Aztec ATS430
Turbidity and total suspended solids sensor
Measurement made easy
Certified turbidity measurement for regulatory effluent discharge consent monitoring

Easy to use
• EZLink plug-and-play digital sensor connection
• Automatic sensor recognition and set-up
• Advanced predictive maintenance diagnostics
• Supplied factory-calibrated ready for use

Accurate and reliable
• Robust construction in stainless steel or titanium
• Scratch-resistant sapphire windows
• Adaptive TSS calibration feature for improved process control
• MCERTS approved

Low cost-of-ownership
• No servicing for the lifetime of the sensor
• In-situ cleaning
• Easy calibration and verification

Flexible installation options
• Suitable for pipe, tank, open channel or flow-cell installation
• Suitable for use in salt water
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**The Aztec 400 range**
The Aztec 400 range of advanced digital sensors are designed for monitoring the key parameters in municipal and industrial water/wastewater treatment.

Featuring ABB’s EZLink technology, the sensors offer plug-and-play measurement with ABB’s latest digital transmitters to create the easiest-to-use and maintain monitoring systems on the market today.

Analysis and signal conditioning is conducted within the robust sensor housing and transmitted digitally to the transmitter.

The Aztec 400 range of digital sensors with EZLink offer:
- plug-and-play digital sensor connection
- automatic sensor recognition and set-up
- advanced predictive maintenance diagnostics
- enhanced measurement accuracy due to minimal electrical noise interference

ABB’s latest range of digital transmitters featuring EZLink offer:
- multiple sensor connection
- data logging and graphical process trending
- full audit trail capability
- SD card / USB stick data download capability
- flexible communications including Ethernet, PROFIBUS®, MODBUS® and analog outputs

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**Aztec ATS430 turbidity and TSS sensor**
The ATS430 is a compact, yet extremely robust turbidity sensor capable of measuring turbidity and total suspended solids (TSS) concentrations up to 4000 NTU or 100,000 mg/l.

Available in stainless steel or titanium these rugged sensors are suitable for use in a wide range of process control applications. The stainless steel version with optional integral cleaning is ideal for general water and wastewater applications, whereas the titanium version can be used in aggressive or corrosive environments, including brine, seawater or high salinity media.

Analysis and signal conditioning is conducted within the robust sensor housing and transmitted digitally to the transmitter.

Featuring ABB’s EZLink technology, simplified calibration and service-free design, users of this system benefit from simple operation, enhanced accuracy and the lowest cost-of-ownership.

**Applications**
Typical applications for the Aztec ATS430 turbidity and TSS sensor include:
- potable water treatment
- Municipal / industrial wastewater treatment
- food and beverage process control
- Pulp & Paper process control
- marine applications

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Figure 1  AWT440 transmitter
Accurate and reliable measurement
The Aztec ATS430 turbidity and TSS sensor uses the latest advancements in optical measurement technology to provide an extremely stable and accurate measurement system that maintains calibration and operates without drift.

Measurement principle
The ATS430 uses nephelometric measurement technology in accordance with EN ISO 7027 (DIN EN 27027 or ISO 7027). Providing accurate measurement of turbidity concentrations up to 4000 NTU and can also be used to determine the total suspended solids (TSS) content in the sample.

Adaptive TSS Calibration
Obtaining a reliable calibration for suspended solids from laboratory measurement data is not necessarily a straightforward task. The ‘Adaptive TSS Calibration’ feature within the ATS430 overcomes this issue and provides a smooth TSS conversion based on process history. It uses a weighted cumulative average to approximate the accuracy of a linear fit over a large set of data. This avoids sudden changes in TSS calibration coefficients often caused by non-representative sampling or erroneous lab results.

Rugged design
The robust ATS430 sensors are available in polished stainless steel or titanium and feature scratch-resistant sapphire optical windows to withstand harsh environments up to 60 °C (140 °F) and pressures up to 10 bar (145 psi).

Automatic cell cleaning
The ATS430 is available with an auto-clean system to maintain accuracy in high-fouling environments. The integral wiper assembly that is available on the stainless steel models physically wipe the optical surfaces at user-programmable intervals.

The highly efficient automatic cleaning process overcomes the problem of optical fouling and ensures that performance can be maintained for extended periods without the need for manual intervention.

Trusted performance
The ATS430 has been certified by the UK Environment Agency under its Monitoring Certification Scheme (MCERTS).
Easy-to-use and maintain
The Aztec ATS430 turbidity and suspended solids sensor features ABB’s EZLink technology to provide plug-and-play measurement with ABB’s latest digital transmitters.

EZLink
No wiring, no complicated sensor set-up or configuration; simply connect the sensor using the EZLink connection and the transmitter configures the sensor set-up automatically.

Factory-calibrated
Each sensor is precisely calibrated at the factory so it is ready to use straight out of the box.

No servicing for the lifetime of the sensor
The ATS430 features a fully encapsulated and hermetically sealed design. This means that there are no O-rings, seals or gaskets to periodically replace.

