SIEMENS

Installation Instructions
Document No. 550-697
Rev. 1, May, 2002

LTEC Unit Ventilator DDC Controller

Product Description

These instructions explain how to install or replace a LTEC (LonMark® Terminal Equipment Controller) UV (Unit Vent) DDC Controller (Figure 1). Each platform supports various applications of the Unit Vent terminal unit. Each application set has a default input / output wiring configuration shown in Figure 5 through Figure 9.

The LTEC UV DDC Controller applications are provided in the following configurations:

- UVC- Unit Vent Chill Water, w/single speed fan, 2 or 4 pipe heating and/or cooling coils, outside air damper control.
- UVD- Unit Vent – DX, w/single speed fan, single or multi stage DX cooling, terminal heating coils, outside air damper control.
- UVF- Unit Vent – Face & Bypass damper control, 2 or 4 pipe cooling and/or heating coils, outside air damper control.

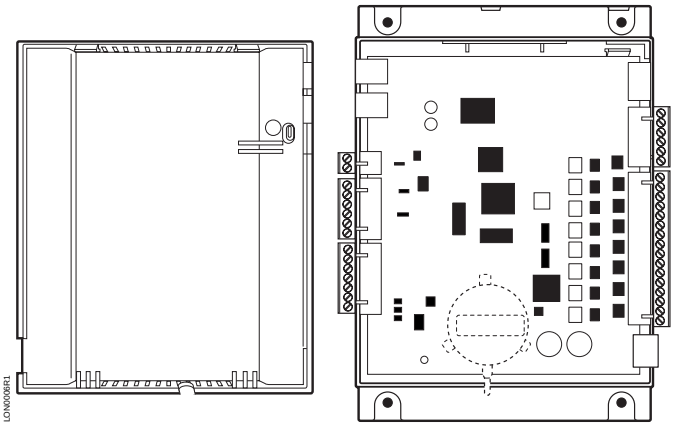


Figure 1. LTEC Controller – open cover.

Product Number

Part number	Application	Input/Output
550-540	LTEC UVC CW/HW 2/4 pipe	4 IN, 6 DO
550-542	LTEC UVC CW/HW 2/4 pipe	5 IN, 8 DO, 3 AO
550-541	LTEC UVD DX w/htg.	4 IN, 6 DO
550-543	LTEC UVD DX w/htg.	5 IN, 8 DO, 3 AO
550-544	LTEC UVF w/Face/Bypass w 2/4 pipe htg/clg	5 IN, 8 DO, 3 AO

In addition to the listed inputs above, each platform can accept a series 550-180 through 550-187 LTEC room temperature sensor (RTS) with optional digital display, occupancy override push button and set point adjustment.

Warning/Caution Notations

WARNING	⚠	Personal injury/loss of life may occur if a procedure is not performed as specified.
CAUTION	⚠	Equipment damage, or loss of data may occur if the user does not follow procedure as specified.

