

# Endura AZ20 series probe

## Combustion oxygen monitor



Installing large surface area filter  
Kit reference: AZ200 737

**Measurement made easy**

Endura AZ20 series probe  
combustion  
oxygen monitor

## 1 Introduction

This publication details fitting of a large surface area filter to the AZ20 probe. These procedures must be carried out by suitably trained personnel and in accordance with the information given.

### Tools required

- M4 open-ended spanner
- 3 mm A/F hexagon wrench
- Solvent (lighter fluid / petroleum ether) or alcohol (surgical spirits)
- Non-metallic pan scouring pad
- Scalpel / Small sharp blade
- Small flat-bladed screwdriver
- Transmitter Instruction manual [IM/AZ20E-EN](#)
- Probe Instruction manual [IM/AZ20P-EN](#)
- Maintenance guide [IM/AZ20M-EN](#)

## 2 For more information

Further information is available from:  
[www.abb.com/analytical](http://www.abb.com/analytical)

or by scanning these codes:



Sales



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## 3 Health & Safety



### WARNING

#### Electrical

- Isolate all high voltage supplies to the transmitter before performing replacement procedures.
- Ensure all electrical connections are kept dry at all times.

### 3.1 Potential safety hazards

#### 3.1.1 Safety precautions – Endura AZ20 sensor / probe – installation to pressurized process

Be sure to read, understand and follow the instructions contained within this document before and during use of the equipment. Failure to do so could result in bodily harm or damage to the equipment.



### DANGER – Serious damage to health / risk to life Pressurized equipment – do not install / remove / the sensor / probe if the process is at positive pressure

Installation, operation, maintenance and servicing of pressurized equipment must be performed:

- by suitably trained personnel only
- in accordance with the information provided in this document
- in accordance with relevant local regulations
- when process conditions are suitable to allow enough to enable installation / maintenance

#### 3.1.2 Process conditions and requirements



### WARNING – Bodily injury

#### Environmental conditions



- High air / equipment / structure temperatures, poor air quality and adverse environmental conditions may be present when the process is running.
- It is recommended that the process is shut down before performing these procedures.
- The process must be cool enough to enable shutdown, disconnection and removal of the sensor in a safe manner and in accordance with relevant local regulations.
- Appropriate PPE, including mask and goggles must be worn when preparing the process for these procedures.

#### 3.1.3 Weight – Endura AZ20 transmitter / integral transmitter / probe



### WARNING – Bodily injury

- Sensor, integral transmitter and transmitter weights are detailed in probe Instruction manual IM/AZ20P-EN.
- Suitable lifting equipment must be available when installing / removing the AZ20 components at the process.

#### 3.1.4 Endura AZ20 analyzer – electrical



### WARNING – Bodily injury

To ensure safe use when operating this equipment, the following points must be observed:

- up to 240 V AC may be present. Ensure the supply is isolated before removing the terminal cover
- normal safety precautions must be taken to avoid the possibility of an accident occurring when operating in conditions of high pressure and / or temperature

Safety advice concerning the use of the equipment described in this document or any relevant Material Safety Data Sheets (where applicable) can be obtained from the Company, together with servicing and spares information.

#### 3.1.5 Product disposal / recycling



### PRODUCT RECYCLING / DISPOSAL

Dispose / Recycle separately from general waste under the WEEE directive.



### PRODUCT RECYCLING / DISPOSAL (Europe only)

Electrical equipment marked with this symbol may not be disposed of in European public disposal systems after 12 August 2005. To conform to European local and national regulations (EU Directive 2002/96/EC), European electrical equipment users should now return old or end-of-life equipment to the manufacturer for disposal at no charge to the user.

ABB is committed to ensuring that the risk of any environmental damage or pollution caused by any of its products is minimized as far as possible.



### IMPORTANT NOTE

For return for recycling, please contact the equipment manufacturer or supplier for instructions on how to return end-of-life equipment for proper disposal.

## 4 Isolating the transmitter and shutting down sensor air / gas supplies

### 4.1 Isolating the transmitter

Referring to transmitter Instruction manual IM/AZ20E-EN.

1. Isolate transmitter from incoming mains powers supplies.



**DANGER – Serious damage to health / risk to life**

Do not proceed until the transmitter is isolated from mains power supplies.

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### 4.2 Shutting down the sensor assembly at the process

Referring to probe Instruction manual IM/AZ20P-EN:



**DANGER – Serious damage to health / risk to life**

Allow sufficient time for the sensor assembly to cool before performing this procedure.

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1. Close / isolate the air supply valve and shut down the test gas line at the supply.

