HSL-DC5
ALCOA (APM) DECORATOR/BASECOATER
HIGH SPEED CONTROL PACKAGE

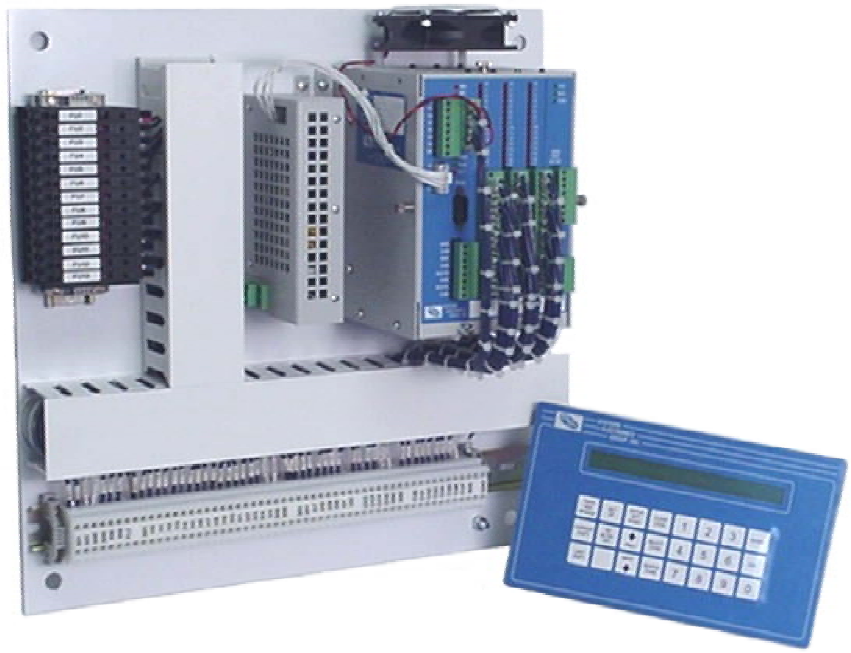
The Systems Engineering HSL-DC5 Ragsdale (APM) Decorator / Basecoater High Speed Control Package provides:

◊ **Reduced Scrap:** Accurate single miss-loaded bad can pin chain blow-off reduces number of good cans blown-off for every miss-load to zero (only the bad, miss-loaded cans are blown-off).

◊ **Improved Quality:** Eliminates silver cans from going down the line. Eliminates inside Litho problems (printed mandrels) as well.

◊ **Quality Control (Select-A-Can) Blow-off:** Allows verification of print quality for each blanket and mandrel by allowing the operator to blow off a can from a selected mandrel. Allows trouble-shooting cut blankets, etc.

◊ **Quick Pay-off:** With the reduction in spoilage incurred, the HSL-DC5 typically pays for itself in just a few months.



Features

- Performs high speed control functions of Ragsdale (APM) Decorator / Basecoater in excess of 2,400 Cans Per Minute. This includes miss-loaded can detection and trip cam control which eliminates inside deco and varnish problems, and single can pin chain (bad can) blow-off which reduces scrap.

- High speed front-end upgrade package which interfaces with existing control system.

- Performs the following control functions:

    - Detection of miss-loaded cans.
    - Odd/Even or A/B/C Trip Cam control.
    - Single can (bad can) pin chain blow-off.
    - Single select-a-can QC pin chain blow-off.
    - Can gate open/close control.
    - Alarm detection: infeed track jam, no can transfer (can on mandrel), and timing signal fail detection.
    - Data Acquisition: Total number of good cans printed, total number of blow-offs, trips per spindle, etc. (for both current and last shift).

- Can be used on all Ragsdale (APM) Basecoaters as well as all Ragsdale (APM) Decorator models (both 24 mandrel and 36 mandrel machines).

General Description

The HSL-DC5 Decorator / Basecoater high speed control package is an electronic upgrade for the Ragsdale (APM) Decorator / Basecoater which reduces excess blow-offs (scrap) by tripping and blowing off the single bad can for each miss-load. In addition, it improves quality by eliminating silver cans down the line as well as eliminating inside litho problems. The package detects miss-loaded cans, performs the odd/even or A/B/C trip cam control, and single can (bad can) blow-off at speeds in excess of 2,400 CPM. The package also provides select-a-can pin chain blow-off for print quality verification, alarm detection, and data collection.

The package is not a dedicated “black box”, but instead is implemented using the high performance Systems M4500 PLC/PLS module which allows easy customization by either SEA or the end user. The module is programmed using the DOS based SYSdev software programming package which allows programming in any combination of Ladder Logic or high-level (subset of “C”), as well as perform on-line monitoring and trouble-shooting. The module incorporates a built-in PLS which interfaces directly with the machine mounted resolver and provides all machine timing, eliminating the need for an external PLS.

Trip Cam Control

Odd/Even (interposer trip machines) or A/B/C (rotary trip machines) trip cam control at speeds in excess of 2,400 CPM is incorporated in the HSL-DC5. The appropriate trip cam is accurately extended for the spindle of the miss-loaded can and retracted back prior to spindle following the miss-loaded can at all speeds. This reduces scrap by providing an accurate single mandrel retract at all speeds. This eliminates inside litho problems by assuring that the miss-loaded spindle is completely skipped.

Bad Can (Pin Chain) Blow-off

The bad can pin chain blow-off incorporates speed compensation to compensate for the response time of the blow-off solenoid regardless of machine speed. This allows the accurate rejection of a single miss-loaded (silver) can from the pin chain at speeds in excess of 2,400 CPM. This reduces scrap by blowing off only the bad cans (and no good cans) when miss-loaded cans occur. This also eliminates silver cans down the line as well.

