HSL-ANCNF
REXAM NECKER/FLANGER
HIGH SPEED CONTROL PACKAGE

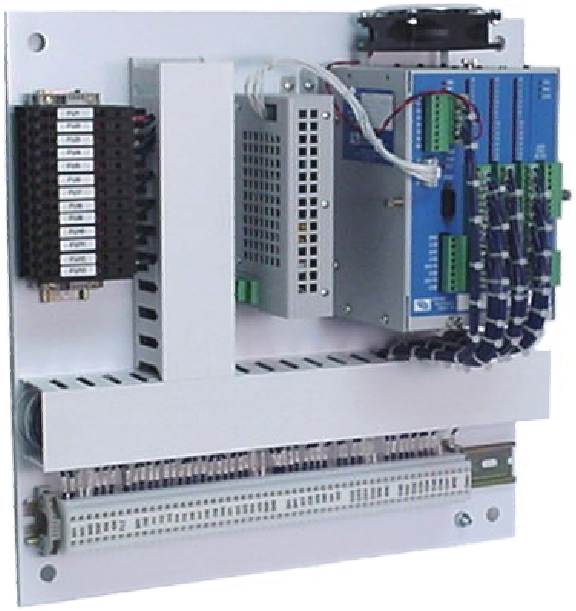
The Systems Engineering HSL-ANCNF Rexam Necker/Flanger High Speed Control Package provides:

◊ **Reduced Tooling Damage:** by accurately detecting and immediately stopping the machine once a transfer jam is detected on any one of the necker stations or flanger.

◊ **Reduces Scrap:** by again accurately detecting and immediately stopping the machine once a transfer jam occurs, damage to otherwise good cans is reduced.

◊ **Easy Transfer Jam Set-up:** With it's auto calibrate feature, the HSL-ANCNF makes setting up the Transfer Jam detection and Calefi valve control a snap. Simply enable the calibration with the machine empty, feed a can completely thru the machine and the number of shifts to each station is automatically determined and set.

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



Features

- Performs high speed control functions of Rexam Necker/Flanger. This includes transfer jam detection, can jam detection, and Calefi valve control.

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

- Performs the following control functions:

    - Detection of transfer jams (Stations 1 thru 11 and Flanger).
    - Detection of can jams (Stations 1 thru 11 and Flanger)
    - Auto Calibration mode to determine number of stations from infeed screw sensor to transfer sensors of each station.
    - Individually adjusted number of missing cans for transfer jam alarm for each station.
    - Timing signal fail detection.
    - Data Acquisition: Total number of good cans necked and flanged, total number of transfer jams, number of transfer jams per station. (For both current shift and last shift)

- Optional Built-in 2 Line X 40 character sealed display with 24 key membrane keypad allows local viewing of collected data (can count, total jams, transfer jams per station) by operator and set-up of all user variables (key switch enabled) by authorized personnel.

- Interfaces directly with machine mounted resolver, infeed screw sensor, transfer sensors (all stations) and Calefi solenoids.

- Based on high performance M4500 PLC/PLS module which allows easy trouble-shooting and user customization using SYSdev (DOS-based) programming package.

- Built-in PLS provides all machine timing, eliminating need for an additional PLS.

General Description

The HSL-ANCNF Necker/Flanger high speed control package is an electronic upgrade for the Rexam Necker/Flanger which detects transfer jams (all stations), can jams (all stations), and provides Calefi valve control. In addition, the package provides timing signal failure detection and data collection including: Total good can count, total number of transfer jams, and transfer jams per station (both for the current shift and previous (last) shift). The package interfaces directly to the machine mounted resolver, infeed screw sensor, transfer sensors and Calefi solenoids as well as the host PLC via discrete DC I/O.

The package is not a dedicated "black box", but is instead implemented using the high performance SYSTEMS M4500 PLC/PLS module which allows easy customization by either SEA or the end user. The M4500 module is programmed using the PC-based SYSdev programming package which allows the module to be programmed in any combination of Ladder or High-level (subset of "C"), as well as perform on-line monitoring and trouble-shooting. The M4500 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.

Transfer Jam Detection

The *Transfer Jam* detection is implemented as follows: the transfer jam for each station is enabled a user settable number of shifts after the infeed screw sensor has detected the first can fed into the machine. At this point, if a user settable number of missing cans is detected, a transfer jam is generated for that station (this is signaled to the host PLC via discrete I/O such that host PLC can stop the machine). This detection is performed for necking stations 1 thru 11 and the flanger. The transfer jam detection can individually be disabled for stations 6 thru 11 on machines not equipped with these stations.