### 4.3 Removing the sensor from the process

Referring to probe Instruction manual IM/AZ20P-EN:



**DANGER – Serious damage to health / risk to life**

- Allow sufficient time for the sensor assembly to cool before performing this procedure.
  - Assess probe / transmitter system weights and ensure suitable / adequate lifting equipment and personnel are used to support the weight when performing this procedure.
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1. Disconnect the air supply and test gas connections at the sensor.
2. Remove the sensor from the process in the reverse order of installation. Ensure the sensor cable is free of cable ties / restrictions before taking the sensor away from the process.

## 5 Removing the diffuser flame arrestor and cell



### **WARNING – Bodily injury** **High temperature**

When in operation, the cell end of the probe reaches temperatures up to 100 °C (212 °F). Allow the cell to reach ambient temperature before starting maintenance procedures.



### **IMPORTANT NOTE**

Check all items for damage as they are removed. Do not re-use the nuts or bolts, always replace damaged items with new parts.

Referring to Fig. 5.1:

1. At the probe cell end, loosen 6 M4 x 50 bolts (A) using an M4 spanner and 3 mm A/F hexagon wrench. Remove and discard the 6 M4 x 50 bolts (A) and associated nuts. If the bolts are seized, use a small hacksaw to cut the through the bolts at the recess between the diffuser flame arrestor (C) and probe end plate (B).
2. Withdraw diffuser flame arrestor (C) while carefully supporting cell (D). Discard diffuser flame arrestor (C). If necessary, use a solvent, for example lighter fluid (petroleum ether) or alcohol (surgical spirits) to lubricate the joint between the diffuser flame arrestor and probe end.



### **CAUTION – Potential damage to equipment**

Do not use oil or release agents – these will damage the components.

3. Remove test gas injection pipe (E) from the cell housing. Retain for re-assembly.
4. Carefully attempt to withdraw cell (F) from the cell housing using minimal force. Retain for re-assembly.
  - If the cell can be withdrawn freely, proceed to step 6.
  - If the cell does not move (is stuck in the probe body), use a spanner on the 2 flats to rock it sideways gently (**no more than 10 to 15 °**) until loose. If this action frees the cell proceed to step 6.
  - If the cell cannot be withdrawn freely and / or is welded to the thermocouple / electrode contact assembly, proceed to step 5.

5. If the cell is welded to the helical contact at the end of the thermocouple / electrode assembly, carefully withdraw the cell and thermocouple / electrode contact assembly until the cell tip (G) is visible.

If the assembly will not withdraw sufficiently to access the joint between the cell and helical contact, disconnect the red (Cell +), green (TC+) and white (TC–) wires (at the probe head end) from the inner terminal block connections and straighten the wires – refer to probe Maintenance guide IM/AZ20M-EN.

Use a sharp blade to separate the wire nest from the cell tip and separate the 2 items.



### **CAUTION – Potential damage to equipment**

Take extreme care not to damage either item when separating the cell tip from the wire nest on the electrode assembly.

6. Remove and discard 'C-ring (H).

If the C-ring is stuck, insert a small screwdriver blade in the hollow of the C-ring (I) and gently prise it in several places until free.



### **CAUTION – Potential damage to equipment**

Do not touch the sealing face or ID of the probe recess with the screwdriver blade. The surface finish must be undamaged to maintain the C-ring's sealing properties.

