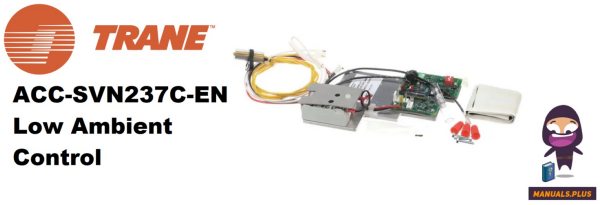


TRANE ACC-SVN237C-EN Low Ambient Control Instruction Manual

Contents

TRANE ACC-SVN237C-EN Low Ambient Control

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 require 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 safety and the proper operation of this machine depend upon the strict observance of these precautions.

Important Environmental Concerns
Scientific research has shown that certain man-made chemicals can affect the earth's naturally occurring stratospheric ozone layer when released into 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 on the environment. Trane advocates the responsible handling of all refrigerants.

Important Responsible Refrigerant
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 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.

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.

WARNING
Proper Field Wiring and Grounding

Required!
Failure to follow the 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 the 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,before 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 THE INTENDED VOLTAGE.

WARNING
Follow EHS Policies!
Failure to follow the 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.

Revision History

- Used with model number information updated.
- Updated General Information chapter.
- Updated Temperature Sensor Installation and Control Box
- Wiring topics in the Installation chapter.

General Information

- Carefully review installation instructions.
- This instruction covers the installation of the low ambient kit on
- Precedent units with 3 phase fixed speed condenser fan motor(s).

NOTICE
Motor Damage
Use of this kit on units with variable speed condenser fan motors could cause motor damage. Do NOT use on units with variable speed condenser fan motors.

Inspection

1. Unpack all components of the kit.
2. Check carefully for shipping damage. If any damage is found, report it immediately, and file a claim against the transportation company

Parts List

Table 1. Parts list

Qty	Description
1	Low ambient control module
1	Control mounting bracket
2	8-32 x 1 in. screws
2	10-16 x 0.5 in. screws
1	Temperature sensor
1	Pressure transducer
1	Pressure tap tee
1	Rubber grommet
1	Outdoor motor power harness
1	Control power harness
1	Temperature sensor harness
1	Temperature sensor extension harness
1	Schematic
1	Installation instructions
1	Installed accessory label
1	Valve control harness (FIALOAM002* only)

Installation

Table 2. Low ambient controller ratings

Volts, AC	208, 240, 380, 415, 480, 600
Control voltage	18-30 Vac
Frequency	50-60 Hz
Operating temperature	-40ºF + 140ºF (-40ºC to 60ºC)
Full load Amps	10 Amps
Transducer pressure control range	0-500 psi

Controller

Hazardous Voltage w/Capacitors!
Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/ tagout procedures to ensure the power cannot be inadvertently energized. Verify with a CAT III or IV voltmeter rated per NFPA 70E that all capacitors have discharged.

1. Disconnect all power from the unit.

2. Remove the compressor and control box access panel(s).
3. Use 8-32 × 1-inch screws to mount the controller bracket. See Figure 1 for orientation.
4. Open the left-side, low-voltage door to access the high-voltage section This is where the controller/bracket will be mounted. See Figure 1 for the mounting location.

Figure 1. Mounting location

5. Use 10-16 × 0.5-inch screws to mount the assembly to the control box back panel.
   Note: The right side of the assembly will slide into the slot in the back panel. Secure the left side with screws (supplied in the kit).

Pressure Transducer

1. Install the supplied tee on the high-pressure service port.
   See Figure 2
   - Remove cap nut from high-pressure service port.
   - Install the pressure sensor on one of the Tee ports. See Figure 3.