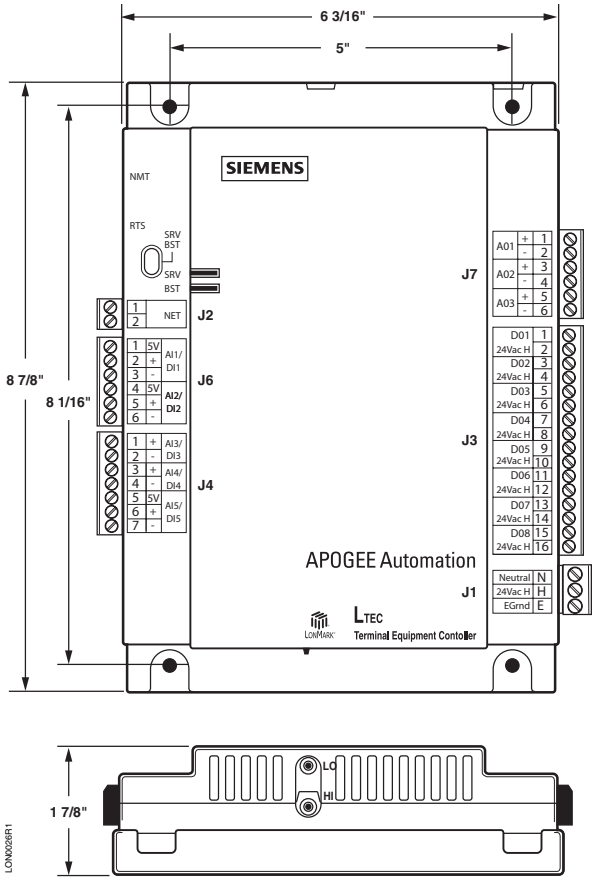


Figure 2. LTEC Controller.

Required Tools

- Pencil
- ESD wrist strap
- Small flat blade screwdriver
- Medium flat blade screwdriver
- Wire stripper
- Medium duty electric drill
- ¼ in (6mm) hex nut bit
- Network Management Tool
- Bus interface and cables

Prerequisites

- Room temperature sensor (RTS), if required, is installed
- Power source of 24 Vac, 60 Hz Class 2 power trunk is available and has a sufficient VA rating for the controller, sensors and actuators
- If required, the controller enclosure is installed
- Power supply to the unit is OFF

WARNING:

The power must be turned OFF prior to wiring the unit.

Installation

The following sections are included in these instructions:

- Controller Mounting
- Power Wiring
- Bus Wiring
- Replacing a Controller

Controller Mounting

1. Using the controller as a template, position the controller vertically and mark the mounting hole locations on the mounting surface (terminal box or mounting enclosure).
2. Using the #6 self-tapping screws (included), fasten the controller to the terminal box or enclosure.

3. Connect the Network Trunk (NOT polarity sensitive) cable to terminals 1 and 2 on J2, 'NET' (Figure 3).

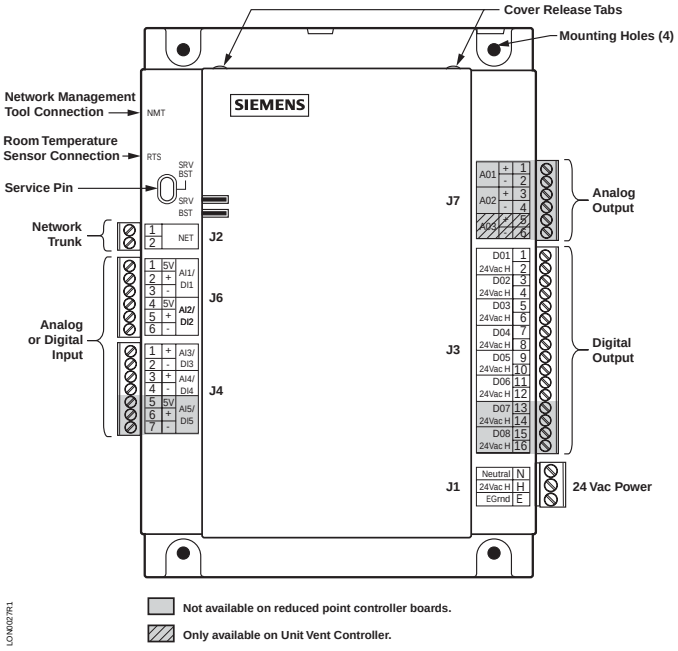


Figure 3. LTEC Wiring Designations.

4. With primary power disconnected, connect 24vac power to terminal block J1.
5. Connect the 'EGrnd' terminal (E) to an earth ground.

   NOTE: A proper ground source is required to protect the electronic circuits, for example; a cold water pipe, power panel ground (green wire) or other comparable ground sources.

6. Connect the input and output wiring for the appropriate UV (Unit Vent) application. Refer to the Terminal Designations section for complete information on LTEC wiring designations for 550-540 through
   550-544 controllers.

7. For input type selection, (digital, voltage, or current) see the jumper and connection information in Table 2.

NOTE: Each DO provides a normally open (NO) and 24 Vac hot (H) terminal. Terminate both connections of a 24 Vac load directly to the controller board. Floating control actuators require 2 DOs and use 3 wire connections.

