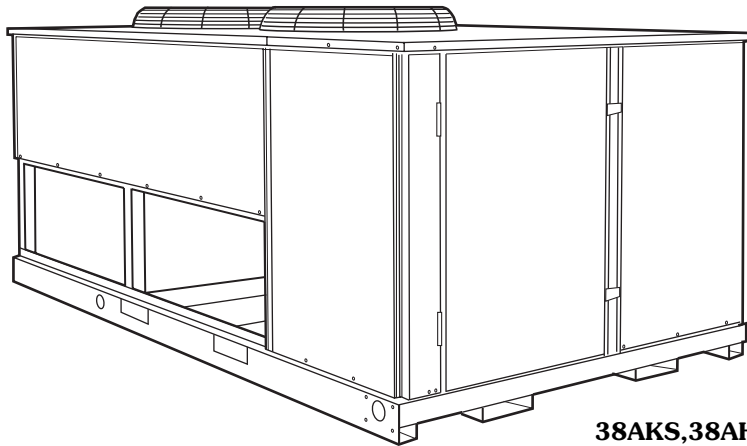




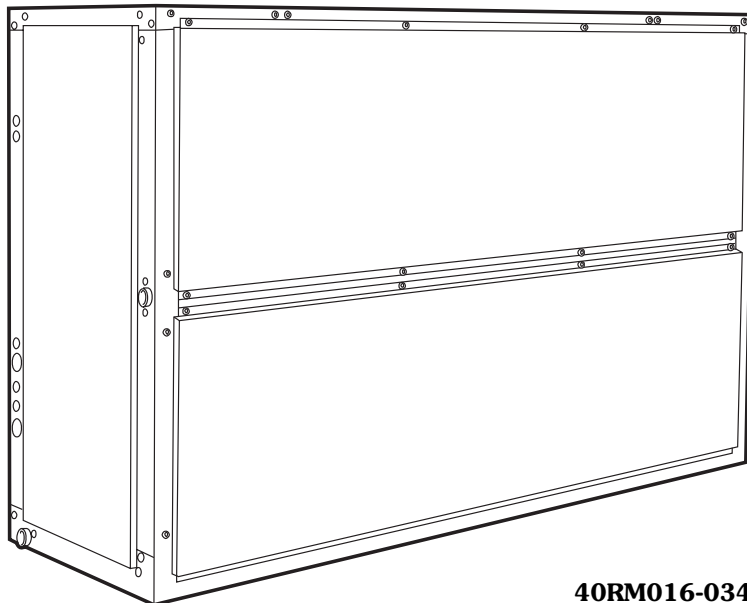
Product Data

GEMINI™ **38AKS028-044** **38AH024-034** **With 40RM016-034** **Commercial Air-Cooled** **Split Systems**

20 to 40 Nominal Tons



38AKS,38AH



40RM016-034



These dependable split systems match Carrier's indoor-air handlers with outdoor condensing units for a wide selection of commercial cooling solutions.

Features/Benefits

Building owners will appreciate the high unit EERs (Energy Efficiency Ratios) offered by the 38AKS and 38AH units. These units provide greater efficiency than similar units in the marketplace, which translates into year-round operating savings. Latest safety standards for 38AKS and 38AH units are assured through UL and UL, Canada approvals.

Constructed for long life

The 38AKS and 38AH units are designed and built to last. Cabinets are constructed of pre-painted galvanized steel, delivering unparalleled protection against the environment. Inside and outside surfaces are protected to ensure long life, good looks and reliable performance. The copper tube-aluminum fin outdoor coil construction provides long term reliability and improved heat transfer. Where conditions require them, copper fin coils are available. For corrosive or coastal environments an epoxy barrier is available to provide superior coil durability.

Reliability

The 38AKS and 38AH condensing units offer the building owner components and operating controls designed for performance dependability. These condensing units feature the time proven highly reliable 06D and 06E

compressors. Unloading capability for superior part load performance is a standard feature of these compressors. The compressor mounting system has vibration isolation to provide quiet operation and reduce component stress.

Each compressor is equipped with a crankcase heater to eliminate the occurrence of liquid slugging at start-up. The compressors also include an oil level sight glass for maintenance ease.

The following safety features are included in each unit:

- Anti short cycling control
- Low oil pressure safety
- Low refrigerant pressure safety
- High refrigerant pressure safety
- Calibrated circuit breakers

38AH series

38AH condensing units feature 2 compressors and 2 refrigeration circuits. These units can be matched with a single air handler or two separate air handlers.

Standard units are designed for constant volume control. A variable air volume (VAV) control is available as a factory installed option. The VAV units feature electrically controlled compressor unloading to precisely match unit capacity to building loads. The VAV equipped unit has a simple control interface for connection to a VAV discharge air control system.

Ease of installation and service

These units are equipped with hinged control box access panels, control interface terminal boards, liquid line shut off valves and compressor service valves.

Innovative Carrier 40RM air-handling units — ideal matches for 38AKS and 38AH condensing units

The 40RM Series has excellent fan performance, efficient direct-expansion (DX) coils, a unique combination of indoor air quality

features, and easy installation. Its versatility and state-of-the-art features help to ensure that your split system provides economical performance now and in the future.

Indoor-air quality (IAQ) features

The unique combination of IAQ features in the 40RM Series air handlers helps to make sure that only clean, fresh, conditioned air is delivered to the occupied space.

Direct-expansion (DX) cooling coils prevent the build-up of humidity in the room, even during part-load conditions. The 40RM016-034 sizes feature dual-circuit coils.

Standard 2-in. disposable filters remove dust and airborne particles from the occupied space.

The pitched PVC drain pan can be adjusted for a right-hand or left-hand connection to provide positive drainage and to prevent standing condensate.

The 40RM accessory economizer can provide ventilation air to improve indoor-air quality. When used with CO₂ sensors, the economizer admits fresh outdoor air to replace stale, recirculated indoor air.

Economy

The 40RM Series packaged air handlers have low initial costs, and they continue to save money by providing reduced installation expense and energy-efficient performance.

Quick installation is ensured by the multipoise design. Units can be installed in either the horizontal or vertical configuration without modifications. All units have drain-pan connections on both sides, and pans can be pitched for right-hand or left-hand operation with a simple adjustment. Fan motors and contactors are prewired and thermostatic expansion valves (TXVs) are factory-installed on all 40RM models.

High efficiency, precision-balanced fans minimize air turbulence, surging, and unbalanced operation, cutting operating expenses.

The economizer accessory precisely controls the blend of outdoor air and room air to achieve comfort levels. When the outside air enthalpy is suitable, outside air dampers can fully open to provide “free” cooling.

Rugged dependability

40RM units are made to last. The die-formed galvanized steel panels ensure structural integrity under all operating conditions. Galvanized steel fan housings are securely mounted to a die-formed galvanized steel deck. Mechanically bonded coil fins provide improved heat transfer. Rugged pillow-block bearings are securely fastened to the solid steel fan shaft with split collets and clamp locking devices.

Coil flexibility

Model 40RM direct-expansion coils have galvanized steel casings; inlet and outlet connections are on the same end. The coils are designed for use with Refrigerant 22 and have ³/₈-in. diameter copper tubes mechanically bonded to aluminum sine-wave fins. The coils include matched, factory-installed TXVs with matching distributor nozzles. Accessory hot water and steam coils and electric heaters are also available.

Easier installation and service

The multipoise design and component layout help you to get the unit installed and running quickly. The DX coils have factory-installed TXVs with matching distributor nozzles. Units can be converted from horizontal to vertical operation by simply repositioning the unit. Drain pan connections are duplicated on both sides of the unit. The filters, motor drive, TXVs, and coil connections are all easily accessed by removing a single side panel.

ARI* capacity ratings



| CONDENSING UNIT | AIR HANDLER/ INDOOR COIL | SYSTEM† | | | CONDENSING UNIT ONLY** | | |
|-----------------|-----------------------------|---------------------|------|------|------------------------|------|------|
| | | Net Capacity (Btuh) | EER | IPLV | Net Capacity (Btuh) | EER | IPLV |
| 38AKS028 | 40RM024H | 282,000 | 8.8 | 11.0 | 330,000 | 10.2 | 12.1 |
| | 40RM028H | 300,000 | 9.0 | 11.2 | | | |
| | 40RM034H | 316,000 | 8.9 | 11.0 | | | |
| 38AKS034 | 40RM028H | 332,000 | 8.6 | 10.6 | 370,000 | 10.1 | 13.1 |
| | 40RM034H | 345,000 | 8.8 | 10.6 | | | |
| 38AKS044†† | — | — | — | — | 506,000 | 10.1 | 13.0 |
| 38AH024 | 40RM016H | 222,000 | 9.8 | 9.4 | 250,000 | 11.7 | 13.7 |
| | 40RM024H | 240,000 | 9.6 | 9.7 | | | |
| | 40RM028H | 250,000 | 10.2 | 10.3 | | | |
| 38AH028 | 40RM024H | 268,000 | 9.4 | 9.5 | 290,000 | 11.2 | 12.9 |
| | 40RM028H | 282,000 | 9.6 | 9.5 | | | |
| | 40RM034H | 290,000 | 9.4 | 9.3 | | | |
| 38AH034 | 40RM028H | 324,000 | 9.4 | 9.2 | 344,000 | 11.1 | 12.9 |
| | 40RM034H | 332,000 | 9.5 | 8.9 | | | |

LEGEND

- EER** — Energy Efficiency Ratio
- IPLV** — Integrated Part Load Value
- SST** — Saturated Suction Temperature



*Air Conditioning and Refrigeration Institute.
 †Ratings in accordance with ARI Standard 360/365.
 **Condensing unit only ratings are at 45 F SST and 95 F entering-air temperature.
 ††38AKS044 units combine with 39 series air handlers. For capacity ratings on these units refer to **AHUBuilder®** software.

