53DS−900−−−086
53DS−900−−−095

Duct−Free Systems

Cooling Only and Heat Pump Units

Low Ambient Temperature Control Accessory

Installation Instructions

NOTE: Read and become familiar with these instructions before beginning installation.

SAFETY CONSIDERATIONS

Installing and servicing air-conditioning equipment can be hazardous due to system pressures and electrical components. Only trained and qualified personnel should install or service air-conditioning equipment. When working on air-conditioning equipment, observe the precautions provided in literature, tags, and labels attached to the unit.

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 National Electrical Code (NEC) for special requirements.

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 these 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 beginning any modification or installation of this kit, be sure the main electrical disconnect is in the OFF position. Ensure power is disconnected to the fan coil unit. On some systems both the fan coil and the outdoor unit may be on the same disconnect. Tag the disconnect switch with a suitable warning label. There may be more than one disconnect.

GENERAL

IMPORTANT: Heat pump models require an isolation relay and field wiring to prevent fan cycling in heat pump mode. See Table 1 for isolation relay part numbers.

Table 1 – Isolation Relay Part Numbers

Models	RCD Part No.	Voltage
38MVQ009/012	P283−0291	120v
38MVQ012	P283−0292	240v
38MVQ018/024	P283−0292	240v
38QRR/QRF	P283−0293	24v
538B_R/538Q_R	P283−0293	24v

Wind baffles are required for low ambient operation. For 38HD, 38QR and 538B models, the baffles are a factory accessory (see Table 2 for part numbers). For 38MVC and 38MVQ models, the baffles are field fabricated using factory drawings (see Table 2 for drawing numbers).

Table 2 – Wind Baffle Accessories for R-410A Units

Models	Wind Baffle Part No.
38HDF/QRF/HDR/QRR018 538E_F/538Q_F018	53DS−900−−−070
38HDF/38HDR024, 38HDF030, 38QRF/38QRR024 538E_F/538A_R024 538E_F030 538Q_F/538B_R024	53DS−900−−−087
38HDF036/38QRF030/035/036, 38HDR/38QRR030/036 538E_F036 538Q_F030/035/036, 538A_R/538B_R030/036	53DS−900−−−071
38HDR/QRR048,060 538A_R/538B_R048,060	53DS−900−−−088

Models	Wind Baffle Drawing No.*
38MVC/38MVQ009	53DS−900−−−097
38MVC/38MVQ012	53DS−900−−−097
38MVC/38MVQ018	53DS−900−−−098
38MVC/38MVQ024	53DS−900−−−099

*Drawings available on HVAC Partners.

Winter Start Control (part number KAAWS0101AAA) is required when low ambient operation (cooling below 55°F/13°C) is required for cooling and heat pump models (018-060) that have a low pressure switch.

The Winter Start Control kit uses a time-delay relay to bypass the low-pressure switch for three (3) minutes on start-up. the time delay relay will take the low pressure switch out of the control circuit to allow the system to build pressure eliminating nuisance trips. *Units with low pressure switches: 38HDR/HDF/QRR/QRF and 538A_B/E_F, 538Q_F.*

Crankcase Heater is required for low ambient operation and must be added. This is a separate accessory to be installed.

These instructions cover the installation of low ambient temperature control accessory kit on the duct-free cooling and heat pump condensing units.

The low ambient temperature control (LAC) is a high cycle rate pressure switch that directly controls the outdoor fan motor.

The low ambient temperature control is designed to maintain a condensing pressure of 255 to 295 psig on models 38MVC/MVQ and 321 to 362 psig for HDF/HDR and QRF/QRR models by directly cycling the outdoor-fan motor. No field adjustments or calibrations are required.

When unpacking the accessory, carefully inspect for shipping damage. If damage is evident, return for replacement.

INSTALLATION

For 38HDR/QRR Models

1. Remove access panels and locate pressure tap on liquid header.
2. Place three drops of compressor oil in the pressure switch for lubrication.
3. Mount switch as shown in Fig. 1.
4. For heat pump units only, mount isolation relay in control box.
5. Connect wiring as shown in Fig. 3 or Fig. 4.
6. Coil any excess wire and secure next to the pressure switch.

For 38MVC/MVQ Models

1. All of the components required for the correct installation of the low ambient control are included in the kit.
2. Remove access panels and locate pressure tap on liquid line.
3. Place three drops of compressor oil in the pressure switch for lubrication.
4. Mount switch as shown in Fig. 2.
5. For heat pump units only, mount isolation relay in control box.
6. Determine locations for electrical connections (see Fig. 3 or Fig. 5).
7. Cut pressure switch leads to correct length and apply the required terminations from the selection supplied in the low ambient control kit.
8. For heat pump units only, use the cut off lead and terminations supplied with the kit to make up the required field wires as shown in Fig. 5.

