



SATRON®

LUMINA™ VOD

Turbidity Optical Sensor

www.satron.com

#LookCloser

The **SATRON VOD** is a hygienically approved optical sensor that operates on the absorption principle using advanced LED technology. It measures light absorption in direct correlation with the clarity of the process medium, making it an ideal solution for applications such as reverse osmosis (RO) outlets, condensate recovery, whey turbidity in separator discharge lines and ultrafiltration processes.

Designed for high-performance and reliability, VOD enables significant process optimization and cost savings in industries requiring precise turbidity monitoring.

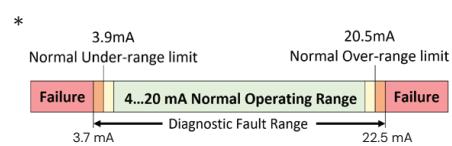
The sensor features a fully flush, flat front design for easy cleaning and optimal hygiene. It supports both analog (4–20 mA) and digital communication via the HART® protocol.



Pipe to be ordered separately

TECHNICAL SPECIFICATIONS

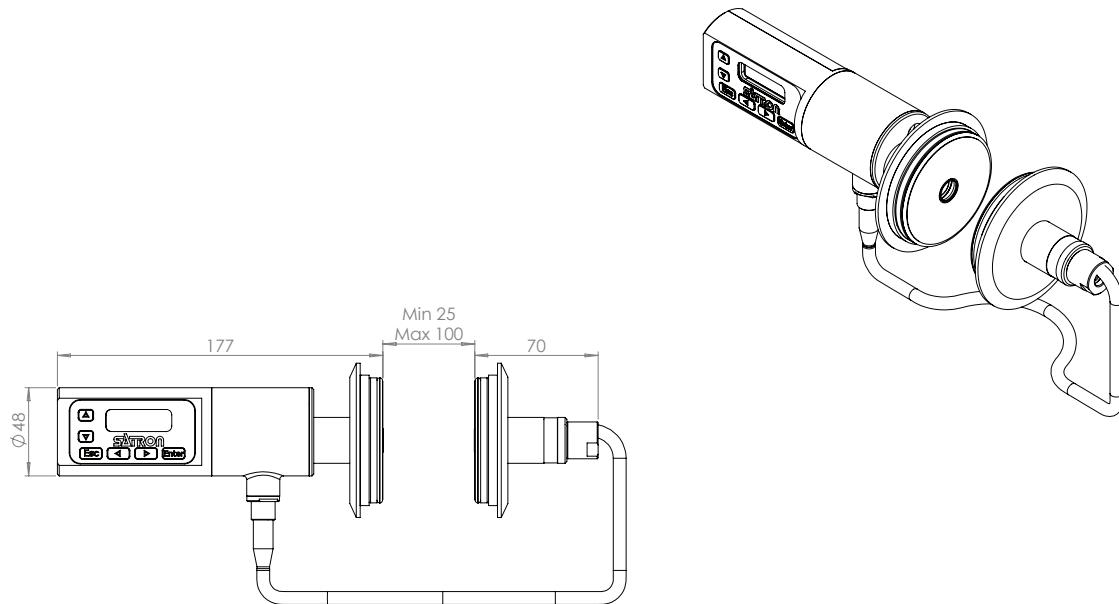
Measuring range	Pressure class	Maximum current	50 mA
0...1 500 NTU equivalent on 1.5" pipe	PN25	Maximum leakage current	10 µA
0...1 000 NTU equivalent on 2" pipe			
0...200 NTU equivalent on 3" pipe			
0...50 NTU equivalent on 4" pipe			
Calibration	CONSTRUCTION	Switch inputs	
The sensor is factory calibrated at 4mA = water, 20mA = full absorption, freely adjustable with pushbuttons or Hart® modem.	Materials: Sensing element ¹⁾ : AISI316L, Duplex (EN. 1.4462), Hast. C276/C22, or Titanium Gr2. Surface quality: Ra <0.8µm Lens: Sapphire or Spinel ceramic Cable material of detector probe: PVC Seal: EPDM, FPM, FFFPM, FEP	Housing N : 1 input ²⁾ Housing L : 3 inputs NC (no connection) 0...2 V	OFF ON
		Minimum values for switch in use	
		Voltage	16 V
		Current	4 mA
		Leakage current	1 mA
Damping	Housing with display , code N :	Current output 2	
