounder with wiper to ensure a clear view	Tank-side mounting ⑤
TSS W sc TriClamp 		All rounder with wiper to ensure a clear view. TriClamp for easy inline installation with quick-acting clamp	Ball valve fitting ① Weld-on fitting ③
Special applications		**Description**	**Type of mounting**
TSS HT sc 		For use in high temperature range up to 90°C	Tank-side mounting ⑤
TSS HT sc TriClamp 		For use in high temperature range up to 90°C. With TriClamp for easy inline installation with quick-acting clamp.	Ball valve fitting ① Weld-on fitting ③
TSS VARI sc 		Flush installation for use in food and pharmaceutical sectors. For VARIVENT industrial systems.	VARIVENT measuring tube ④
TSS XL sc 		Specially designed for use in the beverage and food industries	XL measuring tube ②
TSS EX1 sc 		Special design for use in potentially explosive atmospheres (ATEX Zone 1)	Pool-side mounting ⑤
TSS EX1 sc TriClamp 		Special housing for use in potentially explosive atmospheres (ATEX Zone 1). With TriClamp for easy inline installation with quick-acting clamp	Ball valve fitting ①



Types of mounting
Whether tank-side mounting or inline installation, suitable solutions are available for each measurement situation. Also for use in hygienically clean environments, thanks to special pipe fittings.

Titanium		Description	Type of mounting
TSS TITANIUM2 sc 		For use in aggressive fluids	user defined
TSS TITANIUM2 sc TriClamp 		For use in aggressive fluids. With TriClamp for easy inline installation with quick acting clamp	user defined
TSS TITANIUM7 sc 		Suitable for seawater and strongly saline media	user defined
TSS TITANIUM7 sc TriClamp 		Suitable for seawater and strongly saline media. With TriClamp for easy inline installation with quick acting clamp	user defined

Subject to change For technical data see reverse

TSS sc – Technical data

Measurement			
Measurement method Combined multiple beam alternating light method with infrared diode system and beam focussing	Turbidity (TRB): Solids (TS):	2-channel 90° scattered light measurement in accordance with DIN/EN 27027/ISO 7027, wavelength = 860 nm 120° scattered light measurement, wavelength = 860 nm	
Measuring range	Turbidity (TRB): Solids (TS):	0.001 to 4,000 FNU 0.001 to 500 g/l* With SiO_2 standard solution	
Measurement accuracy	Turbidity (TRB):	up to 1,000 FNU/NTU: <5% of measured value ±0.01 FNU/NTU	
Reproducibility	Turbidity (TRB): Solids (TS):	<3% <4%	
Response time	1 s < T90 <300 s (adjustable)		
Calibration	Turbidity (TRB): Solids (TS): Zero point:	factory calibrated To be calibrated by customer on site Permanently calibrated in the factory	
Ambient conditions			
Pressure range	≤6 bar: ≤10 bar: ≤16 bar:	TSS W sc TSS sc, TSS HT sc, TSS TITANIUM2 sc, TSS TITANIUM7 sc TSS VARI sc, TSS XL sc	
Flow rate	max. 3 m/s		
Ambient temperature	0–50 °C – TSS W sc 0–60 °C - TSS sc, TSS TITANIUM2 sc, TSS TITANIUM7 sc 0–80 °C – TSS VARI sc, TSS XL sc 0–90 °C – TSS HT sc		
Instrument properties			
Explosion protection certificates TSS EX1 sc, TSS EX1 sc Triclamp only	Ex II 2G Ex d IIC T6 Ta = -10...50 °C Ex II 2D Ex tD A21 IP 6X T80 °C Ta = -10...50 °C CE 0820 IBExU09 ATEX 1156		
Dimensions, weight	Tank sensor: Inline sensor (TriClamp): TSS VARI sc, TSS XL sc: Tank sensor, inline sensor (TriClamp): TSS VARI sc, TSS XL sc: approx.	D × L D (shaft) × L D (shaft) × L	40 mm × 330 mm 40 mm × 332 mm 40 mm × 232 mm approx. 1.6 kg 1.5 kg

Subject to change

* Final clarification by HACH LANGE is necessary

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DOC033.52.30134.Sep09