

ONLINE WATER QUALITY ANALYZERS



2020 CATALOG

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BA-MULTIPARAMETER CONTROLLER

For BAS-Smart Probes & Sensors



commitment to excellence

Technical Datasheet

Your trusted global industrial partner since 1990
ISO 9001:2015 certified

The Advantage

Universal Terminals: Use with BAS-Smart Sensors for measurements of water analyzing

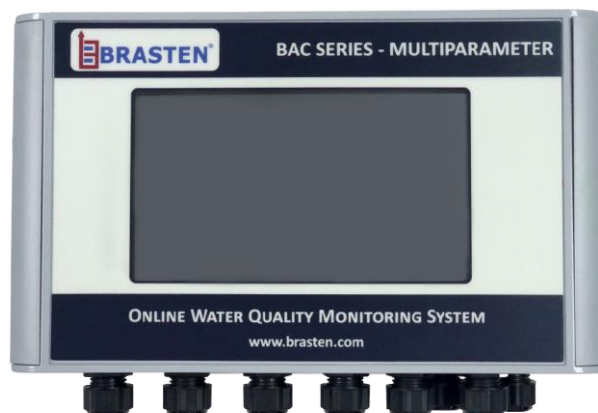
Advanced Display: LCD Touch Screen

Multiple Channels: Simultaneous acquisition of up to 8 channels

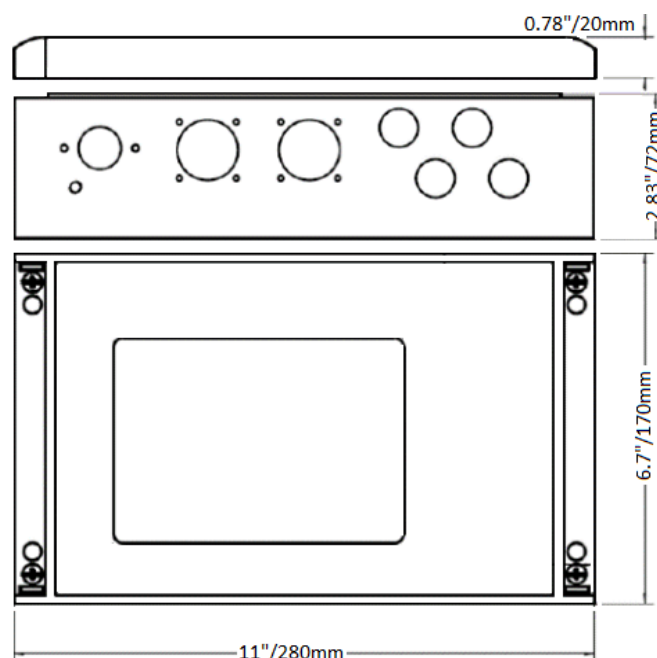
4-20 mA output with Optional HART and Alarm Relays: Flexible configurations for all applications

USB Port: For easy data log

Optional Wi-Fi: For BA-Multiparameter controller, can be connected wirelessly by tablets, smart phones and computers for remote display and operations.



Dimension



Introduction

BA-Multiparameter controller is designed for continuous measurements with BAS-SMART probes & Sensors in all industry types.

BA-Multiparameter controller has the ability to connect to network with intelligent sensors- RS485 output and Modbus RTU protocol.

BA tMultiparameter controller provides power to sensors while simultaneously receiving. A plug & play function which can seamlessly connect sensors to the controller.

Industries Served

- | | | |
|--------------------|------------------|-------------------|
| • Oil & Gas | • Petrochemical | • Chemical |
| • Textile | • Pharmaceutical | • Pulp & Paper |
| • Food & Beverages | • Power plants | • Water Treatment |

Available Sensors

<u>BOD/ COD and others</u>  BAS-SMART UV-Vis Probe	<u>Conductivity/ Salinity</u>  BAS-SMART CS7	<u>Turbidity</u>  BAS-SMART TS7	<u>Low range turbidity</u>  BAS-SMART TR06
<u>Total/ Free Chlorine</u>  BAS-SMART FC7	<u>Ammonium/ Nitrate</u>  BAS-SMART AM7/ NO7	<u>pH/ ORP</u>  BAS-SMART pH7/ RX7	<u>Dissolved oxygen</u>  BAS-SMART DO07

Specification

Possible parameters	Up to 8
Accuracy	±0.1%Full scale
Repeatability	±0.1%Full scale
Linearity	±0.05%Full scale
Response time	T90 < 1s
Power	DC: 24VDC (13 ~ 50VDC) AC: 110VAC/ 220VAC, 50Hz/ 60Hz
Display	LCD touch screen
Temperature	-20 ~ 70 °C
Humidity	0 ~ 95 % RH
Inputs	Analog input : 4~20mA, Digital input: RS 485 MODBUS RTU
Analog Output	4-20mA, Up to 8 channels
Digital output	RS485 MODBUS
Relay	SPDT,5A@250VAC/ 5A@30VDC (option)
IP Ratings	IP 65

Standard Warranty

Standard warranty is 12 months from the date of commissioning & limited to maximum of 15 months from the date of shipment of the analyzer system

Sales & Service Support

- Factory Acceptance Test (FAT)
- Site Acceptance Test (SAT)
- Site Commissioning
- After Sales Service backup
- Guaranteed spares parts availability for maximum 10 years of instrument life.

Ordering information

BAC	-X1	-X2	-X3	-X4	-X5
-X1	-04: four, -06: six, -08: eight (channel)				
-X2	- : RS485, -BP: Profibus-DP, -BH: HART, -BW: WIFI				
-X3	-R4: four, -R6: Six, -R8: eight (SDPT relays)				
-X4	-AC: 110/ 230 VAC, -DC: 24VDC				
-X5	- : None, - ATM: atmosphere compensation				

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Technical Datasheet

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The Advantage

Universal Terminals: Use with BAS-Smart Sensors for measurements of water analyzing

Advanced Display: -40°C tolerance brighter OLED screen

4-20 mA output with Optional HART and Alarm Relays: Flexible configurations for all applications

Explosion-Proof NEMA 4X, IP66

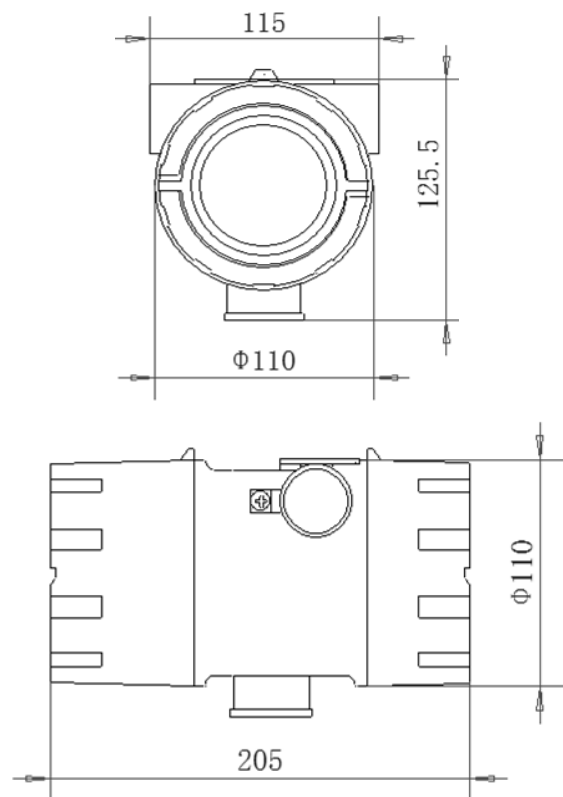


Introduction

BAC-EX are designed for continuous measurements with BAS-Smart Sensors in both general purpose industrial or municipal environments. Our BAC tEX have the ability to connect to network via intelligent sensors with RS485 output or Modbus RTU protocol. The BAC controller terminals supply power to sensors while simultaneously receiving probe input. Our plug and play function seamlessly connects to all sensors in our recommended list. which means by plugging an intelligent sensor into a BAC controller will result in automatic configuration.

