

# NoMax<sup>®</sup>

## SWITCHED CAPACITOR CONTROLS

### 900 SERIES

## Operating & Instruction Manual



NoMax<sup>®</sup> 900T

NoMax<sup>®</sup> 950

NoMax<sup>®</sup> 900



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# NoMax®

## SWITCHED CAPACITOR CONTROLS

### **900 SERIES**

## Operating & Instruction Manual

OVERVIEW .....	3
ORDERING INFORMATION .....	4-5
INSTALLATION .....	5
CONTROL SET UP .....	6-8
DISPLAY MESSAGES .....	9-10
FUSING .....	10
OPERATION .....	11
LED INDICATORS .....	12
AUTOMATIC OPERATIONS .....	13-17
SPECIFICATIONS .....	17
LIMITATION OF WARRANTY & LIABILITY .....	18-19



## OVERVIEW

The NoMax® 900 Series switched bank capacitor controls utilize user selectable functions and parameters to control switched capacitor banks in the following operating modes:

Control Mode	NoMax® 900T	NoMax® 950	NoMax® 900
Voltage		X	X
Time	X	X	X
Time/Volt		X	X
Temp			X
Temp/Volt			X
Time/Temp			X
Schd Temp			X

**VOLTAGE** – The control will close the capacitor bank when the sensed line voltage drops below the user selected close volts setting. The control will open the capacitor bank when the sensed line voltage rises above the user selected open volts setting.

**TIME** – The control will close the capacitor bank when the user selected close time occurs. The control will open the capacitor bank when the user selected open time occurs. Both settings are subject to the weekend settings.

**TIME/VOLT** – The control will function according to the time mode, except the time mode operating conditions will be overridden by voltage conditions according to the volt mode function.

**TEMP** – For Summer Schedule (defined by close temp greater than open temp setting) – The control will close the capacitor bank when the sensed ambient temperature rises above the user selected close temp setting. The control will open the capacitor bank when the sensed ambient temperature drops below the user selected open temp setting.

For Winter Schedule (defined by open temp greater than close temp setting) – The control will close the capacitor bank when the sensed ambient temperature drops below the user selected close temp setting. The control will open the capacitor bank when the sensed ambient temperature rises above the user selected open temp setting.

**TEMP/VOLT** – The control will function according to the temp mode, except the temp mode operating conditions will be overridden by voltage conditions according to the volt mode function.

**TIME/TEMP** – The control will function according to the time mode, except the time mode operating conditions will be overridden by temperature conditions according to the temp mode function.

**SCHD TEMP** – The control will follow the temperature setting only when the schedule allows close operations, which is the time after the CLOSE TIME and before the OPEN TIME. The temperature setting can be set the same as in the Temp mode.

All user settings are directly accessed with the front panel switches.

## ORDERING INFORMATION

**⚠ WARNING:** Prior to installing, operating, maintaining, or testing this equipment, read and understand the material in this manual. Failure to comply can result in death, severe injury or equipment damage. These instructions are intended to supplement, not replace, local safety practices and procedures.

This catalog number matrix provides the necessary information to create the appropriate desired capacitor control product:

example: **NMC 900T 1 4RNN**

### SERIES

900T	Time functions only
950	Time with voltage override functions
900	Time with temperature and voltage override function

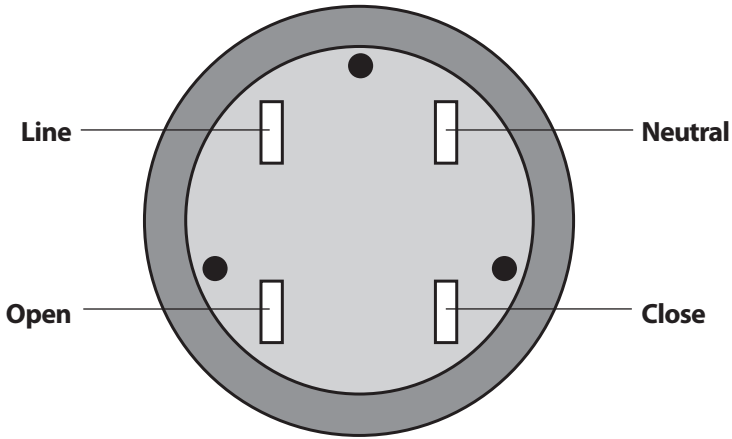
### VOLTAGE OPTION

1	120V, 60Hz
2	240V, 60Hz
3	220V, 50Hz
4	120V, 50Hz

### MOUNTING OPTION\*

4RNN	4 stab meter base with mounting ring
4SNN	4 stab meter base ringless
PNN	Pole bracket mounted with terminal strip - specify hole
PANN	Pole mounted with Amphenol connector

\* See Figure 1 for standard 4-stab wiring diagram



**Figure 1 – Wiring diagram for a standard 4-stab, 4-lead meter socket**

## INSTALLATION

The NoMax® 900 Series Controls can be supplied ready for 4 jaw meter socket mounting or direct pole mounting.

