Endura AZ30
Combustion oxygen monitor
Measurement made easy
Proven technology for use in hazardous area gases and dusts

Hazardous area designations – system
Certification
• ATEX and IECEx
  Certified for use in Class I Zone 1 and Zone 2 – gas groups IIA, IIB + H2, Class II Zone 21 and Zone 22 – dust group IIIC
• FM USA and Canada
  Certified for use in Class I Division 1 gas groups BCD, Class II Division 1 dust groups EFG

Low surface temperature
• Safe T4 135 °C (275 °F) surface temperature rating

Advanced transmitters
• Easy configuration, monitoring and intuitive HMI
• HART communications
• Cell performance logging and diagnostics

Advanced design and precision manufacturing
• Robust, long-life probe for process temperatures up to 800 °C (1472 °F)
• Proven cell design from over 50 years experience
• Fast response to process variations
• Stable and accurate oxygen measurement

Unique integrated auto-calibration system
• Easy compliance for emission monitoring regulation
• Reduced installation costs; eliminates requirement for expensive external calibration panel
• Reduced maintenance costs
Introduction
The Endura AZ30 is an explosion-proof / flameproof combustion gas analyzer system designed for use in Hazardous Areas. Certification covers not only the terminal housing, but the complete system.

The sensor, based on a zirconium oxide cell, is mounted at the tip of the probe that is inserted in the flue duct. The resulting direct, in situ measurement provides accurate and rapid oxygen reading for combustion control optimization and emissions monitoring.

Probe lengths up to 2.0 m (6.6 ft.)
A wide range of probe insertion lengths from 0.5 to 2.0 m (1.7 to 6.6 ft.) enable installation to the optimum measuring point for accurate oxygen measurement within the duct.
A comprehensive range of mounting flanges provide simple installation when plant-wide standard flanges are required or when replacing existing probes.

The transmitter can be probe- or remote-mounted at distances of up to 100 m (328 ft.), providing versatile system options for all applications. The probe-mounted transmitter option provides the lowest cost of installation. However, the remote-mounted transmitter provides flexibility when the operationally ideal probe location does not provide easy access for the user.

Advanced design
Designed and manufactured to exacting standards, the Endura AZ30 ensures long periods of trouble-free operation in even the most arduous of applications.

The operating process temperature of up to 800 °C (1472 °F) extends system suitability into previously impossible applications and enables optimum probe location within the process.

The modular design, with reduced component count, improves the robustness and reliability of the system and simplifies routine maintenance and servicing.

Complete traceability ensures only the highest quality materials are used in the system’s construction and rigorous manufacturing, inspection and testing procedures (to international standard ISO 9001) result in a monitor of superior quality with prolonged probe life.
Easy cell release
The Endura AZ30 probe has retained the easy-access cell arrangement of the previous generation ZFG2 probes. Cell replacement can be performed on-site using basic hand tools; even after long periods of high temperature operation where screw threads have ‘seized’ and can no longer be released. Kits containing all the parts needed to complete maintenance are available from ABB to ensure a technician can perform services quickly, efficiently and at minimum cost.

Proven cell design
ABB’s metallurgically-bonded, multi-layer electrode technology increases the cell’s resistance to sulphurous and reducing atmospheres and high temperature operation. This extends the lifecycle of the cell in the most arduous applications such as sulphur recovery processes, crematoria and industrial / clinical waste incineration.

Test gas / reference air flow rate control using factory-fitted flow restrictors
The factory-fitted flow restrictors regulate the flow rate of test gases and reference air to the sensor by using a fixed supply pressure of 1 bar (15 psi) ±12 %.

The flow restrictors ensure the following conditions:
- the correct flow of test gases and reference air into the sensor for correct sensor operation.
- prevention of pressurization of the sensor’s internal volume above 1.1 bar absolute (44 in. WG) under fault conditions such as internal leaks from the gas lines for certification compliance.

Unique integrated automatic calibration
The optional automatic calibration system eliminates the need for the expensive ancillary equipment required for automatic calibration on traditional flue gas oxygen analyzer systems. ABB’s fully integrated, automatic calibration feature controls the test gas sequence and detects test gas availability, eliminating incorrect calibrations due to loss of test gas.

Integrated automatic calibration secures the oxygen measurement, providing complete confidence in the monitor’s performance.

