North American Electric

VARIABLE FREQUENCY DRIVE (VFD) PANELS
LSis S100 / IS7

GENERAL PURPOSE PANEL
STANDARD PACKAGE
240V / 480V
VT: 1 – 700 HP
CT: 1/2 – 600 HP

1.0 Overview

North American Electric, Inc. (a.k.a NAE)
Re: NAE Motor Controls – Standard Package

General Instructions

Read the instructions carefully before installation and use them as a guide during installation and initial operation.

File these instructions with other documentation, drawings and descriptive data of the NAE panel. Keep this book available for the installation, operation, and maintenance of equipment. Using these instructions will facilitate proper maintenance of the equipment and will prolong its useful life.

Scope of Instructions

The instructions are general in nature. They cover basic requirements for proper installation and maintenance for the panel. These instructions do not attempt to cover all variations and combinations of the panel and installations.

2.0 Safety Notes and Warnings

Equipment operation depends on proper handling, installation and maintenance. Neglecting fundamental requirements may lead to personal injury, failure of the equipment and property damage.

Safety as described in this instruction book involves two conditions:
- Personal injury
- Product or property damage

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2.1 Safety Labels

Safety notations alert personnel to possible death, injury or property damage situations. The safety labels posted on our panels are:

WARNING:
Indicates HIGH VOLTAGE INSIDE! Electrical power must be disconnected before opening enclosure door. “Entry by qualified personnel only”

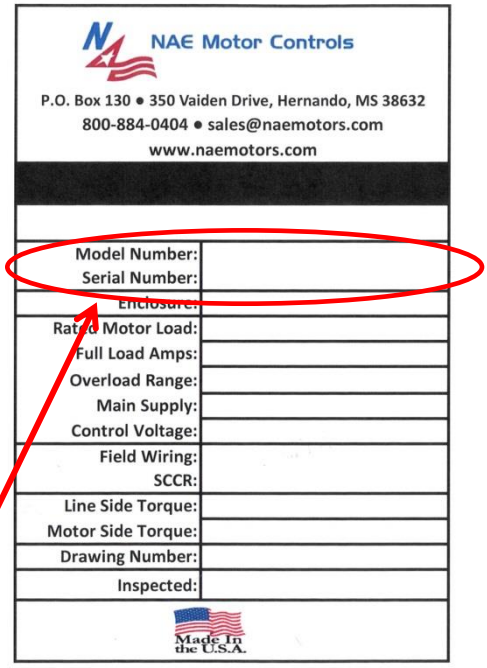
WARNING:
No motor or ground connections shall be made to “N-” Terminal on VFD. Damage will occur.

CAUTION:
Heavy object. Spreader bar required for lifting.

CAUTION:
Automatic equipment. May start at any time.

Personnel installing, operating or maintaining this equipment must be qualified on all applicable local, regional, industrial, governmental and OSHA safety procedures as well as commonly accepted safe working practices. Personnel working in or around this equipment must also exhibit common sense and good judgment regarding the potential hazards for themselves and other personnel in the area. These instructions are intended for use by fully qualified personnel and are not a substitute for adequate training, experience and supervision.

Should clarification or additional information be required, please refer the matter to NAE. When communicating with NAE regarding the product covered by this book, always reference the NAE assigned **MODEL NUMBER** and/or **SERIAL NUMBER**:



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3.0 Receiving, Handling & Storage

Upon receipt, examine the panel for damage or loss. Check the contents against the packing list before discarding any packing material. Notify the carrier and NAE at once of any discrepancies.

If there is damage from improper handling, file a claim at once with the carrier and notify NAE.

3.1 Storage

Store all panels indoors in a well-ventilated area. The storage building should have a well-drained paved floor. The temperature should be between 23°F (-5°C) and 104°F (40°C). The air should be dry (50% maximum humidity).

The panels are shipped wrapped in plastic for protection during shipment only. Remove the plastic wrap just before placing into storage. Cover with heavy wrapping paper or other moisture barrier. Use materials that will not trap moisture inside the unit. Do not cover louvered openings.

