



SATRON®

LUMINA™ VOF Turbidity and Solids Optical Sensor

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#LookCloser

The SATRON VOF is an optical sensor that operates on the absorption principle using reliable LED technology. Designed for flexibility, it can be easily removed from the process line via a 1" ball valve, allowing quick relocation or maintenance without disrupting operations.

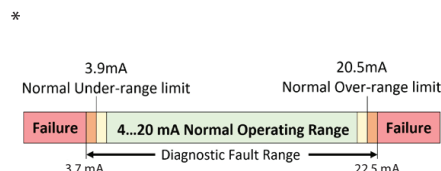
Its robust design makes it ideal for monitoring waste outlets, effluents, and color variations in various processes. It's commonly used to monitor impurities in clean water, detect yeast after membrane filtration in breweries, verify filter integrity, and track impurities in evaporators.

The sensor ensures accurate in-line measurement and communicates via 4–20 mA and the HART® protocol, providing smooth integration with process control.



TECHNICAL SPECIFICATIONS

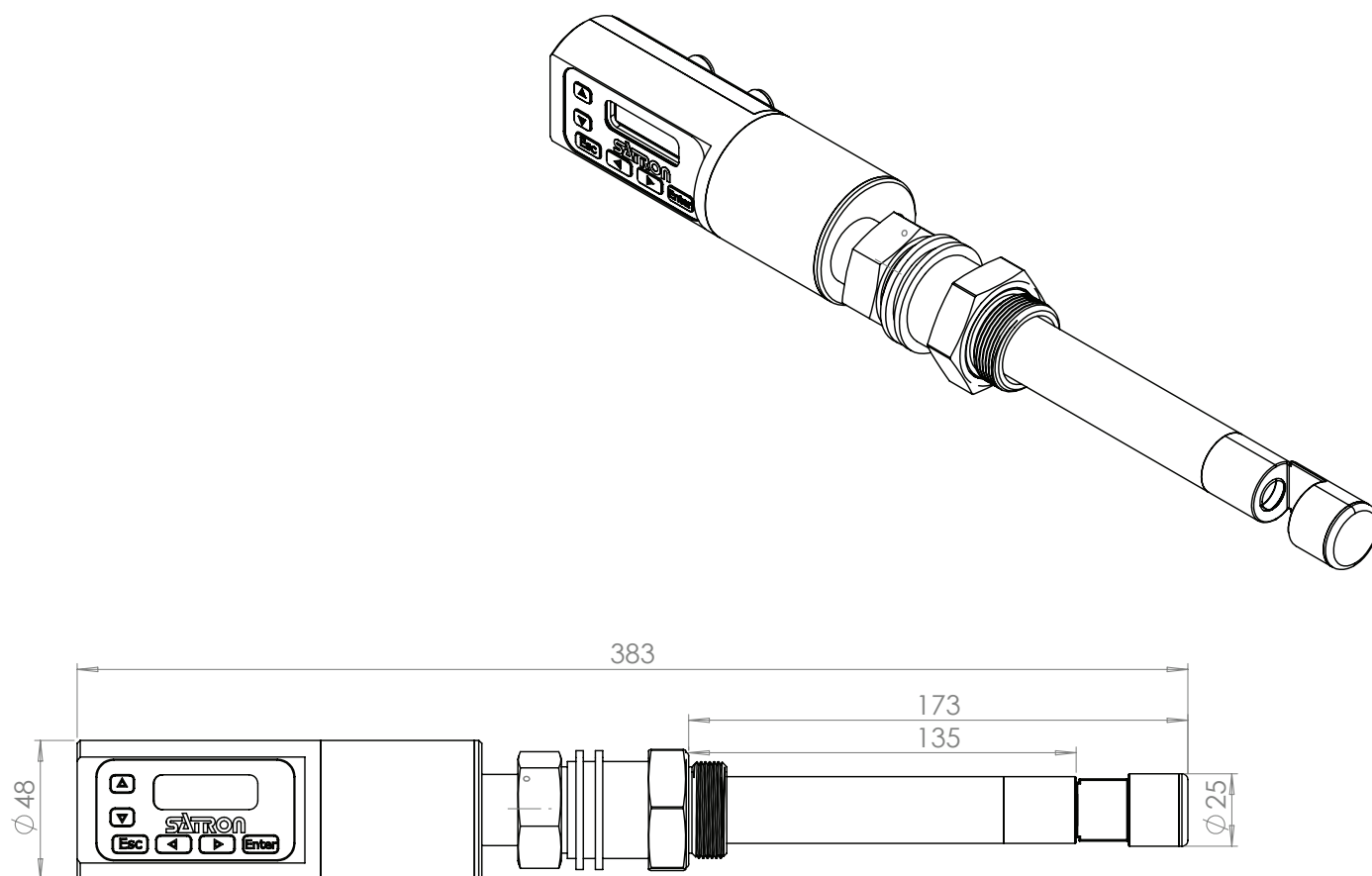
Measuring range 0 ... 1 500 NTU		CONSTRUCTION Materials: Sensing element ¹⁾ : AISI316L, Duplex (EN. 1.4462), Hast. C276/C22, or Titanium Gr2. Surface quality: Ra <0.8µm Lens: Sapphire Seal: EPDM, FPM, FFPM, FEP	NC (no connection) 0...2 V	OFF ON
Calibration The sensor is factory calibrated at 4mA = water, 20mA = full asorption, freely adjustable with pushbuttons or Hart® modem.		Housing with display, code N: Housing: AISI303/316 Seals: FPM Nameplates: Polyester Display window: Polycarbonate	Minimum values for switch in use Voltage Current Leakage current	16 V 4 mA 1 mA
Damping Time constant adjustable 0.01 to 60 s.		Housing without display, code H: Housing: AISI303/316 Seals: FPM and NBR Nameplates: Polyester	Current output2 External power supply Current output 2 is galvanically isolated	
Repeatability 0.1% from maximum span.		Electrical connections 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	Maximum supply voltage Range Factory setting Maximum isolation voltage	35 VDC 3.5...23 mA 4...20 mA 100 VDC
Response time 0.1s (with less than 0.1s damping)		I/O-connections Current output1 Range (Namur NE 043) Maximum load Factory setting	Process connections G1A ball valve insertion. Extension 19cm diameter ø 24mm	
Accuracy 0...50 NTU 0...1 500 NTU	0.2% 1%	Switch outputs Housing N: 1 output ²⁾ Housing L: 3 outputs Solid state relay, grounding contact Maximum voltage Maximum current Maximum leakage current	Protection class IP66, IP67 and IP68 See Selection chart.	
Unit selection %, NTU, FNU, FTU, mg/L, g/dm3, PPM, or custom text		Switch inputs Housing N: 1 input ²⁾ Housing L: 3 inputs	Weight Housing without Display (H): 1.2 kg Housing with Display (N): Remote Housing (L):	1.3 kg 2.5 kg
Temperature limits Ambient: -30 to +80 °C Display operating range: 0 to +50 °C (Does not affect operation of the sensor) Process N type: 0 to +100 °C (120 °C for 10min) Process H type: 0 to +120 °C Shipping and storage: -40 to +80 °C			Output signal according to NAMUR NE043 Signal Level for the failure information of Digital Transmitters. Min. load using HART®-communication250 Ω	
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				
Pressure class: PN25				
EMC directive 2014/30/EC - EN 61326-1: 2021				