Long-term operation without technician intervention minimizes operating costs, total cost-of-ownership, optimizes system accuracy and contributes to the CEMS (Continuous Emissions Monitoring Compliance). A significant proportion of service visits to an analyzer result in ‘no fault found’. Endura AZ30’s high-quality manufacture, advanced diagnostics and fully-integrated, automatic calibration is targeted at reducing this wasted effort and cost.
Advanced transmitter

The Endura AZ30 transmitter incorporates the most up-to-date design and technology available today.

ABB’s universal human machine interface (HMI) with its large, clear, backlit graphical display, ‘through-the-glass’ control and intuitive menu structure simplifies transmitter configuration and operation.

The user-friendly interface enables fast, easy data entry for all parameters and the ‘Easy Setup’ menu speeds and simplifies system commissioning.

Advanced diagnostics, in accordance with NAMUR NE107, classify alarms and warnings as ‘Maintenance Required’, ‘Check Function’, ‘Failure’ and ‘Out-of-Specification’. Cell performance is monitored by the transmitter; indicators such as cell impedance, rate-of-response to test gases and changes in calibration offset / factor are recorded and analyzed. The current cell ‘quality’ is displayed by the transmitter as a visual indication of the measurement confidence; providing the operator all the information required to keep the monitor operating at peak performance.

The Performance Log holds up to 100 time-stamped events. When the log is full, the oldest data is overwritten by new entries. The log contains details of measurements and coefficients for all calibrations and accuracy checks.

2 Relay outputs and a traditional analog output are fitted as standard, with the option of adding a second analog output or 2 digital inputs / outputs (I/O).

The Endura AZ30 transmitter is equipped with HART communication as standard, supported by a full Device Type Manager (DTM) to enable remote access to the analyzer through a user-friendly graphical interface. The DTM provides full access to the transmitter setup, logged data and diagnostics information as well as live data.

The IrDA standard infrared communication port can also be used with the DTM to upload and download device configurations. In addition, it enables data-logged values and diagnostics to be viewed on a hyperterminal interface or a PC. The transmitter’s firmware can also be upgraded using this port.

![Figure 5 DTM graphical interface](image-url)
AZ30 system options
Schematic – probe with integral transmitter

**Hazardous area**
Certified for use in Class I Zone 1 and Zone 2 – gas groups IIA, IIB + H2, Class II Zone 21 and Zone 22 – dust group IIIC plus Class I Division 1 gas groups BCD, Class II Division 1 dust groups EFG

**Transmitter / Terminal housing environment**
- IP66 and NEMA 4X
- EEx d barrier glands**/***** (not supplied)

**Flue / process**
- Process 1.1 bar absolute (44 in. WG)*** maximum process pressure
- Maximum surface temperature T4 135 °C (275 °F)

**Note.** Hazardous area certification is valid only between –20 and 70 °C (–4 and 158 °F)

- Transmitters do not contain a reference air supply for the probe. All external pneumatic fittings may be exchanged – they do not form part of the certified enclosure.
- **Refer to page 12 for barrier gland requirements.
- ***Required for certification.

*Pneumatic fittings:*
- ¼ in. BSP, for 6 mm OD pipes (with metric cable gland option)
- ¼ in. NPT, for ¼ in. OD pipes (with 1/2 in. NPT cable gland option)

ABB supply options
- Mains supply
- Relays
- Output signals

**Signal and mains cable**
- M20 or ½ in. NPT options (not supplied)

**Maximum surface temperature**
- T4 135 °C (275 °F)
**Schematic – probe with remote transmitter / terminal housing**

**Hazardous area**
Certified for use in Class I Zone 1 and Zone 2 – gas groups IIA, IIB + H2, Class II Zone 21 and Zone 22 – dust group IIIC
plus Class I Division 1 gas groups BCD, Class II Division 1 dust groups EFG

**Transmitter / Remote terminal housing environment**

**IP66 and NEMA 4X**

- Process 1.1 bar absolute (44 in. WG)**
- Maximum process pressure
- 0.5 to 2.0 m (1.7 to 6.6 ft.)
- Maximum surface temperature
  - T4 135 °C (275 °F)
- EEx d barrier glands**/**

- Signal and mains cable
  - M20 or ¼ in. NPT options
    - (not supplied)
    - ABB supply options