38AKS028-044, 38AH024-034 SOUND LEVELS, dB

| UNIT | OCTAVE BAND | | | | | | | | dB(A) |
|----------|-------------|-----|-----|-----|------|------|------|------|-------|
| | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | |
| 38AKS028 | 95 | 95 | 93 | 90 | 89 | 84 | 82 | 81 | 93.5 |
| 38AKS034 | 96 | 96 | 94 | 91 | 90 | 85 | 83 | 83 | 94.6 |
| 38AKS044 | 99 | 99 | 96 | 93 | 92 | 88 | 86 | 86 | 96.9 |
| 38AH024 | 95 | 95 | 93 | 90 | 89 | 84 | 82 | 81 | 93.5 |
| 38AH028 | 95 | 95 | 93 | 90 | 89 | 84 | 82 | 81 | 93.5 |
| 38AH034 | 96 | 96 | 94 | 91 | 90 | 85 | 83 | 83 | 94.6 |

NOTES:

1. Estimated sound power levels, dB re 1 Picowatt.
2. This data is based upon a limited amount of actual testing with the estimated sound power data being generated from this data in accordance with ARI standard 370 for large outdoor refrigerating and air-conditioning equipment.
3. Since this data is estimated, the sound power levels should not be guaranteed or certified as being the actual sound power levels.
4. The acoustic center of the unit is located at the geometric center of the unit.

40RM016-034 ESTIMATED SOUND POWER LEVELS (L_w)

| UNIT | CFM | dB(A) | OCTAVE BAND CENTER FREQUENCY | | | | | | |
|---------|--------|-------|------------------------------|-------|------|------|------|------|------|
| | | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 |
| 40RM016 | 6,000 | 92.7 | 98.9 | 94.9 | 90.9 | 91.9 | 85.9 | 83.9 | 79.9 |
| 40RM024 | 8,000 | 96.4 | 102.6 | 98.6 | 94.6 | 95.6 | 89.6 | 87.6 | 83.6 |
| 40RM028 | 10,000 | 96.2 | 102.5 | 98.5 | 94.5 | 95.5 | 89.5 | 87.5 | 83.5 |
| 40RM034 | 12,000 | 98.5 | 104.7 | 100.7 | 96.7 | 97.7 | 91.7 | 89.7 | 85.7 |

NOTE: Since this data is calculated, these sound power levels may be different than the actual sound power levels. The acoustic center of the unit is located at geometric center of the unit.

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Options and accessories



38AKS, 38AH factory-installed options

Enviro-Shield™ condenser options are available to match coil protection to site conditions for optimum durability. See table below and refer to the Application Data for selection guidance. Consult your Carrier representative for further information.

VAV option (38AH only) provides unit with 2 electric unloaders and control box modifications necessary to connect to a field-installed VAV controller.

38AKS, 38AH field-installed accessories

Electric unloader package includes hardware and solenoid valve to convert a pressure-operated unloader to electric unloading.

-20 F low-ambient temperature kit (Motomaster®) controls outdoor-fan motor operation to maintain the correct head pressure at low outdoor ambient temperatures. Only one low ambient temperature kit is required per unit.

Gage panel package provides a suction and a discharge pressure gage for the refrigerant circuit.

VAV controller allows systems to operate as VAV (variable air volume) systems. Includes microprocessor, satellite sequencer, 4 status lights, 5-hour bypass timer, and locked enclosure.

Hot-gas bypass kit (38AKS) prevents the indoor coil from freezing up during low airflow or low return-air temperature applications by maintaining minimum suction pressure.

Carrier's line of thermostats provide both programmable and non-programmable capability with the new **Debonair®** line of commercial programmable thermostats, the **Commercial Electronic** thermostats provide 7-day programmable capability for economical applications.

PremierLink™ controller is a field retrofit split system control compatible with the Carrier Comfort Network (CCN) and other building automation systems (BAS). This control is designed to allow users the access and ability to change factory-defined settings thus expanding the function of the standard unit.

Part-winding-start timing relay (38AKS) reduces in-rush current and locked rotor amps on start-up. This accessory may require a special-order unit. See table below.

PART-WINDING-START TABLE

| UNIT SIZE 38AKS | VOLTAGE (60 Hz) | | | |
|--------------------|-----------------|--------|--------|--------|
| | 208/230 | 380 | 460 | 575 |
| 028 | | | | |
| 034 | Note 1 | Note 2 | Note 3 | Note 2 |
| 044 | | | | |

NOTES:

1. Can be field modified to part winding start by adding a time delay relay (part no. HN67ZA001).
2. Requires **special order** to change circuit breakers and contactors.
3. Requires **special order** to change circuit breakers and contactors, and cannot use triple-voltage compressor.

CONDENSER COIL OPTIONS

| COPPER-TUBE COILS WITH ENVIRO-SHIELD OPTION* | ENVIRONMENT | | | | | |
|----------------------------------------------|-------------|--------------|------------------|----------------|------------|-----------------------------|
| | Standard | Mild Coastal | Moderate Coastal | Severe Coastal | Industrial | Combined Industrial/Coastal |
| Al Fins (Standard Coils) | X | | | | | |
| Cu Fins | | | X | | | |
| Al Fins, E-Coating | | | | | X | |
| Cu Fins, E-Coating | | | | X | | X |
| Al Fins, Pre-coated | | X | | | | |

LEGEND

- Al — Aluminum
- Cu — Copper
- Enviro-Shield — Family of Coil Protection Options
- E-Coated — Epoxy coating Applied to Entire Coil Assembly
- Pre-Coated — Epoxy coating Applied to Fin Stock Material

*See "Selection Guide: Environmental Corrosion Protection" Catalog No. 811-287 for more information.

Options and accessories (cont)



40RM factory-installed options

Prepainted steel units are available from the factory for applications that require painted units. Units are painted with American Sterling Gray color.

High-capacity 4-row coils are available to provide increased latent/sensible capacities and efficiencies.

Alternate fan motors and drives are available to provide the widest possible range of performance.

40RM field-installed accessories

Discharge plenum directs the air discharge directly into the occupied space; integral horizontal and vertical louvers enable redirection of airflow. Accessory is available unpainted or painted.

Two-row hot water coils have 5/8-in. diameter copper tubes mechanically bonded to aluminum plate fins. Coils have non-ferrous headers.

One-row steam coil has 1-in. OD copper tube and aluminum fins. The Inner Distributing Tube (IDT) design provides uniform temperatures across the coil face. The steam coil has a broad operating pressure range; up to 20 psig at 260 F. IDT steam coils are especially suited to applications where sub-freezing air enters the unit.

Electric resistance heat coils have an open-wire design and are mounted in a rigid frame. Safety cutouts for high temperature conditions are standard.

Economizer (enthalpy controlled) provides ventilation air and "free" cooling if outside ambient temperature and humidity are suitable. Can also be used with CO₂ sensors to help meet indoor air quality requirements.

Return-air grille provides a protective barrier over the return-air opening and gives a finished appearance to units installed in the occupied space. Accessory is available unpainted or painted.

Subbase provides a stable, raised platform and room for condensate drain connection for floor-mounted units. Accessory is available unpainted or painted.

Overhead suspension package includes necessary brackets to support units in horizontal ceiling installations.

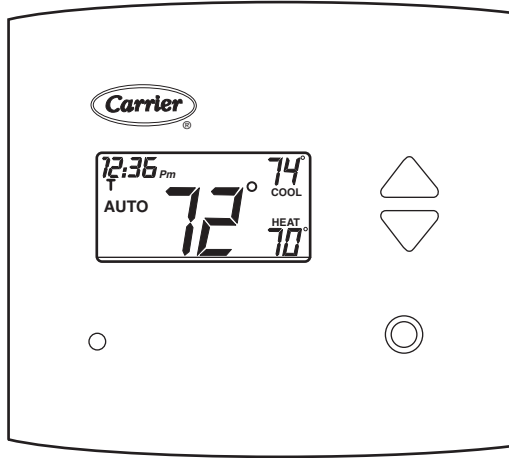
CO₂ sensors can be used in conjunction with the economizer accessory to help meet indoor air quality requirements. The sensor signals the economizer to open when the CO₂ level in the space exceeds the set point. A Carrier Comfort System programmable thermostat can also be used to override the sensor if the outside air temperature is too high or too low.

Condensate drain trap includes an overflow shutoff switch that can be wired to turn off the unit if the trap becomes plugged. The kit also includes a wire harness that can be connected to an alarm if desired. The transparent trap is designed for easy service and maintenance.

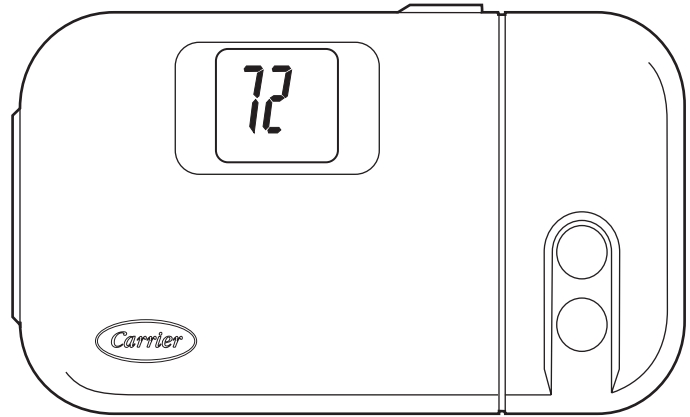
UV-C germicidal lamps kill mold and fungus, which may grow on evaporator coil and condensate pan surfaces. The use of UV-C germicidal lamps eliminates the foul odors that result from this growth of mold and fungus. It also provides a self-cleaning function for the evaporator coil and drain pan.