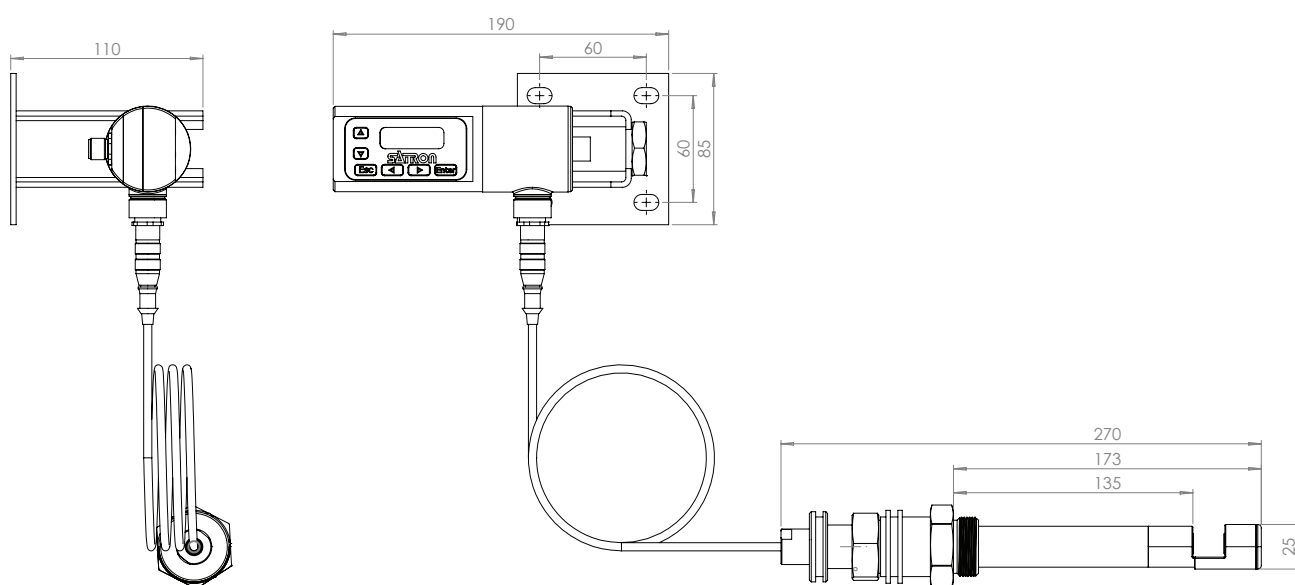
¹⁾ Parts in contact with the process medium are FDA compliant.