The 24 Vac Common is switched through the Triac when the associated DO is energized.

CAUTION:

The controllers Digital Outputs (DOs) control 24 Vac only. The maximum rating is 12 VA for each DO. Use an interposing 24Vac relay for any of the following:

- VA requirements higher than the maximum
- 110 or 220 Vac or higher
- Control load requires DC power
- Separate transformers used to power the load
- Need for dry contacts

8. Plug the room temperature sensor (RTS) cable into the 'RTS' port on the left side of the controller. See Figure 2.
9. Remove one of the controller neuron ID labels (two part label located at the top of the controller board). Record this number as directed in a floor plan layout, job log or place the self-adhesive label on the outside of the controller case or inside the RTS cover.

NOTE: This number is unique to the controller electronics.

Installation is complete.

Power Wiring

Each Controller requires a source of 24 Vac, 60 Hz Class II power supply. The base rating of the controller and the sum of the sensor, actuators and relays connected dictates the VA rating.

Bus Trunk wiring

Bus wiring must be accomplished using approved cables only. These include unshielded and shielded (where specified) two conductor 22 AWG Level IV cable.

WARNING:

Use the recommended LonWorks cable: 22 AWG shielded or unshielded, Level IV per NEMA standards (not equivalent to EIA/TIA Level 4 cable). Connect Air brand cable, 22/1 pair, stranded, unshielded, blue plenum jacketed, Level IV, Part Number W221P-2001 or an approved equal for bus wiring. Bus wiring is NOT polarity sensitive.

The LTEC Controllers use the FTT-10 transceiver that allows free topology wiring. This includes T-taps, stars, branches, loops as well as standard daisy chain. In all cases, max bus wire length, including each sensor cable, cannot exceed 500 meters (1640 feet).

For bus lengths that exceed 500 meters, (1640 feet) a two-port or three-port repeater can be used (Part number 587-450 and 587-455 respectively). This will allow three separate bus lengths of 500 meters. See the *LonTalk ® Two and Three Port Repeater* installation instructions, (P/N: 550-310) for additional information and limitations.

Each bus segment (1 without repeater, 3 with repeater) requires a pair of terminating resistors (Part number 587-649 – packs of 100) that can be located together anywhere on the segment, at the field panel or repeater.

The installation is now complete.

Terminal Designations

Figure 4 shows the LTEC wiring designations and internal jumper locations for both controllers.

NOTE: All inputs and outputs physical connections are pre-configured per application number selected.

The wiring diagrams (Figure 5 thru Figure 9) are shown using the full point controllers (shaded terminals). Reduced point controllers should be used when the additional input/output points are not required.

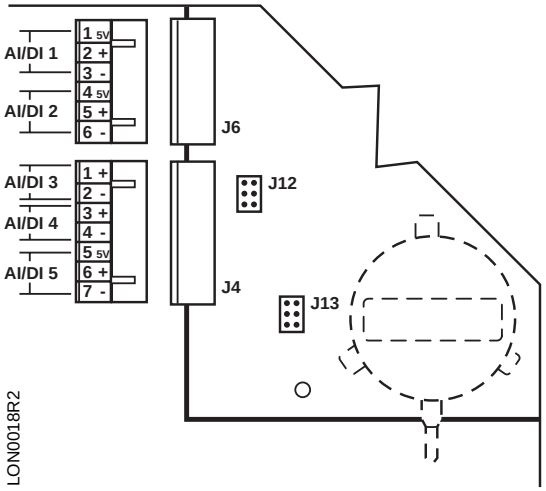


Figure 4. Terminal Designations.

