Network Control Panel

NOTE - ELECTRONIC VERSION ONLY

September 2002 Selection Guide

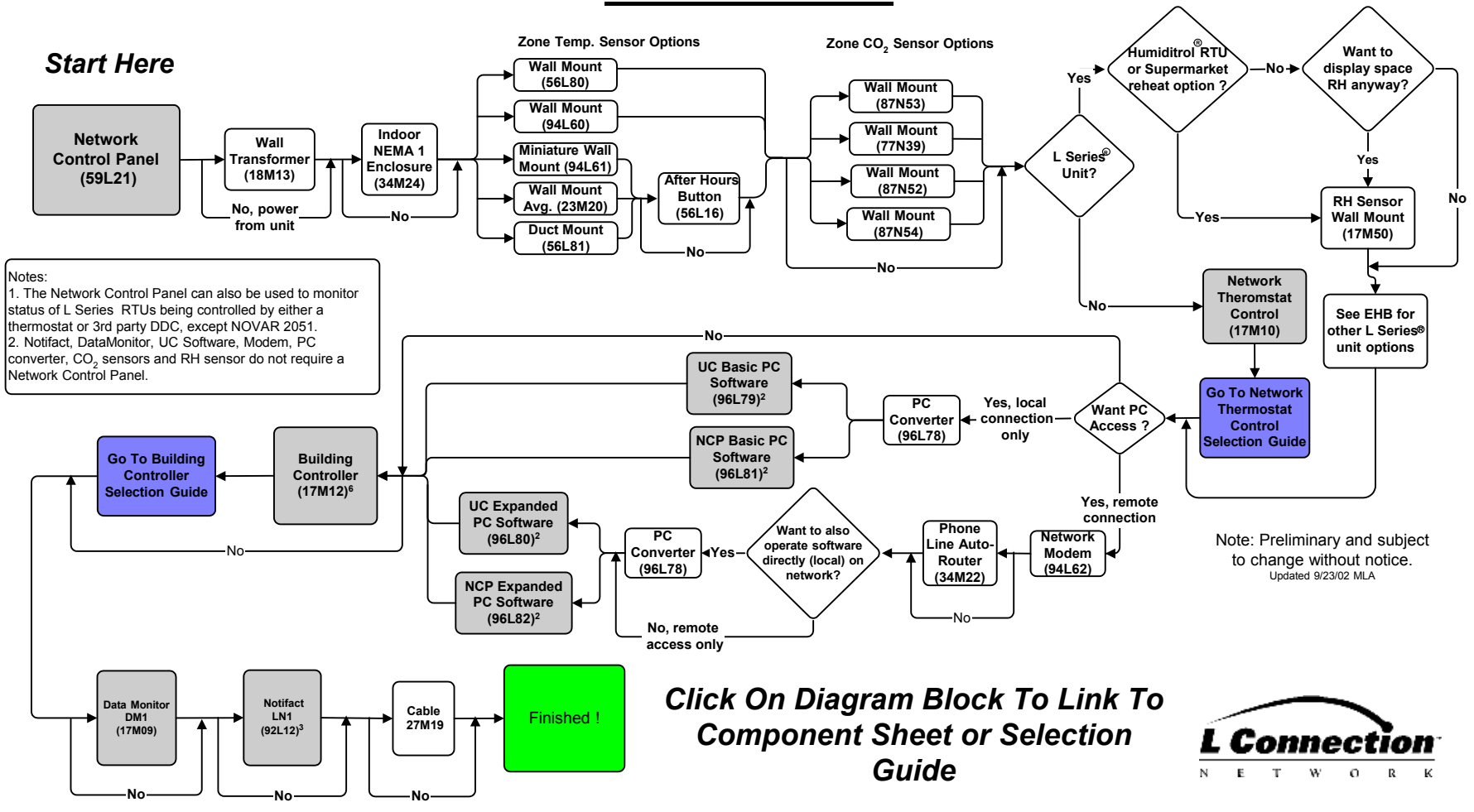
An easy way to select the L Connection® Network components for your application.

LENNOX

BETTER PLACE™

L Connection™ NETWORK

L Connection® Network Control Panel Selection Guide

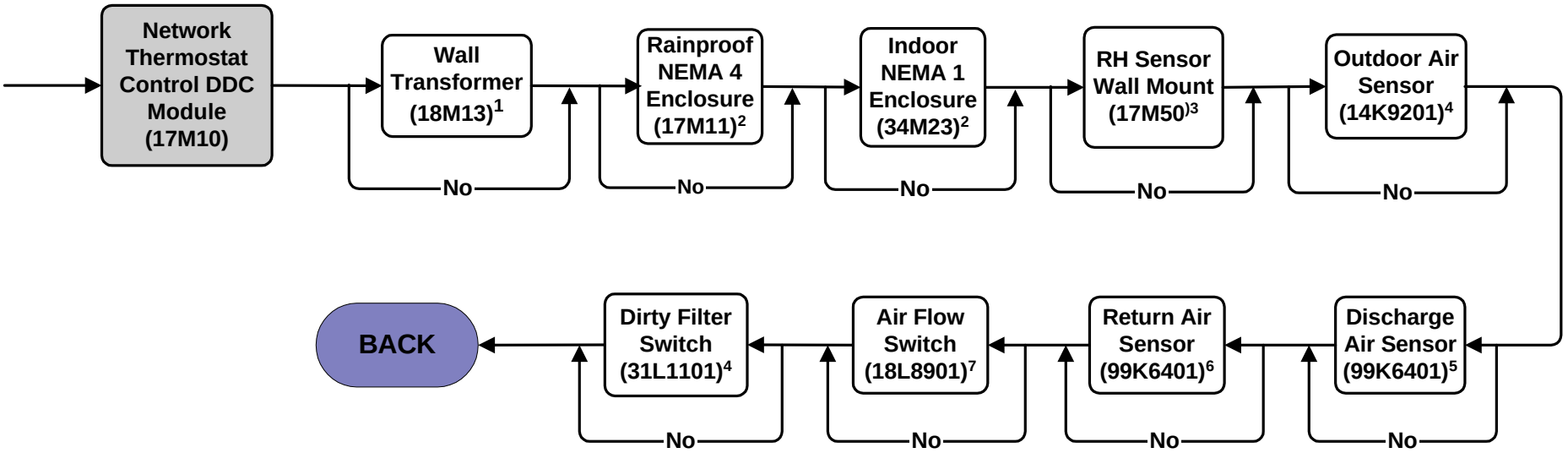


Notes:
1. The Network Control Panel can also be used to monitor status of L Series RTUs being controlled by either a thermostat or 3rd party DDC, except NOVAR 2051.
2. Notifact, DataMonitor, UC Software, Modem, PC converter, CO_2 sensors and RH sensor do not require a Network Control Panel.

Note: Preliminary and subject to change without notice.
Updated 9/23/02 MLA

Click On Diagram Block To Link To Component Sheet or Selection Guide

Network Thermostat Controller Selection Guide



Click On Diagram Block To Link To Component Sheet or Back

Notes:

1. Transformer is rated to power the NTC only. The loads connected to the NTC outputs must be powered by another transfomer and the size of that transformer depends on the loads.
2. The NTC may be mounted inside unit if space is available. If enclosure is required used the 34M23 for indoors and the 17M11 of outdoors.
3. The RH sensor may be used for monitoring only.
4. Outdoor temperature sensor can be used for monitoring, low ambient control and HP Supp. Heat Lockout.
5. Discharge air temperature sensor may be used for monitoring.
6. Air Flow Switch may be used for blower proving.
7. Dirty Filter Switch may be used for dirty filter indication.
8. NCP versions 1.11+ are required for NTC applications.
9. NCP and UC PC Software versions 2.02+ are required for NCP V1.11 and NTC.

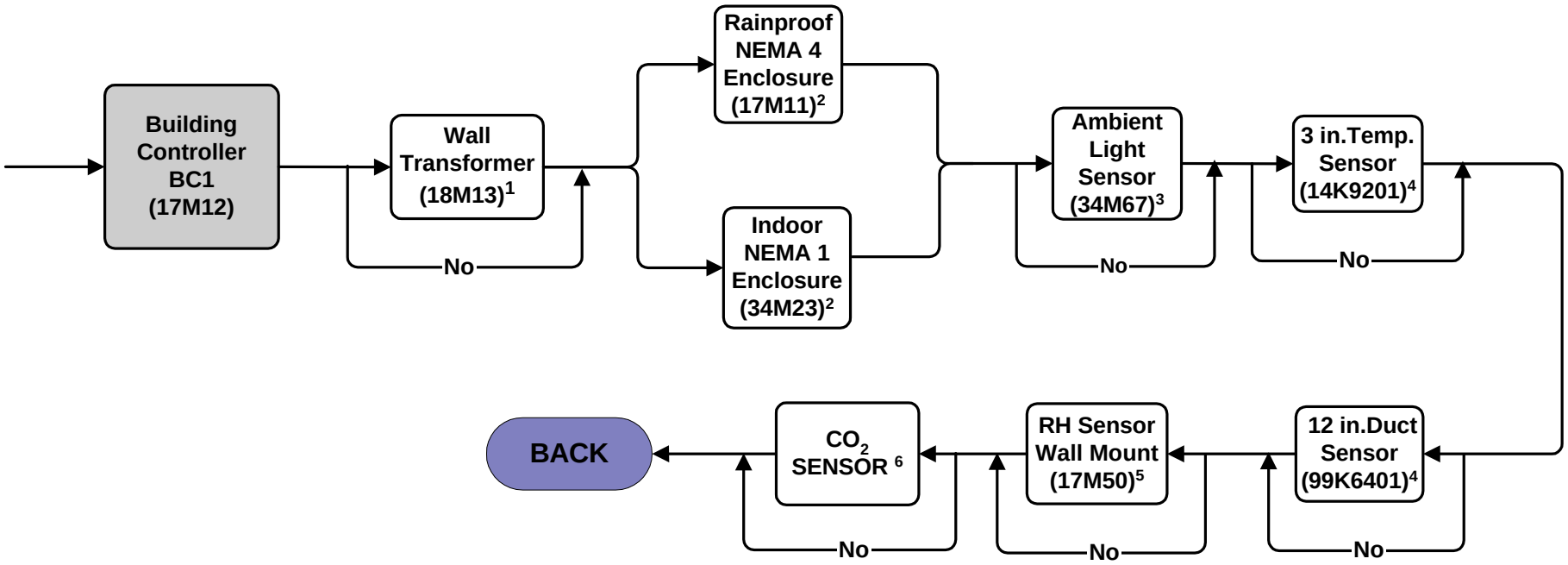
Zone sensor options are selected on the NCP Selection Guide. One is required unless contolling an air handling unit. CO2 sensor options are selected on the NCP Selection Guide and may be used for monitoring.

Other switches may be used with the NTC for service indication and unit shut down such as loss of phase switch, temperature switch, pressure switch, etc.

Note: Preliminary and subject to change without notice.
Updated 3/26/02 MLA

L Connection NETWORK

Building Controller Selection Guide



Click On Diagram Block To Link To Component Sheet or Back

Notes:

1. Transformer is rated to power the BC only. The loads connected to the BC outputs must be powered by another transfomer and the size of that transformer depends on the loads.

2. The BC requires an enclosure. Use the 34M23 for indoors and the 17M11 of outdoors.

3. The Ambient Light Sensor is used for controlling outside lights/signs based on outside sunlight.

4. Temperatrue sensors can be used for monitoring, controlling and alarming.

5. RH sensor can be used for monitoring, controlling and alarming. Can be used to control output to control humidifier, de-humidifier, etc.

6. CO2 sensor can be used for monitoring, controlling and alarming. Can be used to control output to control fresh air vents, fans, etc. Refer to NCP Selection Guide for sensor options.

7. To setup control functions other than time scheduling outputs, the L Connection Unit Controller PC software ver. 2.03+ and PC converter is required.

8. NCP versions 1.13+ are required for BC applications.

9. NCP and UC PC software versions 2.03+ are required for NCP v1.13 and BC.

Other sensors can be used for monitoring. controlling and alarming. The BC has 3 analog inputs (0-10vdc).
The BC has 4 temperature sensor inputs.
Other control devices can be connected to the BC digital inputs for monitoring, controlling and alarming such as loss of phase switch, temperature switch, pressure switch, etc.

