

Procedure for resetting a jammed micrometer inside a Mk IV Brewer spectrophotometer

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Introduction

It is possible, under certain operating conditions, for the micrometer within a Mk IV Brewer spectrophotometer to become inoperational due to a physical jamming against its minimum end stop position. This situation sometimes occurs when there has been a power outage on the Brewer unit but no power loss to the computer. Once a micrometer becomes stuck, the stepper motor which controls its movement will no longer be able to rotate it and the micrometer has to be reset by hand in order for the Brewer instrument to become operational again.

Equipment

Mk IV Brewer spectrophotometer

Purpose

This Standard Operating Procedure (SOP) outlines the NUVMC technique for resetting a micrometer in a Mk IV Brewer spectrophotometer when it has become jammed.

Procedure

1. Place a protective cover on the quartz dome on the top of the Brewer outer cover.
2. Remove the Brewer outer cover by loosening the four latches and lifting the cover up. Never remove the cover during inclement weather and try to pick the driest, wind free day possible.
3. Remove the black spectrometer cover by loosening the two latches and pulling the cover back. Observe and record the default position on the micrometer dial in millimeters. Never remove the cover during inclement weather and try to pick the driest, wind free day possible. DO NOT TOUCH THE MIRROR OR DIFFRACTION GRATING WITH FINGERS OR ANY OTHER OBJECT. DO NOT ATTEMPT TO CLEAN THE MIRROR OR DIFFRACTION GRATING IF ACCIDENTALLY TOUCHED AS THIS WILL CAUSE ADDITIONAL HARM TO THE OPTICAL SURFACES.
4. Locate the micrometer assembly inside the spectrometer. The micrometer barrel has a scale measured in millimeters engraved on its side.
5. Using fingers to rotate the micrometer barrel set it to the default position that is listed on the piece of paper taped to the spectrometer cover. This should be a number between about 11 and 13 mm. If there is no paper with default position listed then set the micrometer to 12 mm.
6. Replace the black spectrometer cover and latch it.
7. At the Brewer Home screen command line give the FR command. The micrometer will run in increments until it reaches the optical switch at the shortest micrometer position. Once the switch is reached the micrometer will back up several steps and then move forward again in smaller increments until the exact step position is determined. The micrometer will then move back to the default position (11-13mm) as set in the Instrument Constants File (ICF). The FR routine also zeroes filter wheel #3.
8. At the Brewer Home screen command line give the HG command and observe if the scan is successful. A successful scan is one at which the peak HG counts are found at step number 15 as appearing on the computer monitor.
9. Remove the black spectrometer cover and note the position of the micrometer in mm's. Replace the cover.

10. At the Brewer Home screen command line give the FR command again.
11. When the routine is complete, remove the black cover again and note the position of the micrometer in mm's. It should match that of the HG scan. Replace the black spectrometer cover.
12. If the micrometer position after the second FR routine does not match the position found after the HG scan, repeat steps 8 through 11. If the micrometer positions from the two scans do match, proceed to step 13.
13. Replace the spectrometer cover and secure both latches.
14. Replace the Brewer outer cover and secure the four latches, ensuring that the outer cover is mounted evenly all the way around the Brewer case. Remove the quartz dome protector.
15. Perform the SR/SI tests if possible before returning the Brewer to schedule.
16. Enter an electronic comment (CM or CO command) describing briefly if the micrometer was reset or and any other observations made. Also enter a brief entry in the paper station log form.
17. Place the Brewer back into schedule by giving the command "skc" at the command line. When prompted for schedule, enter the name of the current network schedule (epa96d for the US EPA/UGA network as of September 2002).

For further information or advice concerning this SOP please contact the NUVMC at the University of Georgia at <http://oz.physast.uga.edu>