For long term storage, or in high-humidity, use space heaters to keep the interior dry.

4.0 Inspection and Installation

4.1 Inspection

1. Remove packing and shipping materials.
2. Make sure that all internal parts are clean and dry. If moisture is present, blow dry with warm air.

4.2 Installation

1. With the panel properly installed per the NEC and local codes, you are now ready to perform the following steps:

    1a) :
    Apply Line Side Power and properly ground panel.

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1b) Verify that proper line side voltage is present.

Check between L1 & L3

Check between L1 & L2

Check between L2 & L3

1c) StrikeSorb (If Applicable): For most applications, modules must be used in accordance to the electrical system voltages.

NOTE: If any unusual conditions exist, such as a high leg, please contact NAE before moving forward.

1d) MotorSaver (If Applicable): Settings must be properly adjusted in accordance to calculations located on instruction sheet found on inside enclosure door or inside customer packet.

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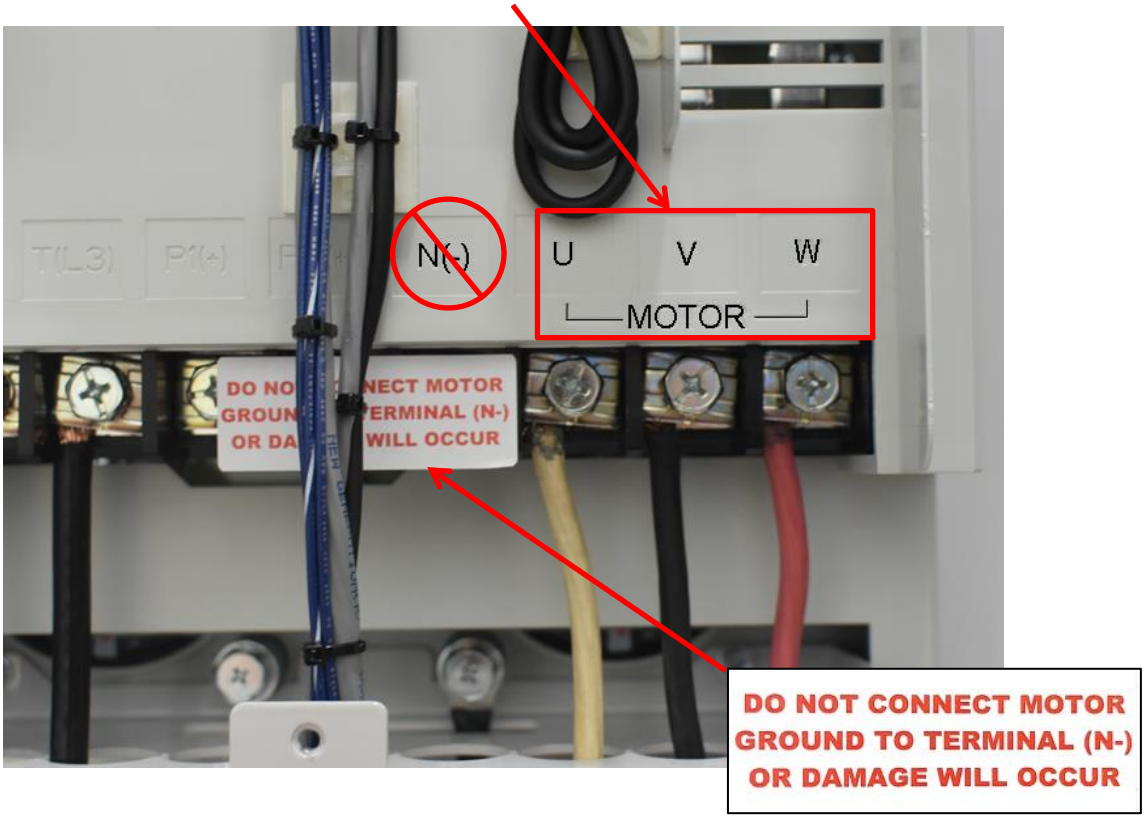
2. Motor Connection:

2a) Be sure to properly ground motor.
IMPORTANT: Connect motor leads to "**U V W**".