**INSTALLING INTO A METER SOCKET** – Socket mounted controls are supplied ready for either ringed or ringless meter sockets. The two types of sockets are not interchangeable; make sure you have the correct type of control for the meter socket to be used.

**INSTALLING INTO A RINGED BASE** – Align the terminals on the back of the control and press firmly into the meter socket. Use the supplied ring to complete the installation. Attach a ground wire to the external ground lug. Seal or lock the ring only after the entire system has been verified.

**INSTALLING INTO A RINGLESS BASE** – Align the terminals on the back of the control and press firmly into the meter socket. Tighten the 3 locking screws located on the meter base. Attach a ground wire to the external ground lug. Seal the 3 locking screws only after the entire system has been verified.

**INSTALLING POLE MOUNTED CONTROLS** – Pole Mounted Controls are mounted with the included pole bracket and user supplied mounting straps or lag screws. After the control is attached to the pole, attach a ground wire to the external ground lug. Connect the control cable from the Capacitor Bank junction box to the 5-pin connector on the Control.

**⚠ WARNING:** Before plugging the control into a live circuit, rotate the main switch out of the “AUTO” position or remove the front panel fuse, and observe all safety procedures for working with live circuits. Failure to comply can result in death, personal injury or equipment damage.

## CONTROL SET UP

The following section describes the switch positions used to set up the NoMax® 900 Series Controls. Please refer to Figures 2, 3 & 4.

### NoMax 900T, 950 and 900 Functions

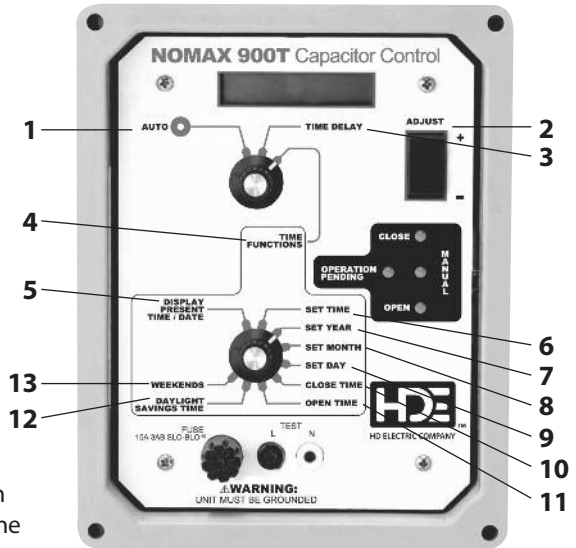
#### 1) AUTO

This places the control in automatic operation allowing it to control the capacitor bank according to the selected control mode and other settings.

#### 2) ADJUST-/+

This switch is used to decrease or increase the selected setting. Pushing and releasing adjusts the setting by its smallest adjustment value. Pushing and holding the ADJUST switch increases or decreases the setting at a faster rate. Continuing to hold the switch increases the adjustment rate.

Figure 2 – NoMax® 900T Unit

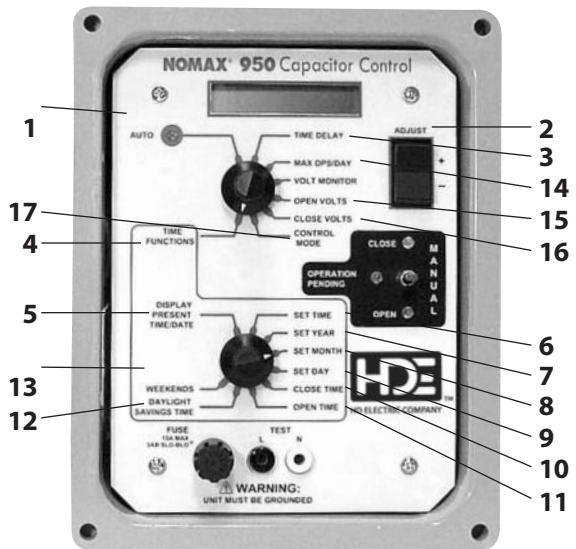


**NOTE:** All of the settings rollover when the maximum or minimum value is exceeded.

#### 3 TIME DELAY

This sets the Operation Time Delay period. This delay is the amount of time, in seconds, the control will wait between determining the bank needs to switch states, and actually energizing the Capacitor Bank Motor Relay. This delay is active for Open and Close operations, and Automatic or Manual operations. The minimum value is 3 seconds. The maximum value is 600 seconds (10 minutes).