CARRIER CONTROLS

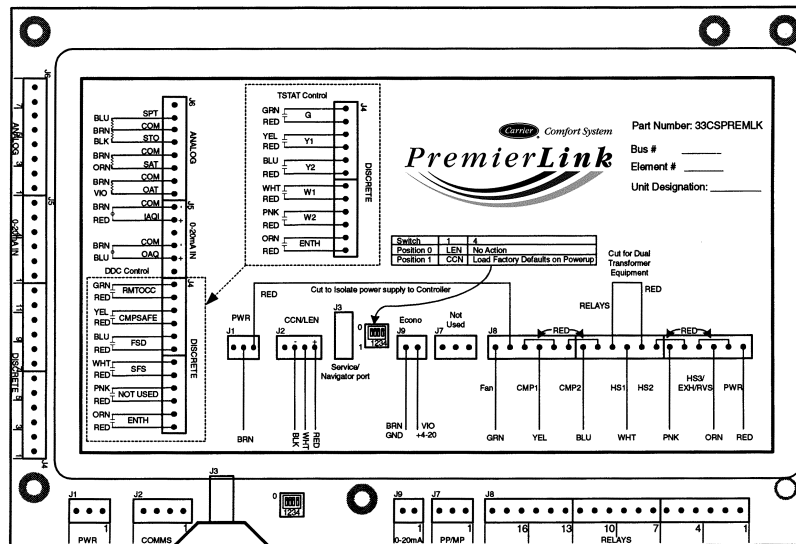
DEBONAIR® COMMERCIAL PROGRAMMABLE THERMOSTAT



COMMERCIAL ELECTRONIC THERMOSTAT



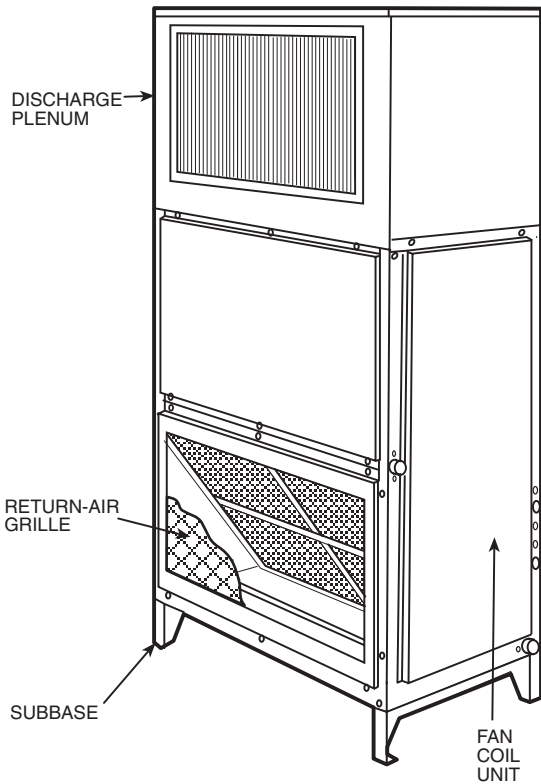
PREMIERLINK™ COMMUNICATING CONTROLS



Options and accessories (cont)



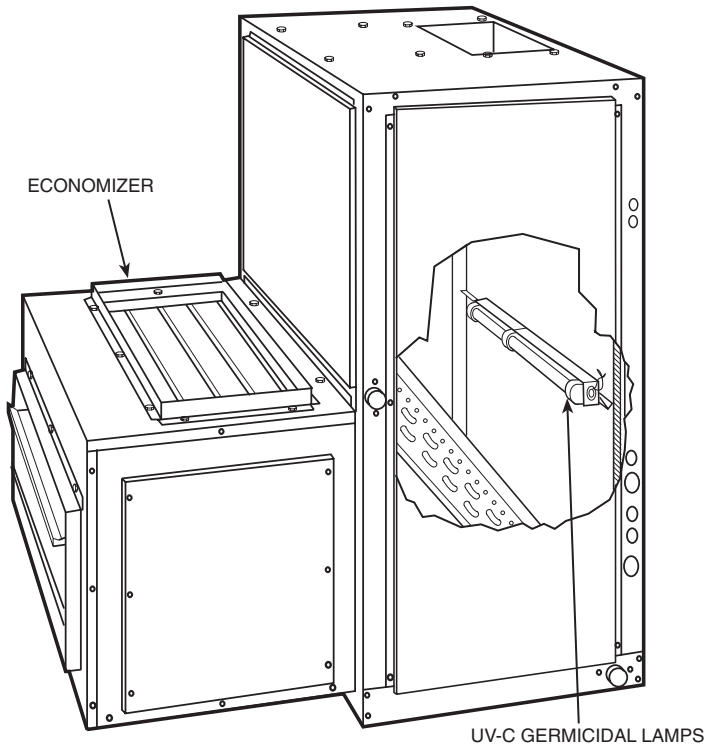
**40RM WITH DISCHARGE PLENUM,
RETURN GRILLE AND SUBBASE**



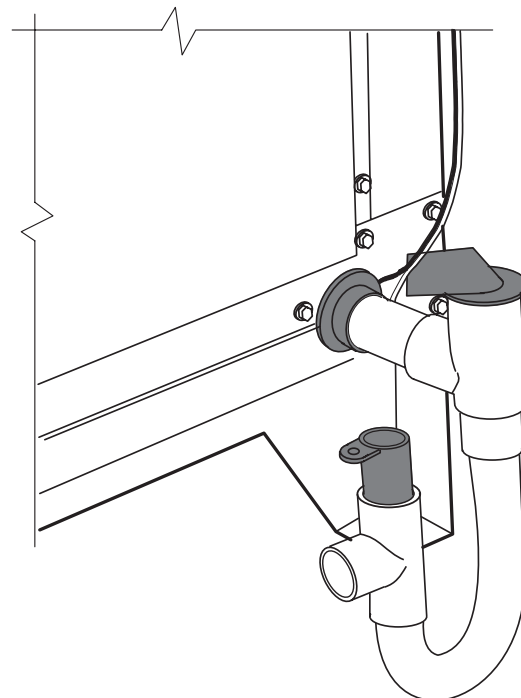
40RM WITH HOT WATER OR STEAM COIL



**40RM WITH ECONOMIZER
WITH UV-C GERMICIDAL LAMPS**



40RM WITH CONDENSATE DRAIN TRAP



Selection procedure — 38AH024-034/40RM



NOTE: See the Performance Data section for combination ratings for 38AH024-034 units and matching 40RM air handlers. If the 38AH units are matched with 39 series air handlers, use the Carrier Electronic Catalog **AHUBuilder®** software package for combination ratings. If Totaline® P702 water coolers are used, determine the performance by cross-plotting the condensing unit performance found in this book against the P702 performance in the P702 product data book. If the 38AH condensing units are matched with 2 independent 40RM units, cross-plot for performance ratings or contact Carrier Application Engineering for assistance.

I Determine cooling load, evaporator-air temperature and quantity.

Given:

| | |
|-----------------------------------------------------------|------------------|
| Total Cooling Capacity Required (TC) | 235,000 Btuh |
| Sensible Heat Capacity Required (SHC) | 185,000 Btuh |
| Temperature Air Entering Condenser (Edb) | 95 F |
| Temperature Air Entering Evaporator (db/wb) | 80 F db, 67 F wb |
| Evaporator Air Quantity. | 8000 cfm |
| External Static Pressure | 0.80 in. wg |
| Length of Interconnecting Refrigerant Piping | 30 ft (Linear) |

II Select condensing unit air-handler combination.

For this example, select a 38AH024 matched with a 40RM024. (See Combination Ratings table.) This 38AH024/40RM024 condensing unit-air handler combination provides 237,200 Btuh of total cooling capacity and 188,600 Btuh of sensible capacity at the given conditions. If other temperatures or airflow values are required, interpolate the values from the combination ratings.

III Determine sizes of liquid and suction lines.

Enter the Refrigerant Pipe Sizes table. The sizes shown are based on an equivalent length of pipe. This equivalent length is equal to the linear length of pipe indicated at the top of each sizing column, plus a 50% allowance for fitting losses. (For a more accurate determination of actual equivalent length in place of using the estimated 50% value, refer to Carrier System Design Manual.) For this example, note in the linear length column that the proper pipe size is $5/8$ in. for the liquid lines and $1\ 3/8$ in. for the suction lines.

IV Determine fan rpm and bhp (brake horsepower).

In the 40RM Fan Performance table section, enter the 40RM024 section at 8000 cfm and move to the External Static Pressure (ESP) column. Note that the conditions require 876 rpm at 4.21 bhp.

V Determine motor and drive.

Enter the Fan Motor Data tables and find that the standard motor for a 40RM024 unit is rated at 5 hp. Since the bhp required is 4.21, a standard motor satisfies the requirement and should be used.

Next, find the type of drive that satisfies the 876 rpm requirement in the Drive Data tables. For a 40RM024 unit, the Medium-Static Drive table shows an rpm range of 798 to 984. Since the rpm required is 876, the medium-static drive satisfies the requirement and should be used. Select the standard motor and medium-static drive combination (option code HC or FD).