Note: Preliminary and subject to change without notice.
Updated 3/28/02 MLA

L Connection
NETWORK

System Manager

Network Control Panel 59L21

Lennox Industries, Inc.
March 2002

Network Control Panel (NCP) 59L21

Network Control Panel

- The Network Control Panel is a building control system that offers sophisticated control, an integrated system, is easy to operate, and is simple to install.
- Sophisticated control functions:
  - Zone status screen displays zone temperature, setpoints, RH, CO_2, unit operation, alarm status, time/date, zone number, program and filter status.
  - Adjustable override setpoints for each program.
  - Password protected if desired.
  - Adjust relative humidity (RH) for L Series® Humiditrol® units or units running in the Supermarket reheat mode.
  - Permanent storage of all data.
  - Two methods of operation for L Series® units:
    - Monitor and control temperature when the zone sensor is used (must be ordered separately).
    - Monitor the unit when a thermostat controls it.
- When used with the Building Controller, it can schedule up to 8 outputs (maybe lighting zones, exhaust fans, sprinklers, etc.) and display up to 3 analog and 4 temperatures inputs with customer-defined names.
- Integrated system
  - Control up to 31 different members on the L Connection® Network.
  - Field upgradeable core software
  - Port for interfacing with the PC and L Connection® Network software.
  - Port for upgrading core software.
- Easy to operate.
  - Large LCD display screen for viewing and editing functions.
  - Keypad consists of four multi-task buttons used to enter and retrieve data using on-screen menus and commands:
    - Left button backs out of (exits) current screen being displayed.
    - ▲ Button scrolls up through current screen selections or changes a highlighted value on the current screen.
    - ▼ Button scrolls down through current screen selections or changes a highlighted value on the current screen.
    - Right button advances (enters) into next screen depending on current screen selection selected with arrow buttons or toggles (highlights) between areas on current screen.
  - Backlit LCD display screen shows 26 different weekly programs (A-Z) for both the HVAC equipment and the Building Controller. Also displays network status, time schedules and editing functions. Seven day independent programming plus holidays (up to 99 different day schedules for HVAC equipment and 50 for the Building Controller).

more

        - Six different time/temperature (F or C) schedules per day for up to 31 single zone units.
        - Up to 50 dates can be entered as holidays and assigned to different day schedules.
        - HVAC day schedules 1-2 and the weekly programs A-B are factory pre-set programs.
- May be remotely accessed and programmed through optional modem by PC running the Network Control Panel Expanded software.
- Simple to install.
    - Network Control Panel connects directly to the Integrated Modular Control (IMC) in the L Series® packaged rooftop unit, to the Network Thermostat Control (NTC1) DDC control module in non L Series® equipment by Lennox or third party equipment and to the Building Controller (BC1) for controlling other building functions.
    - Has re-poll function to automatically search and find new equipment.
    - Terminal blocks for easy field wiring connections to power sources and the L Connection Network bus.
- High impact ABS off-white plastic case.
- Powered by 24VAC, either by unit transformer or by optional transformer (18M13).
- Dimensions (H x W x D) – 5-5/16 x 6-5/8 x 1-13/16 in. (135 x 168 x 46 mm)
- Weight – 2 lbs (9kg).

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Controllers

Network Thermostat Controller 17M10

Building Controller 17M12

Note: The controller standard in all L Series® RTUs, Integrated Modular Control (IMC) is also part of the L Connection® Network.

Lennox Industries, Inc
March 2002

Network Thermostat Control (NTC1) 17M10

- The Network Thermostat Control is a direct digital controller that provides general monitoring and control capabilities for HVAC equipment.
- Use one control system for all your HVAC equipment needs.
  - Up to 31 members may be connected to the L Connection® Network via a twisted pair daisy chain.
  - When linked with the Network Control Panel system manager in the L Connection Network, the Network Thermostat Control will provide the user total HVAC facilities management capabilities.
  - Can control both non Lennox equipment and Lennox equipment that is not equipped with the Integrated Modular Control (IMC).
  - Compatible equipment includes:
    - Packaged rooftop units
    - Air handlers
    - Split systems
    - Commercial and residential products
- Multiple settings and controls options allow for advanced control:
  - Up to 3 cool/2 heat staging for flexible temperature control.
  - Occupied output for controlling day/night operation.
  - 39 optional control parameters.
  - 22 alarm codes permanently stored in memory.
  - Adjustable options including supplemental heat lockout temperature, heating and cooling on/off blower delays, low ambient lockout, and compressor off delay.
- Hardware that is durable and user friendly:
  - Plug-able screw terminal blocks.
  - Operates over a single communication link.
  - Components are clearly labeled.
  - Conveniently located two color heartbeat LED indicates proper functioning.
  - Push button for bypassing time delays and resetting control.
  - Extended ambient (-40 to 158°F, -40 to 70°C) .

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    - Return air temperature limits options.
    - Field upgradeable with PC without replacing control.
- Input features:
    - Four temperature sensor inputs including zone, return air, discharge air and outdoor sensor inputs (sensors ordered separately).
    - CO_2 and RH analog inputs (0-10vdc) for monitoring (CO_2 and RH sensors ordered separately).
    - Damper position analog input (2-10vdc).
    - Air flow proof switch input for optional air flow switch.
    - Normally open switch input (may be set up as optional smoke detector input)
    - Normally closed switch input (may be set up as optional blower overload or loss of phase protector input).
    - Service relay input (may be set up as optional dirty filter input).
    - Each digital input has an LED indicator.
- Output features:
    - Each output is individually fused and has an LED indicator and manual switch for easy service.
    - Reversing valve “O” and “B” outputs for controlling heat pumps.
    - Occupied output for enabling economizer.
- An optional weatherproof NEMA enclosure is available. (17M11)
- Dimensions (H x W x D) 8-1/2 x 6-1/2 x 1-1/2 in (216 x 165 x 38mm)

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Building Controller BC1 17M12

- Controller used for controlling lights, vent hoods, exhaust fans, sprinklers and other devices based upon unit occupied operation or time schedule.
- Allows many other interactions between the building and the HVAC equipment such as load shedding, wake up/shut down building switch, overrides based on temperatures and/or analog inputs.
- Requires the Network Control Panel for system control.
- Eight dry contact outputs rated for 24VAC (2amps).
- Four temperature sensor inputs (-40 to 130F)
- Three analog inputs (0-10VDC)
- Four digital inputs with LED indicator.
- Digital inputs may be used to override outputs on or off.
- Temperature and/or analog inputs may be used to override outputs on and off.
- Temperature and/or analog inputs may be used to issue user selected alarms.
- The occupied status of selected HVAC unit may be used to override outputs on or off.
- Digital inputs may be used to instruct selected HVAC units to operate on override setpoints.
- Digital inputs may be used to instruct selected HVAC units to go to standby (off).
- Digital inputs may be used to instruct selected HVAC units to shift setpoints.
- Each output has a manual “on/auto/off” switch.
- Each output has LED indicator.
- One 0-10VDC input for optional light sensor used to automatically control lighting based on the amount of outside light.
- Multiple Building Controllers may be used on L Connection® Network with the Network Control Panel.
- Optional NEMA 1 and NEMA 4 enclosures are available and highly recommended for mounting.

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Software

Network Control Panel Basic	*96L81*
Network Control Panel Expanded	*96L82*
Unit Controller Basic	*96L79*
Unit Controller Expanded	*96L80*

Lennox Industries, Inc.
March 2002

Network Control Panel (NCP) Basic PC Software 96L81

- The Network Control Panel Software is a windows based PC program for interfacing directly with the Network Control Panel through your personal computer.
- The Basic version permits local access through a computer that is tied in directly to an L Connection® Network.
- Features and benefits:
  - Set-up the Network Control Panel settings and programs from a PC.
  - Can be used to set-up building schedules “off-line”.
  - Easily and quickly upload saved schedules at a later date.
  - Modify setpoints and monitor the status of each controller connected to Network Control Panel.
  - View controller alarms stored in the Network Control Panel.
  - Displays unit operating mode including current space temperature, heating and cooling setpoints, CO_2 levels (optional sensor required), humidity levels (optional sensor required), number of compressors, blower status, economizer status, filter status, and the number of heating and cooling stages.
  - Displays status of the Building Controller including current status of each output, temperature sensor, digital inputs and analog inputs.
  - Print and save reports that include schedules, controller alarms and status.
- Additional equipment:
  - Requires an L Connection® Network to PC converter kit (96L78) for connection to the Network Control Panel.
- CD-ROM includes software and the L Connection® Network controls manuals.
- User manual included.
- Designed for PCs running Windows® 95, 98, NT, Me, 2000 or XP.

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Network Control Panel (NCP) Expanded PC Software 96L82

- The expanded version of the Network Control Panel Software has all the same features and benefits as the Basic version of the Network Control Panel Software.
- Additional features with the expanded version:
  - Allows the user to remotely access the Network Control Panel through an L Connection® Network Modem.
- Additional required equipment:
  - Requires the L Connection® Network modem kit (94L62)
  - Requires an L Connection® Network to PC converter kit (96L78) for direct (local) connection to the Network Control Panel.
- CD-ROM includes software and the L Connection® Network controls manuals.
- User manual is included.
- Designed for PCs running Windows® 95, 98, NT, Me, 2000 or XP.

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Unit Controller Basic PC Software 96L79

- The Unit Controller Basic Software is a windows based PC program for interfacing directly with HVAC equipment.
  - For the L Series® units, the software will interface with the Integrated Modular Control (IMC) unit controller.
  - For non L Series Lennox units or third party equipment including rooftop units and split systems the software will interface with the Network Thermostat Control (NTC1-1) DDC module.
    - This software is required to change the control parameters in the Network Thermostat Control (NTC1-1) DDC module.
  - The software will also interface to the Building Controller (BC1) for configuring building functions.
    - This software is required to change the control parameters in the Building Controller (BC1).
- Features and Benefits:
  - Allows user the option to set-up, monitor, and diagnose rooftop units from their PC.
  - Allows the user to set-up or change the Electronic Configure to Order (ECTO) parameters, view alarm codes, view unit status, test unit and print/save reports.
- Additional equipment required:
  - L Connection Network to PC converter kit (96L78) for direct (local) connection to network.
  - CD-ROM includes software and the L Connection Network controls manuals.
  - Includes the software user manual.
- Designed for PCs running Windows 95, 98, NT, Me, 2000 or XP.

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Unit Controller Expanded PC Software 96L80

- The expanded version of the Unit Controller Network Control Panel Software has all the same features and benefits as the Basic version of the software.
- Additional features on the expanded version include:
    - Remote access to the L Series® unit through the Integrated Modular Control (IMC) unit controller, a Lennox rooftop or split system with the Network Thermostat Control (NTC1-1) DDC module, or third party equipment with the Network Thermostat Control (NTC) DDC module.
        - This software is required to change the control parameters in the Network Thermostat Control (NTC1-1) DDC module.
    - The software will also interface to the Building Controller (BC1) for configuring building functions.
        - This software is required to change the control parameters in the Building Controller (BC1).
    - Has a phonebook that keeps track of remote network modem phone numbers and addresses.
- Additional required equipment:
    - L Connection Network modem kit (94L62) to connect to the remote network.
    - L Connection Network to PC converter kit (96L78) for direct (local) connection to network.
- CD-ROM includes software and the L Connection Network controls manuals.
- Includes user manual.
- Designed for PCs running Windows 95, 98, NT, Me, 2000 or XP.