Input Ports

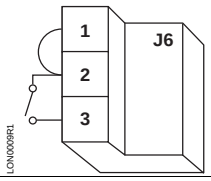
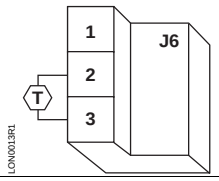
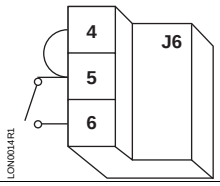
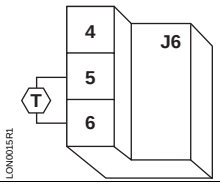
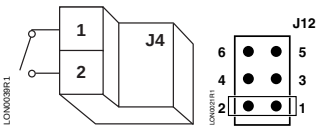
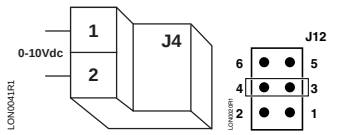
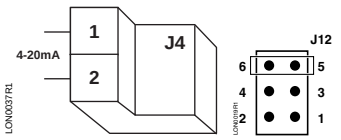
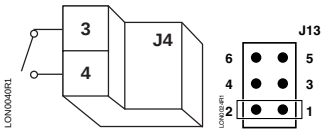
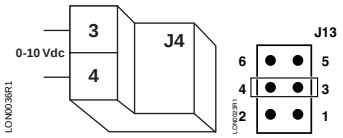
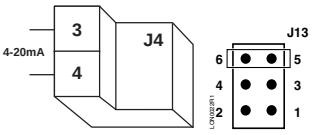
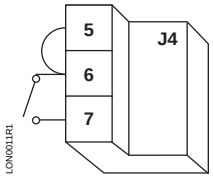
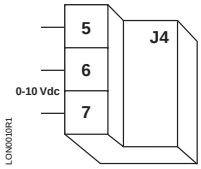
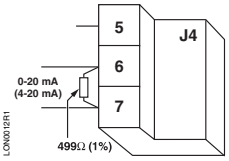
LTECs have configurable, flexible input ports. Table 1 lists each input port and indicates the input options available for that port.

NOTE: Some models have only the first four inputs, while others have five inputs. (Only VAV models have the integral flow sensor port).

Table 1. LTEC Input Port Configuration Options.

Input type/Number	Configurable options	Notes
RJ-11 input jack	Temperature sensor Set point adjustment Override button	550-180 thru 187 wall modules
AI/DI 1	Digital Input Temperature Input	100K thermistor
AI/DI 2	Digital Input Temperature Input	100K thermistor
AI/DI 3	Digital Input Percent Input Temperature transmitter	0-10Vdc or 0-20/4-20 mA
AI/DI 4	Digital Input Percent Input Temperature transmitter	0-10Vdc or 0-20/4-20 mA
AI/DI 5	Digital Input Percent Input Temperature transmitter	0-10Vdc or 0-20/4-20 mA
Integral Flow Sensor	N/a	VAV/CV only

Table 2. Input Configuration and Jumper Settings.

	Digital Input	100 K thermistor	0-10 Vdc input	0-20/ 4-20 mA input
AI/DI 1			Not avail	Not avail
AI/DI 2			Not avail	Not avail
AI/DI 3	 internal jumper	Not avail	 internal jumper	 internal jumper
AI/DI 4	 internal jumper	Not avail	 internal jumper	 internal jumper
AI/DI 5		Not avail		

1. Resistor, 499 Ω 1%, part number (587-152) for AI 5 current input (0-20 mA).
2. See Figure 4 for physical location of internal jumpers and external terminal block connections.
3. The location of physical inputs must match a specific application wiring diagram; see Figure 5 through Figure 9.

Output Ports

LTECs have configurable, flexible output ports. Wiring diagrams (Figure 5 through Figure 9) indicate how these outputs are used in each application.

NOTE: Each application has pre-assigned output configurations. Some models have only the first six Digital outputs and no Analog outputs, while other have all eight Digital outputs and three Analog outputs.

Replacing a Controller

NOTE: Replacement of a LTEC requires you to record, re-enter, and/or update the initial point values from the old controller before replacing it.

LTEC Network Connections (data sharing between controllers; **Connections** tab in Network Management Tool) (NMT) do not need to be recorded if using NMT's **Replace** feature. NMT will re-apply the Connections after the **Replace**. However, if the old controller is to be deleted in NMT, then all connections will need to be recorded first so they can be re-entered after the new controller is added.

