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 IIIIC
- 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 700 °C (1292 °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

Probe lengths up to 2.0 m (6.6 ft.) and industry-standard flange configurations
- Suitable for a wide range of applications
- Extensive installation options

Easy cell release
- Fully site-serviceable probe
- Easy access to internal components
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 700 °C (1292 °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.

Fig. 1: Probe and probe-mounted transmitter

Fig. 2: Probe and remote-mounted transmitter
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

Fig. 3: Zirconia cell
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.

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 gasses 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.

Fig. 5: DTM graphical interface

**Probe connections**
- Cell
- Thermocouple
- ACJC
- Heater

**AutoCal control**
- 2 Solenoid valve outputs
- 2 Test gas detection input

**HART communications**

**Analog output**
- Galvanically isolated
- Programmable over 4 to 20 mA

**Relay outputs**
- 2 x Relays
- Normally closed contacts
- 5 A @ 230 V AC, 30 V DC

**Analog output**
- Galvanically isolated
- Programmable over 0 to 20 mA

**Digital I/O**
- 2 User-configurable as input or output
- Input: volt-free contacts
- Output: 30 V DC @ 220 mA

**KEY**
- Standard
- Option
Endura AZ30
Combustion oxygen monitor

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 + H, Class II Zone 21 and Zone 22 – dust group III C plus Class I Division 1 gas groups BCD, Class II Division 1 dust groups EFG

**Transmitter / Terminal housing environment**

- IP66 and NEMA 4X
- 55 °C (131 °F)***
- –20 °C (–4 °F)***

**Flue / process**

- Process 1.1 bar absolute (44 in. WG)***
- Maximum process pressure
- 700 °C (1292 °F)
- –20 °C (–4 °F)

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

**EEx d barrier glands**/**/***  
Signal and mains cable M20 or ⅛ in. NPT options (not supplied)

**Mains**  
Supply

**Relays**

**Output signals**

**Pneumatic fittings***  
⅛ in. BSP, for 6 mm OD pipes (with metric cable gland option)  
or  
⅛ in. NPT for ¼ in. OD pipes (with ⅛ in. NPT cable gland option)

ABB supply options

- 0.5 to 2.0 m (1.7 to 6.6 ft.)
- Maximum surface temperature
- T4 135 °C (275 °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.
**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.**
Endura AZ30
Combustion oxygen monitor

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

![Diagram of AutoCal with air as test gas 1]

Fig. 6: AutoCal with air as test gas 1

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

![Diagram of Non-AutoCal with air as test gas 1]

Fig. 8: Non-AutoCal with air as test gas 1

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Fig. 7: AutoCal with 2 test gases

![Diagram of AutoCal with 2 test gases]

Fig. 9: Non-AutoCal with 2 test gases

![Diagram of Non-AutoCal with 2 test gases]
Overall dimensions and weights

Probe and integral transmitter dimensions

Dimensions in mm (in.)

<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 (42.90)</td>
<td>27.86 (61.42)</td>
</tr>
<tr>
<td>2.0 (6.6)</td>
<td>19.3 (49.78)</td>
<td>31.63 (69.73)</td>
</tr>
</tbody>
</table>

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
Endura AZ30
Combustion oxygen monitor

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>28.64 (63.23)</td>
</tr>
</tbody>
</table>

Remote transmitter dimensions

Dimensions in mm (in.)

Remote transmitter weights

<table>
<thead>
<tr>
<th>Remote transmitter unpacked – kg (lb)</th>
<th>Remote transmitter packed – kg (lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.5 (20.94)</td>
<td>12.5 (27.55)</td>
</tr>
</tbody>
</table>

*Wall- / Pipe-mount bracket plus U-bolt, pipe clamp and M8 fixings supplied as standard

**Certification requirement
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 (0.5 m [1.7 ft.] probes only)</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</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>Mounting Plate</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</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

*Comprising:
- Mounting plate
- Gaskets
- 6 Each:
  - M6 / M10 shakeproof washers
  - M6 / M10 plain washers
  - M6 / M10 nuts
Endura AZ30
Combustion oxygen monitor

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>152.4 (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>

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 ½ in NPT)
The M20 (or ½ 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>
<tr>
<td>Hebtrie screen / drain</td>
<td>White</td>
<td>(3) Screen (twisted pair / sleeved)</td>
<td>White / Green</td>
<td>0.5 mm²</td>
</tr>
<tr>
<td>4</td>
<td>White</td>
<td>(4) Thermocouple (negative)</td>
<td>White</td>
<td>0.5 mm²</td>
</tr>
<tr>
<td>5</td>
<td>Green</td>
<td>(5) Thermocouple (positive)</td>
<td>Green</td>
<td>0.5 mm²</td>
</tr>
<tr>
<td>6</td>
<td>Black</td>
<td>(6) Oxygen input (negative)</td>
<td>Black</td>
<td>0.5 mm²</td>
</tr>
<tr>
<td>7</td>
<td>Red</td>
<td>(7) Oxygen input (positive)</td>
<td>Red</td>
<td>0.5 mm²</td>
</tr>
<tr>
<td>8</td>
<td>Grey</td>
<td>(8) PT1000 Cold Junction Compensation</td>
<td>Grey</td>
<td>0.5 mm²</td>
</tr>
<tr>
<td>9</td>
<td>Violet</td>
<td>(9) PT1000 Cold Junction Compensation</td>
<td>Yellow</td>
<td>0.5 mm²</td>
</tr>
<tr>
<td>10</td>
<td>White / Yellow</td>
<td>(10) Pressure Switch (1) Gas 2</td>
<td>White / Yellow</td>
<td>0.5 mm²</td>
</tr>
<tr>
<td>11</td>
<td>White / Black</td>
<td>(11) Pressure Switch / Common</td>
<td>White / Black</td>
<td>0.5 mm²</td>
</tr>
<tr>
<td>12</td>
<td>White / Orange</td>
<td>(12) Pressure Switch / Gas 1</td>
<td>White / Orange</td>
<td>0.5 mm²</td>
</tr>
<tr>
<td>13</td>
<td>White / Green</td>
<td>(13) Solenoid Valve / Gas 1</td>
<td>White / Green</td>
<td>0.5 mm²</td>
</tr>
<tr>
<td>14</td>
<td>White / Red</td>
<td>(14) Solenoid Valve / Common</td>
<td>White / Red</td>
<td>0.5 mm²</td>
</tr>
<tr>
<td>15</td>
<td>White / Blue</td>
<td>(15) Solenoid Valve / Gas 2</td>
<td>White / Blue</td>
<td>0.5 mm²</td>
</tr>
</tbody>
</table>

