COD / BOD / TSS UV Spectroscopy Sensor for Online measurement

Model: ABUV Series

This UV-Vis optical water quality sensor measures COD, BOD and TSS using full-spectrum absorbance from 190 to 720 nm wavelength. Designed for continuous online monitoring, it features a high-precision photodetector placed at 180° to capture transmitted light and correlate absorbance to organic load and suspended solids. With multipoint calibration function, the sensor delivers accurate results across diverse wastewater and industrial effluent streams.

FEATURES AND BENEFITS

- UV-LED source range from 190 to 720 nm for COD/BOD organics detection
- Optional TSS detection
- 180° light absorption measurement for highest stability
- Direct in-situ monitoring — no reagents required
- Multipoint calibration function for COD, BOD and TSS
- Automatic fouling compensation (optional air purge)
- High corrosion resistance: SS316 body
- Factory and user calibration modes
- Low power, long-life optical components
- Compatible with PLC/SCADA: RS485 Modbus RTU

3 -5%
Accuracy

<5s
Response Time

IP68
Protection

APPLICATIONS

- **Industrial wastewater outlets**
- **Sewage Treatment Plant (STP)**
- **Boiler feedwater and cooling towers**
- **Process control in aeration, clarifiers & filtration**
- **River and lake quality monitoring**
- **Effluent compliance monitoring (CPCB / local norms)**

Technical Note

COD and BOD are measured optically by analysing the UV-Vis absorption spectrum (190–720 nm) and correlating it to dissolved organic content using mathematical compensation algorithms. TSS measurement is based on light attenuation through suspended particulates. The sensor maintains optical stability through temperature compensation, signal normalization and multi-point calibration.

TECHNICAL SPECIFICATIONS

Measurement

Measurement Parameters	COD, BOD, TSS
Measuring Principle	UV-Vis spectrophotometry, 190–720 nm
Detection Angle	180° transmission photometry
Optical Path Length	2mm/5mm
Calibration	Multipoint calibration; separate Factory and User calibration modes
COD Measurement Range	0–500 / 0–1000 / 0–3000 ppm (as per model)
TSS Measurement Range	0–500 ppm
Accuracy	3-5% of F.S.
Response Time	< 5 seconds

Environmental Specifications

Ambient Temperature	0 to 60 °C
Permissible Sample Water Temperature	0 to 90 °C

Mechanical Specifications

Sensor Body	SS316
Optical Window Material	Quartz
Dimensions	Ø 48 mm x 250 mm (length)
Weight	1.5 kg (with 10 m cable)
IP Rating	IP68 – fully submersible
Cable Length	10 m standard (Extendable)

Electrical Specifications

Output Signals	RS485 (Modbus RTU)
Supply Voltage	12–24 V DC

Special Features

Optional Auto Cleaning	Automatic Air blast

Certifications

Certifications	CE / TUV

ORDERING INFORMATION

ABUV											
	Power Supply										
	0										110/230V AC
	1										24V DC
		Analog Inputs									
		0									NA
		1									1 Channel
		2									2 Channels
		3									3 Channels
			Digital Inputs								
			0								NA
			1								2 Nos.
			2								4 Nos.
				Analog Outputs (4-20 mA)							
				0							NA
				1							2 Channels
				2							4 Channels
				3							6 Channels
					No. of Relay						
					0						NA
					1						2 Nos.
					2						4 Nos.
						RS485 Output					
						0					NA
						1					1 Channel
							Cloud Connectivity				
							0				NA
							1				GSM/GPRS/4G/5G
							2				Wi-Fi
								Mounting			
								0			Wall Mount
								1			Din Rail Mount

ACCESSORIES AND OPTIONS

ABSC – CB
Controller with RS 485, 4-20 mA Relay and Optional PID Outputs

ABFL - CB
Flow cell for COD sensor

ABAC-CB
Auto Cleaning Module for Sensor

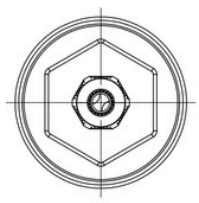
CAB-EXT-XX
Cable extension — specify length