Time constant adjustable 0.01 to 60 s.	Housing: AISI303/316 Seals: FPM Nameplates: Polyester Display window: Polycarbonate	External power supply	
		Current output 2 is galvanically isolated	
Repeatability	Housing without display , code H :	Maximum supply voltage	35 VDC
0.1% from maximum span.	Housing: AISI303/316 Seals: FPM and NBR Nameplates: Polyester	Range	3.5...23 mA
		Factory setting	4...20 mA
Response time	Connection cable between sensor and housing (RDU) code L :	Maximum isolation voltage	100 VDC
0.1s (with less than 0.1s damping).	PVC signal cable Nameplates: Polyester Display window: Polycarbonate		
Accuracy	Electrical connections	Process connections	
0...50 NTU 0.2% 0...1 500 NTU 1%	Housing without display code H : 1x M12 plug connector Housing with display, code N : 2x M12 plug connector Remote display unit, code L : 3x PG9 gland for cable; Conductor cross section: max 2.5 mm ²	Tuchenhangen Type "N"	
Unit selection	I/O-connections	Protection class	
%, NTU, FNU, FTU, mg/L, g/dm ³ , PPM, or custom text	Current output1 Turbidity active Range (Namur NE 043) 3.5...23 mA Maximum load 600 Ω Factory setting 3.7...22.5 mA*	IP66, IP67 See Selection chart.	
Temperature limits	Switch outputs	Weight	
Ambient: -30 to +80 °C Display operating range: 0 to +50 °C (Does not affect operation of the sensor) Process N type: -5 to +100 °C (120 °C for 10min) Process H type: -5 to +120 °C Shipping and storage: -40 to +80 °C	Housing N : 1 output ²⁾ Housing L : 3 outputs Solid state relay, grounding contact Maximum voltage 35 V	Housing without (H): 1.0 kg Housing with Display (N): 1.3 kg Remote Housing (L): 2.5 kg	
Output			
3-wire (3W), 4–20 mA NAMUR NE43, IO-Link (optional)			
Supply voltage			
Nominal 24 VDC, (21.6 – 27.6V) 200mA			
Humidity limits			
0–100% RH			