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Network Devices

LN-1 Notifact Wireless Transmitter 92L12

DataMonitor Gateway 17M09

Lennox Industries, Inc.
December 2001

LN-1 Notifact® Transmitter 92L12

- The LN-1 Notifact® Wireless Transmitter is a hardware device that delivers unit operation information through a wireless medium.
- Communication features:
  - 24-hour operation through telephone, fax, numeric pager, cell phone or e-mail.
  - Ability to send single or multiple detailed diagnostic messages to qualified people in minutes.
  - Send messages for all Integrated Modular Control alarm codes or create your own abbreviated list of alarms that require immediate service.
  - Automatic alarm transmission if there is a power outage greater than 15 minutes or it the battery backup power is low.
  - Daily reports of transmitter status help determine reliability of the unit.
- Internet options:
  - Notifact® offers a secure website that has a complete list of the alarms and user-defined inputs at www.notifact.com
  - Able to configure messaging option from the website.
- Connection features:
  - Communicates with up to ten units.
  - Up to three transmitters can connect to the same L Connection® Network with up to thirty units controlled by the Network Control Panel.
  - Connects to the network through “plug and play” connection to the Integrated Modular Control unit controller in the L Series® units.
  - Eight standard user-defined inputs monitor a variety of conditions such as security lighting, hot water heating, etc.
- Additional features include:
  - Display indicating signal status.
  - Battery backup.
  - Service button that verifies if technician is working at the site.
  - NEMA-4 enclosure with high impact ABS plastic that is suitable for mounting the LN-1 outdoors.
- Dimensions (H x W x D) – 9-5/8 x 7-1/8 x 3-1/2 in. (244 x 181 x 89 mm)
- Shipping weight – 5 lbs (2kg)

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Data Monitor (DM1) 17M09

- The DataMonitor gateway is a hardware device that allows third party control devices and PC's to monitor up to 31 member of the L Connection® Network.
- Compatible with various types of HVAC equipment.
  - L Series® packaged rooftop units
  - Lennox packaged rooftop units equipped with the NTC1 DDC module.
  - Third party equipment manufacturer's units equipped with the NTC1 DDC module.
- Connection features:
  - Connects directly to the L Connection® Network (single unit or network of up to 31 members).
  - Has an RS-232 (9 pin) port for 3rd party control or PC interface.
  - Includes a terminal block connection for the L Connection® Network bus.
- Features and benefits include:
  - Operates in either passive or active mode.
  - Displays and permanently stores alarm data (non-volatile memory).
  - Internal real time clock and calendar with a 10-year battery backup.
  - Outputs data in hexadecimal formats on the RS-232 port when requested by 3rd party control or PC.
  - Front panel includes on/off switch, control heartbeat and communication LEDs
  - Off-white ABS plastic case.
- Includes programming manual with communication protocol and 24VAC wall transformer.
- Requires programming of the 3rd party control or PC in order to view data.
- Dimensions (H x W x D): 2-1/2 x 8 x 7 in. (63.5 x 203 x 178 mm).

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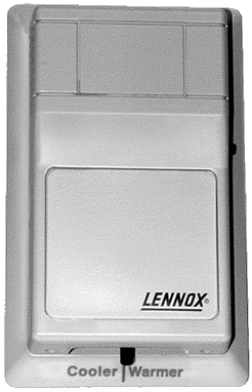
Sensors/Switches

Wall Mount Zone Sensors	*56L80* *94L60* *94L61*
Duct Mount Zone Sensor	*56L81*
Wall Mount Averaging Kit	*23M20*
After Hours Override Button	*95L16*
Wall Mount CO_2 Sensors	*87N53* *77N39* *87N54* *87N52*
Wall Mount RH Sensor	*17M50*
Return/Discharge Air Temp. Sen.	*99K6401*
Outdoor Air Temp. Sensor	*14K9201*
Air Flow Switch	*18L8901*
Dirty Filter Switch	*31L1101*

Wall Mounted Zone Sensors 56L80 and 94L60



- Terminal blocks for wiring connections.
- After hours override button provides occupied time and temperature control based on Network Control Panel settings.
- Warmer/Cooler adjustment on bottom of sensor provides plus or minus 3 degree zone temperature offset control.
- Sensor has a L Connection® Network phone jack that may be used for connecting to PC with L Connection software. Sensor does not require this connection to network to function.
- Off-white cover.
- Dimensions (H x W x D): 4-1/2 x 2-3/4 x 1-1/8 in. (114 x 70 x 29 mm)
- 94L60 is same as 56L80 but does not have zone offset temperature adjustment.

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Miniature Wall Mounted Zone Sensor 94L61

- Small size.
- Terminal block for wiring connections.
- Off-white cover.
- Dimensions (H x W x D): 1-1/2 x 2 x 1 in. (38 x 51 x 25 mm)

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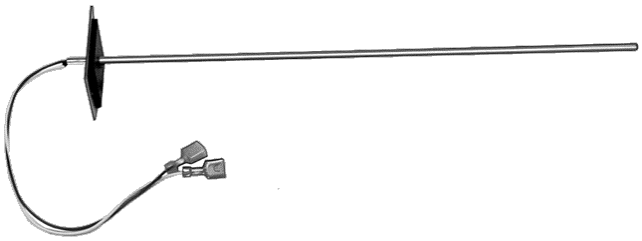
Return Duct Mount Version Zone Sensor 56L81



- Option used in place of wall mount sensor.
- For return air duct mounted sensing.
- 12 in. probe with mounting plate
- Stainless steel construction

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Wall Mounted Averaging Sensor Kit 23M20

- Allows two-sensor option for controlling one unit.
- Kit includes two wall-mounted sensors.
- Terminal block for wiring connections.
- Off-white cover.
- Dimensions of each sensor (H x W x D): 1-1/2 x 2 x 1 in. (38 x 51 x 25 mm)

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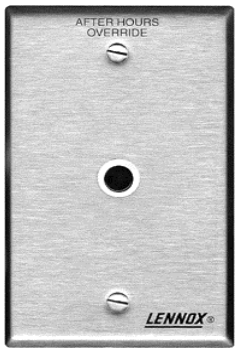
After Hours Override Button 95L16



- Momentary pushbutton used with duct-mounted sensor for override capabilities.
- Provides occupied time and temperature control based on Network Control Panel settings.
- May be used with any zone sensor where an additional button is required.
- Stainless steel wall mounting plate.

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Wall Mount CO_2 Sensor 87N53

87N53 does not have the display as shown on this model.

- Plug and play compatible with the Integrated Modular Control (IMC) unit controller on the L Series® packaged rooftop unit for Demand Control Ventilation.
- On the Network Thermostat Control (NTC1) unit controller applications, this sensor will display the indoor CO_2 level on the Network Control Panel (NCP) and PC programs.
- Single beam absorption infrared diffusion sample method.
- Accuracy: +/- 75ppm or 7% whichever is greater.
- Elevation (pressure) correction.
- Measurement range: 0-2000ppm
- Output range: 0-10VDC
- Has automatic background calibration logic for self-calibration.
- On-board relay with adjustable setpoint and dead-band.
- High impact ABS off-white plastic case.
- Power: 24VAC
- Dimensions (H x W x D) – 5-5/8 x 3-1/4 x 1-1/8 in.
- Weight – 2 lbs (9kg).

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Wall Mount CO_2 Sensor 77N39

- Plug and play compatible with the Integrated Modular Control (IMC) unit controller on the L Series® packaged rooftop unit for Demand Control Ventilation.
- On the Network Thermostat Control (NTC1) unit controller applications, this sensor will display the indoor CO_2 level on the Network Control Panel (NCP) and PC programs.
- Has display of zone CO_2
- Single beam absorption infrared diffusion sample method.
- Accuracy: +/- 75ppm or 7% whichever is greater.
- Elevation (pressure) correction.
- Measurement range: 0-2000ppm
- Output range: 0-10VDC
- Has automatic background calibration logic for self-calibration.
- On-board relay with adjustable setpoint and dead-band.
- High impact ABS off-white plastic case.
- Power: 24VAC
- Dimensions (H x W x D) – 5-5/8 x 3-1/4 x 1-1/8 in.
- Weight – 2 lbs (9kg).

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Wall Mount CO_2 Sensor 87N54

87N54 is black and does not have the display as shown on this model.

- Plug and play compatible with the Integrated Modular Control (IMC) unit controller on the L Series® packaged rooftop unit for Demand Control Ventilation.
- On the Network Thermostat Control (NTC1) unit controller applications, this sensor will display the indoor CO_2 level on the Network Control Panel (NCP) and PC programs.
- Single beam absorption infrared diffusion sample method.
- Accuracy: +/- 75ppm or 7% whichever is greater.
- Elevation (pressure) correction.
- Measurement range: 0-2000ppm
- Output range: 0-10VDC
- Has automatic background calibration logic for self-calibration.
- On-board relay with adjustable setpoint and dead-band.
- High impact ABS black plastic case.
- Case is UL94-5V rated so it may be duct mounted.
- Power: 24VAC
- Dimensions (H x W x D) – 5-5/8 x 3-1/4 x 1-1/8 in.
- Weight – 2 lbs (9kg).

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Wall Mount CO_2 Sensor 87N52

87N52 is black

- Plug and play compatible with the Integrated Modular Control (IMC) unit controller on the L Series® packaged rooftop unit for Demand Control Ventilation.
- On the Network Thermostat Control (NTC1) unit controller applications, this sensor will display the indoor CO_2 level on the Network Control Panel (NCP) and PC programs.
- Has display of zone CO_2
- Single beam absorption infrared diffusion sample method.
- Accuracy: +/- 75ppm or 7% whichever is greater.
- Elevation (pressure) correction.
- Measurement range: 0-2000ppm
- Output range: 0-10VDC
- Has automatic background calibration logic for self-calibration.
- On-board relay with adjustable setpoint and dead-band.
- High impact ABS black plastic case.
- Case is UL94-5V rated.
- Power: 24VAC
- Dimensions (H x W x D) – 5-5/8 x 3-1/4 x 1-1/8 in.
- Weight – 2 lbs (9kg).

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Wall Mounted Relative Humidity Sensor 17M50

- Terminal blocks for wiring connections.
- Required for controlling the Humiditrol® option available in the L Series® units.
- On Network Thermostat Control (NTC1) unit controller applications, this sensor will display the indoor relative humidity on the Network Control Panel (NCP) and PC programs.
- If a Network Control Panel is used to control the unit during supermarket reheat, then this sensor is required.
- Optional for controlling L Series® units that are operating in the Supermarket reheat mode and being controlled by a Network Control Panel.
- Displays indoor RH on the Network Control Panel.
- Off-white color.
- Powered from 24VAC, Output: 0-10VDC
- Relative humidity range: 0-100%
- Dimensions (H x W x D): 4-1/2 x 2-3/4 x 1-1/8 in. (114 x 70 x 29 mm)

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Return Air Sensor 99K6401

- ***Network Thermostat Control (NTC1) Applications***
  - When used on Network Thermostat Control (NTC1) unit controller applications, the return air sensor (99K6401) displays the return air temperature on the Network Control Panel (NCP) and PC programs. This sensor will act as a backup in case the zone sensor has a wiring problem or malfunctions. It will also allow the use of the return air limit option.

- ***Building Controller (BC1) Applications***
  - When used on Building Controller (BC1) applications, the sensor can be used to display the temperature at the NCP and PC programs and to override an output.

- For additional technical information, please view the part specification sheet on the following page.

Go To Part Specification Sheet | *Back To BC Selection Guide* | *Back To NTC Selection Guide*

Discharge Air Sensor 99K6401

- ***Network Thermostat Control (NTC1) Applications***
  - When used on Network Thermostat Control (NTC1) unit controller applications, the discharge air sensor (99K6401) displays the discharge air temperature on the Network Control Panel (NCP) and PC programs.

- ***Building Controller (BC1) Applications***
  - When used on Building Controller (BC1) applications, the sensor can be used to display the temperature at the NCP and PC programs and to override an output.

- For additional technical information, please view the part specification sheet on the following page.

Go To Part Specification Sheet | *Back To BC Selection Guide* | *Back To NTC Selection Guide*

Part Number: 99k6401 **Revision:** B **Previous ECN:** e200176 **Void:** N
ECN Number: e201508 **Release Date:** 01/15/01 **Part Type:** P **Description:** TEMP SENSOR

CAD DRAWING

LENNOX ® Industries Inc.

PARTS SPECIFICATIONS SHEET ONLY

ALT. NO.	DATE	ALTERATIONS	ENGR APPD	EVAL APPD	CHKR APPD
X		ECN- E200176 INITIAL RELEASE			
1	1-15 01	ECN - E201508: (BDJ) A) DIMENSION 1.000 WAS 1.500. B) DIMENSION .500 WAS .750. C) DIMENSION 13.125 WAS 13.100. D) DIMENSION .062 WAS .060. E) ADDED 22 GAUGE TO 14" LONG WIRES.			