If a wiper system is fitted the ATS430 monitors usage and alerts the user when replacement is due. Wiper replacement is simple and takes a matter of seconds.

Simple to calibrate
The ATS430’s performance can be easily verified with ABB’s sensor verification and calibration kit. Each kit is provided with a range of different calibration discs that have been calibrated against primary turbidity standards at the factory.

Simple, safe and cost-effective. The ATS430 sensor verification and calibration kit removes the need for the use of chemical standards that can be difficult to prepare, costly and hazardous.

Furthermore, as the kit can be used across different ATS430 sensors and each calibration disk can be reused, it is extremely cost effective.
The benefits of using the ATS430 sensor verification and calibration kit include:

- **Minimum analyzer downtime**
  - Simple and fast procedure to verify analyzer performance.

- **Low cost-of-ownership**
  - Reduce usage of consumable chemical standards and the time taken to prepare such standards.

- **Minimize employee’s exposure to Formazine**
  - Formazin is highly toxic and a suspected carcinogen.

- **Repeatable and reliable**
  - Removes any chemical standard preparation errors.

- **Simple to use**
  - Simply place the appropriate calibration disc into the holder, add a small droplet of optical coupling agent to the optical window of the turbidity sensor and insert into the holder.

### Mounting options

<table>
<thead>
<tr>
<th>Item</th>
<th>Mounting option</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Open channel mounting kit: ATS4000768, suitable for floor/wall (surface) mounting (ATS4000720 chain mounting kit available separately)</td>
</tr>
<tr>
<td>B</td>
<td>Wall mounting accessory: ATS4000700, suitable for 40 mm / 1.25 in. dia dip pole</td>
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<tr>
<td>C</td>
<td>Dip pole assembly (supplied with 40 mm dia pole): ATS4000750: 2.5 m (8.2 ft) straight ATS4000716: 2.5 m (8.2 ft) 90° bend ATS4000719: 2.5 m (8.2 ft) 45° bend Dip pole mounting adaptor kits (to attach to user-supplied pole) ATS4000751: for attachment to 40 mm dia or 1.25 in. NB pole (straight) ATS4000710: for attachment to 1.25 in. NB pole (90° bend) ATS4000711: for attachment to 1.25 in. NB pole (45° bend) ATS4000714: for attachment to 40 mm dia pole (90° bend) ATS4000715: for attachment to 40 mm dia pole (45° bend) Note. Handrail mounting brackets are not supplied with this kit and must be purchased separately.</td>
</tr>
<tr>
<td>D</td>
<td>Open tank flanged dip mount: ATS4000785, for mounting on user-supplied mounting bracket</td>
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<tr>
<td>E</td>
<td>Wiper arm protective shroud assembly: ATS4000725</td>
</tr>
<tr>
<td>F</td>
<td>Flow cell pipeline mount kit: ATS4000765, suitable for wall / surface mounting (includes wall mounting clip)</td>
</tr>
<tr>
<td>G</td>
<td>Handrail mounting bracket – swivel / tilt action: ATS4000762 for 1.25 in. NB dip pole, suitable for 42 or 51 mm (1.7 or 2.0 in.) dia. handrail ATS4000763 for 40 mm dia dip pole, suitable for 42 or 51 mm (1.7 or 2.0 in.) dia. handrail</td>
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<tr>
<td>H</td>
<td>Handrail mounting bracket – tilt action: ATS4000760 for 40mm or 1.25 in. dia dip pole, suitable for 42 or 51 mm (1.7 or 2.0 in.) dia handrail</td>
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<td>I</td>
<td>Retractable insertion assembly: ATS4000780, maximum pressure 10 bar (145 psi), for mounting on user-supplied flange: BS EN 1092-1, Type 01B, DN50, PN16, stainless steel 316L or similar. Maximum distance from flange sealing face to pipe I/D must not exceed 70 mm (2.75 in.).</td>
</tr>
</tbody>
</table>

Table 1  ATS430 sensor mounting / cleaning options
Figure 7  Mounting options
**Specification**

**Sensor type**  
Optical nephelometric turbidity and suspended solids sensor

**Sensor**  
**IP rating**  
IP68

**Range**  
Turbidity: 0 to 4000 NTU  
Suspended solids: dependent on sample:  
- up to 5000 mg/l kaolin  
- up to 15000 mg/l Fullers earth  
- up to 100,000 mg/l SiO2

**Accuracy**  
1. Turbidity: <±2 % measured value  
2. Suspended solids: dependent on sample

**Repeatability and limit of detection**  
1. Repeatability: <1 %  
2. Limit of detection: 0.006 NTU

**Display resolution**  
- Turbidity: 0.001 NTU  
- Suspended solids: 0.001 mg/l

**Response time**  
T90 < 30 s with filtering disabled

**Storage conditions**  
-5 to 70 °C (23 to 158 °F)

**Operating temperature**  
0 to 60 °C (32 to 140 °F)

**Operating pressure**  
Up to 10 bar (145 psi) for metal versions

**Dimensions**  
- 40 mm (1.57 in.) diameter  
- 180 mm (7.08 in.) length

**Weight**  
- Stainless steel: approx. 0.65 kg (1.43 lb) without cable  
- Titanium: approx. 0.4 kg (0.88 lb) without cable

