

Harmonic Drive LLC Machining Center Pallet Changer

- Hollow-shaft
- Integrated output bearing

In order to allow machining centers to operate unattended for longer periods, there is a trend toward increasing automation of workpiece handling.

One example of this trend is the pallet changer shown in the drawing. This changer is used in a horizontal-spindle machining center and transfers pallets carrying the workpiece from a loading station to the NC rotary table of the machining center. It consists of a cast-iron cube carrying 4 pallets, each of which carries a cubic fixture holding a number of individual workpieces. When fully loaded the pallet changer carries enough workpieces to allow the machining center to operate unattended for several hours. The design shown is driven by a CSF-2UH Unit combined with a brushless DC servo motor. An interesting feature of this design is the orientation of the input shaft relative to the gear. The Wave Generator is mounted on an input shaft, which passes through the hollow center of the output flange. The input shaft is connected to the motor via a shaft coupling. This arrangement allows the output-side cross-roller bearing of the unit to be mounted close to the line of the center-of-gravity of the cast-iron cube. As a result, the tilting moment acting on the output bearing is minimized, ensuring a long, maintenance-free, operating life. This design solution is particularly compact and offers high dynamic performance, thereby minimizing idle time for the machining center.