²⁾ Either 1 output or 1 input.

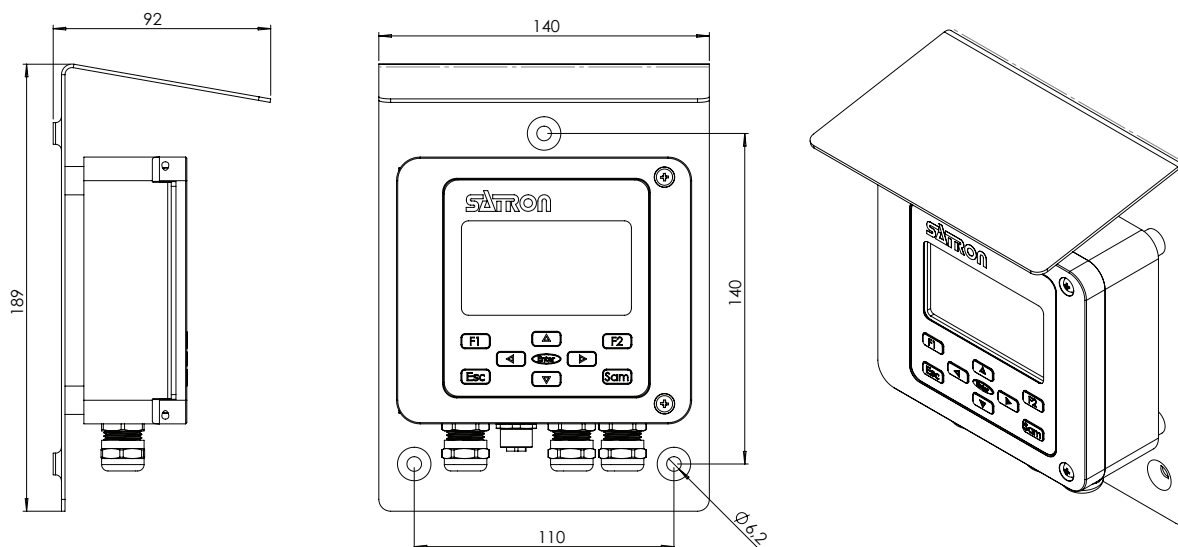
Dimensions and Housing types VOF (mm)



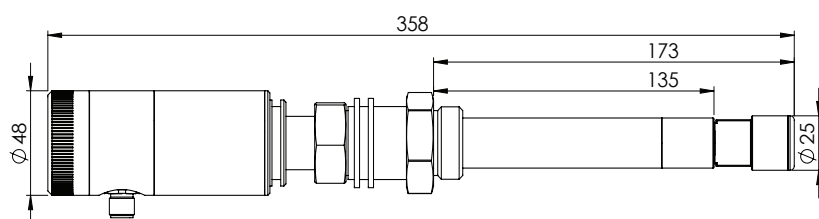
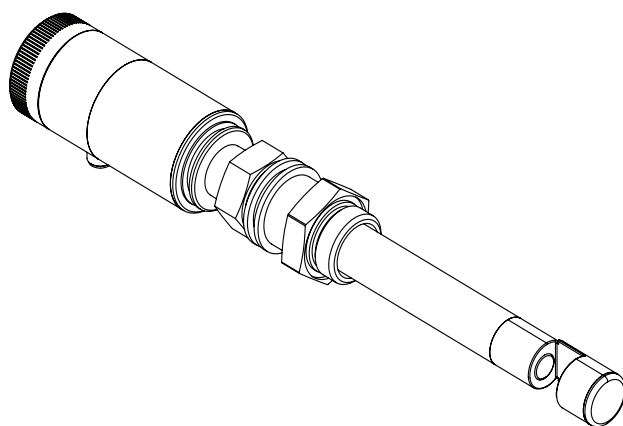
VOF B1 with display and pushbuttons (N housing)



