



**MANUAL – INSTALLATION**

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# Linear Natural Convection Terminal

## Perimeter Series

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**PRICE**<sup>®</sup>

# LINEAR NATURAL CONVECTION TERMINAL

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# LINEAR NATURAL CONVECTION TERMINAL

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## PRODUCT CONFIGURATIONS

### Introduction

In this manual, you will find technical descriptions and diagrams of underfloor system components along with their installation instructions. Practical guidelines and recommendations are also provided. If more information is required about this equipment, please contact a Price sales representative.

### General Safety Guidelines

This document is intended for use by owner-authorized operating/service personnel who are expected to possess the required training to enable them to perform their tasks properly and safely. This individual must have read and understood this document and any referenced materials prior to performing any task on this equipment. Also, it is essential that this individual be familiar with and comply with all applicable governmental standards and regulations pertaining to the task in question. This individual must also verify that installation and connections comply with local building codes. It is the obligation and responsibility of the operating/service personnel to identify and recognize these inherent hazards, protect themselves, and proceed safely in completing their tasks. Failure to comply with any of these requirements could result in severe personal injury or death to themselves and people at the site, as well as serious damage to the equipment and the property in which it is situated.

The equipment discussed in this manual is relatively complicated apparatus and must be handled with the necessary precautions. Individuals may be exposed to certain components or conditions such as refrigerants, oils, materials under pressure, rotating components, and both high and low voltage during installation, operation, maintenance or service of this equipment. If misused or mishandled, each item has the potential to cause bodily injury or death.

# LINEAR NATURAL CONVECTION TERMINAL

## PRODUCT CONFIGURATIONS

### LNT

The LNT is designed to deliver heating in perimeter applications by heating room air through a natural convection process. The LNT has integrated hot water coils or electric coil configurations available. In heating mode, the heater is turned on and the cooler room air at the floor level is pulled into plenum, heated as it flows through the coil, then allowed to rise into the room through the buoyancy of the warm air.

### LNT with Air Valve

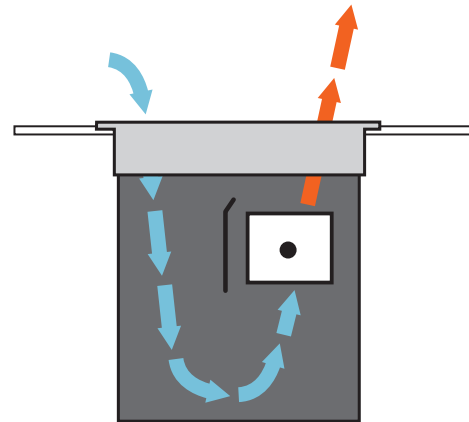
The LNT with VAV damper uses the damper to supply cool plenum air. When the occupied zone is above the setpoint, the controller sends a signal to the LNT to modulate the damper open to a position dependant on the cooling load. The LNT has integrated hot water coils or electric coil configurations available for heating. In heating mode, the damper is at minimum position and the electric coil or hot water coil is activated. The cool air at the floor level is pulled into the grille then allowed to rise into the room through the buoyancy of the warm air.

### LNT Cooling Only

The LNT cooling only has a VAV damper which it uses to supply cool plenum air into the occupied space. The cooling only LNT has no chilled water coil or electric coil.

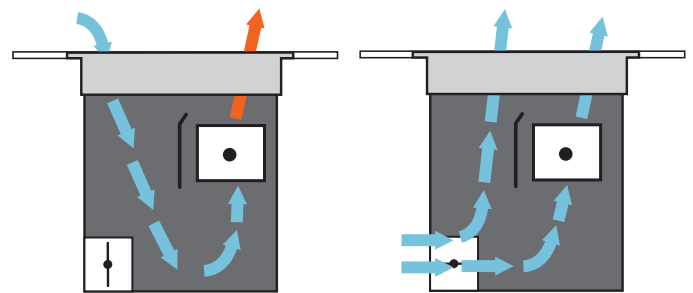
**NOTE:** Covering the grille and blocking the airflow of any LNT product is a fire hazard.

