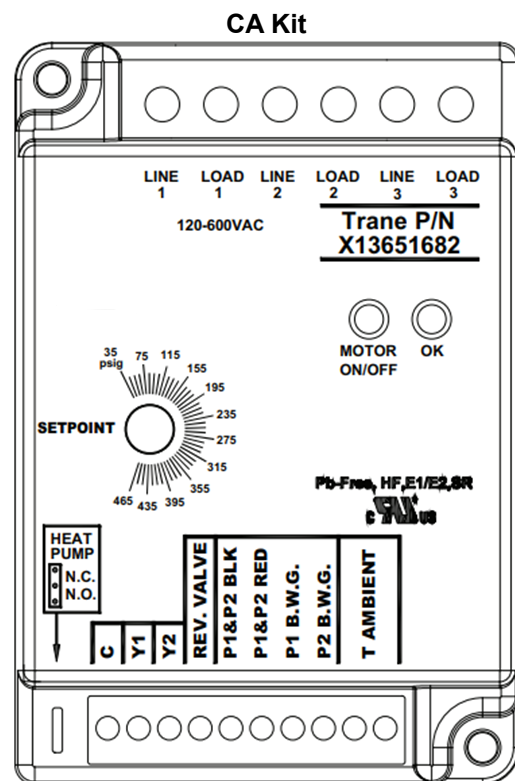
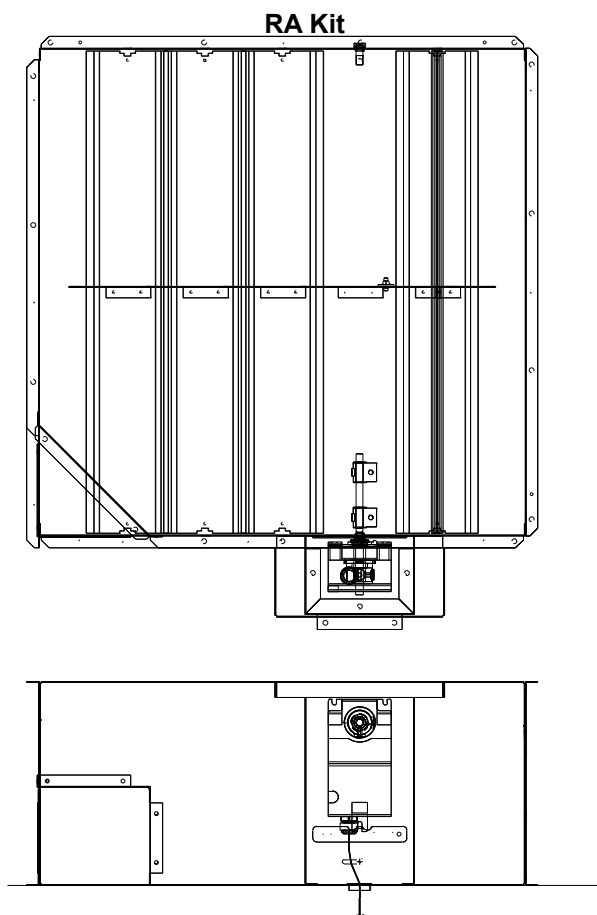




# Installation Guide

## Low Ambient Kit Commercial Air Conditioners



### ⚠ SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.



# Introduction

Read this manual thoroughly before operating or servicing this unit.

## Warnings, Cautions, and Notices

Safety advisories appear throughout this manual as required. Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

The three types of advisories are defined as follows:



Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.



Indicates a situation that could result in equipment or property-damage only accidents.

## Important Environmental Concerns

Scientific research has shown that certain man-made chemicals can affect the earth's naturally occurring stratospheric ozone layer when released to the atmosphere. In particular, several of the identified chemicals that may affect the ozone layer are refrigerants that contain Chlorine, Fluorine and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFCs). Not all refrigerants containing these compounds have the same potential impact to the environment. Trane advocates the responsible handling of all refrigerants.

