Magnet Use with Boston Scientific Pacemakers and CRT-Ps

A Model 6860 doughnut magnet may be used with Boston Scientific pacemakers to provide asynchronous pacing support (e.g., in the presence of electromagnetic interference), and also enables clinicians to assess battery status, pacing output safety margin, and general device function without using a programmer. Additionally, the Magnet Response can be programmed to store a logbook episode in order to assess patient symptoms.

Magnet Response Feature
The pulse generator Magnet Response settings can be programmed to control the behavior of the pulse generator when a magnet is detected. The following Magnet Response settings are available: Pace Async, Store EGM, and Off.

- **Pace Async** (nominal setting) – If Magnet Response is programmed to Pace Async, magnet application will convert the programmed pulse generator Brady Mode to a fixed asynchronous pacing rate with a 100 ms AV Delay. For CRT-Ps, the pacing chamber is set to BiV and LV Offset is set to 0 ms. The pacing mode converts as follows:

<table>
<thead>
<tr>
<th>If the programmed Brady Mode is</th>
<th>then the Magnet Mode will be</th>
</tr>
</thead>
<tbody>
<tr>
<td>DDD, DDRR, DDI or DDIR</td>
<td>DOO</td>
</tr>
<tr>
<td>VDD, VDDR, VVI, VVIR</td>
<td>VOO</td>
</tr>
<tr>
<td>AAI and AAIR</td>
<td>AOO</td>
</tr>
</tbody>
</table>

The pacing rate activated by magnet application provides an indication of battery status, on the Battery Status Summary screen, and can be interpreted as follows:

<table>
<thead>
<tr>
<th>If the Magnet Rate is</th>
<th>then the Battery Status summary will be</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 ppm</td>
<td>More than One Year Remaining</td>
</tr>
<tr>
<td>90 ppm</td>
<td>One Year or Less Remaining</td>
</tr>
<tr>
<td>85 ppm</td>
<td>Explant</td>
</tr>
</tbody>
</table>

- **Store EGM** – If Magnet Response is programmed to Store EGM, magnet application will activate the Patient Triggered Monitor (PTM) functionality. The Patient Triggered Monitor feature allows the patient to manually place a magnet over the device and trigger the storage of EGMs, intervals, and marker data during a symptomatic episode. Instruct the patient to place the magnet over the device briefly (~2 seconds) and one time only. **NOTE:** Only one EGM can be generated and stored. To store another EGM, the PTM feature must be re-enabled using the programmer.

  When in ‘Store EGM’ mode, initial application of the magnet will trigger EGM storage, but will not cause asynchronous pacing. However, after one PTM EGM is stored (or if a PTM is not stored within 60 days), Magnet Response mode will automatically revert to the nominal setting of ‘Pace Async’ and subsequent magnet applications will cause the device to pace asynchronously (until the PTM feature is re-enabled with a programmer).

- **Off** – If Magnet Response is programmed to Off, the pulse generator will not revert to asynchronous operation in the presence of a magnet. Magnet application will have no effect on pulse generator operation.
How to Program the Magnet Response Feature

The Magnet Response feature is nominally set to ‘Pace Async,’ however can be changed using a Model 3120 ZOOM™ LATITUDE™ programmer. From the Settings Summary Tab on the programmer’s Main Screen, Select Brady/CRT Settings > Select ‘Timing, Rate Enhancements, Magnet, Noise’ > Select programmable value(s) (See Figure 1).

![Magnet Response Settings Screen](image)

Figure 1. Magnet Response Settings Screen.

How to Use the Model 6860 Doughnut Magnet

To use a Model 6860 magnet with a Boston Scientific pacemaker, position the magnet over the middle of the pulse generator, in close proximity (within 3 centimeters) from the pulse generator can, as seen in Figure 2.

![Proper position of the Model 6860 magnet to activate magnet features](image)

Figure 2. Proper position of the Model 6860 magnet to activate magnet features.

When the magnet is removed, the pulse generator automatically resumes operation according to previously programmed parameters (note that if the Magnet Response was programmed to Store EGM, device Magnet Response mode will automatically be set to Pace Async following EGM storage or 60 days without EGM storage).

NOTES:

- **A pace threshold test determines the minimum output needed to capture in a specific chamber. The third pulse during the Pace Async Magnet Response will be issued at 50% of the programmed Pulse Width. If loss of capture is observed at the third beat after magnet application, consider re-assessing the pacing energy safety margin. A minimum 2X voltage or 3X pulse width safety margin is recommended for each chamber based on the capture thresholds, which should provide an adequate safety margin yet help preserve battery longevity.**

- **Magnet Response behavior and terminology is different for older generations of Boston Scientific pacemakers and CRT-Ps. For example, differences for the INSIGNIA™ and ALTRUA™ families of pacemakers include:**
  - Magnet Response settings are referred to as ‘Async’, ‘EGM’, and ‘Off’
  - When a magnet is applied, VVT pacing mode reverts to VOO, and AAT pacing mode reverts to AOO
  - Battery Status terminology: 100 ppm = GOOD, 90 ppm = ERN, 85 = ERT, <= 85 = EOL
  - More than one EGM can be stored in EGM mode, and Magnet Response mode will not change following EGM storage.

Please contact Technical Services for additional information or reference the applicable Instructions for Use.