BAC-EX explosion-proof allow it to be programmed without removing the cover, making it easy and economical to change batch sizes in the hazardous area

Dimension



Unit: mm

Industries Served

- | | | |
|--------------------|------------------|-------------------|
| • Oil & Gas | • Petrochemical | • Chemical |
| • Textile | • Pharmaceutical | • Pulp & Paper |
| • Food & Beverages | • Power plants | • Water Treatment |

Available Sensors

<u>BOD/ COD and others</u>  BAS-SMART UV-Vis Probe	<u>Conductivity/ Salinity</u>  BAS-SMART CS7	<u>Turbidity</u>  BAS-SMART TS7	<u>Low range turbidity</u>  BAS-SMART TR06
<u>Total/ Free Chlorine</u>  BAS-SMART FC7	<u>Ammonium/ Nitrate</u>  BAS-SMART AM7/ NO7	<u>pH/ ORP</u>  BAS-SMART pH7/ RX7	<u>Dissolved oxygen</u>  BAS-SMART DO07

Specification

Possible parameters	O1/ O2
Accuracy	±0.1%Full scale
Repeatability	±0.1%Full scale
Linearity	±0.05%Full scale
Response time	T90 < 1s
Power	DC: 24VDC (13 ~ 50VDC) AC: 110VAC/ 220VAC, 50Hz/ 60Hz
Display	OLED screen
Temperature	-20 ~ 70 °C
Humidity	0 ~ 95 % RH
Inputs	Analog input : 4~20mA, Digital input: RS 485 MODBUS RTU
Analog Output	4-20mA
Digital output	RS485 MODBUS
Relay	SPDT,5A@250VAC/ 5A@30VDC (option)
IP Ratings	IP 66

Standard Warranty

Standard warranty is 12 months from the date of commissioning & limited to maximum of 15 months from the date of shipment of the analyzer system

Sales & Service Support

- Factory Acceptance Test (FAT)
- Site Acceptance Test (SAT)
- Site Commissioning
- After Sales Service backup
- Guaranteed spares parts availability for maximum 10 years of instrument life.

Ordering information

BAC-EX	-X1	-X2	-X3	-X4	-X5
-X1	-01: single channel, -02: dual channel				
-X2	- : RS485, -BP: Profibus-DP, -BH: HART				
-X3	- : None, -R1: One SDPT relays				
-X4	-AC: 110/ 230 VAC, -DC: 24VDC				
-X5	- : None, - ATM: atmosphere compensation				

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BAC SERIES

Single/ Dual Parameter Controller



commitment to excellence

Technical Datasheet

Your trusted global industrial partner since 1990
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The Advantage

Universal Terminals: Use with BAS- Smart Sensors for measurements of a variety of different parameters

Advanced Display: -40°C tolerance brighter OLED screen

Multiple Channels: Simultaneous Acquisition one or two sensors for BAC 01(single channel) or BAC 02(dual channel)

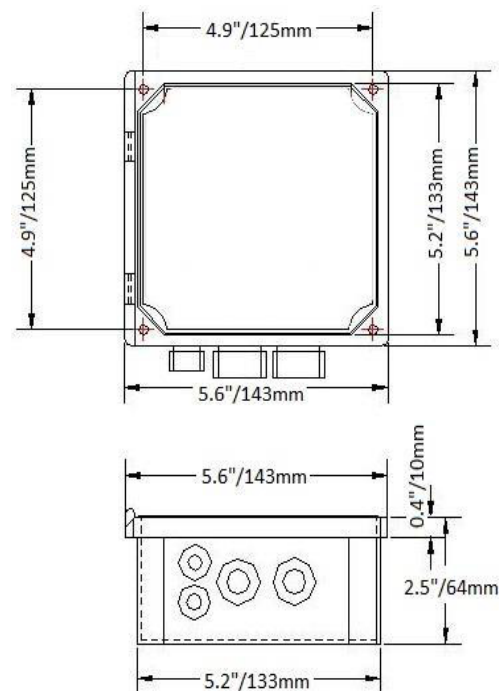
4-20 mA output with Optional HART and Alarm Relays: Flexible configurations for all applications



Introduction

The BAC controller series terminals are designed for continuous measurements with BAS-Smart Sensors in both general purpose industrial or municipal environments. Our BAC Controller terminals have the ability to connect to network via intelligent sensors with RS485 output or Modbus RTU protocol. The BAC controller terminals supply power to sensors while simultaneously receiving probe input. Our plug and play function seamlessly connects to all sensors in our recommended list. which means by plugging an intelligent sensor into a BAC controller will result in automatic configuration.

Dimension



Industries Served

• Oil & Gas	• Petrochemical	• Chemical
• Textile	• Pharmaceutical	• Pulp & Paper
• Food & Beverages	• Power plants	• Water Treatment

Available Sensors

<p><u>pH/ ORP</u></p>  <p>BAS-SMART pH7/ RX7</p>	<p><u>Conductivity/ Salinity</u></p>  <p>BAS-SMART CS7</p>	<p><u>Turbidity</u></p>  <p>BAS-SMART TS7</p>	<p><u>Low range turbidity</u></p>  <p>BAS-SMART TR06</p>
<p><u>Total/ Free Chlorine</u></p>  <p>BAS-SMART FC7</p>	<p><u>Ammonium/ Nitrate</u></p>  <p>BAS-SMART AM7/ NO7</p>	<p><u>Dissolved oxygen</u></p>  <p>BAS-SMART DO07</p>	

Specification

Possible parameters	01 / 02
Accuracy	±0.1%Full scale
Repeatability	±0.1%Full scale
Linearity	±0.05%Full scale
Response time	T90 < 1s
Power	DC: 24VDC (13 ~ 50VDC) AC: 110VAC/ 220VAC, 50Hz/ 60Hz
Display	OLED screen
Temperature	-40 ~ 60 °C
Humidity	0 ~ 95 % RH
Inputs	Analog input : 4~20mA, Digital input: RS 485 MODBUS
Analog Output	4-20mA, HART (option)
Digital output	RS485 MODBUS
Relay	2 x SPDT,5A@250VAC/ 5A@30VDC (option)
IP Ratings	IP 66

Standard Warranty

Standard warranty is 12 months from the date of commissioning & limited to maximum of 15 months from the date of shipment of the analyzer system

Sales & Service Support

- Factory Acceptance Test (FAT)
- Site Acceptance Test (SAT)
- Site Commissioning
- After Sales Service backup
- Guaranteed spares parts availability for maximum 10 years of instrument life.

Ordering Information

BAC	-X1	-X2	-X3	-X4	-X5
-X1	-01: single channel, -02: dual channel				
-X2	- : RS485, -BP: Profibus-DP, -BH: HART				
-X3	- : two SDPT relays, -R4: four SDPT relays				
-X4	-AC: 110/ 230 VAC, -DC: 24VDC				
-X5	- : None, - ATM: atmosphere compensation				

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BA-SMART UV-VIS PROBE

Multi-parameter depends on application



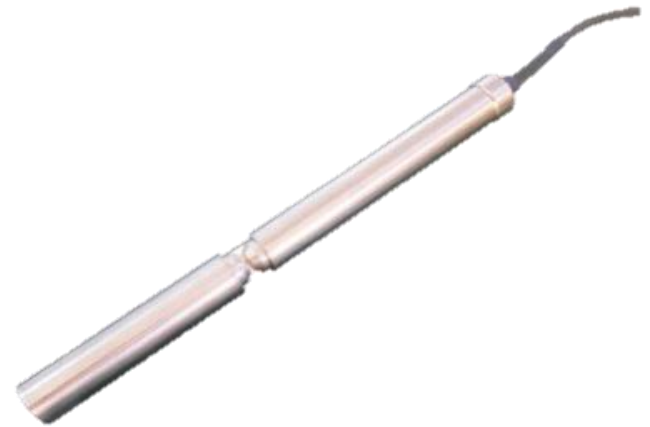
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Technical Datasheet

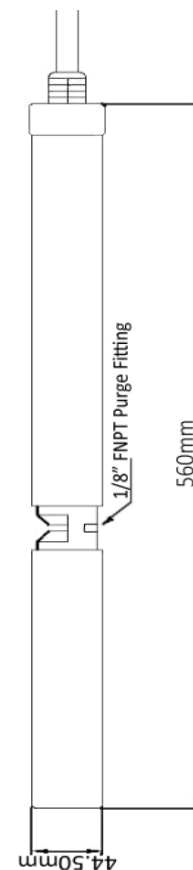
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The Advantage

- **Online multi-parameter immersion spectra analysing sensor**
- **Xenon flash light** 50 years theoretical life
- **Different optical path lengths** for various ranges and application
- **316L Stainless steel housing** compatible with water with high salinity
- **Factory pre-calibration** for easy set up and field calibration for more accuracy
- **Turbidity compensation**
- **Fully integrated with Automatic Air pressure cleaning** (optional mechanical wiper)



Dimension



Introduction

BA-SMART UV-Vis Spectrum probe is a full absorption spectrum probe which analyses water from 190 to 750 nm, which monitors NO₃-N, COD, BOD, TOC, DOC, SAC₂₅, TSS, Turbidity, Colour and O₃ (application dependent).

BA-SMART UV-Vis probe incorporates spectrum compensation for light absorbing particles and turbidity which provides a unique solution for the monitoring of dissolved organic substances without sample pre-treatment.