1. To record Initial Values, before disconnecting the old controller, do one of the following:
   - If the controller is communicating with the field panel, update the controller initial values at the field panel.
   - If the controller does not communicate with the field panel, but does communicate with the NMT, record the appropriate configuration points on Table 3 at the end of these instructions.
   - If the old controller is not communicating at all, record all data available in the Point Definition Report, or from the last valid initial values uploaded from the controller.
2. Disconnect power to the controller (remove the power connector, terminal block J1).
3. Disconnect all input and output removable terminal blocks and insure they do not short out.
4. Remove the RTS and network (RJ11) connectors.
5. Remove the controller board by pressing the internal tabs and lifting the board out (or the complete controller, by removing the mounting screws).
6. Install the new controller board (or base and board).
7. Install jumpers.
   - Ensure jumpers for AI/DI 3 and AI/DI 4 are configured to match the removed controller, see Table 2.
   - Ensure AI/DI 1, AI/DI 2 and AI/DI 5, external jumpers, remain in place or are reinstalled.
8. Remove one of the Neuron® ID labels (two part label located at the top of the controller board). Record this number as directed; on a floor plan layout, job log or inside the RTS cover.

NOTE: This number is unique to the controller electronics. It is imperative that the old neuron label be removed or covered.

9. Reconnect input and output terminal blocks.
10. Reconnect RTS and network (RJ-11) connectors.
11. Reconnect power to controller, terminal block J1.
12. Connect NMT to the LTEC or L model MEC.
13. Run NMT and use **Replace** to replace the old controller with new one.

NOTE: If the replacement controller was previously used elsewhere (not in factory packaging) the factory defaults must be re-established as follows:
Using NMT, select the controller, select **Application Configuration** and apply **the Set to Defaults** command.

14. Apply the appropriate Configuration Template.
15. Restore initial values as follows:
    - MMI: If a field panel update was performed, the LTECs initial values will be loaded automatically.
    - NMT: If a field panel update was NOT performed, set the initial values previously recorded in Table 3.
16. NMT: Verify LTEC Connections are correct, update as needed.
17. Save the peak database (.pkd file) to flash/file as needed.

Replacement installation is complete.

Disposal As an aid to environmentally responsible disposal, the larger plastic components bear a recycle symbol. The controller should not be disposed of with domestic waste. The printed circuit board and plastic components should be disposed of separately in accordance with local regulations.