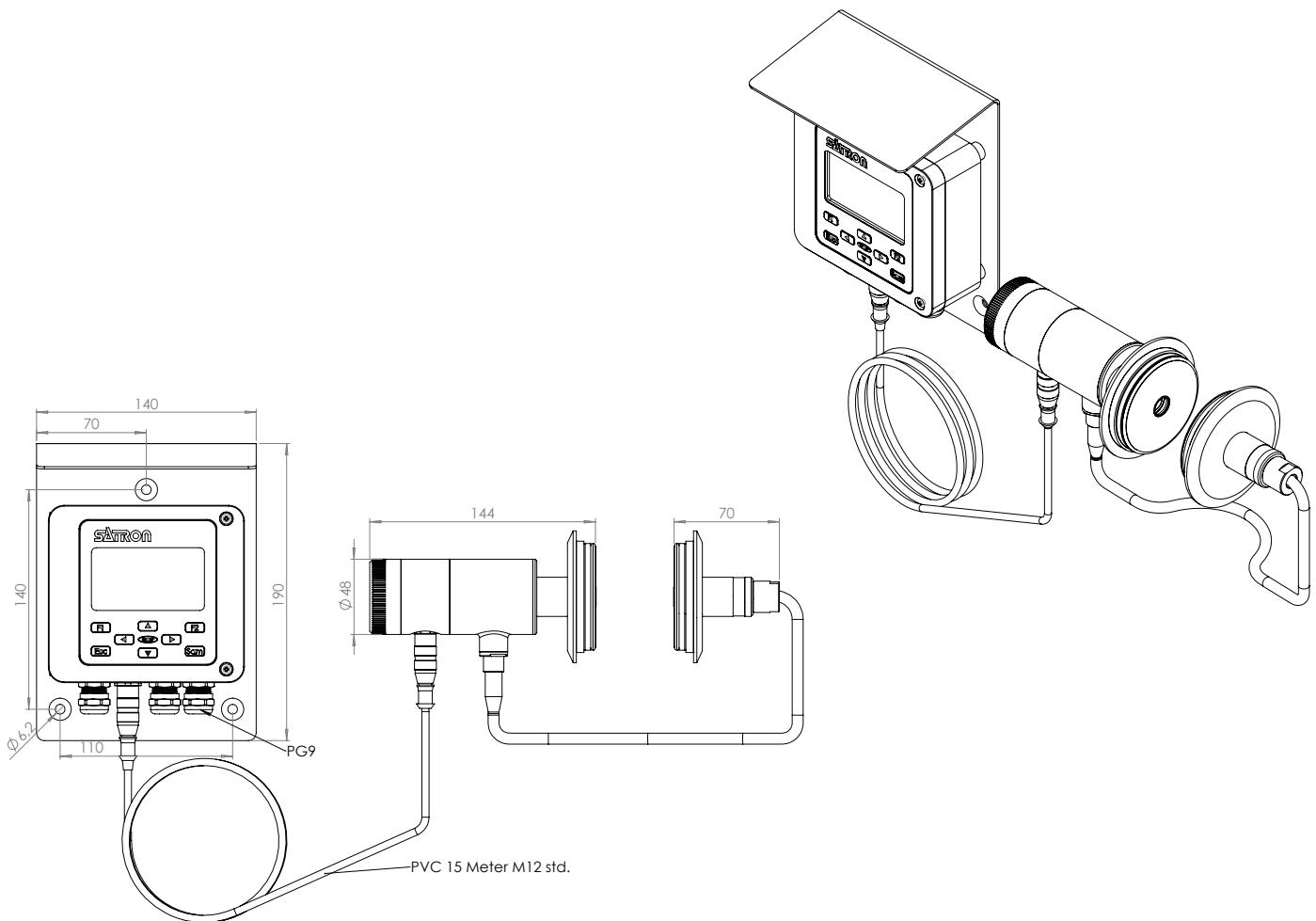
¹⁾ Parts in contact with the process medium are FDA compliant.

