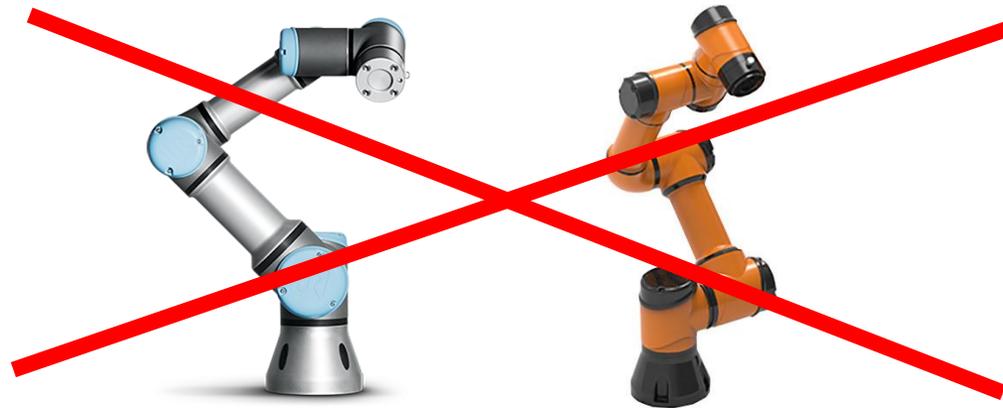




Why most of the Robotic
arm are not suitable for
camera device
image quality testing

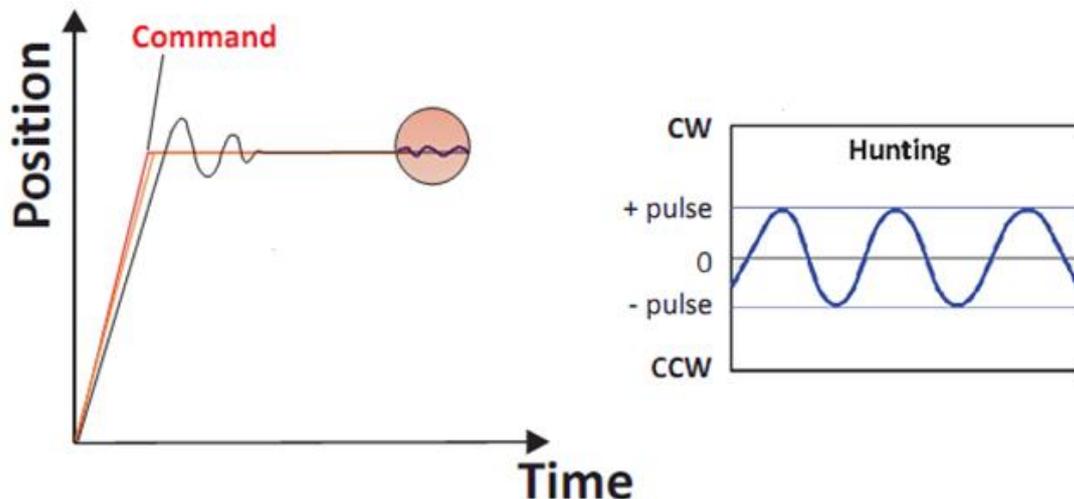


Most robotic arms are not suitable for camera device image-quality testing.

Are you planning to push your camera laboratory automation to the next level utilizing robotic arms?

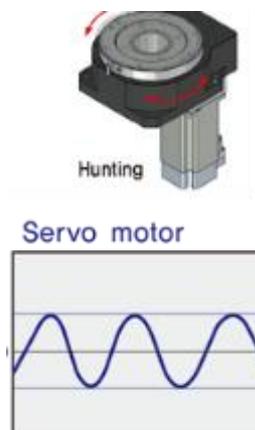
If yes, you should know all the facts before making any hardware investment.

