6DOF ISO Base[™] User Guide

Model 023-08



6DOF ISO BaseTM User Guide

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1 Introduction

The CIRS 6DOF ISO Base, Model 023-08 is an optional accessory of ISO Phantom. It is designed for positioning and leveling of ISO Phantom and quick calculation of complex 3D shifts of RT treatment systems with an integrated robotic couch.

There are two milled pockets on the CIRS 6DOF ISO Base. The ISO alignment pocket can be used to position and level the ISO Phantom[™] on the treatment couch. It contains a set of four Tungsten spheres that are used by ISO Analyze[™] Software to calculate the actual Pixel Size for both the MV and kV image detectors.

When positioned in the shifted 6DOF pocket, internal structures of the ISO Phantom allows for the calculation of rotation and translation shifts. The shifted 6DOF pocket is machined with the mechanical limits of commercially available couches in mind, which can correct for Pitch, Roll and Yaw of +/- 3 degrees of rotation. The 6DOF pocket is rotated within the IEC 61217 Coordinate System, +1.5° about X-axis, +2.0° about Y-axis and +2.5° about Z-axis and translated -15 mm on X-axis, +25 mm on Y-axis and -2 mm on Z-axis. The translations about the X, Y and Z-axes are applied with respect to the ISO center of ISO Phantom. Having rotational shifts smaller than the mechanical limits of the robotic couches allows the user to determine if there are errors on either side of the induced shift.

Both the ISO alignment pocket and the 6DOF pocket are CNC machined in a single setup. The 6DOF ISO Base is also assembled as a single piece to minimize cumulative assembly errors.

Note: Feet are adjustable, but not removable.



2 Use of the 6DOF ISO Base™

To check the 6DOF shifts the following procedure is recommended:

Acquire Image Reference Set

Align the ISO Phantom to the imaging system that is to be used to acquire the image reference set. To do this, place the ISO base on the couch of the imaging system (CT) and register it to an indexing bar. Use a high quality spirit level and level it. Place the ISO Phantom in the ISO alignment pocket.



Transfer Reference to R&V

Once the reference image set is acquired, the user can make a plan, simulation CT and DRRs based on it and transfer them to the R&V software suite for creation of a daily imaging QA patient.



Daily QA Shifts Setup

For daily QA checks of the DOF shifts the 6DOF ISO base is registered to an indexing bar of the Linac couch and leveled. The ISO Phantom is then placed in the ISO alignment pocket and the whole assembly is aligned to the Linac's light field and lasers by translating only the couch about the orthogonal axes. Providing that the MV and kV pixel size is to be calculated acquire the corresponding planar images that were defined in the ISO Analyze software for these two parameters. Remove the ISO Phantom from the ISO Alignment pocket and carefully place it in the 6DOF shifted pocket. Make sure the ISO Phantom rest firmly against the

bottom of the 6DOF shifted pocket and against the sides of the deepest corner of this pocket.



6DOF Shift Calculations

Apply the translational shifts on each axis with the opposite value shown on the 6DOF ISO Base and then rotate the couch -2.5° about Z-axis, -2° about Y-axis and -1.5° about X-axis. Take images of the ISO Phantom and perform 2D/3D kV/Mv image matching. The difference between zero and the actual values for each

individual shift shown after 2D/3D kV/Mv images match should be within the setup tolerances.



Translation on Z-axis

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3 Support and Maintenance

Hardware Maintenance

Inspection

Inspect your phantom regularly for signs of damage and weight loss. If any noticeable changes to the phantom are detected, return the phantom immediately for repair or replacement.

Repair

There are no user-serviceable components for this product. If there are problems with the instrument, contact technical support.

Cleaning

The phantom may be cleaned with mild soap and water ONLY. Avoid solventbased, alcohol-based, or abrasive cleaning agents.

Storage

For longest life, the phantom should be cleaned after each use and stored at room temperature.

Disposal and Recycling



Regulations regarding disposal of materials with trace acrylamide monomer vary by locality. Contact your local authority for instructions. If assistance is desired in the proper disposal of this product, including accessories and components, after its useful life, please return to Sun Nuclear.

Contacting Sun Nuclear Support

You may request support in two ways:

- Submit a support request using our online form. See Support Website below.
- Contact the Sun Nuclear Support team by telephone:
 - U.S.A.: +1 321-259-6862,
 - Netherlands: +31 20 399 90 41,
 - Germany: +49 61 02 50 49 500, Option 2

Support Website

- 1 Open an internet browser and navigate to <u>sunnuclear.com/support</u>.
- 2 Enter your email address and password and then click Login.
 - To download product information, click **Products and Devices**, select the product, and then select the download type.

• To open a Support request, click **Open New Case**, complete the form, and then click **Create Case**.

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Appendix A: Regulatory Supplement

In addition to the regulatory information contained in the body of this manual, the following supplemental regulatory information is provided.

Sun Nuclear Corporation Symbols

The following symbols are used in this guide and in Sun Nuclear Corporation's product labels.



WARNING: This symbol indicates a hazard that could result in major injury or equipment damage. (EN ISO 7010, W001)



CAUTION: This symbol indicates a potential hazard that could result in minor injury or equipment damage. (EN ISO 15223-1, 5.4.4)



CAUTION: This symbol indicates a pinch hazard. (EN ISO 7010, W024)



Note: Important or supporting information.



Manufacturer's Identification (name and address). (EN ISO 15223-1, 5.1.1)



Date of Manufacture. (EN ISO 15223-1, 5.1.3)



Temperature limitation. (EN ISO 15223-1, 5.3.7)



Humidity limitation. (EN ISO 15223-1, 5.3.8)

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Atmospheric pressure limitation. (EN ISO 15223-1, 5.3.9)



Serial Number. (EN ISO 15223-1, 5.1.7)



Catalog Number. (EN ISO 15223-1, 5.1.6)



Consult instructions for use. This equipment must be used in accordance with the instructions in this manual. Read all instructions and safety labels before use. (EN ISO 15223-1, 5.4.3)



Do not throw in trash; dispose of in an environmentally friendly way. (EN 50419) $\,$

Operator Responsibility

The instructions in this manual are intended for trained clinical personnel. The operator is solely responsible for the accurate setup and use of the phantom.

Reporting Health or Safety Related Issues or Concerns

A notice to the user and/or patient that any serious incident that has occurred in relation to the device should be reported to the manufacturer and the competent authority of the Member State in which the user and/or patient is established.

To report any safety or health related issues or concerns regarding the use of Sun Nuclear products, contact Sun Nuclear directly.

Modifications to Equipment

Any changes or modifications to the device that are not expressly approved by Sun Nuclear Corporation could void your warranty.



