Technical Publications
Litho U.S.A.

504,793M
05/2013
Supersedes 10/2012

LOW AMBIENT CONTROL KIT

INSTALLATION INSTRUCTIONS FOR LOW AMBIENT CONTROL KIT (54M89) USED WITH PSC FAN HEAT PUMP UNITS

⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause personal injury, loss of life, or damage to property.

Installation and service must be performed by a licensed professional installer (or equivalent) or a service agency.

⚠ CAUTION

Physical contact with metal edges and corners while applying excessive force or rapid motion can result in personal injury. Be aware of, and use caution when working nearby these areas during installation or while servicing this equipment.

⚠ WARNING

Electric Shock Hazard. Can cause injury or death. Unit must be grounded in accordance with national and local codes.

Line voltage is present at all components when unit is not in operation on units with single-pole contactors. Disconnect all remote electric power supplies before opening access panel. Unit may have multiple power supplies.

Shipping and Packing List

Package 1 of 1 contains the following:

1 - Low ambient pressure switch assembly (S11)

1 - K58 relay

4 - 20” Lengths of wire (c/w 3/16” Female quick connects on one end of wire)

4 - Wire nuts

2 - #10-16 X 5/8” S.D.S.T. screws

1 - Schrader® depressor tee with seal cap

Additional Parts Required

1. All units will require one field-provided properly sized freezestat (S49) for use with this kit. Order part using table below.

Table 1. Freezestat Selection (S49)

Tubing Size	Wire Length	Wire Gauge	Catalog Number	Freezestat Set Points	
				Open	Close
3/8”	90-13/16”	18	93G35	29ºF (-2ºC)	58ºF (10ºC)
5/8”	36-1/2”	18	50A93	36ºF (2ºC)	58ºF (10ºC)

2. Outdoor unit must have installed a compressor crankcase heater (order separately) for low ambient operation. *Refer to the model's Production Specification bulletin to order the required **crankcase heater**.*
3. Use ONLY expansion valve metering devices on units with low ambient kits. Refer to the heat pump's Production Specification bulletin to order the required expansion valve for the indoor coil.

Application

NOTE - This kit may be applied in expansion valve systems only. It is not suitable for use in systems using either piston-type or capillary tube metering devices.

NOTE - This kit is suitable only for use with heat pump units in HFC-410A refrigerant applications.

The low ambient control pressure switch **S11** cycles the outdoor fan, while allowing continuous compressor operation during a cooling demand. This intermittent outdoor fan operation maintains a minimum pressure differential across the expansion device as the ambient temperature drops, thus reducing capacity losses during low ambient conditions. The freezestat (ordered separately) senses suction line temperature and cycles the compressor off when suction line temperature falls below its setpoint. This kit is designed for use in ambient temperatures that are no lower than 30°F (-1°C) unless otherwise noted in the Product Specification bulletin.

Installation

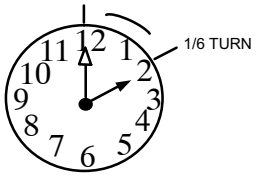
LOW AMBIENT PRESSURE SWITCH (S11)

The provided low ambient pressure switch is factory set for 450 psig (3100 kPa) cut-in and 240 psig (1600 kPa) cut-out. This switch is not adjustable. See figure 1 for S11 installation example.

1. - Turn off the electrical power to the unit.
2. - Remove compressor compartment access panel, if applicable.
3. - Install provided low ambient pressure switch on open port (no valve core) of provided tee fitting.

NOTE — Pressure switch must be installed on tee first. Then install tee on liquid line service port to avoid refrigerant loss.

4. - Install tee fitting on condensing unit liquid line service port.
5. - Install cap on valve core port and tighten to 6 to 8 ft.-lbs. When a torque wrench is not available, finger tighten and use an appropriately sized wrench to turn an additional 1/6 turn clockwise.