VOF B1 with remote electronics (NRT housing)



RDU - Remote Display Unit (L) T1370009

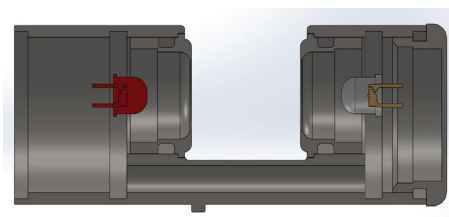


VOF B1 with no display (H or L housing)

VOF measurement principle

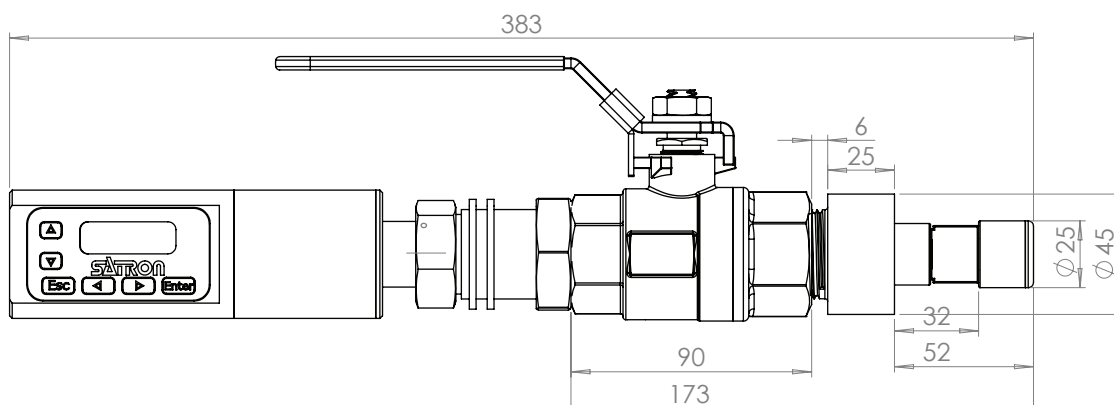
The SATRON VOF sensor uses the absorption principle to measure turbidity with LED light sources (see selection chart). The LED (red) emits light through the process medium, and a photodetector (grey) receives the transmitted light.

As turbidity increases, more light is absorbed and scattered by particles, reducing the signal at the detector. This change is used to calculate turbidity in real time. The sensor's optical components are built for durability, with an expected lifetime of over 20 years.