7. Proceed to Section 6, page 6 to fit the large surface area filter.

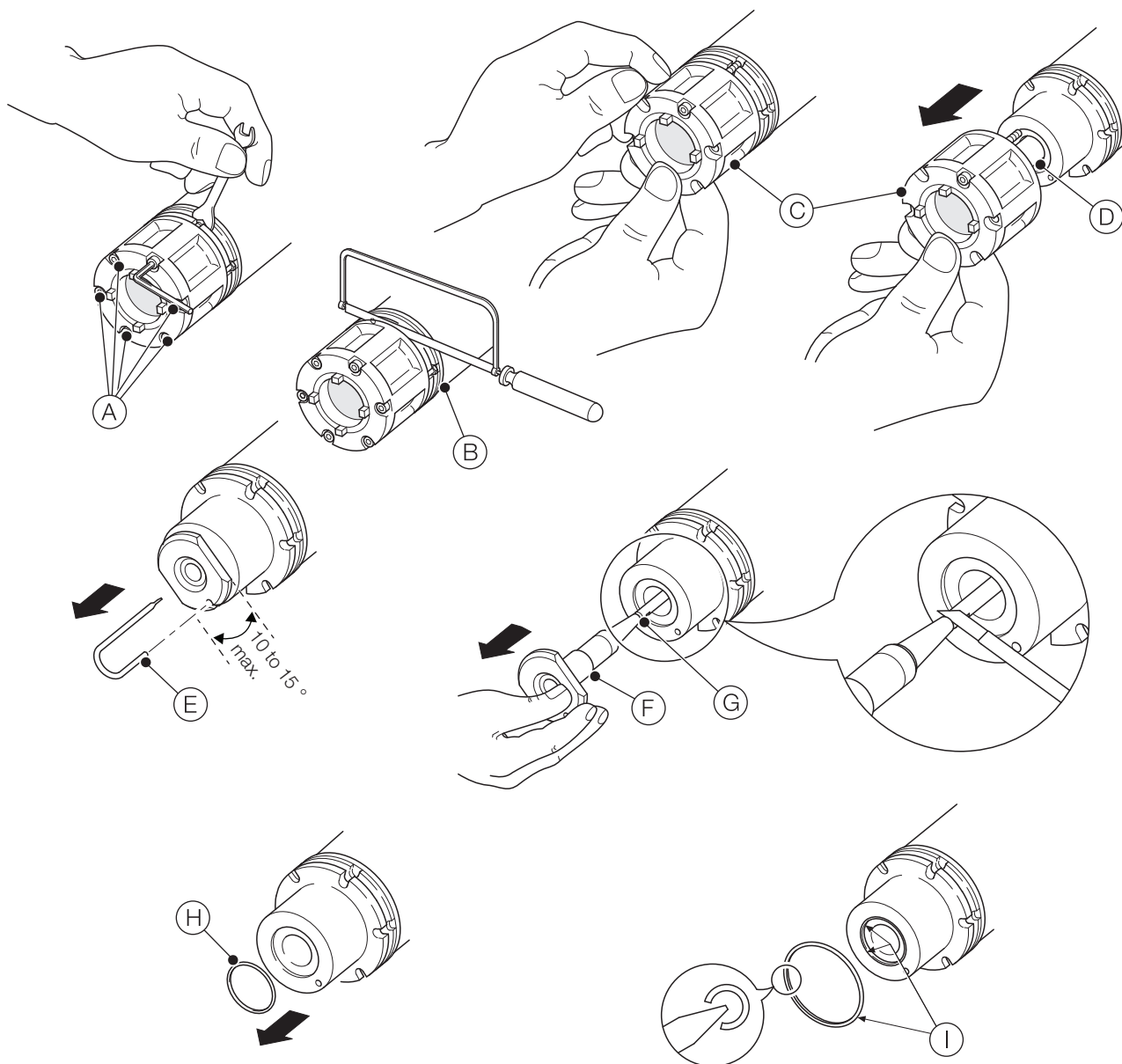


Fig. 5.1 Removing the diffuser flame arrestor and cell

## 6 Refitting the cell and large surface area filter

Referring to Fig. 6.1, page 7:

1. Check the cell mounting area for damage and ensure it is clean and dry. Clean by hand only using a non-metallic pan scouring pad – do not use any other abrasives.
2. Fit (new) C-ring (A) into recess (B).
3. Locate cell (C) and use a small screwdriver to align it with test gas injection pipe hole (D) in probe body end plate (E).
4. Carefully slide cell (C) into the probe body end plate (E).

### **i** IMPORTANT NOTE

Do not rotate the cell once it has engaged with the helical contact at the end of the thermocouple / electrode assembly (contained within the probe body).

5. Refit test gas injection pipe (F) ensuring the short end fits into the test gas injection pipe hole (D).
6. Locate probe filter carrier (G) by aligning the internal notch (H) with test gas injection pipe (F).
7. Locate 6 M4 x 50 bolts (I) and fit nuts (J) using an M4 spanner and 3 mm A/F hexagon wrench – tighten opposing bolts evenly to a torque of 2 Nm (1.47 ft/lb).

### **i** IMPORTANT NOTE

A small amount of anti-seize grease or oil can be used on these nuts only to assist assembly. Do not use anti-seize grease or oil on any other probe fixings.

8. Locate ceramic filter adaptor (K).
9. Locate the 3 off M4 x 50 bolts (L) and fit nuts (M) using an M4 spanner and 3 mm A/F hexagon wrench – tighten bolts evenly to a torque of 2 Nm (1.47 ft/lb).

### **i** IMPORTANT NOTE

A small amount of anti-seize grease or oil can be used on these nuts only to assist assembly. Do not use anti-seize grease or oil on any other probe fixings.

10. Locate filter gaskets (N), ceramic filter (O) and clamp plate (P).

### **i** IMPORTANT NOTE

Fit the same number of gaskets each side of ceramic filter (O).