²⁾ Either 1 output or 1 input.

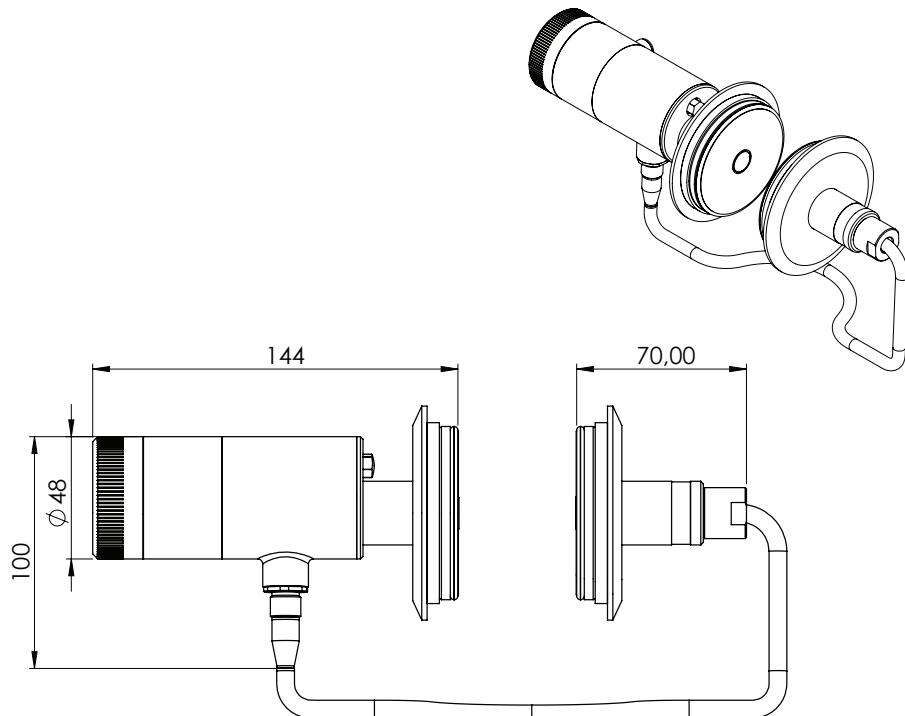
Dimensions and Housing Types VOD (mm)



