

INSTALLATION INSTRUCTIONS

Low-Ambient Kit

NASA201LA, NASA401LA

These instructions must be read and understood completely before attempting installation.

Safety Labeling and Signal Words

DANGER, WARNING, CAUTION, and NOTE

The signal words **DANGER**, **WARNING**, **CAUTION**, and **NOTE** are used to identify levels of hazard seriousness. The signal word **DANGER** is only used on product labels to signify an immediate hazard. The signal words **WARNING**, **CAUTION**, and **NOTE** will be used on product labels and throughout this manual and other manuals that may apply to the product.

DANGER – Immediate hazards which **will** result in severe personal injury or death.

WARNING – Hazards or unsafe practices which **could** result in severe personal injury or death.

CAUTION – Hazards or unsafe practices which **may** result in minor personal injury or product or property damage.

NOTE – Used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

Signal Words in Manuals

The signal word **WARNING** is used throughout this manual in the following manner:



WARNING

The signal word **CAUTION** is used throughout this manual in the following manner:



CAUTION

Signal Words on Product Labeling

Signal words are used in combination with colors and/or pictures on product labels.



WARNING

ELECTRICAL SHOCK HAZARD

Failure to turn off electric power could result in personal injury or death.

Before installing or servicing system, turn off main power to the system. There may be more than one disconnect switch, including accessory heater(s).

NOTE: Read the entire instruction manual before starting the installation.

SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may cause death, personal injury, or property damage. Consult a qualified installer, service agency, or your distributor or branch for information or assistance. The qualified installer or agency must use

factory-authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with the kits or accessories when installing.

Follow all safety codes. Wear safety glasses, protective clothing, and work gloves. Use quenching cloth for brazing operations. Have fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions included in literature and attached to the unit. Consult local building codes and current editions of the National Electrical Code (NEC) NFPA 70. In Canada, refer to current editions of the Canadian electrical code CSA 22.1.

Recognize safety information. This is the safety-alert symbol . When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words **DANGER**, **WARNING**, and **CAUTION**. These words are used with the safety-alert symbol. **DANGER** identifies the most serious hazards which **will** result in severe personal injury or death. **WARNING** signifies hazards which **could** result in personal injury or death. **CAUTION** is used to identify unsafe practices which **may** result in minor personal injury or product and property

damage. NOTE is used to highlight suggestions which will result in enhanced installation, reliability, or operation.

WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Before installing, modifying, or servicing system, main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.

INTRODUCTION

These instructions cover the installation of Low-Ambient Pressure Switch Part No. NASA201LA and NASA401LA in all single-speed air conditioners or heat pumps using R-22 or R-410A refrigerant. This kit is also acceptable for use on 2-stage air conditioners or heat pumps using R-410A and permanent split capacitor (PSC) fan motors.. Refer to Table 1 for kit usage.

DESCRIPTION AND USAGE

The Low-Ambient Pressure Switch Kit is a long-life pressure switch which turns the fan on and off as shown in Table 1. It is wired in series with black fan lead. Sleeve-bearing motors can be used with this control.

Other accessories may be required. Refer to the Required Changes for Cooling Units and Heat Pump Units section in this document for further details.

CAUTION

CUT HAZARD

Failure to follow this caution may result in personal injury.

Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate protective clothing and gloves when handling parts.

INSTALLATION

The pressure switch is mounted inside the outdoor unit cabinet by using adapter tube supplied. The adapter tee is mounted to liquid service valve and tube is either routed through one of the knockout holes in unit cabinet (vertical discharge product) or through one of the service valve holes in unit cabinet (horizontal discharge product). From inside cabinet, the flare nut is attached to extender tube. (See Fig. 1.) The pressure switch is wired in series with black or common fan lead.

WIRING FOR ALL VOLTAGES OF COOLING UNITS

A. Single- And Two-Stage Non-Communicating Capable

For all voltages of cooling units, refer to Fig. 2 and wire low-ambient pressure switch as follows:

1. Disconnect black fan lead from contactor and connect this lead to yellow or violet wire from low-ambient pressure switch using connector supplied.