PART NO.: 99K6401
PART NAME: TEMP SENSOR
(C) DATE: 8-13-97 DRN. BY: NL

TOLERANCES — UNLESS OTHERWISE NOTED
LINEAL DIM'S ±
ANGLES ±
HOLES ±

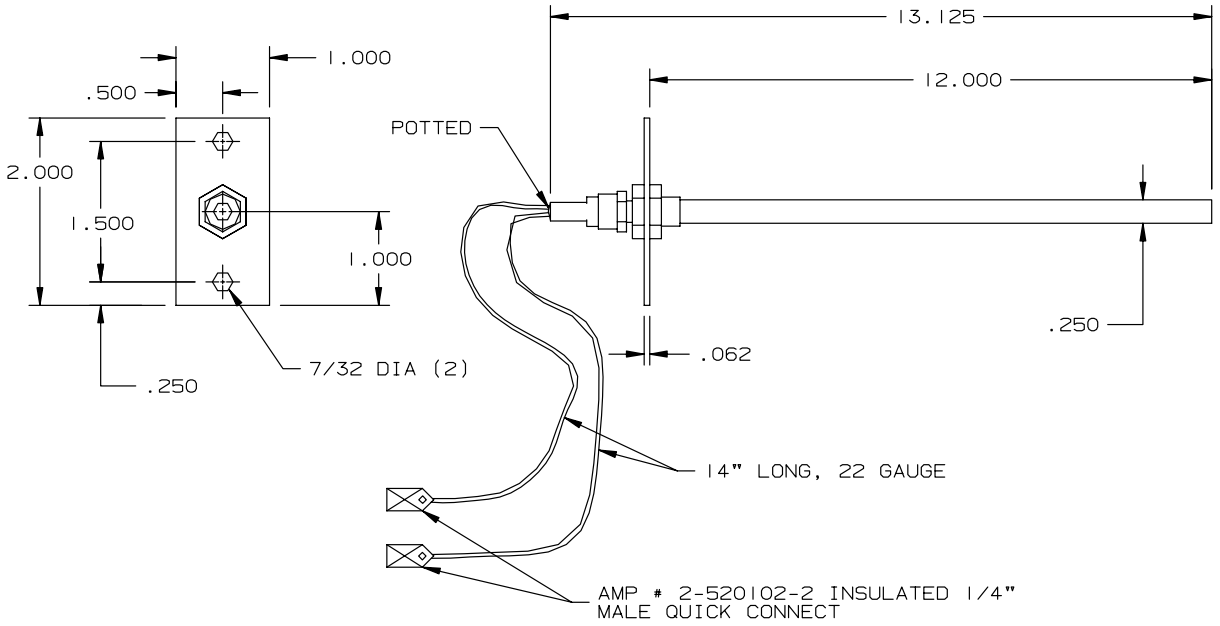
NOTICE - BY ACCEPTANCE OF PURCHASE ORDER, VENDOR AGREES TO NOTIFY LENNOX INDUSTRIES OF ANY CHANGES IN DESIGN, MATERIAL OR SPECIFICATIONS, IN ADVANCE THEREOF.

2-D GEOMETRY

REF: KEY# RT6, RT16

Thermistor Type: NTC
Resistance: 10,000 ohms ±2% @ 25 °C
T.C. @ 25 °C = -4.4%/°C
25/75 BETA = -3965 DEG.K ±1.4%
Temp./Resistance Ref. Table

°F	Resistance
30	34,566
40	26,106
50	19,904
60	15,313
70	11,884
80	9,298
90	7,332
100	5,826



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MANUFACTURER	MFR'S NO.	COMMENTS	COMD. CODE	PURCH. CODE
MAMAC SYSTEMS	TE-205-H-7-D-1		LA	2
FENWAL ELECTRONICS INC	535-42BF04-103			
THERM-O-DISC	95JP-475004			

FORM PS-811-5

Outdoor Air Sensor 14K9201

- ***Network Thermostat Control (NTC1) Applications***
  - When used on Network Thermostat Control (NTC1) unit controller applications, the outdoor air sensor (14K9201) displays the outdoor air temperature on the Network Control Panel (NCP) and PC programs. It also allows the use of the low ambient compressor control option and will allow use of the heat pump supplemental heat lockout option that will keep the supplemental heat off if outside air temperature is above the selected setpoint.

- ***Building Controller (BC1) Applications***
  - When used on Building Controller (BC1) applications, the sensor can be used to display the temperature at the NCP and PC programs and to override an output.

- For additional technical information, please view the part specification sheet on the following page.

Go To Part Specification Sheet *Back To BC Selection Guide* *Back To NTC Selection Guide*

Part Number: 14k9201 | Revision: 2 | Previous ECN: e101207 | Void: N
ECN Number: e200105 | Release Date: 01/23/96 | Part Type: P | Description: TEMP SENSOR

CAD DRAWING

LENNOX ® Industries Inc.

PARTS SPECIFICATIONS SHEET ONLY

ALT. NO.	DATE	ALTERATIONS	ENGR APPD	EVAL APPD	CHKR APPD
X		ECN- E101084 INITIAL RELEASE			
1	2-15 95	ECN - E101207: (MDK) A) ADDED FENWAL AS A SOURCE. B) ADDED MIN DIMENSION.			
2	12-6 95	ECN - E200105: (NDL) A) WIRE LENGTH WAS 72" LONG			

PART NO.: 14K9201
PART NAME: TEMP SENSOR
(C) DATE: 1-11-95 DRN. BY: VL

— TOLERANCES — UNLESS OTHERWISE NOTED
LINEAL DIM'S ±
ANGLES ±
HOLES ±

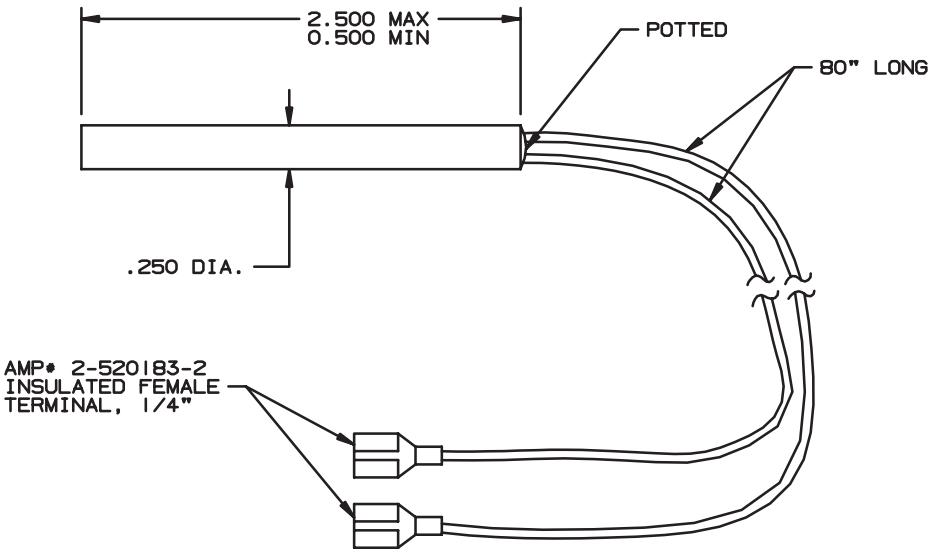
NOTICE - BY ACCEPTANCE OF PURCHASE ORDER, VENDOR AGREES TO NOTIFY LENNOX INDUSTRIES OF ANY CHANGES IN DESIGN, MATERIAL OR SPECIFICATIONS, IN ADVANCE THEREOF.

2-D GEOMETRY

REF: KEY# RT17

Thermistor Type NTC
Resistance: 10,000 ohms ±2% @ 25 °C
T.C. @ 25°C = -4.4%/°C
25/75 BETA = -3965 °K. ±1.4%
Wire: #22 AWG UL. 1015 105°C 600V
Temp./Resistance Ref. Table

°F	Resistance
30	34,566
40	26,106
50	19,904
60	15,313
70	11,884
80	9,298
90	7,332
100	5,826



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MANUFACTURER	MFR'S NO.	COMMENTS	COMD. CODE	PURCH. CODE
MAMAC	TE-205E7E2-215		LA	2
THERMODISC	9RT1H663			
FENWAL ELECTRONICS INC	535-59DV18-103			

FORM PS-811-5

Air Flow Switch 18L8901

- ***Network Thermostat Control (NTC1) Applications***
  - When used on Network Thermostat Control (NTC1) unit controller applications, this switch allows the use of the blower proving input. This allows the information to be displayed at the NCP and PC programs and will shut down the unit if the airflow is lost.

- ***Building Controller (BC1) Applications***
  - When used on Building Controller (BC1) applications, the switch used to display the information at the NCP and PC programs and to override an output.

- For additional technical information, please view the part specification sheet on the following page.

Go To Part Specification Sheet ***Back To BC Selection Guide*** ***Back To NTC Selection Guide***

Part Number: 18I8901 **Revision:** 0 **Previous ECN:** none **Void:** N
ECN Number: e200562 **Release Date:** 11/19/97 **Part Type:** P **Description:** AIR SWITCH

CAD DRAWING

LENNOX ® Industries Inc.

PARTS SPECIFICATIONS

SHEET ONLY

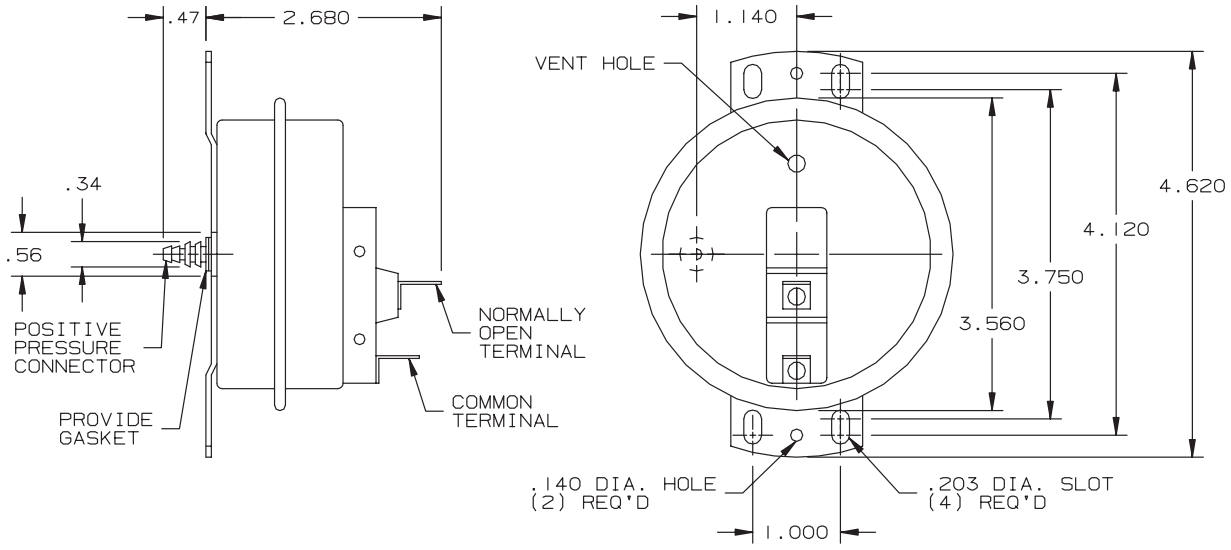
ALT. NO.	DATE	ALTERATIONS	ENGR APPD	EVAL APPD	CHKR APPD
X	11-17-97	ECN- E200562 INITIAL RELEASE			

PART NO.: 18L8901
PART NAME: SWITCH-AIR
(C) DATE: 11-17-97 DRN. BY: DAO

TOLERANCES — UNLESS OTHERWISE NOTED
LINEAL DIM'S ± 1/32
ANGLES ± 2°
HOLES ± .010

NOTICE - BY ACCEPTANCE OF PURCHASE ORDER, VENDOR AGREES TO NOTIFY LENNOX INDUSTRIES OF ANY CHANGES IN DESIGN, MATERIAL OR SPECIFICATIONS, IN ADVANCE THEREOF.

2-D GEOMETRY



SPECIFICATIONS:

ELECTRICAL RATING:
10 MA AT 5VDC
GOLD ALLOY

ELECTRICAL SWITCH:
SINGLE POLE, NORMALLY OPEN, SNAP ACTING CONTACTS

ELECTRICAL CONNECTORS:
COMMON, NORMALLY OPEN (NO)
1/4 IN. QUICK CONNECT TERMINALS

CONTROL SET POINT:
NON-ADJUSTABLE

OPERATING PRESSURE:
NORMALLY OPEN CONTACTS CLOSE ON PRESSURE RISE AT 0.14±0.05 IN W.C.