Figure 2. High pressure service port

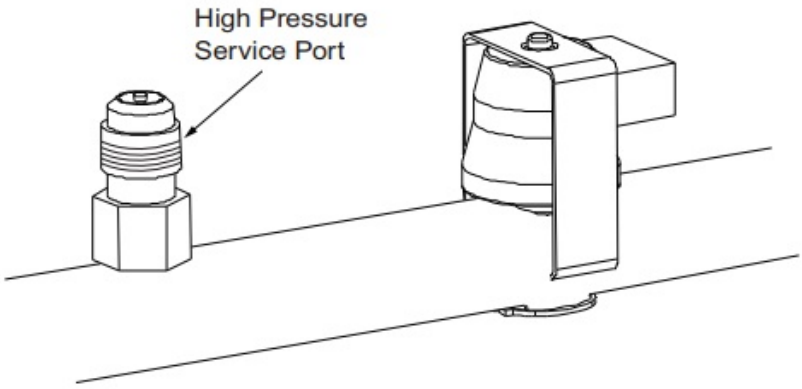
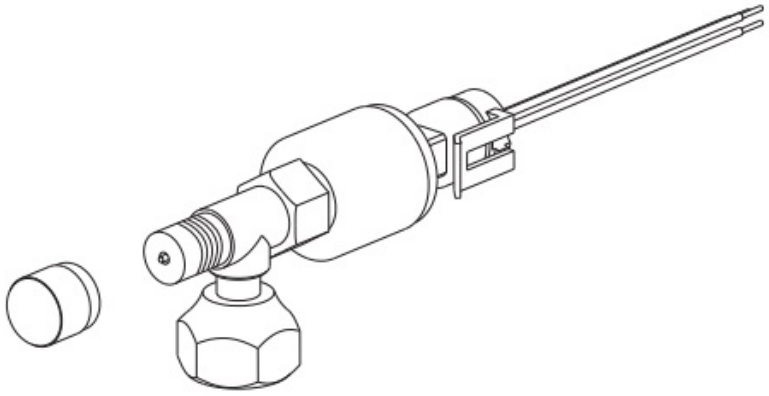
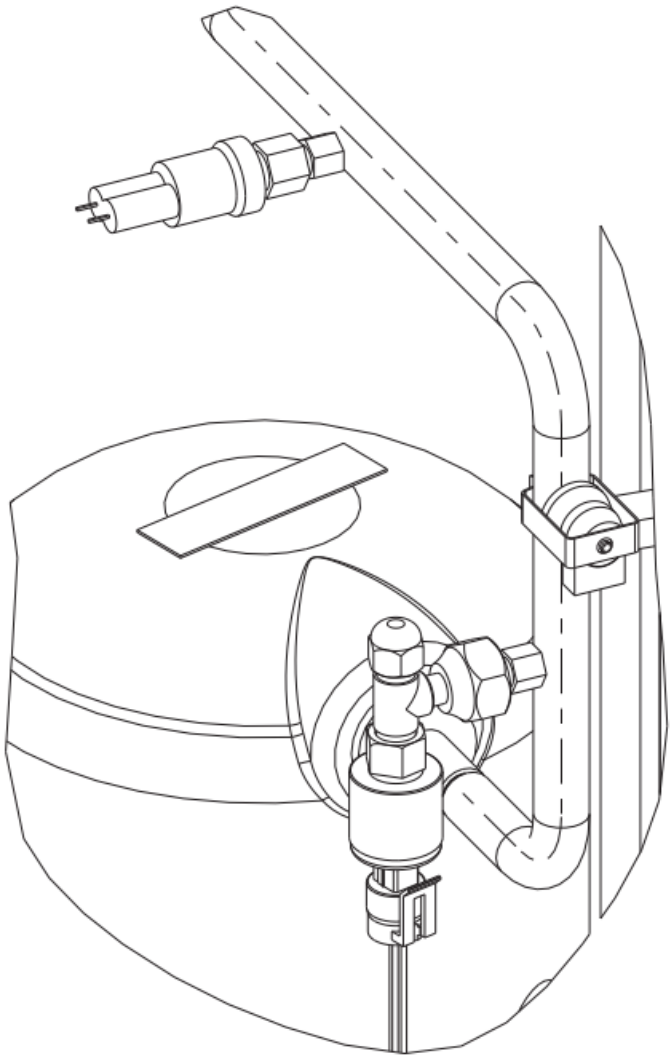


Figure 3. Transducer to tee



- Place the tee flare nut with the valve core depressor on the high-pressure tap. See Figure 4.

Figure 4. Tee and transducer installed on high pressure service port



- Tighten the flare nut securely to the high-pressure service port and check for leaks.
- Place cap nut on the open port tee.
- Route wires along with existing sensor wires into the main control box. Refer to the wire harness installation section for a proper wire routing path back to the controller mounting location.
- Connect wires to the appropriate controller terminals. See schematic.

