

Application Handbook

Machine Tools

Harmonic Drive LLC

Machining Center Workpiece Loading Robot

- Hollow-shaft
- Special sealing arrangement

This design example shows the first rotary axis of a special robot, used to load work-pieces into a vertical-spindle machining center. This axis features a SHF-2UH hollow-shaft unit with a special sealing arrangement.

For applications with high continuous input speeds or a very high duty cycle, the friction of the rotary shaft seals running on the hollow input-shaft can result in increased temperatures.

This design example shows how it is possible to reduce this effect by means of a special sealing arrangement. The standard shaft seals, located in the input and output-side flanges, are removed and a hollow sleeve is passed through the unit. One end of the sleeve is fixed to the base housing of the robot, while a V-seal connected to the other end of the sleeve seals the unit against lubricant migration and dirt contamination. The V-seal acts against a thin plate located in the rotating arm of the robot. This plate rotates with the reduced output speed of the gear. The hollow sleeve is used to pass cables and pipes, for sensors and for gripper respectively, through the center of the gear. The sleeve thereby protects the cables from abrasion due to the high-speed rotation of the SHF's hollow-shaft input. The hollow-shaft is driven via a spur gear arrangement.

