

## Installation Instructions

# Low Ambient Control

## Foundation™ Packaged Rooftop Units

### 3-Phase, 15 to 25 Tons

Model Numbers:	Used With:
BAYLOAM301*	E/GCC180-300 (except E/GCC300 - 240V)
BAYLOAM302*	E/GCC300 (240V)

### 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.

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## Warnings, Cautions, and Notices

Read this manual thoroughly before operating or servicing this unit. 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:

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

**CAUTION** 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.

**NOTICE** 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 Labeling 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.

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### Inspection

Remove the contents of the kit from the shipping package. Check carefully for shipping damage. If any damage is found, report it immediately, and file a claim against the transportation company. Any missing parts should be immediately reported to your supplier and replaced with authorized parts only.

## Parts List

Table 1. Parts list

Qty	Description
1	Speed Controller
1	Temperature Sensor
1	Pressure Tap
2	Screws
5	Wire Harnesses
1	Pressure Transducer
13	Wire Ties
1	Grommet
1	Gasket
1	Airflow Sleeve
1	Installers Guide
1	Installed Accessory Label
2	Motors (only in Kit BAYLOAM302**)
2	Fans (only in Kit BAYLOAM302**)

## Installation

Table 2. Electrical, temperature, and pressure ratings

Volts, AC	208, 240, 380, 415, 480, 600
Control Voltage	18 to 30 VAC
Frequency	50 to 60 Hz
Operating Temperature	-40°F + 140°F (-40°C to 60°C)
Full Load Amps	10 Amps
Transducer Pressure Control Range	0 to 500 psi

## Controller

### 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.

1. Prepare the unit for installation.
  - a. Disconnect all power from the unit.
  - b. Remove the compressor and control box access panel(s).
2. Refer to Figure 1 and Figure 2 to determine the mounting location and position of the controller inside the control box.
3. Mount the controller in the appropriate position using two screws. If airflow sleeve is not installed, install it with the gasket using two screws as shown in Figure 3. If airflow sleeve is installed then proceed to next step.
4. Install temperature sensor in airflow sleeve with grommet provided, as shown in Figure 3.

Figure 1. Low ambient controller location in control box - CV units

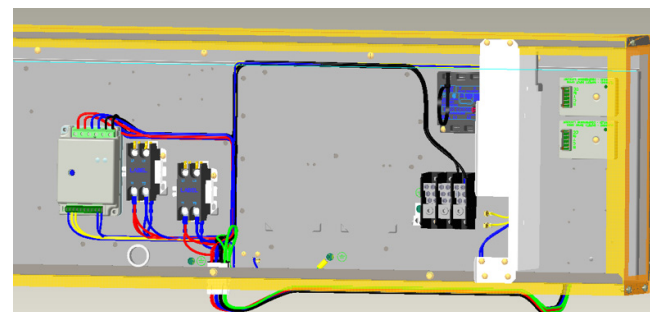


Figure 2. Low ambient controller location in control box - VFD units

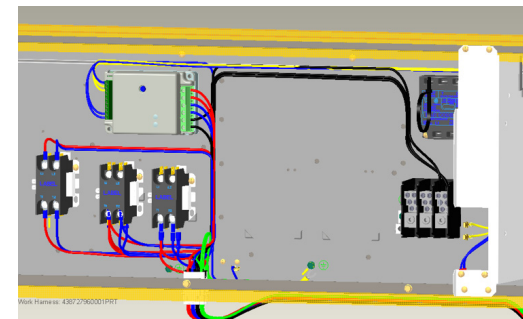
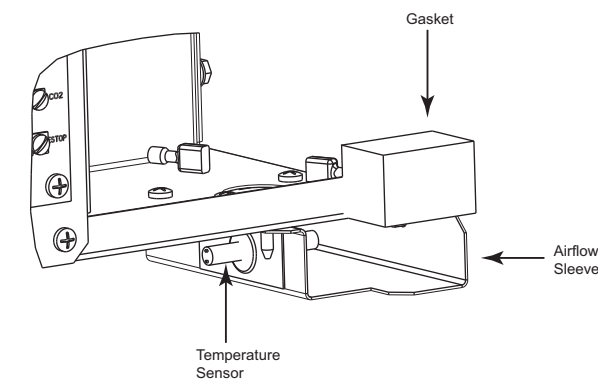


Figure 3. Airflow sleeve and sensor location



## Transducer and Tee

1. Remove cap nut from the unit high pressure service port on the discharge lines that run from each compressor. See Figure 4.
2. Install the transducer onto the tee port. See Figure 5.
3. Place the tee flare nut with valve core depressor on the unit high pressure tap, where the cap nut was located.
4. Tighten flare nut securely to the high pressure service port and check for leaks.
5. Ensure that the transducer and tee do not come into contact with the access panel.