VOD with display and pushbuttons (N housing)



VOD with remote electronics housing with display (L housing)

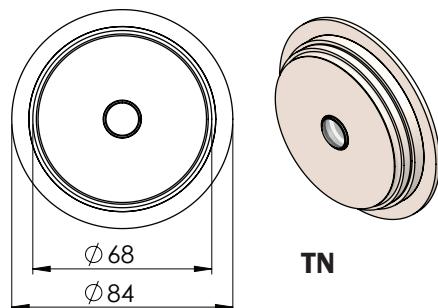


VOD with no display (H-housing)

Process connection details

The Satron VOD is equipped with a VARINLINE process connection TYPE N.

Several pipe diameters are commercially available. Change of pipe diameter will require a recalibration of the sensor.

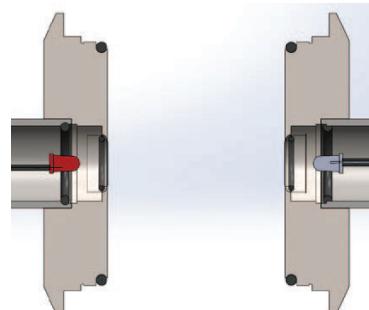


VOD measurement principle

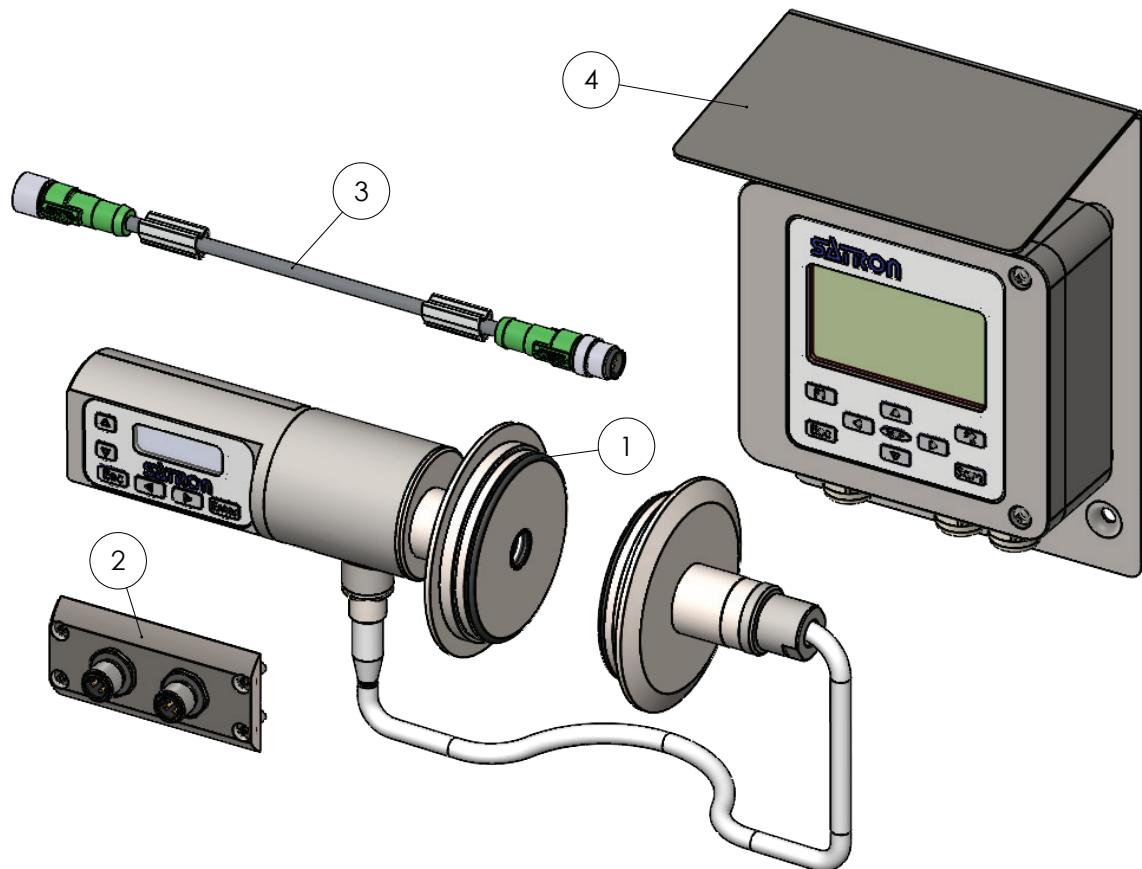
The SATRON VOD sensor utilizes the absorption-based turbidity measurement method, employing high-performance, LED light sources (see selection chart). In this configuration, the LED emitter (shown in red) transmits a focused beam of light through the process medium. The transmitted light is then received by a precision photodetector (shown in grey) positioned on the opposite side of the optical path.