Application Areas

- | | | |
|-----------------------------|-------------------------------|--------------------------|
| • Drinking water analyzer | • Waste water treatment plant | • Process water analysis |
| • Environmental monitoring | • Ocean & marine water | • Aquaculture |
| • Municipal treatment plant | • Sewage treatment plant | |

Measuring Scale & Optical Path Length

Application	WWTP Influent/ Sewer		WWTP Effluent	River water	Drinking water
Path Length	2 mm.	5 mm.	5 mm.	5 mm.	5 mm.
NO ₃ -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
SAC ₂₅₄ 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
O ₃ mg/L	-	-	0.1-10	-	0.1-10

Specification

Measuring Principle	UV-Vis full spectrum (190 -750 nm.)
Measuring Principle Detail	Spectral Analysis Xenon Flash Lamp
Optical Path Length	2 mm/ 5mm/ 20mm/ 35 mm
Automatic Compensation	Turbidity/ Solids/ Organic substance
Calibration	Factory calibrated all parameters (Local multipoint calibration)
Resolution	±0.5% Full Scale
Accuracy	±2% of Full Scale
Measuring Interval	10sec t 9999sec , programmable
Working temperature	-10 °C~ 50 °C
Storage temperature	-10 °C ~ 60 °C
MOC	4-20mA, Up to 8 channels
Sample Flow requirement	3m/s (Max)
Operating Pressure	0 t3 Bar, high pressure range on request
Automatic cleaning	Compressed Air, Max pressure 4 bar
Installation/ Mounting	Submersed
Power	by BA-Multiparameter controller, 12VDC, 3W
IP Ratings	IP 68

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BAS-SMART CS7

Conductivity/ Salinity Sensor



commitment to excellence

Technical Datasheet

Your trusted global industrial partner since 1990
ISO 9001:2015 certified

The Advantage

- **4 electrode conductivity sensor (2 graphite & 2 Platinum)**
- **Lightening and Surge Protection** for Power and RS485 Communication
- **Temperature Compensation**
- **Robust & Water proof (IP68)**
- **Factory pre-calibration** for easy set up and field calibration for more accuracy
- **Standard Modbus RTU Protocol**, Direct Connected with PLC, HMI, Eliminate I/O Module Cost
- **Fully compatible with PC software ViewTM** for easy setup and data logging

Introduction

BAS-SMART CS7 includes two parallel plates are placed into the measuring medium , provide potential on the two plates (usually are sine wave voltage), then measure the current between them : the sensor has two types two polar and four polar type. the self-cleaning function can be selected according to the use environment. it has stable data and reliable performance.

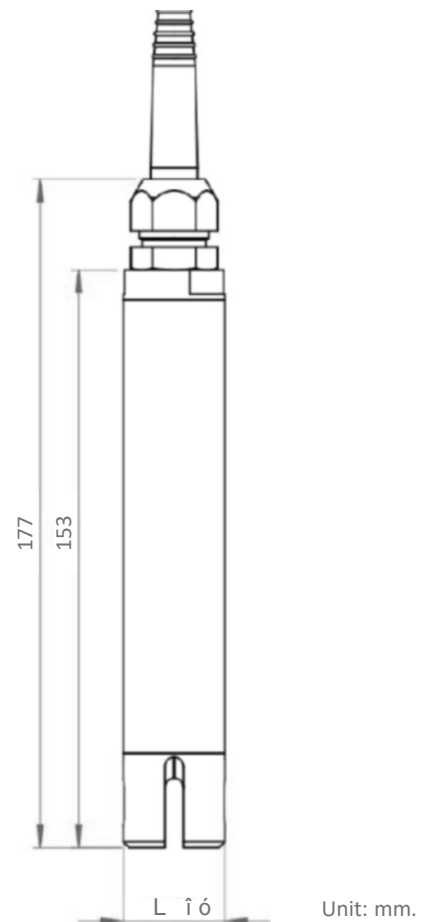
Internal self-diagnosis function make ensure accurate data .Its installation and calibration are easy , It can be widely used in sewage plant, water plant, water station, surface water, industry and other applications

Application Areas

• Industrial Wastewater	• Municipal & Sewage Wastewater	• Drinking Water
• Surface Water Monitoring	• Sanitation Network	



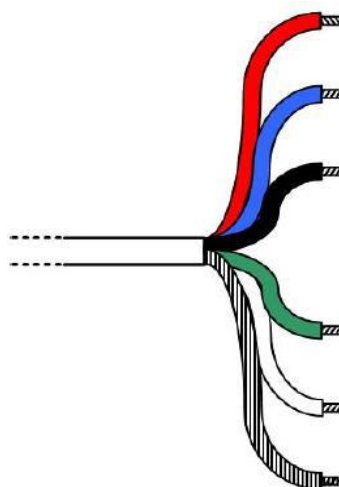
Dimension



Specification

Measuring Principle	Conductivity sensor with 2 or 4 electrodes
Measuring Range	Low range: 0- 20 mS/cm (Two electrodes for ground water, constant: 0.4 ±0.7) High range: 0 - 200 mS/cm (Four electrodes, constant: 1)
Accuracy	+/-1 % of the full range
Resolution	0.01 to 1 according the range
Salinity Range	5-60 g/kg
Response Time	< 5 Sec
Temp. Compensation	Pt100, 0 to 85°C Auto compensation
Temp. Accuracy	±0.5 °C
Operate Pressure	Max. 5 bar
Operate Temp.	32 °F to 122 °F (0 to 50°C)
Store Temp.	14 to 140 °F (-10 to 60°)
Interface	Modbus RS485
Electric Consumption	^ š v Ç î ñ ... Average RS485(1 measure/s): 6.3mA Average SDI12(1 measure/s): 9.2 mA Current pulse: 500 mA
Material	PVC, Stainless Steel
Cable & Length	9 armored connectors, polyurethane jacket, bare-wires or waterproof 3 meter(standard), higher length on request
Weight	Approx. 450g with 3meter cable
Protection	IP 68
CE Marking	EN 61326-1:2013 Electromagnetic Compatibility EMC

Wiring of Sensor



Red	V+
Blue	SDI-12
Black	V-
Green	RS485 A
White	RS485 B
Gray	Shield

Standard Warranty

Standard warranty is 12 months from the date of commissioning & limited to maximum of 15 months from the date of shipment of the analyzer system

Sales & Service Support

- Factory Acceptance Test (FAT)
- Site Acceptance Test (SAT)
- Site Commissioning
- After Sales Service backup
- Guaranteed spares parts availability for maximum 10 years of instrument life.

Ordering information

	CS7	-X1	-X2
X1		-L: 0- 20 mS/cm -H: 0 - 200 mS/cm	
-X2		-C10: 10 ft. Cable -C20: 20 ft. Cable -C33: 33 ft. Cable	
Please contact factory for other cable length			

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BAS-SMART DO07

Dissolved Oxygen Sensor



commitment to excellence

Technical Datasheet

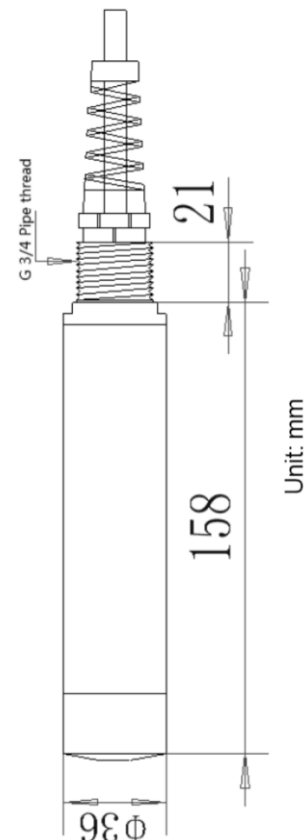
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The Advantage

- **Optical sensor is not damaged by ambient light**, unlike other luminescent DO technologies
- **An accurate measure in all situations** especially in the medium with very low oxygen concentrations
- **Factory pre-calibration** for easy set up and field calibration for more accuracy
- **Fully compatible with PC software ViewTM** for easy setup and data logging
- **316L Stainless steel housing** compatible with water with high salinity
- **All of the optics and electronics are solid-state** with no moving parts



Dimension



Introduction

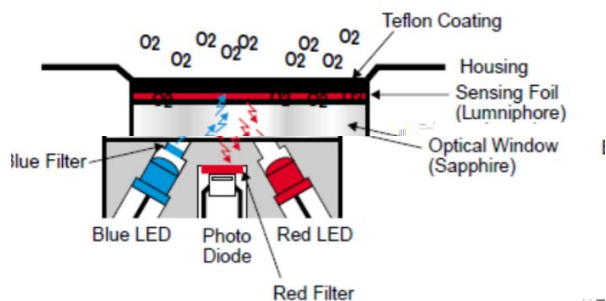
Introducing the NEW Rugged Dissolved Oxygen Sensor exclusively for BAS-SMART DO07. The BAS-SMART DO07 sensor utilizes lifetime-based optical fluorescence sensor technology to provide an extremely stable, precise and low maintenance dissolved oxygen sensor. Unlike traditional DO sensors.

