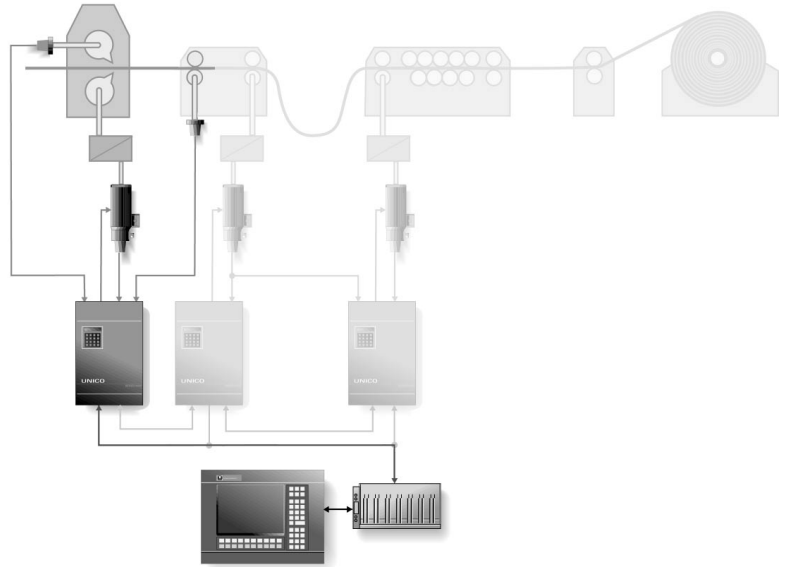**UNICO**

MRC™

*Embedded
Metal Rotary
Cutoff Control*

Overview

The MRC™ software module is engineered specifically for controlling rotary-cutoff applications for the metal industry. The program is embedded within the controller of a UNICO drive, eliminating the need for an external control rack. When used in conjunction with a programmable controller, the drive forms a powerful automation work cell that can either stand alone or be easily integrated with other UNICO automation cells to build a complete control system for a metal-processing line. Embedded control reduces system complexity while taking full advantage of the exceptional performance, flexibility, and ease of use of UNICO drives.

Features

Cut-to-Length or Cut-to-Mark

The rotary cutoff control cuts a continuously moving strip of material into specified lengths. A measuring wheel is used to track the movement of the material. Two different modes offer the choice of cutting prescribed lengths or cutting relative to printed registration marks or holes using a mark detector to scan the material. Windowing features minimize spurious mark errors during registration cutting.

Pattern Recognition

The drive can search for a user-defined pattern of marks or holes in the material. When a pattern or hole is recognized, the shear makes a cut at a specific location relative to the last mark in the pattern. A pattern tolerance setup establishes the degree to which the distance between consecutive marks can vary from the set distance and still be considered a valid part of the pattern.

Simulators

Two simulation tools facilitate setting up, testing, and troubleshooting a rotary cutoff system. A line simulator makes it possible to run the cutoff without material by simulating the feedback that the measuring wheel or pull roll would provide as the line ramps up, ramps down, or runs at speed. A mark detector simulator provides marks at a specified separation to allow testing in cut-to-mark mode.

Cut Torque Boost and Limit

A torque boost option applies torque during the cut to prevent speed droop and help eliminate material damage.

Batch Control

Two different part lengths and batch sizes can be specified at once, allowing the operator to set up the next order while the current one is running. In cut-to-mark mode, batches also specify the mark offset and up to eight pattern edges. Orders change automatically at the end of a batch or when requested by the operator. A customizable early warning feature indicates when a batch is nearly complete. A single length may also be produced indefinitely.

Features
(continued)

Cut Angle Calculation

The ideal cut angle is automatically calculated from shear and material data. The program accommodates four different blade types: driven bow-tie, driven straight, undriven bow-tie, and undriven straight.

Smooth Cut

The drive latches the line speed at the beginning of a cut and follows this speed while the shear is engaged in the material. This feature is necessary with heavy-gauge material to prevent the shear from stalling during the cut.

Back-Up

When producing long lengths, the shear is stopped at a point beyond top and backed up to a point an equal distance ahead of top. This allows longer acceleration and deceleration distances required for higher line speeds.

Dual-Motor Operation

The control supports both single- and dual-motor operation. If two motors are coupled to the knife, the user must arbitrarily choose one as the master and the other as the slave.

Maximum Line Velocity Calculation

The program calculates the maximum velocity at which the line can operate based upon part length. The velocity is computed using a number of parameters that describe the shear, the shear motor, the shear drive, and the material.

Cam Outputs

Programmable limit switch (PLS) outputs replace mechanical cams by electronically following the position of the rotary cutoff.

**Inputs/
Outputs**

A variety of input/output functions are provided for integrating the rotary cutoff control with external devices. The user can select the functions required by a given system and specify their corresponding hardware or serial I/O points.

Inputs

- motor on
- fault reset
- DC field on
- motor thermal ok
- motor blower ok
- jog forward
- jog reverse
- goto position
- auto
- order change
- follow load pg
- dereference
- cut to mark
- skip mark
- set window
- advance offset
- retard offset
- reference u
- reference v
- reference w

Outputs

- motor on
- no fault
- DC field on
- manual
- auto
- reference
- reference variation warning
- at position
- line too fast
- cut error
- at goto position
- batch complete
- early warning
- calculating
- missed mark
- open window
- cut to mark

- cam 1
- cam 2
- cam 3
- cam 4
- cam 5
- cam 6
- cam 7
- cam 8
- motion
- forward motion
- reverse motion
- motor rms warning
- thermal warning

UNICO — Worldwide

Corporate Headquarters

2000.21(008) 5/20

Unico is a leading global innovator of motion-control solutions for industry. Founded in 1967, the company develops, manufactures, and services variable-speed drives, application-engineered drive products, integrated drive systems, and ancillary products that improve operations by increasing productivity, safety, and equipment life while lowering energy and maintenance costs.