Can Jam Detection

The *Can Jam* detection is implemented as follows: If the transfer sensor for a corresponding station is covered for a time delay once the machine is running, a can jam alarm is generated for that station. These alarms are available to the host PLC via the transfer jam alarm outputs.

This alarm not only detects a can jammed in front of the sensor but also verifies the operation of the transfer sensors as well. While the *Transfer Jam* detects that the sensors do not “see” cans (sensor “off”), this alarm verifies that the sensors do not fail “on” (always “seeing” cans).

Timing Signal Failure Detection

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 failure detection verifies that the timing signals do not fail either “off” or “on”. This alarm is available to the host PLC via a discrete output. This should be used to stop the machine and indicate the problem when the alarm occurs.

Data Collection

The following data is collected for both the current shift and the previous (last) shift: Total number of good cans necked and flanged, total number of transfer jams, and the total number of transfer jams for each station.

This data can either be viewed locally on the display by the operator or can be sent to the host PLC via RS-232 communications (MODBUS or Allen-Bradley DF1 protocols) using the optional S4516 communications board. This information is updated ("current" shift transferred to "Last" shift) based on the change of state of a discrete input. This input can be activated on an 8 or 12 hour shift basis or alternatively could be activated manually on a label run basis depending on the user's preference.

In addition to the shift data collection, a separate buffer is available to collect transfer jams per station counts as a diagnostics aid to the operator for trouble-shooting a transfer jam problem for a specific station. Unlike the shift data, these counts can be reset manually by the operator at will. This allows the operator to note an abnormally high count on a specific station, attempt to correct the problem, reset the counts and then check the counts at a latter time to determine if the problem is corrected. This data is viewed on the HSL-ANCNF display.

HSL-ANCNF Set-up Program

The "HSLANF" set-up program is a Windows/DOS based menu driven program which allows the user to easily view the HSL-ANCNF data or alter the HSL-ANCNF set-up variables using an IBM PC or compatible. In addition to setting the set-up variables, "HSLANF" can be used to set the machine timing (machine offset, timing signal locations, etc.). The set-up variables are used to configure and tune the HSL-ANCNF to match the configuration and performance of the specific necker/flanger.

The set-up program allows the user to perform the following: Set the number of shifts to necker stations/flanger, set the transfer jam alarm count presets, set the machine timing, view the number of transfer jams per station data, view the current shift data, view the last shift data, download the program to the M4500, download the set-up data to the M4500, upload (save) the set-up data from the M4500.

Auto Calibration Mode

The HSL-ANCNF package incorporates a feature which automatically determines the number of shifts from the Infeed Screw sensor to each station’s transfer sensor. These "Calibration Counts" can then be entered in as the "Number of Shifts" for each station. The “Number of Shifts” is used to enable the transfer jam alarm detection and activate the Calefi valves, thus an accurate count for the number of shifts is required.

The auto calibration consists of first emptying the machine completely of cans, entering the calibration mode, and then feeding cans into the machine. The HSL-ANCNF then determines the number of shifts from the infeed to each respective station. This saves the effort of having to actual count the number of shifts manually for each station and also provides greater accuracy in determining the number of shifts.

Optional HSL-ANCNF Keypad / Display

The optional keypad of the HSL-ANCNF contains 24 keys consisting of data display commands, setup commands, and a numeric keypad. The display of the HSL-ANCNF 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 the current and last shift data as well as the jams per station diagnostic data. In addition, the keypad/display 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-ANCNF 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-ANCNF if required space is not available in the existing user's cabinet. The part number for the optional NEMA 12 enclosure is HSL-CD4-ENCL. The order number for the HSL-ANCNF is as follows:

Part Number	***Description***
HSL-ANCNF	Rexam Necker/Flanger high speed control package consisting of a pre-wired sub-panel (17" X 17" X 8") for mounting in the existing user's control cabinet including the following: 1ea. M4500 PLC/PLS module (with required I/O boards) 1ea. S4516 Communications Board 1ea. HSL-ANCNF User's Manual 1ea. HSL-ANCNF Program Disk 1ea. M4500 User's Manual

HSL-ANCNF Options (*purchased separately)*

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

Part Number	***Description***
D4591	Display/Keypad
HSL-CD4-ENCL	NEMA 12 enclosure for HSL-ANCNF (20" 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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