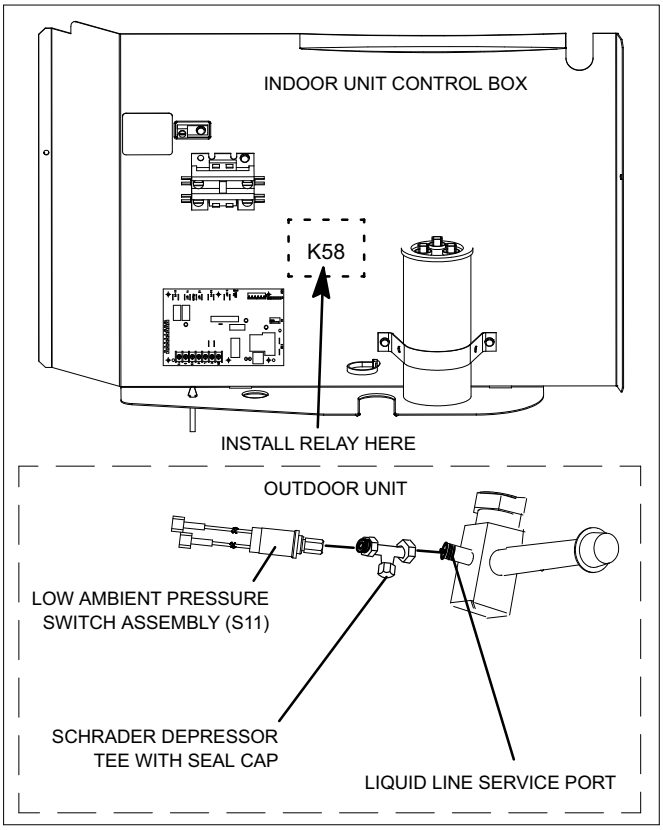


Figure 1. Typical Installation of Low Ambient Pressure Switch (S11) and Relay K58

6. - Route pressure switch wires into control box and connect per applicable unit wiring diagram.

RELAY (K58)

Use the four provided screws to install the provided K58 and relay in the control box as illustrated in figure 1. Make wiring connections as exampled in figure 4.

FREEZESTAT (S49)

The freezestat (ordered separately) will open and close at the non-adjustable set points listed in table 1.

1. - A freezestat, sized per table 1 and ordered separately, must be installed. Install the freezestat on one of the copper lines between the last hairpins and the suction manifold (see figure 2).
2. - The freezestat senses the line temperature and cycles the compressor off when the line temperature fails below its setpoint. The freezestat will open and closed as listed in table 1.
3. - Connect freezestat (S49) wires as exampled in figure 3.

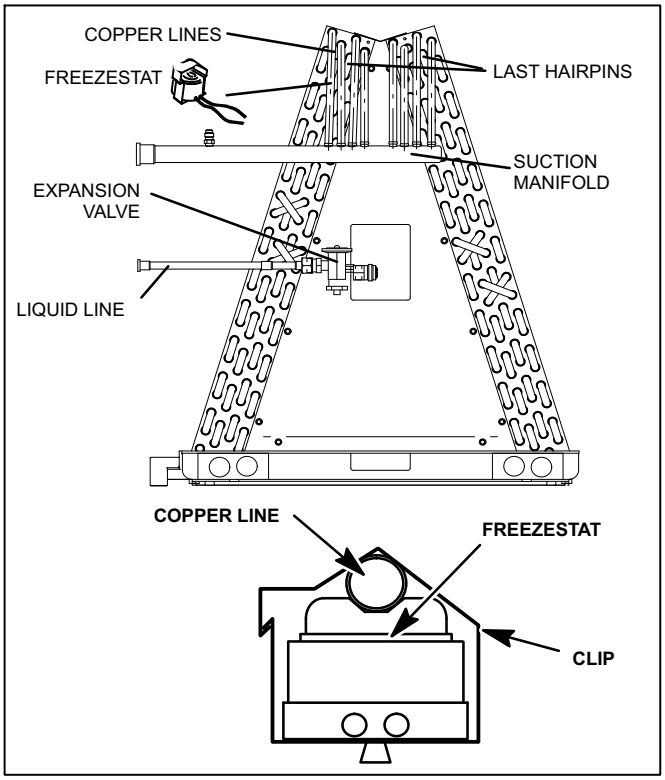


Figure 2. Typical Freezestat (S49) Installation (Indoor Coil)

⚠ CAUTION

ELECTROSTATIC DISCHARGE (ESD) PRECAUTIONS AND PROCEDURES	Electrostatic discharge can affect electronic components. Take care during unit installation and service to protect the unit's electronic controls. Precautions will help to avoid control exposure to electrostatic discharge by putting the unit, the control and the technician at the same electrostatic potential. Touch hand and all tools on an unpainted unit surface before performing any service procedure to neutralize electrostatic charge.

