

Application Handbook

Machine Tools

Harmonic Drive LLC

Special-Purpose Milling Machine Tool Revolver

- High precision output bearing
- Output-side clamping arrangement

This design example shows the tool revolver of a special-purpose milling machine. The revolver disc carries driven tools to mill the profile of special keys. A CSF-2A-GR component set is used to index the revolver disc and bring the required tool to the tool drive shaft, which is then coupled in to drive the tool. The design provides a unique combination of a high precision gear and a highly accurate output bearing.

The four point flange bearing is available with a run out of less than 5 μm for selected bearings and is therefore ideally suited for applications in the rotary axis of high precision machines.

The outer race of the bearing also serves as the housing for the gearbox. The Circular Spline, as the fixed gear element, is connected directly to the outer race of the bearing. This design reduces the number of component parts and also ensures a low angular transmission error. In this application high cutting forces act on the output flange, so a hydraulic clamping arrangement is used to fix the output flange during the milling operation. The previous design featured a pre-loaded worm gear and separate position flange bearing. The new design reduces the number of individual components and significantly reduces cost, while at the same time improves accuracy. Also higher rotational speeds are permissible without an unacceptable temperature increase.

