

ABB MEASUREMENT & ANALYTICS | DATA SHEET

Endura AZ25 oxygen analyzer

Combustion gas analysis



Measurement made easy

Superior technology and quality from the world leader in oxygen measurement

Dependable

- Measurement of O₂ in a wide variety of processes
- Virtually instantaneous response
- Resistance to sulphurous reducing atmospheres

Versatile

- 600 to 1250 mm (2 to 4 ft.) lengths
- Choice of protective sheath materials
- Integral thermocouple for automatic temperature compensation
- High temperature operation up to 1400 °C (2552 °F)

Low cost-of-ownership

- In situ measurement
- No sampling system required
- Automatic calibration functionality as standard
- Optional automatic calibration hardware

Introduction

The Endura AZ25 combustion oxygen analyzer is the latest in a long line of high-quality, combustion gas analyzers from ABB. The AZ25 is designed to measure oxygen concentration in high temperature furnace atmospheres.

The sensor, based on a zirconium oxide cell, is mounted at the tip of the probe that is inserted directly into the furnace. The resulting direct, in-situ measurement provides an accurate and rapid oxygen reading, for combustion control / optimization and process quality control purposes.

The in-situ technique provides a true oxygen measurement inside the process. It eliminates 'equilibrium shift' that is common to systems in which gas samples are extracted and cooled before measurement.

Reference air (500 to 1000 ml/min [1 to 2 ft³/hr]) is required for accurate operation and can be supplied from an ABB mains-powered pump unit or a flow regulator unit.

Applications

- Furnace atmosphere monitoring
- Annealing furnace
- Sintering of metals
- Ferrite sintering
- Whiteheart malleablizing
- Combustion measurement and control in:
 - Soaking pits
 - Process heaters
 - Fluidized bed boilers
 - High temperature incinerators
- All other combustion processes where the flue gas temperature is in excess of 600 °C (1112 °F)

Probe lengths up to 1250 mm (49 in.)

A wide range of probe insertion lengths allows for optimum sensor positioning within the furnace or flue duct to ensure accurate and representative oxygen measurement.

A comprehensive range of mounting flanges, provide simple installation when plant-wide standard flanges are required or when replacing existing probes.

The remote transmitter can be mounted up to 100 m (328 ft.) from the probe. Probe locations are often high temperature, hostile and inaccessible areas, the flexibility of long cable lengths permits appropriate siting of the remote transmitter.

Sheath material options

To ensure material compatibility with the process conditions there is a choice of three sheath materials:

- Aluminous porcelain
 - Entry level sheath material suitable for applications with temperatures up to 1250 °C (2282 °F).
 - Limited resistance to corrosive chemicals and mechanical and thermal stress.
- Recrystallized alumina
 - Suitable for applications with temperatures up to 1400 °C (2552 °F).
 - Resistant to corrosive chemicals and severe mechanical and thermal stress.
- Incoloy 800
 - Suitable for applications with temperatures up to 850 °C (1562 °F) when mounted horizontally and up to 1000 °C (1832 °F) when mounted vertically.
 - Limited resistance to corrosive chemicals but resistant to mechanical and thermal stress.

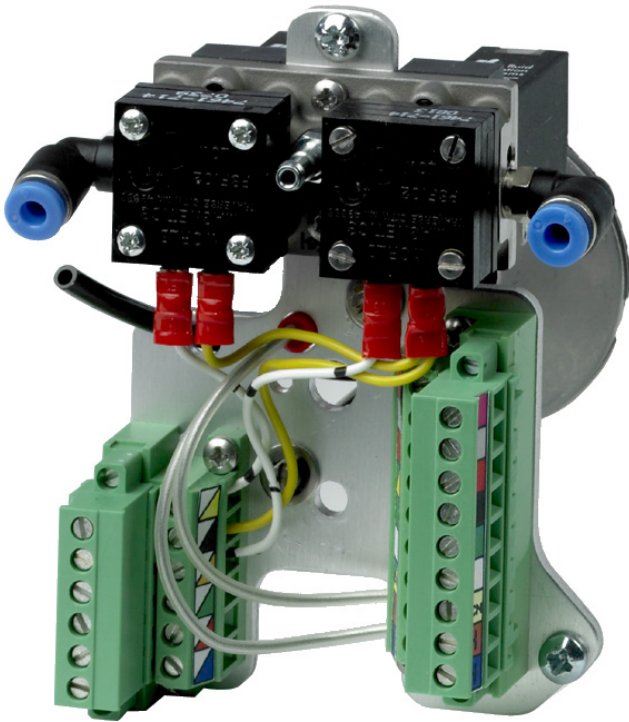


Unique integrated automatic calibration

The Endura AZ25 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 analyzer's performance.

Long-term operation without technician intervention minimizes operating costs, total cost-of-ownership and optimizes system accuracy. A significant proportion of service visits to an analyzer result in 'no fault found'. Endura AZ25's high-quality manufacture, advanced diagnostics and automatic calibration is targeted at reducing this wasted effort and cost.



Advanced transmitter

The Endura AZ25 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.

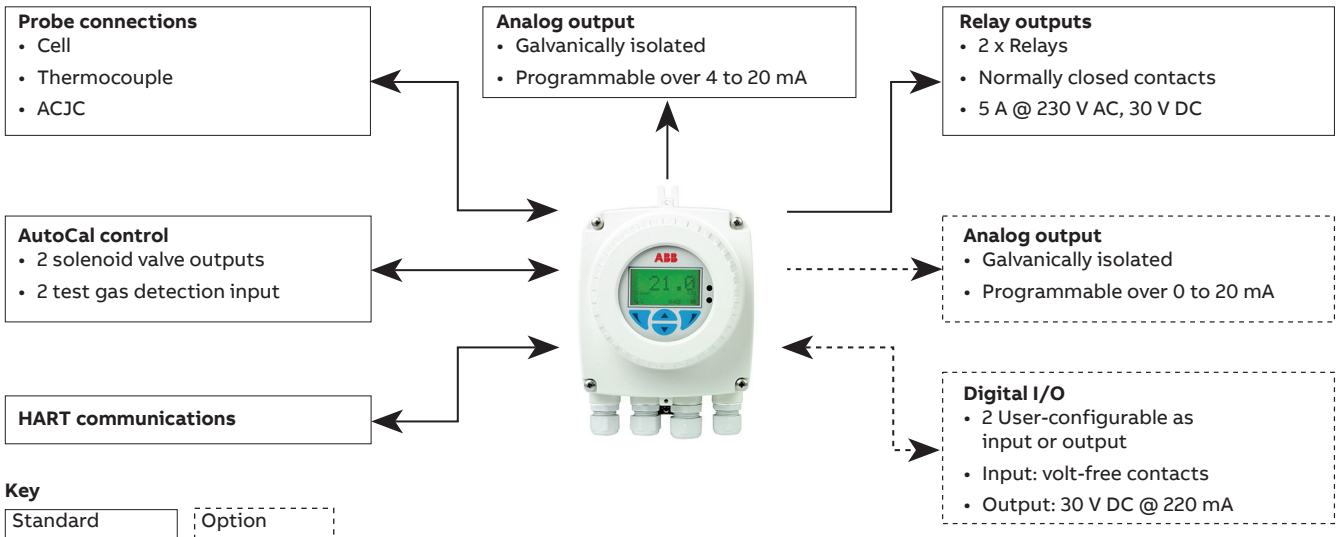
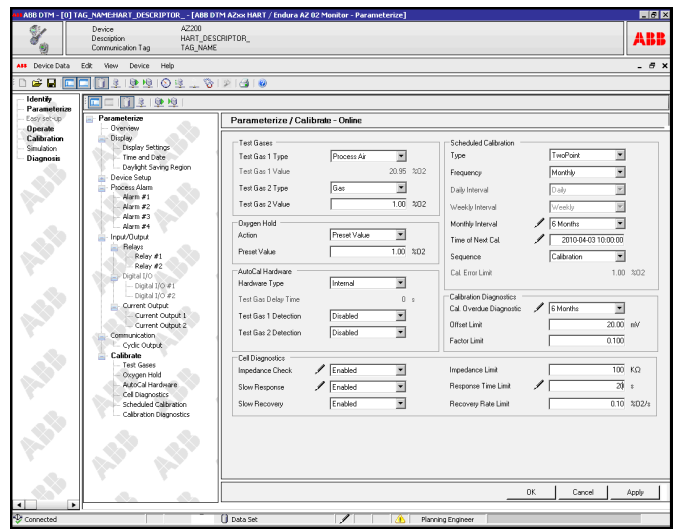
Advanced diagnostics, in accordance with NAMUR NE107, classify alarms and warnings as 'Maintenance Required', 'Check Function', 'Failure' and 'Out-of-Specification'. Cell performance is monitored by the transmitter; indicators such as cell impedance, rate-of-response to test gasses and changes in calibration 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 AZ25 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 hyper-terminal interface or a PC. The device's firmware can also be upgraded using this port.