### LNT ▼



LNT heating only airflow pattern

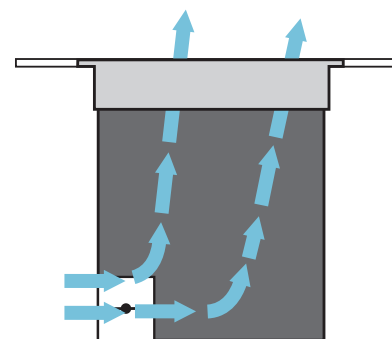
### LNT WITH AIR VALVE ▼



LNT airflow pattern in heating mode

LNT airflow pattern in cooling mode

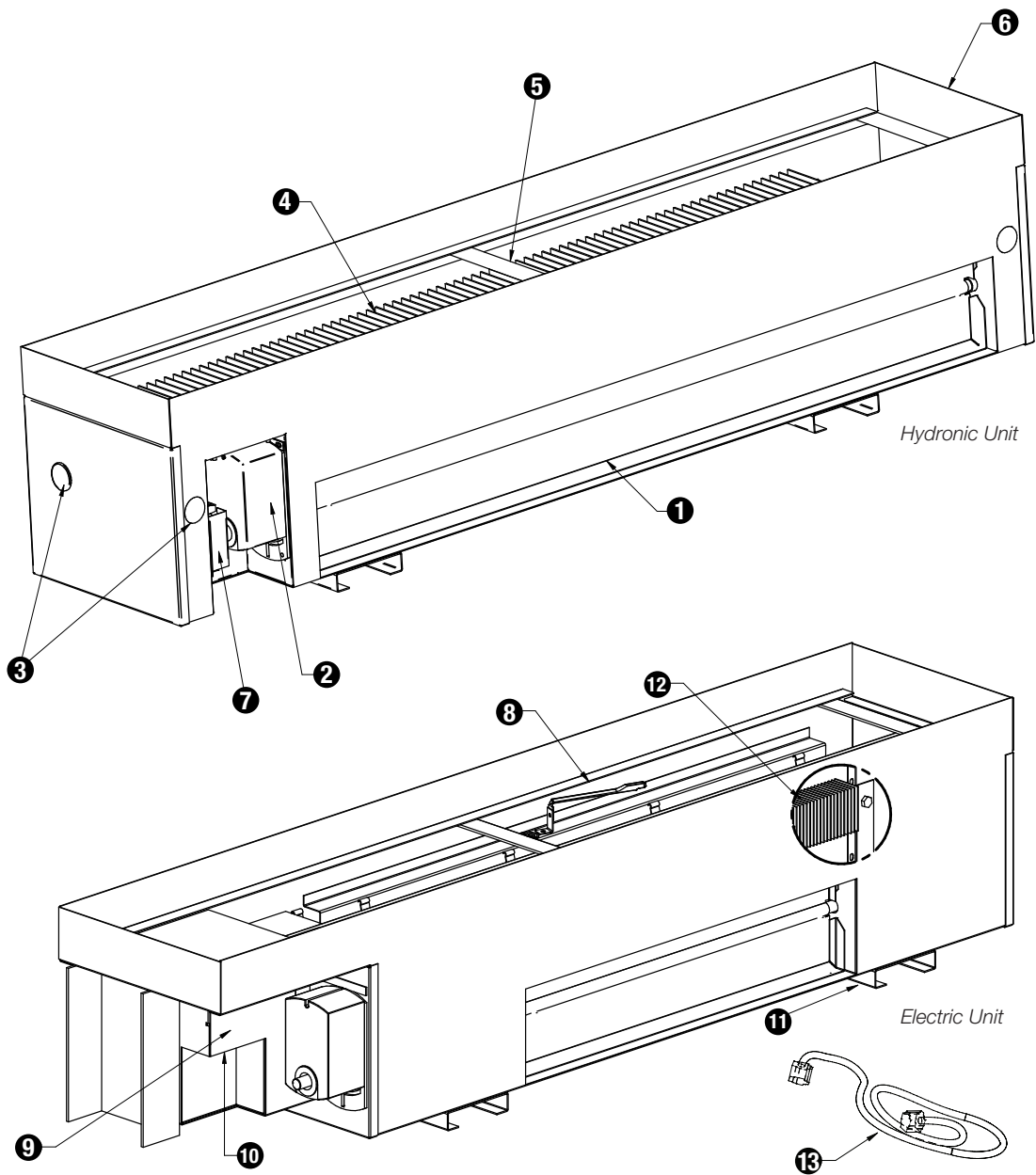
### LNT COOLING ONLY ▼



LNT airflow pattern in cooling mode

# LINEAR NATURAL CONVECTION TERMINAL

## LNT PARTS AND FEATURE LIST



| No. | Feature                  | No. | Feature                                      |
|-----|--------------------------|-----|--|
| 1   | Air Valve (OPT)          | 8   | DAT Probe (OPT)                              |
| 2   | Damper Actuator          | 9   | SCR/Staged Heat Enclosure                    |
| 3   | Piping Knockouts         | 10  | High Voltage Quick Connect Receptacles (OPT) |
| 4   | Fintube Water Coil       | 11  | Pedestal Brackets (OPT)                      |
| 5   | Handle Bars (Removeable) | 12  | Electric Coils                               |
| 6   | Removeable Endcaps       | 13  | CFlex Power and Control Cable                |
| 7   | Plug and Play Board      |     |  |

# LINEAR NATURAL CONVECTION TERMINAL

## INSTALLATION & MOUNTING INSTRUCTIONS

### Floor Tile Supported Installation

- The floor opening should be the same size as the nominal opening size used to order the floor plenum. See submittal for reference.

**Optional:** Install mounting angle (by others) along the perimeter wall. Angle should be installed at same height as finished floor. Install the first row of floor tiles maintaining the rough opening width.

- For heating units connect the Purple CFlex RJ45 cable and for cooling units connect the Green CFlex RJ12 cable. Remove necessary knockouts for piping. Piping knockout and CFlex connection locations shown in Fig 1.

- Install plenum into floor opening with support flange resting above the tile. See Detail A in Fig 2 for reference. If plenum includes coil ensure coil is located on perimeter side or if air valve is installed ensure air valve is on room side. See Fig 2.

**Optional:** For pedestals, install pedestal by sliding the pedestal head into the pedestal bracket before installing setting plenum in floor opening. Ensure unit is level by adjusting pedestal heights.

- Connect HW piping connections.

**NOTE:** No piping required for LNT for cooling only unit.

- Install LFG floor grille into plenum. See Fig 3 for LNT with grille installed.