LTEC UV Application Wiring Diagrams

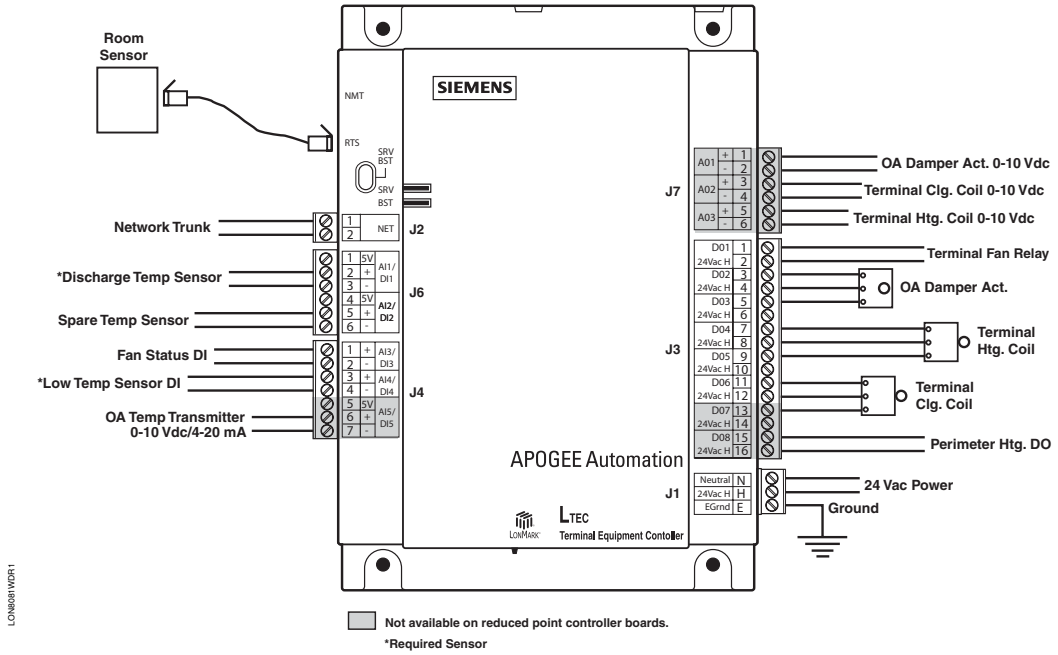


Figure 5. Application 8081 – UV-CW 4-pipe Cooling/Heating (550-540 or 550-542).

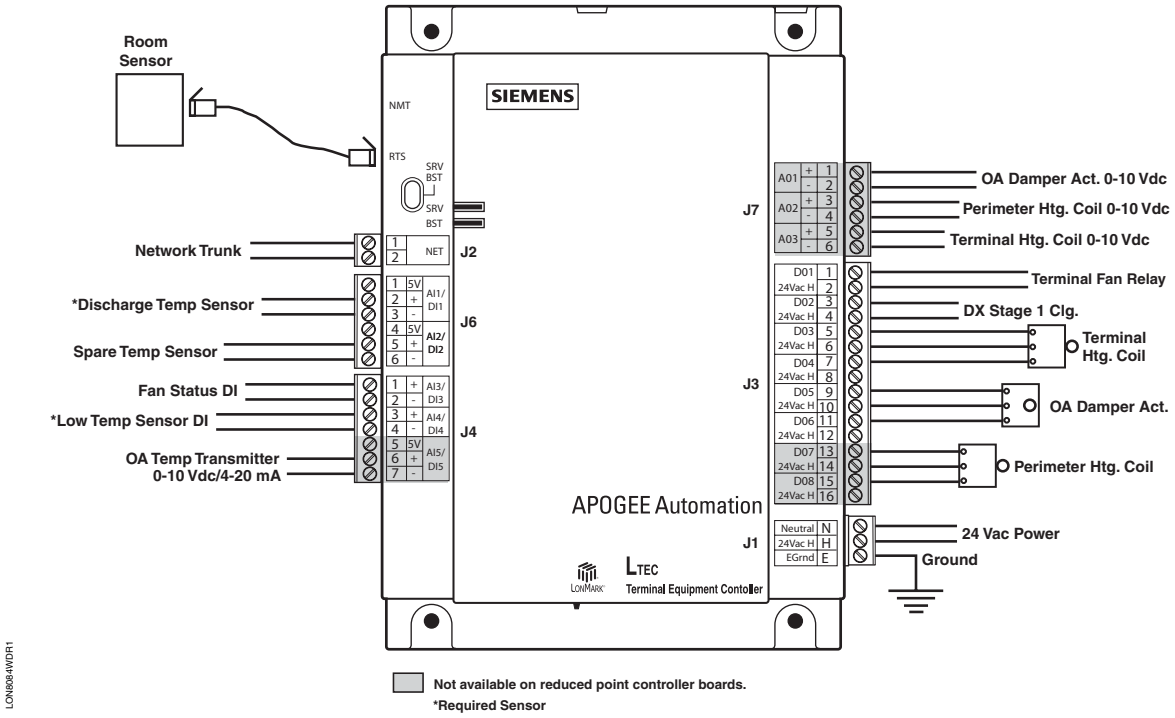


Figure 6. Application 8084 – UV-DX with Hot Water Heat (550-541 or 550-543).