System location requirements

Endura AZ25 system without AutoCal

IP66 (NEMA 4) ✓

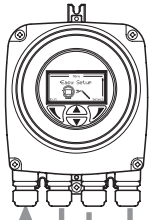


100 °C (212 °F) ✓
-20 °C (-4 °F) ✓

1400 °C (2552 °F) ✓
600 °C (1112 °F) ✓

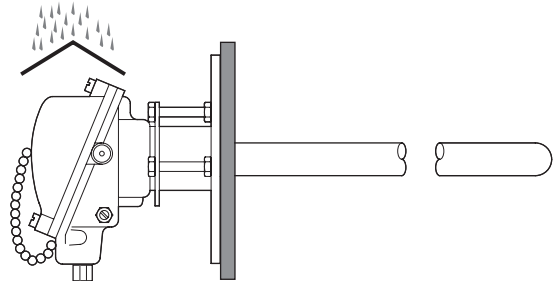
Endura AZ25 remote transmitter

55 °C (131 °F) ✓
-20 °C (-4 °F) ✓



Mains supply
Relays
Output signals

Endura AZ25 probe



6-core screened sensor cable (coded option) – maximum length 100 m (328 ft.)

*Maximum temperature is sheath-dependant – see 'Sheath material options' on page 3.

Endura AZ25 system with AutoCal

IP66 (NEMA 4) ✓

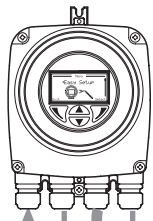


100 °C (212 °F) ✓
-20 °C (-4 °F) ✓

1400 °C (2552 °F) ✓
600 °C (1112 °F) ✓

Endura AZ25 remote transmitter

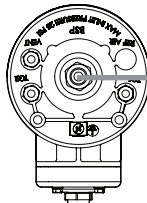
55 °C (131 °F) ✓
-20 °C (-4 °F) ✓



Mains supply
Relays
Output signals

Endura AZ25 AutoCal unit

55 °C (131 °F) ✓
-20 °C (-4 °F) ✓



Endura AZ25 probe

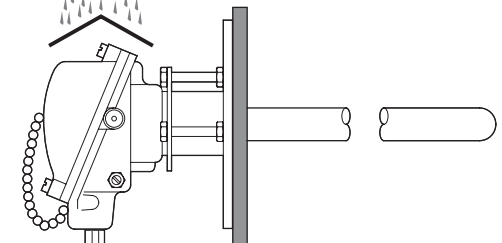


ABB 14-core screened cable (coded option)

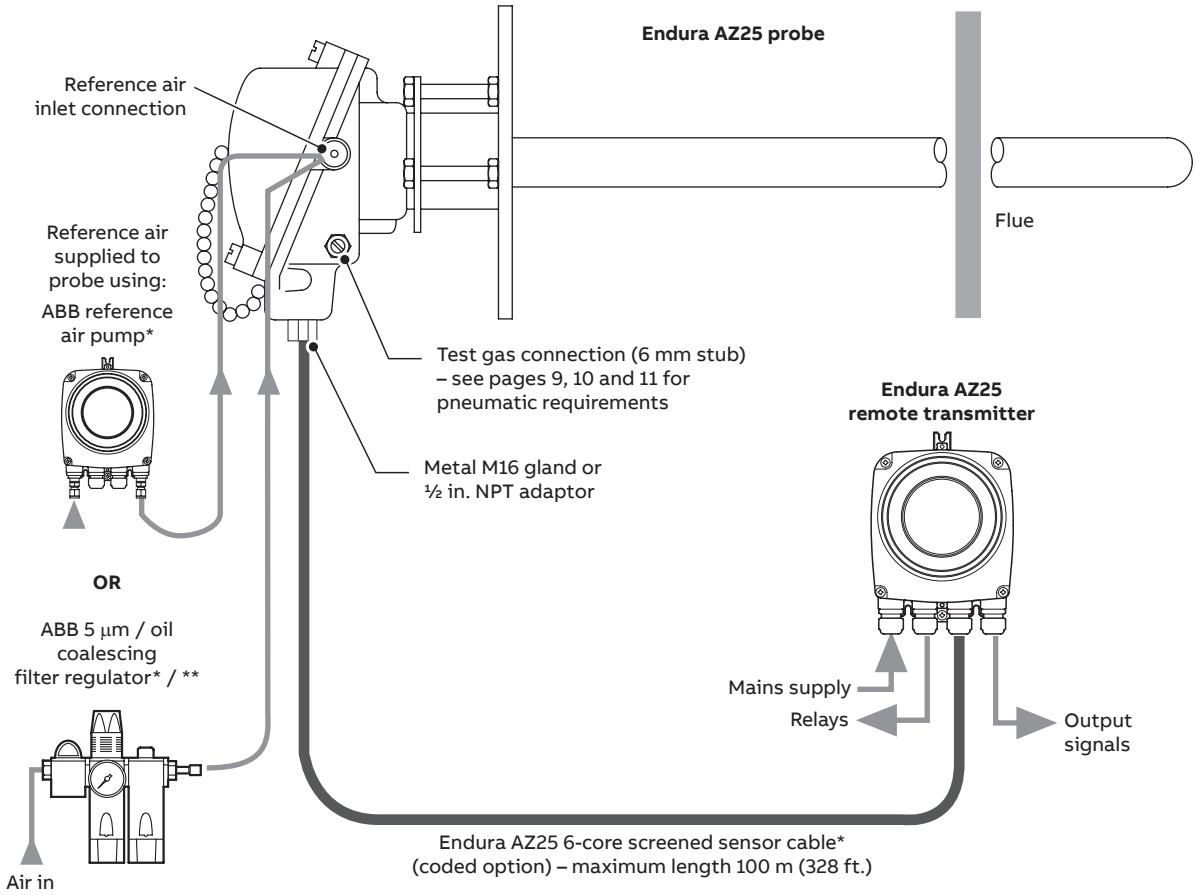
6-core screened sensor cable (coded option)

Maximum cable length (combined 6-core and 14-core runs) length 100 m (328 ft.)

*Maximum temperature is sheath-dependant – see 'Sheath material options' on page 3.