**NOTE:** LNT units should be placed so that wall thermostats are not in direct path of the airflow.

FIG 1. CFLEX CABLE CONNECTION PORTS AND PIPING KNOCKOUTS ON LNT ▼

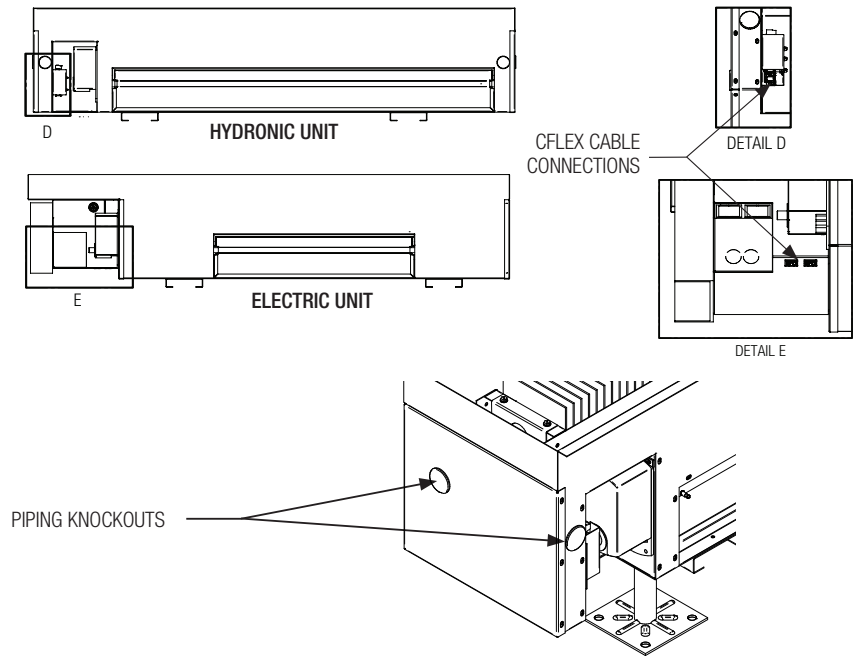


FIG 2. LNT FLOOR TILE SUPPORTED PLENUM SIDE VIEW ▼

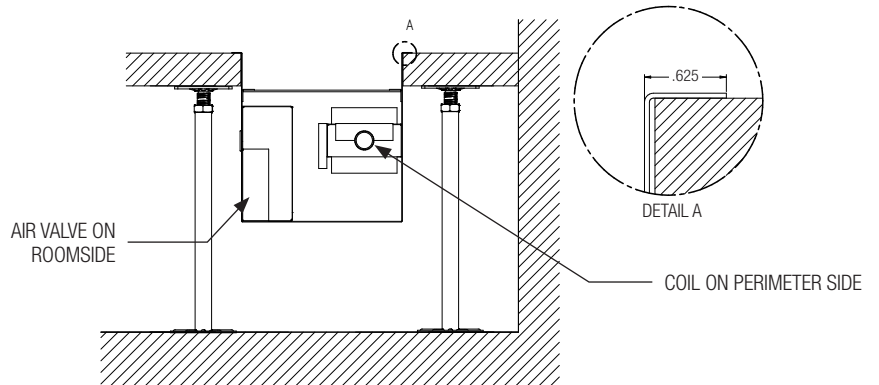
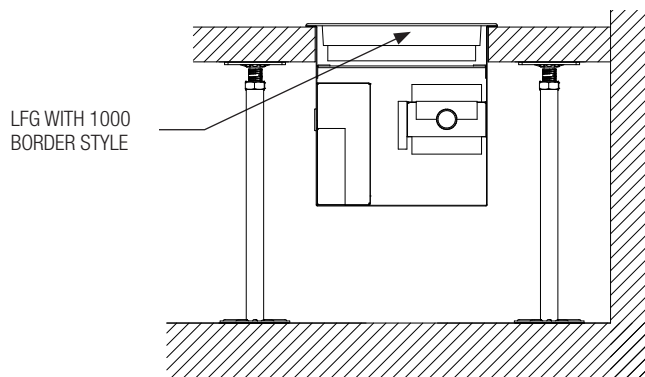


FIG 3. LNT FLOOR TILE SUPPORTED PLENUM WITH LFG GRILLE INSTALLED ▼



# LINEAR NATURAL CONVECTION TERMINAL

## INSTALLATION & MOUNTING INSTRUCTIONS

### Flangeless Plenum Installation

1. Install pedestal (supplied by others) by sliding the pedestal head through the slot in the pedestal brackets.
2. Install compression gasket (supplied by others) between LNT plenum and tile for proper sealing. See Detail C in Fig 4 for reference.
3. Install plenum with installed pedestals in floor opening. Secure pedestal to slab and adjust pedestal heights to level plenum.

**NOTE:** For units with a coil, ensure coil is located closest to perimeter. For units with air valve, direct air valve towards the room.

4. For heating units connect the Purple CFlex cable and for cooling units connect the Green CFlex cable. Remove necessary knockouts for piping. Piping knockout and CFlex connection locations shown in Fig 1.