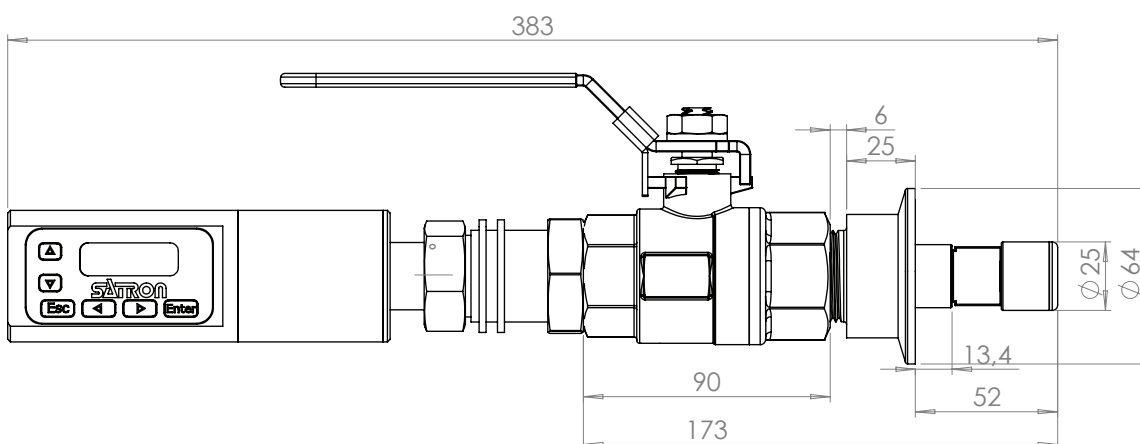


Process connection details

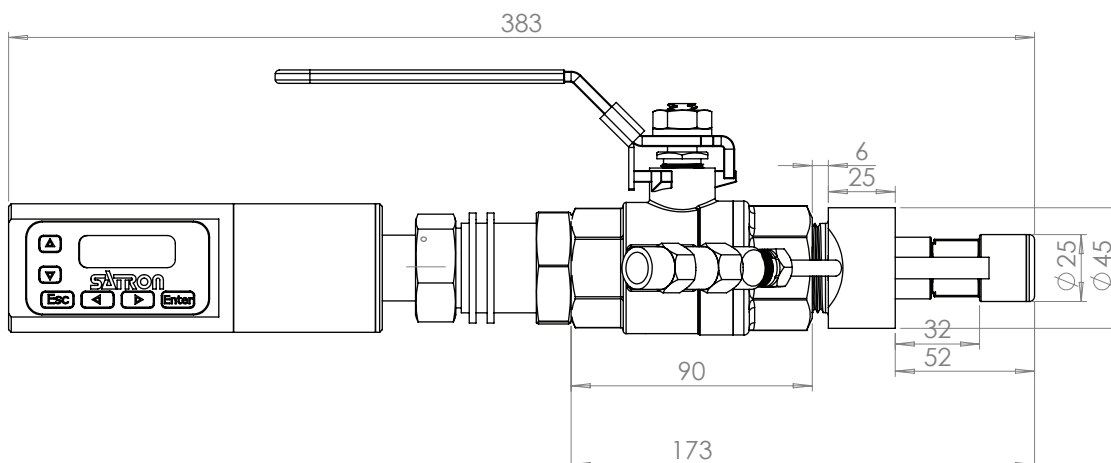
The Satron VOF comes with a G1" retractable process connection type B1.
Different process couplings allow for welding, flanged or clamped connection.



