

# Application Handbook

# Machine Tools

## Harmonic Drive LLC Gantry Milling Machine Tool Changer

- Integrated output bearing

Harmonic Drive® strain wave gear and Harmonic Drive® actuators are well suited to applications in the peripheral axes of large machine tools, such as in tool or work-piece magazines and changers. This design example shows the electro-mechanical tool changer of a special gantry milling machine, used for the machining of large moulds and dies. Large tools, weighing up to 75 kg, must be inserted directly into the machine spindle or milling head at various angles.

The gear must exhibit a high positioning accuracy to avoid damage to the tool holder. A high stiffness output bearing is also necessary to support the tool gripper assembly. The CSF-2UH Unit is positioned so that the line of the center-of-gravity of the welded housing and tools passes through the plane of the output bearing. This reduces the tilting moment acting on the output bearing as much as possible. An HPG Planetary gear is used to drive the tool gripper. The individual grippers are moved via a ballscrew which is, in turn, driven via a spur gear arrangement.