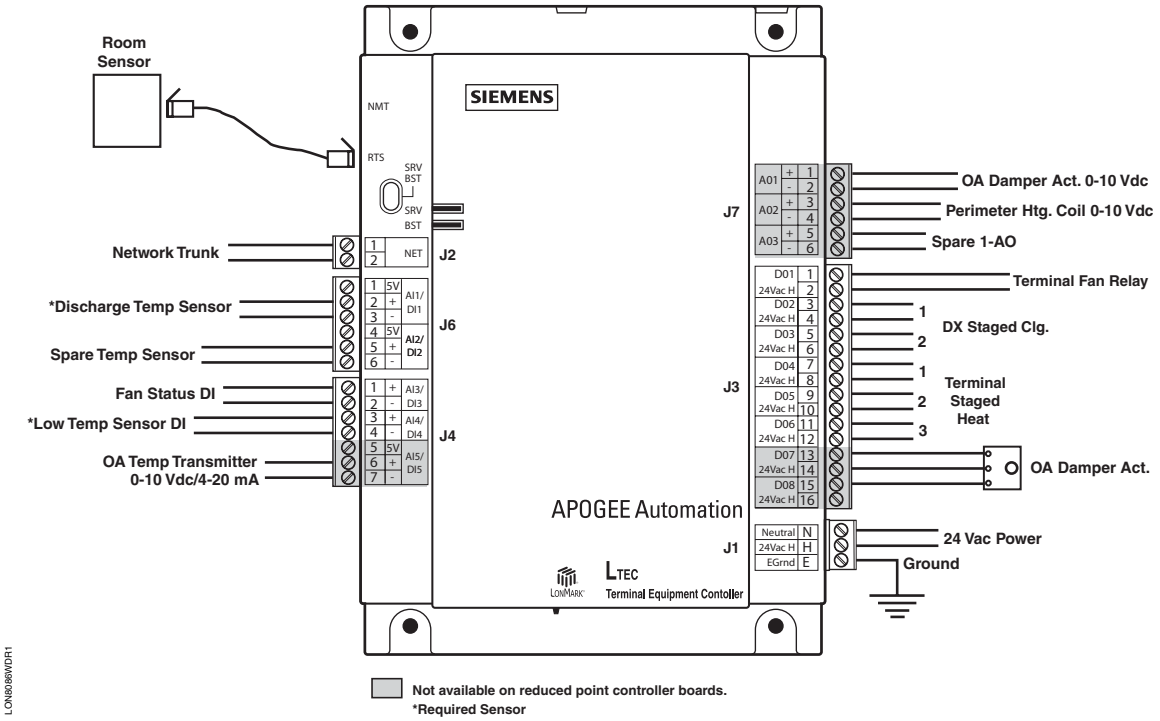


Figure 7. Application 8086 – UV-DX 2 stage and Electric Heat (550-541 or 550-543).