Hazardous Voltage w/Capacitors!
Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/ tagout procedures to ensure the power cannot be inadvertently energized. Verify with a CAT III or IV voltmeter rated per NFPA 70E that all capacitors have discharged.

The existing thermistor, used by the unit controls, measures the outdoor ambient air temperature.

- 3 to 12.5 tons – The existing thermistor is mounted on the condenser base pan in front of the compressors.
- 12.5 to 25 tons – existing thermistor is mounted in the lower, right corner of the main control box.

The low ambient controller requires a second thermistor. Both locations are factory-designed with a second hole for the controller temperature sensor.

1. Install a grommet in the second hole located next to the existing temperature.
2. Insert controller temperature sensor in grommet. Confirm majority of the sensor is pushed through the grommet.

Control Box Wiring
Hazardous Voltage w/Capacitors!
Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/ tagout procedures to ensure the power cannot be inadvertently energized. Verify with a CAT III or IV voltmeter rated per NFPA 70E that all capacitors have discharged.

1. Disconnect the outdoor motor (ODM1) from the power circuit.
    - Unplug the orange fan motor connector (PPM79) from underneath the control box.
    - Remove the orange fan motor connector (PPF79) from the sheet metal opening in the control box wrapper.
2. Install the outdoor motor harness in the control box as shown in Figure 6.

Figure 5. Panel mount connector location

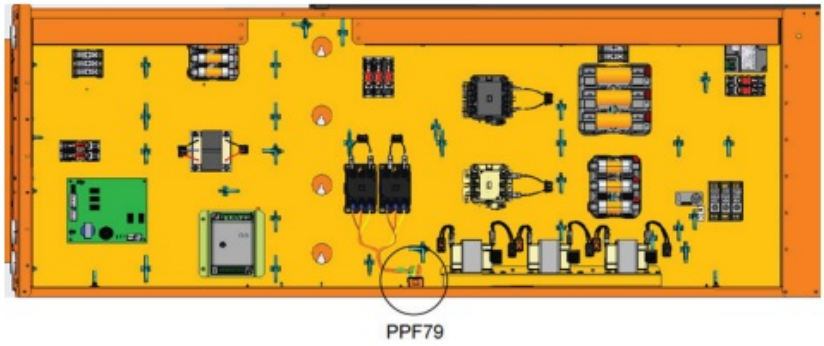
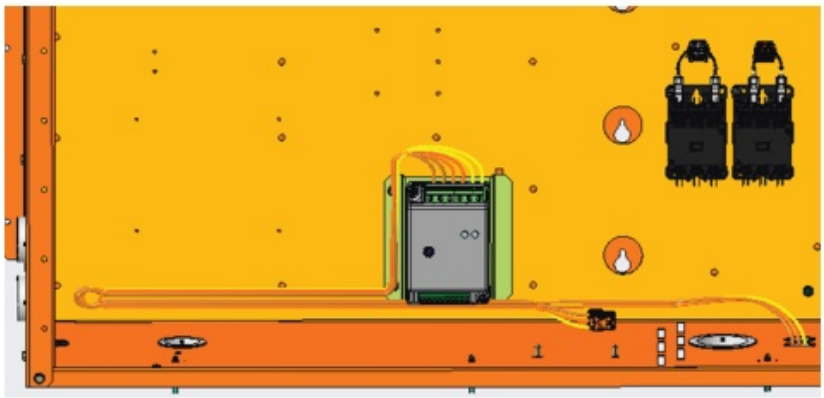


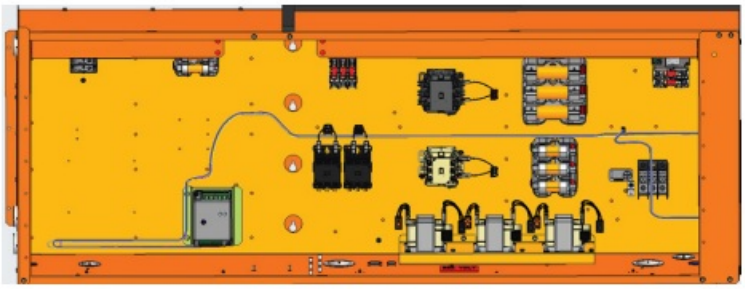
Figure 6. Outdoor motor power harness



- Plug (PPF79) from outdoor fan contactor 1 (OFC1) into kit-supplied power harness (PPM79B).
- Snap kit supplied (PPF79B) into the control box wrapper where the fan motor connector (PPF79) was originally placed.
- Plug the fan motor connector (PPM79) into the power harness (PPF79B).
- Refer to the schematic for connection points and install the remaining strip lead connections into the controller.

