Maintenance services
Electromagnetic flowmeter refurbishment
Measurement made easy
Remove, refurbish and re-commission – good as new

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Harsh processes cause flowmeters to wear
• A refurbished flowmeter fitted during routine maintenance reduces unscheduled maintenance ensuring maximum uptime of your plant and process

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Harsh measuring environments can affect product accuracy
• A refurbished flowmeter ensures your measurement accuracy is maintained

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Increase the lifespan of your Flowmeter
• Implement a Routine Refurbishment Program

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Refurbishment is often-cost effective for
• Large sizes
• Custom sized or unusual flange types
• Custom lay-lengths
• Flowmeters over 15 years of age

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Electronics upgrade to latest model
• A new electronics ensure the maximum reliability from your flowmeter
• Buy a replacement electronics, same model as before to maintain continuity
• Buy a retrofit electronics with the latest technology unlocking new features and functionality

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A refurbishment comes with 1-year warranty
• Peace of mind for your measurement security

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Overview
As products age they may require special attention or maintenance to ensure your measurement is accurate. Wear and tear affects the accuracy and integrity of any flow measuring device. Electromagnetic flowmeters have no moving parts, but they can still be affected by the harsh properties found in certain flowing fluids.

In some cases it is more economic for you to arrange for your flowmeter to be taken offline and refurbished rather than simply replacing it. During refurbishment why not replace the electronics or upgrade to the latest model, unlocking new features and enhancements that may improve your measurement experience.

Applications where refurbishment may be the answer
Electromagnetic flowmeters are the flow measurement of choice in tough applications like mining, dredging and cement manufacture.

Liquids and chemicals containing high solids content such as sand, metal particles or rocks, can wear or coat flowmeter linings and electrodes – even the best linings and the hardest electrodes still wear over time.

The life span of your ABB flowmeter system when used in such harsh environments can be increased by implementing a routine refurbishment program on the primary flow sensor.
Overview

What can happen to a flowmeter if it is not replaced or refurbished in time?

Damage to the flow sensor lining affects not only the accuracy of the flow measurement, but also creates the possibility of the process leaking into the casing of the sensor and damaging the magnetic coils. Coil replacement is possible, but adds further costs that could be prevented.

Damage to the electrodes will create even greater errors in the flow measurement and can even cause total loss of the measurement signal. Heavily damaged electrodes create a possibility of the process leaking into the casing of the sensor and could again damage the magnetic coils.

Replacement vs. Refurbishment

Whilst the complete replacement of the flow sensor may be possible, a routine refurbishment program is recommended for the following installations:

- large flow sensors (> 250 mm [10 in.] diameter)
- custom-sized flange sizes/types
- custom sensor ‘lay’ lengths
- older flowmeters (> 15 years)

Our proposal

Depending on the process fluid type and application, an agreed refurbishment program will be established for routine removal of the flowmeter system and complete refurbishment of the flow sensor. The refurbishment period could range from between 6 months (for dredging applications) to 10 years.

Upon completion of the refurbishment work, a wet calibration (to ISO/IEC 17025 standards) is performed. Your flowmeter is then returned together with a calibration certificate (to ISO/IEC 17025 standards) and 1-year warranty.

What if the product you want to refurbish is no longer available?

ABBE uses a life-cycle management model with 4-phases to effectively manage products in the market, these phases are defined as Active, Classic, Limited and Obsolete.

During its lifetime, a product is successively transferred from the Active phase to the Classic, followed by the Limited and finally the Obsolete phase. A product remains in the Active phase as long as it is actively manufactured, marketed and sold. Spare parts availability is secured throughout the first three phases – Active, Classic and Limited. New Spare parts are actively manufactured in the Active and Classic phases. Depending on the phase your product is currently in will determine whether it is necessary to upgrade the electronics to a newer version.

Assured quality

All refurbishment work is carried out in our approved manufacturing and repair facility in accordance with International quality procedures (ISO 9001). All flowmeters are calibrated on NATA accredited calibration rigs to provide the end-user with complete assurance of both quality and performance of the flowmeter.

The flow sensor refurbishment process

To ensure your product is returned in perfect condition, we perform a number of processes during the refurbishment. Below is a list of the processes we typically perform (items marked with an * are optional extras):

1. De-commission and prepare for transport to ABB site.*
2. Strip down and clean.
3. Remove wiring and electronics.
4. Re-line sensor with same material or better (as new technology allows).
5. Perform Hydrostatic Pressure test.*
6. Replace all electrodes and wiring with same metal or better (as new technology allows).
7. Paint all exposed surfaces with Marine grade primer and topcoat.
8. If product is now obsolete prepare for upgrade.*
9. Perform a 1-, 3-, or 6-point wet calibration on an ABB NATA accredited calibration rig.
11. Perform on-site commissioning.*

Figure 2 6-Phase life-cycle management model

Figure 3 ABB workshop repairs process

Prepare goods for repair

- Complete the standard COSHH form to avoid quarantine of goods
- Complete standard repair form highlighting device problems
- Package goods safely

ABB receipt of goods

- Standard check for inclusion of COSHH and repair forms
- Acknowledgement of receipt of goods and estimate of evaluation/repair time

Workshop repair

- Device components repaired according to pre-agreed requirements
- Device is calibrated (where required) specific to application
- Notification of repair completion and estimated transit time

Despatch

- Device is packaged and delivery is arranged to end user site
- Notification of repair completion and estimated transit time

The flow sensor refurbishment process
Refurbishment options

<table>
<thead>
<tr>
<th>Standard sensor lining materials</th>
<th>Standard electrode materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>basalt</td>
<td>316SS</td>
</tr>
<tr>
<td>alumina ceramic</td>
<td>Hastelloy B</td>
</tr>
<tr>
<td>polyurethane</td>
<td>Tantalum</td>
</tr>
<tr>
<td>PTFE</td>
<td>Titanium</td>
</tr>
<tr>
<td>rubber</td>
<td>Tungsten</td>
</tr>
<tr>
<td>Linatex</td>
<td></td>
</tr>
</tbody>
</table>

Sensor sizes
All sizes up to 750 mm (30 in.).

 Calibration uncertainty
In accordance with original factory calibration, least uncertainty +/- 0.15%

Useful information
To discuss your refurbishment requirements, please contact one of our experts.

An example of the type of information that can help us to support you more efficiently is given below:

<table>
<thead>
<tr>
<th>Product serial number (if known):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application (tick):</td>
</tr>
<tr>
<td>Dredging</td>
</tr>
<tr>
<td>Mining</td>
</tr>
<tr>
<td>Process /Chemical</td>
</tr>
<tr>
<td>Water</td>
</tr>
<tr>
<td>Waste Water</td>
</tr>
<tr>
<td>Other</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Approximate diameter:</th>
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</thead>
<tbody>
<tr>
<td>Lining material</td>
</tr>
<tr>
<td>Electronics type</td>
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</tbody>
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