## Important Responsible Refrigerant Practices

Trane believes that responsible refrigerant practices are important to the environment, our customers, and the air conditioning industry. All technicians who handle refrigerants must be certified according to local rules. For the USA, the Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering and recycling of certain refrigerants and the equipment that is used in these service procedures. In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. Know the applicable laws and follow them.

### ⚠ WARNING

#### Proper Field Wiring and Grounding Required!

Failure to follow code could result in death or serious injury.

All field wiring **MUST** be performed by qualified personnel. Improperly installed and grounded field wiring poses **FIRE** and **ELECTROCUTION** hazards. To avoid these hazards, you **MUST** follow requirements for field wiring installation and grounding as described in **NEC** and your local/state/national electrical codes.

### ⚠ WARNING

#### Personal Protective Equipment (PPE) Required!

Failure to wear proper PPE for the job being undertaken could result in death or serious injury.

Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, **MUST** follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- **Before installing/servicing this unit, technicians MUST put on all PPE required for the work being undertaken (Examples; cut resistant gloves/sleeves, butyl gloves, safety glasses, hard hat/bump cap, fall protection, electrical PPE and arc flash clothing). ALWAYS refer to appropriate Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.**
- **When working with or around hazardous chemicals, ALWAYS refer to the appropriate SDS and OSHA/GHS (Global Harmonized System of Classification and Labelling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection and handling instructions.**
- **If there is a risk of energized electrical contact, arc, or flash, technicians MUST put on all PPE in accordance with OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, PRIOR to servicing the unit. NEVER PERFORM ANY SWITCHING, DISCONNECTING, OR VOLTAGE TESTING WITHOUT PROPER ELECTRICAL PPE AND ARC FLASH CLOTHING. ENSURE ELECTRICAL METERS AND EQUIPMENT ARE PROPERLY RATED FOR INTENDED VOLTAGE.**

**⚠ WARNING****Follow EHS Policies!**

Failure to follow instructions below could result in death or serious injury.

- All Trane personnel must follow the company's Environmental, Health and Safety (EHS) policies when performing work such as hot work, electrical, fall protection, lockout/tagout, refrigerant handling, etc. Where local regulations are more stringent than these policies, those regulations supersede these policies.
- Non-Trane personnel should always follow local regulations.

**⚠ WARNING****R-454B Flammable A2L Refrigerant!**

Failure to use proper equipment or components as described below could result in equipment failure, and possibly fire, which could result in death, serious injury, or equipment damage.

The equipment described in this manual uses R-454B refrigerant which is flammable (A2L). Use **ONLY R-454B** rated service equipment and components. For specific handling concerns with R-454B, contact your local representative.

**⚠ WARNING****Refrigerant under High Pressure!**

Failure to follow instructions below could result in an explosion which could result in death or serious injury or equipment damage.

System contains refrigerant under high pressure. Recover refrigerant to relieve pressure before opening the system. See unit nameplate for refrigerant type. Do not use non-approved refrigerants, refrigerant substitutes, or refrigerant additives.

**⚠ WARNING****Explosion Hazard!**

Failure to follow instructions below could result in an explosion which could result in death or serious injury, and equipment damage.

**NEVER** bypass system safeties in order to pump down the unit component's refrigerant into the microchannel heat exchanger (MCHE) coil. Do **NOT** depress the compressor contactor since it effectively bypasses the high-pressure control.

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# Overview of RA Low Ambient Kit

**Note:** One copy of this document ships inside each kit and is customer property. It must be retained by the unit's maintenance personnel.

The RA portion of this manual provides installation, setup, and checkout procedures for the low ambient damper(s), actuators, and controls. The kit is equipped with a damper assembly, 24V transformer, dual analog LLID, actuator, associated harnesses, and hardware.

Before attempting to operate or service this equipment, refer to the instructions below, the unit wiring diagrams, and procedures in this manual and the applicable Installation, Operation and Maintenance manual, listed on the unit nameplate.

**Important:** The procedures discussed in this manual should only be performed by qualified, experienced HVAC technicians. Do not release refrigerant to the atmosphere! If adding or removing refrigerant is required, the service technician must comply with all federal, state, and local laws.