MAXIMUM PRESSURE:
1/2 PSI

OPERATING TEMPERATURE RANGE:
-40° TO 190°F

RECOMMENDED OPERATING POSITION:
DIAPHRAGM VERTICAL

SAMPLE LINE CONNECTOR:
POSITIVE: COMBINATION BARBED TYPE FOR USE WITH 1/4 IN. OR 5/16 IN. I.D. FLEXIBLE PLASTIC OR RUBBER TUBING.

GASKET MAT'L.:
FLEXIBLE RUBBER, FOAM OR PLASTIC

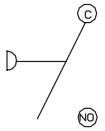
PART TO BE LABELED "18L8901"

USAGE: AIR ONLY

EXPECTED LIFE: 100,000 CYCLES

NOTE:
MOUNTING IN NON-VERTICAL POSITION WILL VARY SET POINT

APPROVALS:
U.L.-FILE NO.: MH11121
C.S.A.: LR45785



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MANUFACTURER	MFR'S NO.	COMMENTS	COMD. CODE	PURCH. CODE
TRIDELTA IND. INC.	FP4597	STYLE #01051	LD	1

FORM PS-811-5

Dirty Filter Switch 31L1101

- ***Network Thermostat Control (NTC1) Applications***
  - When used on Network Thermostat Control (NTC1) unit controller applications, this switch allows the use of the dirty filter input that will issue a dirty filter alarm.

- ***Building Controller (BC1) Applications***
  - When used on Building Controller (BC1) applications, the switch used to display the information at the NCP and PC programs and to override an output.

- For additional technical information, please view the part specification sheet on the following page.

Go To Part Specification Sheet | *Back To BC Selection Guide* | *Back To NTC Selection Guide*

Part Number: 31l1101 **Revision: 0** **Previous ECN: none** **Void: N**
ECN Number: e200715 **Release Date: 06/09/98** **Part Type: P** **Description: AIR SWITCH**

CAD DRAWING

LENNOX ® Industries Inc.

PARTS SPECIFICATIONS

SHEET ONLY

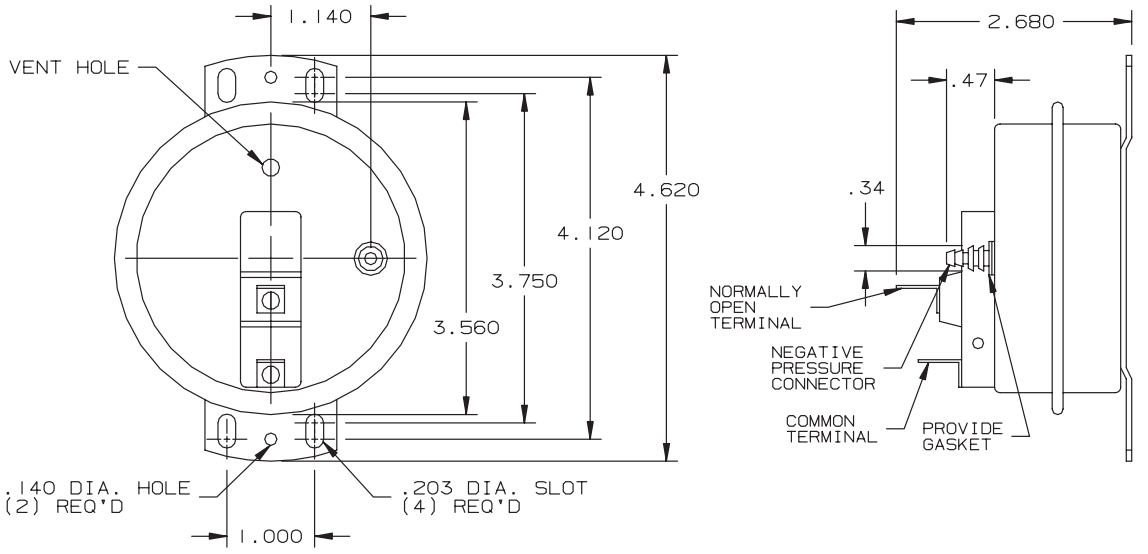
ALT. NO.	DATE	ALTERATIONS	ENGR APPD	EVAL APPD	CHKR APPD
X	6-2-98	ECN- E200715 INITIAL RELEASE			

PART NO.: 31L1101
PART NAME: SWITCH-AIR
(C) DATE: 6-2-98 DRN. BY: JK

TOLERANCES
UNLESS OTHERWISE NOTED
LINEAL DIM'S ± 1/32
ANGLES ± 2°
HOLES ± .010

NOTICE - BY ACCEPTANCE OF PURCHASE ORDER, VENDOR AGREES TO NOTIFY LENNOX INDUSTRIES OF ANY CHANGES IN DESIGN, MATERIAL OR SPECIFICATIONS, IN ADVANCE THEREOF.

2-D GEOMETRY



SPECIFICATIONS:

ELECTRICAL RATING:
10 MA AT 5VDC
GOLD ALLOY

ELECTRICAL SWITCH:
SINGLE POLE, NORMALLY OPEN, SNAP ACTING CONTACTS

ELECTRICAL CONNECTORS:
COMMON, NORMALLY OPEN (NO)
1/4 IN. QUICK CONNECT TERMINALS

CONTROL SET POINT:
NON-ADJUSTABLE

OPERATING PRESSURE:
NORMALLY OPEN CONTACTS CLOSE ON PRESSURE RISE AT 1.0±0.10 IN W.C.

MAXIMUM PRESSURE:
1/2 PSI

OPERATING TEMPERATURE RANGE:
-40° TO 190°F

RECOMMENDED OPERATING POSITION:
DIAPHRAGM VERTICAL

SAMPLE LINE CONNECTOR:
NEGATIVE: COMBINATION BARBED TYPE FOR USE WITH 1/4 IN. OR 5/16 IN. I.D. FLEXIBLE PLASTIC OR RUBBER TUBING.

GASKET MAT'L.:
FLEXIBLE RUBBER, FOAM OR PLASTIC

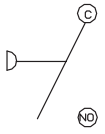
PART TO BE LABELED "31L1101"

USAGE: AIR ONLY

EXPECTED LIFE: 100,000 CYCLES

NOTE:
MOUNTING IN NON-VERTICAL POSITION WILL VARY SET POINT

APPROVALS:
U.L.-FILE NO.: MH11121
C.S.A.: LR45785



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MANUFACTURER	MFR'S NO.	COMMENTS	COMD. CODE	PURCH. CODE
TRIDELTA IND. INC.	FS4602-2692	STYLE #01021	LD	1

FORM PS-811-5

Accessories

Plug-In Transformer	*18M13*
Network Modem Kit	*94L62*
Phone Line Auto-Router	*34M22*
PC Converter	*96L78*
Ambient Light Sensor	*34M67*
NEMA 4 Enclosure	*17M11*
NEMA 1 Enclosure	*34M23*
NEMA 1 Enclosure	*34M24*
Network Cable	*27M19*

Plug-In 24V Network Control Panel (NCP) Transformer 18M13

- Optional power transformer for the Network Control Panel (NCP).
- 20VA, Class 2, Primary 120V, 60Hz, Secondary 24V.
- Secondary termination: (2) #6-32 screw terminals.
- UL 1310 & CSA Listed.

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Back To NTC Selection Guide

Back To NCP Selection Guide

L Connection® Network Modem Kit 94L62

- Connects phone line directly to L Connection® Network for remote access.
- Specially programmed for the L Connection® Network.
- L Connection® Network Expanded PC software required.
- The modem kit consists of the modem, converter, cables, transformer and instructions.

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Selection Guide

L Connection® Phone Line Auto-Router 34M22

- Allows L Connects Modem to share a phone line with a phone and fax machine.
- Uses security code to automatically route the incoming call to the modem.
- May be used to connect up to three modems on one phone line.
- No professional rewiring is required for use in single-line businesses.
- Complete compatibility with existing equipment and easy to program.
- “Caller ID” compatibility and silent transferring between equipment.
- Power/Call Status” light, non-volatile memory that saves programming in case of a power outage.
- Wall-plug 115V transformer included.
- Dimensions (H x W x D) – 2-1/2 x 8 1/8 x 1-1/2 in.

Back To NCP Selection Guide

L Connection® Network Bus To PC Converter 96L78

- Required for direct (local) connection between the L Connection® Network and a PC running the L Connection® Network PC software.
- Plugs directly into PC serial connector (9pin).
- Has phone jack connector for L Connection® Network.
- No transformer required.
- Self powered through the PC.
- Phone cord for direct connection to any L Connection® Network device included.

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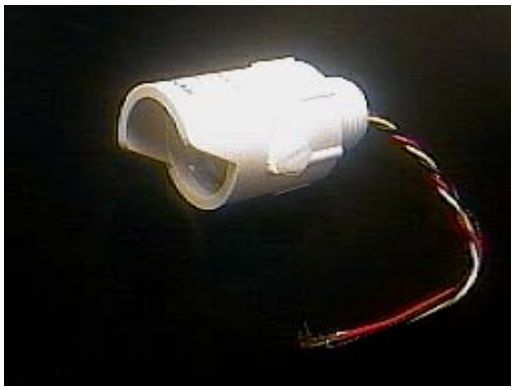
Building Controller Ambient Light Sensor 34M67



- Outdoor ambient light sensor for use with the Building Controller and Network Control Panel for automatic lighting control
- Sensor range: 0-250 FC
- Output voltage: 0-10VDC
- Mounts to a standard threaded ½ in. conduit or ½ in. knockout.
- Electronics encased in a clear epoxy and sealed with an electronic grade non-corrosive urethane resin.
- Three 4in. 18Ga. cable for connection to the Building Controller.
- Dimensions (Dia. x Length) 1.28 in x 2.56 in.

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Selection Guide

NEMA 4 Hinged Enclosure 17M11

- The NEMA 4 Hinged Enclosure is an optional enclosure that is available for the Network Thermostat Control (NTC1) 17M10 or the Building Controller (BC1) 17M12.
- This is used as a mounting option if the unit's control box doesn't have room for the Network Thermostat Control (NTC1) unit controller.
  - The control may be mounted in the conditioned space if within 100 feet of the unit.
- Features and Benefits:
  - Continuous hinge, clamped cover.
  - Body and cover formed from 16-gauge steel.
  - Includes inner panel with pre-drilled holes to match the NTC1 mounting plate.
  - Three plugged holes on bottom for conduit connections.
  - Complies with NEMA type 3R, 4.4X, 12 and 13.
  - Finished with smooth ANSI/ASA 61 gray powder coating.
- Dimensions (H x W x D): 12 x 10 x 5 in. (305 x 254 x 130 mm)

Back To BC Selection Guide

Back To NTC Selection Guide

NEMA 1 Hinged Enclosure 34M23

Shown with optional Modem and Auto-Router

Shown with optional Building Controller

- The NEMA1 Hinged Enclosure is an optional enclosure that is available for the Network Thermostat Control (NTC1) 17M10, Building Controller 17M12 or the L Connection Modem 94L62 and Auto-Router 34M22 for indoor mounting.
- Body and cover formed from 16-gauge steel.
- Includes inner panel with pre-drilled holes to match the NTC1/BC mounting plate.
- Includes Velcro strips for mounting of modem and auto-router.
- Finished with smooth white paint.
- Dimensions (H x W x D): 12 x 10 x 4 in.

Back To NCP Selection Guide

Back To BC Selection Guide

Back To NTC Selection Guide

NEMA 1 Hinged Enclosure 34M24

Shown with optional NCP & Modem

- The NEMA1 Hinged Enclosure is an optional enclosure that is available for the Network Control Panel (59L21) and L Connection Modem (94L62) for indoor mounting option.
- Body and cover formed from 16-gauge steel.
- Includes inner panel with pre-drilled holes to match the NCP mounting plate.
- Includes Velcro strips for mounting of modem.
- Three plugged holes on bottom for conduit connections.
- Finished with smooth white paint.
- Dimensions (H x W x D) 14 x12 x 4 in.

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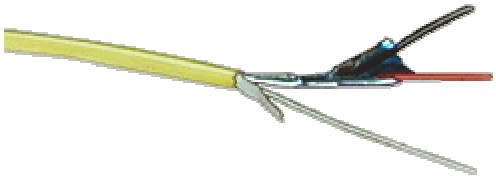
L Connection® Network Cable 27M19



- Twisted pair communication cable.
- 22 AWG, Yellow jacket, 200C rated
- Plenum rated.
- Jacket has L Connection® and Lennox® written on it.
- 500 ft. (152m) roll.