VOF with standard welding adapter M1050598

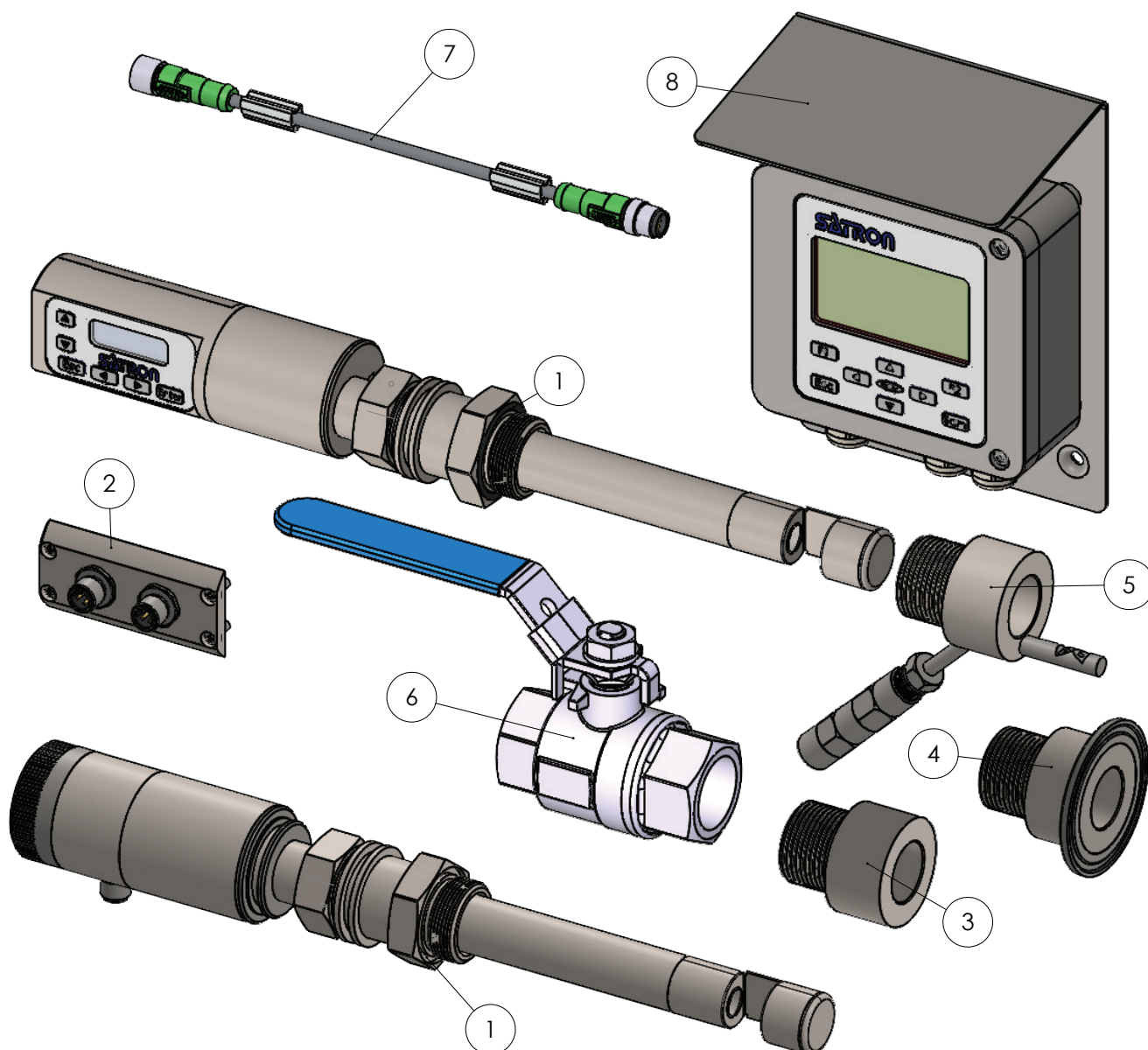


VOF with tri-clamp adapter M1051276



VOF with flushing adapter M1050102-VOF

Spare-parts VOF



No.	Part name	Order code
1	O-ring EPDM	80033426
2	Plug cover M12* N-housing	T1370011
2	Plug cover M12* B-housing	T1370012
3	B1 Welding process coupling	M1050598
4	Male 1" to Tri-Clamp DN 40...51 ISO2852 (C7=64,0mm)	M1050222
5	Flushing coupling for VOF	M1050102-VOF
6	AISI316L ball valve	82500003
7	L-Housing data cable 10m PVC*	70000600
7	L-Housing data cable 15m PVC*	70000601
8	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

Adjustability	Span, min		Span, max	
VOF	0... 50 NTU		0... 1 500 NTU	
Process temperature limits		N	Normal version 0...+100 °C continuous (120 °C for 10 minutes)	
		H ¹⁾	High temperature 0...+120 °C continuous	
Output	S	4-20mA DC/HART® for 50Hz (Europe)		T ²⁾ 4-20mA DC/HART® + IO-Link for 50Hz
	J	4-20mA DC/HART® for 60Hz (USA / Japan)		K ²⁾ 4-20mA DC/HART® + IO-Link for 60Hz
Material of wetted parts		Body	Lens	Seal FEP +
		2 AISI316L	2 Sapphire	1 EPDM 2 FPM 3 FFPM
Housing type	B	Housing with display and push buttons, 1mA output		
	N	Housing with display and push buttons, 2mA outputs, binary in/output		
	H	Housing without display		
	L	Remote electronics housing with display		
Probe type	0	No remote probe		
	R	Remote measuring probe (not available with L housing), IP68		
Connection type	T	M12, IP67		
	V	PG9 (always with L housing), IP66		
Cable material	0	No L or R option selected		
	2 ⁴⁾	AISI316L braided PTFE hose		
	4	PVC cable (std.) Extension 10m PVC cable available (code: 70000600)		
Cable length	0	No L or R option selected		
	2	10 meters (std.)		
	3	15 meters		
Lightsource	3	460nm		
	7	880nm		
	9	IR+		
Process connections	B1	G1A ball valve insertion. Extension 17,3cm diameter ø 25mm.		

Example code

VOF N S 221 N O T O O 7 B1

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

¹⁾ Only in combination with FFPM seals. And only 880nm.

²⁾ IO-Link only with N housing type