The BAS-SMART DO07 does not require membranes, stirring, and cleaning and allows deployment for many months without need for re-calibration.

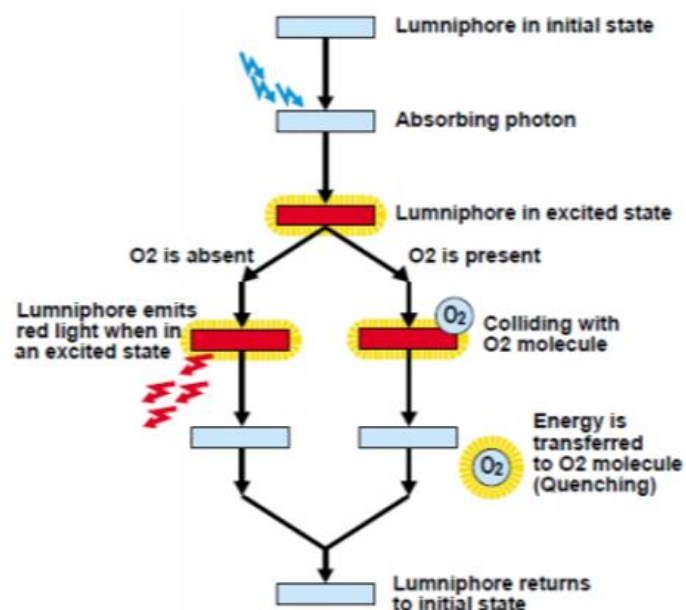
Application Areas

• Drinking water analyzer	• Waste water treatment plant	• Process water analysis
• Environmental monitoring	• Ocean & marine water	• Aquaculture
• Municipal treatment plant	• Sewage treatment plant	

Optical DO Technology



BAS-SMART DO07 are based on selected substances that can act as dynamic fluorescence quenchers. For example, for oxygen, if a ruthenium-complex is illuminated with a blue LED it is excited and emits back a red luminescent light with an intensity, or lifetime, which directly depends on the oxygen concentration. Lifetime based measurements are superior for both long-term (no drift) and fast response applications.



Specification

Measuring Principle	Fluorophore impregnated membrane optical sensor, dynamic luminescence quenching technique
Range	0.00~20.00ppm, 0.00~20.00mg/L, 0~200% Air Saturation
Respond Time	T90 < 16 seconds, oxygen increasing
Calibration	1 or 2 point, typical calibration duration 12 months
Operate Temp.	32~122°F (0~50°C)
Store Temp.	14~140°F (-10~60°C)
Protection	Immersible, >IP68
Pressure	5bar
Sensor Material	316L, Titanium optional
Digital Interface	Modbus RTU
Power	24VDC (18-36VDC)
Weight	2.2 lbs. (1 kg) with SS housing and 33ft cable

Standard Warranty

Standard warranty is 12 months from the date of commissioning & limited to maximum of 15 months from the date of shipment of the analyzer system

Sales & Service Support

- Factory Acceptance Test (FAT)
- Site Acceptance Test (SAT)
- Site Commissioning
- After Sales Service backup
- Guaranteed spares parts availability for maximum 10 years of instrument life.

Ordering information

DO07 –C10	with 10 ft. cable
DO07 –C30	with 30 ft. cable
DO07 –C33	with 33 ft. cable
DO07 –C50	with 50 ft. cable
Please contact factory for other cable length	

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BAS-SMART pH7/ RX7

pH/ ORP Sensor



commitment to excellence

Technical Datasheet

Your trusted global industrial partner since 1990
ISO 9001:2015 certified

The Advantage

- **0.05 W Ultra Low Power Consumption**, Ideal for Outdoor Applications
- **Lightening and Surge Protection** for Power and RS485 Communication
- **1 sec On-line Realtime Measurement**
- **Temperature Compensation**
- **Robust & Water proof (IP68)**
- **Factory pre-calibration** for easy set up and field calibration for more accuracy
- **Standard Modbus RTU Protocol**, Direct Connected with PLC, HMI, Eliminate I/O Module Cost
- **Fully compatible with PC software ViewTM** for easy setup and data logging

Introduction

BAS-SMART pH7/ RX7 is based on the electro-chemical ion selective method, which transforms the changes of ions in water into continuous electrical signals. It is mainly composed of two parts, electro-chemical conversion and signal acquisition and conversion.

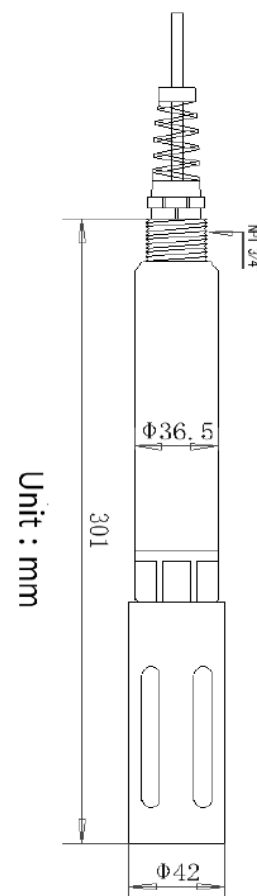
The BAS-SMART pH7/ RX7 housing in a robust IP68 proof enclosure, 1500 N tensile strength Kelvar reinforced cable, up to 1.2 km. digital data transmission, the transmitter is ideally used in water/ wastewater industry.

Application Areas

- | | | |
|----------------------------|---------------------------------|------------------|
| • Industrial Wastewater | • Municipal & Sewage Wastewater | • Drinking Water |
| • Surface Water Monitoring | • Sanitation Network | |



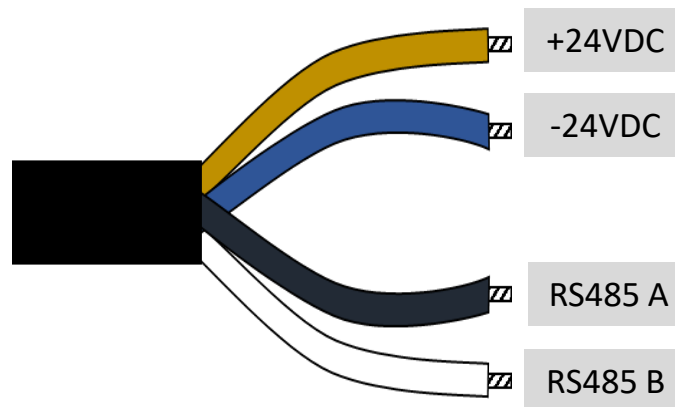
Dimension



Specification

Measuring Principle	The electro-chemical ion selective method
Measuring Range	pH: 0 - 14pH ORP: -2000~2000mV
Accuracy	pH: 0.01pH 1Digit ORP: -0.1% 1 Digit
Resolution	pH: 0.01pH ORP: 0.1mV
Repeatability	pH: ±0.02pH ORP: ±0.5mV
Response Time	T90 approx. 1 s
Temp. Compensation	Pt100, 0 to 85°C Auto compensation
Temp. Accuracy	±0.5 °C
Operate Pressure	Max. 5 bar
Operate Temp.	32 °F to 185 °F (0 to 85°C)
Store Temp.	14 to 149 °F (-10 to 65°)
Process Flowrate	G ÷ X ñ u l •
Interface	Modbus RS485
Material	Glass Sensor, Housing POM
Cable & Length	Coaxial armored, Polyurethane, bare wire or Fisher connector 10 meters (standard) , higher length on request
Weight	Approx. 150g(POM), Cable 80 g/m
Protection	IP 68
CE Marking	EN 61326-1:2013 Electromagnetic Compatibility EMC

Wiring of Sensor



Standard Warranty

Standard warranty is 12 months from the date of commissioning & limited to maximum of 15 months from the date of shipment of the analyzer system

Sales & Service Support

- Factory Acceptance Test (FAT)
- Site Acceptance Test (SAT)
- Site Commissioning
- After Sales Service backup
- Guaranteed spares parts availability for maximum 10 years of instrument life.

