Aztec measurement head assembly repairs

Measurement made easy

1 Introduction

This publication details cleaning procedures to be performed before returning an Aztec piston assembly to the factory for repair.

Before returning an Aztec piston assembly to the factory, ensure it has been cleaned and all liquid has been expelled from the piston chamber. Two options can be used:

— if the piston is NOT seized, initiate a manual clean (refer to Section 4.2, page 5) before removing it for return (refer to Section 4.3, page 6)

— if the piston is seized a manual clean may not be possible, remove it from the housing (refer to Section 4.3, page 6)

Follow these guidelines to prevent damage to the piston in transit and also to comply with the de-contamination declaration you must sign and return for the repair to be processed.

Before starting any procedures, read Section 3, page 2. These procedures must be carried out by a suitably-trained technician.

2 Tools / Items required

— Operating instruction IM/AZT6CR-EN*
— Medium flat-bladed screwdriver
— Small crosshead screwdriver

*Operating instruction IM/AZT6CR-EN can be downloaded via the link (above) or by scanning this code:
3 Health & Safety

3.1 Safety
Information in this manual is intended only to assist our customers in the efficient operation of our equipment. Use of this manual for any other purpose is specifically prohibited and its contents are not to be reproduced in full or part without prior approval of the Technical Publications Department.

3.2 Health & Safety
To ensure that our products are safe and without risk to health, the following points must be noted:
— The relevant sections of these instructions must be read carefully before proceeding.
— Warning labels on containers and packages must be observed.
— Installation, operation, maintenance and servicing must only be carried out by suitably trained personnel and in accordance with the information given.
— Normal safety precautions must be taken to avoid the possibility of an accident occurring when operating in conditions of high pressure and/or temperature.
— Chemicals must be stored away from heat, protected from temperature extremes and powders kept dry. Normal safe handling procedures must be used.
— When disposing of chemicals ensure that no two chemicals are mixed.

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

3.3 Electrical Safety – CEI/IEC 61010-1:2001-2
This equipment complies with the requirements of CEI/IEC 61010-1:2001-2 ‘Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use’ and complies with US NEC 500, NIST and OSHA.
If the equipment is used in a manner NOT specified by the Company, the protection provided by the equipment may be impaired.

3.4 Symbols – CEI/IEC 61010-1:2001-2
One or more of the following symbols may appear on the equipment labelling:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>Protective earth (ground) terminal.</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>Functional earth (ground) terminal.</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>Direct current supply only.</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>Alternating current supply only.</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>Both direct and alternating current supply.</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>The equipment is protected through double insulation.</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>This symbol, when noted on a product, indicates a potential hazard which could cause serious personal injury and/or death. The user should reference this instruction manual for operation and/or safety information.</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>This symbol, when noted on a product enclosure or barrier, indicates that a risk of electrical shock and/or electrocution exists and indicates that only individuals qualified to work with hazardous voltages should open the enclosure or remove the barrier.</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>This symbol indicates that the marked item can be hot and should not be touched without care.</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>This symbol indicates the presence of devices sensitive to electrostatic discharge and indicates that care must be taken to prevent damage to them.</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>This symbol identifies a risk of chemical harm and indicates that only individuals qualified and trained to work with chemicals should handle chemicals or perform maintenance on chemical delivery systems associated with the equipment.</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>This symbol indicates the need for protective eye wear.</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>This symbol indicates the need for protective hand wear.</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>Electrical equipment marked with this symbol may not be disposed of in European public disposal systems. In conformity with European local and national regulations, European electrical equipment users must now return old or end-of-life equipment to the manufacturer for disposal at no charge to the user.</td>
</tr>
<tr>
<td><img src="image" alt="Symbol" /></td>
<td>Products marked with this symbol indicates that the product contains toxic or hazardous substances or elements. The number inside the symbol indicates the environmental protection use period in years.</td>
</tr>
</tbody>
</table>
3.5 Product recycling information

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

3.6 Product disposal

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.

3.7 Restriction of Hazardous Substances (RoHS)

The European Union RoHS Directive and subsequent regulations introduced in member states and other countries limits the use of six hazardous substances used in the manufacturing of electrical and electronic equipment. Currently, monitoring and control instruments do not fall within the scope of the RoHS Directive, however ABB has taken the decision to adopt the recommendations in the Directive as the target for all future product design and component purchasing.