3.

Figure 7. Control power harness

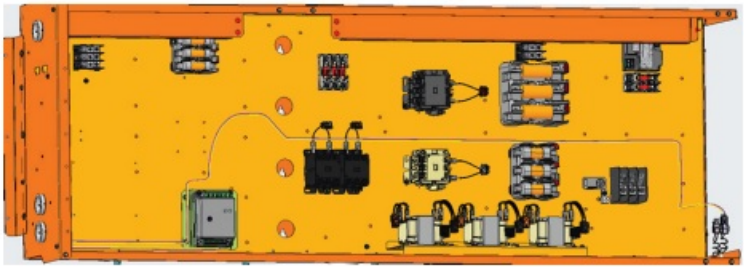


Install the control power harness in the control box as shown in Figure 7.

- Install gray and blue wires for the control power harness to the controller. Refer to the schematic for wire connections.
- For heat pump units, install a black wire from the valve control harness to the REV VALVE terminal at this time.
- Route the harness across the back panel and up onto the right low voltage door to the adapter board.
- Route valve control harness with control power harness to the adapter board.
  Note: Following existing wiring paths to adapter board but routing through horseshoe-shaped opening on low voltage door. All harnesses in this kit utilize the factory-installed releasable wire ties in all wiring paths. To release the zip ties, pull up on tab near the head of the zip tie and push the loose end of the zip tie.
- Connect P6 from the control power harness to AB-J6. Refer to main unit schematic sheet 4.
- For heat pump units, remove the J11 connector from Symbio™ controller and plug into PPM11 plug-on valve control harness. Plug J11 from the valve control harness into the Symbio P11 plug.

4. Temperature sensor harness
   - Install temperature sensor harness in a control box as shown in Figure 8.

Figure 8. Temperature sensor harness



   - Refer to the schematic and connect wires to the appropriate terminals on the controller.
   - Route the harness across the back panel and into the lower right corner.
   - 3 to 12.5 tons – use temperature sensor extension harness to continue routing down to sensor location.
   - 15 to 25 tons – connect to sensor previously mounted in the control box.
   - Connect harness to temperature sensor connector.
5. Final wiring

   Securely installed wires with wire ties

Installation
Controller Settings and Operation
Jumper Position

- For non-heat pump applications, the heat pump select jumper must be in the default normally open (N.O.)

- REV. VALVE terminal must not be connected.
- For heat pump applications, move the jumper to the normally closed (N.C.) position and wire the REV. VALVE terminal with the REV Valve harness included in the kit.