3. Turn on Circuit Breaker (shown in UP position) after line side voltage verification.

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5.0 Putting Panel Into Service

The panel is now ready to be put into service.

There are hazards of electrical shocks and/or burns whenever working in or around electrical equipment. Turn off power of the NAE panel before performing any inspection or maintenance operations. Check incoming line terminals to verify that the equipment is de-energized and grounded. Check outgoing terminals to ensure that no back feed condition exists.

6.0 Maintenance

6.1 Overview

Visually inspect all NAE panel installations at frequent intervals. If the observer notes any loose parts or connections, please take corrective action immediately.

6.2 Quarterly Inspection

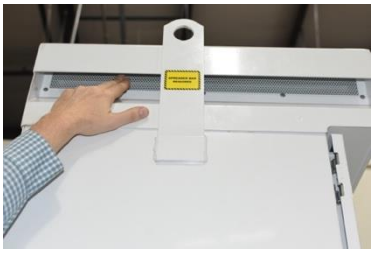
Perform a thorough inspection of the NAE panel at least quarterly. Emphasize the following points:

1. Perform an overall visual inspection.
2. Check all indicators, meters and instruments for proper operation.
3. Bolted and/or screw connections should be properly tightened; excessive corrosion, cracks or discolored insulation may indicate an overheated connection.
4. Check the control wiring for signs of damage or wear.
5. Change the wires that present doubtful conditions.
6. Check for undue noise and or vibration.
7. Look for evidence of moisture inside the NAE panel.
8. Inspect and clean any and all air intake filters.

6.3 Tunnel Maintenance (if Applicable)

1. Turn off all power to enclosure.
2. Inspect and clean bottom air intake screen.

3. Inspect and clean top exhaust screens.



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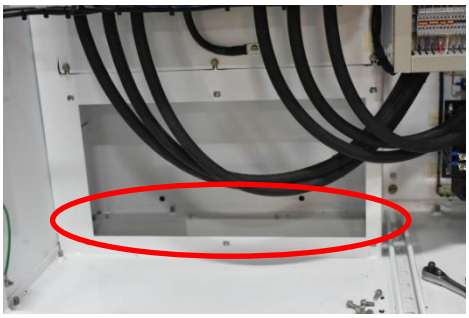
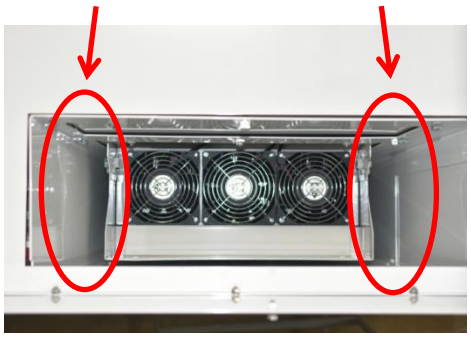
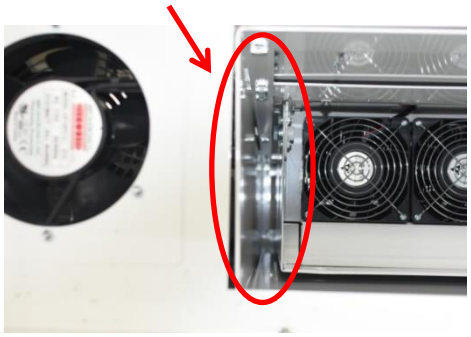
4. Inspect tunnel internally for blockage, through access panels located on front of tunnel above and below VFD. Remove any blockages.



4a) To access top exhaust screen, loosen external screws located on the front and back of enclosure and lift off the top hood.


4b) Make sure to inspect down the sides of the VFD.