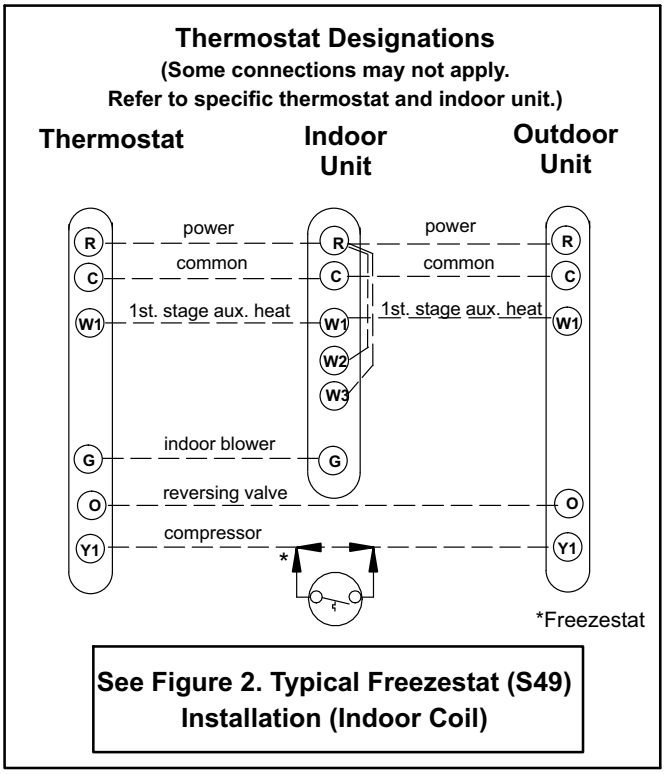


Figure 3. S49 Freezestat Wiring

Wire Connections

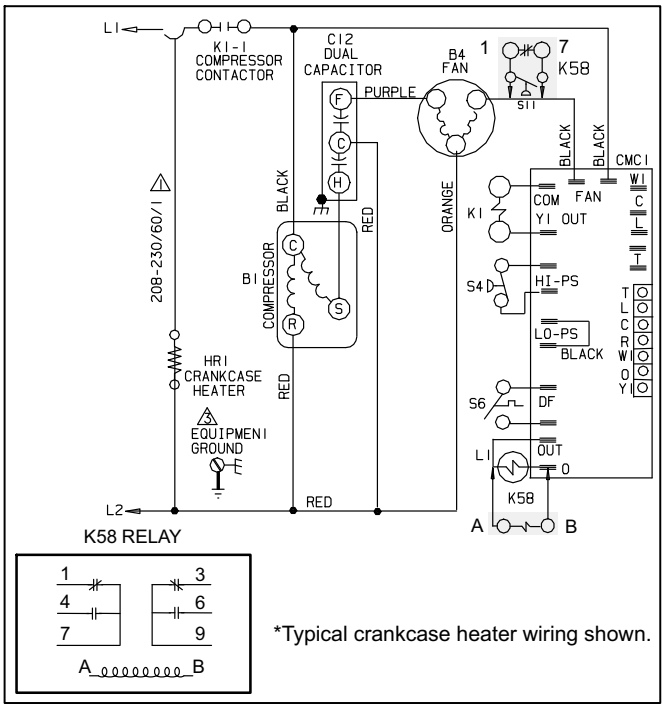


Figure 4. Typical PSC Fan Heat Pumps

Operational Checkout

COOLING MODE

- Set the room thermostat to call for cooling.
- The defrost control in the unit will receive a **Y** and **O** signal from the room thermostat.
- The **O** signal will energize the reversing valve and the **K58** relay coil. Contact **K58-1** will open.
- The **Y** signal will go through the freezestat to **Y1** on the defrost control.
- The signal will go into defrost control to the **HI-PS** terminals, out to the high pressure switch and discharge thermostat, then back to the other **HI-PS** terminal.
- The signal will come back out of the defrost control on the **Y** terminal, which will energize the compressor contactor coil. The compressor will cycle **ON**.
- The outdoor fan motor will be **OFF** until the liquid line pressure reaches the setting of the low ambient pressure switch (450 psig - 3100kPa).

NOTE — The outdoor fan motor will be cycled by the low ambient and K58 relay. During a call for cooling when the liquid line pressure rises above 450 psig (3100 kPa), the outdoor fan will cycle ON. When the liquid line pressure falls below 240 psig (1600 kPa), the outdoor fan will cycle OFF.

HEATING MODE

- Set the room thermostat to call for heating.
- The defrost control in the unit will receive a **Y** signal from the room thermostat.
- The **O** signal from the room thermostat is not energized, so the **K58** relay coil will not be energized. Contact **K58-1** will remain closed.
- The **Y** signal will go through the freezestat to **Y1** on the defrost control.
- The signal will go into defrost control to the **HI-PS** terminals, out to the high pressure switch and discharge thermostat and back to the other **HI-PS** terminal.
- The signal will come back out of the defrost control on the **Y** terminal which will energize the compressor contactor coil. The compressor will cycle **ON**.
- The **K58-1** relay contacts (which are normally closed) will prevent the low ambient pressure switch from interrupting the outdoor fan motor operation during the heating mode.