System options

Endura AZ25 system without AutoCal

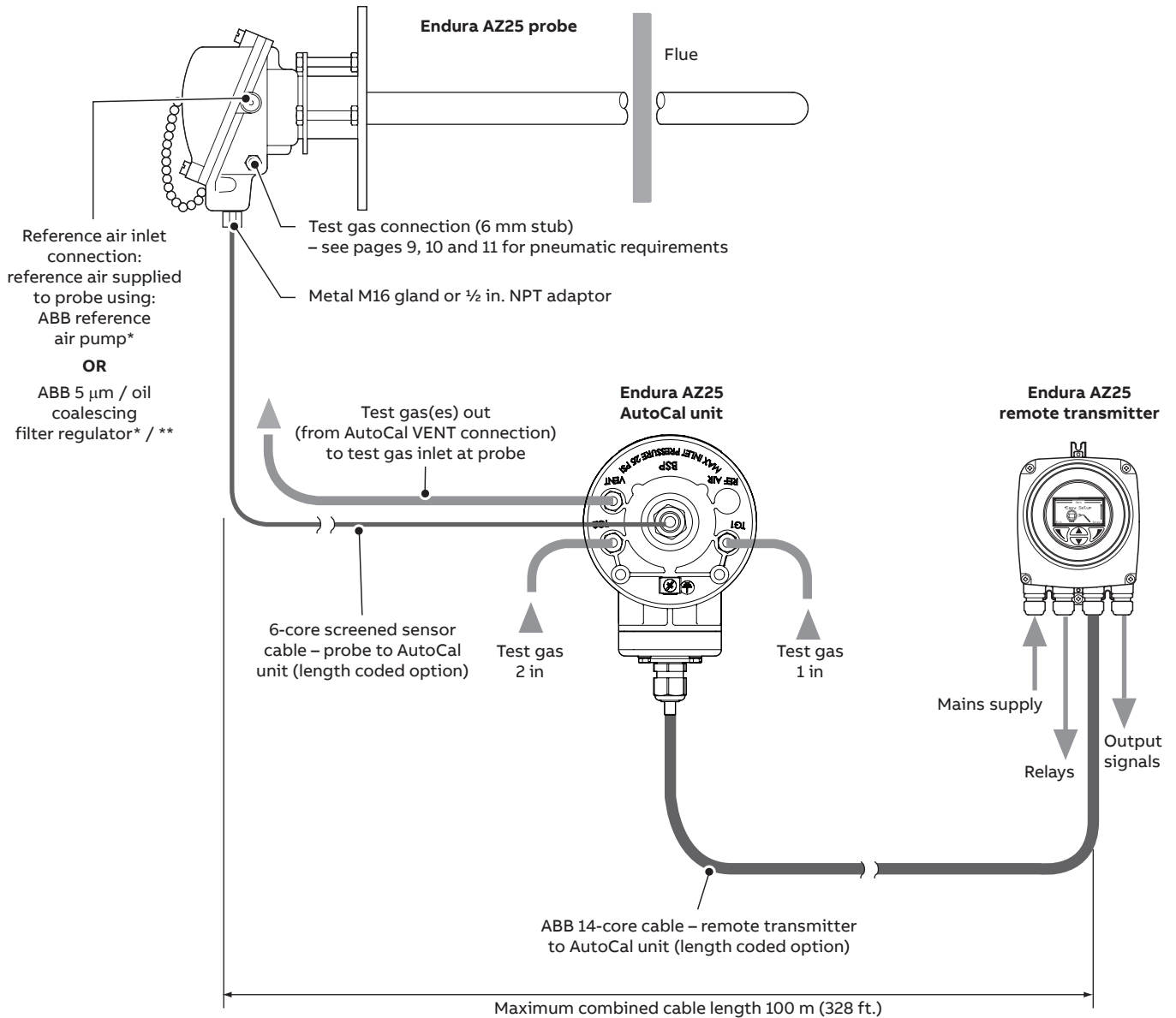


*Refer to page 25 for ABB part numbers

**Clean dry instrument air free from hydrocarbons

...System options

Endura AZ25 system with AutoCal

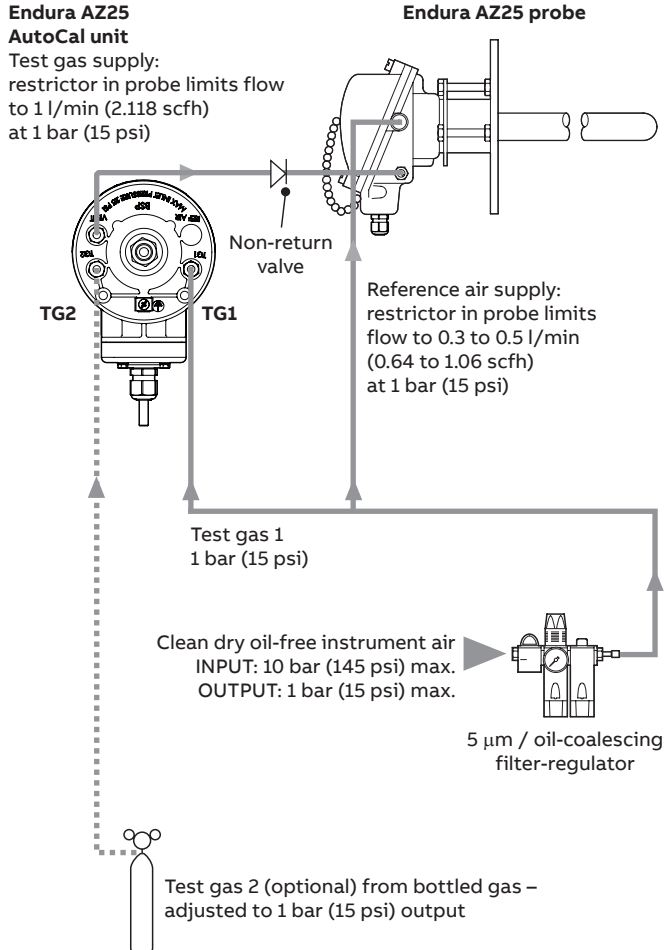


*Refer to page 23 for ABB part numbers

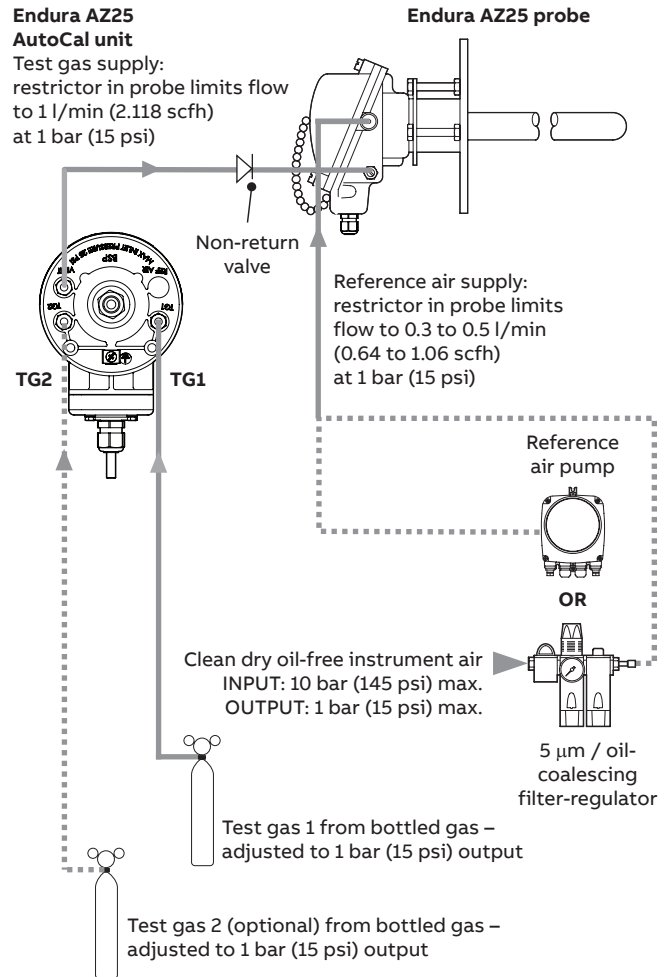
**Clean dry instrument air free from hydrocarbons

Test gas and reference air supply configurations – AutoCal systems with restrictors

System using air as test gas 1 and bottled gas as (optional) test gas 2

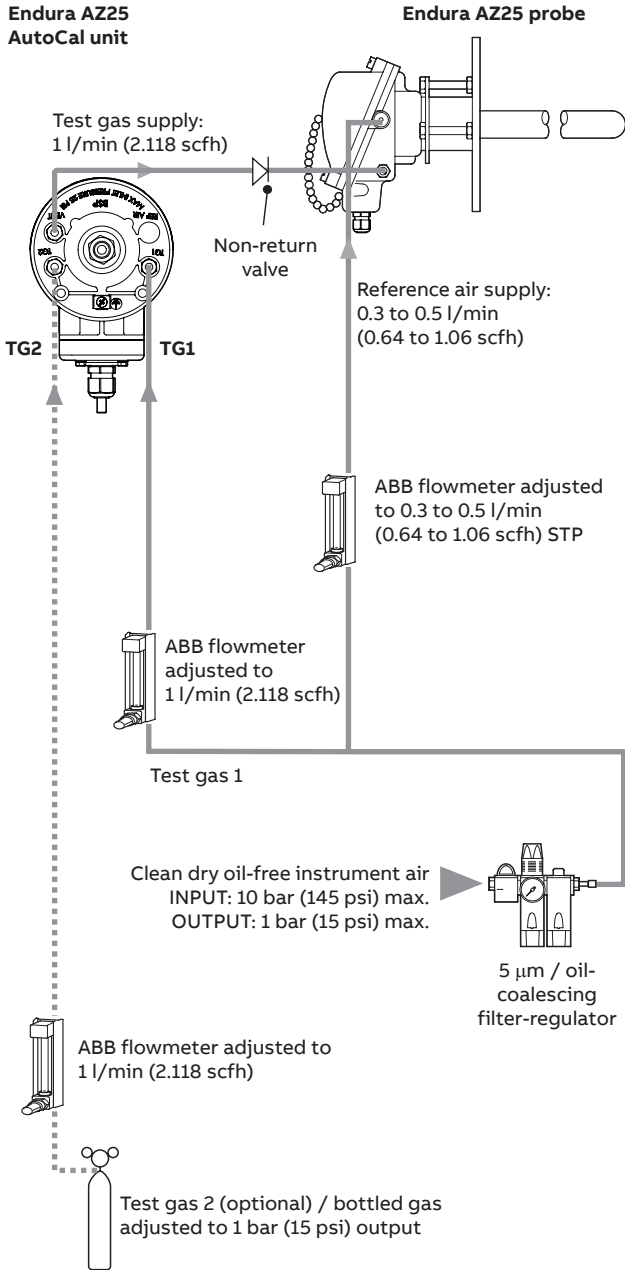


System using 2 bottled test gases

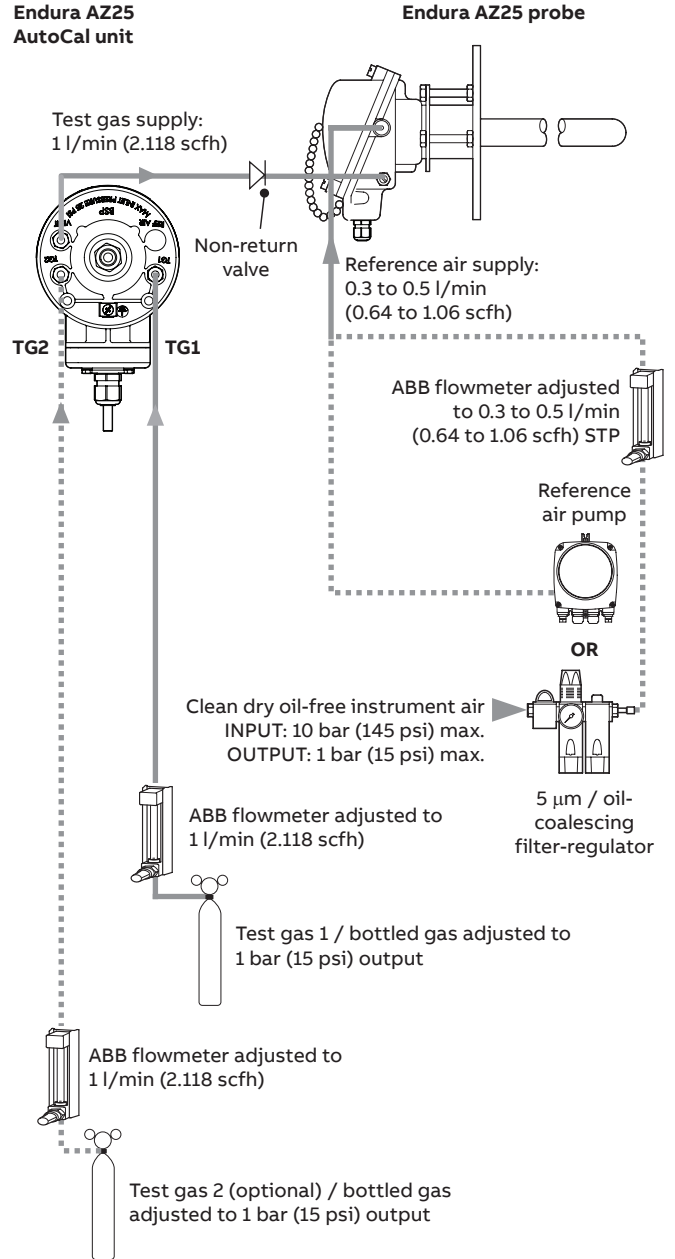


...Test gas and reference air supply configurations – AutoCal systems without restrictors