EB-100-MG
E-Brix IOT Gateway

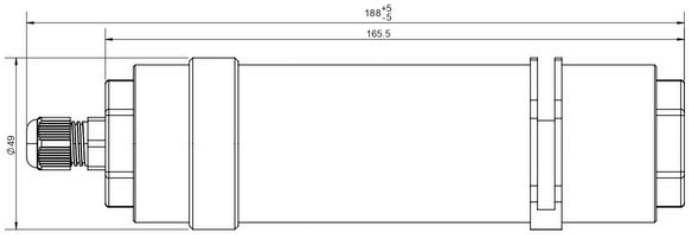
AX-Cloud-XX
Cloud subscription for Data Monitoring – Mention no. of months

DIMENSION DRAWINGS

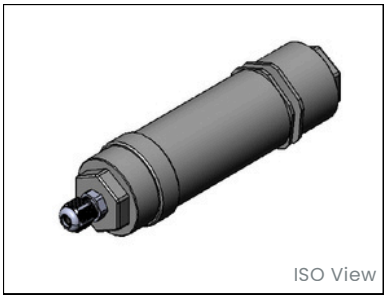
I. Sensor Without Air Cleaning



FRONT VIEW

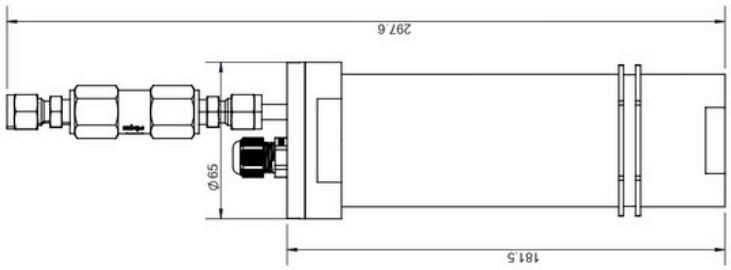


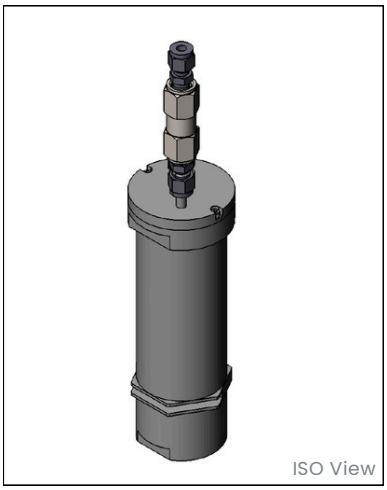
SIDE VIEW



ISO View

II. Sensor With Air Cleaning



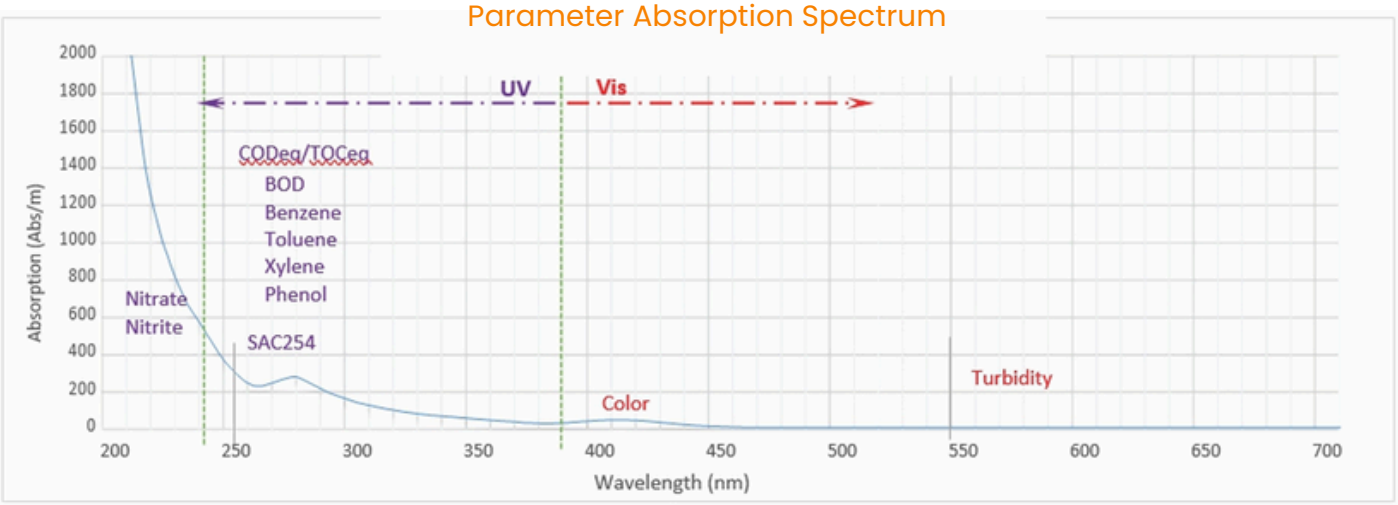


MEASURING SCALE & OPTIONAL PATH LENGTH

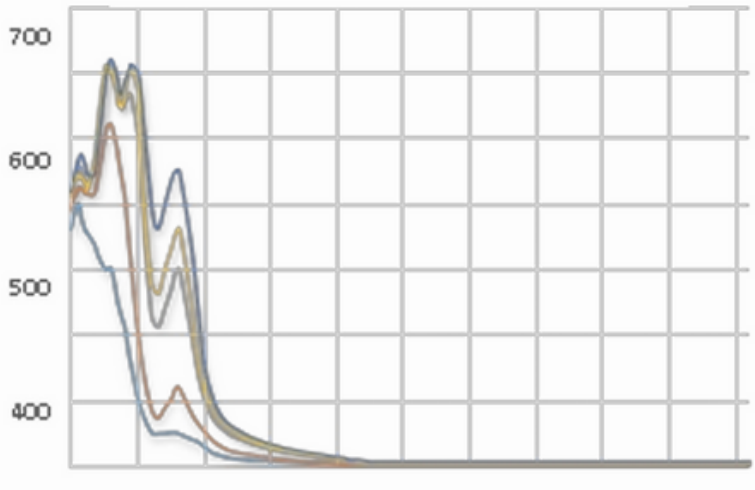
Application	WWTO Influent/ Sewer		WWTP Effluent	River Water	Drinking Water
Path Length	**2 mm**	**5 mm**	**5 mm**	**5 mm**	**5 mm**
NO3-N mg/L	0.5-10	-	0.2-25	0.3-70	0.1-10
COD mg/L	23-3750	10-1500	2-500	-	-
BOD mg/L	20-1250	10-500	2-300	-	-
TOC mg/L	-	-	-	1-150	0.1-20
DOC mg/L	-	-	-	0.5-75	0.1-10
SAC254 Abs/m	5-750	2-300	2-300	2-300	0.1-40
TSS mg/L	25-2500	10-1000	2-500	-	-
Turbidity mg/L	-	-	-	5-1400	0.5-150
O3 mg/L	-	-	0.1-10	-	0.1-10

UV-VIS ABSORPTION SPECTRUM

Parameter Absorption Spectrum



UV-Vis Absorption Curves



The validated spectral calibration by SMART UV-Vis uses multiple wavelengths to monitor and compensate for each sum parameter, which enables a much more accurate and robust measurement than the single wavelength method. Using eld special calibration that employs specic features of the absorption spectrum, it is even possible to distinguish various fractions of organic carbon groups. For a speci c application, the relevant calculation and calibration of desired parameters require their corresponding spectra and reference values obtained from the analytical chemistry lab. The spectral data plus one or more corresponding measured values are called reference value pairs. The sensor uses the reference value pair and the proprietary spectral algorithm to perform calibration. The more reference value pairs are provided; the more accurate calibration is given.

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