Figure 3 – NoMax® 950 Unit



- 4) **TIME FUNCTIONS** – When the upper rotary switch is placed in this position the lower rotary switch becomes active.
- 5) **DISPLAY PRESENT TIME/DATE** – The present time and date of the control clock will be displayed.
- 6) **SET TIME** – Adjusts the time of the control clock. The time is incremented in 5-minute intervals and the rate of change will increase if the adjust switch is held for several seconds.
- 7) **SET YEAR** – Adjusts the year of the control clock.
- 8) **SET MONTH** – Adjusts the month of the control clock.
- 9) **SET DAY** – Adjusts the day of the control clock.
- 10) **CLOSE TIME** – The time setting threshold for closing the capacitor bank.
- 11) **OPEN TIME** – The time setting threshold for opening the capacitor bank.
- 12) **DAYLIGHT SAVINGS TIME** – When enabled, the control clock will automatically adjust for daylight savings time (i.e. Move ahead 1 hour at 2am on the second Sunday in March and move back 1 hour at 2 am on the first Sunday in November).
- 13) **WEEKENDS** – Weekend settings are active in all control modes. If Saturday and/or Sunday is off, the bank will open on a weekend. If Saturday, Sunday or both are on, the bank will operate as per the selected control mode. If there is a clock error and the control is set for Voltage or Temperature only, it will operate in this mode all the time. If there is a clock error and the control is set for Time/Volt, Time/Temp or Time/Volt/Temp, the control will operate in the selected mode without time.  
**NOTE:** Automatic time control is always active Monday through Friday if a time control mode is active

## NOMAX 900 AND 950 FUNCTIONS

- 14) **MAX OPS/DAY** - The number of Automatic Close operations allowed by the control in a 24-hr period. The minimum value is two operations. The maximum value is 24 operations.  
**NOTE:** "Manual" Close operations, and "Aborted" Automatic Close pending operations, are not counted against the Max Ops/Day setting.
- 15) **OPEN VOLTS** - The level of the line voltage which increments the Volts Open counter. The minimum value is the CLOSE VOLTS setting plus 3.0 volts. The maximum value is 130.0 volts.
- 16) **CLOSE VOLTS** - The level of the line voltage which increments the Volts Close counter. The minimum value is 105.0 volts. The maximum value is the OPEN VOLTS setting minus 3 volts.
- 17) **CONTROL MODE** - This sets the control mode that will be used to automatically control the capacitor bank.

# NOMAX 900 FUNCTIONS

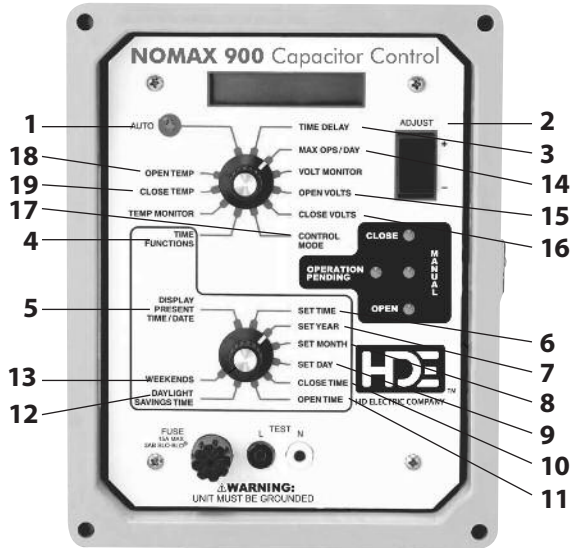
**18) OPEN TEMP** - The temperature setting threshold for opening the capacitor bank. The minimum value is 5 degrees. The maximum value is 125 degrees (The NoMax® 900 prevents the OPEN TEMP setting from being closer than 5 degrees to the CLOSE TEMP setting). The control will issue an open command to the capacitor bank based upon the Winter/Summer schedule as follows:

Winter Schedule  
(defined by OPEN TEMP greater than CLOSE TEMP setting) – The capacitor bank will Open when the temperature rises above the OPEN TEMP setting.

Summer Schedule  
(defined by CLOSE TEMP greater than OPEN TEMP setting) – The capacitor bank will Open when temperature drops below the OPEN TEMP setting.

**19) CLOSE TEMP** - The temperature setting threshold for closing the capacitor bank. The minimum value is 5 degrees. The maximum value is 125 degrees (The NoMax® 900T prevents the CLOSE TEMP setting from being closer than 5 degrees to the OPEN TEMP setting). The control will issue a close command to the capacitor bank based upon the Winter / Summer schedule as follows:

**Figure 4 – NoMax® 900 Unit**



Winter Schedule (defined by OPEN TEMP greater than CLOSE TEMP setting) – The capacitor bank will Close when the temperature drops below the CLOSE TEMP setting.

Summer Schedule (defined by CLOSE TEMP greater than OPEN TEMP setting) – The capacitor bank will Close when the temperature rises above the CLOSE TEMP setting.

## DISPLAY MESSAGES

The following describes the messages the user can expect to see on the Liquid Crystal Display.