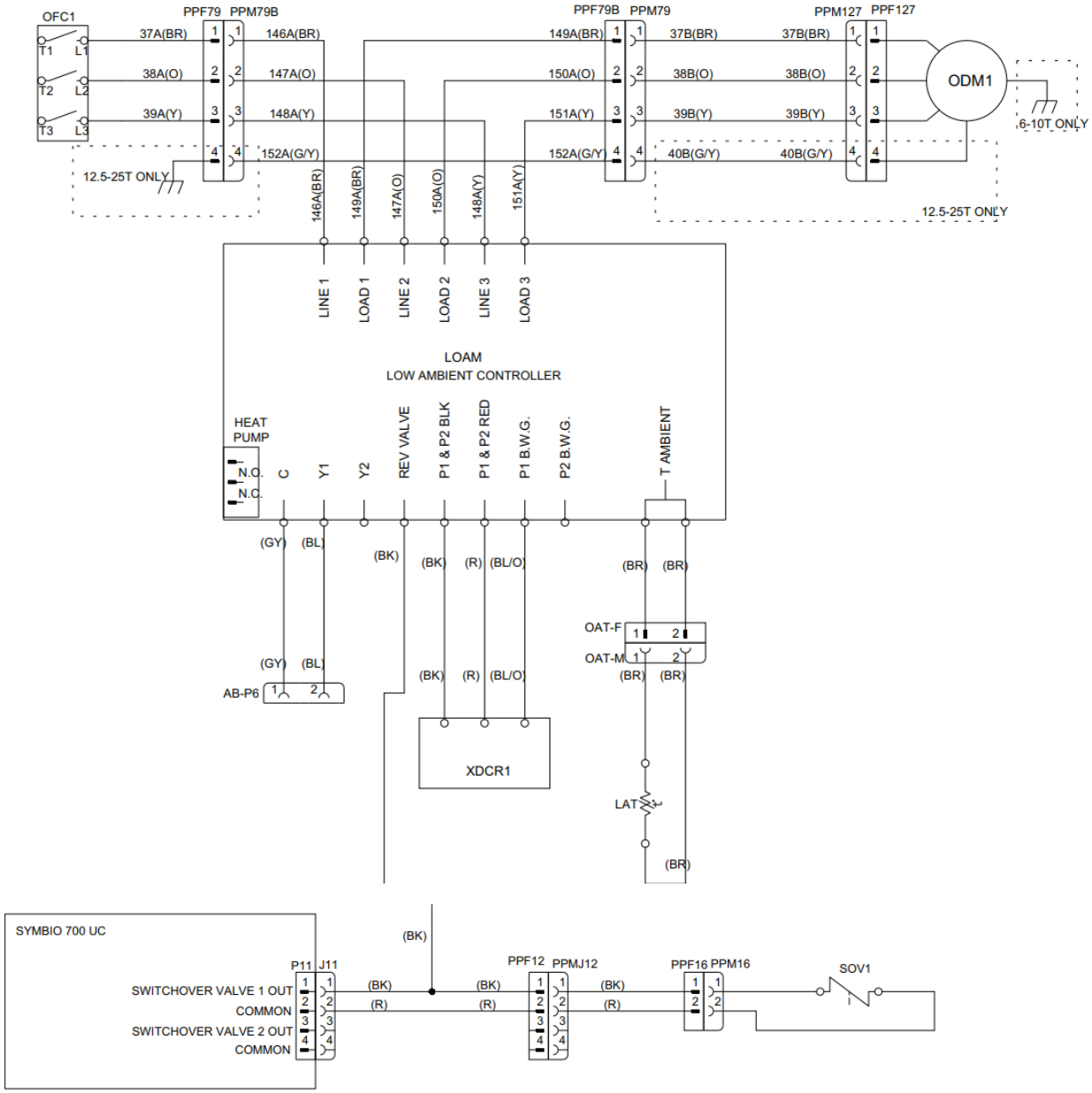
Controller Operation

The LOAM controller is used to maintain head pressure within an acceptable range when ambient temperature falls below 50ºF. It reads discharge pressures from refrigeration circuits. It cycles outdoor fan motors on and off to maintain the highest of the two discharge pressures at the selected setpoint anytime one or more compressors are operating. Above 50º F, fans will be energized continuously.

Pressure Setpoint

Set the pressure setpoint to the recommended value of 245 psig (see Figure 11, p. 9).

Figure 9. Low ambient controller



REF DES	DESCRIPTION	LINE NO
LAT	LOW AMBIENT TEMP SENSOR	38
LOAM	LOW AMBIENT MODULE	24
ODM1	OUTDOOR FAN MOTOR	19
OFC1	OUTDOOR FAN CONTACTOR	18
SOV1	SWITCH OVER VALVE	40
SYMBIO	SYMBIO 700 UC	41
XDCR1	PRESSURE TRANSDUCER CKT1	34

WIRE COLOR ABBREVIATION CODES			
CODE	COLOR	CODE	COLOR
BK	BLACK	PK	PINK
BL	BLUE	R	RED
BR	BROWN	TQ	TURQUOISE
G	GREEN	V,(PR)	PURPLE
GY	GREY	W	WHITE
O	ORANGE	Y	YELLOW

At ambient temperatures lower than 50ºF, the controller will maintain discharge pressures between 15 psig above

and 15 psig below-dialed pressure setpoint.