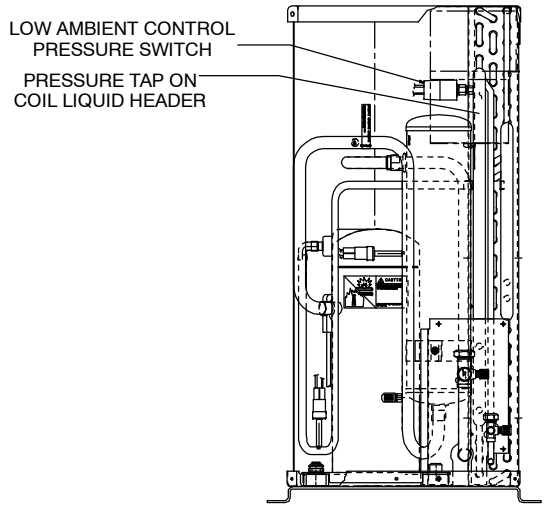

Fig. 1 - Representative of 38HDR/38QRR OR 538A/538B Models

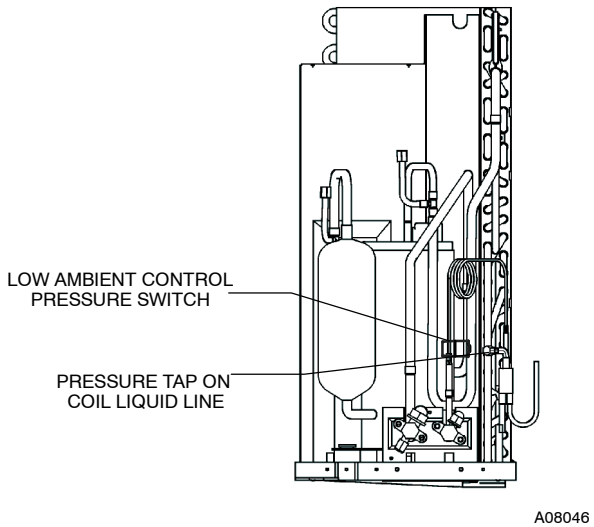

Fig. 2 - Representative of 38MVC/38MVQ Models

COOLING ONLY MODELS	
Model No.	**Wire Color**
38MVC009–024	Black = 009 & 012 Red = 018 & 024
38HDF018–036	Black
38HDR018–060	Black
538A Series	Black
538E Series	Black

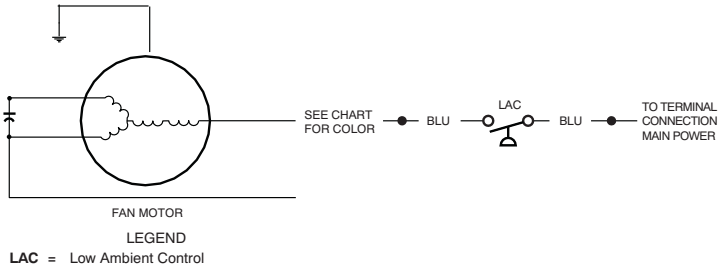

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Fig. 3 - Low Ambient Temperature Control Wiring - Cooling Only Models

HEAT PUMP MODELS (Reversing Valve Energized in Cooling)	
Model No.	**Wire Color**
38QRF018–036	Black
38QRR018–060	Black
538BNR018–060	Black
538QNF018–036	Black

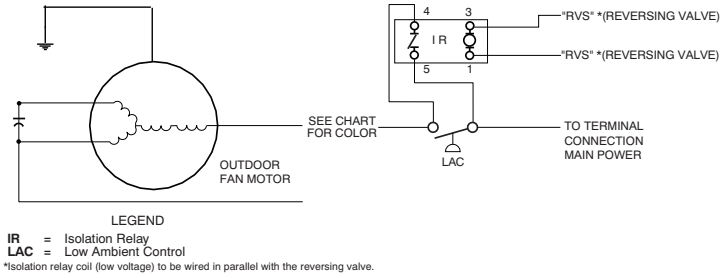

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Fig. 4 - Low Ambient Temperature Control Wiring - Heat Pump Models (Reversing Valve Energized in Cooling)

HEAT PUMP MODELS (Reversing Valve Energized in Heating)	
Model No.	**Wire Color**
38MVQ009–012	Black
38MVQ018–024	Red

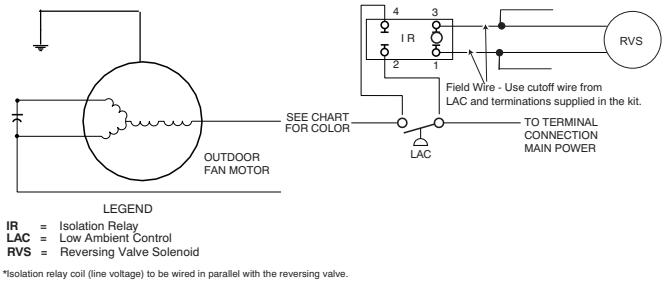

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Fig. 5 - Low Ambient Temperature Control Wiring - Heat Pump Models (Reversing Valve Energized in Heating)

CHECK OPERATION

Before starting the system to check operation of low ambient temperature control, ensure that the power wiring and location of control assembly are correct. To check operation of low ambient temperature control:

1. Turn power on to system.
2. Set thermostat below room temperature.
3. Ensure that there is the standard 3-minute time delay for the microprocessor controlled high wall fan coil systems.
4. Check time delay of installed accessories:
   Under-ceiling (40QAC/QAQ) fan coils using the duct-free 24-v thermostat delay settings: 2 or 4 minute delay.

The outdoor-fan motor will not operate until the condensing pressure reaches the control set point of 295 psig for 38MVC/MVQ models or 362 psig for 38QRF-018-036 and 38QRR-018-060 models (± 10 psig). When the set point is reached, the outdoor fan will cycle to maintain the set point condensing pressure.

If the low ambient temperature control does not operate correctly:

- Ensure that power is being supplied to the system.
- Check condensing pressure: if condensing pressure is below 255 psig for 38MVC/MVQ models or 321 psig for 38QRF-018-036 and 38QRR-018-060 models, the outdoor-fan motor should be off and there should be no voltage across the 2 blue fan power leads coming out of the control. If condensing pressure is about 295 psig or greater for 38MVC/MVQ models or 362 psig for 38QRF-018-036 and 38QRR-018-060 models, the outdoor-fan motor should be on and will cycle off at around 255 psig for 38MVC/MVQ or 321 psig for 38QRF-018-036 and 38QRR-018-060 models.

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