- EEx d barrier glands**/**
  - M25 or ⅝ in. NPT
    - (ABB supply options)

- Mains supply
- Relays
- Output signals

**Flue / process**

- EEx d barrier gland**/**
  - M25 or ⅝ in. NPT
    - (ABB supply options)

- 800 °C (1472 °F)
- ~20 °C (~4 °F)

- Note. Hazardous area certification is valid only between –20 and 70 °C (~–4 and 158 °F)

- Special remote transmitter housing / probe 16-core Endura AZ30
- probe cable (ABB supplied) – max. 100 m (300 ft.)
- Customer-supplied (alternative) cabling should conform to the cable specifications detailed on page 13 and local installation regulations.

**Note.** For alternative wiring, barrier glands or stopper boxes must be used at both probe and transmitter entries. Where conduit is used, the stopper box must not be more than 0.457 m (18 in.) from the enclosure.

*Transmitters do not contain a reference air supply for the probe. All external pneumatic fittings may be exchanged – they do not form part of the certified enclosure.

**Refer to page 12 for barrier gland requirements.

***Required for certification.
...AZ30 system options

Test gas and reference air supply configurations –
automatic calibration (AutoCal) systems

- Clean dry oil-free instrument air in – 10 bar (145 psi) max.
- 5 μm / oil-coalescing filter-regulator
- 1 bar (15 psi) ±12 %
- Test gas 1
- Test gas 2 (optional)
- Probe with restrictors
- Vent to dry area (unrestricted flow)
- Reference air

Test gas and reference air supply configurations –
non-automatic calibration (non-AutoCal) systems

- Clean dry oil-free instrument air in – 10 bar (145 psi) max.
- 5 μm / oil-coalescing filter-regulator
- 1 bar (15 psi) ±12 %
- Test gas 1
- Test gas 2 (optional)
- Probe with restrictors
- Vent to dry area (unrestricted flow)
- Reference air

* Shut-off valve required for test gas runs >10 m (33 ft.)
Overall dimensions and weights

Probe and integral transmitter dimensions

Dimensions in mm (in.)

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Dimensions from flange to probe cell in m (ft.)
0.5, 1.0, 1.5, 2.0 (1.7, 3.3, 5.0, 6.6)

For flange dimensions refer to page 11

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Probe and integral transmitter weights

<table>
<thead>
<tr>
<th>Length m (ft.)</th>
<th>Unpacked – kg (lb)</th>
<th>Packed – kg (lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 (1.7)</td>
<td>13.32 (29.36)</td>
<td>18.54 (40.87)</td>
</tr>
<tr>
<td>1.0 (3.3)</td>
<td>16.44 (36.24)</td>
<td>23.07 (50.86)</td>
</tr>
<tr>
<td>1.5 (5.0)</td>
<td>17.0 (36.37)</td>
<td>27.86 (61.42)</td>
</tr>
<tr>
<td>2.0 (6.6)</td>
<td>19.3 (42.90)</td>
<td>31.63 (69.73)</td>
</tr>
</tbody>
</table>
Overall dimensions and weights

Remote probe dimensions
Dimensions in mm (in.)

Remote probe weights

<table>
<thead>
<tr>
<th>Length m (ft.)</th>
<th>Probe only unpacked – kg (lb)</th>
<th>Probe only packed – kg (lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 (1.7)</td>
<td>9.82 (21.65)</td>
<td>15.02 (33.11)</td>
</tr>
<tr>
<td>1.0 (3.3)</td>
<td>12.94 (28.53)</td>
<td>19.54 (43.08)</td>
</tr>
<tr>
<td>1.5 (5.0)</td>
<td>15.96 (35.18)</td>
<td>24.16 (53.26)</td>
</tr>
<tr>
<td>2.0 (6.6)</td>
<td>19.18 (42.28)</td>
<td>28.68 (63.23)</td>
</tr>
</tbody>
</table>

Remote transmitter dimensions
Dimensions in mm (in.)

Remote transmitter weights

Remote transmitter unpacked – kg (lb) | Remote transmitter packed – kg (lb)
-------------------------------------|-------------------------------------|
9.5 (20.94)                           | 12.5 (27.55)
Probe flanges (all probe lengths) and mounting plates for standard probe flanges

Dimensions in mm (in.).

Note. The pressure ratings for these flanges do not apply.