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Selection Guide

L Connection ® Network Products

Guide Specification

May 2002

Updated 5-21-02

LENNOX

A BETTER PLACE™

L Connection NETWORK

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Zone Relative Humidity Sensors…….. Page 23

CO2 Sensors…… Page 23

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Network Control Panel PC Interface Software…….. Page 24

Network Control Panel (NCP) Network Manager

(NCP1-1 software version 1.13)

HVAC Scheduling

- Panel shall also have the ability to perform all of the following Energy Management routines:
    - Store up to 99 different Day Schedules with up to six setpoint changes per day.
    - Store up to 26 different programs. (seven day + holiday)
    - Store up to 50 holidays.
    - Store one relative humidity setpoint per program for L Series® units with the Humiditrol® option or operating in the Supermarket reheat mode.
    - Store one override heating and one override cooling setpoint per program.
    - User selected temperature override limit range between 0-10°F.
    - User selected override time limit range between 0-8 hours.
    - Panel shall provide a user adjustable setpoint recovery stagger delay of between 0-4 minutes that will stagger each HVAC unit's setpoint change in order to help control peak power loading.

Building Controller Scheduling

- Panel shall also have the ability to perform all of the following Energy Management routines:
    - Store up to 50 different Day Schedules with up to four changes per day.
    - Store up to 26 different programs. (seven day + holiday).
    - Use the same holidays as defined in the HVAC scheduling.
    - A different schedule program may be used for each Building Controller output.
    - User selected override time limit range between 0-8 hours.

HVAC Status Display Data

- Panel shall display the following information on the Zone Status Screen:
    - Zone number, address number, zone description, zone temperature, zone setpoints, outdoor temperature, date/time/day of week, unit mode of operation, unit alarm indication, filter reminder, zone CO_2 level when optional CO_2 sensor is connected to the unit controller and zone relative humidity % when optional relative humidity sensor is connected to the unit controller.
- Panel shall display the following information on the Unit Data Screen:

  For L Series® Units:
    - Unit number, unit type, IMC version, IMC mode, return air temperature, supply air temperature, outdoor temperature, CO_2 level when optional CO_2 sensor is connected to unit, zone relative humidity % when optional relative humidity sensor is connected to the unit, economizer mode, damper position when optional economizer is used, most recent alarm, blower status, number of heating and cooling stages operating and number of condenser fans operating.

Network Control Panel (NCP) Network Manager
(NCP1-1 software version 1.13)

For other equipment using the Network Thermostat Control (NTC1)

- Unit number, unit type, NTC version, return air temperature if optional sensor is connected to the NTC1, supply air temperature if optional sensor is connected to the NTC1, outdoor temperature if optional sensor is connected to the NTC1, CO_2 level when optional CO_2 sensor is connected to the NTC1, zone relative humidity % when optional relative humidity sensor is connected to the NTC1, damper position when optional economizer is used and feedback voltage is connected to the NTC1, most recent alarm, blower status, and number of heating and cooling stages operating.

Building Controller Status Display Data

- Panel shall display the following information on the Zone Status Screen:
  - Address number, date/time/day of week, page number, BC description, name of each output (8), program assigned to output, output status that includes, on or off, in override mode or in local override mode and override timer. Override mode means override by NCP and local override means the output is overridden by control function programmed in Building Controller by user.
  - Description of each analog input (3) and value of each input in volts.
  - Description of each temperature input (4) and value of each input in degrees F or C.
  - Description of the ambient light sensor and indication of light or dark.
- Panel shall display the following information on the Unit Data Screen:
  - Status of each digital input, digital output, temperature input and analog input.
  - Most recent alarm.

Controllers

- Panel shall monitor and/or control up to 31 total of the following L Connection controllers: Integrated Modular Controls (IMC), the standard unit controller in the L Series® rooftop equipment, the NTC1-1 DDC module used for non-L Series equipment and the Building Controller (BC) used for controlling non-HVAC equipment such as lights, exhaust fans, etc. and for reading additional analog and temperature sensors.

Diagnostics

- Panel shall display “alarm” on zone status screen to indicate that a new alarm has occurred in the unit controller.
- Panel shall display all unit controller alarm codes with date/time stamp on the alarm list screen.
- Panel shall display a full description of the unit alarm and action taken by unit controller on the alarm description screen.
- Panel shall have a panel test function that allows the user to test the panel’s LCD display, buttons, network communications, speaker (beeper), clock and memory.

Network Control Panel (NCP) Network Manager

(NCP1-1 software version 1.13)

PC Access

- The module may be accessed locally by using a PC running the optional Network Control Panel Software and the optional L Connection® Network PC Converter.
- The module may be accessed remotely by using the optional L Connection Network Modem (on site), and a PC with modem running the optional Network Control Panel Expanded Software.

Real Time Clock

- The panel shall have an internal real time clock with a 10-year life back-up battery.
- Panel shall have a user selectable Daylight Savings Auto set function that will automatically set the internal clock for daylight saving time.

Password Option

- Panel shall have 1 to 6 character alphanumeric user selected password option.
- If password is enabled, user must enter password to change programs, control settings and to delete the alarm list both at the panel and via the NCP PC software.
- If password is enabled, user can override the schedule program setpoints within the override setpoint range for the override time.

Control Options

- Panel shall have a user adjustable program override timer that will allow a person at panel to temporarily change the setpoints for specific time when panel is controlling the space temperature based on a program.
- Panel shall have a user adjustable program override temperature range that will allow a person at panel to temporarily change the setpoint within a specific range when the panel is controlling the space temperature based on a program.
- Panel shall have an audible beeper option that will beep once every 10 seconds if a unit connected to the network is in a lockout condition.
- Panel shall have a filter timer that will keep the blower run time of each unit connected to the network and indicate on the zone status screen when to check filter based on the filter time selected by the user of between 0-60 days.
- Panel shall have the option to return to factory settings.
- Panel shall have user adjustable display options to adjust the contrast, backlight and brightness.
- Panel shall have a user selected Fahrenheit or Celsius temperature display option.

Network Control Panel (NCP) Network Manager

(NCP1-1 software version 1.13)

Electrical/Environmental

- Panel shall consist of a microprocessor-based digital panel with large LCD display and power supply.
- Panel shall have one RS-232 serial data communication port for connection to personal computer for uploading new software versions.
- Panel shall have one L Connection Network serial data communication port for communicating with unit controllers connected to the network.
- Panel's software version shall be capable of being upgraded without removing or replacing the panel by using PC connected to the RS-232 serial data port.
- Panel shall have a user adjustable backlighted graphical LCD display.
- Panel shall operate safely over a temperature range from 0 to 125°F.
- Panel shall operate safely from 18 to 30VAC.
- Panel's programs shall be stored in non-volatile flash memory.
- Panel shall be connected to the L Connection network via 2 conductor twisted pair, shielded, 22 gauge communication cables. Belden type 8761 or 88761.
- Panel may be connected to a unit's 24VAC supply via 2 conductor, 18 gauge standard thermostat wire for power or with an optional wall plug 115VAC transformer,

L Series® Unit Standard Rooftop Unit Controller, Integrated Modular Control (IMC)

(Main Controller M1-6, software version 4.10)

Operation Modes

- The module shall be capable of stand-alone operation with either a standard room thermostat or zone sensor without the use of an interface board.
- The module shall control the stages of heating and cooling as well as directly control the optional economizer via analog output.

Unit Diagnostics

- The module shall provide unit diagnostics by monitoring each unit safety switch and sensor and identifying which safety switch or sensor has opened.
- The module shall indicate the unit's problem with up to 84 different alarm codes, depending on the size and type of unit.
- The module shall keep a permanent history of the last 84 diagnostic codes stored in non-volatile EEPROM memory. User can view and erase the history at any time either by using the on-board pushbutton, using a PC running Unit Controller software, or at the Network Control Panel.

Stage Control

- The module shall be capable of controlling up to 4 stages of cooling, 2 stages of gas or resistive heating and 3 stages of heat pump heating (1 compressor, 2 supplemental) when using an optional zone sensor and Network Control Panel.
- When using an optional zone sensor, the module shall provide user adjustable default cooling stage differentials of 0.5 degrees F for each cooling stage available in unit.
- When using an optional zone sensor, the module shall provide user adjustable default heating stage differentials of 0.5 degrees F for each heating stage available in unit except the supplemental heat pump heat stages which defaults are 1 degrees F.
- The module shall be capable of controlling up to 2 stages of heating and 2 stages of cooling by means of the standard thermostat inputs.
- With the addition of one control relay, the module can control 3 stages of cooling by means of the standard thermostat inputs.

Network Manager

- The module shall communicate with the optional Network Control Panel network manager.

PC Access

- The module may be accessed locally by using a PC running the optional Unit Controller Software and the L Connection PC Converter.
- The module may be accessed remotely by using the optional L Connection Network Modem (on site) and a PC with modem running the optional Unit Controller Expanded Software.

L Series® Unit Standard Rooftop Unit Controller, Integrated Modular Control (IMC)

(Main Controller M1-6, software version 4.10)

Sensor/Switch Inputs

- The module shall be factory installed and wired complete with Return Air Sensor, Discharge Air Sensor, Outdoor Air Sensor, a high pressure, low pressure, and freezestat switch on each refrigeration circuit (up to 4); a primary heat limit, secondary heat limit, and a roll-out switch on each gas heat section (up to 2); and defrost control switches on heat pump models. Optional blower proving switches, dirty filter switches and zone sensors are available.
- The module shall have a 0-10 VDC (0-100% RH) input used for displaying the relative humidity (RH) of an optional RH sensor and controlling the indoor relative humidity on gas-electric L Series units if the Supermarket reheat option is selected and on gas-electric and electric-electric L Series units with the Humiditrol® option
- The module shall have a 0-10VDC (0-2000ppm) input for a CO2 sensor used for demand control ventilation.

On Board User Interface

- The module shall have a three-digit display and a user interface that consists of dip switches and a push button that will allow the user to display control information and change options without any additional equipment. The display will show the temperature reading (in Fahrenheit or Celsius) of the outdoor temperature sensor, return air temperature sensor, discharge air sensor, and optional zone temperature sensor. In addition, the display will display the CO_2 reading of an optional CO_2 sensor, relative humidity of an optional RH sensor, and damper position for demand control ventilation and free cooling operation.
- The module shall have a DIP switch for setting the unit network address when using the L Connection® Network.
- The module shall have a DIP switch used for selecting the unit type (gas-electric, electric-electric, heat pump, single/three phase) and the number of compressors and condenser fans.
- The module shall have LED lights that indicate room thermostat demands.
- The module shall provide an LED “heartbeat” light on each board that indicates that the control is operating normally.
- Each input and output on the module shall be clearly marked with the wiring diagram key number.
- The module shall provide a means to reset the control by pressing and holding the on-board pushbutton for 5 seconds.

Adjustable Control Parameters

- The module shall provide up to 115 user adjustable control parameters (options) that can be changed by using the on-board push-button and display or by PC.
- The module shall provide backup factory default control parameters that the user may restore if desired.
- The module shall ship from the factory with the default program and control parameters built in so that installer does not have to program control for unit operation.

L Series® Unit Standard Rooftop Unit Controller, Integrated Modular Control (IMC)

(Main Controller M1-6, software version 4.10)

Backup Modes

- The module shall provide 2 automatic backup options, while operating in the zone sensor mode, in the event that the zone sensor fails or becomes disconnected. One option will automatically switch over to the return air sensor and one will automatically switch over to an optional room thermostat.
- The module shall have automatic backup setpoint temperatures while operating in the zone sensor mode in the event of a network failure. These backup setpoints shall be adjustable by the user.

Economizer Control Modes

- The module shall control the economizer's minimum position and proportional free cooling with user selected control modes of differential temperature, single enthalpy (with optional sensor), differential enthalpy (with optional sensors) and global when a third party DDC module is used.
- The damper minimum position shall be adjustable between 0-100% travel. It may be set at the module or by PC running the interface software either locally or remotely.

Exhaust Fan Control

- The module shall provide user adjustable control of the optional exhaust fan based on the damper position.

Fresh Air Tempering

- Module shall have user selected fresh air tempering mode that monitors the supply air temperature and activates the heat section to control the temperature of the supply air to a minimum of 65 °F. Temperature control point can be adjusted.