Operating sequences

38AKS028-044 — When space thermostat calls for cooling, the no. 1 condenser fan and compressor starts after control module (CM) initial time delay of seconds. If an optional airflow switch is used, compressor and no. 1 condensing fan will not start until sufficient indoor airflow has closed the switch. After 7 seconds the compressor starts and the liquid line solenoid valve (for solenoid drop control) opens. The crankcase heater is deenergized. If the head pressure reaches 260 psig, the second condenser fan starts.

If cooling demand is low, suction pressure at the compressor drops. As the pressure drops, the compressor unloads 1 or 2 banks of cylinders as required. If cooling demand is high and 2-stage operation is used, the second step of the thermostat activates the capacity control liquid line solenoid which activates the second stage evaporator coil. The compressor cylinders load or unload in response to compressor suction pressure to meet evaporator load.

For two and a half minutes after the compressor starts, the low-pressure switch (LPS) is ignored. If the LPS trips during the first 2¹/₂ minutes of operation, the compressor remains operational. If a high-pressure switch (HPS) trips at any time, or the LPS trips after 2¹/₂ minutes, the compressor cannot restart until the 3-minute CM anti-short cycle timer expires.

As the space cooling load is satisfied, the second stage of the thermostat opens, and closes the field-supplied capacity control liquid line solenoid valve to deactivate the second stage coil. The compressor adjusts the number of active cylinders to meet the new load. When the space temperature is satisfied, the first stage of the thermostat opens and the control relay opens. This closes the solenoid drop control valve. The compressor stops and the crankcase heater is energized, preventing refrigerant from migrating to the compressor during the off cycle solenoid drop refrigerant control). The CM anti-short-cycling timer is energized and runs for approximately 3 minutes. During this time, the compressor is not able to restart.

38AH024-034 standard constant volume unit with 2-stage cooling thermostat — Seven seconds after a thermostat call for the first stage of cooling, compressor no. 1 and the outdoor fans start. The no. 2 fan only starts if the outdoor ambient temperature is above 70 F (21.1 C). The oil-pressure switch and the low-pressure switch are bypassed for the 1 and 2¹/₂ minutes, respectively. If either the low-pressure switch or oil pressure switch remain open after the delay, the unit shuts down and goes into alarm mode. The indoor-fan motor starts immediately whenever there is a call for cooling. If a liquid line solenoid valve has been installed (for refrigerant control during the off cycle), then the solenoid valve for compressor no. 1 opens immediately upon a call for cooling.

On standard units, compressor no. 1 operates either fully loaded or at one step of unloading, depending on the suction pressure, which is dependent on the evaporator load conditions.

As the cooling demand increases, the thermostat calls for the second stage of cooling. Within 7 seconds from a call for the second stage of cooling, compressor no. 2 starts. The oil switch and low-pressure switch for circuit no. 2 are bypassed during start-up.

As the cooling load is satisfied, the thermostat stops the call for the second stage of cooling, which in turn deenergizes compressor no. 2, closes the no. 2 liquid line solenoid (if installed) and energizes the compressor no. 2 crankcase heater.

If the space temperature continues to decrease, then the thermostat stops the call for the first stage of cooling, which then deenergizes compressor no. 1 and the outdoor fans, closes the no. 1 liquid line solenoid valve (if installed), and energizes the compressor no. 1 crankcase heater.

The unit controls prevent both compressors from reenergizing within 3 minutes from a previous call for operation.

If the unit safeties trip during operation, refer to the Start-Up, Installation and Service instructions.

NOTE: If the thermostat fan switch is in the auto position, the indoor fan cycles on and off as the thermostat calls for cooling (or heating). If the switch is in the continuous position, the fan runs when the outdoor unit is powered.

38AH024-034 optional variable air volume unit with ModuPanel™ control — The ModuPanel control regulates up to 10 stages of cooling to maintain a leaving-air temperature for variable air volume (VAV) applications. When connected to one 38AH condensing unit, only 6 stages are used. See the table on next page for unit loading and compressor operating sequence.

When the timeclock connected to the panel closes, the indoor-fan contactor is energized through a field-supplied relay. (The relay must be a pilot-duty SPST relay with 115-v coil and 30 va maximum coil draw.) After the time delays programmed into the ModuPanel control have elapsed, and with the leaving air above the set point, the stages of mechanical cooling are sequenced as follows:

1. Stage 1 starts compressor no. 1 with 2 banks of cylinders unloaded (¹/₃ loaded). Both unloader solenoids are energized.
2. Stage 2 loads one bank of compressor no. 1 cylinders (²/₃ loaded) by deenergizing unloader solenoid no. 1.
3. Stage 3 loads the second bank of compressor no. 1 by deenergizing unloader solenoid no. 2.
4. Stage 4 starts compressor no. 2 and unloads 2 banks of compressor no. 1 cylinders unloaded (¹/₃ loaded). Both unloader solenoids are energized.
5. Stage 5 loads one bank of compressor no. 1 cylinders (²/₃ loaded) by deenergizing unloader solenoid no. 1.
6. Stage 6 loads one bank of compressor no. 1 cylinders (fully loaded) by deenergizing unloader solenoid no. 2.



Two 38AH024-034 optional variable air volume units with a single ModuPanel™ control — The ModuPanel control regulates up to 10 stages of cooling to maintain a leaving-air temperature for variable air volume (VAV) applications. When connected to two 38AH condensing units, all 10 stages are used. See the table below for unit loading and compressor operating sequence.

When the timeclock connected to the panel closes, the indoor-fan contactor is energized through a field-supplied relay. (The relay must be a pilot-duty SPST relay with 115-v coil and 30 va maximum coil draw.) After the time delays programmed into the ModuPanel control have elapsed, and with the leaving air above the set point, the stages of mechanical cooling are sequenced as follows:

1. Stage 1 starts unit no. 1 compressor no. 1 with 2 banks of cylinders unloaded ($1/3$ loaded). Both unloader solenoids are energized.
2. Stage 2 loads one bank of unit no. 1 compressor no. 1 cylinders ($2/3$ loaded) by deenergizing unloader solenoid no. 1.
3. Stage 3 turns off unit no. 1 compressor no. 1 and starts compressor no. 2 fully loaded.
4. Stage 4 starts unit no. 1 compressor no. 1 with 2 banks of cylinders unloaded ($1/3$ loaded). Both unloader solenoids are energized.
5. Stage 5 loads one bank of unit no. 1 compressor no. 1 cylinders ($2/3$ loaded) by deenergizing unloader solenoid no. 1.
6. Stage 6 loads one bank of unit no. 1 compressor no. 1 cylinders (fully loaded) by deenergizing unloader solenoid no. 2.

7. Stage 7 starts unit no. 2 compressor no. 1 with 2 banks of cylinders unloaded ($1/3$ loaded). Both unloader solenoids are energized.
8. Stage 8 turns off unit no. 2 compressor no. 1 and starts compressor no. 2 fully loaded.
9. Stage 9 starts unit no. 2 compressor no. 1 with 2 banks of cylinders unloaded ($1/3$ loaded). Both unloader solenoids are energized.
10. Stage 10 loads 2 banks of unit no. 2 compressor no. 1 cylinders (fully loaded) by deenergizing both unloader solenoids.

Restart — Manual reset of the 24-v control circuit is required if unit is shut down by any of the safety devices. Applicable devices include the high pressure switch (HPS), low-pressure switch (LPS), oil-pressure switch (OPS), and compressor overtemperature protection (COTP) switch. To restart the unit after the unit has been shut down, raise the thermostat set point above the space temperature (thereby removing the call for cooling) and then lower the set point back to the desired setting.

If unit circuit breakers trip during unit shutdown, they must be reset manually.

Causes of complete unit shutdown:

- interruption of supplied power
- open compressor overtemperature protection (COTP)
- compressor electrical overload protection (CB1 or CB2)
- open high-pressure or low-pressure safety switches
- open oil pressure switch