- "Total Ops xxxxxx" The total number of Close operations since installation
- "24Hr Auto Ops xx" The number of Automatic Close operations today
- "Close Inh. xx:xx" The remaining time Close Inhibit is active
- "Auto In xx:xx" The remaining time a Manual Open or Manual Close maintenance operation is active before the control returns to automatic operation
- "Opening In xx:xx" The remaining time until an Automatic Open Operation occurs
- "Closing In xx:xx" The remaining time until an Automatic Close Operation occurs
- "Bank Switching!" Indicates an IMMEDIATE operation is in progress
- "Bank Volts x.x" The Delta Volts measurement
- "Line Volts xxx.x" The Line Volts measurement
- "Fahrenheit +xxx" The Temperature measurement (positive) (NoMax® 900 only)
- "Fahrenheit -xxx" The Temperature measurement (negative) (NoMax® 900 only)
- "Time xx:xx:xx" The present control clock time
- "Date xx/xx/xx" The present control clock date
- "Sunday" (or other day) The present control clock day

**NOTE:** All messages which include an equality sign "=" indicates the user is accessing a set point.

- "Seconds = xxx" The OPERATION TIME DELAY setting
- "Max. Ops./24 Hr. = xx" The MAX OPS/DAY setting
- "Open V = xxx.x" The OPEN VOLTS setting
- "Close V = xxx.x" The CLOSE VOLTS setting
- "Close Temp. = xxx" The CLOSE TEMP setting (NoMax® 900 only)
- "Open Temp. = xxx" The OPEN TEMP setting (NoMax® 900 only)
- "Mode = Time" The CONTROL MODE is Time only
- "Mode = Time/Temp" The CONTROL MODE is Time with Temperature Override (NoMax® 900 only)
- "Mode = Time/Volt" The CONTROL MODE is Time with Voltage Override (NoMax® 900 and 950)
- "Mode = Voltage" The CONTROL MODE is Voltage Only
- "Mode = Temp" The CONTROL MODE is Temperature Only (NoMax® 900 only)
- "Mode = Temp/Volt" The CONTROL MODE is Temperature with Voltage Override (NoMax® 900 and 950)
- "Time = xx:xx:xx" The control clock time setting
- "Year = xxxx" The control clock year setting
- "Month = xx" The control clock month setting
- "Day = xx" The control clock day setting
- "Close = xx:xx" The CLOSE TIME setting
- "Open = xx:xx" The OPEN TIME setting
- "DST = xxxxxxxx" Daylight Savings Time Enabled/Disabled

## DISPLAY MESSAGES *continued*

- "Wkend = xxxxxxxx" Weekend Enabled/Disabled
- "Volt Sensor Err." The control has determined the Voltage Sensor has failed (NoMax® 900 and 950)
- "Temp. Sensor Err." The control has determined the Temperature Sensor has failed (NoMax® 900 only)
- "Clock Error" The internal back-up battery for the clock has failed

**NOTE 1:** Each time the control is turned on the control will energize ALL LEDs and the LCD will display "HD Electric Co" followed by the control type and firmware version ("Model NoMax 900 Vx.xx", "Model NoMax 950 Vx.xx", or "Model NoMax 900T Vx.xx").

**NOTE 2: FOR THE NOMAX® 900:** If the Voltage Sensor fails, the control will initiate an Open operation.

For the NoMax® 900: If both the Voltage and Temperature Sensors fail, the control will initiate an Open operation. If Voltage Only Mode is active, and the Voltage Sensor fails, the control will initiate an Open operation. If Temperature Only Mode is active, and the Temperature Sensor fails, the control will initiate an Open operation.

**NOTE 3:** While in a failure Mode (see Note 2) Manual Close, while in AUTO, is disabled. Manual Close, when NOT in AUTO, is still enabled.

## FUSING

The NoMax® 900 Series Controls are supplied with a 15 Amp Slo-Blo® fuse, accessible from the front panel. This fuse disables the control and protects the capacitor bank switches. If it was removed before installation, the fuse should be reinstalled after installation is complete.

The control circuitry is also protected by an internal fuse which is not replaceable. All repairs should be referred to the factory.

## OPERATION

The following settings and features are common to all control modes:

**TIME DELAY** – Sets the operation time delay period. Using the Adjust switch, select the desired time delay, in seconds, from 3 to 600. This will delay both Open and Close operations in both Manual and Automatic operation mode by the time selected. The Operation Pending light flashes before every Open or Close operation for the period of time selected for the time delay. If in AUTOMATIC operation, the LCD displays the operation type (Close or Open) and time until the operation will occur.

If initiated by a MANUAL OPEN or MANUAL CLOSE command, the pending operation can be aborted by switching to AUTO.

If initiated by a MANUAL OPEN command, and the Capacitor Bank is Closed, the pending Open operation can be aborted by operating the MANUAL CLOSE switch.

If initiated by a MANUAL CLOSE command, and the Capacitor Bank is Open, the pending Close operation can be aborted by operating the MANUAL OPEN switch.

**MAX OPS/DAY** – Sets the maximum allowable number of automatic capacitor bank close operations per 24 hour period. This can be set from 2 to 24 operations using the Adjust switch. This setting overrides all other automatic operation settings. Manual operations do not count against the limit set by Max Ops/Day.

**FIVE MINUTE CLOSE INHIBIT** – The controls use a built-in time delay to prevent the line from closing into a charged Capacitor Bank. This “Close Inhibit” delay begins after every Open operation and is active for 5 minutes. Neither Automatic nor Manual Close operations will take place while “Close Inhibit” is active.