QC (Select-A-Can) Blow-off

The Quality Control (select-a-can) feature allows the operator to dial in a mandrel number, either at the remote PB station or from the keypad of the HSL-DC5, and blow-off one can printed on that mandrel. Mandrels 1 through 24 (or 36) can be individually blown-off this way to verify the print quality of each mandrel. This allows the quick determination of a cut blanket, etc.

Two other select-a-can blow-off modes are also available: 12 or 24/36 can blow-off. These modes blow-off 12 or 24/36 consecutive cans starting with blanket #1. This allows all 12 blankets or all 24/36 spindles to be checked at one time. In addition, the HSL-DC5 can be set up to automatically blow-off 12 consecutive cans, starting at blanket #1, on a periodic basis (i.e. once every hour).

Alarm Detection

The package detects the following alarms*: Infeed Track Jam*, *No Can Transfer* (can on mandrel), and *Timing Signal Fail*. The *Infeed Track Jam* alarm occurs when 6 consecutive empty mandrels are detected by the "can/no can" sensor after the can gate is opened. The *No Can Transfer* alarm occurs when the "no can transfer" sensor detects a can on a mandrel after the disc transfer location. The *Timing Signal Fail* occurs when any of the timing signals generated in the PLS section fail to change state periodically while the machine is running. The above alarms can be used to stop the machine when the respective alarm occurs.

"HSLDC5" SETUP PROGRAM

The "HSLDC5" setup program is a DOS based menu driven program which allows the user to easily view the HSL-DC5 data or alter the HSL-DC5 setup variables using an IBM PC or compatible. These variables include the pin chain/QC blow-off parameters, QC blow-off shift offset, and the spindle trip offset. In addition to setting the variables, "HSLDC5" can be used to set the machine timing, view the current and last shift data, view the trips per spindle, download the HSL-DC5 application program to the M4500 as well as download and upload the setup data to the M4500.

Data Collection

The following data is collected for both the current shift and the previous (last) shift: Total number of good cans printed, total number of cans blown-off, total number of miss-loaded cans (bad cans), total number of restart blow-offs, total number of manual blow-offs, total number of select-a-can QC blow-offs, and the total trips per spindle. This data can be viewed locally on the display of the HSL-DC5 by either the operator or production control personnel. This information is updated ("current" shift transferred to "last" shift) based on the change of state of a discrete input.

In addition to the shift data collection, a separate buffer is available to collect trips per spindle counts as a diagnostics aid to the operator for trouble-shooting a loading problem on a specific mandrel. Unlike the shift data, these counts can be reset manually by the operator at will.

HSL-DC5 Keypad / Display

The keypad of the HSL-DC5 contains 24 keys consisting of data display commands, setup commands, and a numeric keypad. The display of the HSL-DC5 is a 2 line by 40 character back-lit LCD display which displays the selected data and setup menus. The keypad/display can be used by the operator to view data or activate the select-a-can QC blow-off and can be used by authorized personnel (passcode or key switch protected) to adjust the timing and all setup parameters.

Specifications

Power Requirements:
Voltage: 100-240VAC, 50/60HZ
Current: 0.5 Amps @ 115VAC
0.25 Amps @ 230VAC

Temperature Ranges:
Operating: 0 to 55°C
Storage: 0 to 70°C

Resolver Interface:
Resolver Type: Systems Electronics Group RSV34-MS1 or equivalent (also can be paralleled with existing resolver/PLS)

Resolver Cable: Systems Electronics Group RSV-RSCBLE-XX

Control Inputs:
Voltage Range: 10-30VDC
Input "On" Voltage (min): 10.0 volts
Input "On" Voltage (max): 30.0 volts
Input "Off" Voltage (max): 5.0 volts
Input Current (max): 15 milliamps @ Vin=30V
Optical Isolation: 1500 Vrms

Outputs:
Voltage Range: 10-30VDC
Output "On" Voltage (min): VCC-2.00 volts
Output "On" Voltage (max): VCC-0.25 volts
Output "Off" Voltage (max): 1.5 volts
Output "On" Current (max-cont): 0.5 Amps DC
Output "On" Current (100msec): 3.0 Amps DC
Optical Isolation: 1500 Vrms

Ordering Information

The HSL-DC5 package is provided for back-panel mounting inside the existing user's control cabinet. In addition, a NEMA 12 enclosure can be purchased to house the HSL-DC5 if required space is not available in the existing user's cabinet. The part number for the optional NEMA 12 enclosure is HSL-DC5-ENCL. The order number for the HSL-DC5 is as follows:

Part Number	***Description***
HSL-DC5	Ragsdale (APM) Decorator / Basecoater high speed control package consisting of a pre-wired sub-panel (20" X 17" X 8") for mounting in the existing user's control cabinet including the following: 1ea. M4508 PLC/PLS module (with required I/O boards) 1ea. D4591 Display/Keypad 1ea. HSL-DC5 User's Manual 1ea. HSL-DC5 Program Disk 1ea. M4500 User's Manual

HSL-DC5 Options (*purchased separately)*

The following items can be purchased separately as required or desired:

Part Number	***Description***
HSL-QCSTA	Remote Select-A-Can PB station
HSL-DSP	Remote RPM/Position Display
HSL-DC5-ENCL	NEMA 12 enclosure for HSL-DC5 (24" X 20" X 10")
RSV34-MS1	Resolver (required if machine is not already equipped with resolver)
RSV-RSCBLE-XX	Resolver Cable

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