### ABB probe flange types and dimensions

<table>
<thead>
<tr>
<th>Flange type</th>
<th>A</th>
<th>B</th>
<th>C (Ø)</th>
<th>D (PCD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABB standard</td>
<td>101 (3.97)</td>
<td>6 (0.24)</td>
<td>7.3 (0.29)</td>
<td>80 (3.15)</td>
</tr>
<tr>
<td>ABB standard 0.5 m (1.7 ft.) probes only</td>
<td>165 (6.50)</td>
<td>12 (0.47)</td>
<td>12.5 (0.50)</td>
<td>140 (5.51)</td>
</tr>
</tbody>
</table>

### ABB flange mounting plates*

<table>
<thead>
<tr>
<th>Flange type</th>
<th>A</th>
<th>B</th>
<th>C (Ø)</th>
<th>D (PCD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 m (1.7 ft.)</td>
<td>160 (6.3)</td>
<td>160 (6.3)</td>
<td>7 (0.27)</td>
<td>16 (0.63)</td>
</tr>
<tr>
<td>1.0 to 2.0 m (3.3 to 6.6 ft.)</td>
<td>203 (8.0)</td>
<td>203 (8.0)</td>
<td>20 (0.79)</td>
<td>32 (1.26)</td>
</tr>
</tbody>
</table>

Standard mounting plate for 0.5 m (1.7 ft.) probe – part no. AZ200 796

### 4-hole probe flange types and dimensions

<table>
<thead>
<tr>
<th>Flange type</th>
<th>A</th>
<th>B</th>
<th>C (Ø)</th>
<th>D (PCD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSI 2 in 150</td>
<td>152.4 (6.00)</td>
<td>12 (0.47)</td>
<td>19 (0.75)</td>
<td>120.6 (4.75)</td>
</tr>
<tr>
<td>ANSI 2.5 in 150</td>
<td>177.8 (7.00)</td>
<td>12 (0.47)</td>
<td>19 (0.75)</td>
<td>139.7 (5.50)</td>
</tr>
<tr>
<td>ANSI 3 in 150</td>
<td>190.5 (7.50)</td>
<td>12 (0.47)</td>
<td>19 (0.75)</td>
<td>152.6 (6.00)</td>
</tr>
<tr>
<td>DIN 65 PN16</td>
<td>185 (7.28)</td>
<td>12 (0.47)</td>
<td>18 (0.70)</td>
<td>145 (5.70)</td>
</tr>
<tr>
<td>JIS 65 5K</td>
<td>155 (6.10)</td>
<td>12 (0.47)</td>
<td>15 (0.59)</td>
<td>130 (5.12)</td>
</tr>
<tr>
<td>JIS 80 5K</td>
<td>180 (7.08)</td>
<td>12 (0.47)</td>
<td>19 (0.75)</td>
<td>145 (5.71)</td>
</tr>
</tbody>
</table>

### 8-hole probe flange types and dimensions

<table>
<thead>
<tr>
<th>Flange type</th>
<th>A</th>
<th>B</th>
<th>C (Ø)</th>
<th>D (PCD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSI 4 in 150</td>
<td>228.6 (9.0)</td>
<td>12 (0.47)</td>
<td>19 (0.75)</td>
<td>190.5 (7.50)</td>
</tr>
<tr>
<td>DIN 80 PN16</td>
<td>200 (7.87)</td>
<td>12 (0.47)</td>
<td>18 (0.70)</td>
<td>160 (6.30)</td>
</tr>
<tr>
<td>DIN 100 PN16</td>
<td>220 (8.66)</td>
<td>12 (0.47)</td>
<td>18 (0.70)</td>
<td>180 (7.08)</td>
</tr>
<tr>
<td>JIS 100 5K</td>
<td>200 (7.87)</td>
<td>12 (0.47)</td>
<td>19 (0.75)</td>
<td>165 (6.50)</td>
</tr>
</tbody>
</table>

*Comprising:
  - Mounting plate
  - Gaskets
  - 6 Each:
    - M6 / M10 shakeproof washers
    - M6 / M10 plain washers
    - M6 / M10 nuts
Barrier gland requirements

M25 (or ¾ in NPT) probe cable glands
If the optional ABB-supplied barrier glands are not used, any M25 or ¾ in NPT cable glands selected must be of the barrier type, approved for use in hazardous areas and certified suitable for use in Zone 1 and Zone 2 Gas groups IIA, IIB + H2, Zone 21, Zone 22 Dust groups IIIC and / or Class I Division 1 Gas groups BCD, Class II Division 1 Dust groups EFG.