Labels
Apply self-adhesive labels supplied with the kit to the inside of the panel covering the main control box:

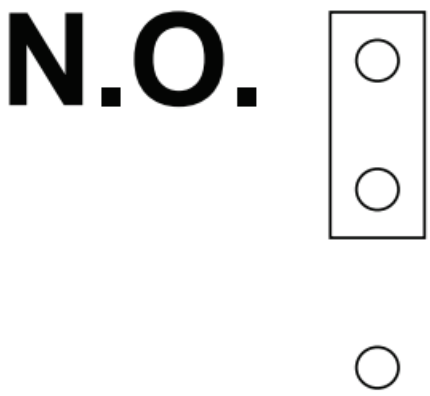
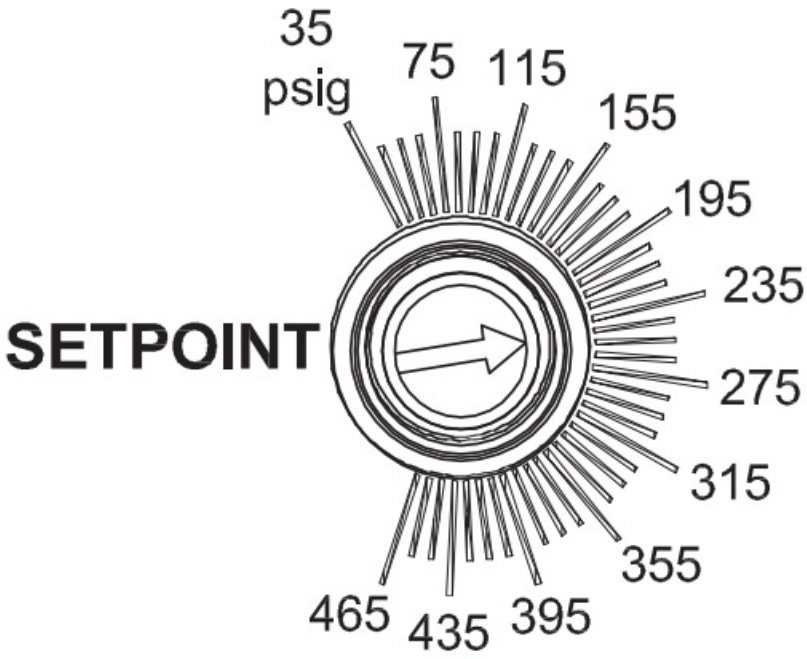


Figure 11. Pressure setpoint



1. Accessory label: Apply near the unit nameplate.
2. Supplementary wiring diagram label: Schematic can be placed in the schematic pouch already located on the back of the right side low voltage door that contains all main unit schematics.
3. Close-Up, Fan Inspection, and Restart

Inspect condenser fans

1. Manually rotate the condenser fans to ensure free movement and check motor bearings for wear.
2. Verify that all fan mounting hardware and fan hubs are tight.
3. Connect all power to the unit.

Troubleshooting

Confirm the unit is operating properly through the desired pressure range.

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 brown, orange, and yellow 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.
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 24Vac 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.
	Dirty or blocked condenser coil	Clean condenser coil.
Fan motor is cycling on thermal overload	Dirty or blocked condenser coil	Clean condenser coil.
Unit fails to start	Incorrect/No voltage present	Using an AC voltmeter, measure the voltage between the 24 V ac terminals. It should read approximately 24 volts. Measure line voltage between LINE1, LINE2 and LINE 3 to confirm that line voltage is present.
	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 4.
The fuse is blown and/or signs of damage on the unit	Miswired	The unit has been mis-wired and may be permanently damaged.

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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ACC-SVN237C-EN 15 Sep 2024
Supersedes ACC-SVN237B-EN (Nov 2022)

Documents / Resources

	**TRANE ACC-SVN237C-EN Low Ambient Control** [pdf] Instruction Manual FIALOAM001, FIALOAM002, ACC-SVN237C-EN Low Ambient Control, ACC-SVN237C-EN, Low Ambient Control, Ambient Control

References

- **American Standard® | Air Conditioning and Heating | HVAC Systems**
- **Trane Heating & Air Conditioning**
- **User Manual**