## Kit Inspection

1. Refer to [Table 1, p. 5](#) to verify the appropriate kit was ordered for the unit being converted.
2. Use the parts list on the installation drawing (17540302) to confirm all components are present in the kit.
3. Verify there is no damage prior to starting the installation.
4. Contact the Trane Parts Center if there is damage or missing components.

## Actuator Specifications

The damper actuator is a direct coupled, non-spring return device. It is designed to drive the damper shaft either clockwise (closed damper position) or counterclockwise (opened damper position) depending on the Input signal. The actuator is shipped from the factory in the full counterclockwise (opened) position.

## Electrical Ratings

- Power Input: 24 VAC, 50/60 Hz
- Torque Ratings at Rated Voltage:
  - Lift and Hold Minimum: 44lb-in. (5 N-m)
  - Breakaway Minimum: 44lb-in. (5 N-m)
  - Stall Minimum: 44lb-in. (5 N-m)
  - Stall Maximum: 58lb-in. (6.5 N-m)
- Actuator Stroke: 95 degrees nominal +/- 3 degrees, mechanically limited.
- Actuator Timing at 90 degree Stroke: 90 seconds.
- Ambient Temperature Rating: -22°F to +122°F (-30°C to +50°C).

**Table 1. RA Low Ambient field installed kits**

Kit Number	Unit Tonnage
175403000001	20-30T
175403000002	40-120T

# Installation

## ⚠ WARNING

### Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury.

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Verify that no power is present with a voltmeter.

## Component Installation

Follow the instructions on the installation drawing (17540302) to install these components:

1. Mount actuator to damper assembly (see drawing 43567151 included in kit).
2. Mount damper assembly with actuator to roof.

**Notes:** Before installing the damper assembly with the actuator, confirm the location is

- Not subject to escaping gas or other explosive vapors that could accidentally be ignited by a spark from the actuator or the attached parts.
- Free from acid fumes or other deteriorating vapors that could attack the metal parts.

3. 24V transformer
4. Dual analog LLID
5. Communication cable to the LLID

## Wiring

Follow the instructions on the installation drawing (17540302) to install these harnesses:

- Controls power distribution harness
- Control box harness
- Raceway harness(es)

**Note:** Refer to unit wiring diagrams that shipped with the unit, if necessary.

## Actuator Setup

### NOTICE

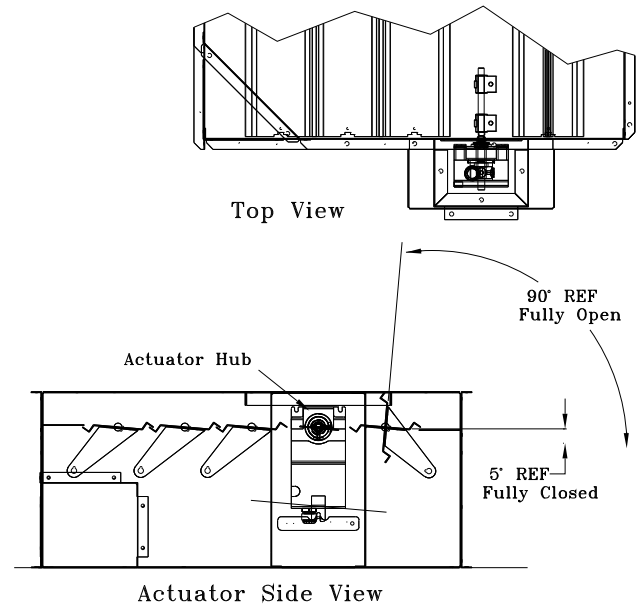
#### Actuator Damage!

Do not depress actuator clutch while actuator is energized as it could result in actuator damage.

The actuator should be in the full clockwise (closed) position. To align the actuator hub in the correct fully closed position, refer to [Figure 1, p. 6](#) and follow the steps below.