- The M25 (or ¾ in. NPT) barrier cable gland must be suitable for use with the ABB ‘special’ 16-core cable if ordered with the AZ30 system or for any alternative cable to our specifications – see page 13.

- The M25 (or ¾ in. NPT) barrier cable gland must provide a standard seal for non-armored cable – refer to cable specifications on page 13.

- An alternative to barrier glands is the use of stopper boxes where local regulations permit.

Mains, relay and output signals cable glands – M20 (or ¼ in NPT)
The M20 (or ¼ in. NPT) cable glands used on the transmitter must be of the EEx d barrier type, approved for use in hazardous areas and certified suitable for use in Zone 1 and Zone 2 Gas groups IIA, IIB + H2, Zone 21, Zone 22 Dust groups IIIC and / or Class I Division 1 Gas groups BCD, Class II Division 1 Dust groups EFG.
## Probe cable connections – remote transmitter terminal housing to probe

### Standard ABB cable specifications

<table>
<thead>
<tr>
<th>Tx wire ident number</th>
<th>Terminal label color</th>
<th>(Position) Terminal block connection</th>
<th>Cable color</th>
<th>Cable requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Blue</td>
<td>(1) Heater</td>
<td>Blue</td>
<td>0.75 mm²</td>
</tr>
<tr>
<td>2</td>
<td>Brown</td>
<td>(2) Heater</td>
<td>Brown</td>
<td>0.75 mm²</td>
</tr>
</tbody>
</table>

**Heater screen / drain**

| 3 | Brown | (3) Screen (twisted pair / sleeved) | Screen (Yellow / Green) | 0.5 mm² |

**Separately screened signal cables**

| 4 | White | (4) Thermocouple (negative) | White | 0.5 mm² |
| 5 | Green | (5) Thermocouple (positive) | Green | 0.5 mm² |
| 6 | Black | (6) Oxygen input (negative) | Black | 0.5 mm² |
| 7 | Red   | (7) Oxygen input (positive) | Red   | 0.5 mm² |
| 8 | Grey  | (8) PT1000 Cold Junction Compensation | Grey | 0.5 mm² |
| 9 | Violet| (9) PT1000 Cold Junction Compensation | Violet | 0.5 mm² |
| 10| White / Yellow | (10) Pressure Switch / Gas 1 | White / Yellow | 0.5 mm² |
| 11| White / Black | (11) Pressure Switch / Common | White / Black | 0.5 mm² |
| 12| White / Orange | (12) Pressure Switch / Gas 1 | White / Orange | 0.5 mm² |
| 13| White / Green | (13) Solenoid Valve / Gas 1 | White / Green | 0.5 mm² |
| 14| White / Red | (14) Solenoid Valve / Common | White / Red | 0.5 mm² |
| 15| White / Blue | (15) Solenoid Valve / Gas 2 | White / Blue | 0.5 mm² |

**Signal cables screen / drain**

| 16| Grey | (8) PT1000 Cold Junction Compensation | Grey | 0.5 mm² |

### Requirements for non-ABB supplied cable / conduit

**Screens and drains:**

- Heater wires must be sleeved separately from the screened signal cables.

**Heater cores (items 1 and 2) and heater drain**

- Heater cores: 0.75 mm², 24/0.2 CU wire, resistance (20°C) 26 Ω/km max.
- Heater drain: 0.5 mm², 16/0.2 CU wire, resistance (20°C) 39 Ω/km max.

**Signal cores (items 3, 15) and signal drain**

- Signal cores / signal drain: 0.5 mm², 16/0.2 CU wire, resistance (20°C) 39 Ω/Km max.

**Voltage rating**

- 300 V to earth.
- 500 V between cores.

### Cable (non-ABB supply) operating temperature requirements

- −20 °C (−4 °F) min.; 80 °C (176 °F) max.

### Cable conduit (non-ABB supply)

Stainless-steel (for alternative wiring, barrier glands or stopper boxes must be used at both probe and transmitter entries). Where conduit is used, the stopper box must not be more than 0.457 m (18 in.) from the enclosure (remote terminal housing or integral probe).
...Probe cable connections – remote transmitter terminal housing to probe

*Probe internal connections already made at the factory.