Most robotic arms use servo motors. When a linear or a rotary axis must follow a predefined move profile to reach or maintain a precise position, speed, or torque, a closed-loop servo system is often the best choice. Feedbacks from an encoder mounted on the motor or directly on the axis provides information regarding the system's actual state (position, speed, and torque). These values are compared with the desired state, and the controller issues commands to correct any error. In an ideal system, the control loop would be perfectly accurate and work instantaneously, and the desired state would be achieved without overshoot, oscillation, or extended settling time.

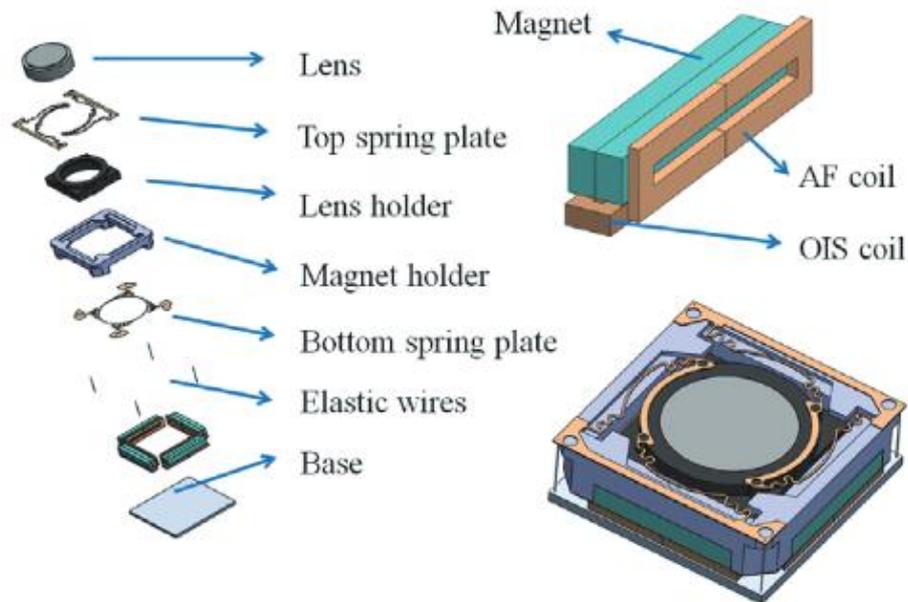


A technical definition of hunting, in the context of motion control, is periodic oscillation of the axis of the target position.

In real-world applications, this is rarely the case. Servo-controlled loops must be tuned to minimize the error between the commanded and actual values. When the goal of tuning is to minimize position error, one undesirable result is that the system continuously overshoots and then undershoots; therefore, struggle to reach and settle the technical definition of hunting; in the context of motion control, periodic oscillation of the axis about the target position at the target position. These phenomena are often referred to as "hunting."



For small camera modules, the focus lens is usually suspended between spring plates. According to Sofica's research, knowledge, and customer feedbacks, using Servo-driven robot arm in camera testing can cause serious problems.



In camera device testing, when the robot arm stops, we expect it to be complete stationary (same as a camera on the tripod). However, this is not always the case in a servo-driven robot arm. Even when it appears to be stationary, it is continually hunting in a smaller scale. The reason is that the axis control processor is constantly checking the position and making small adjustments. This can cause resonance in the springs holding the lens. And when the lens resonates, it causes problems for the focusing mechanism. What makes this worse is that you never know when it is happening.

Our customers have reported serious difficulties solving this problem when engineers try to find the cause of a sudden loss of sharpness. After a lot of debugging of hardware and software, they find the cause being the test device, not because the camera is underdeveloped. This problem may become expensive for your company and delays the product launch.

Hunting can also cause difficulties for OIS functionality. When testing image quality, the device must be stationary. If there is any hunting at all, it may keep your camera OIS functionality running. This is far from ideal. There are plenty of hand tremor simulators available on the market designed for OIS testing. A robotic arm with any possibility of hunting should be avoided as it may be a kind of shaker when it's not meant to be.

Sofica's robot arm is driven by hybrid stepping motors, and from constant current modules that hold position accurately. This is the safest solution for any kind of image-quality testing automation laboratory.

For more information contact@sofica.fi
www.sofica.fi