Ordering information

	X1	-X2
X1	pH7: pH Sensor	
	RX7: ORP Sensor	
-X2	-C10: 10 ft. Cable	
	-C20: 20 ft. Cable	
	-C33: 30 ft. Cable	
Please contact factory for other cable length		

BAS-SMART AM7/ NO7

Ammonium/ Nitrate Sensor



commitment to excellence

Technical Datasheet

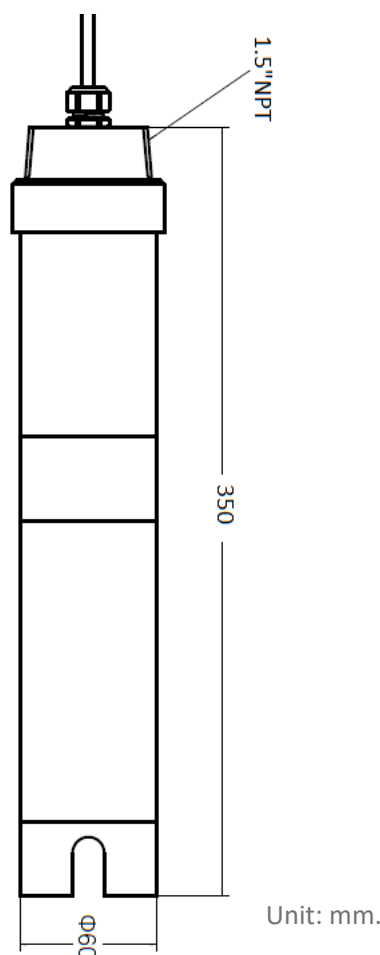
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The Advantage

- **AM7 Ammonium Sensor:**
 - **Ammonium ISE electrode**, K^+ , pH and Temp. electrodes.
 - **Fast and accurate Ammonium measurement**
 - **Fully compensated** for pH, K^+ interferences & Temperature
- **NO7 Nitrate Sensor:**
 - **Nitrate ISE electrode**, Cl^- and Temp. electrodes.
 - **Fast and accurate Nitrate measurement**
 - **Fully compensated** for Cl^- interferences & Temperature (Optional pH electrode)
- **The AN7 Ammonium/Nitrate Sensor is optional for both Ammonium & Nitrate measuring at same time**
- **Robust & Water proof (IP68)**
- **Factory pre calibration** for easy set up and field calibration for more accuracy
- **Rugged PVC design**, Removable electrode guard for easy maintenance
- **Integral Spray Head Cleaner**, Cleans the sensor in-situ with pressurized water or air
- **Internal Signal Conditioning**, RS485 Modbus Digital signals allow up to 300 meters long communication between the Sensor and the controller



Dimension



Application Areas

- | | | |
|----------------------------|---------------------------------|------------------|
| • Industrial Wastewater | • Municipal & Sewage Wastewater | • Drinking Water |
| • Surface Water Monitoring | • Ground Water | |

Introduction

The **BAS-SMART AM7** - Ammonium Sensor measures the concentration of dissolved ammonium nitrogen ($\text{NH}_4^+\text{-N}$) in water. The sensor uses three electrodes to determine the $\text{NH}_4^+\text{-N}$ concentration, an Ammonium Ion Electrode, a Potassium Ion Electrode and a pH Electrode.

The **BAS-SMART NO7** - Nitrate Sensor measures the concentration of dissolved nitrate nitrogen ($\text{NO}_3^-\text{-N}$) in water. The sensor uses two electrodes to determine the $\text{NO}_3^-\text{-N}$ concentration, a Nitrate Ion Electrode and a Chloride Ion Electrode.

The **BAS-SMART AM7/ NO7** sensor has a 1-1/2 _NPT rear facing thread for attaching an extension/immersion tube for easy installation from catwalks or handrails. The NO7 sensor is submersible with an IP68 degree of ingress protection. (The BAS-SMART AM7 sensor cannot support its weight by the attached cable)

A removable electrode guard facilitates easy electrode replacement when necessary. The sensor features an internal digital signal conditioning unit that allows the sensor to be mounted up to 300 meters from the controller.

Specification

Measuring Principle	Ion selective electrodes method
Measuring Range	Ammonium: 0.02 to 20.00 ppm, 100 / 500 / 1000 ppm Nitrate: 0.02 to 20.00 ppm, 100 / 500 / 1000 ppm pH: 0 to 14, Temp.: 0 to 100 °C (32 °F to 212 °F)
Accuracy	±3% of reading, depends on Calibration
Resolution	0.01 ppm
Repeatability	2%
Response Time	T90 < 1 minute
Automatic Compensation	Temp.: 0 to 100 °C Optional: pH, K+, Cl-
Operate Pressure	Max. 0.5 bar
Operate Temp.	32 °F to 122 °F (0 to 50 °C)
Interface	Modbus RS485
Power Supply	24VDC by GDC, Max. 1W
Auto-Cleaning	3 to 5 bar air or water
Material	SS316, PVDF, PTFE, Glass
Protection	IP 68
CE Marking	EN 61326-1:2013 Electromagnetic Compatibility EMC

Standard Warranty

Standard warranty is 12 months from the date of commissioning & limited to maximum of 15 months from the date of shipment of the analyzer system

Sales & Service Support

- Factory Acceptance Test (FAT)
- Site Acceptance Test (SAT)
- Site Commissioning
- After Sales Service backup
- Guaranteed spares parts availability for maximum 10 years of instrument life.

Ordering information

X1		-X2	
X1	AM7: Ammonium Sensor		
	NO7: Nitrate Sensor		
	AN7: Ammonium and Nitrate Sensor		
-X2	-C10: 10 ft. Cable		
	-C20: 20 ft. Cable		
	-C30: 30 ft. Cable		
Please contact factory for other cable length			

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Technical Datasheet

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The Advantage

- **For no reagent and membrane in Chlorine probe**, this sensor significantly lowers the operating cost and maintenance
- **The sensor can work with all terminals** which can receive the RS485 signals.
- **IP65 Dust and Water Proof Structure**
- **Temperature and pH Compensation**
- **Factory pre-calibration** for easy set up and field calibration for more accuracy
- **Standard Modbus RTU Protocol**, Direct Connected with PLC, HMI, Eliminate I/O Module Cost
- **Fully compatible with PC software ViewTM** for easy setup and data logging

Introduction

The **BAS-SMART FC7** free chlorine sensor (non-reagent type) is used for measuring concentration of free chlorine present in sample water, such as chlorine (Cl_2) hypochlorous acid (HClO), and hypochlorite ion (ClO^-).

The **BAS-SMART FC7** determines the free chlorine concentration by applying an applied voltage corresponding to the diffusion current between the indicator and counter electrodes and by applying temperature compensation to the diffusion current.

Application Areas

- | | | |
|----------------------------------|----------------------------------|------------------|
| • Chlorination System | • Swimming Pool | • Drinking Water |
| • Monitoring Disinfectant dosing | • Monitoring Conditioning Agents | |

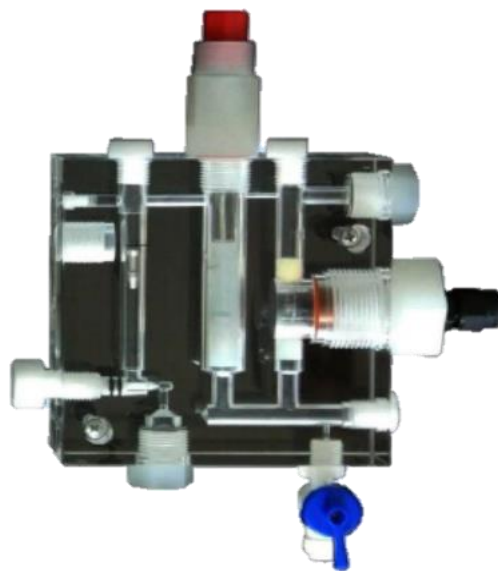
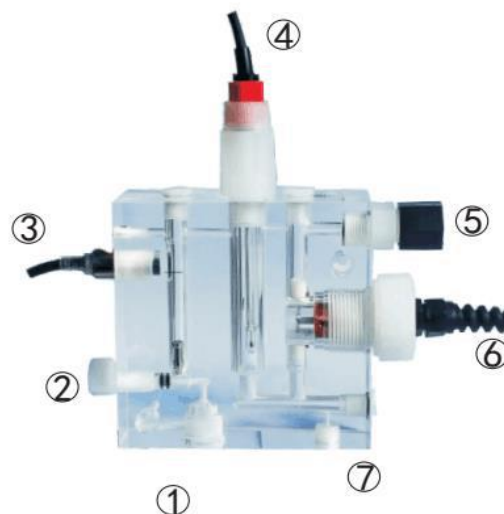


Diagram of the flow cell



1. Water inlet
2. Flow regulator
3. Velocity sensor (option)
4. pH compensation electrode
5. Water outlet
6. FC measuring element
7. Sampling outlet

Specification

Measuring Principle	Polarographic method using rotating electrode
Measuring Range	Low range: 0 - 1, 2, 3 ppm High range: 0 t 5, 10, 20 ppm
Accuracy	0.05mg/l
Resolution	0.01mg/l
Repeatability	±1%FS
Response Time	T90 approx. <2 min
Temp. Compensation	Automatically, by an integrated temperature sensor
Temp. Accuracy	±0.5 °C
pH Compensation	Automatic pH measurement and compensation
Operate Pressure	Max. 6 bar, no pressure impulses and/or vibrations
Sample Flowrate	Max. 30L/h
Operate Temp.	41 to 113 °F (5 to 45 °C)
Interface	Modbus RS485
Run in Time	First start up 2 hours
Power	24VDC, 40mA
Digital Interface	RS485 Modbus RTU
Size & Weight	5.31 x 5.12 x 2 inch & 2 lb (135x130x50mm & 0.9 kg) with Flow Cell
Protection	IP 68
CE Marking	EN 61326-1:2013 Electromagnetic Compatibility EMC

Principle

The free chlorine sensor measures the content of hypochlorous acid, then calculates to get the residual chlorine in the solution with the measured pH value or defined pH value by the operator.