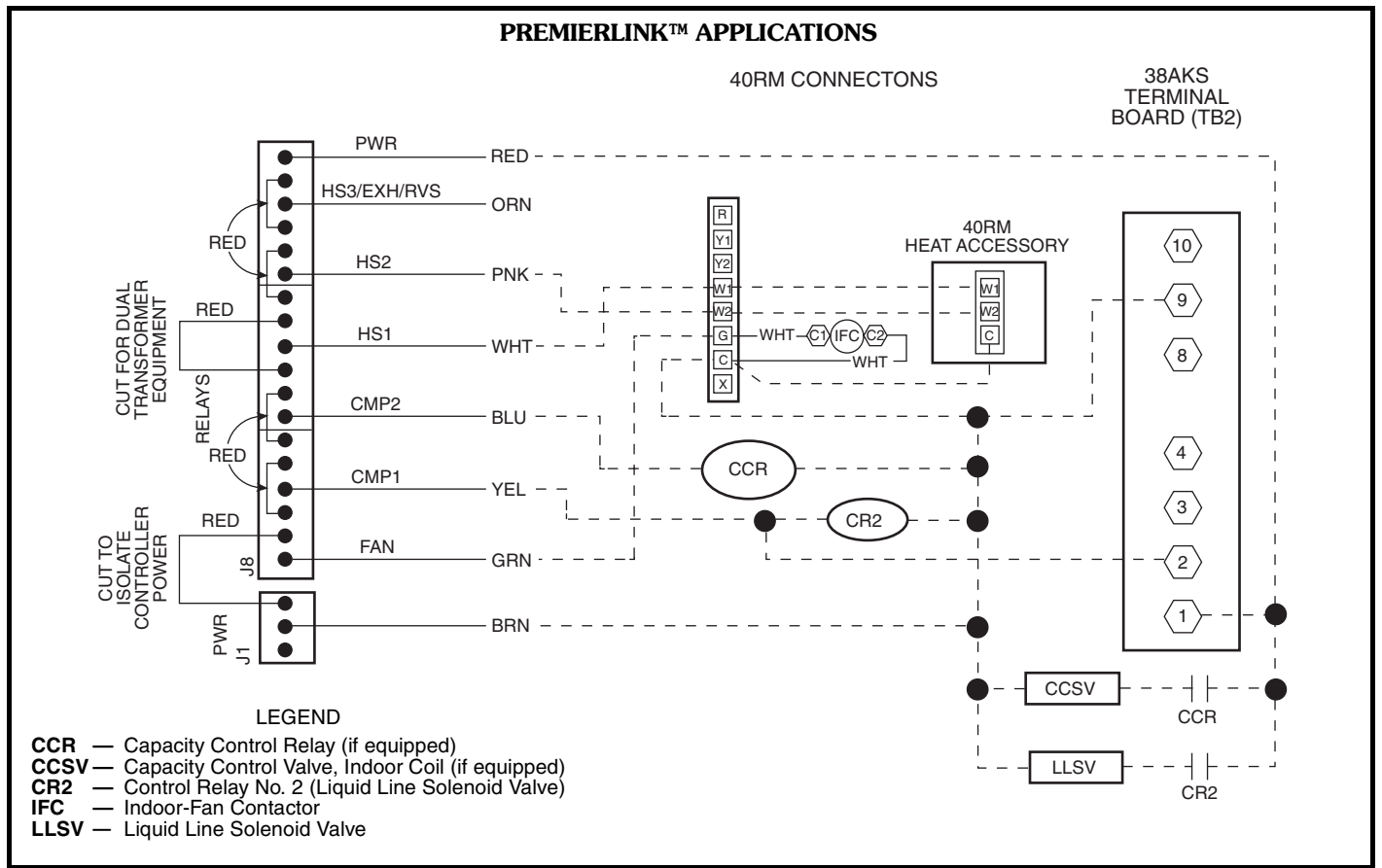
38AH UNIT LOADING SEQUENCE WITH MODUPANEL CONTROL

| STAGE | NO. CYLINDERS | LOADED CYLINDERS | | CAPACITY STEP (%) |
|-------|---------------|------------------|------------------|-------------------|
| | | Compressor No. 1 | Compressor No. 2 | |
| 1 | 2 | 2 | — | 17 |
| 2 | 4 | 4 | — | 33 |
| 3 | 6 | 6 | — | 50 |
| 4 | 8 | 2 | 6 | 67 |
| 5 | 10 | 4 | 6 | 83 |
| 6 | 12 | 6 | 6 | 100 |

LOADING SEQUENCE, TWO 38AH CONDENSING UNITS WITH MODUPANEL CONTROL

| STAGE | NO. CYLINDERS | UNIT 1 LOADED CYLINDERS | | UNIT 2 LOADED CYLINDERS | | CAPACITY STEP (%) |
|-------|---------------|-------------------------|------------------|-------------------------|------------------|-------------------|
| | | Compressor No. 1 | Compressor No. 2 | Compressor No. 1 | Compressor No. 2 | |
| 1 | 2 | 2 | — | — | — | 8 |
| 2 | 4 | 4 | — | — | — | 17 |
| 3 | 6 | — | 6 | — | — | 25 |
| 4 | 8 | 2 | 6 | — | — | 33 |
| 5 | 10 | 4 | 6 | — | — | 41 |
| 6 | 12 | 6 | 6 | — | — | 50 |
| 7 | 14 | 6 | 6 | 2 | — | 58 |
| 8 | 18 | 6 | 6 | — | 6 | 75 |
| 9 | 20 | 6 | 6 | 2 | 6 | 83 |
| 10 | 24 | 6 | 6 | 6 | 6 | 100 |

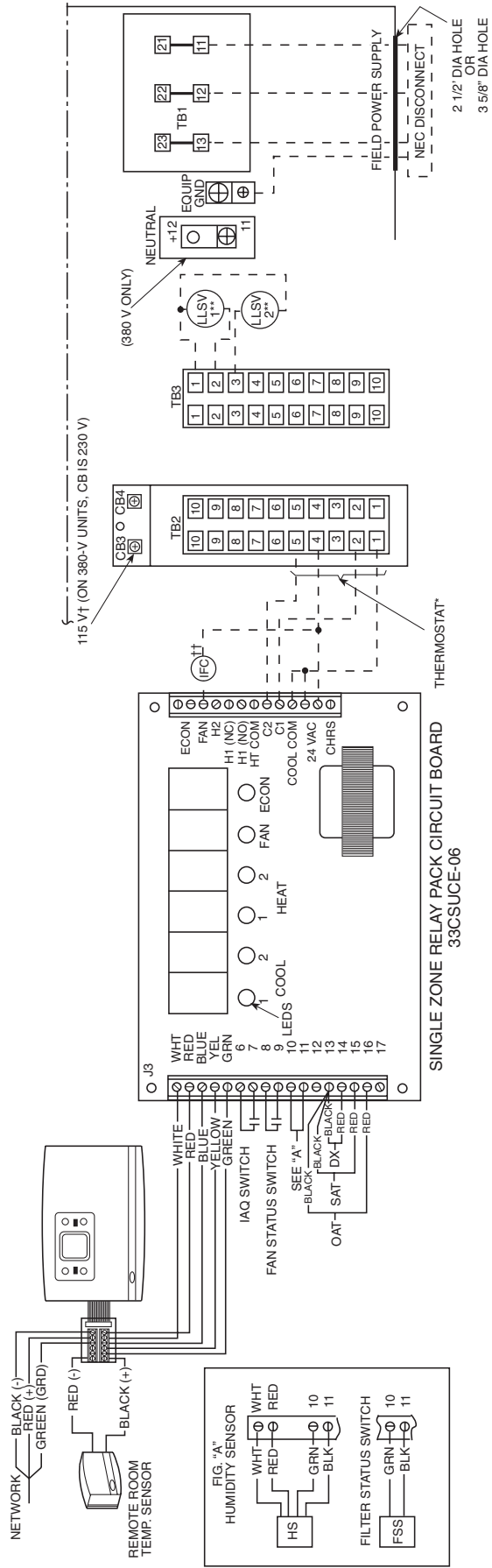
Controls (cont)



Typical control wiring



38AH024-034 UNITS WITH SINGLE AIR HANDLER



LEGEND

- CB — Circuit Breaker
- COM — Common
- DX — Direct Expansion
- EQUIP — Equipment
- GND — Ground
- IAQ — Indoor-Air Quality
- IFC — Indoor-Fan Contactor
- LLSV — Liquid Line Solenoid Valve
- NEC — National Electrical Code
- OAT — Outdoor-Air Thermistor
- SAT — Supply-Air Thermistor
- TB — Terminal Block
- Field Control Wiring
- Factory Wiring
- Field Power Wiring

*Use thermostat wiring shown here for single air-handler applications.
 †CB3 protects control circuit at the following unit voltages:

| CONTROL CIRCUIT PROTECTED AT: (V-Ph-Hz) | UNIT (V-Ph-Hz) |
|--------------------------------------------|--------------------------------------|
| 115-1-60 | 208/230-3-60 460-3-60 575-3-60 |
| 230-1-60 | 380-3-60 |

**For a single air handler, LLSV valve 1 is to be used on the lower (no. 1) evaporator circuit. The LLSV valve 2 is to be used on the upper (no. 2) evaporator circuit.
 ††Only one indoor-fan contactor is required on single air-handler applications. Use Carrier accessory part no. 40RR900181 for indoor-fan contactor.