5. Connect HW piping connections.

**NOTE:** No piping required for LNT for cooling only.

6. Install floor tiles, making sure plenum is level with finished floor see Detail C in Fig 4.

7. Install LFG floor grille into the plenum. See Fig 6 for full installation.

FIG 4. LNT FLANGELESS PLENUM SIZE VIEW

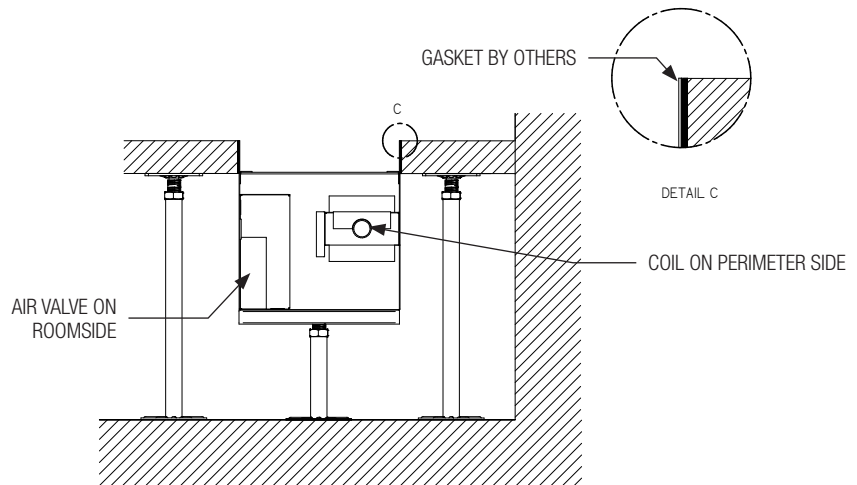


FIG 5. LNT FLANGELESS PLENUM FRONT VIEW

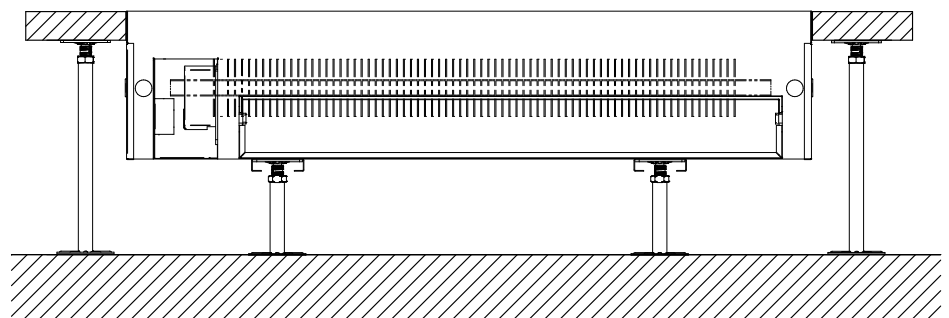
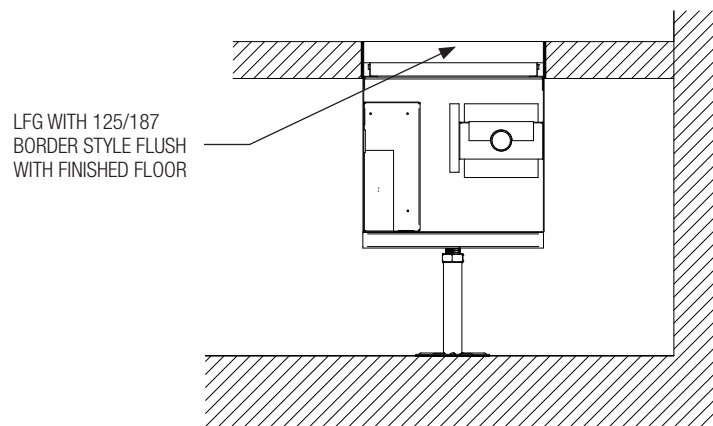


FIG 6. LNT FLANGELESS PLENUM WITH LFG GRILLE INSTALLED



# LINEAR NATURAL CONVECTION TERMINAL

## INSTALLATION & MOUNTING INSTRUCTIONS

### Continuous Grille Installation

1. Remove endcaps by removing screws securing the endcaps to the plenum. Screw locations shown in Fig 7.
2. Cut blank offs (UFB ordered separately) to required lengths and install with connector plates as shown in Fig 8 (see UFB installation manual for more detail).
3. Seal all joints to prevent underfloor plenum leakage into the space. Install LFG grille (ordered separately).
4. Install LFG grille (ordered separately). For continuous grille installation please see LFG install manual.

### Accessing Actuator from Roomside

5. Remove LFG grille.
6. Remove three screws holding actuator cover. See Fig 9.
7. Remove actuator cover by sliding upwards. Be cautious when removing actuator cover to ensure wiring to plug and play wiring is not disconnected.