System using air as test gas 1 and bottled gas as (optional) test gas 2



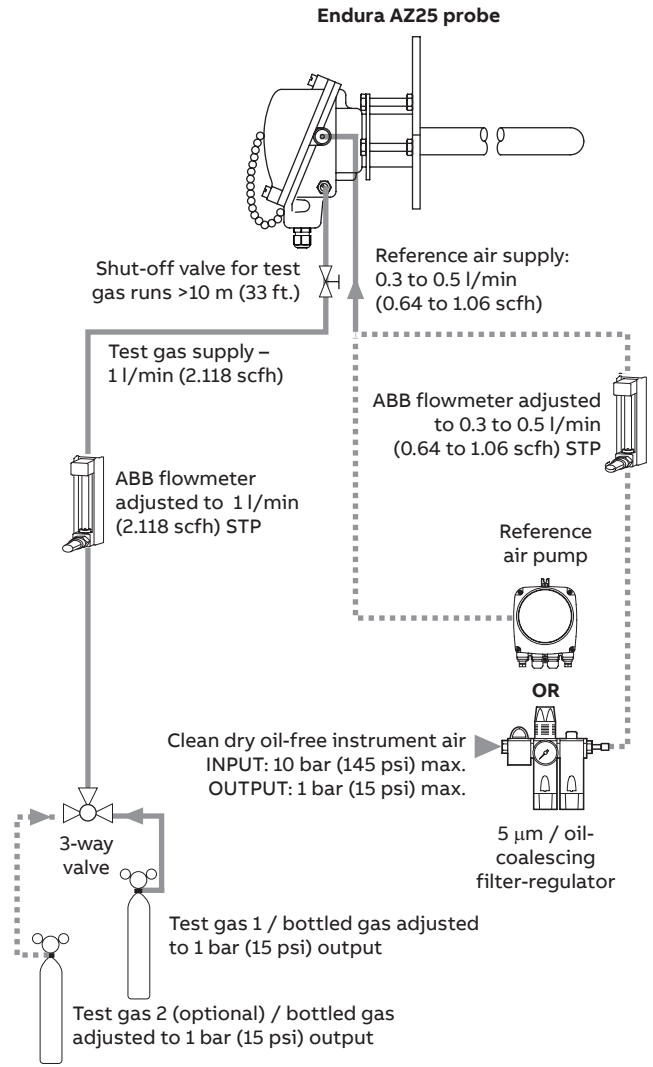
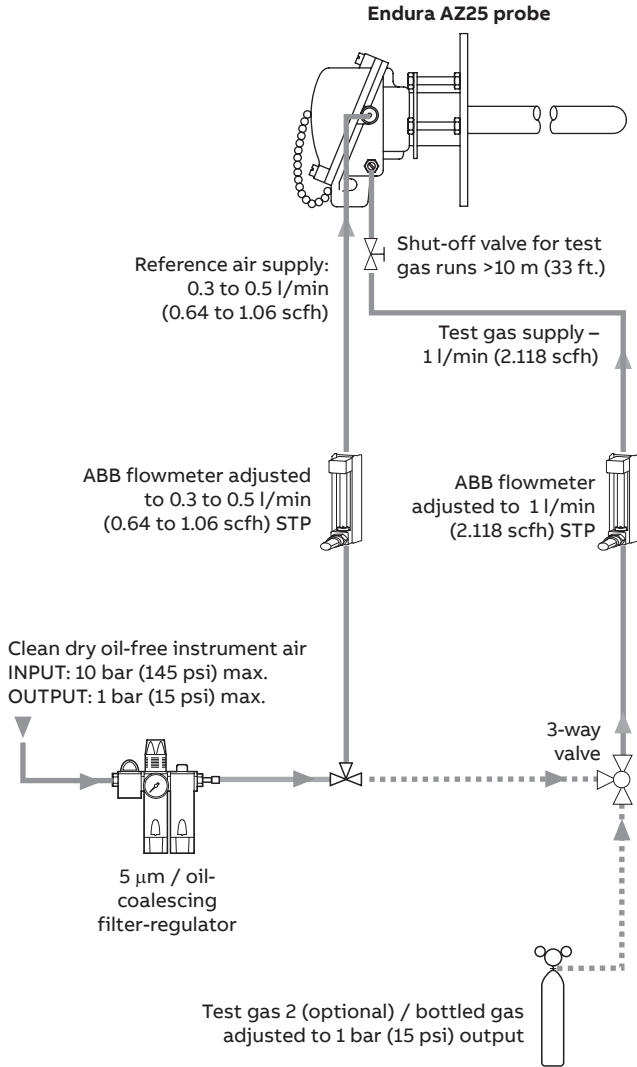
System using 2 bottled test gases



Test gas and reference air supply configurations – non-AutoCal systems without restrictors

System using air as test gas 1 and bottled gas as (optional) test gas 2

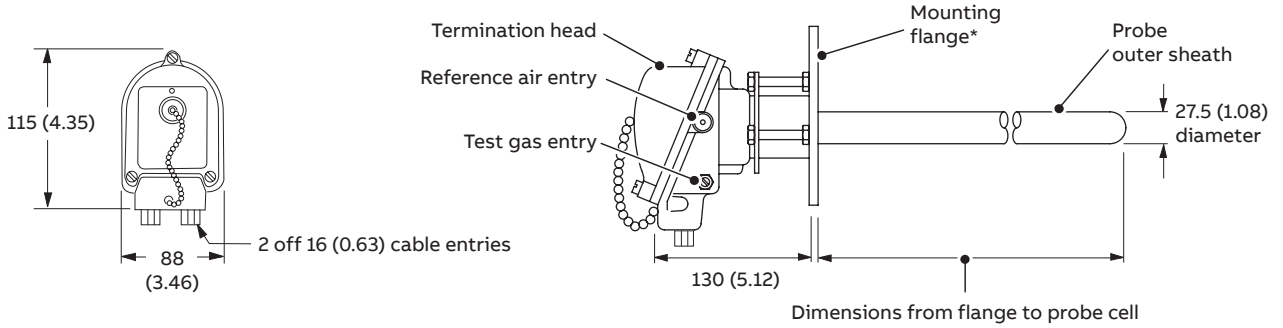
System using 2 bottled test gases



Overall dimensions

Probe

Dimensions in mm (in.)

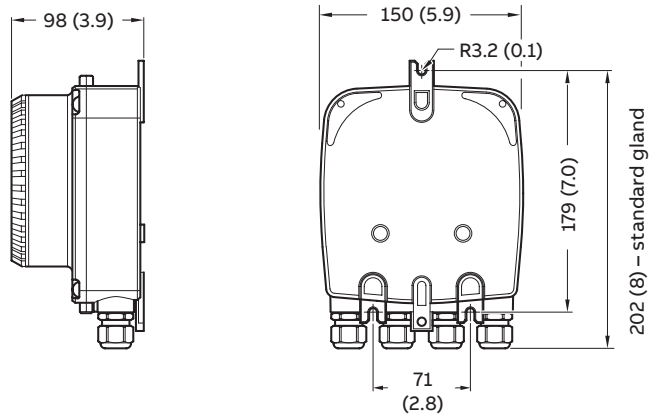


| Probe length | Probe insertion length |
|---------------------|------------------------|
| 500 mm (23.62 in.) | 556 mm (21.89 in.) |
| 700 mm (27.56 in.) | 701 mm (27.60 in.) |
| 800 mm (31.50 in.) | 801 mm (31.53 in.) |
| 900 mm (35.43 in.) | 901 mm (35.47 in.) |
| 1000 mm 39.37 in.) | 956 mm (37.64 in.) |
| 1250 mm (49.21 in.) | 1251 mm (49.25 in.) |

*Fixing holes in mounting flange to be drilled by customer – see page 14 for flange details

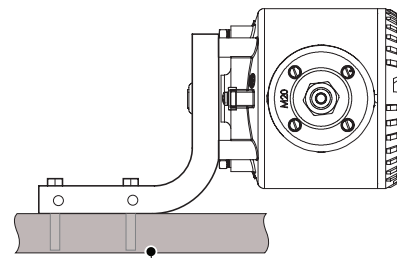
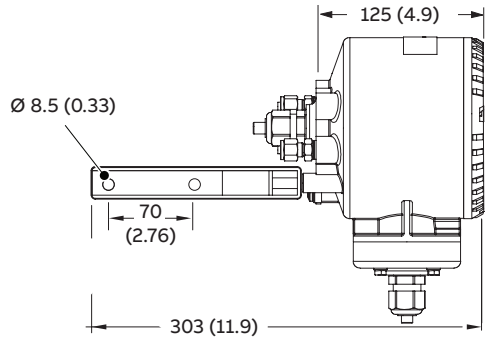
Transmitter (standard gland shown)

Dimensions in mm (in.)