**Power**  
Consumption (maximum)  
100 mA @ 24 V DC

**Cable**  
Fixed length  
1 or 10 m (3.28 or 32.8 ft.)

EZLink digital sensor connector IP rating  
IP67 (when connected)

**Extension cable (options)**  
1, 5, 10, 15, 25, 50 m (3.2, 16.4, 32, 49.2, 82, 164 ft.)

**Maximum length (including optional extension cable)**  
Up to 210 m (826 ft.)

**Methods**  

**Materials of construction**  
**Stainless steel version**  
316 Stainless Steel, Viton, Noryl (wiper version only), Sapphire and F08 Epoxy

**Titanium version**  
Titanium grade 2, Sapphire and F08 epoxy

**Sensor flow cell body**  
ABS

**Retractable insertion assembly**  
Parts in contact with sample  
Stainless steel (316/1.4408), Viton, TFM™1600


2. ±0.1 NTU for measurement below 5 NTU, provided an accurate calibration is performed to compensate for environmental interferences. To achieve the best accuracy at low levels a two-point calibration is advised.

### Dimensions

All dimensions in mm (in.)

#### Figure 8  Sensor

- Dimensions in mm:
  - 10 (0.40)
  - 40 (1.57)
  - 180 (7.09)
  - 150 (5.90)
  - 1 in. BSP thread

#### Figure 9  Flowcell

- Dimensions in mm:
  - Ø 75 (2.95)
  - 10 (0.39)
  - 17 (0.66)
  - 58 (2.3)

#### Figure 10  Retractable insertion assembly

- Dimensions in mm:
  - 318 (12.51)
  - 440 (17.32)
  - 70 (2.75)
  - 208 (8.19)
### Ordering information

<table>
<thead>
<tr>
<th>Aztec ATS430 turbidity sensor</th>
<th>Main code</th>
<th>Options</th>
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<td>Titanium</td>
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<td>Sensor verification and calibration kit</td>
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<td>Calibration pot for use with formazine</td>
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<td>A5</td>
</tr>
<tr>
<td>Wiper arm protection shroud</td>
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<td>A6</td>
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</tbody>
</table>

### Mounting options

- **Dip pole assemblies**
  - Dip pole assembly (straight), metric 2.5 m (8.2 ft)
  - Dip pole assembly (90° bend), metric 2.5 m (8.2 ft)
  - Dip pole assembly (45° bend), metric 2.5 m (8.2 ft)
  - **BA1**
  - **BA4**
  - **BA5**

- **Dip pole mounting adaptor kits (to attach to user-supplied pole)**
  - Pole mounting adaptor kit (Straight) for attachment to 40 mm or 1.25 in. NB pole
  - **BD1**
  - Pole mounting adaptor kit (90°) for attachment to 1.25 in. NB pole
  - **BD2**
  - Pole mounting adaptor kit (45°) for attachment to 1.25 in. NB pole
  - **BD3**
  - Pole mounting adaptor kit (90°) for attachment to 40 mm pole
  - **BD4**
  - Pole mounting adaptor kit (45°) for attachment to 40 mm pole
  - **BD5**

- **Dip pole mounting brackets**
  - Wall mounting bracket for dip pole (40 mm or 1.25 in. NB)
  - **BB1**
  - Handrail mounting bracket (Tilt) for dip pole (40 mm or 1.25 in. NB), suitable for 42 or 51 mm (1.7 or 2.0 in.) dia. handrail
  - **BB2**
  - Handrail mounting bracket (Swivel & Tilt) for dip pole (1.25 in. NB), suitable for 42 or 51 mm (1.7 or 2.0 in.) dia. handrail
  - **BB5**
  - Handrail mounting bracket (Swivel & Tilt) for dip pole (40 mm), suitable for 42 or 51 mm (1.7 or 2.0 in.) dia. handrail
  - **BB6**
  - Open tank flanged mount for dip pole (40 mm or 1.25 in. NB)
  - **BT1**

- **Chain mount options**
  - Open channel mounting kit supplied with 3 m (9.8 ft.) chain
  - **BB3**
  - Chain fitting adaptor kit supplied with 3 m (9.8 ft.) chain
  - **BB4**

- **Pipe mount options**
  - Flow cell
  - **BF1**
  - Retractable insertion assembly
  - **BH1**

- **Certification**
  - Calibration certificate
  - **CD**

### EZLink digital sensor extension cable

- 1 m (3.2 ft)
  - **E01**
- 5 m (16.4 ft)
  - **E05**
- 10 m (32.8 ft)
  - **E10**
- 15 m (49.2 ft)
  - **E15**
- 25 m (82 ft)
  - **E25**
- 50 m (164 ft)
  - **E50**

### Acknowledgements

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