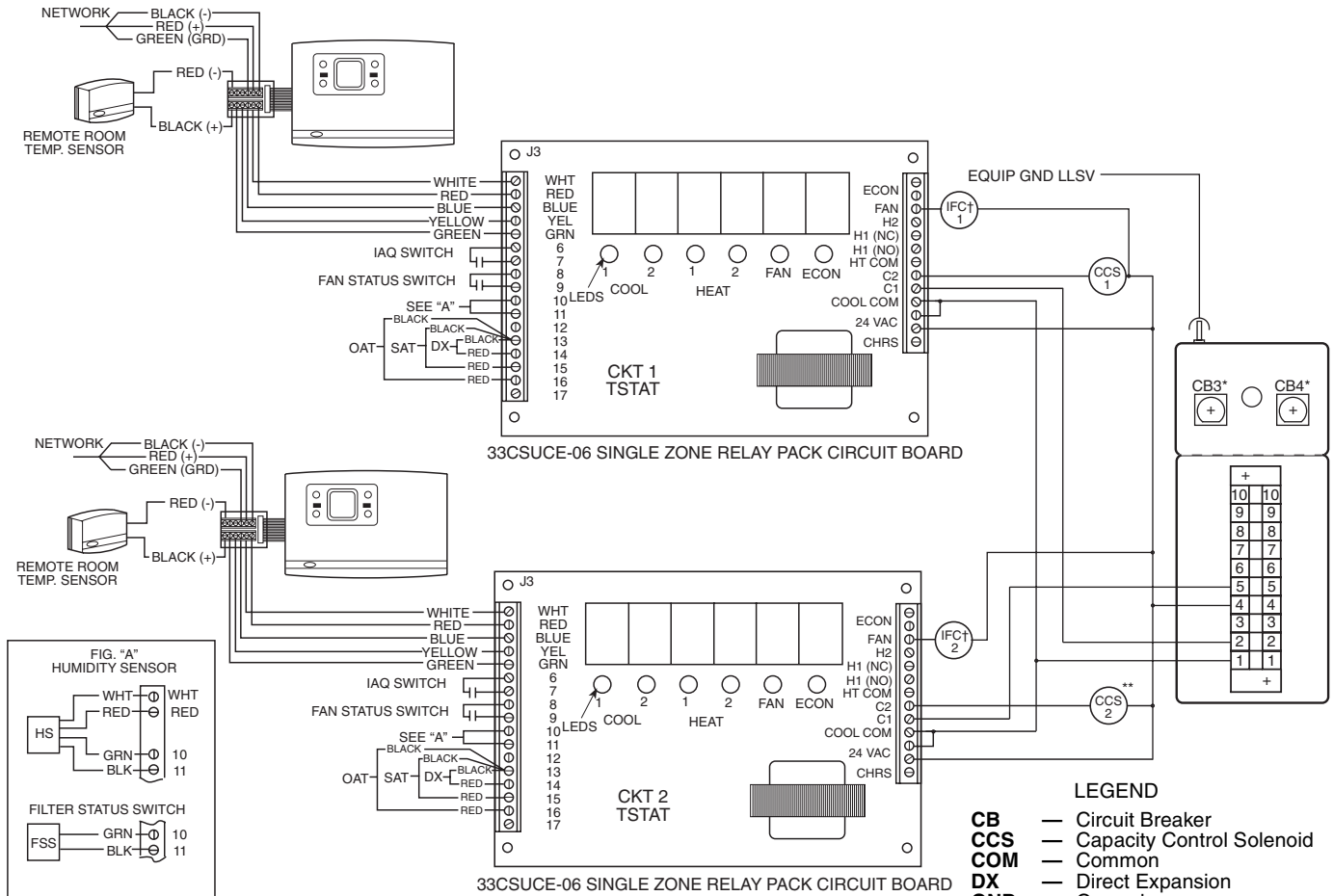
NOTES:

1. CB4 protects TB2 circuit; CB3 protects TB3 circuits.
2. LLSV1 and LLSV2 are field supplied.
3. On the Single Zone Relay Pack, the outside-air sensor, supply-air sensor, and direct expansion coil sensor are available as options.
4. TB2 is 24 v and TB3 is 115 v.

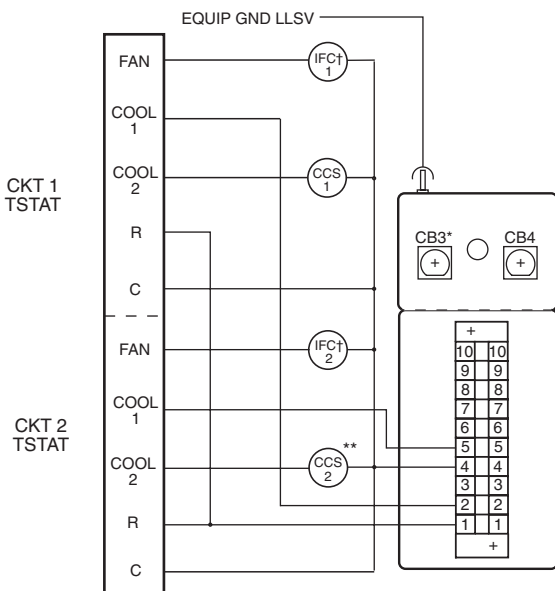
Typical control wiring (cont)



38AH024-034 UNITS WITH 2 AIR HANDLERS THERMOSTAT WIRING



OPTIONAL WIRING TO FACILITATE CONNECTION TO OTHER CONTROL DEVICES



*CB3 protects control circuit as follows:

| CONTROL CIRCUIT PROTECTED AT: (V-Ph-Hz) | UNIT (V-Ph-Hz) |
|--------------------------------------------|----------------|
| 115-1-60 | 208/230-3-60 |
| | 460-3-60 |
| | 575-3-60 |
| 230-1-60 | 380-3-60 |

†Use Carrier accessory part no. 40RR900181 for indoor-fan contactor.
**Do not install CCS2 unless accessory unloader is field-installed on circuit no. 2 compressor.

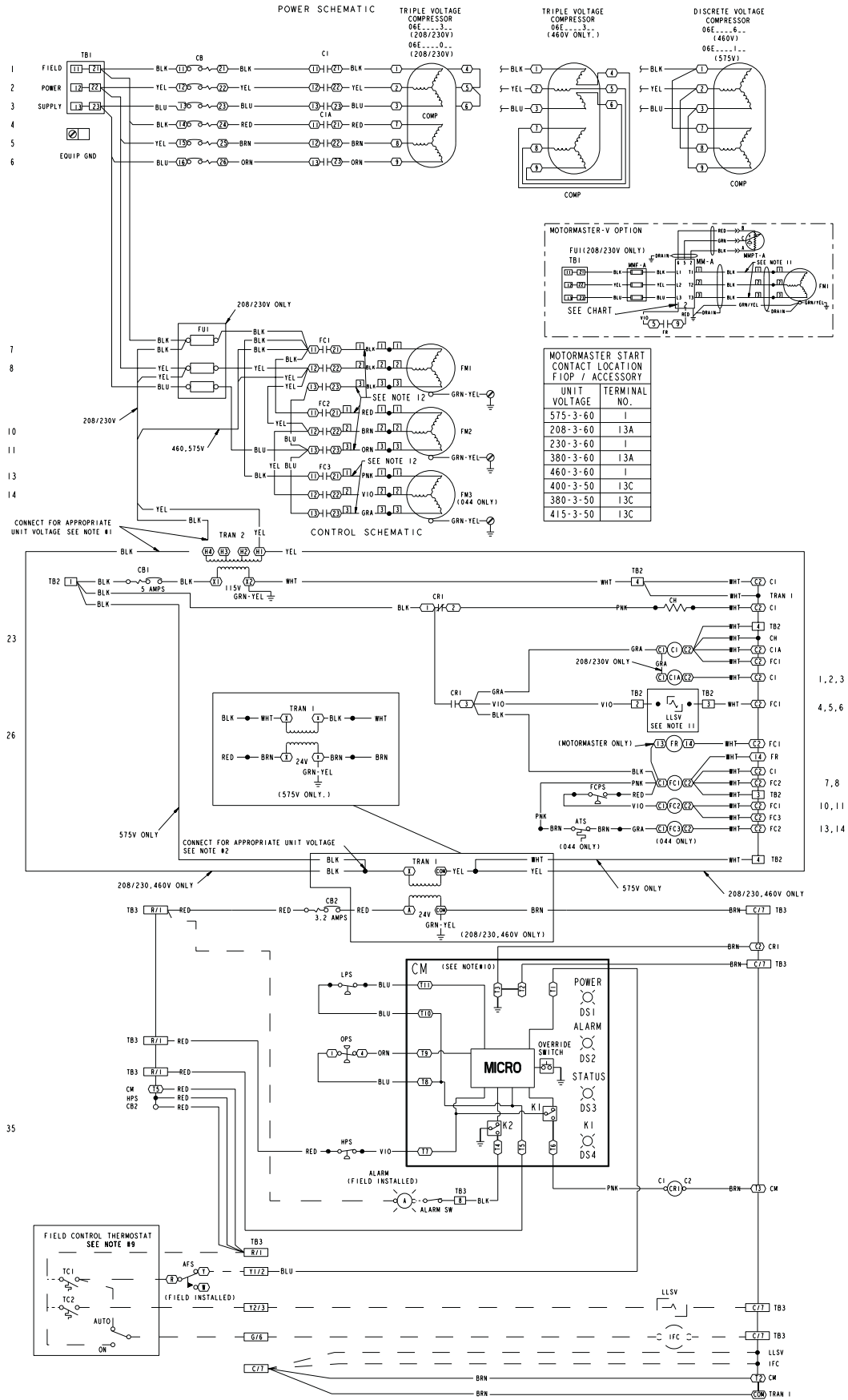
NOTES:

1. Capacity control solenoid (and liquid line solenoid drop refrigerant control) valves are field supplied.
2. On the 33CSUCE-06 Relay Pack, the outside-air sensor, supply-air sensor, and direct expansion coil sensor are available as options.
3. 33CSUCE-06 relay pack requires 10 va.
4. Install LLS valve no. 1 in the liquid line of the air handler controlled by the 38AH circuit no. 1 thermostat. Install LLS valve no. 2 in the liquid line of the air handler controlled by the 38AH circuit no. 2 thermostat. The LLS valves are field supplied. Wire LLS for circuit 1 to TB3 terminals 1 and 2. Wire LLS for circuit 2 to TB3 terminals 1 and 3.