Demand Control Ventilation

- The module shall be capable of accepting a CO_2 sensor input to control the opening of outdoor air dampers.
- Either a two position or modulating control algorithm shall be available for user selection.
- The damper opening CO_2 ppm setpoint shall be adjustable from 0 to 2000 ppm.

Humidity Control

- The module shall have a default user adjustable internal relative humidity setpoint of 60 % that is used to control gas-electric L Series units if the Supermarket reheat option is selected and on gas-electric and electric-electric units if the Humiditrol® option is selected.
- The humidity setpoint shall be adjustable from 0 to 100% at the module or by using optional PC interface software.
- When operating in the zone sensor mode the humidity setpoint is adjustable at the Network Control Panel.
- The module shall have a relative humidity sensor analog input. The input range shall be 0-10VDC (0-100%RH)

L Series® Unit Standard Rooftop Unit Controller, Integrated Modular Control (IMC)

(Main Controller M1-6, software version 4.10)

- The relative humidity sensor may be used to control the unit operating the Supermarket option (LGx only), control Humiditrol® units or for displaying relative humidity (all units) on the optional Network Control Panel and/or PC interface software.

Smoke Detector Inputs/Modes

- The module shall have a normally open 24VAC input for an optional smoke detector.
- The module shall have five selectable smoke alarm modes: unit off, purge, positive pressure, negative pressure with blower and negative pressure without blower. Only "unit off" is available when used without the optional economizer and exhaust fan.

Occupied Mode

- The module shall be capable of controlling the unit in the occupied and unoccupied modes.

Time Delays

- The module shall provide a default minimum run time of four minutes for each compressor when used on three phase units. (user adjustable)
- The module shall provide a default minimum off delay of five minutes for each compressor when used on single-phase units. (user adjustable)
- The module shall have a 3 second thermostat bounce delay.
- The module shall have a 1 second delay between starting each compressor stage to prevent current surges.
- The module shall provide user selected blower on delay for cooling operation.
- The module shall provide user selected blower off delay for cooling operation.
- The module shall provide user selected blower on delay for heating operation.
- The module shall provide user selected blower off delay for heating operation.
- The module shall provide a means to bypass times delays during testing operation by pressing the on-board push button.
- The module shall provide a user adjustable default autochangover delay of 5 minutes between heating and cooling.
- The module shall provide a user adjustable default start-up demand delay of 2 minutes. This delay may be adjusted to stagger unit demands when units are powered on by setting different time delays for each unit.

Return Air Limits

- The module shall have user selected return air limits that interrupt the heating or cooling demands if limits are exceeded.

Low Ambient Control

- The module shall provide user selected independent low ambient lockout control for each compressor.
- The module shall provide user adjustable low ambient control so that the unit can operate down to 0°F as standard by staging the condenser fan(s).

On-Board Test Modes

- The module shall provide test mode to simulate room thermostat demands for testing heating and cooling operation of unit.
- The module shall provide test mode to independently energize the blower, each condenser fan, each reversing valve, each reheat solenoid, service relay and exhaust fan output for testing the operation of the unit.

Service Relay

- The module shall provide a service relay output that turns on if the unit is in a lockout condition.

Electrical/Environmental

- The module shall be microprocessor based with core software stored in non-volatile flash memory and adjustable control parameters values stored in non-volatile EEPROM memory.
- The module core software may be field upgradeable with a PC without changing hardware.
- The module shall operate safely over a temperature range from -40°F to 155°F.
- The module shall operate safely from 18 to 30VAC.
- The module printed circuit boards shall be conformal coated to protect critical components.

Gas-Electric Units Only

- The module shall have a default blower on delay of 40 seconds. (user adjustable)
- The module shall have a default delay of 30 seconds between the first and second stages of heat. (user adjustable)
- The module shall have a default minimum timed off delay of 100 seconds. (user adjustable).
- The module shall have user selected reheat operation that may be used on process air applications such as supermarkets to reduce the indoor humidity. Optional de-humidistat switch or humidity sensor required

Heat Pump Units Only

- The module shall provide a user selected blower on delay for heating operation.
- The module shall provide a default blower off delay of 20 seconds for heating operation. (user adjustable)
- The module shall provide a default delay of 12 seconds between stage one and stage two of supplemental heat. (user adjustable)
- The module shall provide independent defrost control for each heat pump stage.
- The module shall provide a default of 64 seconds minimum time allowed between defrost cycles. (user adjustable)
- The module shall provide a default of 15 minutes maximum allowed defrost cycle. (user adjustable)
- The module shall provide a user selected option to disable the use of supplemental heat during the defrost cycle.
- The module shall provide a means to test the defrost cycle by using the DIP switches and pushbutton.

L Series® Unit Standard Rooftop Unit Controller, Integrated Modular Control (IMC)

(Main Controller M1-6, software version 4.10)

Electric-Electric Units Only

- The module shall provide user selected blower on delay during heating.
- The module shall provide a default blower off delay of 20 seconds during heating. (user adjustable)

L Series units with Humiditrol® Option

- Module shall provide the outputs for controlling up to two solenoid reheat valves.
- The control will provide an LED display that indicates the status of each reheat valve solenoid output.
- The module can operate Humiditrol reheat in two control modes: thermostat and zone sensor. In the thermostat mode the module allows up to two stages of cooling. In the zone sensor mode the module allows up to four stages of cooling.
- When operating in the thermostat control mode the humidity setpoint is set in the module at a default of 60%. This setpoint is adjustable between 0 to 100% at the module or by using optional PC interface software.
- When operating in the zone sensor mode the humidity setpoint is adjustable at the Network Control Panel.
- Module shall start condenser reheat circuits if the humidity exceeds the humidity set point.
- Module shall prioritize heat demand over dehumidification demands.
- Module shall turn off the compressors if a heat demand occurs during a dehumidification demand.
- Module shall prioritize cooling demands over dehumidification demands.
- If the space humidity is greater than the humidity setpoint, the module will not use outside air for free cooling.
- On two compressor units, if both a dehumidification and first stage cooling demands occur, the module will operate one compressor in reheat and one in cooling. If a second stage cooling demand occurs, the module will de-energize the reheat valve and operate both compressors in cooling.
- On three compressor units, if both a dehumidification and a first stage cooling demand occurs, the module will operate compressors one and two in reheat and compressor three in cooling. In the thermostat control mode, if a second stage cooling demand occurs, the module will de-energize the reheat valves and operate compressors one, two, and three in cooling. In the zone sensor control mode, if a second stage cooling demand occurs, the module will de-energize the reheat valves and operate compressors one and two in cooling. In the zone sensor control mode, if a third or fourth stage cooling demand occurs, the module will de-energize the reheat valves and operate compressor one, two and three in cooling.
- On four compressor units operating in the thermostat control mode: If both a dehumidification and first stage cooling demand occurs, the module will operate compressors one and two in reheat and compressors three and four in cooling. If a second cooling demand occurs the module will de-energize the reheat valves and operate all four compressors in cooling.

L Series® Unit Standard Rooftop Unit Controller, Integrated Modular Control (IMC)
(Main Controller M1-6, software version 4.10)

- On four compressor units operating in the zone sensor control mode: If both a dehumidification and first stage cooling demand occurs, the module will operate compressors one and two in reheat and compressor three in cooling. If a second cooling stage demand occurs the module keeps compressors one and two in reheat and operates compressors three and four in cooling. If a third cooling stage demand occurs the module will de-energize the reheat valves and operate compressors one, two and three in cooling. If a fourth cooling stage demand occurs the module will de-energize the reheat valves and operate all four compressors in cooling.

Network Thermostat Control DDC Module (NTC1-1)

(Software version 1.00)

Stage Control

- Each module shall control up to 2 stages of heating and 3 stages of cooling, blower operation, unit economizer and heat pump reversing valve.
- The module shall provide user adjustable default cooling stage differentials of 0.5 degrees F for each cooling stage available in unit.
- The module shall provide user adjustable default heating stage differentials of 0.5 degrees F for each heating stage available in unit.

Unit Type

- The module shall have user selectable options for controlling packaged or split system gas/electric, electric/electric and heat pump units. The option is set by on-board DIP switches.

Network Manager

- The module shall communicate with the optional Network Control Panel network manager.

PC Access

- The module may be accessed locally by using a PC running the optional Unit Controller Software and the optional L Connection® Network PC Converter.
- The module may be accessed remotely by using the optional L Connection Network Modem (on site) and a PC with modem running the optional Unit Controller Expanded Software.

Temperature Inputs

- The module shall have a zone sensor input that uses the standard L Connection Network thermistor type zone sensors.
- The module shall provide a user adjustable zone sensor calibration option for adjusting the zone sensor temperature +/-5 degrees F.
- The module shall have a return air, discharge air and outdoor air sensor input that uses the optional standard L Connection Network thermistor type sensors.

Analog Inputs

- The module shall have a 0-10 VDC (0-2000ppm) input to display information from an optional CO_2 sensor.
- The module shall have a 0-10 VDC (0-100% RH) input to display information from an optional RH sensor.
- The module shall have a 2-10 VDC (0-100% travel) input to display the damper position on an optional damper or economizer.

Digital Inputs

- The module shall provide a normally closed user selectable 24VAC digital input that may be used for either an optional shut off relay or smoke detector that can shut off the unit and issue either a service or smoke alarm.

Network Thermostat Control DDC Module (NTC1-1)

(Software version 1.00)

- The module shall provide a user selectable input that may be used for either an optional service relay or dirty filter switch used to issue an alarm.
- The module shall provide a user selectable input that may be used for either an optional blower overload relay or loss of phase protector that can shut off the unit and issue an alarm.

Outputs/Inputs

- Each output shall be a relay dry contact and have an LED indicator fuse and be rated at 2 Amps.

Occupied Mode, Warm-up and Cool Down Operation

- The module shall be capable of controlling the unit's occupied and unoccupied modes by controlling the occupied output.
- The module shall provide user adjustable default warm-up delay of 30 minutes that keeps the occupied output off for that time or until the first heating demand is met.
- The module shall provide user adjustable default cool-down delay of 30 minutes that keeps the occupied output off for that time or until the first cooling demand is met.

Time Delays

- The module shall provide a user adjustable default minimum off delay of five minutes for each compressor.
- The module shall have a 3 second de-bounce delay in all digital inputs except when configured as a smoke alarm input. In that case, the input has a 1 second delay.
- The module shall have a 1 second delay between starting each compressor stage to prevent current surges.
- The module shall provide a user adjustable default autochangover delay of 5 minutes between heating and cooling.
- The module shall provide a user adjustable default time delay of 20 seconds for the air flow proving switch input.
- The module shall provide a user adjustable default start-up demand delay of 2 minutes. This delay may be adjusted to stagger unit demands when units are powered on by setting different time delays for each unit.
- The module shall provide user-selected blower on delay for cooling operation.
- The module shall provide user-selected blower off delay for cooling operation.
- The module shall provide user-selected blower on delay for heating operation.
- The module shall provide user-selected blower off delay for heating operation.

Adjustable Control Parameters

- The module shall provide up to 38 user adjustable control parameters (options) that can be changed by using a PC running Unit Controller software version 2.02 or greater.
- The module shall provide backup factory default control parameters that the user may restore if desired.
- The module shall ship from the factory with the default program and control parameters built in so that the installer does not have to program control for unit operation.

Network Thermostat Control DDC Module (NTC1-1)

(Software version 1.00)

Unit Diagnostics

- The module shall provide diagnostic alarms for optional switch and sensor inputs that are displayed on the Network Control Panel or a PC running Unit Controller software version 2.02 or greater.
- The module shall provide up to 22 different alarm codes.
- The module shall keep a permanent history of the last 84 diagnostic codes stored in non-volatile EEPROM memory. User can view and erase the history at any time by using a PC running Unit Controller software version 2.02 or greater.

Backup Modes

- The module shall provide a backup option to operate on an optional return air sensor in the event that the zone sensor fails or becomes disconnected.
- The module shall have user adjustable default back-up set points of 70° F for heating and 75 ° F for cooling that are automatically used in the event of a network failure or disconnect.

Return air Limits

- The module shall have user selected return air limits that can interrupt the heating or cooling demands if limits are exceeded. This function will only work if the optional return air sensor is used.

Low Ambient Control

- The module shall provide a user adjustable heat pump compressor lockout setpoint of –30° F if optional outdoor temperature sensor is used.
- The module shall provide a user adjustable cooling compressor lockout setpoint of 0° F if optional outdoor temperature sensor is used.