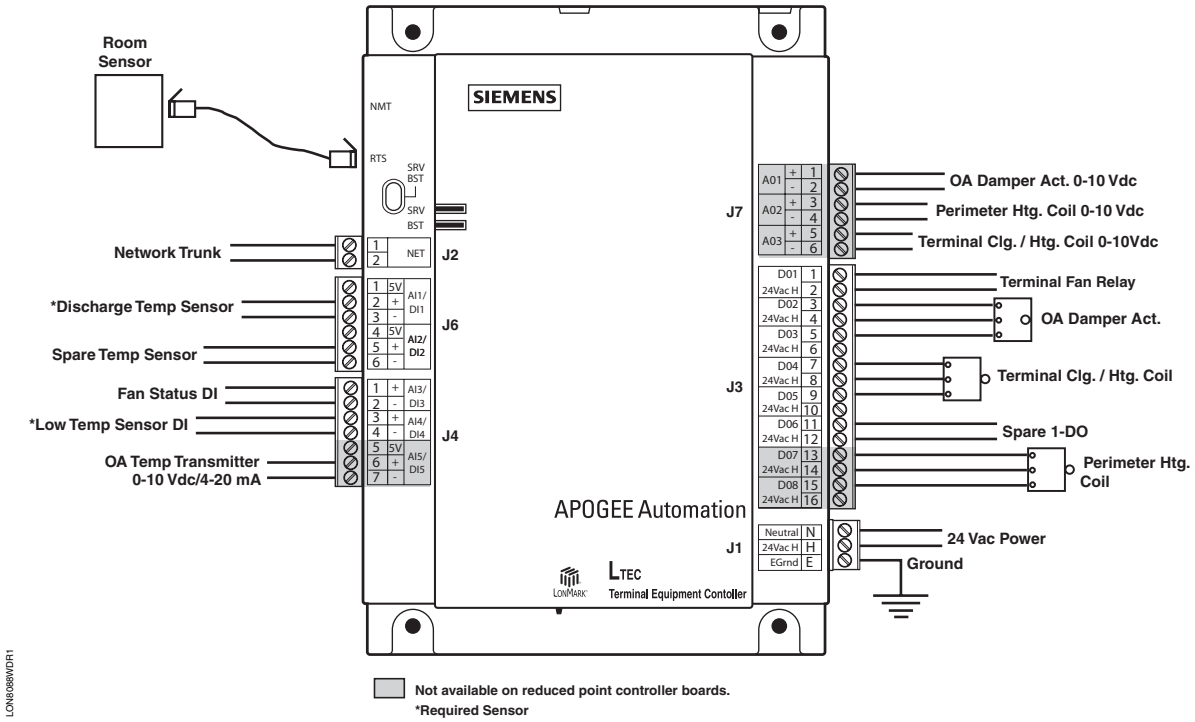


Figure 8. Application 8088 – UV-CW 2-pipe Cooling/Heating (550-540 or 550-542).

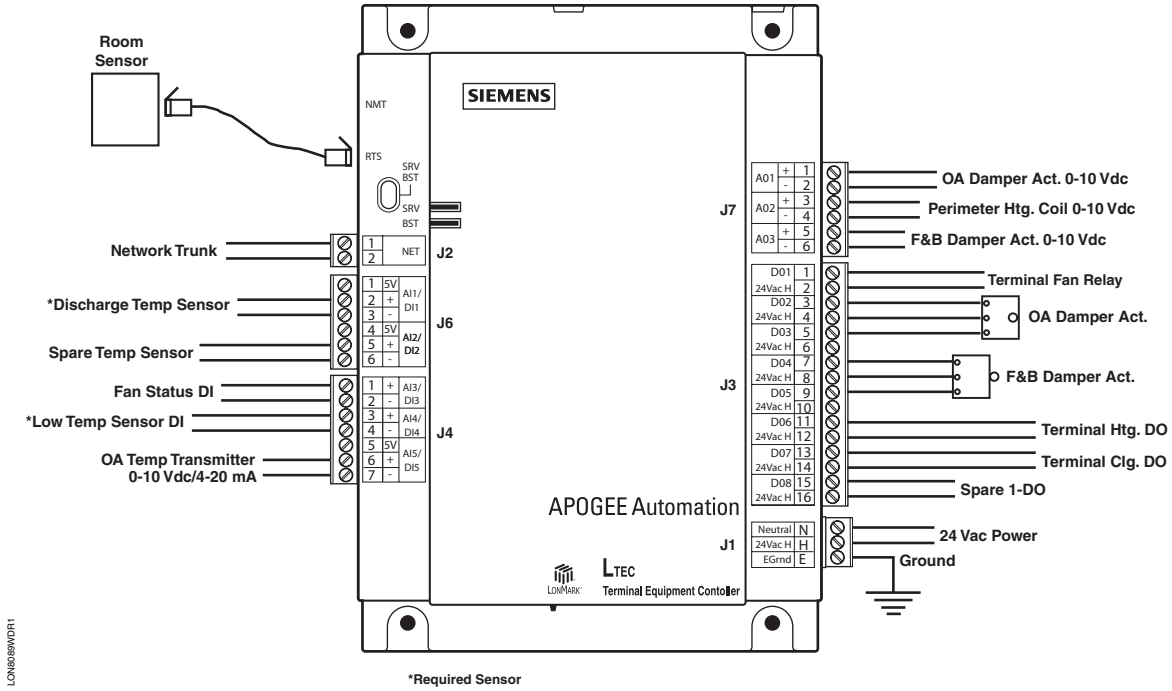


Figure 9. Application 8089 – UV 4-pipe Face/Bypass, Cooling/Heating. (550-544)

Table 3. Record of Controller Modified Initial Values.

Point Number	Descriptor	Initial Value	Point Number	Descriptor	Initial Value