NOTE: To ensure electrical isolation and strain relief, it is recommended to wrap connector with UL approved electrical

tape overlapping the wires on each side by a minimum of 1 inch.

2. Connect remaining blue wire from low-ambient pressure switch to contactor terminal from which black fan lead was removed.

B. Single- And Two-Stage Communicating Capable

For all stages of cooling units, refer to Fig. 3 and use Low-Ambient Pressure Switch as follows:

1. Disconnect black fan lead from control board and connect it to yellow or violet wire from low ambient pressure switch connector supplied.

NOTE: To ensure electrical isolation and strain relief, it is recommended to wrap connector with UL approved electrical tape overlapping the wires on each side by a minimum of 1 inch.

2. Connect blue wire from low-ambient pressure switch to control board terminal from black fan lead was removed.

WIRING FOR HEAT PUMPS

Heat pumps require a normally closed Isolation Relay (Part No. NASA00101IK or equivalent) with the 24v coil connected to the C and O terminals of defrost board or control board.

A 208/230v Applications

For 208/230v heat pump applications, refer to Fig. 4 and wire low-ambient pressure switch as follows:

1. Remove black lead of outdoor fan motor connected to defrost board OF2 or control board ODF depending on type of unit.
2. Install piggyback female terminal on violet wire harness (provided in isolation relay kit) to tab 1 of isolation relay. Connect non-piggyback female termination of same violet wire to one side of provided connector. Connect the female termination of violet (or yellow) lead of low ambient pressure switch to the other side of the provided connector. Connect the female termination of the black fan motor lead to the male piggy back terminal located at tab 1 of relay.

NOTE: To ensure electrical isolation and strain relief it is recommended to wrap connector with UL approved electrical tape overlapping the wires on each side by a minimum of 1".

3. Install piggyback female terminal on black wire harness (provided in isolation relay kit) to tab 2 of relay. Connect non-piggyback female termination of same black wire to OF2 on defrost board or ODF on control board. Connect the female termination of blue lead of low ambient pressure switch to the male piggy back terminal located at tab 2 of relay.
4. Install orange wire (provided in isolation relay kit) to one side of the relay coil. Connect the other side to the O wire coming from defrost board or control board.
5. Install black wire (provided in isolation relay kit) to opposite side of the relay coil. Connect the other side to the C wire coming from defrost board or control board.
6. Reinstall control box cover and reconnect power to unit.

B. 460v Applications

For 460v heat pump applications, refer to Fig. 5 and wire low-ambient pressure switch as follows:

1. Remove black lead of outdoor fan motor connected to outdoor fan relay terminal 3.
2. Install piggyback female terminal on violet wire harness (provided in isolation relay kit) to tab 1 of

isolation relay. Connect non-piggyback female termination of same violet wire to one side of provided connector. Connect the female termination of violet (or yellow) lead of low ambient pressure switch to the other side of the provided connector. Connect the female termination of the black fan motor lead to the male piggy back terminal located at tab 1 of relay.

NOTE: To ensure electrical isolation and strain relief it is recommended to wrap connector with UL approved electrical tape overlapping the wires on each side by a minimum of 1" (25.4 mm).

3. Install piggyback female terminal on black wire harness (provided in isolation relay kit) to tab 2 of relay. Connect non-piggyback female termination of same black wire to outdoor fan relay terminal 3. Connect the female termination of blue lead of low ambient pressure switch to the male piggy back terminal located at tab 2 of relay.
4. Install orange wire (provided in isolation relay kit) to one side of the relay coil. Connect the other side to the O wire coming from defrost board or control board.
5. Install black wire (provided in isolation relay kit) to opposite side of the relay coil. Connect the other side to the C wire coming from defrost board or control board.
6. Reinstall control box cover and reconnect power to unit.

