HSM-NCNF
NO CONTAINER / NO FILL
HIGH SPEED LOGIC MODULE

The Systems Engineering HSM-NCNF No Container / No Fill High Speed Logic Module provides:

- ◊ **Accurate speed compensated lockout** control up to 2,400 CPM on a wide variety of fillers and seamers.
- ◊ **Auto lockout response calibration** automatically determines both extend and retract lockout response times.
- ◊ **Alarm detection including:** infeed jam, infeed low, discharge jam, timing sensor fail, and lockout response too long.
- ◊ **Data acquisition including:** total number of containers filled and total number of lockouts (both for the current shift/fill run and last shift/fill run).

Features

- Used in conjunction with existing fill station control system, the HSM-NCNF control module provides high speed No Container/No Fill Lockout solenoid control.

- Up to two-station advance compensated Lockout solenoid control.

- Auto Lockout Response Calibration: Automatic determination of Lockout response with determined response times used for extend and retract compensation.

- User Adjustable Parameters (passcode protected):

    - Lockout solenoid response times (manual mode).
    - Number of stations: Infeed sensor-to-container sensor.
    - Number of stations: Container-to-Lockout solenoid.
    - Number of stations: Infeed sensor-to-discharge jam.
    - Maximum allowed Lockout response time (0 – 255msec).

- Alarm Detection: Infeed jam, infeed low, discharge jam, timing sensor fail, and Lockout response feedback.

- Data Acquisition: Total number of containers filled and total lockouts (for both current shift/fill run and last shift/fill run).

- Can be used on a wide variety of both fillers and seamers.

General Description

The HSM-NCNF is designed to work in conjunction with the existing control system of either food/beverage fill machines or seamers. The module performs the following functions: speed compensated No Container/No Fill Lockout solenoid trip at speeds in excess of 2,400 CPM with up to two station advance. Lockout solenoid control incorporates lockout mechanism reaction feedback allowing the compensation of the actual lockout mechanism reaction time. In addition the module includes a "Wash Down By-Pass" mode, sensed either by a remote input or through keypad entry. The module also provides alarm detection and data collection.

The package is not a dedicated "black box", but instead is implemented using the high performance Systems M4502 PLC module which allows easy customization by either SEA or the end user. The module is programmed using the PC 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 24-key keypad/2-line LCD display used to view the collected data and enter the set-up variables.

Lockout Solenoid Control

The HSM-NCNF provides direct control of the No Container/No Fill Lockout solenoid. The solenoid is primarily controlled by the container sensor (working in conjunction with the fill station timing sensor) such that when the container sensor does detect a container the lockout solenoid is not activated. However, when the container sensor does not detect a container, the lockout solenoid is activated at a precise time to "hit" the lockout pin to prevent an empty station from being filled. As soon as the container sensor detects containers again, the solenoid is retracted to prevent any containers from not being filled.

The reaction of the lockout solenoid is speed compensated such that as the speed of the machine increases, the activation/deactivation point of the solenoid is advanced to compensate for the speed of the machine and the reaction time of the solenoid/lockout mechanism. Lockout mechanism feedback using a sensor to detect the reaction time of the lockout mechanism is provided such that the actual activation/deactivation response times can be determined and compensated for.

Alarm Detection

The module detects the following alarms*: Infeed Jam, Infeed Low, Discharge Jam, Timing Sensor Failure*, and *Lockout Response Feedback alarm*. Each alarm is provided with it's own discrete output as well as deactivating the "machine run enable" output upon detection. The corresponding alarm is also displayed on the HSM-NCNF display when active.

Infeed Jam: This alarm is generated when containers are fed into the machine but not detected by the "container sensor" after a user defined number of empty stations.

Low Infeed: The "infeed low sensor" is used to verify that there are containers to be loaded into the machine from the infeed track. If, after a user defined number of seconds, no containers are detected at the infeed, the *Low Infeed* alarm is generated.