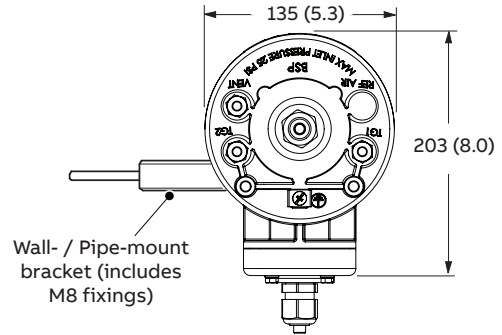
AutoCal unit (with wall / pipe-mounting bracket)

Dimensions in mm (in.)

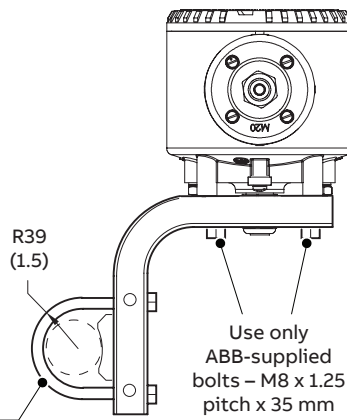


Wall-mount arrangement
2 x M8 fixings through bracket

Pipe-mount arrangement using U-bolt / pipe clamp
Minimum clamping dia. 42 (1.65)
Maximum clamping dia. 60 (2.36)



Wall- / Pipe-mount
bracket (includes
M8 fixings)



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

...Overall dimensions

Probe flanges (all probe lengths) and mounting plates for standard probe flanges

Dimensions in mm (in).

The pressure ratings for these flanges do not apply.

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

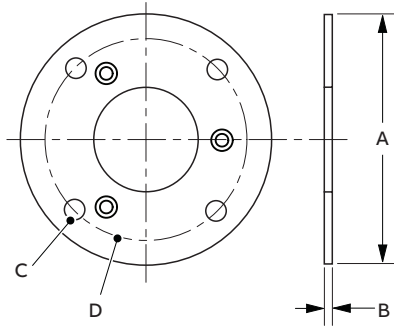


Table 1 4-hole probe flanges

| Flange type | A | B | C (Ø) | D (PCD) |
|--------------|------------|----------|------------|-----------|
| ABB standard | 101 (3.97) | 6 (0.24) | 7.3 (0.29) | 80 (3.15) |

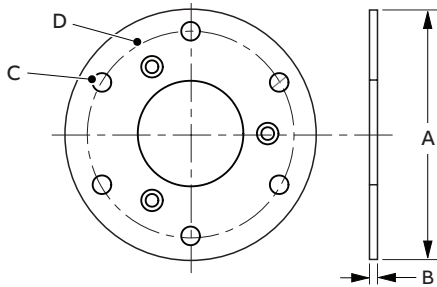


Table 2 ABB 6-hole probe flanges

| Flange type | A | B | C (Ø) | D (PCD) |
|----------------|-------------|-----------|-----------|--------------|
| ANSI 4 in. 150 | 228.6 (9.0) | 12 (0.47) | 19 (0.75) | 190.5 (7.50) |
| DIN 80 PN16 | 200 (7.87) | 12 (0.47) | 18 (0.70) | 160 (6.30) |
| DIN 100 PN16 | 220 (8.66) | 12 (0.47) | 18 (0.70) | 180 (7.08) |
| JIS 100 5K | 200 (7.87) | 12 (0.47) | 19 (0.75) | 165 (6.50) |

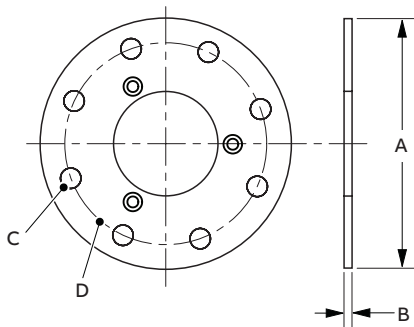


Table 3 8-hole probe flanges

| Mounting plate | A | B | C | D |
|----------------|-----------|-----------|----------|-----------|
| ABB standard | 160 (6.3) | 160 (6.3) | 7 (0.27) | 16 (0.63) |

Comprising: mounting plate, gasket, 6 each: M6 / M10 shakeproof washers, plain washers and nuts

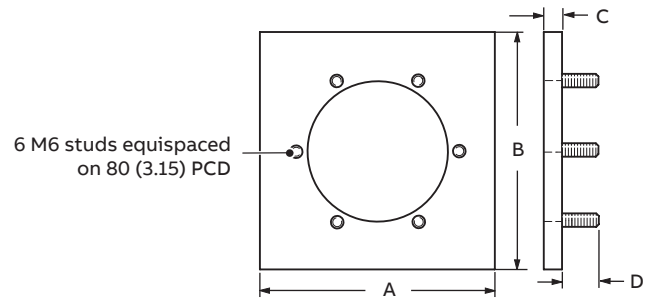


ABB standard flange mounting plate – part no. AZ200 796

Table 4 ABB flange mounting plate

| Blank flange | A | B | C |
|---------------|------------|---------|--|
| ZGP2 heritage | 125 (4.92) | 5 (0.2) | Fixing holes (location / quantity) drilled by customer |

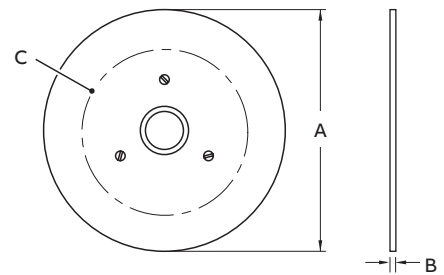


ABB standard flange mounting plate – part no. AZ200 796

Table 5 ABB blank (heritage) flange

| Flange type | A | B | C |
|-----------------|-------------|-----------|-----------|
| 1 in. NPT / BSP | 69.8 (2.74) | 15 (0.59) | 45 (1.77) |

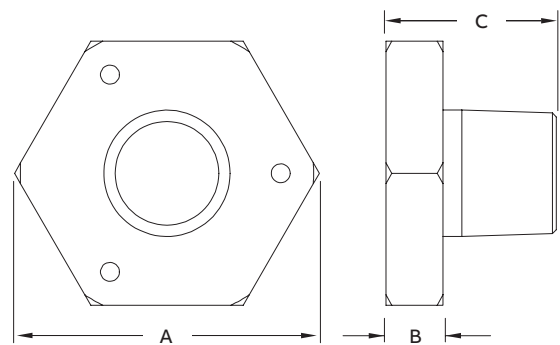


ABB standard flange mounting plate – part no. AZ200 796

Table 6 NPT / 1 in. BSP mounting flange

Weights (excluding flanges)

Transmitter / AutoCal unit

| Transmitter only – unpacked | AutoCal unit only – packed / unpacked | AutoCal unit with bracket – unpacked |
|-----------------------------|---------------------------------------|--------------------------------------|
| 4.4 kg (8.8 lb) | 8.5 kg (18.7 lb) / 3.0 kg (6.6 lb) | 11.0 kg (24.5 lb) |

Probe with aluminous porcelain sheath

| Probe version | Total probe length | Probe-only – packed /unpacked | Probe + Tx – packed / unpacked |
|---------------------|---------------------|------------------------------------|-------------------------------------|
| 500 mm (23.62 in.) | 686 mm (27.01 in.) | 3.9 kg (8.5 lb) / 1.4 kg (3.0 lb) | 6.4 kg (14.0 lb) / 3.9 kg (8.5 lb) |
| 700 mm (27.56 in.) | 831 mm (32.72 in.) | 4.1 kg (9.0 lb) / 1.6 kg (3.5 lb) | 6.6 kg (14.5 lb) / 4.1 kg (9.0 lb) |
| 800 mm (31.50 in.) | 931 mm (36.56 in.) | 4.2 kg (9.2 lb) / 1.7 kg (3.7 lb) | 6.7 kg (14.7 lb) / 4.2 kg (9.2 lb) |
| 900 mm (35.43 in.) | 1031 mm (40.59 in.) | 4.3 kg (9.4 lb) / 1.8kg (3.9 lb) | 6.8 kg (14.9 lb) / 4.3 kg (9.4 lb) |
| 1000 mm (39.37 in.) | 1086 mm (42.76 in.) | 4.4 kg (9.6 lb) / 1.9 kg (4.1 lb) | 6.9 kg (15.1 lb) / 4.4 kg (9.6 lb) |
| 1250 mm (49.21 in.) | 1381 mm (54.37 in.) | 5.8 kg (12.8 lb) / 2.1 kg (4.5 lb) | 8.3 kg (18.3 lb) / 4.6 kg (10.0 lb) |

Probe with Incoloy 800 (1.4876) sheath

| Probe version | Total probe length | Probe-only – packed /unpacked | Probe + Tx – packed / unpacked |
|---------------------|---------------------|------------------------------------|-------------------------------------|
| 500 mm (23.62 in.) | 686 mm (27.01 in.) | 4.7 kg (10.2 lb) / 2.2 kg (4.7 lb) | 7.2 kg (15.7 lb) / 4.7 kg (10.2 lb) |
| 700 mm (27.56 in.) | 831 mm (32.72 in.) | 5.0 kg (10.9 lb) / 2.5 kg (5.4 lb) | 7.5 kg (16.4 lb) / 5.0 kg (10.9 lb) |
| 800 mm (31.50 in.) | 931 mm (36.56 in.) | 5.2 kg (11.3 lb) / 2.7 kg (5.8 lb) | 7.7 kg (16.8 lb) / 5.2 kg (11.3 lb) |
| 900 mm (35.43 in.) | 1031 mm (40.59 in.) | 5.4 kg (11.8 lb) / 2.9 kg (6.3 lb) | 7.9 kg (17.3 lb) / 5.4 kg (11.8 lb) |
| 1000 mm (39.37 in.) | 1086 mm (42.76 in.) | 5.6 kg (12.2 lb) / 3.1 kg (6.7 lb) | 8.1 kg (17.7 lb) / 5.6 kg (12.2 lb) |
| 1250 mm (49.21 in.) | 1381 mm (54.37 in.) | 7.2 kg (15.8 lb) / 3.5 kg (7.6 lb) | 9.7 kg (21.3 lb) / 6.0 kg (13.1 lb) |