1. With the actuator clamp loose, depress the actuator clutch button on the lower left side of the actuator and rotate the hub clockwise to the fully closed position.
2. Holding the low ambient dampers in the fully closed position, tighten the actuator clamp.
3. Set the direction switch on the actuator to 1 for the Belimo actuator, or 10...2V for the Honeywell (switch rotated to the fully clockwise position).
4. Install the actuator cover (assembled earlier) on the damper assembly by removing the center damper guard screw and sliding the top of the cover between the grill and sheetmetal flange. Reinstall the grill screw and use 1/4-20 x 1/2-inch screws for the remaining three holes. .
5. Inspect the damper blades for proper alignment and operation. Dampers should be in the closed position during the Off cycle. If adjustment is required, repeat steps 1-4.

**Figure 1. Damper actuator and blade alignment**





# Unit Configuration

For field installed Low Ambient kits, the unit needs to be re-configured as low ambient:

1. Contact your local Trane office for a Trane technician to perform configuration changes.
2. Using Tracer™ TU Service Tool, navigate to Equipment Utility > **Configuration** tab.
3. Select **Options**.
4. Under the Low Ambient drop-down menu, select **Installed**.
5. Click **Save**.

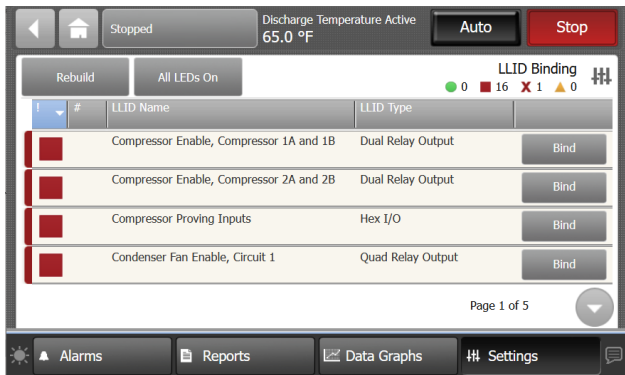
## LLID Binding

**Important:** . This feature should only be used by experienced service technicians.

1. On the user interface home screen, tap **Settings**.
2. Tap the **LLID Binding** button.

This provides access to the machine bus network to bind and unbind devices as needed based on configuration.

**Figure 2. LLID Binding**

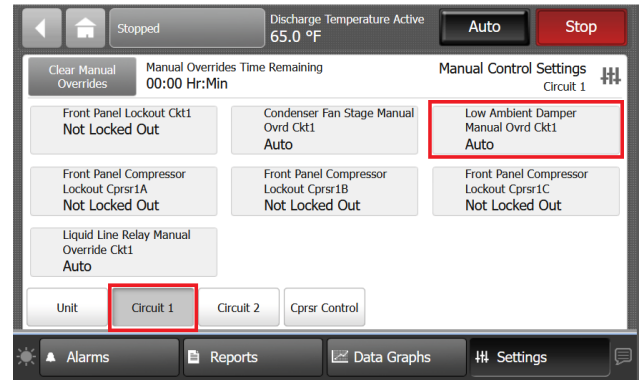


**To check damper operation:**

1. On the home screen, tap **Settings**.
2. Tap the **Manual Control Settings** button.
3. Tap **Circuit 1** or **Circuit 2**.
4. Tap **Low Ambient Damper Manual Ovr CktX**.

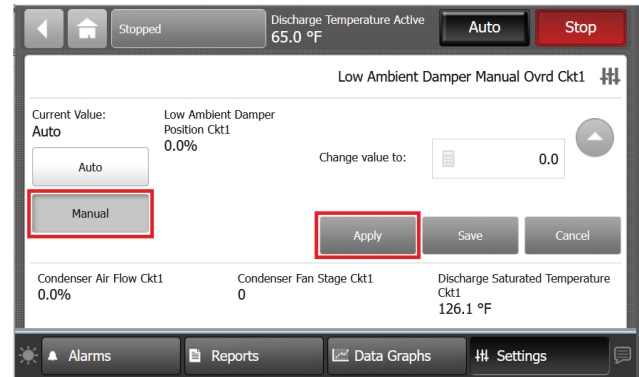
**Note:** The unit must be in Stop mode. Tapping the Auto button will terminate low ambient manual override.