FIG 7. END CAP SCREW LOCATIONS ▼

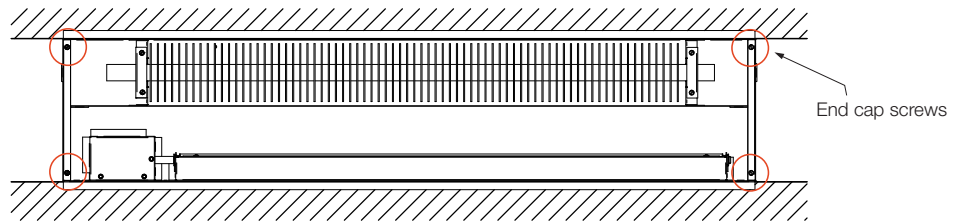


FIG 8. BLANK OF PLATE INSTALLATION ▼

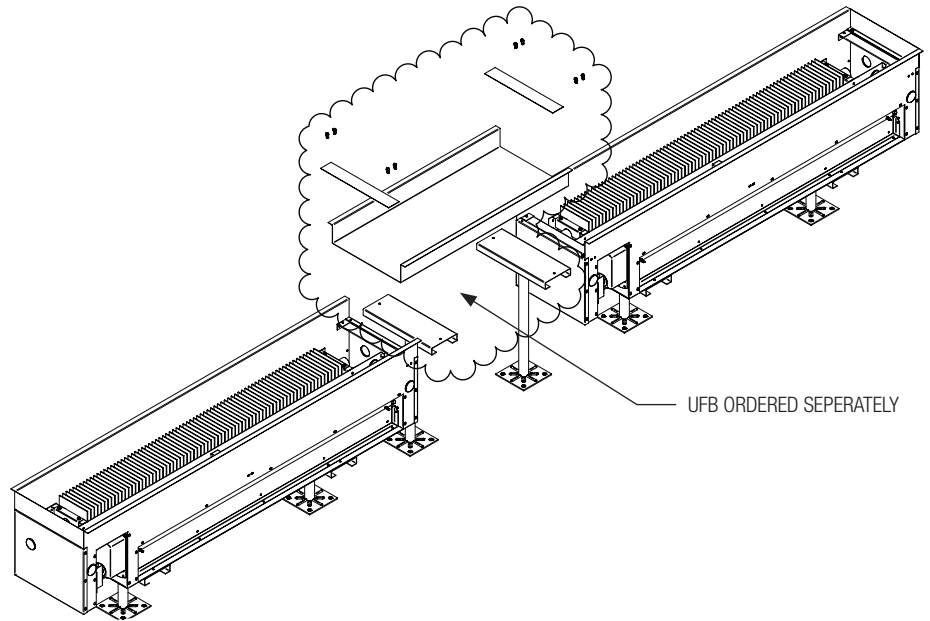
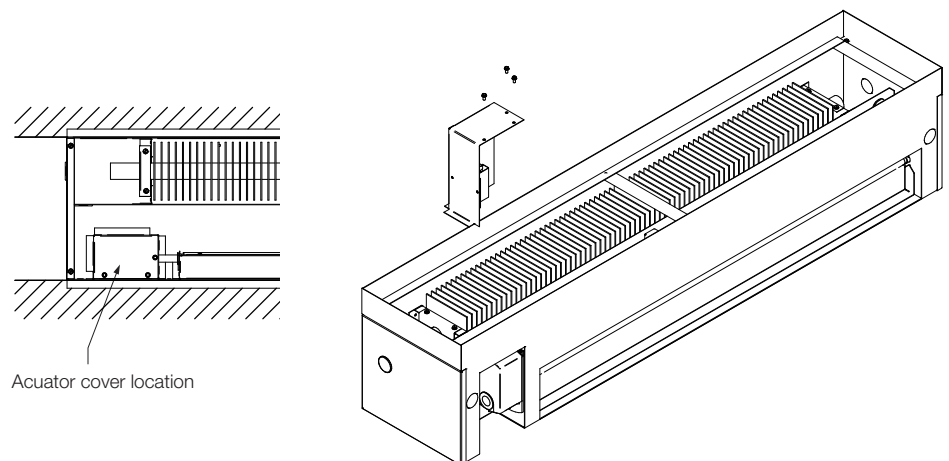


FIG 9. ACTUATOR COVER REMOVAL ▼





# LINEAR NATURAL CONVECTION TERMINAL

## INSTALLATION & MOUNTING INSTRUCTIONS

### Piping Multiple Units

Multiple LNT units can be connected to meet room design requirements. Only hot water versions of LNT may be connected in this fashion. The units may be piped in a series or parallel configuration as shown in Fig 10.