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

- Mains power
- Relays
- Comms
- Earth
- Power supply / output terminals (behind transmitter lid)
- Remote transmitter / terminal housing
- External earth connection
- Integral transmitter

*Mains power connections*:
- L
- N
- 10 NC
- 9 C
- 8
- 7 NC
- 6 C
- 5
- 4 +
- 3 –
- 2
- 1

*Relay 1 connections*:
- Relay 1
- NC
- C

*Relay 2 connections*:
- Relay 2
- C

*Current output (4 to 20 mA) HART connections*:
- +
- –

*Option board connections*:

<table>
<thead>
<tr>
<th></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>
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
- T90 < 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 to 70 °C [-4 to 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: 2001

Approvals and safety certification:
- CE mark
- cFMus
- ATEX
Probe specification

Hazardous area certifications
- II 2 GD
- Ex d 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:
- 316 stainless steel

Mounting angle:
- Horizontal to vertically down

Threaded entries
Gland entry (certified):
- probe cable gland entry: 1 x M25 or (optional) ⅜ 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: ⅛ in. BSP for 6 mm OD pipe (with M20 cable gland option) or ⅜ in. NPT for ⅜ in. OD pipe (with ⅜ 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 700 °C (–4 to 1292 °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
Endura AZ30 Combustion oxygen monitor

Transmitter specification

Hazardous area certifications
Transmitter
- Ex II 2 GD
- Ex d IIB +H2 T6 Gb (Ta -20°C to 55°C)
- Ex tb IIIC T85°C Db IP66 (Ta -20°C to 55°C)
- Certified component
- IECEx BAS12.0050U
- Baseefa12ATEX0078U

- Class I Division 1 Groups BCD T6
- Class I Zone 1 AEx/Ex d IIB+H2 T6
- Class II Division 1 Groups EFG T6
  (Ta -20 °C to +55 °C) Type 4X
- FM Certificate No. 3039243
- Max Current 1.2A

Remote terminal housing
- Ex II 2 GD
- Ex d IIB +H2 T6 Gb (Ta -20°C to 70°C)
- Ex tb IIIC T85°C Db (Ta -20°C to +70°C) IP66
- Cert. No IECEx BAS12.0049X
- ATEX Cert No. Baseefa12ATEX0077X

- Class I Division 1 Groups BCD T6
- Class I Zone 1 AEx/Ex d IIB+H2 T6
- Class II Division 1 Groups EFG T6
  (Ta -20 °C to +70 °C) Type 4X
- FM Certificate No. 3039243

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:
- 316 stainless steel

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 ¼ 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)

*For driving internal automatic calibration (AutoCal) probes or can be used to drive external calibration units on remote transmitters only.
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

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:
—user-configurable for:
  — 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

Analogue 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
Endura AZ30
Combustion oxygen monitor

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
### Spares and accessories

#### Documentation and software

<table>
<thead>
<tr>
<th>Part number</th>
<th>Description</th>
</tr>
</thead>
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*Enter this address in your browser and search MI/AZ30M–EN – the Maintenance Guide is the top link.

#### AZ30 DTM Software

Device Type Manager – contact ABB for details

#### Transmitter spares

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>AZ200 750</td>
<td>AZ30 Transmitter cartridge</td>
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<tr>
<td>AZ200 751</td>
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<td>AZ200 752</td>
<td>— Standard + Analog O/P</td>
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<td>AZ200 757</td>
<td>— Standard + Digital O/P</td>
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<td>AZ200 785</td>
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#### Accessories

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<td>AZ200 731</td>
<td>Coalescing filter-regulator*</td>
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<td>AZ200 732</td>
<td>— ⅛ NPT 5 µm</td>
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<td>— ⅛ BSP 5 µm</td>
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*Required for Reference and test gas air

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#### Probe spares

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<tr>
<td>AZ200 701</td>
<td>Thermocouple / electrode assembly</td>
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<td>AZ200 702</td>
<td>Length dependant – see below</td>
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<td>AZ200 706</td>
<td>2.0 m (6.6 ft.)</td>
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<td>AZ200 727</td>
<td>Restrictor spares kit</td>
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#### Probe tool kit

*Included with probe as standard
## Ordering information

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