Probe with recrystallized alumina sheath

| Probe version | Total probe length | Probe-only – packed /unpacked | Probe + Tx – packed / unpacked |
|---------------------|---------------------|------------------------------------|-------------------------------------|
| 500 mm (23.62 in.) | 686 mm (27.01 in.) | 4.1 kg (9.0 lb) / 1.6 kg (3.5 lb) | 6.6 kg (14.5 lb) / 4.1 kg (9.0 lb) |
| 700 mm (27.56 in.) | 831 mm (32.72 in.) | 4.3 kg (9.4 lb) / 1.8 kg (3.9 lb) | 6.8 kg (14.9 lb) / 4.3 kg (9.4 lb) |
| 800 mm (31.50 in.) | 931 mm (36.56 in.) | 4.4 kg (9.6 lb) / 1.9 kg (4.1 lb) | 6.9 kg (15.1 lb) / 4.4 kg (9.6 lb) |
| 900 mm (35.43 in.) | 1031 mm (40.59 in.) | 4.5 kg (10.0 lb) / 1.9 kg (4.1 lb) | 6.9 kg (15.1 lb) / 4.4 kg (9.6 lb) |
| 1000 mm (39.37 in.) | 1086 mm (42.76 in.) | 4.7 kg (10.2 lb) / 2.2 kg (4.7 lb) | 7.2 kg (15.7 lb) / 4.7 kg (10.2 lb) |
| 1250 mm (49.21 in.) | 1381 mm (54.37 in.) | 6.2 kg (13.6 lb) / 2.4 kg (5.3 lb) | 8.7 kg (19.1 lb) / 4.9 kg (10.8 lb) |

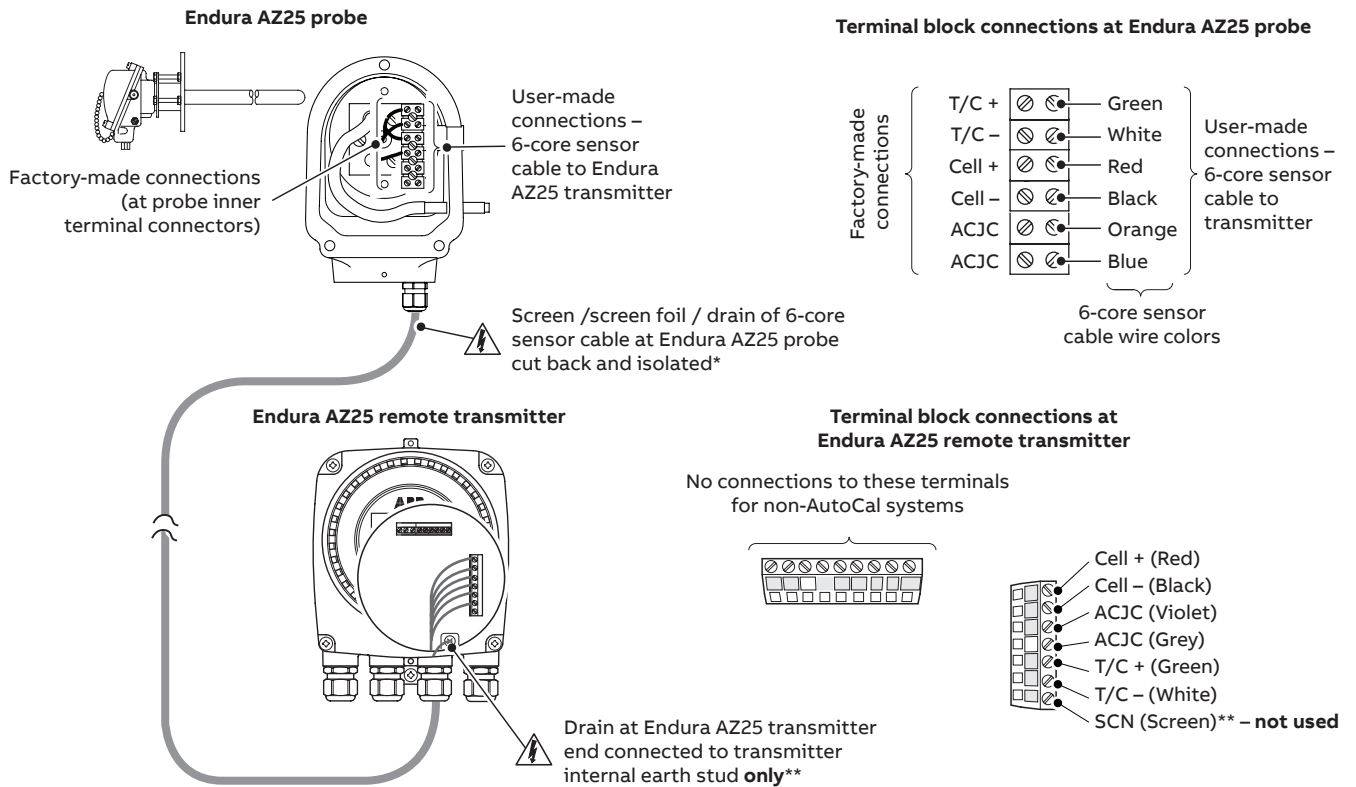
Cable – AutoCal cable / probe (sensor) cable

| Cable length | AutoCal cable (14-core) – unpacked | Probe (sensor) cable (6-core) – unpacked |
|-----------------|------------------------------------|--|
| 5 m (16 ft.) | 1 kg (2.2 lb) | 0.2 kg (0.44 lb) |
| 10 m (33 ft.) | 3 kg (6.6 lb) | 0.4 kg (0.88 lb) |
| 25 m (82 ft.) | 7 kg (15.4 lb) | 0.9 kg (1.98 lb) |
| 50 m (164 ft.) | 15 kg (33 lb) | 1.8 kg (2.2 lb) |
| 75 m (246 ft.) | 22 kg (48.4 lb) | 2.7 kg (7.92 lb) |
| 100 m (328 ft.) | N/A | 3.6 kg (7.92 lb) |

Electrical connections

6-core screened sensor cable connections – remote transmitter to probe (non-AutoCal system)

| Sensor cable wire colors | Terminal connections at remote Endura AZ25 transmitter terminal block | Terminal connections at Endura AZ25 probe terminal block (outer connectors) |
|--------------------------|---|--|
| Green | TC+ (green wire to green connector) | TC+ (green wire) |
| White | TC- (white wire to white connector) | TC- (white wire) |
| Red | Cell + (red wire to red connector) | Cell + (red wire) |
| Black | Cell - (black wire to black connector) | Cell - (black wire) |
| Orange | ACJC (orange wire to violet connector) | ACJC (orange wire) |
| Blue | ACJC (blue wire to grey connector) | ACJC (blue wire) |
| Screen (drain) | SCN – not used, drain connected to transmitter internal earth stud | Screen, screen foil and drain at probe head cut back and isolated – not connected at probe |