The working electrode is a pair of electrodes, the platinum electrode is the cathode and the copper electrode is the anode. When they are immersed in a fluid containing residual chlorine, the electrons are transferring from the copper electrode to the platinum electrode, so that there is a current generated between the working electrodes. This current is proportional to the content of the hypochlorous acid, therefore, by measuring the current, concentration of residual chlorine in the solution can be determined.

Standard Warranty

Standard warranty is 12 months from the date of commissioning & limited to maximum of 15 months from the date of shipment of the analyzer system

Sales & Service Support

- Factory Acceptance Test (FAT)
- Site Acceptance Test (SAT)
- Site Commissioning
- After Sales Service backup
- Guaranteed spares parts availability for maximum 10 years of instrument life.

Ordering information

FC7	X1	-X2
X1	-L: Low range: 0 - 1, 2, 3 ppm	
	-H: High range: 0 t 5, 10, 20 ppm	
-X2	-C10: 10 ft. Cable	
	-C20: 20 ft. Cable	
	-C30: 30 ft. Cable	
Please contact factory for other cable length		

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BAS-SMART TS7

Turbidity/ Suspended Solids Sensor



commitment to excellence

Technical Datasheet

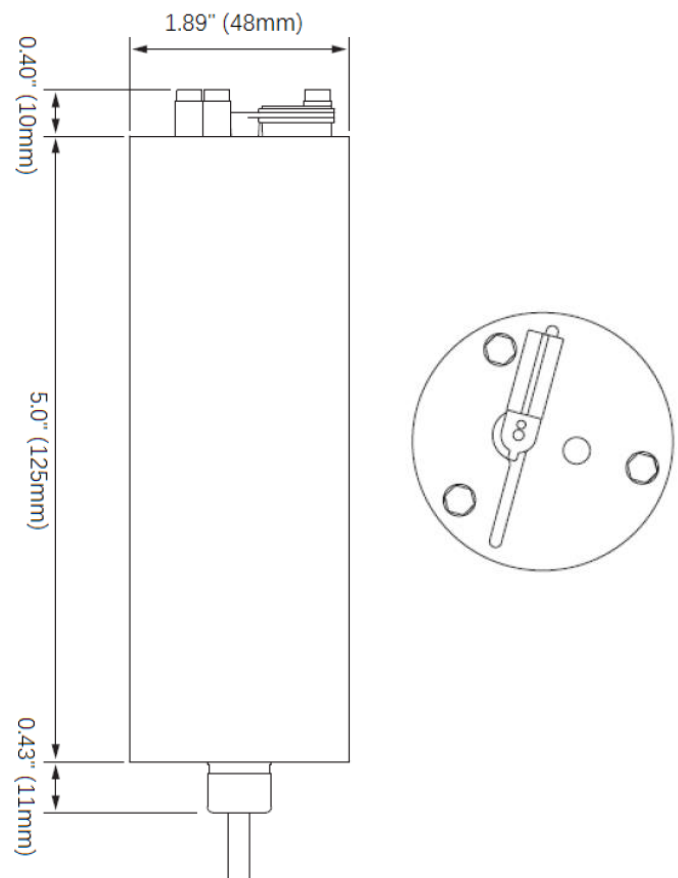
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The Advantage

- **Optical Sensor Near infrared LED (880nm) and 90°scattered light method** in accordance with ISO 1027/EN 27027
- **Automated mechanical wiper** is available for Surface cleaning & air bubble removal
- **Robust & Water proof (IP68) Digital sensor:** Modbus RS-485
- **Factory pre-calibration** for easy set up and field calibration for more accuracy
- **Fully compatible with PC software ViewTM** for easy setup and data logging



Dimension



Introduction

BAS-SMART TS7 sensor consists of a light source and a photodetector. Incident light is scattered by the particles in the sample, and the scattered light is measured by the detector.

The sensor uses a long life near infrared LED (880 nm) and the 90° scattered light method in accordance with ISO1027/EN27027 to assure accurate turbidity values.

An automated mechanical wiper is available to remain surface clean and remove air bubbles of the optical Window in order to maximize the accuracy and minimize the maintenance requirement.

Application Areas

• Industrial Wastewater	• Municipal & Sewage Wastewater	• Drinking Water
• Surface Water Monitoring	• Sanitation Network	

Specification

Measuring Principle	Near infrared LED (880nm) and 90°scattered light method in accordance with ISO 1027/EN 27027
Measuring Range	0 to 500 NTU /4000 NTU 0 to 1250 mg/L, up to 50 g/L
Unit	NTU, FTU, ppm, mg/L, g/L
Accuracy	<±1%FS (Turbidity) <±5%FS (Suspended solids)
Source Voltage	DC 24V±10% Powered by BAC / BA-MPC
Consumption	At regular operation: 50mA(Max) At cleaning operation: 240mA(Max)
Resolution	0.01 to 1NTU 0.01 to 1mg/L
Pressure	Max. 5 bar
Operate Temp.	32 to 122 °F (0 to 50°C)
Store Temp.	14 to 140 °F (-10 to 60°)
Interface	Modbus RS485
Material	316L, Sapphire Glass
Auto-Cleaning	Automatic wiper cleaning system
Cable & Length	9 armored connectors, polyurethane jacket, bare wires or waterproof Fisher 3 meter(standard) , higher length on request
Weight	Approx. 1.3 kgs(sensor + cable 3 metres)
Protection	IP 68
CE Marking	EN 61326-1:2013 Electromagnetic Compatibility EMC

Turbidity Technology

Scattering method is a detector source emits lights (the measurement light) met suspended solids in sample water scattering occurs and a light source into an optical detector at a 90 degree angle can detected scattered light (scattered light).

Suspended solids or turbidity measurements according to the intensity of the detected scattered light. This is called the 90 ° scattered light method. This sensor with high sensitivity, simple optical structure, particles of various sizes have a balanced sensitivity. More turbid water, stronger the intensity of reflected light of suspended matter.

Standard Warranty

Standard warranty is 12 months from the date of commissioning & limited to maximum of 15 months from the date of shipment of the analyzer system

Sales & Service Support

- Factory Acceptance Test (FAT)
- Site Acceptance Test (SAT)
- Site Commissioning
- After Sales Service backup
- Guaranteed spares parts availability for maximum 10 years of instrument life.

Ordering information

TS7	-X1	-X2
-X1	-1: 0~500NTU (0~1250mg/l)	
	-2: 0~4000NTU (0~50g/l)	
-X2	-C10: 10 ft. Cable	
	-C20: 20 ft. Cable	
	-C30: 30 ft. Cable	
Please contact factory for other cable length		

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BAS-SMART TR06

Low Range Turbidity Sensor



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Technical Datasheet

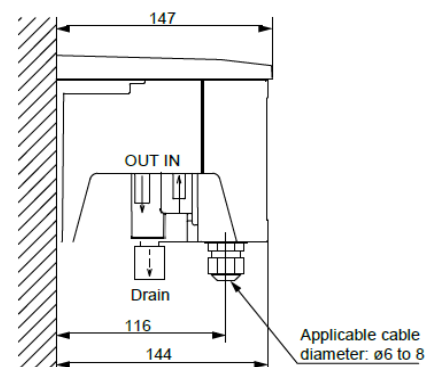
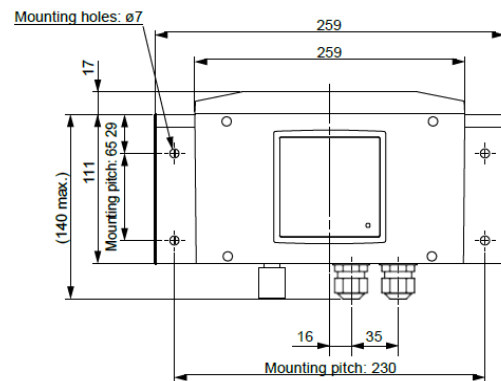
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The Advantage

- **Prevention of Dew Condensation System Inside**
- **Built-In Bubble Removal Design**
- **LED (880nm) and 90° scattered light method** in accordance with ISO 1027/EN 27027
- **IP65 Dust and Water Proof Structure**
- **Easy to clean** measurement tank and Deaerator by using a clean soft cloth
- **Factory pre-calibration** for easy set up and field calibration for more accuracy
- **Fully compatible with PC software ViewTM** for easy setup and data logging



Dimension



Unit: mm

Introduction

BAS-SMART TR6 Sensor consists of a light source and a photodetector. Incident light is scattered by the particles in the sample, and the scattered light is measured by the detector.