REQUIRED CHANGES FOR COOLING UNITS AND HEAT PUMP UNITS

1. Crankcase heaters are required on all applications where low-ambient controls are used.
2. Start capacitor and relay (hard start) kits are required on all single-phase applications where low-ambient controls are used.
3. Evaporator freeze thermostat NASA00201FS is required on all applications where low-ambient controls are used.
4. Wind baffles are recommended for temperatures below 0°F (-17.80°C) or where there is substantial wind. For vertical discharge outdoor products see Fig. 7 for dimensions of Baffle Assembly. For horizontal discharge outdoor products consult Product Data for Wind Baffle Kits.

NOTE: When wind baffles are used on vertical discharge products, raising the unit off of pad a minimum of 4 in. is required to provide better airflow for moderate- and

high-ambient temperatures. Check presale literature for available service feet or unit risers.

5. For cooling applications only, winter start control NASA00201WS must be used where low-pressure switch tripping may be encountered. Winter start control must be wired in parallel with low-pressure switch. This allows a delay of 3 minutes before low-pressure switch becomes part of control circuit. (See Fig. 6.)

NOTE: See Winter Start Control Kit for detailed Installation Instruction.

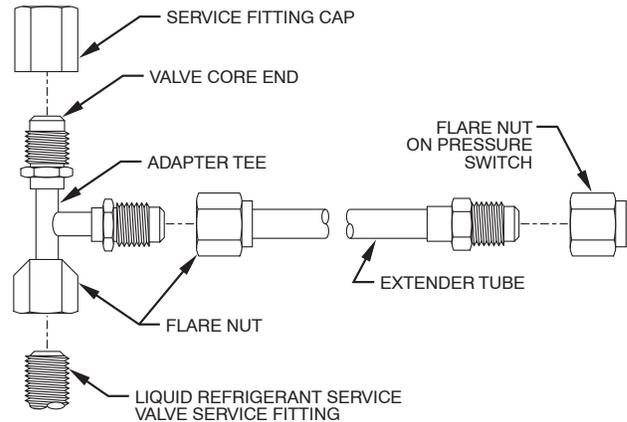


Fig. 1 — Low Ambient Pressure Switch

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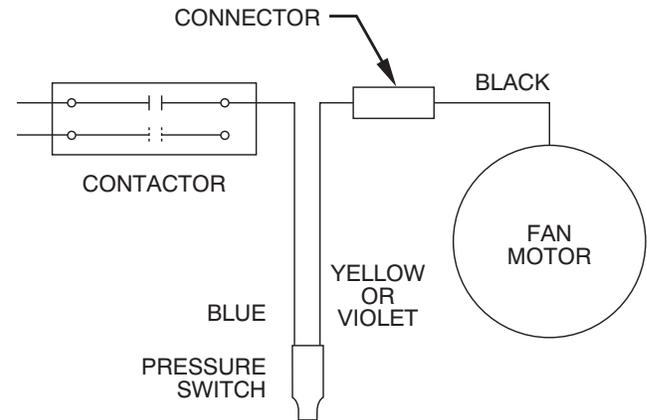
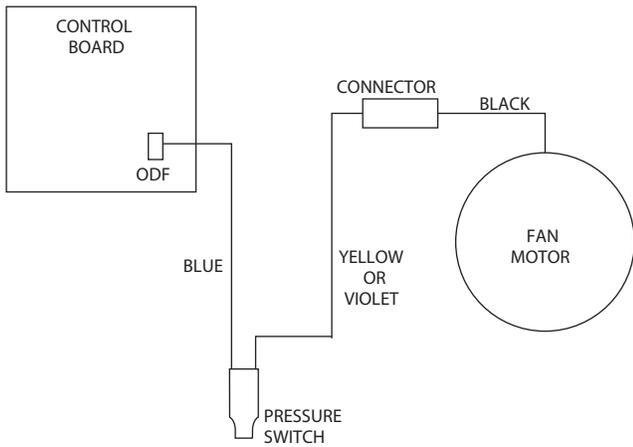