**Figure 3. Low Ambient Damper Manual Override**



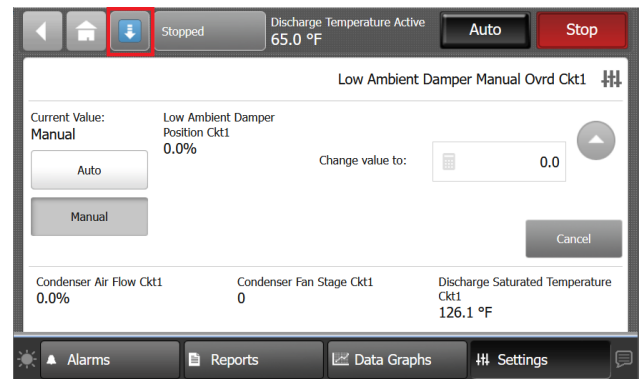
5. On the Low Ambient Damper Manual Ovr CktX screen, tap **Manual**.
6. Tap **Apply**.

**Figure 4. Low Ambient Damper Manual Ovr CktX**



7. The Manual Override indicator displays at the top of the user interface home screen.

**Figure 5. Low Ambient Damper Manual Override Indicator**

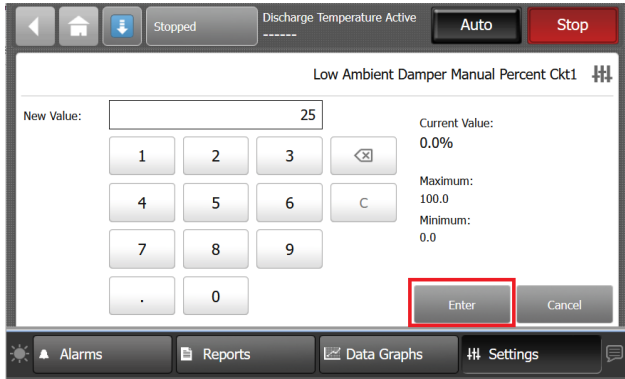


8. For example, to change the damper position from 0% to 25%:

## Unit Configuration

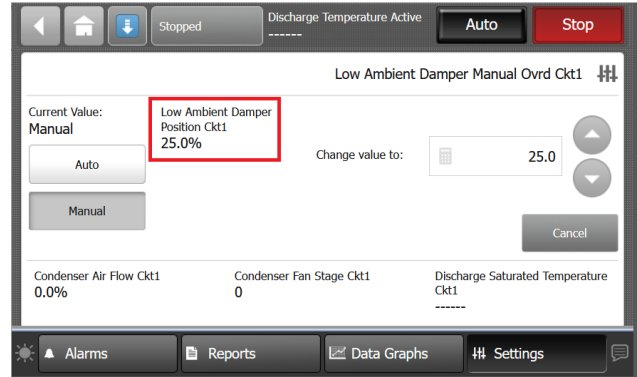
- Tap the cursor in the **Change Value To:** box.
- Using the number pad, type in 25.
- Tap **Enter**.

**Figure 6. Low Ambient Damper Manual Override Position**



- The screen will revert to [Figure 4, p. 7](#). Tap **Apply**. The Low Ambient Damper Position will drive to the design % open.

**Figure 7. Low Ambient Damper Position CktX**







## Overview of CA Low Ambient Kit

**Note:** One copy of this document ships inside each kit and is customer property. It must be retained by the unit's maintenance personnel.

The CA portion of this manual provides installation, setup, and checkout procedures for the low ambient controls. The kit is equipped with head pressure controllers, thermistors, pressure transducers, temperature switches, a 24V transformer, associated harnesses, and hardware.

Before attempting to operate or service this equipment, refer to the instructions below, unit wiring diagrams, and applicable Installation, Operation, and Maintenance manual listed on the unit nameplate.

**Important:** The procedures discussed in this manual should only be performed by qualified, experienced HVAC technicians. Do not release refrigerant to the atmosphere! If adding or removing refrigerant is required, the service technician must comply with all federal, state, and local laws.