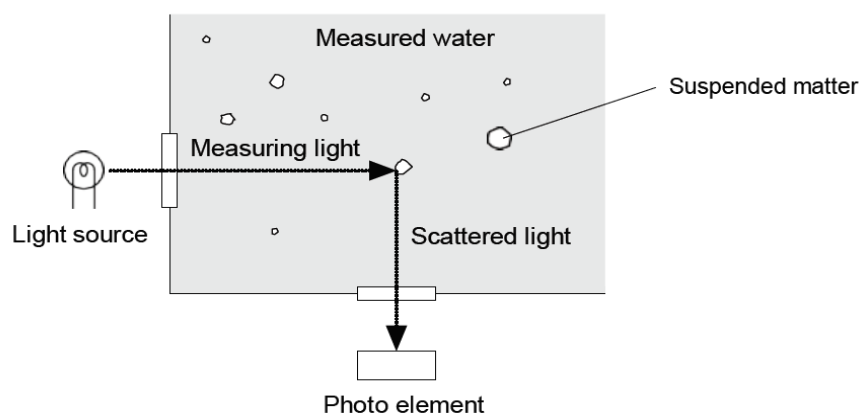
The amount of scattering depends on the amount of material in the sample, the wavelength of light used and the size and composition of the suspended particles.

The sensor uses long life LED (880nm) and the 90° scattered light method in accordance with ISO1027/ EN27027 to assure accurate & stable turbidity values.

Application Areas

- | | | |
|----------------------------|---------------------------------|------------------|
| • Industrial Wastewater | • Municipal & Sewage Wastewater | • Drinking Water |
| • Surface Water Monitoring | • Sanitation Network | |

Low Range Turbidity Technology



BAS- SMART TR6 uses a method of 90 degree scattered light. In this method, a light source illuminates the surfaces of matter suspended in the water, and the light is scattered by these surfaces is detected by a photo element installed at an angle of 90 degrees from the light axis of the measured light. The turbidity is determined by the amount of the scattered light.

Specification

Measuring Principle	LED (880nm) and 90°scattered light method in accordance with ISO 1027/EN 27027
Measuring Range	0.0001 to 9.9999 NTU/FNU 0.001 to 100.000 NTU/FNU
Accuracy	±2 of Reading or 0.02 NTU @ 0 to 10 NTU ±5 of Reading @10 to 100 NTU
Source Voltage	DC 24V±10% Powered by BAC / BA-MPC
Measuring water flow rate	100 to 200 mL / min
Operate Temp.	-20°C to + 50°C Humidity 95% R.H. or less
Measuring Water Temp.	0 to +40°C (unfrozen)
Main Material	PP-GF, AES, SUS316L
Pressure	5bar
Interface	Modbus RS485
Power	24VDC (18-36VDC)
Protection	IP 65

Standard Warranty

Standard warranty is 12 months from the date of commissioning & limited to maximum of 15 months from the date of shipment of the analyzer system

Sales & Service Support

- Factory Acceptance Test (FAT)
- Site Acceptance Test (SAT)
- Site Commissioning
- After Sales Service backup
- Guaranteed spares parts availability for maximum 10 years of instrument life.

Ordering information

TR6 –C10	with 10 ft. cable
TR6 –C30	with 30 ft. cable
TR6 –C40	with 40 ft. cable
TR6 –C50	with 50 ft. cable
Please contact factory for other cable length	

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BAS-SMART OW7

Oil in Water Sensor



commitment to excellence

Technical Datasheet

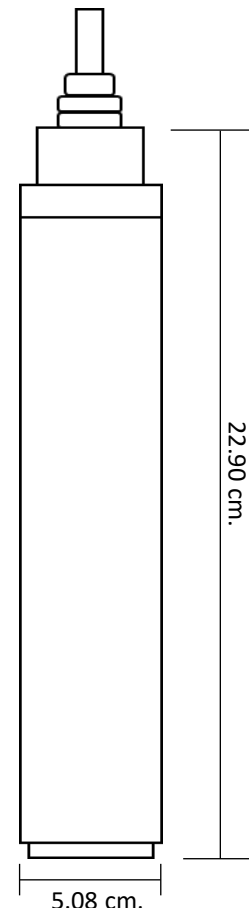
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The Advantage

- **A reliable and low maintenance** measuring system of UV fluorescence achieves this goal
- **Automated mechanical wiper** is available for Surface cleaning & air bubble removal (Optional)
- **Robust & Water proof (IP68) Digital sensor:** Modbus RS-485
- **Factory pre-calibration** for easy set up and field calibration for more accuracy
- **Fully compatible with PC software ViewTM** for easy setup and data logging



Dimension



Introduction

BAS-SMART OW7 is a new generation of immersion sensors for measurement of oil or hydrocarbons in water based on the UV fluorescence principle. When excited by a light beam at a specific wavelength, some compounds re-emit light at a longer wavelength. Since there are very

limited number of chemicals such as PAH that have fluorescence signatures, this method gives a highly selective measurement with much higher sensitivity than the conventionally used infrared-based technology. This makes it possible to determine even the slightest traces of PAH's.

Application Areas

• Industrial Wastewater	• Municipal & Sewage Wastewater	• Drinking Water
• Surface Water Monitoring	• Sanitation Network	• Sea Water

Oil in Water Technology

UV fluorescence is a sensitive method of detecting aromatic hydrocarbon compounds in water. Fluorescence is generally defined as a phenomenon in which a part of the radiation absorbed by a compound of interest at a certain wavelength is radiated out at a longer wavelength. Certain compounds, including aromatic hydrocarbons, absorb energy when the water is excited by light of a specific wavelength usually in the UV range. This absorbed light energy is radiated out again at a higher wavelength and the amount of this radiated energy is proportional to the concentration of the light absorbing compound. Each compound has a specific wavelength range for absorbing and re-emitting this radiation. This allows specificity for the compound in question to be detected by measuring the fluorescent light at prescribed wavelengths.

In addition to PAHs, the BAS-SMART OW7 is also recommended for detection of monocyclic aromatic hydrocarbons (e.g., benzene, toluene, xylene; also referred to as BTX). As with all BAS-SMART sensors, the BAS-SMART OW7 sensor is delivered pre-calibrated, so that the sensor is ready to be used.

Specification

Measuring Principle	Light Source: Xenon flash lamp + filter(254nm) Detector: Photo diode + filter (360nm)
Light Source	Fluorescence
Measuring Range	0 to 50 ppb, 500 ppb, 0 to 5 ppm, 50 ppm, 150 ppm
Accuracy	3 %
Respond Time	T90 < 10s
Measuring Interval	5 s
Operate Pressure	3 bar, 1 bar in Flow cell 2 to 4 L/min
Operate Temp.	32 to 104 °F (0 to 40 °C)
Power	24 VDC, Max. 30W
Interface	RS485 Modbus RTU
Output	4 to 20 mA
Housing	Material: 316L, titanium is optional; >IP68 Submersible
Dimension	10 1/2" X 4 1/2" X 6 1/2" (229 mm)
Weight	6 lbs ~ 1 X 6" IP • 1/2" 3/4" 1" 1 1/2" 2" 3" 4" 6" 8" 10" 12" 14" 16" 18" 20" 22" 24" 26" 28" 30" 32" 34" 36" 38" 40" 42" 44" 46" 48" 50" 52" 54" 56" 58" 60" 62" 64" 66" 68" 70" 72" 74" 76" 78" 80" 82" 84" 86" 88" 90" 92" 94" 96" 98" 100"
CE Marking	EN 61326-1:2013 Electromagnetic Compatibility EMC

Standard Warranty

Standard warranty is 12 months from the date of commissioning & limited to maximum of 15 months from the date of shipment of the analyzer system

Sales & Service Support

- Factory Acceptance Test (FAT)
- Site Acceptance Test (SAT)
- Site Commissioning
- After Sales Service backup
- Guaranteed spares parts availability for maximum 10 years of instrument life.

Ordering information

	OW7	-X1	-X2
-X1		-1: 0-500 ppb	
		-2: 0-150 ppm	
		-3: Custom range(Maximum 150 ppm)	
-X2		-C10: 10 ft. Cable	
		-C20: 20 ft. Cable	
		-C30: 30 ft. Cable	
Please contact factory for other cable length			

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Technical Datasheet

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The Advantage

- Automatic Calibration/ Validation/ Cleaning (Application Dependent)
- Automatic High sensitivity and Selectivity
- Higher measuring ranges possible by using Dilution
- Multiple streams analysis (optionally)
- Increased lifespan by adopting corrosion resistant material
- Solid state Data logger with storage capacity of up to 10,000 results
- Large (7.1" Color LCD Display)
- Low reagent consumption
- Factory configured, tested & calibration

Introduction

The Online Wet Chemistry Analyzer is a single parameter versatile, robust suitable for analysis of water, wastewater & Process liquids.