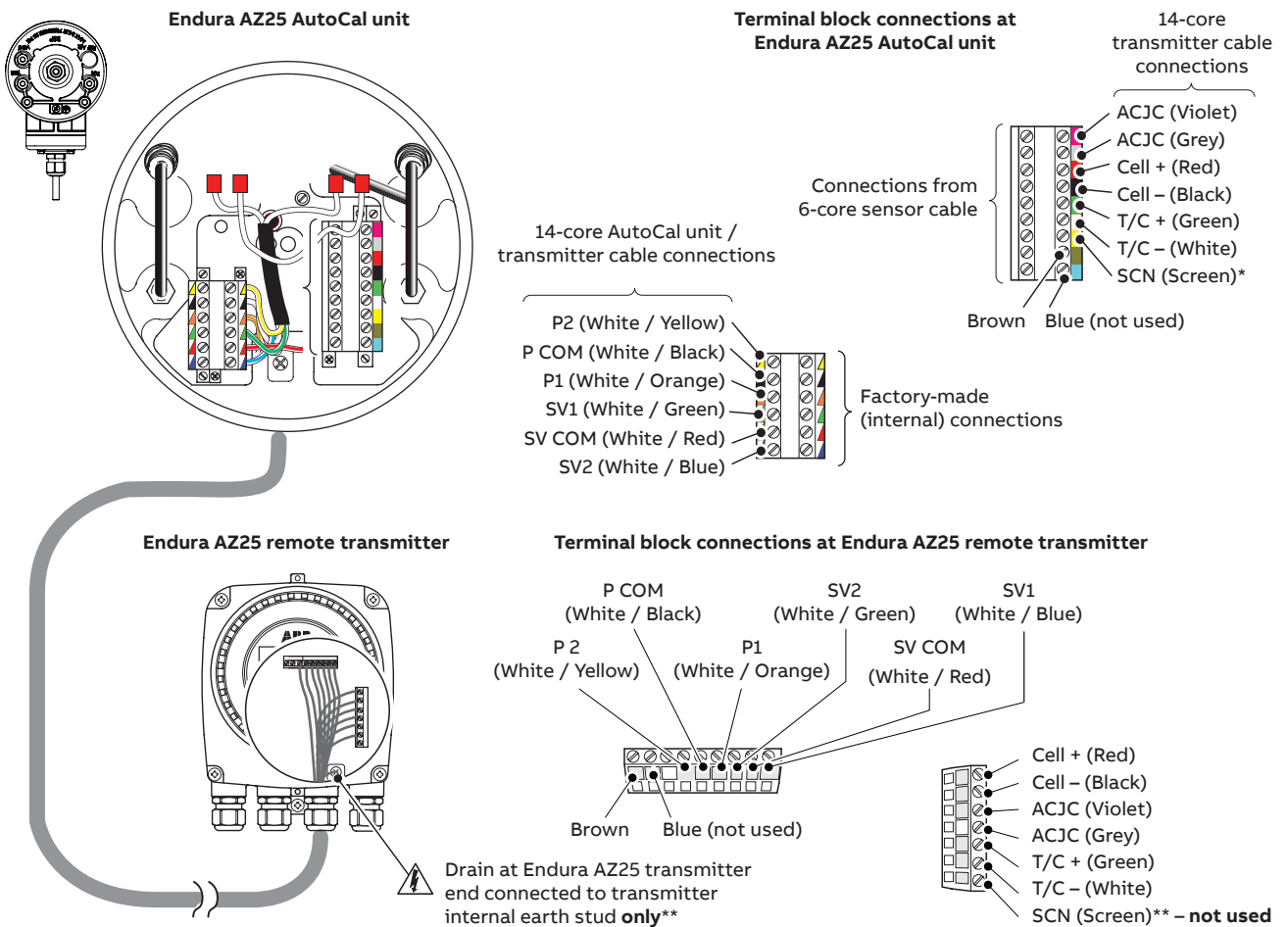


*Cut back and isolate the screen, screen foil and drain at the probe head – **do not connect it to the probe**

Connect the 6-core sensor cable drain to the transmitter's internal earth stud **only – **do not connect it to the transmitter's SCN terminal**

14-core screened cable connections – AutoCal unit to remote transmitter

| Connection at remote transmitter terminal block (label color) | Connection at AutoCal unit (outer) removable terminal block (label color) | Connection type | Cable color |
|---|---|-----------------------|-----------------------|
| White / Yellow | White / Yellow | PS2 (test gas 2) | White / Yellow |
| White / Black | White / Black | P COM | White / Black |
| White / Orange | White / Orange | PS1 (test gas 1) | White / Orange |
| White / Green | White / Green | SV2 | White / Green |
| White / Red | White / Red | SV COM | White / Red |
| White / Blue | White / Blue | SV1 | White / Blue |
| Red | Red | Cell + (oxygen input) | Red |
| Black | Black | Cell – (oxygen input) | Black |
| Violet | Violet | ACJC | Violet |
| Grey | Grey | ACJC | Grey |
| Green | Green | T/C + | Green |
| White | White | T/C – | White |
| Brown (not used) | Brown (not used) | Not used | Brown (wire cut back) |
| Blue (not used) | Blue (not used) | Not used | Blue (wire cut back) |



⚠️ *Connect the 14-core cable drain to the AutoCal unit's outer SCN terminal **only**

⚠️ **Connect the 14-core cable drain to the transmitter's internal earth stud **only** – **do not connect it to the transmitter's SCN terminal or the transmitter external earth**

...Electrical connections

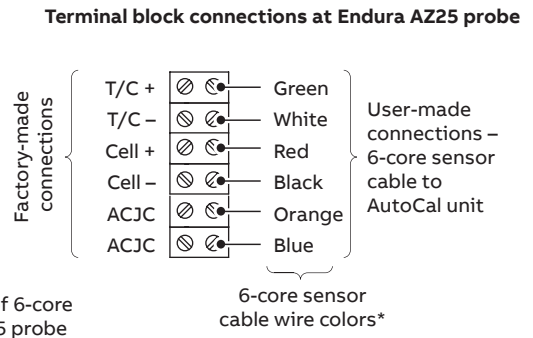
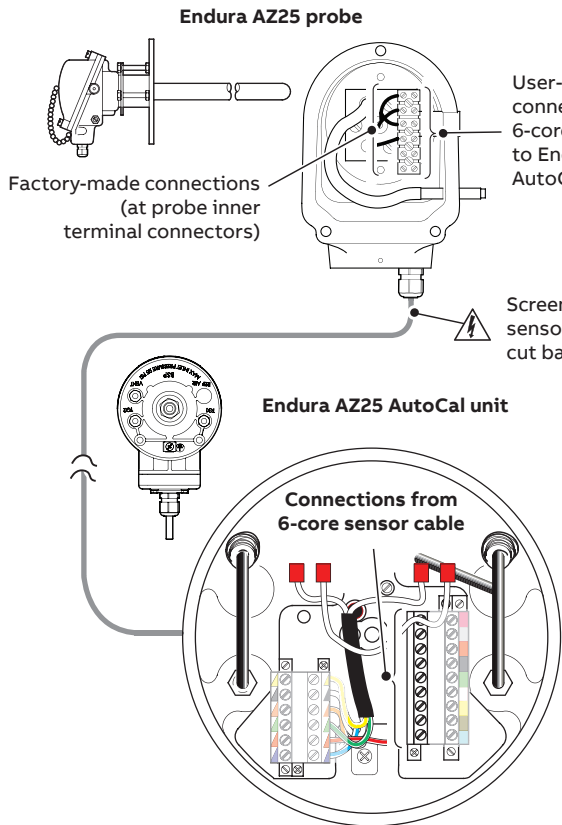
6-core screened sensor cable connections – probe to AutoCal unit

6-core screened sensor cable terminal connections at probe (outer terminal connections)

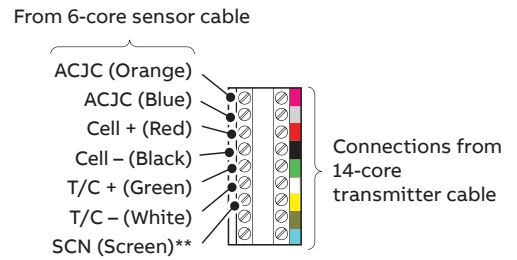
| |
|---|
| TC+ (green wire) |
| TC- (white wire) |
| Cell + (red wire) |
| Cell - (black wire) |
| ACJC (orange wire) |
| ACJC (blue wire) |
| Screen / screen foil / drain of 6-core sensor cable at Endura AZ25 probe cut back and isolated (not connected at probe) |

6-core screened sensor cable terminal connections at AutoCal unit inner terminal connections

| |
|---|
| TC+ (green wire) |
| TC- (white wire) |
| Cell + (red wire) |
| Cell - (black wire) |
| ACJC (orange wire) |
| ACJC (blue wire) |
| SCN (drain from 6-core sensor cable must be connected to this SCN only) |



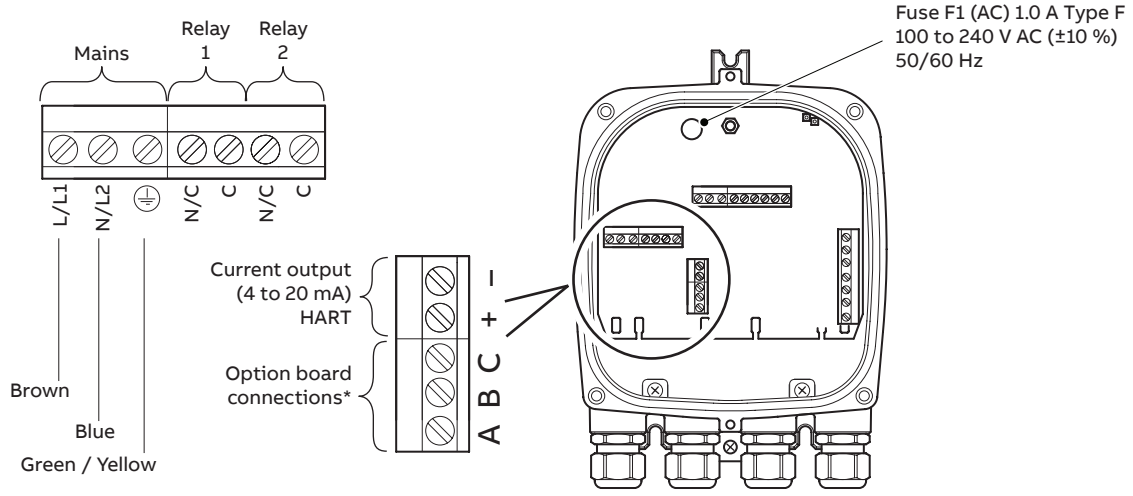
Terminal block connections at Endura AZ25 AutoCal unit



*Cut back and isolate the screen, screen foil and drain at the probe head – **do not connect it to the probe**

Connect the 6-core sensor cable drain to the AutoCal unit's inner SCN terminal **only

Transmitter power supply and output connections



| *Option board connections | A | B | C |
|---------------------------|------|------|-----|
| Analog output | + | - | |
| Digital I/O | DIO1 | DIO2 | COM |

System specification

Measurement performance

Range:

0 to 25 % O₂

Test gas response time

- Initial dead time 3 seconds
- T₉₀ < 10 seconds

System accuracy

< ±2.0 % of reading or 0.2 % O₂, whichever is the greater (reference conditions)

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 standard cable: -20 to 100 °C (-4 to 212 °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

Electronics / AutoCal enclosures: IP66 (NEMA 4)

Power supply

AC power supply

100 to 240 V AC ±10 % (90 V min. to 264 V max.) 50 / 60 Hz

Electronics

< 10 W

EMC

Emissions and immunity

Conforms to EN61326-1:2006

Safety

General safety

Conforms to EN61010-1: 2001

Approvals and safety certification

CE mark

Probe specification

Physical

Probe insertion lengths

- 556 mm (21.89 in.)
- 700 mm (27.60 in.)
- 800 mm (31.53 in.)
- 900 mm (35.47 in.)
- 956 mm (37.64 in.)
- 1250 mm (49.25 in.)