Discharge Jam: This alarm is generated when filled containers (as detected by the "container sensor") are not detected by the "discharge sensor" after a user defined number of missing containers.

Timing Sensor Failure: This alarm is generated if the "timing sensor" fails to change state once every station once the machine is running.

Lockout Response Feedback Alarm: This alarm is generated whenever the actual response time of the Lockout solenoid is greater than a user defined number of milliseconds.

Wash Down By-Pass

The *Wash Down By-Pass* mode allows the machine to be run empty of cans during maintenance and wash-down in-between fill runs. This mode is entered either by activating the remote wash down by-pass input or thru the keypad of the HSM-NCNF. Once this mode is entered, all alarms are reset, the machine run enable output is activated, and the *Infeed Low* alarm is overridden.

Data Collection

The following data is collected for both the current shift/fill run and the previous (last) shift/fill run: Total number of containers filled and the total number of lockouts (miss-loaded containers). This data can be viewed locally on the display of the HSM-NCNF 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.

HSM-NCNF Keypad / Display

The keypad of the HSM-NCNF contains 24 keys consisting of data display commands, setup commands, and a numeric keypad. The display of the HSM-NCNF 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 shift and last shift production data as well as used by authorized personnel to adjust the 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

Display/Keypad:
Display:
Lines x Characters: 2 line x 40 character
Type: Back-Lit LCD
Character Height: 0.19"
Keypad:
Rows x Columns: 3 rows x 8 columns
Type: Sealed

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 HSM-NCNF module is provided for door mounting on the user's control cabinet door or console. The order number for the HSM-NCNF is as follows:

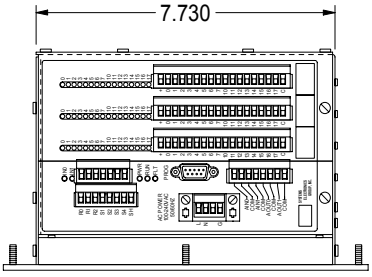
Part Number	***Description***
HSM-NCNF	No Container/No Fill high speed logic module which includes the following: 1ea. HSM-NCNF module (M4502 with required I/O boards) 1ea. HSM-NCNF User's Manual 1ea. HSM-NCNF Keypad Quick Reference Manual 1ea. HSM-NCNF Program Disk 1ea. M4500 User's Manual

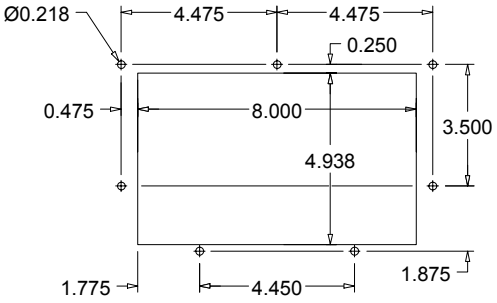
HSM-NCNF Options (*purchased separately)*

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

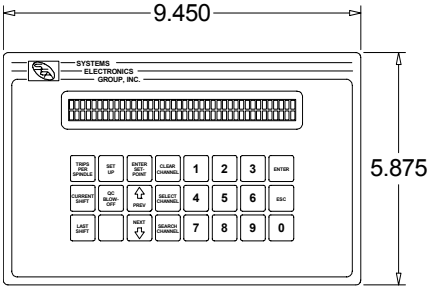
Part Number	***Description***
HSL-NCNF-ENCL	16" x 14" x 8" Enclosure
BZL4591	Nema 4x Bezel (required for wash down rating)

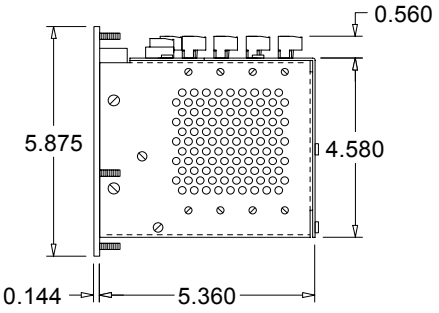
Dimensions





(Recommended Panel Cut-Out)





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