3.8 Chemical reagents

WARNING – Bodily injury
To familiarize yourself with handling precautions, dangers and emergency procedures, always review the Material Safety Data Sheets prior to handling containers, reservoirs, and delivery systems that contain chemical reagents and standards. Protective eye wear and protective hand wear is always recommended when contact with chemicals is possible.

3.9 Safety precautions

Please read the entire manual before unpacking, setting up, or operating this instrument. Pay particular attention to all warning and caution statements. Failure to do so could result in serious injury to the operator or damage to the equipment. To ensure the protection provided by this equipment is not impaired, do not use or install this equipment in any manner other than that which is specified in this manual.

3.10 Safety conventions

WARNING – Bodily injury
In this manual, a warning is used to indicate a condition which, if not met, could cause serious personal injury and/or death. Do not move beyond a warning until all conditions have been met. If a warning sign appears on the instrument itself, refer to Precautionary Labels – UL Certification and Electrical Safety – CEI/IEC 61010-1:2001-2 for an explanation.

CAUTION – Minor injuries
A caution is used to indicate a condition which, if not met, could cause minor or moderate personal injury and/or damage to the equipment. Do not move beyond a caution until all conditions have been met.

NOTE
A note is used to indicate important information or instructions that should be considered before operating the equipment.
3.11 Safety recommendations
For safe operation, it is imperative that these service instructions be read before use and that the safety recommendations mentioned herein be scrupulously respected. If danger warnings are not heeded to, serious material or bodily injury could occur.

WARNING – Bodily injury
The installation of the instrument should be performed exclusively by personnel specialized and authorized to work on electrical installations, in accordance with relevant local regulations.

3.12 Service and Repairs
Other than the serviceable items listed in IM/AZT6CR-EN, Appendix F, none of the instrument’s components can be serviced by the user. Only personnel from ABB or its approved representative(s) is (are) authorized to attempt repairs to the system and only components formally approved by the manufacturer should be used. Any attempt at repairing the instrument in contravention of these principles could cause damage to the instrument and corporal injury to the person carrying out the repair. It renders the warranty null and void and could compromise the correct working of the instrument and the electrical integrity or the CE compliance of the instrument. If you have any problems with installation, starting, or using the instrument please contact the company that sold it to you. If this is not possible, or if the results of this approach are not satisfactory, please contact the manufacturer’s Customer Service.

3.13 Potential safety hazards
The following potential safety hazards are associated with operating the analyzer:
- Electrical (line voltage)
- Potentially hazardous chemicals

4 Procedure

4.1 Isolating the analyzer
Referring to Fig. 4.1.
1. Isolate transmitter A from incoming mains powers supplies B before removing the piston for return.

DANGER – Serious damage to health / risk to life
Isolated the analyzer from mains power supplies before performing the procedures in Section 4.3, page 6 and Section 4.4, page 7.

Fig. 4.1 Isolating the transmitter from incoming mains power supplies
4.2 Initiating a manual piston clean / reset

**IMPORTANT (NOTE)**
Perform this procedure to clean the piston of any solution / chemicals and reset it before returning it to the factory for repair.

To initiate a manual clean / reset:
1. At the Indicator View screen, press the key to display the Operate menu and use the key to highlight Diagnostics:

2. Press the key to select Diagnostics sub-menu options and use the and keys to highlight Cell Diagnostics:

3. Press the key to display Cell Diagnostics sub-menu options:

4. Use the and keys to navigate between fields and enter data in the first 3 fields as shown below:

<table>
<thead>
<tr>
<th>Fields</th>
<th>Selection / Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation</td>
<td>Bring In</td>
</tr>
<tr>
<td>Volume</td>
<td>9 ml</td>
</tr>
<tr>
<td>Port</td>
<td>DI</td>
</tr>
<tr>
<td>Detector</td>
<td>Read-only</td>
</tr>
<tr>
<td>Voltage</td>
<td>(detector voltage [0 to 4095 mV] in real time).</td>
</tr>
<tr>
<td>LED Current</td>
<td>Read-only</td>
</tr>
<tr>
<td></td>
<td>(LED current in real time).</td>
</tr>
</tbody>
</table>

5. Use the key to highlight the button press to initiate the clean.

6. When the clean is complete, the and keys to navigate to the Operation field and select Reset Pump.

7. The piston can now be removed from the instrument and returned to the factory for repair – refer to Section 4.3, page 6.