## Kit Inspection

1. Verify the appropriate kit (175403080001) was ordered for the unit being converted.
2. Use the parts list on the installation drawing (17540309) to confirm all components are present in the kit. Note that some parts in the kit may not be required, depending on the unit configuration. These details are outlined on the installation drawing.
3. Verify there is no damage prior to starting the installation.
4. Contact the Trane Parts Center if there is damage or missing components.

# Installation

## ⚠ WARNING

### Hazardous Voltage!

Failure to disconnect power before servicing could result in death or serious injury.

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Verify that no power is present with a voltmeter.

## Component Installation

Follow the instructions on the installation drawing (17540309) to install these components:

- Head pressure controller(s)
- 24V Transformer
- Temperature switch(es) and cover(s)
- Thermistor(s)
- Pressure transducer(s)

**Note:** Pressure transducers are to be installed on the refrigerant discharge line(s). The harness provided will reach up to 20 feet from the CA unit control box.

## Wiring

Follow the instructions on the installation drawing (17540309) to install these harnesses:

- Controls power distribution harness
- Power harness(es)
- Controls harness(es)
- Temperature switch harness(es)
- Pressure transducer harness(es)

**Note:** Refer to unit wiring diagrams that shipped with the unit and low ambient field installation kit, if necessary.

## Temperature Switch Setpoint

On units that include the temperature switches (1S30 and 1S31), these should be adjusted to 65°F after installation.

## Head Pressure Controller Setpoint

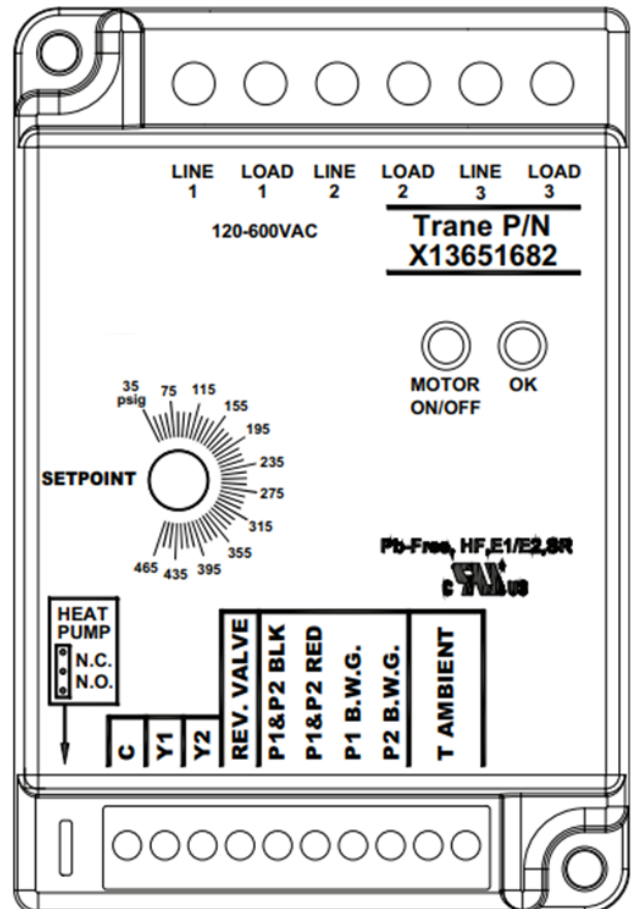
The pressure setpoint should be adjusted to 230 psig initially.

- When the ambient temperature is above 50°F, the condenser fan motor will be energized continuously.
- When the ambient temperature is below 50°F, the pressure sensor measurement is used to switch the condenser fan motor on or off.
- When the measured pressure is 15 psi below the set pressure the condenser fan motor will be turned off.
- When the measured pressure is 15 psi above the set pressure, the condenser fan motor will be turned on.

### Notes:

- The pressure setting is adjustable from 35-465 psig
- The "Heat Pump" jumper should be placed in the N.O. position

**Figure 8. CA Low Ambient head pressure controller**





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