**Numbered connections from the transmitter to the transmitter’s terminal housing already made at the factory.

***Screens must be connected to terminal 3 in the remote terminal housing where they are earthed via a de-coupling capacitor. Screens must not be connected directly to earth elsewhere.
Transmitter power supply and output connections

<table>
<thead>
<tr>
<th>*Option board connections</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog output</td>
<td>+</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Digital I/O</td>
<td>DIO1</td>
<td>DIO2</td>
<td>COM</td>
</tr>
</tbody>
</table>

Remote transmitter / terminal housing

**Power supply / output terminals (behind transmitter lid)**

**External earth connection**

**Integral transmitter**
System specification

Hazardous area certifications
ATEX and IECEx:
  Certified for use in Class I Zone 1 and Zone 2 – gas groups IIA, IIB + H2, Class II Zone 21 and Zone 22 – dust group IIIC
FM
  Certified for use in Class I Division 1 gas groups BCD, Class II Division 1 dust groups EFG

Measurement performance
Range:
  0 to 20.95 % O₂ max. (condition of certification)
Test gas response time:
  • initial dead time 3 seconds
  • T9 0 < 10 seconds
System accuracy:
  < ±0.75 % of reading or 0.05 % O₂
Drift:
  • < ± 1 % maximum % O₂ range value per month
    (without calibration)
  • < ± 0.2 % typical

Environmental data
Ambient operating temperature:
  • transmitter: –20 to 55 °C (–4 to 131 °F)
  • probe: –20 to 70 °C (–4 to 158 °F)
    (hazardous area certification is valid only between –20 and 70 °C [–4 and 158 °F])
Storage temperature:
  –40 to 85 °C (–40 to 185 °F)
Operating humidity:
  up to 95 % RH, non-condensing
Sunlight:
  store and operate out of direct sunlight
Ingress protection:
  • probe (excludes process side of mounting flange)
    IP66 and NEMA 4X
  • electronics enclosures (remote and integral)
    IP66 and NEMA 4X

Power supply
AC power supply:
  100 to 240 V AC ±10 %
  (90 V min. to 264 V max.) 50 / 60 Hz
  Maximum current 1.2 A
Electronics:
  < 10 W
Probe heater:
  < 100 W

EMC
Emissions and immunity:
  conforms to EN61326-1:2006

Safety
General safety:
  conforms to EN61010-1: 2010
Approvals and safety certification:
  • CE mark
  • cFMus
  • ATEX
SIL2:
  conforms to EN61508
Probe specification

Hazardous area certifications

- II 2 GD
- Ex db IIB +H2 T4 Gb (Ta –20°C to 70°C)
- Ex tb IIIC T135°C Db (Ta –20°C to +70°C) IP66
- Cert. No IECEx BAS12.0048X
- ATEX Cert No. Baseefa12ATEX0076X
- Class I Division 1 Groups BCD T4
- Class I Zone 1 AEx/Ex d IIB+H2 T4
- Class II Division 1 Groups EFG T4 (Ta –20 °C to +70 °C) Type 4X
- Max working pressure 1.1bar absolute
- FM Certificate No. 3039243

Physical

Probe insertion lengths:
- 0.5 m (1.7 ft.)
- 1.0 m (3.3 ft.)
- 1.5 m (5.0 ft.)
- 2.0 m (6.6 ft.)

Process connection:
- All probe lengths (flange pressure ratings do not apply):
  - ANSI B16.5 150 lb
  - 2, 2.5, 3, 4 in
  - DIN2501 Part 1
  - 65, 80, 100 mm
  - JIS B2238 5K
- 0.5 m (1.7 ft.) probes: ABB standard small flange
- 1.0 m (3.3 ft.): ABB standard large flange

Probe body material:
- 316L stainless steel

Mounting angle:
- Horizontal to vertically down

Threaded entries

Gland entry (certified):
- probe cable gland entry: 1 x M25 or (optional) ¾ in. NPT (remote probe only)

Pneumatic entries (not certified):
- 4 fittings supplied with AutoCal options or 3 fittings and 1 blanking plug supplied with non-AutoCal options.
  - Size options: ⅜ in. BSP for 6 mm OD pipe (with M20 cable gland option) or ¼ in. NPT for ⅛ in. OD pipe (with ⅝ in. NPT option)