**OTHER OPERATIONAL FEATURES** – If the control loses power while the Capacitor Bank Motorized Switch is operating (either Open or Close Direction), an IMMEDIATE operation occurs upon restoration of power, bypassing the OPERATION TIME DELAY. This insures the Motorized Switch finishes its travel.

If the control loses power while Close Inhibit is active, an IMMEDIATE OPEN operation occurs upon restoration of power, bypassing the OPERATION TIME DELAY.

If the user switches from AUTO to any of the rotary switch Setup positions, and an operation is pending, the operation is suspended.

If the user switches from any of the rotary switch Setup positions to AUTO, and an operation is pending, the operation is suspended.

**VOLTAGE MONITOR (NOMAX® 900 AND 950)** – When the front panel rotary switch is set to VOLT MONITOR, the display will show the sensed line voltage.

**TEMPERATURE MONITOR (NOMAX® 900 ONLY)** – When the front panel rotary switch is set to TEMP MONITOR the display will show the measured ambient temperature.

## LED INDICATORS

**AUTO** – Indicates the Control is in Automatic mode and is using the operator settings to control the Capacitor Bank state.

**OPERATION PENDING** – Flashes to warn the operator an operation is about to occur. In Automatic mode, the LCD displays the type of operation about to occur (i.e. Close or Open), and the amount of time before it occurs. The OPERATION TIME DELAY setting determines OPERATION PENDING period.

**CLOSE** – When flashing, the CLOSE LED indicates the Close Motor Relay is energized. When solid, the CLOSE LED indicates the Capacitor Bank is connected to the line.

**OPEN** – When flashing, the OPEN LED indicates the Open Motor Relay is energized. When solid, the OPEN LED indicates the Capacitor Bank is NOT connected to the line.

**NOTE:** Both OPEN and CLOSE LEDs off indicates the Control has recently powered on and the Line Voltage is within the Open and Close settings. There is not a preferred Capacitor Bank state on the NoMax<sup>®</sup> 900; the operator settings and Manual operations control the Capacitor Bank state.

**MANUAL BANK CONTROL** – The MANUAL OPEN and MANUAL CLOSE toggle switch is used to “Manually” Open or Close the Capacitor Bank. To manually CLOSE or OPEN the capacitor bank:

Switch the control out of the AUTO mode, verify the red LED is off, and select TIME DELAY. Using the ADJUST switch, select the desired time delay, in seconds, from 3 to 600.

Use the toggle switch to OPEN or CLOSE the capacitor bank. The OPERATION PENDING LED will flash for the duration of the selected time delay. The CLOSE or OPEN LED will flash during the time the output is energized and will remain on.

**NOTE 1:** Pending manual operations can be cancelled by turning the control to AUTO.

**NOTE 2:** The capacitor bank cannot be closed within less than 5 minutes from the previous open operation to allow discharge of the capacitor bank. See Five Minute Close Inhibit section, page 12.

**NOTE 3:** Manual operations are counted by the operations counter (close operations only), but manual operations do not count against the preset daily limit set by 24Hr Auto Ops. See Automatic Operation section, page 14.

**MANUAL MAINTENANCE OPERATION** – When the rotary switch is in the AUTO position, a Manual Open or Close is considered a maintenance operation. The Manual operation completes and the Control suspends its Automatic testing for ten minutes. At the end of ten minutes, the Control reverts to Automatic operation and will automatically Open or Close the capacitor bank based upon the Automatic Operation programmed settings. While in AUTO, the amount of time remaining before Automatic testing resumes is cycled on the LCD.

**⚠ WARNING:** The Control will revert to Automatic operation after 10 minutes following a Manual Maintenance Operation. The control will then automatically Open or Close the capacitor bank based upon the Automatic Operation programmed settings.

## AUTOMATIC OPERATIONS

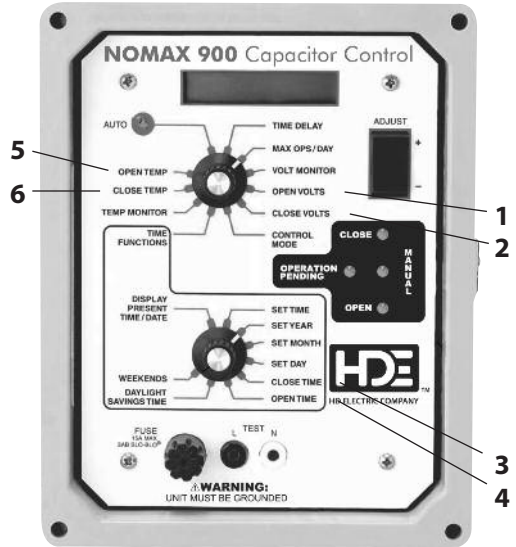
***For the following operations, please reference the Overview Section (pg. 4) to see if the operation pertains to your control.***

### AUTOMATIC VOLTAGE OPERATION –

Automatic Voltage Control Mode is active when the front panel rotary switch position is set to AUTO, and the Control Mode is set to Voltage. The AUTO LED will also light. When Automatic Voltage Control Mode is active, the control tests the Voltage against the programmed Open and Close settings. The control can be made to remain open on weekends by setting weekends off. To adjust the set points for automatic voltage operation, use the front panel rotary switch to select the parameter. Please refer to Figure 5.