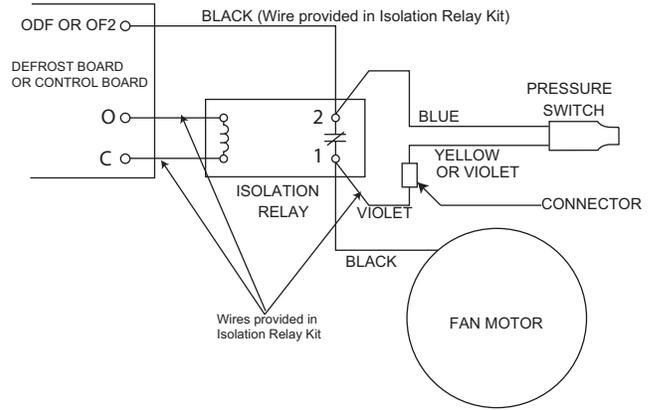
Fig. 2 — Power Wiring for All Voltages of Cooling Applications – Single and Two-Stage Non-Communicating Capable

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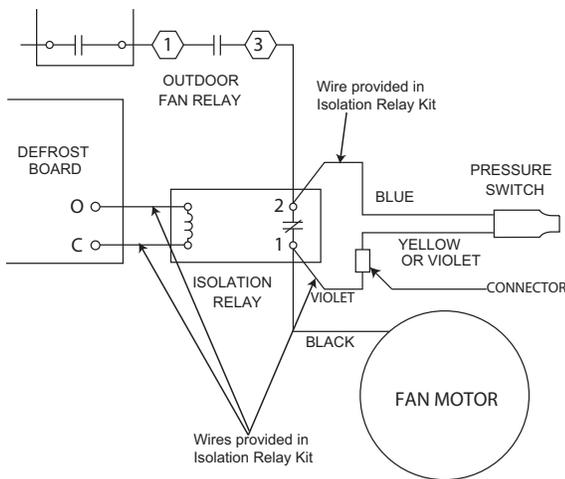
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Fig. 3 — Power Wiring for All Voltages of Cooling Applications – Single and Two-Stage Communicating Capable



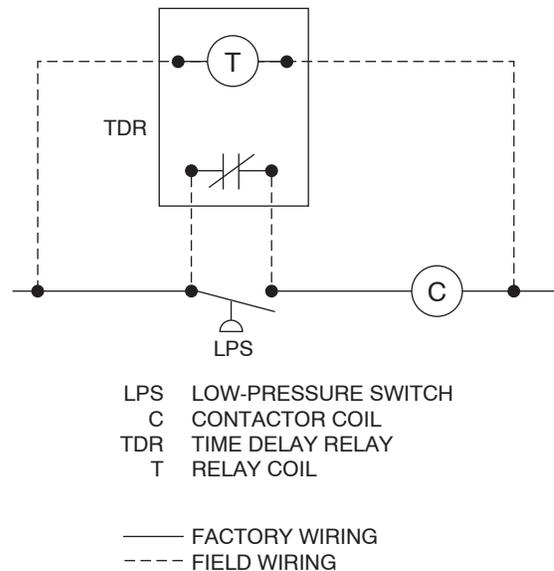
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Fig. 4 — Power Wiring for 208/230v Heat Pump Applications



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Fig. 5 — Power Wiring for 460v Heat Pump Applications



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Fig. 6 — Low Voltage Wiring for Winter Start Control