Figure 4. High pressure service port

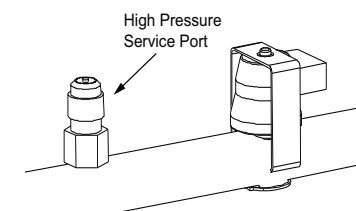


Figure 5. Transducer to tee

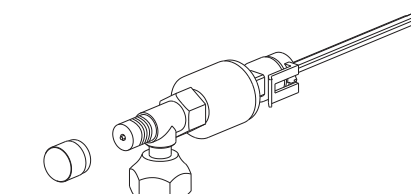
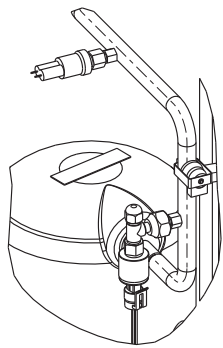


Figure 6. Tee and transducer installed on high pressure service port

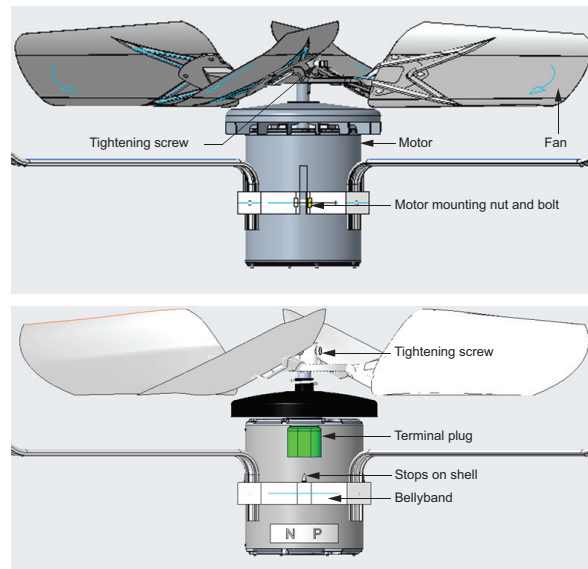


## Outdoor Motor change (only for BAYLOAM302\*)

**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.

Figure 7. Tee and transducer installed on high pressure service port



1. Confirm all power to the unit has been disconnected and locked out.
2. The power harness connector must be disconnected from the terminal plug on the motor, prior to removing motor.
3. Remove the fan tightening screw and slide the fan out.

**WARNING**

**Risk of Motor Falling!**  
Motor is mounted in such a position that it could fall when bolts are removed. To avoid possible injury, the motor should be supported prior to removing the bolts.

4. Loosen the motor securing nut and bolt from bellyband and slide the motor out.
5. Replace the motor with the one from kit.
6. While tightening the bolt, confirm the stops on the motor shell are resting on the top edge of bellyband (in all four positions – 90 degree from center of terminal plug), and the terminal plug is opposite to the mounting bolt.
7. The bolt and nut assembly, (holding the bands around motor) shall be torqued to 100 to 120 in-lb.

**NOTICE**

**Equipment Damage!**  
Failure to follow instructions below could result in equipment damage. Proper alignment of the motor is important to ensure optimal unit operation. Improper alignment, over tightening or under tightening the can result in motor slippage, fan misalignment, bearing damage and possible failure of fan motor mounts.

8. Assemble the fan on the motor shaft with a fan tightening screw while maintaining a 3-inch distance from top cover to top of fan hub.

**Note:** Fan hub to shaft set screw to be torqued to 130 to 150 in-lb.

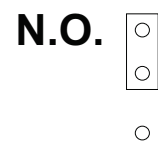
**WARNING**

**Rotating Components!**  
Failure to disconnect power before servicing could result in rotating components cutting and slashing technician which could result in death or serious injury. During installation, testing, servicing and troubleshooting of this product it may be necessary to work with live and exposed rotating components. Have a qualified or licensed service individual who has been properly trained in handling exposed rotating components, perform these tasks.

**Important:** Dimension from bottom of grille to the highest point of fan blade shall not be less than one inch.

9. Use a tool to rotate fan manually to check for minimum clearance of 0.12 inches between fan and orifice.
10. Connect the power harness female connector to the terminal plug on the motor.
11. Repeat the process for the second condenser motor and fan in the unit.

Figure 8. Jumper position



## Controller Operation

This electronic control will be used on an air conditioner system to reach and maintain head pressure within an acceptable range when ambient temperature falls below 50°F. It reads discharge pressure from a pressure transducer and accordingly turns on and off the outdoor fan motor to maintain discharge pressure at the selected set point.

## For Constant Volume Units

Outdoor fan cycling will occur when the ambient temperature is below 50°F. Both outdoor fans will energize and cycle at the same time. Above 50°F, the outdoor fans will energize at the same time without cycling.

