**Wiring Diagrams**

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*Units produced after 03/31/03.

### LEGEND (Fig. 1-11)

- C — Contactor, Compressor
- CAP — Capacitor
- CB — Circuit Breaker
- CCH — Crankcase Heater
- CLO — Compressor Lockout
- COMP — Compressor
- DFC — Defrost Control
- DFT — Defrost Thermostat
- DGT — Discharge Gas Thermostat
- EQUIP — Equipment
- FM — Fan Motor
- GND — Ground
- HP,HPS — High-Pressure Switch
- IFC — Indoor-Fan Contactor
- IFM — Indoor-Fan Motor
- LAR — Low Ambient Relay
- LAS — Low Ambient Switch
- LCS — Loss-of-Charge Switch
- LLSV — Liquid Line Solenoid Valve
- LP, LPS — Low-Pressure Switch
- MMR — Motormaster® Relay
- NEC — National Electrical Code
- OFM — Outdoor-Fan Motor
- OFR — Outdoor-Fan Relay
- PS — Pressure Switch
- RV — Reversing Valve
- RVS — Reversing Valve Solenoid
- TB — Terminal Block
- TRAN(S) — Transformer
- TSTAT — Thermostat

- Field Splice
- Marked Wire
- Terminal (Marked)
- Terminal Block
- Splice
- Factory Power Wiring
- Field Control Wiring
- Field Power Wiring
- Accessory or Optional Wiring
- To indicate common potential only, not to represent wiring.

### NOTES (Fig. 1 and 2)

1. Factory wiring is in accordance with National Electrical Code (NEC). Field modifications or additions must be in compliance with all applicable codes.
2. Use copper conductors only.
3. CAUTION: Not suitable for use on systems exceeding 150 volts to ground.
4. Manual reset circuit breaker is integral to the transformer.

### NOTES (Fig. 3-10)

1. If any of the original wire furnished must be replaced, it must be replaced with type 90° C wire or its equivalent.
2. For thermostat and subbase part no. see price pages.
3. Set heat anticipator at .6.
4. Use copper conductors only.
5. Three-phase motors are protected under primary single phasing conditions.
6. 39 va available for field-installed accessories. Control power requirement for heat pump condensing unit is 36 va (sealed). Supplied control transformer is 75 va.

### NOTES (Fig. 11)

1. Factory wiring is in accordance with National Electrical Code (NEC). Field modifications or additions must be in compliance with all applicable codes.
2. Use copper conductors only.
SEQUENCE OF OPERATION — 38AQ007 OUTDOOR UNIT WITH 40RM008 INDOOR UNIT

When power is supplied to unit, the transformer (TRAN) and crankcase heater (CCH) are energized.

**Cooling** — On a call for cooling, the thermostat completes the following circuits: R-G, R-Y, and R-O. If the compressor recycle delay of 3 minutes is complete, the compressor and outdoor fan start. The reversing valve is energized for cooling and the indoor-fan motor stops.

When the thermostat is satisfied, the circuits are opened, and the compressor, outdoor-fan motor, and indoor-fan motor stop. The reversing valve is deenergized.

**Heating** — On a call for heating, the thermostat completes the following circuits: R-G and R-Y. If the optional electric heat package is used, the heat relay is energized, and the electric heaters are energized.

When the thermostat is satisfied, the circuits are opened, and the compressor, outdoor-fan motor, heaters, and indoor-fan motor stop.

**Defrost** — The Defrost board (DB) is a time and temperature control, which includes a field-selectable time period between checks for frost (30, 50, and 90 minutes). Electronic timer and defrost cycle start only when contactor is energized and defrost thermostat (DFT) is closed (below 36 F [2.2 C]).

Defrost mode is identical to Cooling mode, except outdoor-fan motor (OFM) stops and a bank of supplemental electric heat turns on to warm air supplying the conditioned space. Defrost mode is terminated when the DFT reaches 51 F (10.6 C).

**Low Ambient** — Cooling head pressure control at low ambient conditions is accomplished through a low ambient relay and switch. The switch is factory set to close at 250 psig and open at 100 psig. In Heating mode, the low ambient switch is bypassed by normally closed contacts on the low ambient relay.

**Air Circulation** — When the fan switch is at FAN ON, the indoor-air fans operate continuously to provide ventilation. The thermostat operates the other components as described above.

**Emergency Heat Cycle** — If the compressor is inoperative due to a tripped safety device, the second stage of the thermostat automatically energizes the indoor-air fan and the electric resistance heaters (if equipped).

SEQUENCE OF OPERATION — 38ARQ008,012 OUTDOOR UNIT WITH 40RMQ008,012 INDOOR UNIT

When power is supplied to unit, the transformer (TRAN) is energized. The crankcase heater is also energized.

**Cooling** — With the thermostat in the cooling position, and when the space temperature comes within 2°F of the cooling set point, the thermostat makes circuit R-O. This energizes the reversing valve solenoid (RVS) and places the unit in standby condition for cooling.

As the space temperature continues to rise, the second stage of the thermostat makes, closing circuit R-Y. When compressor time delay (5 ± 2 minutes) is completed, a circuit is made to contactor (C), starting the compressor (COMP) and outdoor-fan motor (OFM). Circuit R-G is made at the same time, energizing the indoor-fan contactor (IFC) and starting the indoor-fan motor (IFM) after a one-second delay.

When the thermostat is satisfied, contacts open, deenergizing C. The COMP, IFM, and OFM stop.

**Heating** — On a call for heat, thermostat makes circuits R-Y and R-G. When compressor time delay (5 ± 2 minutes) is completed, a circuit is made to contactor (C), starting COMP and OFM. Circuit R-G also energizes IFC and starts IFM after a 1-second delay.

Should room temperature continue to fall, circuit R-W is made through second-stage thermostat bulb. If optional electric heat package is used, a relay is energized, bringing on supplemental electric heat. When thermostat is satisfied, contacts open, deenergizing contactor and relay; motors and heaters deenergize.

**Defrost** — Defrost board (DB) is a time and temperature control, which includes a field-selectable time period between checks for frost (30, 50, and 90 minutes). Electronic timer and defrost cycle start only when contactor is energized and defrost thermostat (DFT) is closed (below 28 F [−2.2 C]).

Defrost mode is identical to Cooling mode, except outdoor-fan motor (OFM) stops and a bank of supplemental electric heat turns on to warm air supplying the conditioned space. Defrost mode is terminated when the DFT reaches 65 F (18.3 C).
Fig. 1 — Control Schematic and Component Arrangement — 38AQ007 (208/230 V)

Fig. 2 — Control Schematic and Component Arrangement — 38AQ007 (460 and 575 V)
Fig. 3 — Control Schematic and Component Arrangement — 38ARQ008 and 012 (208/230-3-60) Units Produced Before 03/31/03
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Fig. 11 — 48RMQ008-012 (208/230-3-60, 460-3-60, 575-3-60, 400-3-50) Wiring Detail