**Figure 5 – NoMax® 900 Unit**

Check your control for specific functions



- 1) OPEN VOLTS is the set point for opening the capacitor bank based upon sensed line voltage. When the sensed line voltage rises above this set point for one minute continuous, the control will open the capacitor bank after the preset time delay. Use the Adjust switch to select the desired value. The minimum value is the Close Volts setting plus 3 volts. The maximum value is 130 volts.
- 2) CLOSE VOLTS is the set point for closing the capacitor bank based upon sensed line voltage. When the sensed line voltage drops below this set point for one minute continuous, the control will close the capacitor bank after the preset time delay. Use the Adjust switch to select the desired value. The minimum value is 105 volts. The maximum value is the Open Volts setting minus 3 volts.

The Line Voltage is tested at one-second intervals. The Line Voltage is averaged over eight cycles per interval.

The control also incorporates an Adaptive Trip feature utilizing the Delta Volt measurement. The Delta Volt measurement is the voltage contribution of the Capacitor Bank. If the next close operation would cause the control voltage to be above the open voltage set point, the close operation is not performed until the voltage falls below the open voltage set point minus Delta Volts.

Similarly, if the next open operation would cause the control voltage to be below the close voltage set point, the operation is not performed until the voltage rises above the close voltage set point plus Delta Volts. Upon power on, Delta Volts is preset to 0.5 volts. At the first Automatic Close operation, Delta Volts is set to the difference measured just before the Bank Closes and one-minute later. From that point on every four Automatic Close operations are averaged. This average is used as the Delta Volts measurement.

#### **AUTOMATIC VOLTAGE OPERATION CONTROL PRIORITY**

The OPEN VOLTS setting has priority over the CLOSE VOLTS setting.

**CAPACITOR BANK SWITCHING COORDINATION FEATURE** – The OPERATION TIME DELAY feature can be used to have the control automatically abort Voltage Open or Close operations, thus allowing Capacitor Bank switching coordination.

If a Volt Open operation is pending, and the Line Voltage drops below the OPEN VOLTS setting (minus 1 Volt) for 50% of the OPERATION TIME DELAY setting, the Volt Open operation will be aborted.

Likewise, if a Volts Close operation is pending, and the Line Voltage increases above the CLOSE VOLTS setting (plus 1 volt) for 50% of the OPERATION TIME DELAY setting, the Volt Close operation will be aborted.

#### **EXAMPLE:**

Two sites are controlled by a NoMax® 900 Control. The Cap Bank Voltage contribution is 2.2 Volts (i.e. Delta Volts is 2.2 volts).

Site 1's CLOSE VOLTS setting is 118.0 and the OPERATION TIME DELAY setting is 60 seconds.

Site 2's CLOSE VOLTS setting is 118.0 and the OPERATION TIME DELAY setting is 180 seconds.

The Line Voltage drops below 118.0 for more than 60 seconds, both Site 1 & 2 initiate pending Close operations (i.e. the Close Event counters exceed 60).

After another 60 seconds, Site 1's Close Motor Relay energizes (i.e. the OPERATION TIME DELAY for Site 1 is 60). Shortly thereafter, the Line Voltage increases to 120.2 volts (118.0 + 2.2 Volts Delta). Site 2 is 60 seconds into its Operation Time Delay.

90 seconds later Site 2's Close operation automatically aborts (i.e. the OPERATION TIME DELAY for Site 2 is 180) approximately 30 seconds before its Close Motor Relays would have energized.

**NOTE:** If a pending operation aborts, the Voltage condition counter which initiated the operation, resets to zero.

While in Automatic Voltage Control Mode, the control will cycle through several different status messages. The messages include the Total Operations counter, the number of 24 hour Auto operations, the Line Voltage, the Present Time and either the Delta Volts or any activated timer (i.e. the "Close Inhibit" timer, or the Manual Open/Close maintenance timer).

If the control powers on into a high Line Voltage condition (> 130.0 volts) an IMMEDIATE OPEN operation occurs, bypassing the OPERATION TIME DELAY time.

**AUTOMATIC TIME OPERATION** – Automatic Time Control Mode is active when the front panel rotary switch position is set to AUTO and the Control Mode is set to "Time". The AUTO LED will also light. When Automatic Time Control Mode is active, the control will open the capacitor bank when the control clock reaches the "Open" set point and the control will close the capacitor bank when the control clock reaches the "Close" set point, subject to the weekend settings. To adjust the set points for automatic time operation, use the front panel rotary switches to select the parameter. Please refer to Figure 5.