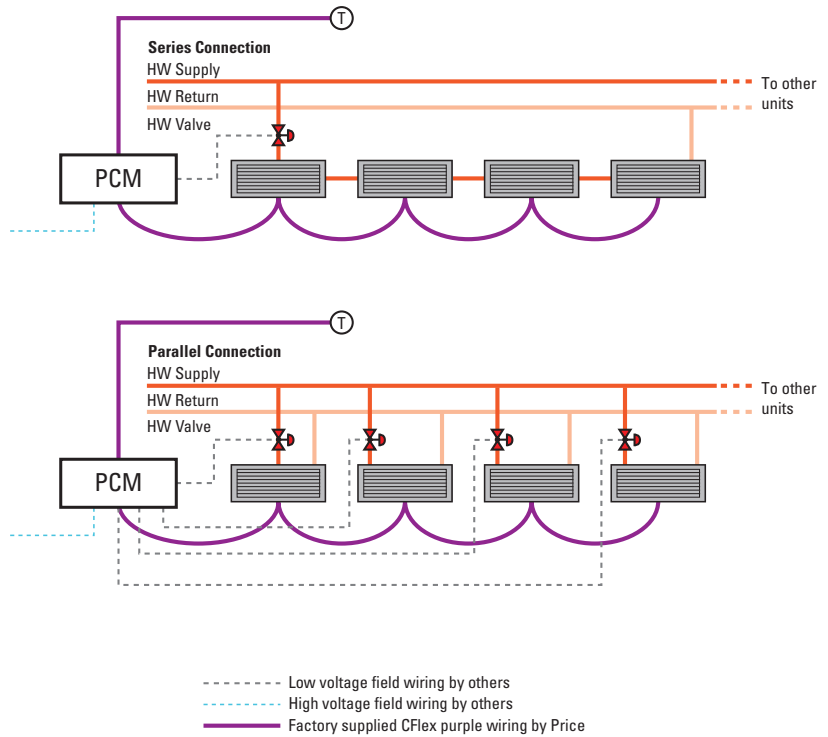
A PCM controller may be wired to the HW Valves (analog) to control the water delivered to the units to maintain the space design conditions.

### Control Wiring Units

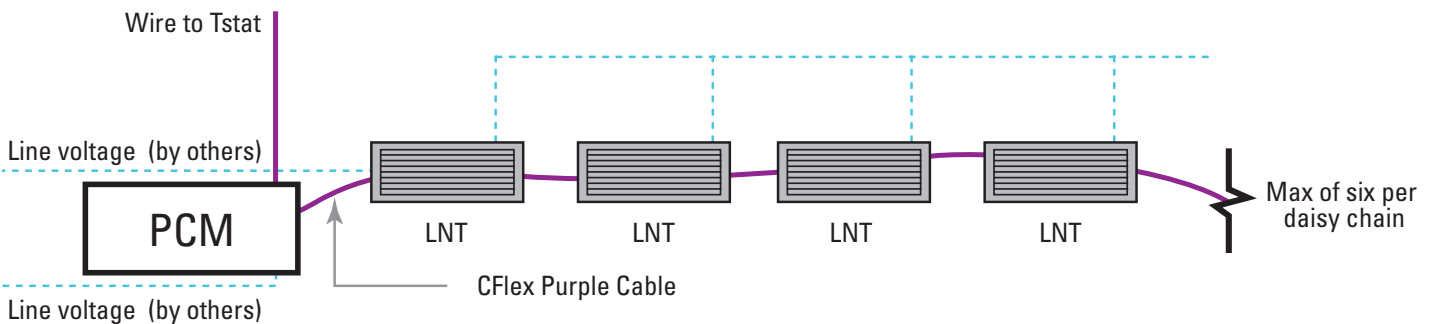
One PCM can control up to 12 LNT linear floor heaters. Each PCM controls a single zone in which all dampers and heaters will operate in synchronization. Each linear floor heater is supplied with a plenum rated and stranded quick-connect cable. See Fig 11 for daisy chain wiring example.

**NOTE:** A maximum of 6 units are recommended per daisy chain.

FIG 10. PIPING STRATEGIES FOR MULTIPLE LNT



### CONTROL WIRING STRATEGY FOR ELECTRICAL UNITS



# LINEAR NATURAL CONVECTION TERMINAL

## INSTALLATION & MOUNTING INSTRUCTIONS

### Electric Heater

The integral electric heater may be selected for staged heat or SCR operation. With the staged heat option the heater will operate in an on / off (binary) mode. When the incoming signal threshold is reached, the relay will fire and the electric coil will be turned fully on.

When selected with SCR, the default SCR operation will provide modulation of the heater through its full operating range proportionally to the input signal from the PCM through the CFlex cable, ensuring reliable and silent operation. A discharge air temperature (DAT) probe can also be selected to be included with the SCR option. With the DAT probe, the SCR will cycle on and continue increasing heat output every few seconds until the temperature reaches the design set point. The set point can be set via the on-board dial on the SCR between 65F and 130F. For information regarding the SCR, refer to the SCR installation manual.

