Types of gearboxes commonly used with motors in robotic applications:

Planetary Gearbox:
Pros: High torque output, compact size, and good efficiency. Provides excellent load distribution among gears due to its planetary arrangement.
Cons: It can be relatively expensive and complex to manufacture.
Use: Planetary gearboxes are often used in industrial robots and CNC machines where precise positioning and high torque are required.

Spur Gearbox:
Pros: Simple and cost-effective design, suitable for low to moderate torque applications.
Cons: Lower efficiency compared to some other types, limited in handling shock loads.
Use: Spur gearboxes are commonly found in consumer robotics, toys, and automotive applications where cost is a critical factor.

Worm Gearbox:
Pros: High gear reduction ratio, self-locking, and compact design.
Use: Worm gearboxes are used in applications where the motor needs to hold a position without power, such as in elevators and certain industrial robotics.

Harmonic Drive Gearbox:
Pros: Extremely precise and lightweight, with zero backlash and high reduction ratios.
Cons: More expensive and complex to manufacture compared to other types.
Use: Harmonic drive gearboxes find applications in precision robotics, medical devices, and space applications.

Regarding the use of gearboxes in drone applications, it depends on the specific drone's design and purpose. Many consumer drones use direct-drive brushless motors without gearboxes to maximize efficiency and reduce weight. However, larger drones, especially those used for heavy lifting or industrial purposes, may incorporate gearboxes to achieve higher torque and control precision. The choice depends on the trade-off between payload capacity, efficiency, and cost.