- 3) CLOSE TIME is the set point for closing the capacitor bank based upon the control clock. To adjust this setting, the upper rotary switch must be set to TIME FUNCTIONS and the lower rotary switch set to CLOSE TIME. Use the Adjust switch to select the desired time.
- 4) OPEN TIME is the set point for opening the capacitor bank based upon the control clock. To adjust this setting, the upper rotary switch must be set to TIME FUNCTIONS and the lower rotary switch set to OPEN TIME. Use the Adjust switch to select the desired time.

While in Automatic Time Control Mode, the control will cycle through several different status messages. The messages include the Total Operation counter, the number of 24 hour Auto operations and the present time.

**AUTOMATIC TIME OPERATION WITH VOLTAGE OVERRIDE OPERATION** –

Automatic Time with Voltage Override Control Mode is active when the front panel rotary switch is set to Auto and the Control Mode is set to "Time/Volt". The Auto LED will also light. When this mode is active, the control will operate as described for Automatic Time Operation as long as the sensed voltage is in the "non-Voltage Control Range" (below the OPEN VOLT setting and above the CLOSE VOLT setting). Automatic Voltage Override will occur when the sensed voltage crosses either the OPEN VOLT or CLOSE VOLT setting with the following priority:

The OPEN VOLT setting has priority over the CLOSE VOLT setting, the CLOSE TIME setting and the OPEN TIME setting.

The CLOSE VOLT setting has priority over the CLOSE TIME setting and the OPEN TIME setting.

**AUTOMATIC TEMPERATURE OPERATION** – Automatic Temperature Control Mode is active for the NoMax 900® when the Control Mode is set to “Temp. Only” and the rotary switch position is set to AUTO. The AUTO LED will also light. When Automatic Temperature Control Mode is active, the control tests the ambient temperature against the programmed OPEN TEMP and CLOSE TEMP settings. The control can be made to remain open on weekends by setting weekends off. To adjust the set points, use the front panel rotary switch to select the parameter. Please refer to Figure 5.

5) OPEN TEMP is the set point for opening the capacitor bank based upon measured ambient temperature. Use the Adjust switch to select the desired value. The minimum value is 5 degrees. The maximum value is 125 degrees (The Control prevents the OPEN TEMP setting from being closer than 5 degrees to the CLOSE TEMP setting). The control will issue an open command to the capacitor bank based upon the Winter/Summer schedule as follows:

Winter Schedule (defined by OPEN TEMP greater than CLOSE TEMP setting) –  
When the ambient temperature rises above the OPEN TEMP setting for 5 minutes continuous, the capacitor bank will Open after the preset time delay.

Summer Schedule (defined by CLOSE TEMP greater than OPEN TEMP setting) –  
When the ambient temperature drops below the OPEN TEMP setting for 5 minutes continuous, the capacitor bank will Open after the preset time delay.

6) CLOSE TEMP is the set point for closing the capacitor bank based upon measured ambient temperature. Use the Adjust switch to select the desired value. The minimum value is 5 degrees. The maximum value is 125 degrees (The Control prevents the CLOSE TEMP setting from being closer than 5 degrees to the OPEN TEMP setting). The control will issue a close command to the capacitor bank based upon the Winter/Summer schedule as follows:

Winter Schedule (defined by OPEN TEMP greater than CLOSE TEMP setting) –  
When the ambient temperature drops below the CLOSE TEMP setting for 5 minutes continuous, the capacitor bank will Close after the preset time delay.

Summer Schedule (defined by CLOSE TEMP greater than OPEN TEMP setting) –  
When the ambient temperature rises above the CLOSE TEMP setting for 5 minutes continuous, the capacitor bank will Close after the preset time delay.

While in Automatic Temperature Control Mode, the control will cycle through several different status messages. The messages include the total operations counter, the number of 24 hour Auto operations, the present time and the sensed temperature (Fahrenheit).

## AUTOMATIC TEMPERATURE WITH VOLTAGE OVERRIDE OPERATION

Automatic Temperature with Voltage Override Control Mode is active for the NoMax® 900 when the Control Mode is set to “Temp/Volt” and the rotary switch position is set to AUTO. The AUTO LED will also light. When this mode is active, the control will operate as described for Automatic Temperature Operation as long as the sensed voltage is in the “non-Voltage Control Range” (below the OPEN VOLT setting and above the CLOSE VOLT setting).

Automatic Voltage Override will occur when the sensed voltage crosses either the OPEN VOLTS or CLOSE VOLTS settings with the following priority:

The OPEN VOLTS setting has priority over the CLOSE VOLTS setting, the OPEN TEMP setting and the CLOSE TEMP setting.

The CLOSE VOLTS setting has priority over the OPEN TEMP setting and the CLOSE TEMP setting.