### Electric Heater Wiring

The power for the electric heater on the standard LNT with electric heat is provided via terminal block as shown in Fig 12. Detail A of Fig 12 highlights the wiring required for the terminal block.

### High Voltage Plug and Play Wiring (Optional)

When selected with the High voltage plug and play option, the LNT with electric heater will be equipped with one high voltage output plug and one input receptacle. See LNT submittal for high voltage options.

To wire, connect the male end of the starter cable or extender cable wired to a previous unit to the input receptacle on the unit (See Fig 13). Continue the daisy chain by connecting the female end of the extender high voltage cable to the open output plug and repeating the process with the next unit in the chain.

**WARNING:** Do not allow any furniture or obstruction to be placed over the grille. Units operate on natural convection in heating and need sufficient clearance for the room air to travel into the floor terminal otherwise the heater can trip frequently and lower the life of the heater or cause warm temperatures at the grille.

FIG 12. STANDARD HIGH VOLTAGE WIRING FOR LNT WITH ELECTRIC HEAT ▼

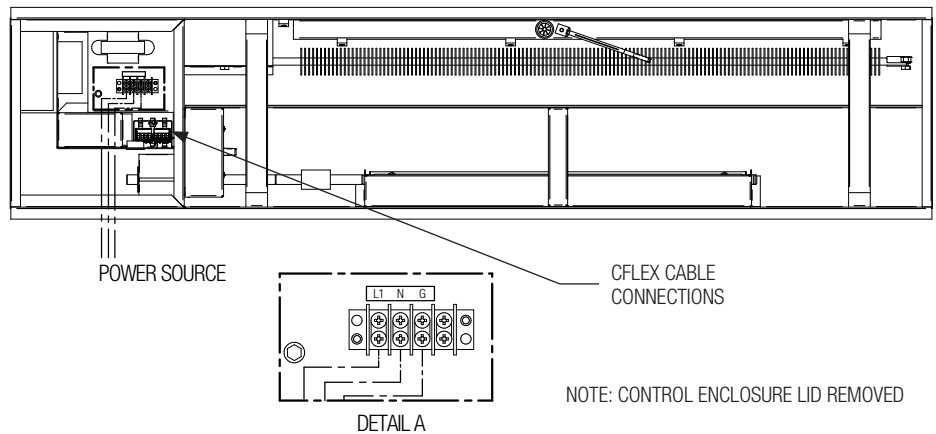
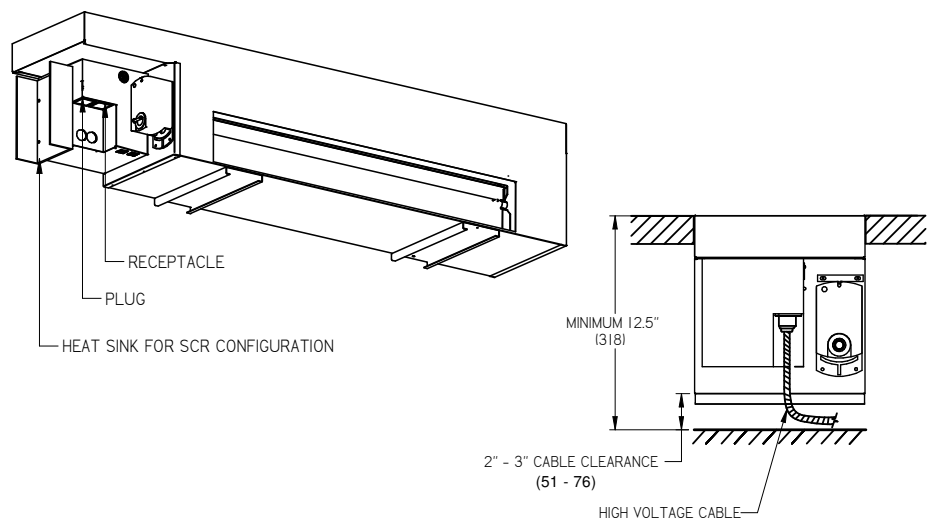


FIG 13. OPTIONAL HIGH VOLTAGE PLUG AND PLAY WIRING FOR LNT WITH ELECTRIC HEAT ▼





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