**IMPORTANT (NOTE)**
If this procedure is selected while the analyzer is operating, the following warning is displayed with the Continue option active:

Warning: The monitor is still in operation. Continuing will override normal monitor operation.

To exit press the key, to proceed, press the key.
4.3 Removing a piston

**IMPORTANT (NOTE)**
Perform this procedure if the piston is seized.

**DANGER – Serious damage to health / risk to life**
Isolate the analyzer from mains power supplies before performing this procedure.

**WARNING – Bodily injury**
- do not allow any fluid from the measurement cell sample tube to come into contact with either the skin or any metallic / electronic parts of the analyzer. The fluid is contaminated with acid from the reagents used in the analyzer – wipe up any spillages immediately
- wear appropriate PPE when emptying any liquid from the piston

Referring to Fig. 4.2:
1. Turn handle \( A \) \( \frac{1}{4} \) turn clockwise, pull the analytical section forward and allow it to rest against its stops.

![Fig. 4.2 Opening the analytical section](image)

Referring to Fig. 4.3:
2. Disconnect the measurement cell ribbon cable \( B \) from the connector on the back of the measurement cell.
3. Remove 4xM4 screws \( C \) and remove the measurement cell assembly.

![Fig. 4.3 Removing the measurement cell assembly](image)

Referring to Fig. 4.4:
4. Depress catch \( D \) and remove cover \( E \).

![Fig. 4.4 Removing the measurement cell cover](image)

Referring to Fig. 4.5:
5. Invert the measurement cell assembly, remove 4 screws \( F \) and remove base plate \( G \).
6. Remove sample tube end face sealing cap \( H \) and remove seal \( I \). Discard the seal.
7. Remove all traces of fluid from the inside of sample tube \( J \).

![Fig. 4.5 Removing the measurement cell base plate](image)
8. Remove 2 screws (K) and remove measurement cell top cover (L).


10. Remove 4 screws (N) and remove motor and sample tube (O) from the lower half of the measuring cell.

11. Slide sample tube (P) off piston assembly (Q). Discard the sample tube.

12. Loosen retaining grub screw (R) and unscrew piston assembly (Q) from piston shaft (S), clean the piston assembly using DI water and return it to the factory.

4.4 Fitting the piston assembly

1. Lightly lubricate new O-ring (T) and piston seal (U) with the silicon grease from the piston kit.

2. Fit the O-ring and piston seal to new piston base (V).

3. Insert the piston base, complete with seal and O-ring, into the new piston top (W) and secure loosely with new piston cone adjusting screw (X) and spring washer (Y).

IMPORTANT (NOTE)
Do not tighten the piston cone adjusting screw at this stage.

4. Insert new piston assembly (Q) into the top of new sample tube (P) and, holding the piston firmly, tighten piston cone adjusting screw (X) until a continuous seal is achieved between piston seal (U) and sample tube (P).

5. Remove the piston assembly from the sample tube and refit it to piston shaft (S). Fit and tighten new retaining grub screw (R).

6. Remove O-ring (Z) from the base of the motor mounting plate and discard.

7. Fit new O-ring (Z) ensuring it is located correctly in the groove in the base of the motor mounting plate.

8. Fit the sample tube over the piston assembly and slide it up until it contacts O-ring (Z).
Referring to Fig. 4.8, page 7:
9. Refit the motor and sample tube to the lower half of the measurement cell, ensuring that the motor wiring plug is aligned with the socket (see M in Fig. 4.7, page 7).
Secure the motor mounting plate to the lower half of the measurement cell with 4 screws N.

Referring to Fig. 4.7, page 7:
10. Reconnect motor wiring plug M.

Referring to Fig. 4.6, page 7:
11. Refit measurement cell top cover L and secure with 2 screws K.

Referring to Fig. 4.5, page 6:
12. Fit a new O-ring I to end cap H, ensuring it is located correctly in the groove in the end cap.
13. Invert the measurement cell assembly and position end cap H over the end of sample tube J.
14. Refit base plate G ensuring that the end cap is centered in the hole in the base plate. Secure the base plate with 4 screws F.

Referring to Fig. 4.4, page 6:
15. Refit cover E.

Referring to Fig. 4.3, page 6:
16. Locate the measurement cell assembly onto the analytical section back plate and secure with the 4 x M4 screws C.
17. Reconnect measurement cell ribbon cable B.

Note
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