## AUTOMATIC TIME WITH TEMPERATURE OVERRIDE OPERATION

Automatic Time with Temperature Override Control Mode is active when the front panel rotary switch is set to Auto and the Control Mode is set to “Time/Temp”. The Auto LED will also light. When this mode is active, the control will operate as described for Automatic Time Operation as long as the sensed ambient temperature is in the “non-Temperature Control Range” (sensed temperature between the OPEN TEMP and CLOSE TEMP set points). Automatic Temperature Override will occur when the sensed temperature crosses either the OPEN TEMP or CLOSE TEMP setting with the following priority:

The OPEN TEMP setting has priority over the CLOSE TEMP setting, the CLOSE TIME setting and the OPEN TIME setting.

The CLOSE TEMP setting has priority over the CLOSE TIME setting and the OPEN TIME setting.

## SPECIFICATIONS

- 16 bit High Performance in-circuit re-programmable Flash Processor
- 16 Character x 1 Line Liquid Crystal Display
- Front Panel Voltage Test points
- Enclosure – NEMA 4x, Dimensions 6”x 8”
- Mounting – 4 Jaw Meter Socket or Direct Pole Mount
- Environmental – -22° to +185° F (-30° to +85°C) 5-95% non-condensing humidity
- Voltage Sensor is True RMS and Transformer Isolated (Galvanic isolation)
- Voltage Input accuracy – +/- 1% Full Scale -22° to +176° F (-30° to +80°C)
- Voltage Input resolution – .15 VRMS internal, .1 VRMS displayed
- Voltage range – 80 to 145 VRMS
- Temperature Sensor accuracy – {+/- 0.9° F (0.5°C)} 32° to +158° F (0° to 70°C), {+/- 1.8° F (1°C)} 14° to +185° F (-10° to 85°C)
- Temperature Sensor range – -22° to +185° F (-30° to +85°C)
- Motor Relays – Rated 30 Amps, fused 15Amp SloBlo®, 15 Second ON duration
- Relay Protection – MOV and Snubbers across contacts
- Control Protection – MOV and Snubbers Line 1 to Neutral, Neutral to Ground, Line 1 to Ground Fused at 1 amp





## LIMITED WARRANTY AND LIMITATION OF LIABILITY

This warranty applies to all products sold by HD Electric Company (the "Products"); provided, however, that the term Products does not include any third party products purchased through HD Electric Company, for which no warranties are made (the "Third Party Products"). Third Party Products may be subject to a separate manufacturer's warranty; [should you have any question regarding whether a separate warranty applies, please contact HD Electric Company].

NOTICE: READ THIS LIMITATION OF WARRANTY AND LIABILITY BEFORE BUYING OR USING THE PRODUCTS CONTAINED HEREIN.

It is impossible to eliminate all risks associated with the use of the Products. Risks of serious injury or death, including risks associated with electrocution, arcing and thermal burns, are inherent in work in and around energized electrical systems. Such risks arise from the wide variety of electrical systems and equipment to which Products may be applied, the manner of use or application, weather and environmental conditions or other unknown factors, all of which are beyond the control of HD Electric Company.

HD Electric Company does not agree to be an insurer of these risks.

WHEN YOU BUY OR USE THESE PRODUCTS, YOU AGREE TO ACCEPT THESE RISKS.

HD Electric Company warrants to the original purchaser that the Products (excluding any third party products purchased through HD Electric Company, for which no warranties are made) will be free from defects in material and workmanship, under normal use and regular service, and preventative maintenance for a period of one (1) year from the date of shipment (the "Warranty Period"). Should any failure to conform with this warranty be found during the Warranty Period, you must notify HD Electric Company of your claim within thirty (30) days of discovery, and within the Warranty Period. Your failure to give notice of claims of breach of warranty within the Warranty Period shall be deemed an absolute and unconditional waiver of claims for such defects. HD Electric Company will have no responsibility to honor claims received after the date the applicable Warranty Period expires.

Upon notice of your claim, HD Electric Company will provide a return authorization number, and further instructions on how to return the product for service. You must follow HD Electric Company's instruction. You are responsible for all Product removal, handling, re-installation, and shipping (both to and from HD Electric Company). Products returned for repair, as well as repaired or replacement Products shall be sent postage / freight prepaid. After receipt of a product which HD Electric Company determines is defective, HD Electric will, at its option, either (1) repair (or authorize the repair of) the Product or (2) replace the Product, subject to the following: The Products are made using parts sourced from a variety of manufacturers. Due to the rapidly changing technology environment, parts may become obsolete / unavailable over time (end of life). In the event that a Product cannot be repaired or replaced due to unavailability of parts, HD Electric Company will use commercially reasonable efforts to obtain substitute parts or conduct work around design, but cannot guarantee its ability to do so.

Items not found defective will be returned at your expense, or failing receipt of instruction from you on return of such items within five (5) business days of our notice to you that the product is not defective, HD Electric may dispose of the product at its discretion and with no liability to you. HD Electric Company's determination of defects is final. Products repaired or replaced during the Warranty Period shall be covered by the foregoing warranties for the remainder of the original Warranty Period or ninety (90) days from the date of delivery of the repaired or replaced Products, whichever is longer.

### LIMITATIONS:

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Printed in U.S.A. © HD Electric Company 2011 • Bulletin No. NMC 900 IM-400a