Typical wiring schematic



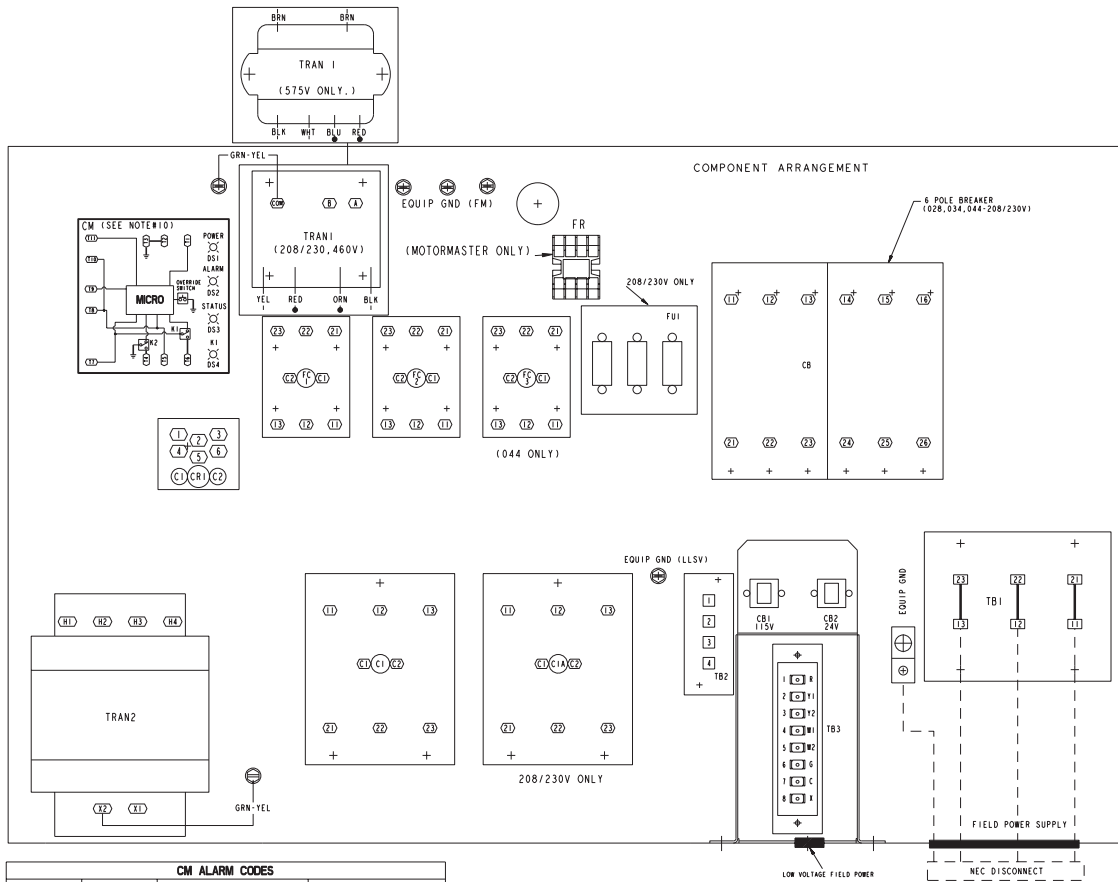
38AKS028-044



Typical wiring schematic (cont)



38AKS028-044 (cont)



| CM ALARM CODES | | | | |
|----------------|--------------------|---------------|----------------|---------------------|
| LED | NUMBER OF BLINKS * | ON TIME (sec) | OFF TIME (sec) | STATUS |
| DS1 POWER LED | 1 | 1/4 | 1/4 | NORMAL OPERATION |
| | | STEADY | | LOCKOUT STATE |
| DS2 ALARM LED | | STEADY | I | HPS OR COTP OPEN |
| | 1 | 1/4 | I | LPS OPEN |
| | 2 | 1/4 | I | OPS OPEN |
| DS3 STATUS LED | 3 | 1/4 | I | LPS/OPS OPEN |
| | | STEADY | STEADY | NO CALL FOR COOLING |
| DS4 "KI" LED | | STEADY | 1/4 | COOLING |
| | 1 | 1/4 | 1/4 | 3 MIN. CMP DELAY |
| | | STEADY | | RELAY KI CLOSED |

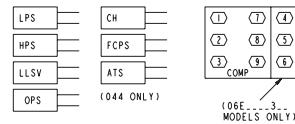
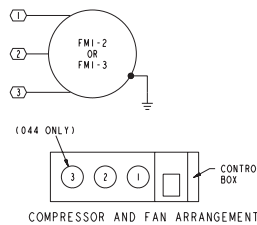
* - MULTIPLE BLINKS ARE A SERIES OF ON/OFF FLASHES OF EQUAL DURATION FOLLOWED BY 1 SECOND OFF.

NOTES:

- CONNECT TRAN2 TO TERMINAL H3 FOR 230V, H4 FOR 460V, AND H2 FOR 575V UNITS. IF 208/230V UNITS ARE RUN WITH A 208V POWER SUPPLY CONNECT TO TERMINAL H2.
- CONNECT TRAN1 TO ORN LEAD FOR 230V, BLK LEAD FOR 460V, AND WHT LEAD FOR 575V UNITS. IF 208/230V UNITS ARE RUN WITH A 208V POWER SUPPLY CONNECT TO RED LEAD.
- COMPRESSOR & FAN MOTORS THERMALLY PROTECTED, THREE PHASE MOTORS PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
- REPLACEMENT OF ORIGINAL WIRES MUST BE WITH TYPE 90°C WIRE OR ITS EQUIVALENT.
- LINE # INDICATES LOCATION OF CONTACTS: # SIGNIFIES SINGLE POLE DOUBLE THROW CONTACTS; # SIGNIFIES A NORMALLY CLOSED CONTACT; # SIGNIFIES A NORMALLY OPEN CONTACT.
- FACTORY WIRING IS IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE (NEC).
- WIRING FOR FIELD POWER SUPPLY MUST BE IN COMPLIANCE WITH ALL APPLICABLE CODES. FIELD MODIFICATIONS OR ADDITIONS MUST BE IN COMPLIANCE WITH ALL APPLICABLE CODES.
- TERMINALS G/6, Y/2/3 & C/7 OF TB3 ARE FOR CLASS 2 (24V) FIELD EXTERNAL INTERLOCK CONNECTIONS. CLASS 1 FIELD INTERLOCK CONTACTS MUST HAVE MINIMUM RATING OF 180 VA, 220V, 50/60HZ PILOT DUTY. CLASS 2 FIELD INTERLOCK CONTACTS MUST HAVE MINIMUM RATING OF 70 VA, 24V, 50/60HZ PILOT DUTY.
- THERMOSTAT FOR STANDARD UNITS: HHO1AD042, HHO7AT172 & HHO7AT174. SUBBASE: HH93AZ042, HH93AZ176 & HH93AZ180.
- CONTROL MODULE INTERNAL ILLUSTRATED TO INDICATE COMPONENTS ORIENTATIONAL SEQUENCE. ALL ITEMS ILLUSTRATED ARE THEORETICALLY REPRESENTED AS INTERNAL TO COMPONENT.
- THE FACTORY SUPPLIED LSVW CONTROL IS SHIPPED WITH THE 38AKS UNIT BUT FIELD INSTALLED AT THE INDOOR UNIT.
- TO CHANGE FAN ROTATION, INTERCHANGE FAN MOTOR CONNECTIONS 1 & 3.

LEGEND

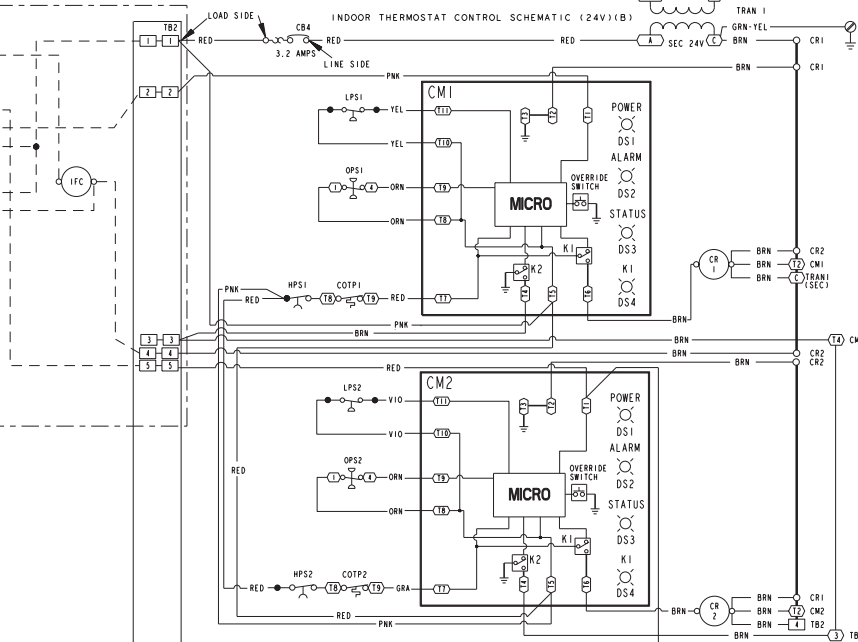
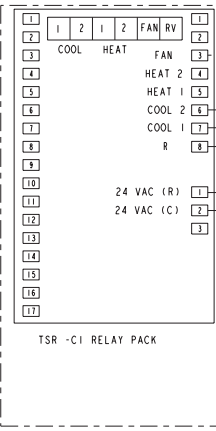
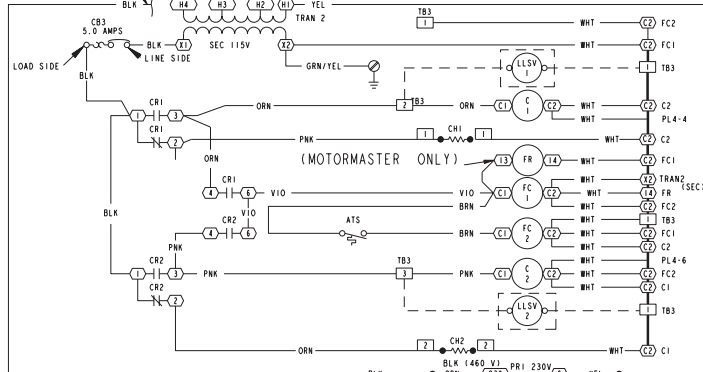
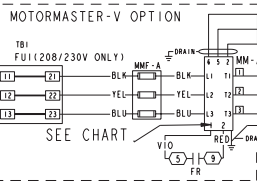
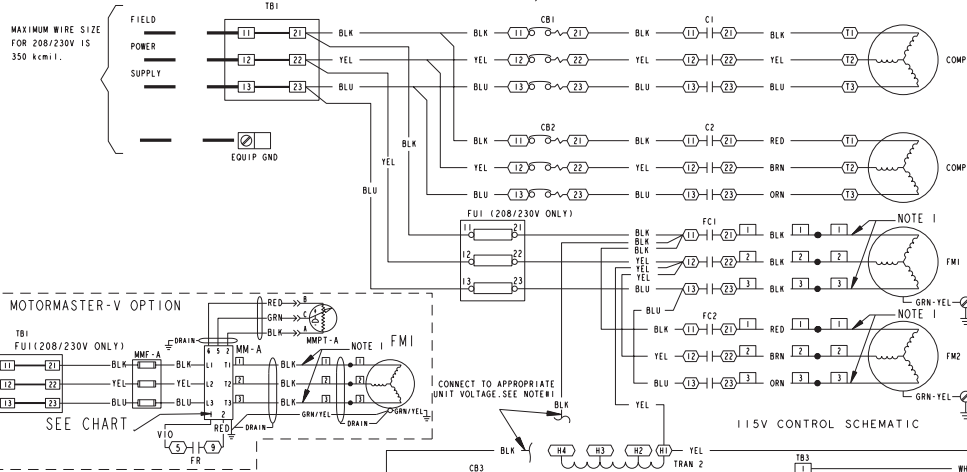
- AFS AIR FLOW SWITCH
- ATS AIR TEMPERATURE SWITCH
- BPR BYPASS RELAY
- C CONTACTOR, COMPRESSOR
- CB CIRCUIT BREAKER
- CH CRANKCASE HEATER
- CM CONTROL MODULE
- COMP COMPRESSOR
- CR CONTROL RELAY
- EQUIP EQUIPMENT
- FC FAN CONTACTOR
- FCPS FAN CYCLING PRESSURE SWITCH
- FM FAN MOTOR
- FR FAN RELAY
- FU FUSE
- GND GROUND
- HPS HIGH PRESSURE SWITCH
- LLSV LIQUID LINE SOLENOID VALVE
- LPS LOW PRESSURE SWITCH
- OPS OIL PRESSURE SWITCH
- TC THERMOSTAT-COOLING
- TRANS TRANSFORMER
- TERMINAL BLOCK CONNECTION
- MARKED TERMINAL
- UNMARKED TERMINAL
- MARKED SPLICE
- UNMARKED SPLICE
- FACTORY WIRE
- FIELD CONTROL WIRING
- FIELD POWER WIRING
- INDICATES COMMON POTENTIAL DOES NOT REPRESENT WIRING



