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.

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**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.

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**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.

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**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.

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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 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.

Figure 5  DTM graphical interface
**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

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**Transmitter / Terminal housing environment**

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

**Flue / process**

- Process 1.1 bar absolute (44 in. WG)***
- Maximum process pressure
- –20 °C (–4 °F) ***
- 800 °C (1472 °F)

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

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**EEEx d barrier glands**/** ***

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

**Mains supply**

**Relays**

**Output signals**

**Pneumatic fittings**

¼ in. BSP, for 6 mm OD pipes (with metric cable gland option) or ¼ in. NPT for ¼ in. OD pipes (with 1/2 in. NPT cable gland option)

ABB supply options

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*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.
**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**

-20 °C (-4 °F)

70 °C (158 °F)

-20 °C (-4 °F)**

55 °C (131 °F)

70 °C (158 °F)***

0.5 to 2.0 m (1.7 to 6.6 ft.)

Maximum surface temperature
T4 135 °C (275 °F)

**Flue / process**

Process 1.1 bar absolute (44 in. WG)***

Maximum process pressure

70 °C (158 °F)

55 °C (131 °F)

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

**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.

Mains supply
Relays
Output signals

M20 or 1/2 in. NPT options (not supplied)

ABB supply options

Pneumatic fittings*
1/4 in. BSP, for 6 mm OD pipes (with metric cable gland option) or 1/4 in. NPT for 1/4 in. OD pipes (with 1/4 in. NPT cable gland option)

Note. 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

![Diagram of AutoCal with air as test gas 1](image1)

![Diagram of AutoCal with 2 test gases](image2)

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

![Diagram of Non-AutoCal with air as test gas 1](image3)

![Diagram of Non-AutoCal with 2 test gases](image4)
Overall dimensions and weights

Probe and integral transmitter dimensions

Dimensions in mm (in.)

| 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) |
| 341 (13.4) |  |
| 390 (15.3) |  |
| 407 (16.0) |  |
| 168 (6.6) |  |
| Ø 135 (5.3) |  |
| Ø 62 (2.4) |  |

For flange dimensions refer to page 11

 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 (37.99)</td>
<td>27.86 (61.42)</td>
</tr>
<tr>
<td>2.0 (6.6)</td>
<td>19.3 (42.98)</td>
<td>31.63 (69.73)</td>
</tr>
</tbody>
</table>
Overall dimensions and weights

Remote probe dimensions
Dimensions in mm (in.)

- 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

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.)

- Wall-mount installation*
  - Use only ABB-supplied bolts – M8 x 1.25 pitch x 35 mm (SS hex. head)**

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</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>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</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>152.4 (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 SK</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 SK</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 SK</td>
<td>200 (7.87)</td>
<td>12 (0.47)</td>
<td>19 (0.75)</td>
<td>165 (6.50)</td>
</tr>
</tbody>
</table>

Standard mounting plate for 1.0 to 2 m (3.3 to 6.6 ft.) probes – Part No. AZ200 795

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

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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></td>
<td></td>
<td><strong>Heater screen / drain</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Separately screened signal cables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Chassis earth</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yellow (SCN)</td>
<td>Terminal label color: Yellow (SCN)</td>
<td>Cable color: Yellow (SCN)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3) Screen (twisted pair / sleeved)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></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>Violet</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>
<tr>
<td></td>
<td></td>
<td><strong>Signal cables screen / drain</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></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

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*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

Remote transmitter / terminal housing

Integral transmitter

Power supply / output terminals (behind transmitter lid)

External earth connection

Mains power

Relay 1

Relay 2

Current output (4 to 20 mA) HART

*Option board connections

Analog output

Digital I/O

DIO1

DIO2

COM

<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>
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 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
### 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:**
- 316L stainless steel

**Mounting angle:**
- Horizontal to vertically down

#### Threaded entries

**Gland entry (certified):**
- probe cable gland entry: 1 x M25 or (optional) ¼ 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: 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:**
- 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
- 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 +70 °C) Type 4X
- FM Certificate No. 3039243
- Max current 1.2A

Remote terminal housing
- 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:
- 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 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)

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:**
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

**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>
<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> *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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<th>Description</th>
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<tr>
<td>AZ200 750</td>
<td>AZ30 Transmitter cartridge</td>
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<td>AZ200 751</td>
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<tr>
<td>AZ200 752</td>
<td>• Standard + Analog O/P</td>
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<td>AZ200 752</td>
<td>• Standard + Digital O/P</td>
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<tr>
<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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#### Accessories

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<th>Part number</th>
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<tr>
<td>AZ200 731</td>
<td>Coalescing filter-regulator*</td>
</tr>
<tr>
<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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</table>

| AZ200 740   | Filter elements for pre-June 2013 regulator: |
| AZ200 741   | • 5µm filter element |
| AZ200 742   | • Oil coalescing filter element |
| AZ200 743   | Filter elements for post-June 2013 regulator |
|             | • 5µm filter cartridge |
|             | • Oil coalescing filter cartridge |

#### Probe spares

<table>
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<th>Part number</th>
<th>Description</th>
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<tr>
<td>Length dependant – see below</td>
<td>Thermocouple / electrode assembly</td>
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</table>

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<td>AZ200 703</td>
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<tr>
<td>2.0 m (6.6 ft.)</td>
<td>AZ200 704</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* |
| AZ200 799 | NPT (AZ30) |
|           | BSP (AZ30) |
|           | *Included with probe as standard
### Ordering information

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### Ordering information

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<th>AZ30/</th>
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</thead>
</table>

#### Flange type
- None (no probe required)  
- ABB standard flange  
- DIN 65 mm flange  
- DIN 80 mm flange  
- DIN 100 mm flange  
- ANSI 2 in flange  
- ANSI 2.5 in flange  
- ANSI 3 in flange  
- ANSI 4 in flange  
- JIS 65 mm flange  
- JIS 80 mm flange  
- JIS 100 mm flange  

#### Thermocouple type
- None (no probe required)  
- Type K

#### Cell options
- None (no probe required)  
- Standard cell

#### Cable (excludes barrier glands)
- None  
- 5 m (16 ft.)  
- 10 m (33 ft.)  
- 25 m (82 ft.)  
- 50 m (164 ft.)  
- 75 m (246 ft.)  
- 100 m (328 ft.)

#### Cable type
- None  
- STD

#### Ex gland option
- None  
- M25  
- ¾ in. NPT

#### Certification option
- ATEX / IECEx  
- FMus  
- cFM  
- ATEX/IECEx + MCERTS  
- EAC

#### Language
- English  
- German  
- French  
- Spanish  
- Italian  

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