Automatic calibration

AutoCal hardware:
- optional built-in solenoid valves for control of test gas flow
- built-in pressure switches to detect presence of test gases

Process conditions

Standard process temperature:
- all probe lengths –20 to 800 °C (–4 to 1472 °F)

Process:
- this probe is certified for use in non oxygen-enriched atmospheres, 0 to 20.95 % air only and a maximum pressure of 1.1 bar absolute (44 in. WG)

Operating requirements

Reference air (clean dry instrument air free from oil):
- regulated supply: 1 bar (15 psi) ±12 %*

Test gases – regulated to 1 bar (15 psi) ±12 %*:
- user-selectable, 100 to 0.1 % O₂ balance N₂ and / or air (air is recommended as one of the test gases)

Calibration:
- manual, semi-automatic or automatic (controlled by Endura AZ30 transmitter)

Heater operational requirements

Nominally 190 W, 70 W at 115 V AC – power is limited to 70 W max. by AZ30 transmitter over an 85 to 265 V AC range

*Condition of certification
Transmitter specification

Hazardous area certifications

Transmitter
- Ex d IIB
- Ex tb IIIC T85°C Db (Ta –20°C to 55°C)
- Class II Division 1 Groups EFG T6 (Ta –20 °C to +70 °C) Type 4X
- FM Certificate No. 3039243
- Max current 1.2A

Remote terminal housing
- Ex d IIB
- Ex tb IIIC T85°C Db (Ta –20°C to +70°C) IP66
- Class I Division 1 Groups BCD T6
- Class I Zone 1 AEx/Ex d IIB+H2 T6
- Ex tb IIIC T85°C Db (Ta –20°C to +70°C) IP66
- Class I Division 1 Groups EFG T6 (Ta –20 °C to +70 °C)
- FM Certificate No. 3039243
- Cert. No IECEx BAS12.0050U
- Baseefa12ATEX0078U
- ATEX Cert No. Baseefa12ATEX0077X
- Class II Division 1 Groups EFG T6 (Ta –20 °C to +70 °C) Type 4X
- FM Certificate No. 3039243
- Max current 1.2A

Transmitter enclosures

Remote transmitter
(mounted to remote terminal housing):
- wall-, pipe- or stand-mounted
  (mounting bracket supplied)

Integral transmitter:
- head-mounted to probe

Physical

Remote transmitter:
- aluminium (EN AC44200 or 47000)

Remote terminal housing:
- 316L stainless steel

Integral transmitter:
- aluminium transmitter housing / stainless steel probe and terminal housing

Threaded entries

Gland entries (certified):
- power and signals gland entries:
  3 x M20 or (optional) ½ in. NPT
- remote terminal housing cable gland entry:
  1 x M25 or (optional) ¾ in. NPT (remote system only)

Pneumatic entries (not certified):
- 4 fittings supplied with AutoCal options or 3 fittings and 1 blanking plug supplied with non-AutoCal options. Size options: ¼ in. BSP for 6 mm OD pipe (with M20 cable gland option) or ¼ in. NPT for ½ in. OD pipe (with ½ in. NPT option)

Automatic calibration

AutoCal hardware:
- isolated solenoid valve control as standard,
  24 V @ 2 W per valve*
- dedicated isolated digital inputs to monitor pressure switch contacts as standard: voltage-free, normally closed with gas present

Display and switches

Display type:
- graphical 128 x 64 pixel LCD

Display backlight
- green LED

Operator switches
- 4 capacitive switches (operated through the front glass)

Relay outputs

Number:
- 2 standard

Type:
- normally closed, 5 A @ 230 V AC or 30 V DC (non-inductive)

Functions
- User-configurable: can be activated by 1 or more of the following signals:
  - process alarm 1, 2, 3, 4
  - calibration in progress
  - calibration failed
  - out of test gas 1, 2
  - test gas 1 valve control
  - test gas 2 valve control
  - failure diagnostic
  - out-of-specification diagnostic
  - maintenance required diagnostic
  - function check diagnostic