As turbidity increases, suspended particles in the medium cause more light to be absorbed and scattered, resulting in a lower intensity of light reaching the photodetector. This decrease in detected light is used to determine the turbidity level in real time.

SATRON employs industrial-grade optical components in the VOD sensor design. The integrated LEDs and photodetectors are selected for their long-term stability and robustness, with typical lifespans exceeding 20 years under normal operating conditions.



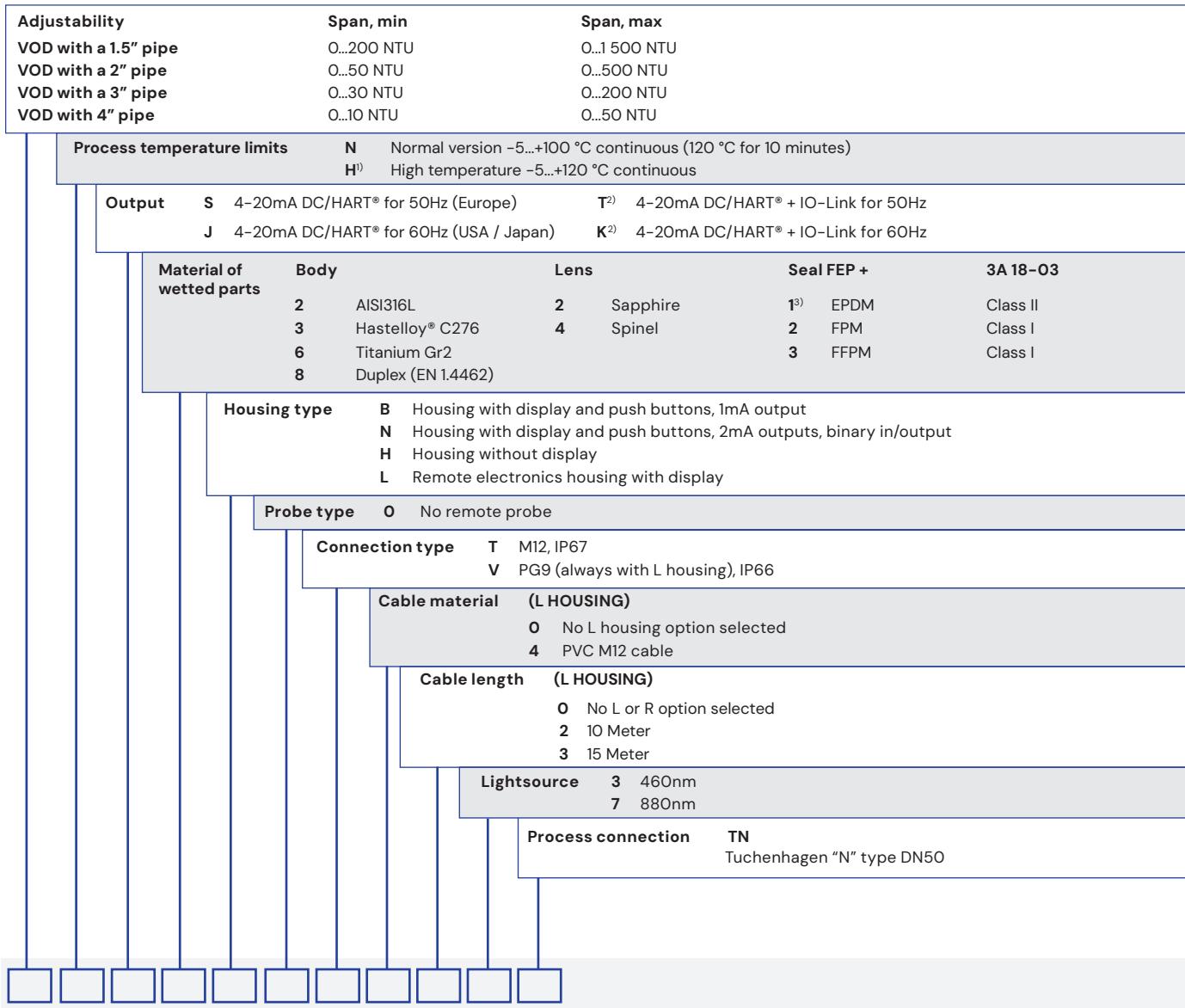
Spare-parts VOD



No.	Part name	Order code	Note
1	O-ring EPDM	80036203	3A 18-03 Class II (Do not exceed above 8% fat content)
1	O-ring FPM	80016203	3A 18-03 Class I
1	O-ring FPPM	80046203	3A 18-03 Class I
2	Plug cover M12* N-housing	T1370011	
2	Plug cover M12* B-housing	T1370012	
3	L-Housing data cable 10m PVC*	70000600	
3	L-Housing data cable 15m PVC*	70000601	
4	Remote Display Unit RDU*	T1370009	

*Compatible with M3 model sensors. For older generations with 4 button displays (M1 and M2), please contact Satron.

SELECTION CHART



Example code

VOD N S 227 N O T O O 3 TN

Documentation

Material certificates

MC1 Raw material certificate without appendices, in accordance with SFS-EN 10204-2.1 (DIN 50049-2.1) standard

MC2 Raw material certificate for wetted parts, in accordance with SFS-EN 10204-2.2 (DIN 50049-2.2) standard

MC3 Raw material certificate for wetted parts, in accordance with SFS-EN 10204-3.1 B (DIN 50049-3.1 B) standard

MC3-3A Raw material certificate for wetted parts, in accordance with SFS-EN 10204-3.1 B (DIN 50049-3.1 B) standard + 3A approval

1) 3A approval in combination only with FFFPM

2) IO-link only with N housing type

3) Do not exceed above 8% fat content process media

We reserve the right for technical modifications without prior notice.
 HART® is a registered trademark of FieldComm Group, Inc.
 Hastelloy® is the registered trademark of Haynes International, Inc.
 PASVE® is the registered trademark of Satron Instruments Inc.
 3-A is a registered mark owned and administered by 3-A SSI.

UL 61010-1, 3rd Ed. Rev May 11, 2012
 CAN/CSA C22.2 No. 61010-1-12, Ed. 3
 EMC directive 2014/30/EC
 - EN 61326-1: 2021