11. Pass 2 M4 x 60 screws (Q) through clamp plate (P) and fit 2 nuts (R) into the recess in ceramic filter adaptor (K). Tighten bolts evenly to a torque of 2 Nm (1.47 ft/lb) using a 3 mm A/F hexagon wrench.
12. Re-install the probe as detailed in probe Instruction manual IM/AZ20P-EN.
13. Make gas supplies to the probe and electrical supplies to the transmitter – refer to transmitter Instruction manual IM/AZ20E-EN and probe Instruction manual IM/AZ20P-EN.
14. Use the new cell's Zero and Cal. Factor data on the Commissioning Label to commission and calibrate the probe – refer to transmitter Instruction manual IM/AZ20E-EN for calibration details.

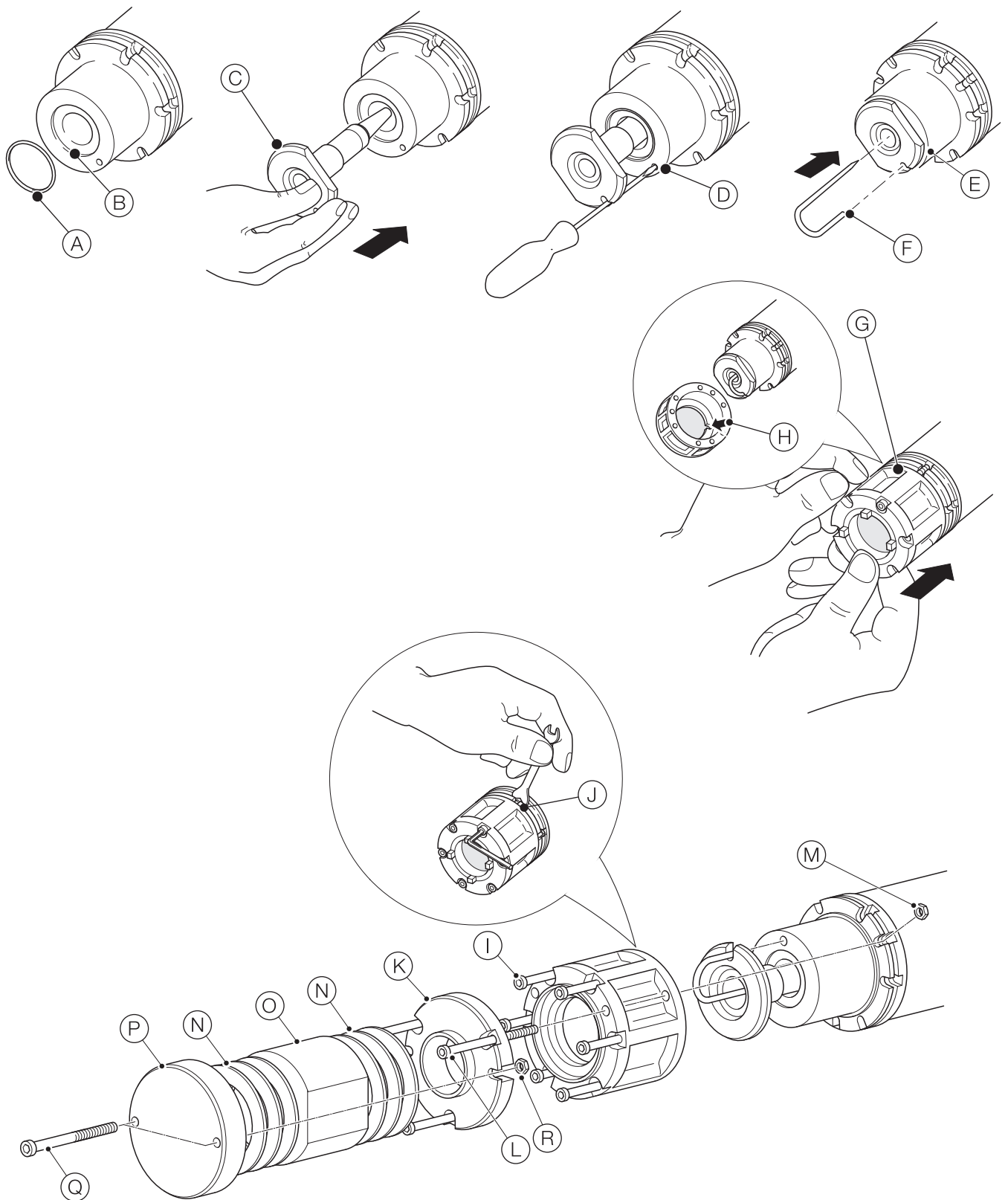


Fig. 6.1 Refitting the cell and fitting the large surface area filter

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