

Application Handbook

Industrial Robots

Harmonic Drive LLC 6-Axis Primary Axes

- Hollow-shaft
- Integrated output bearing

Industrial robotics continues to be one of the major application areas for Harmonic Drive® strain wave gears.

This application example shows the base and shoulder axes of a 6-axis robot for assembly and arc welding applications. This application requires zero backlash gears with high torque capacity, high torsional stiffness, and excellent repeatability. This design uses a special version of our SHF 2UH hollow-shaft design. Both axes are supported by the stiff output bearing of the unit. The SHF product range features a particularly strong cross-roller bearing, and is therefore ideally suited to applications in the primary axes of robots, where there are significant tilting moments on the output bearing of the gears in each joint.

The design example shows a particularly interesting use of the hollow-shaft. The hollow input shaft is connected to the motor shaft by means of a shaft coupling, which is mounted inside the hollow shaft to reduce the axial length of the motor-gear assembly. This design solution is particularly compact and allows the motor to be readily disassembled from the gear for maintenance purposes.