*For driving internal automatic calibration (AutoCal) probes or can be used to drive external calibration units on remote transmitters only.
Digital inputs / outputs
Number: 2 (optional)
Type: user-configurable as either input or output
Input: volt-free contact
Output:
- transistor switch capable of sinking 220 mA
- low output, < 2 V DC
- switch voltage 30 V DC maximum
Isolation: not isolated from each other or from other circuitry
Input functions:
- automatic calibration start
- automatic calibration stop
- automatic calibration start / stop
Functions user-configurable, can be activated by one or more of the following signals:
- process alarm 1, 2, 3, 4
- calibration in progress
- calibration failed
- out of test gas 1
- out of test gas 2
- test gas 1 valve control
- test gas 2 valve control
- failure diagnostic
- out-of-specification diagnostic
- maintenance required diagnostic
- function check diagnostic

Hart communications
Version: 5.7 as standard
Integration:
- Device Type Manager (DTM) and Electronic Device Description (EDD)
- provide online / offline device configuration, online monitoring of measurement values and diagnostic states
DTM
- FDT v1.2.1 compliant
- works with FDT framework packages (for example, ABB Asset Vision Basic)
EDD
- compliant with suitable framework tools (for example, SDC 625 and Simatic PDM tools)

Infrared service port
Accessibility: through front face
Type:
- IrDA standard
Baud rate:
- up to 115 K baud
Functions:
- firmware update
- remote HMI
- diagnostic log download
- datalog output
- HART via IrDA

Languages
- English
- French
- German
- Italian
- Spanish

Calibration
Manual calibration
- 1 point (offset)
- 1 point (factor)
- 2 point (offset + factor)
Automatic calibration:
- 1 point (offset)
- 2 point (offset + factor)
Calibration control:
- front panel controls
- digital inputs
- HART commands
- user-defined schedule
Calibration scheduler:
- user-defined schedule enables automatic calibration frequency to be set from 1 day to 12 months

Analog outputs
Standard:
- 1 isolated current output
- programmable to retransmit oxygen (linear or logarithmic) or temperature
- programmable over 4 to 20 mA
- over-range capability to indicate system failure programmable from 4 to 22 mA
Optional:
- 1 isolated current output
- programmable to retransmit oxygen (linear or logarithmic) or temperature
- programmable over 0 to 20 mA
- over-range capability to indicate system failure programmable from 0 to 22 mA
### Spares and accessories

#### Documentation and software

<table>
<thead>
<tr>
<th>Part number</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>MI/AZ30M-EN</td>
<td>Maintenance Guide – download* from: <a href="http://www.ABB.com/analytical-instruments">www.ABB.com/analytical-instruments</a></td>
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<td>*Enter this address in your browser and search MI/AZ30M-EN – the Maintenance Guide is the top link.</td>
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AZ30 DTM Software  Device Type Manager – contact ABB for details

#### Transmitter spares

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<tr>
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<td>AZ200 750</td>
<td>AZ30 Transmitter cartridge</td>
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<td>AZ200 751</td>
<td>Standard</td>
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<td>AZ200 752</td>
<td>Standard + Analog O/P</td>
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<td>AZ200 757</td>
<td>Transmitter backplane</td>
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<tr>
<td>AZ200 785</td>
<td>USB to IrDA adaptor kit</td>
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#### Probe spares

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<td>AZ200 750</td>
<td>Length dependent – see below</td>
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<td>Thermocouple / electrode assembly</td>
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#### Probe length

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<td>AZ200 754</td>
<td>2.0 m (6.6 ft.)</td>
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#### AZ300 745

Cell assembly – includes C-ring and commissioning label

AZ200 727  Restrictor spares kit

AZ300 746  Diffuser flame arrestor assembly – includes C-ring

AZ200 798  Probe tool kit*  

*Included with probe as standard

#### Accessory

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<td>AZ200 731</td>
<td>Filter-regulator*</td>
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<td>AZ200 732</td>
<td>• ¼ NPT 5 µm</td>
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<td>• ¼ BSP 5 µm</td>
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<td>*Required for reference and test gas air</td>
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Pre-June 2013 regulator  Post-June 2013 regulator

AZ200 740  Filter elements for pre-June 2013 regulator:  

• 5µm filter element  
| AZ200 741   | Oil coalescing filter element                   |

AZ200 742  Filter elements for post-June 2013 regulator:  

• 5µm filter cartridge  
| AZ200 743   | Oil coalescing filter cartridge                 |
### Ordering information

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## Ordering information

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## Trademarks and acknowledgments

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