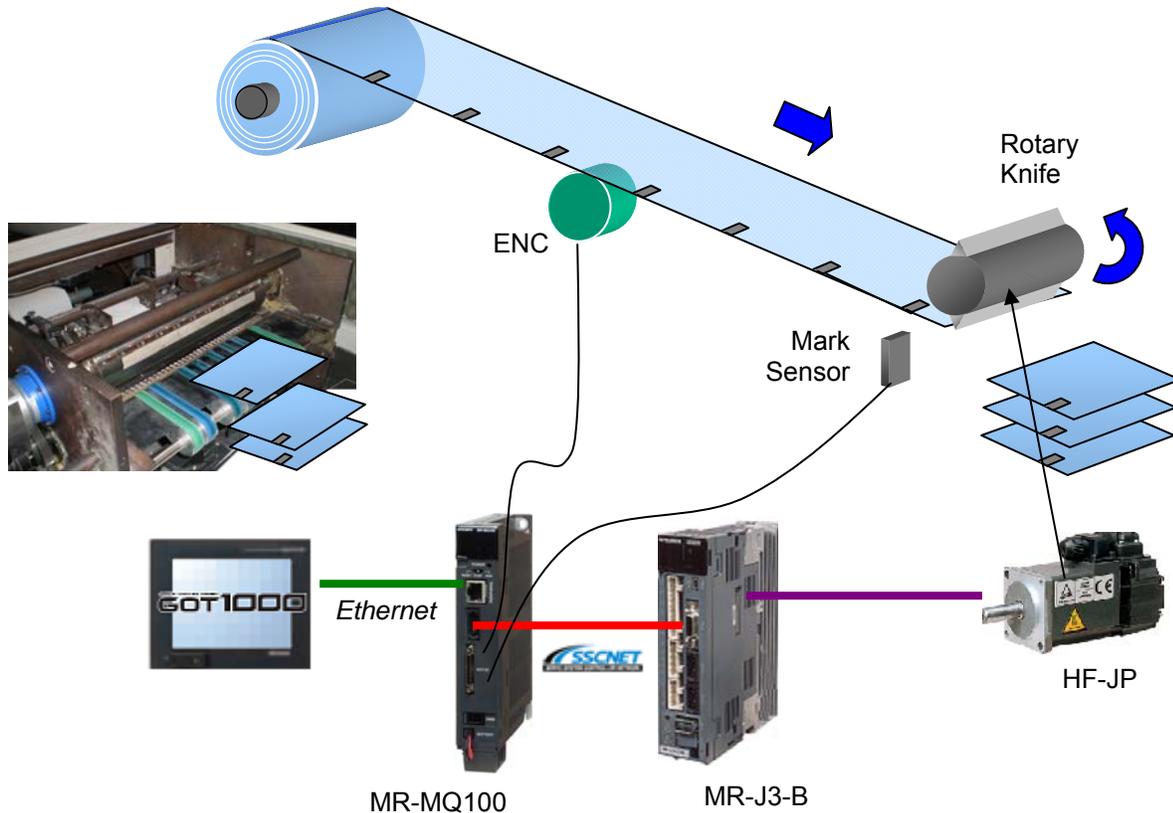Sales Application Reference Guide

## Rotary Knife

## Mitsubishi Solution

Single Axis Motion Controller: **MR-MQ100**       Servo Amplifier: **MR-J3-B**
Servomotor: **HF-JP, HF-MP**                      Graphic Operation Terminal: **GOT1000**



◇ **Overview**

Rotary knife applications include an axis of servo that responds intelligently to incoming pulses from an encoder to cut a material that is moving.  Typically, the servo axis rotates continuously to perform a cutting action while responding dynamically to any fluctuations in the line speed or product length.  A synchronous encoder following function is used in combination with high speed registration.
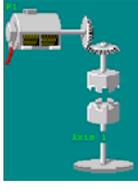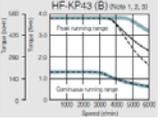
◇ **Example Applications**

Rotary knife applications can be adapted to perform a variety of functions.  Some of the example machine applications include:

| | | |
|---|---|---|
| ♦ Steel & paper cutting | ♦ Perforation | ♦ Labeling |
| ♦ Stamping | ♦ Flat material sealing | ♦ Scanning |

◇ **Solution features, advantages and benefits**

| Features | Advantages/Benefits |
|---|---|
| • Mechanical support language and CAM function<br>  ➢ Easy to design complex motion profiles using motion development software, MT Developer. | • 30% reduced programming time<br>• Reduced labor cost<br>• Reduced machine cost (less mechanical components) |
| • High speed registration function<br>  ➢ Captures the mark sensor position within 30µs or less. | • Increased machine productivity<br>• Higher quality production<br>  ➢ Less scrap material |
| • Ethernet communication<br>  ➢ Easy to set up and configure<br>    ▪ Automatic IP detection for programming<br>  ➢ High speed open network | • Reduced setup time (plug & play)<br>• Reduced wiring cost (standard cabling) |
| • Real-time model adaptive auto tuning<br>  ➢ MR-J3 amplifiers tune automatically and continuously, eliminating the need to re-tune or adjust manually. | • 10% reduced machine setup time<br>• Improved productivity<br>• Increased machine lifetime |
| • Servo adaptive filter II<br>  ➢ The optimum "machine resonance suppression filter" is automatically set without measuring the machine's frequency characteristics. | • Reduced machine setup time<br>• Improved productivity<br>• Increased machine lifetime |
| • Direct connection to HMI<br>  ➢ Customizable screen development<br>  ➢ Built-in monitoring and diagnostics | • Easy to use<br>  ➢ Less effort for programming and operating<br>• Reduced maintenance time & cost |
| • High speed, low inertia servo motors<br>  ➢ High response for sharp acceleration and deceleration motion profiles | • Improved machine productivity<br>  ➢ 13" pieces with web speeds up to 460 ft/min<br>• Reduced machine cost and complexity |
| • High resolution absolute encoders<br>  ➢ Smooth and accurate positioning with 18-bit resolution (262,144 ppr) absolute encoders. | • 20% reduced cost<br>  ➢ Reduced inventory cost (absolute encoder is standard)<br>  ➢ Reduced machine & maintenance costs (eliminate switches)<br>• Improved production quality<br>  ➢ 200% positioning accuracy improvement |

*Note:  The values listed in the table are based on a real world application.