START-UP

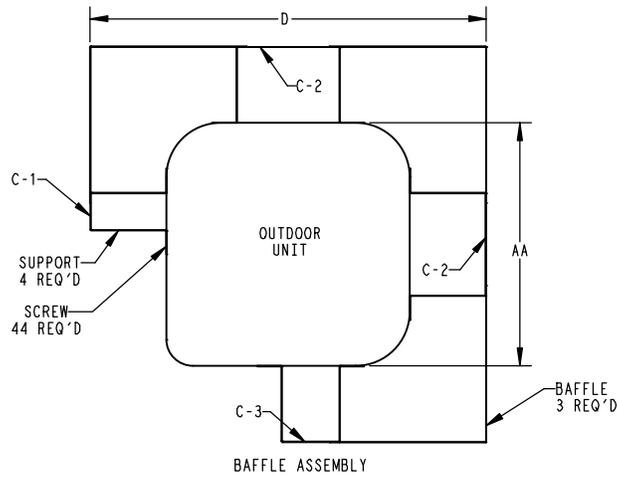
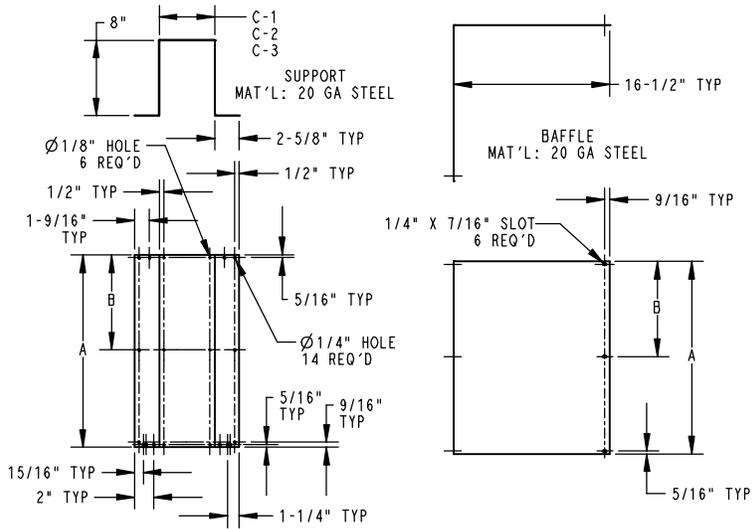
To start units equipped with the low-ambient pressure switch, perform the following steps:

1. Turn power on to unit.
2. Set thermostat below room temperature.
3. Wait for the unit to start. There may be a 5-minute delay in the thermostat or in the outdoor unit.

4. Observe unit operation as described below.
 - a. The fan will be off when compressor starts.
 - b. At outdoor temperatures around 0°F (-17.8°C), fan may not run at all.
 - c. At summer temperatures, fan will start after 10 to 30 seconds of compressor operation and may not turn off until thermostat is satisfied.
 - d. At outdoor ambient between 80°F (26.7°C) and 20°F (-6.7°C), fan will turn on and off to maintain pressure as shown in Table 1.

Table 1—Kit Usage and Cut-In / Cut-Out Pressures

KIT PART NO.	REFRIGERANT	PRESSURE SWITCH CLOSES (PSIG)	PRESSURE SWITCH OPENS (PSIG)	WIRE COLORS
NASA201LA	R-22	225	100	Blue and Yellow
NASA401LA	R-410A	365	200	Blue and Violet



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Vertical Units (in.)								
UNIT SIZE	AA	UNIT HEIGHT	A	B	C-1	C-2	C-3	D
Mini Base	23-1/8	25-5/16	20-3/8	10-1/16	1-5/16	8-1/4	3-1/2	39-1/4
		28-11/16	23-13/16	11-3/4				
		32-1/8	27-3/16	13-1/2				
		35-1/2	30-5/8	15-3/16				
		38-15/16	34	16-7/8				
		42-5/16	37-3/8	18-9/16				
Small	25-3/4	45-11/16	40-13/16	20-1/4	3-15/16	10-7/8	6-1/8	41-7/8
		25	20-3/8	10-1/16				
		28-7/16	23-13/16	11-3/4				
		31-13/16	27-3/16	13-1/2				
		35-1/4	30-5/8	15-3/16				
		38-5/8	34	16-7/8				
Medium	31-1/4	42	37-3/8	18-9/16	9-3/8	16-5/16	11-9/16	47-3/8
		45-7/16	40-13/16	20-1/4				
		25-1/2	20-3/8	10-1/16				
		28-15/16	23-13/16	11-3/4				
		32-5/16	27-3/16	13-1/2				
		35-3/4	30-5/8	15-3/16				
Large	35	39-1/8	34	16-7/8	13-3/16	20-1/8	15-3/8	51-1/8
		42-1/2	37-3/8	18-9/16				
		45-15/16	40-13/16	20-1/4				
		25-1/2	20-3/8	10-1/16				
		28-15/16	23-13/16	11-3/4				
		32-5/16	27-3/16	13-1/2				

Fig. 7 — Vertical Discharge Products Baffle Assembly

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