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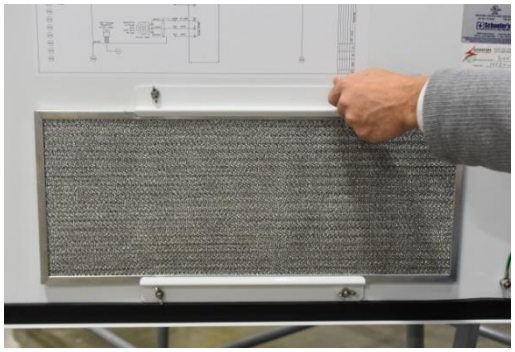
5. Inspect necessary and clean front door air filter (use warm water; dry filter before re-installing). Replace when.



6. Inspect and clean internal circulation fan (make sure fan is in proper working condition).

6.4 Semi-Annual Inspection

In addition to the quarterly inspection, perform the following recommended inspection and maintenance semi-annually, or sooner, if required by local conditions or regulations.

- Check the resistors and other devices prone to overheating.
- Follow the recommendations of any individual device instructions furnished for maintenance of the device.

6.5 Spare Parts

For replacement parts, please call NAE Customer Service.

6.6 End of Life of Product

The responsibility of the company is to facilitate subsequent recycling or disposal at the end of the product's life. During disposal of the product, it is always necessary to act in accordance with all local and national legal requirements that are in effect at the time of disposal.

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7.0 Contact Information

Key Contact Information:

Hernando, Mississippi Office
PO Box 130 350 Vaiden Drive Hernando, MS 38632-0130 www.naemotors.com
Toll Free: 800-884-0404 Phone: 662-429-8049 Fax: 662-429-8546
AR Fax (Secure): 662-912-1406

Customer Service & Sales
Toll Free: 800-884-0404
Phone: 662-429-8049
Fax: 662-429-8546
E-Mail: sales@naemotors.com

Technical Support / Warranty
Toll Free: 800-884-0404
Phone: 662-429-8049
Fax: 662-429-8546
E-Mail: dougmassey@naemotors.com

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8.0 LSis VFD Quick Start Guide – C100, S100, H100 and iS7

8.1 C100 Basic Setup Parameters

The basic drive and motor parameters are shown in Table 1. Set the parameters according to your application.

Table 1. C100 Basic Setup Parameters

C100						
7 Segment Group	7 Segment No	Description	Default		Set Options	Notes
Drive	0.00	Command Freq	0.00		0 - Max Freq	
Drive	ACC	Acc Time	20		0 - 6000	
Drive	dEC	Decel Time	30		1 - 6000	
Drive	drV	Run Command	1	Fx/Rx-1	0: Keypad 1: Fx/Rx-1 2: Fx/Rx-2 3: Comm RS485	Start/Stop FW or REV wired separate (P1 = FW, P2 = Rev) 2 Wire Start/Stop (P1 = FW, P2 = Rev)
Drive	Frq	Freq Command	0	Keypad-1	0: Keypad-1 1: Keypad-2 2: Panel Pot V2 (0-5V) 3: Terminal A1 (0-10V) 4: Terminal A1 (4-20mA) 5: Panel Pot + Terminal A1 (4-20mA) 6: Panel Pot + Terminal A1 (0-10V) 7: Comm RS485 8: Up/Down	Press ENTER to save values Value Changes immediately Set J1 to V Set J1 to I Set J1 to I Set J1 to V
F	39	Motor Voltage	Depends on drive		40 - 110%	Set as a percentage from the default (220V & 380V)
F	67	Input Voltage (200V)	220		170 - 240V	
F	68	Input Voltage (400V)	380		320 - 480V	
H	30	Motor Capacity	Depends on drive		Depends on drive	
H	31	Poles	4		2 - 12	
H	33	Motor Rated Current	Depends on drive		Depends on drive	
H	36	Motor Eff %	72		70 - 100%	

Note: Many applications will not require changes to the basic setup parameters from their default values.

1.1. C100 Recommended Additional Parameter Changes

The C100 has some default settings the user may want to change to obtain better protection of the drive/ motor and the application. These changes are recommended, but not needed for all applications.

Auto Reset:

- Program H21 (Reset/Restart after a fault) to “1”
- Program H26 (Number of Retries) to a number between 0 -10.

Start on Power Loss

- Program H20 (Power on Start) to “1”.