Process connection

All probe lengths

- ANSI B16.5 150 lb
- 2, 2.5, 3, 4 in
- DIN2501 Part 1
- 65, 80, 100 mm
- JIS B2238 5K
- 65, 80, 100 mm
- 1 in. NPT
- 1 in. BSP
(flange pressure ratings do not apply)
- ABB pattern heritage flange

Probe body material

- Aluminous porcelain
- Incoloy 800
- Recrystallized alumina

Mounting angle

Horizontal to vertically down

Process conditions

Process temperature

- Aluminous Porcelain:
 - 600 to 1250 °C (1112 to 2282 °F)
- Incoloy 800:
 - 600 to 850 °C (1112 to 1562 °F)
- Probe mounted horizontally – Incoloy 800:
 - 600 to 1000 °C (1112 to 1832 °F)
- Probe mounted vertically down – recrystallized alumina:
 - 600 to 1400 °C (1112 to 2552 °F)

Process pressure

5 kPa (0.7 psi) positive or negative (Nernstian response)

Operating requirements

Reference air

- Regulated supply:
 - probes with restrictors:
 - reference air supply set to 1 bar (15 psi), gives flow of 0.3 to 0.5 l / min (0.64 to 1.06 scfh) flowmeters not required
 - probes without restrictors:
 - 1 bar (15 psi) flowmeters required with flow set to 0.3 to 0.5 l / min (0.64 to 1.06 scfh)
- Pumped supply:
 - probes with / without restrictors:
 - preset flow: 0.3 to 0.5 l / min (0.64 to 1.06 scfh)

Test gas

User-selectable, 25 to 0.1 % O₂ balance N₂ and / or air (air 20.95 % is recommended as one of the test gases)

- AutoCal system with restrictors:
 - 1 bar (15 psi) – flowmeters not required as restrictors preset flow to 1 l/min (2.118 scfh)
- systems without restrictors:
 - 1 bar (15 psi) flowmeters required, set to 1 l/min (2.118 scfh)

Calibration

Manual, semi-automatic or automatic (controlled by Endura AZ25 transmitter)

Automatic calibration

AutoCal hardware

- Optional standalone unit with built-in solenoid valves for control of test gas flow
- Built-in pressure switches to detect presence of test gases

Transmitter specification

Transmitter enclosures

Remote

- Wall-, pipe- or stand-mounted
4 gland entries
- Optional ½ in. NPT, M20

Integral

- Head-mounted
- 3 gland entries
- Optional ½ in NPT, M20

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 one 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

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

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

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

Hart communications

Integration

- Device Type Manager (DTM) and Electronic Device Description (EDD)
- Provide online / offline device configuration, online monitoring of measurement values and diagnostic states

Version

5.7 as standard

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

Calibration

Manual calibration

- 1 point (offset)
- 1 point (factor)
- 2 point (offset + factor)

Automatic calibration

- 1 point (offset)
- 2 point (offset + factor)

Calibration control


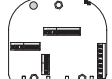
- Front panel controls
- Digital inputs
- HART commands
- User-defined schedule

Calibration scheduler

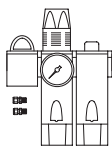
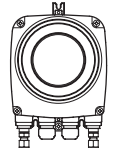
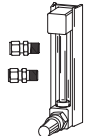
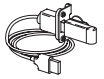

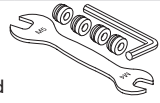
User-defined schedule enables automatic calibration frequency to be set from 1 day to 12 months

Spares and accessories

Transmitter spares

| Part number | Description | |
|-------------|--|---|
| AZ200 750 | AZ20 Transmitter cartridge <ul style="list-style-type: none"> • Standard • Standard + Analog O/P • Standard + Digital O/P |  |
| AZ200 751 | | |
| AZ200 752 | | |
| AZ200 758 | Remote (type 4) Transmitter backplane |  |

Accessories

| Part number | Description | |
|-------------|---|---|
| AZ200 731 | Coalescing filter-regulator <ul style="list-style-type: none"> • ¼ NPT • ¼ BSP |  |
| AZ200 732 | | |
| AZ200 770 | ABB reference air pump <ul style="list-style-type: none"> • ¼ BSP (metric) 230 V AC 50 / 60 Hz • ¼ BSP (metric) 115 V AC 50 / 60 Hz • ¼ NPT (imperial) 230 V AC 50 / 60 Hz • ¼ NPT (imperial) 115 V AC 50 / 60 Hz |  |
| AZ200 771 | | |
| AZ200 772 | | |
| AZ200 773 | | |
| AZ200 788 | ABB flowmeter <ul style="list-style-type: none"> • ¼ NPT • ¼ BSP |  |
| AZ200 789 | | |
| AZ200 785 | USB to IrDA adaptor kit |  |
| E35 | Connection cables <ul style="list-style-type: none"> • Type K • Type R • Signal cable |  |
| E37 | | |
| YBM 1178 | | |
| AZ200 798 | Probe tool kit* <ul style="list-style-type: none"> • NPT (AZ20) • BSP (AZ20) *Included with probe as standard |  |
| AZ200 799 | | |

Ordering information

| | Tx | | | | | | | Probe | | | | | | | | | | /STD |
|--|-------|---|---|---|---|---|---|-------|---|---|---|---|---|---|---|---|---|------|
| | AZ25/ | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | 0 | |
| Transmitter options | | | | | | | | | | | | | | | | | | |
| None | 0 | | | | | | | | | | | | | | | | | |
| Standard | 1 | | | | | | | | | | | | | | | | | |
| Standard + 2 nd analog output | 2 | | | | | | | | | | | | | | | | | |
| Standard + 2 digital inputs / outputs | 3 | | | | | | | | | | | | | | | | | |
| Transmitter entry type | | | | | | | | | | | | | | | | | | |
| None (no transmitter required) | 0 | | | | | | | | | | | | | | | | | |
| Metric (M20) | 1 | | | | | | | | | | | | | | | | | |
| Imperial (NPT) | 2 | | | | | | | | | | | | | | | | | |
| Transmitter system type | | | | | | | | | | | | | | | | | | |
| None (no transmitter required) | | | | | | 0 | | | | | | | | | | | | |
| Remote | | | | | | 2 | | | | | | | | | | | | |
| Probe type | | | | | | | | | | | | | | | | | | |
| None (no probe required) | | | | | | 0 | | | | | | | | | | | | |
| Standard | | | | | | 1 | | | | | | | | | | | | |
| Probe entry type | | | | | | | | | | | | | | | | | | |
| None (no probe required) | | | | | | | | | | 0 | | | | | | | | |
| Metric (M16) | | | | | | | | | | 1 | | | | | | | | |
| Imperial (½ in. NPT) | | | | | | | | | | 2 | | | | | | | | |
| Insertion length | | | | | | | | | | | | | | | | | | |
| None (no probe required) | | | | | | | | | | 0 | | | | | | | | |
| 0.5 m (2 ft.) | | | | | | | | | | 1 | | | | | | | | |
| 0.7 m (2.3 ft.) | | | | | | | | | | 2 | | | | | | | | |
| 0.8 m (2.6 ft.) | | | | | | | | | | 3 | | | | | | | | |
| 0.9 m (3 ft.) | | | | | | | | | | 4 | | | | | | | | |
| 1.0 m (3.3 ft.) | | | | | | | | | | 5 | | | | | | | | |
| 1.25 m (4.1 ft.) | | | | | | | | | | 6 | | | | | | | | |
| Protective sheath material | | | | | | | | | | | | | | | | | | |
| None (no probe required) | | | | | | | | | | 0 | | | | | | | | |
| Aluminous porcelain, standard | | | | | | | | | | 1 | | | | | | | | |
| Incoloy 800 (1.4876) | | | | | | | | | | 2 | | | | | | | | |
| Recrystallised alumina | | | | | | | | | | 3 | | | | | | | | |
| Thermocouple type | | | | | | | | | | | | | | | | | | |
| None (no probe required) | | | | | | | | | | 0 | | | | | | | | |
| Type R Pt/Pt 13% Rh EN60584.1 Pt 2 | | | | | | | | | | 1 | | | | | | | | |
| Type K NiCr/NiAl EN60584.1 Pt 4 | | | | | | | | | | 2 | | | | | | | | |
| Type S Pt/Pt 10% Rh EN60584 Pt 1 | | | | | | | | | | 3 | | | | | | | | |
| Type B Pt 30% Rh/Pt 6% Rh EN60584.1 Pt 7 | | | | | | | | | | 4 | | | | | | | | |

Continued on next page...

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