## For Units Equipped with an Optional VFD

The outdoor fans are staged based on outdoor ambient temperature. In ambient temperatures below 50°F, only 1 fan will energize and cycle. When the ambient temperature reaches above 50°F, the controller will no longer cycle outdoor fans. The unit will stage the outdoor fans based on the unit temperature sensor. For ambients above 60°F +/-5°F, both outdoor fans should be energized. Below 60°F +/-5°F, single fan operation is normal.

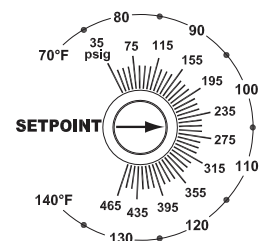
## Setting the Pressure Setpoint

When using a pressure transducer, the control will maintain condenser pressure between 15 psig above and 15 psig below dialed pressure setpoint. The dial pressure setpoint range is 35 psig to 465 psig. The pressure setpoint should be adjusted to 250 psig initially. Monitor the condenser discharge pressure and

adjust the pressure setpoint so the condenser fan operates at full speed when the ambient temperature is greater than 50°F and modulates speed when the ambient temperature is below 50°F.

**Note:** There is no exact correlation between dial temperature and pressure scales on the control.

Figure 9. Pressure setpoints



## Troubleshooting

Before leaving the installation, observe for correct operation through the desired pressure range. See Table 3.

Table 3. Troubleshooting guide

Problem	Possible cause	Possible solution
No fan operation	No 24 volt control voltage	Check for 24 VAC at control and verify correct wiring. If wired correctly, check voltage across the transformer.
	No line voltage	Check voltage across the black, red, and blue OD motor leads. If no line voltage is present, verify all wiring is correct.
Improper fan operation	Heat pump jumper not configured correctly	Refer to the IOM or correct hook-up diagram and verify the heat pump jumper is configured correctly.
	Control is not wired correctly	See wiring diagrams. Ensure that the 24 VAC power supply is connected in-phase with the motor power supply.

Table 3. Troubleshooting guide (continued)

Problem	Possible cause	Possible solution
No fan modulation	No need to modulate the fan	If pressure is equal to or greater than the head pressure control setpoint, the fan will be operating at full speed.
	No input pressure to control	Check for proper transducer and Tee installation. Schrader valve depressor must depress Schrader valve enough to allow refrigerant into pressure transducer.
	Miswired	Check that the 24 VAC signal and the transducer are wired up correctly into the controller.
Erratic fan operation	Control is not wired correctly	See wiring diagrams.
	Pressure transducer problem	Check for proper transducer and Tee installation. Schrader valve depressor must depress Schrader valve enough to allow refrigerant into pressure transducer.
Fan motor is cycling on thermal overload	Dirty or blocked condenser coil	Clean condenser coil.
	Wrong motor for fan speed control application. Verify new motor was installed. Replace with motor	Verify new motor was installed. Replace with motor approved for fan speed control application.
	Incorrect/No voltage present	Using an AC voltmeter, measure the voltage between the 24VAC terminals. It should read approximately 24 volts. Measure line voltage between LINE1, LINE2, and LINE3 to confirm that line voltage is present.
Unit fails to start	Transducer malfunction or not installed	If lights are flashing alternatively, then no probe is connected or the probe is malfunctioning. When using a pressure transducer, with power applied to the control, use a voltmeter to measure volts DC between COMM and P1 or P2, where the wire is connected. The reading should be according to Table 3 below.

## Control Box Wiring

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1. Following the unit schematic, make all indicated connections in unit control box. See unit schematic located on compressor access panel.
  - a. Remove the existing harness connected from the ODM contactors to the PPM30 connector in the control panel.
  - b. Install harness parts 438726240001, 438727960001, and 438729830001 for non-VFD units. Install harness parts 438726240001, 438727960002, and 438729830002 for VFD units. Refer to Figure 1 and Figure 2 to route the harnesses inside the control box.
  - c. Connect the leads from the temperature sensor to the harness part 438726240001 and the leads from the pressure transducer to the controller. Cut wire ties, if necessary, to properly route wires.
2. Finish wiring installation:
  - a. Using wire ties, bundle and dress any excess wires.
  - b. After the settings have been properly adjusted (see "Controller Operation"), reinstall the compressor and control box access panels and secure with screws that were removed.
  - c. Re-connect all power to the unit. Refer to "Troubleshooting" section, Table 3, if needed.

## Controller Settings

For non-heat pump applications, the heat pump select jumper must be in the Default (N.O.) position, and the HP terminals must be left unconnected.

Table 4. Pressure vs. voltage

Pressure (psig)	Voltage (Vdc)
0	0.5
50	0.9
100	1.3
150	1.7
200	2.1
250	2.5
300	2.9
350	3.3
400	3.7
450	4.1
500	4.5

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