For each application & measuring range the most suitable methodology is applied in **BA-Enviro**. The Online Wet Chemistry Analyzer is a single parameter versatile, robust suitable for analysis of water, wastewater & Process liquids.

For each application & measuring range the most suitable methodology is applied in **BA-Enviro**.

Application Areas

• Drinking water

• Boiler feed water

• Cooling water

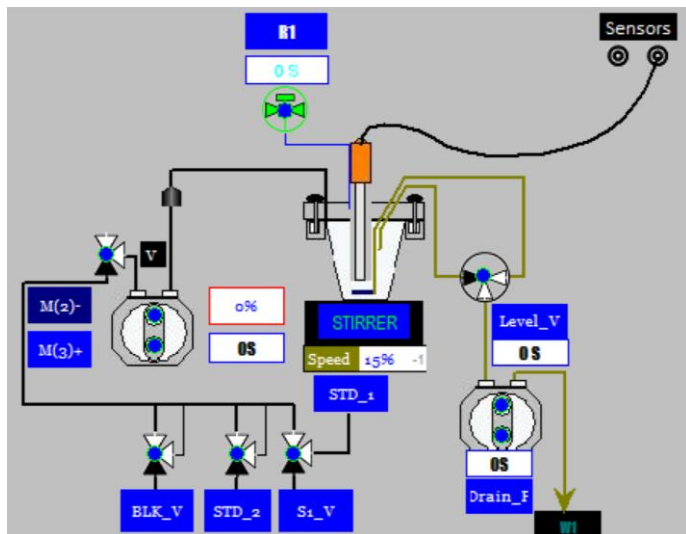
• Waste water

• Process water

• Surface water



Analyzer Configuration



Analyzer Methods

- Titration
- Colorimetric
- Ion-Selective

Specification

General Specifications

Parameters	As listed below or customized on request
Measuring ranges	.. / Pt to g/L
Analysis Method	<ul style="list-style-type: none"> - Titration - Colorimetric - Ion-Selective
Inaccuracy	1 - 5% of Full scale (Application dependent)
Repeatability	1 - 5% of Full scale (Application dependent)
Cycle Time	1 cycle: 08 - 30 minutes (Application dependent)
Display	6 X 4.3" LCD Colour touch screen / optional
Communication & Controls	
Data logging	Available up to 10,000
Analog outputs	Max. 8 AO (4-20 mA) max 500 ohm load
Analog inputs (Programmable)	Max 8 x AI
Digital Inputs (Programmable)	Max 12 x DI (Poten free)
Digital Outputs (Programmable)	Max. 8 x DO (Poten free) - Malfunctioning Alarm - Result Alarm - Ext. control; Pump, value or light etc.
Modbus/RS485	Optional

Utilities & Environment

Power	115 / 230 VAC, 50-60Hz
Instrument Air	Dry & oil free, up to 3 bar
Demin water	For Cleaning, rinsing & Dilution (if required)
Drain	Atmospheric pressure, vented
Ambient Temp.	5 °C - 35 °C, 95% RH (Non condensing)
Reagent Temp.	Reagent Temp.
Sample Pressure	Atmospheric
Sample flow rate	10 - 40 ml per minute
Analyzer Cabinet	
IP Ratings	Cabinet - IP 55 (Other options available)
Cabinet material	ABS / Polycarbonate (Stainless steel on request)
Dimensions	600mm X 500mm X 200mm (H X W X D)
Weight	Approx. 15 kg (w/o reagents)
Options	
Filtration	Self-cleaning filtration (different pore sizes)
Dilution	Internal Sample Dilution for high measuring ranges
Reagent Level Detection	For reagent containers, early Alarm of reagents qty.
Multiplexer for Multi streams	Stream Selector (build in program (2- 4 streams)

Parameter List

Parameter	Measuring range	Methodology
Acetic Acid	Up to 2000 mg/l	Titration
Acidity	Up to 5000 mg/l	Titration
Alkalinity	Up to 5000 mg/l	Titration
Aluminum	Up to 300 ug/l	Colorimetric
Ammonia	0 t 2.5 mg/l	Colorimetric
Ammonia	0 t 1000 mg/l	Ion-Selective
Boron	0 t 1 mg/l	Colorimetric
Bromide	0.5 t 5 mg/l	Colorimetric
Calcium	1 t 1000 mg/l	Ion-Selective
Chlorine Free	0 t 5 mg/l	Colorimetric
Chlorine Total	0 t 5 mg/l	Colorimetric
Chlorine Dioxide	0 t 5 mg/l	Colorimetric
Chromium III	0 t 1 mg/l	Colorimetric
Chromium VI	0 t 500 ug/l	Colorimetric
Chromium Total	0 t 2 mg/l	Colorimetric
Chloride	Up to 1000 mg/l	Ion-Selective
Chloride	Up to 50 mg/l	Colorimetric, Ion-Selective
Cyanide	0 t 5 mg/l	Colorimetric, Ion-Selective
Cyanide Total	0 t 5 mg/l	Colorimetric
Chemical Oxygen Demand (CODcr)	Up to 1500 mg/l	Titration, Colorimetric
Chemical Oxygen Demand (CODMn)	Up to 200 mg/l	Titration
Chemical Oxygen Demand (CODcr +Ammonia)	CODcr: 0 -1000 mg/l, NH3: 0 t 10 mg/l	Colorimetric
Fluoride	Up to 1000 mg/l	Ion-Selective
Hardness	Up to 1000 mg/l	Ion-Selective
Hydrazine	0 t 500 ug/L	Colorimetric
Hydrochloric acid	Up to 5000 mg/l	Titration
Hydrogen fluoride	Up to 5000 mg/l	Titration

Parameter	Measuring range	Methodology
Hydrogen peroxide	0 t 2.5 mg/l	Colorimetric
Hypochlorite	Up to 1000 mg/l	Titration
Iron	Up to 5 mg/l	Colorimetric
Lactic acid	Up to 5000 mg/l	Titration
Manganese	0 t 5 ug/l	Colorimetric
Nickel	0 t 500 mg/l	Colorimetric
Nitrate	0 - 1 t 20 mg/l	Colorimetric
Nitrite	0 t 0.2 t 20 mg/l	Colorimetric
Nitric Acid	Up to 5000 mg/l	Titration
Nitrogen Total	0 t 20 mg/l	Colorimetric
Phenol	0 t 5 mg/l	Colorimetric
Phosphoric Acid	Up to 5000 mg/l	Titration
Phosphorus Total	0 t 20 mg/l	Colorimetric
Phosphate	0 t 15 mg/l	Colorimetric
Silica	0 - 5 t 5 mg/l	Colorimetric
Sodium	0 t 0.1 t 1 mg/l	Ion-Selective
Sodium hydroxide	Up to 5000 mg/l	Titration
Sulphate	0 t 20 - 200 mg/l	Colorimetric
Sulphide	0 t 2.5 mg/l	Colorimetric
Sulphite	0 t 20 mg/l	Colorimetric
Sulphuric acid	Up to 5000 mg/l	Titration
Thiocyanate	0 t 500 ug/l	Colorimetric
Total Acid	Up to 5000 mg/l	Titration
Total Alkalinity	Up to 5000 mg/l	Ion-Selective
Total Nitrate (TN)	Up to 20 mg/l	Colorimetric
TMAH	Up to 5000 mg/l	Titration
Urea	0 t 250 mg/l	Colorimetric
Zinc	0 t 2 mg/l	Colorimetric

Standard Warranty

Standard warranty is 12 months from the date of commissioning & limited to maximum of 15 months from the date of shipment of the analyzer system

Sales & Service Support

- Factory Acceptance Test (FAT)
- Site Acceptance Test (SAT)
- Site Commissioning
- After Sales Service backup
- Guaranteed spares parts availability for maximum 10 years of instrument life.

Ordering information

BA-ENV	X1	X2	X3	X4	X5	X6
-X1	-D7: 6.5" LCD Colour touch screen					
	-D10: 10.4" LCD Colour touch screen					
-X2	-CM: Modbus					
	-CRS: RS485					
-X3	- : None					
	-DM: Require Demin water					
-X4	-CB : ABS / Polycarbonate cabin					
	-CBSS : Stainless steel cabin					
-X5	-Parameter : In parameter list					
-X6	-Range : Following application					
Please contact factory for other cable length						

USA Office

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ASIA Region

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