Phase Loss

- Program H19 (Phase Loss) to the correct bit to the high state for output, input, or both phase loss recognition.

The display is in the form of 2 bits. Left bit is the Input, Right bit is bit is the Output. H100 and iS7 are shown as dip switches to represent bits.

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8.2 S100/H100/iS7 Basic Setup Parameters

The basic drive and motor parameters are shown in Table 2. Set the parameters according to your application.

Table 2. iS7/H100/S100 Basic Setup Parameters

S100/H100/iS7							
7 Segment		LCD Keypad		Description	Default		Set Options
Group	No	Group	No				(Use # for 7 Seg)
Operation	0.00	DRV	1	Command Freq		0.00	0 - Max Freq
Operation	ACC	DRV	3	Acc Time		20	0 - 6000
Operation	dEC	DRV	4	Decel Time		30	1 - 6000
Operation	drV	DRV	6	Run Command	1	Fx/Rx-1	0: Keypad 1: Fx/Rx-1 2: Fx/Rx-2 3: Comm RS485 4: Field Bus
Operation	Frq	DRV	7	Freq Command	0	Keypad-1	0: Keypad-1 1: Keypad-2 2: V1 4: V2 5: I1/I2 6: Comm RS485 8: Field Bus 12: Pulse
dr		DRV	14	Motor Capacity		Depends on drive	Depends on drive
bA		BAS	11	Poles		4	2 - 12
bA		BAS	13	Motor Rated Current		Depends on drive	Depends on drive
bA		BAS	15	Motor Voltage		Depends on drive	Depends on drive
bA		BAS	16	Motor Eff %		72	70 - 100%
bA		BAS	19	Input Voltage		220/380	170 - 480V

Notes

Start/Stop FW or REV wired separate
(P1 + FW, P2 + REV) 2 Wire Start/Stop
(P1 = FW, P2 = Rev)

Value Changes immediately

S100 &H100 = I2, iS7 = I1

Note: Many applications will not require changes to the basic setup parameters from their default values.

2.1 S100/H100/iS7 Recommended Additional Parameter Changes

The S100, H100, and iS7 have some default settings the user may want to change to obtain better protection of the drive/motor and the application. These changes are recommended, but not needed for all applications.

Auto Reset:

- Program CON 71 bit 3 to High State (0100).
- Program PRT 08 (Reset/Restart after a fault) to “1” (Yes).
- Program PRT 09 (Number of Retries) to a number between 0 -10.
- Program PRT 10 (Auto Reset Time) to desired time to allow cause of fault to clear and safe starting.

Start on Power Loss:

- Program ADV 10 (Power on Start) to “1” (Yes).

Phase Loss:

- Program PRT 05 (Phase Loss) to the correct bit to the high state for output, input, or both phase loss recognition. S100 LED display is in the form of 2 bits. Left bit is the Input, Right bit is bit is the Output.

H100 *and iS7 are shown as dip switches to represent bits.*

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8.3 HP to kW Conversion Table

The basic drive and motor parameters are shown in Table 2. Set the parameters according to your application.

Use the following conversion table to enter the motor HP. Select the closet size the drive allows in kW (motor power is in kW on most LSIS drives).

Table 3. HP to kW Conversion

HP	1/4	1/2	1	1.5	2	3	5	7	10	15	20	25	30	40	50	60	75	100	125	150	200	225	250	300	350	400	500	600
kW	0.2	0.4	0.75	1.1	1.5	2.2	3.7	5.5	7.5	11.0	15.0	18.5	22.0	30.0	37.0	45.0	55.0	75	90	110	132	160	185	220	280	315	375	450

8.4 HP to kW Conversion Table

4. RPM Entry

Table 4. Poles to RPM

RPM	3600	1800	1200
Poles	2	4	6

Example:
Actual motor RPM = 3450

Enter Poles = 2

Enter Slip RPM = 150 RPM

CONTACT INFORMATION:

North American Electric, Inc.

Phone: 662-429-8049 Toll Free (800) 884-0404 Fax: (662) 429-8546
350 Vaiden Dr., Hernando, MS 38632 www.naemotors.com

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