Heat Pump Supplemental Heat Lockout

- The module shall provide a user adjustable default heat pump supplemental heat lockout setpoint of 40 ° degrees F if optional outdoor temperature sensor is used.

Blower Control Options

- The module shall provide a user selectable option for setting the blower to cycle with the demand or run continuously during occupied time periods.

On-Board User Interface

- The module shall provide a means to bypass time delays during testing operation by pressing the on-board pushbutton.
- The module shall provide a means to reset the control by pressing and holding the on-board pushbutton for 5 seconds.
- The module shall have dipswitches for setting the type of unit and number of stages of heating and cooling.
- The module shall have dipswitches for setting the network address (1-31).
- The module shall have LED lights that indicate each digital input and output.

Network Thermostat Control DDC Module (NTC1-1)

(Software version 1.00)

- The module shall provide a two color LED "heartbeat" light on each board that indicates that the control is operating normally or in a lockout condition.
- Each input and output on the module shall be clearly marked.
- The module shall have pluggable screw terminal blocks to provide convenient connection points.
- Each digital output shall have a manual slide switch used for overriding the control in order to test the unit operation.

Electrical/ Environmental

- The module shall be microprocessor based with core software stored in non-volatile flash memory and adjustable control parameters values stored in non-volatile EEPROM memory.
- The module core software may be field upgradeable with a PC without changing hardware.
- The module shall operate safely over a temperature range from -40°F to 155°F.
- The module shall operate safely from 18 to 30VAC.
- The module shall have a fuse rated at 2Amp on the power input (24VAC).
- The module may be mounted in the unit's control box but not directly adjacent to a gas ignition module.
- The module may be mounted in a dry location within 100 feet of the unit.
- An optional NEMA 4 or NEMA 1 enclosure shall be available.
- The module shall have solid-state circuit protection on the L Connection Network RS-485 bus port to protect the circuit from inadvertently being connected to 24VAC.
- The module shall have solid-state circuit protection on the voltage analog inputs to protect the circuit from inadvertently being connected to 24VAC.
- The module printed circuit boards shall be conformal coated to protect surface mount components on the bottom of the control.
- The module shall be mounted on an aluminum base to protect the surface mount components used for mounting.

Building Controller Module (BC1-1)

(Software version 1.00)

Digital Outputs

- The module shall have 8 dry contact outputs rated at 24VAC, 2Amps that may be used for controlling building lights, vent hoods, exhaust fans, etc.
- Each output has an individual fuse, an LED indicator and a manual override switch.

Network Manager

- The module shall communicate with the optional Network Control Panel network manager.

PC Access

- The module may be accessed locally by using a PC running the optional Unit Controller Software and the optional L Connection® Network PC Converter.
- The module may be accessed remotely by using the optional L Connection Network Modem (on site) and a PC with modem running the optional Unit Controller Expanded Software.

Digital Inputs

- The module shall have four 24VAC digital inputs.
- Each input may be used for monitoring purposes only or for overriding any module output, forcing selected HVAC units to shift setpoints, operate on their override setpoints or go to standby (off).
- Each input may be read on the Network Control Panel or with PC running the optional L Connection software.

Analog Inputs

- The module shall have three 0-10VDC analog inputs.
- Each input may be used for monitoring purposes only or for overriding any module output, forcing selected HVAC units to shift setpoints, operate on their override setpoints or go to standby (off).
- Each input voltage reading may be read on the Network Control Panel or with PC running the optional L Connection software.

Temperature Inputs

- The module shall have four temperature inputs that use the standard L Connection Network thermistor type sensors.
- The range of each input is –40°F to 130°F.
- Each input may be used for monitoring purposes only or for overriding any module output, forcing selected HVAC units to shift setpoints, operate on their override setpoints or got to standby (off).
- Each input temperature reading may be read on the Network Control Panel or with PC running the optional L Connection software.

Guide Specifications For Lennox' L Connection® Network Control System

DataMonitor Gateway (DM1-1)

(Software version 1.11)

Controllers

Gateway shall monitor up to 31 unit controllers of the L Connection Network.

Unit Controller Alarms

- Gateway shall provide all unit controller alarms codes with date/time stamp.
- Gateway shall provide a full description of the unit alarm and action taken by unit controller.

Real Time Clock

- Gateway shall have an internal real time clock that with a 10-year life back-up battery.
- Gateway shall have a user selectable Daylight Savings Auto set function that will automatically set the internal clock for daylight saving time.

User Interface

- Gateway shall provide control heartbeat LED, communication LED and on/off switch on front panel.
- Gateway shall include programming instruction manual.

Electrical/Environmental

- Gateway shall consist of a microprocessor-based digital controller.
- Gateway shall have one RS-232 serial data communication port for interfacing to the 3rd party control system or PC.
- Gateway shall outputs data in hexadecimal formats on the RS-232 port when requested by 3rd party control or PC.
- Gateway shall have one L Connection Network serial data communication port for communicating with unit controllers connected to the network.
- Gateway's software version shall be capable of being upgraded without removing or replacing the panel by using PC connected to the RS-232 serial data port.
- Gateway shall operate safely over a temperature range from 0 to 125°F.
- Gateway shall include 115VAC wall plug power transformer.
- Gateway unit alarms list shall be stored in non-volatile flash memory.
- Gateway shall be connected to the L Connection network via 2 conductor twisted pair, shielded, 22-gauge communication cable. Belden type 8761 or 88761. Lennox cat.# 27M19.

Zone Temperature Sensors

Wall Mount 59L80

- Sensor shall be compact wall sensor complete with optional after-hours override button, warm/cool offset adjustment.
- Sensor shall have an L Connection Network convenience phone jack that may be used for connecting a PC converter to a PC with L Connection Network software.
- Sensor shall have terminal block for wiring connections.
- Sensor shall be connected to the unit controller via 2 conductor, 22 gauge twisted pair shielded cable.
- The sensor shall have an accuracy of +/-0.4°.F.
- Sensor shall not be located in direct sunlight or close to supply air diffuser or any other heat source.
- Sensor shall be mounted about 5 ft above finished floor (refer to local codes for height requirements).
- Sensor shall be mounted on the zone wall at a distance not exceeding 100 ft from the unit controller.

Wall Mount 94L60

- Sensor shall be compact wall sensor complete with optional after-hours override button.
- Sensor shall have an L Connection Network convenience phone jack that may be used for connecting a PC converter to a PC with L Connection Network software.
- Sensor shall have terminal block for wiring connections.
- Sensor shall be connected to the unit controller via 2 conductor, 22 gauge twisted pair shielded cable.
- The sensor shall have an accuracy of +/-0.4°F.
- Sensor shall not be located in direct sunlight or close to supply air diffuser or any other heat source.
- Sensor shall be mounted about 5 ft above finished floor (refer to local codes for height requirements).
- Sensor shall be mounted on the zone wall at a distance not exceeding 100 ft from the unit controller.

Wall Mount 94L61

- Sensor shall be 2 x 1 ½ inches in size.
- Sensor shall have terminal block for wiring connections.
- Sensor shall be connected to the unit controller via 2 conductor, 22 gauge twisted pair shielded cable.
- The sensor shall have an accuracy of +/-0.4°.F.
- Sensor shall not be located in direct sunlight or close to supply air diffuser or any other heat source.
- Sensor shall be mounted about 5 ft above finished floor (refer to local codes for height requirements).

Zone Temperature Sensors

- Sensor shall be mounted on the zone wall at a distance not exceeding 100 ft from the unit controller.

Duct Mount 56L81

- Sensor shall be duct mount probe used in place of wall mount sensor.
- Sensor shall be 12in. probe with mounting plate.
- Sensor probe shall be constructed of stainless steel.
- The sensor shall have an accuracy of +/-0.4°F.
- Sensor shall be mounted in the return air duct at a distance not exceeding 100 ft from the unit controller.

Averaging Kit 23M20

- Sensor shall be two-sensor averaging kit.
- Kit shall include two sensors that are 2 x 1 ½ inches each in size.
- Sensor shall have terminal block for wiring connections.
- Sensor shall be connected to the unit controller via 2 conductor, 22 gauge twisted pair shielded cable.
- Each sensor shall have an accuracy of +/-0.4°.F.
- Sensor shall not be located in direct sunlight or close to supply air diffuser or any other heat source.
- Sensor shall be mounted about 5 ft above finished floor (refer to local codes for height requirements).
- Sensor shall be mounted on the zone wall at a distance not exceeding 100 ft from the unit controller.

Zone Relative Humidity Sensors

Wall Mount 17M50.

- Sensor shall have terminal block for wiring connections.
- Sensor shall be connected to the unit controller via 2- 2 conductor, 22 gauge twisted pair shielded cable.
- The sensor shall have an accuracy of +/-3%RH from 20 to 95%RH.
- Sensor shall not be located in direct sunlight or close to supply air diffuser or any other heat source.
- Sensor shall be mounted about 5 ft above finished floor (refer to local codes for height requirements).
- Sensor shall be mounted on the zone wall at a distance not exceeding 100 ft from the unit controller.
- Sensor shall have a long-term stability of less than 2% RH drift/5 years.

CO_2 Sensors

Wall Mount

- Sensor shall have terminal block for wiring connections.
- Sensor shall include self-calibration that may eliminate the need for manual calibration.
- Optional black case is UL94-V5 rated which makes it suitable for duct mounting.
- Sensor shall provide for proportional or exponential output signal.
- Sensor shall have conformal coated electronic to resist airborne contaminants.
- Sensor shall have an accuracy of +/-100ppm or 7% whichever is greater.
- Sensor shall have response time of less than 1 minute at 25°C.
- Sensor shall have a warm-up time of less than 2 minutes at 25°C.
- Sensor temperature operating range shall be 60 to 90°F. (0-95%RH, non-condensing)
- Sensor shall operate safety over a voltage range of 18-30 VAC, 50/60Hz.
- Optional LCD display will indicate the CO_2 ppm level.

Unit Controller PC Interface Software

(Software version 2.03)

Basic Version

- Software shall provide method for interfacing with the Integrated Modular Control (IMC) unit controller used in the L Series® rooftop units.
- Software shall provide method for interfacing with the Network Thermostat Control (NTC1-1) DDC module used for non L Series Lennox units or third party equipment including rooftop units and split systems.
- Software shall provide method for interfacing to the Building Controller (BC1).
- Software shall provide method for the user to set-up or change the Electronic Configure to Order (ECTO) parameters, view alarm codes, view status, test and print/save reports.
- Software allows saving a controllers ECTO parameters to a file for use on other controllers.
- Software allows uploading ECTO parameters to up to 31 like controllers at one time.
- Software shall allow a PC to connect to the L Connection Network via a PC converter kit for direct (local) connection to network.
- Software shall connect to the PC converter kit via COM1-COM4 PC serial ports.
- Software allows connecting to either one controller or to up to 31 controllers that are connected together on the network.
- CD-ROM includes software and the L Connection® Network controls manuals.
- Software is Windows based.
- Software designed for PCs running Windows® 95, 98, NT, Me, 2000 or XP.

Expanded Version

- Same features at Basic Version with the following additions:
    - Remote access via PC modem to any controller or network equipped with an L Connection® modem kit.
    - PC modem is required for remote access.
    - Has a phonebook that keeps track of remote network modem phone numbers and addresses.

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Network Control Panel PC Interface Software

(Software version 2.03)

Basic Version

- Software shall provide a method for interfacing directly with the Network Control Panel connected to a L Connection network.
- Software shall allow a PC to connect to the L Connection Network via a PC converter kit for direct (local) connection to network.
- Software shall connect to the PC converter kit via COM1-COM4 PC serial ports.

Network Control Panel PC Interface Software

(Software version 2.03)

- Software provides method for setting the Network Control Panel settings, schedule programs, controller descriptions and for viewing controller alarms.
- Software provides method for viewing real time status of each controller.
- Software shall print and save reports that include schedules, controller alarms and status.
- CD-ROM includes software and the L Connection® Network controls manuals.
- Software is Windows based
- Designed for PCs running Windows® 95, 98, NT, Me, 2000 or XP.

Expanded Version

- Same features at Basic Version with the following additions:
    - Remote access via PC modem to Network Control Panel on network equipped with an L Connection® modem kit.
    - PC modem is required for remote access.
    - Has a phonebook that keeps track of remote network modem phone numbers and addresses.