Figure 10 The AIA filter-wheel mechanism. The wheel has five openings containing various filters for each telescope as described in Table 3.

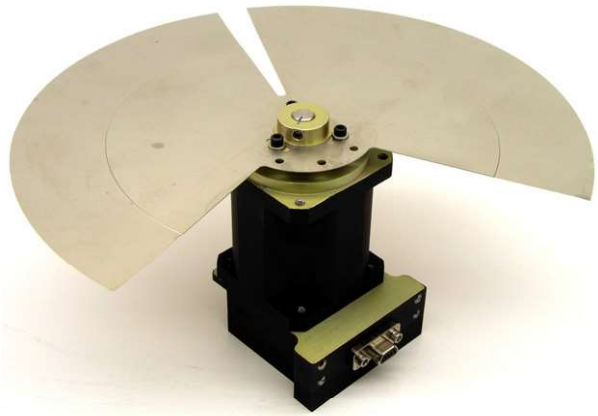

Figure 11 The AIA shutter mechanism consisting of its blade and shutter motor. The narrow slot is used for 5-ms exposures and the larger opening is used for 80-ms and longer exposures.

the optical design has a magnification of three, this corresponds to an approximately 22-μm change in focus per step. The design is based on the TRACE focus mechanism and employs a stepper motor manufactured by CDA InterCorp to drive a screw that pushes a level arm attached to the secondary mirror cell. The focus can be adjusted as often as every exposure if necessary.

The filter wheel is based on the *Triana/Earth Polycromatic Imaging Camera* (EPIC) and *Hinode*/XRT designs and consists of a thin, brushless DC motor manufactured by H. Magnetics (Figure 10). To the motor is added an optical encoder, and the mechanism is operated as a stepper motor with 324 steps per revolution. A one-position move requires about one second. For telescope numbers 1, 2, and 4 the filter wheel contains four metal (focal-plane) filters and the fifth position is left open for calibration purposes. Telescope number 3 contains two metal filters and three glass filters (for the UV channels).

The shutter mechanism consists of a 159-mm diameter thin blade mounted to a Kollmorgen RB-00704-G02 motor (Figure 11). The housing and optical encoder are a LMSAL design and the bearings are from Timken MPB. This design has flight heritage on several missions including SOHO/MDI, TRACE, STEREO/SECCHI, and *Hinode/Focal Plane Package* (FPP) and XRT. The blade rotates to open the shutter, exposing the CCD. The blade has a narrow opening that provides a 5-ms exposure when rotated over the CCD and a wide opening that provides an 80-ms exposure. Longer exposures are obtained by stopping the wide opening in front of the CCD for a specified length of time that is controlled by the flight software. Exposure times longer than 5 ms and shorter than 80 ms are acquired by sweeping the shutter's narrow opening over the CCD multiple times.