38AH024-034

POWER SCHEMATIC
208/230V, 460-3-60

NOTES:
1. TO CHANGE FAN ROTATION, INTERCHANGE FAN MOTOR CONNECTIONS 1 & 3.



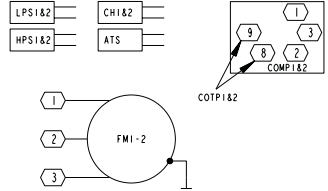
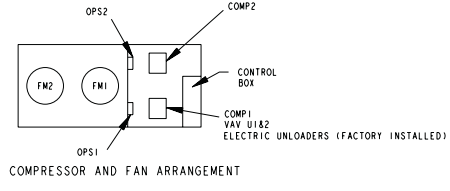
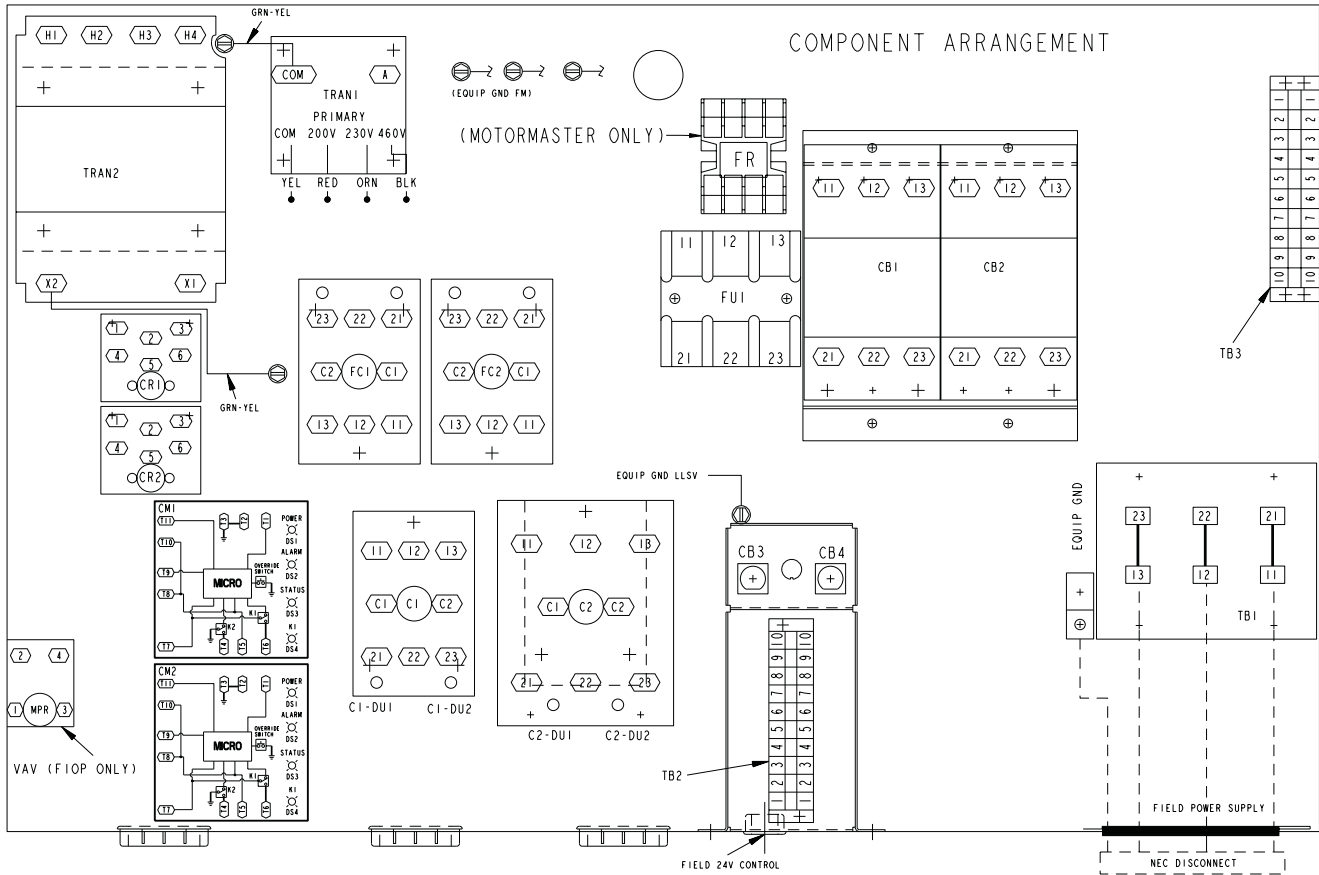
FACTORY INSTALLED VAV WIRING
SEE MODUPANEL™ ACCESSORY INSTALLATION FOR SCHEMATIC

Typical wiring schematic (cont)



38AH024-034 (cont)

COMPONENT ARRANGEMENT



- NOTES:**
1. FOR TRANS 2 FOR 208/230V CONNECT TO H3. FOR 460V CONNECT TO H4.
 2. TRANS 1 CONNECTED TO ORANGE LEAD FOR 208/230V AND TO BLK FOR 460V.
 3. COMPRESSOR & FAN MOTORS THERMALLY PROTECTED. THREE PHASE MOTORS PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
 4. REPLACEMENT OF ORIGINAL WIRES MUST BE WITH TYPE 90° WIRE OR ITS EQUIVALENT.
 5. FACTORY WIRING IS IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE (NEC). FIELD MODIFICATIONS OR ADDITIONS MUST BE IN COMPLIANCE WITH ALL APPLICABLE CODES.
 6. WIRING FOR FIELD POWER SUPPLY MUST BE RATED 75°C. USE COPPER, COPPER-CLAD ALUMINUM OR ALUMINUM CONDUCTORS.
 7. V.A. AVAILABLE TB2 IS 140A
 8. FUI (208-230V ONLY)

| CM ALARM CODES | | | | |
|-----------------------|--------------------|------------|--------|---------------------|
| LED | NUMBER OF BLINKS * | TIME (sec) | | STATUS |
| | | ON | OFF | |
| DS1 POWER LED | | | | |
| | 1 | 1/4 | 1/4 | NORMAL OPERATION |
| | | STEADY | | LOCKOUT STATE |
| DS2 ALARM LED | | | | |
| | | STEADY | | HPS OR COTP OPEN |
| | 1 | 1/4 | 1 | LPS OPEN |
| | 2 | 1/4 | 1 | OPS OPEN |
| | 3 | 1/4 | 1 | LPS/OPS OPEN |
| DS3 STATUS LED | | | | |
| | | | STEADY | NO CALL FOR COOLING |
| | | | | COOLING |
| | 1 | 1/4 | 1/4 | 3 MIN. CMP DELAY |
| DS4 "KI" LED | | | | |
| | | | STEADY | RELAY K1 CLOSED |

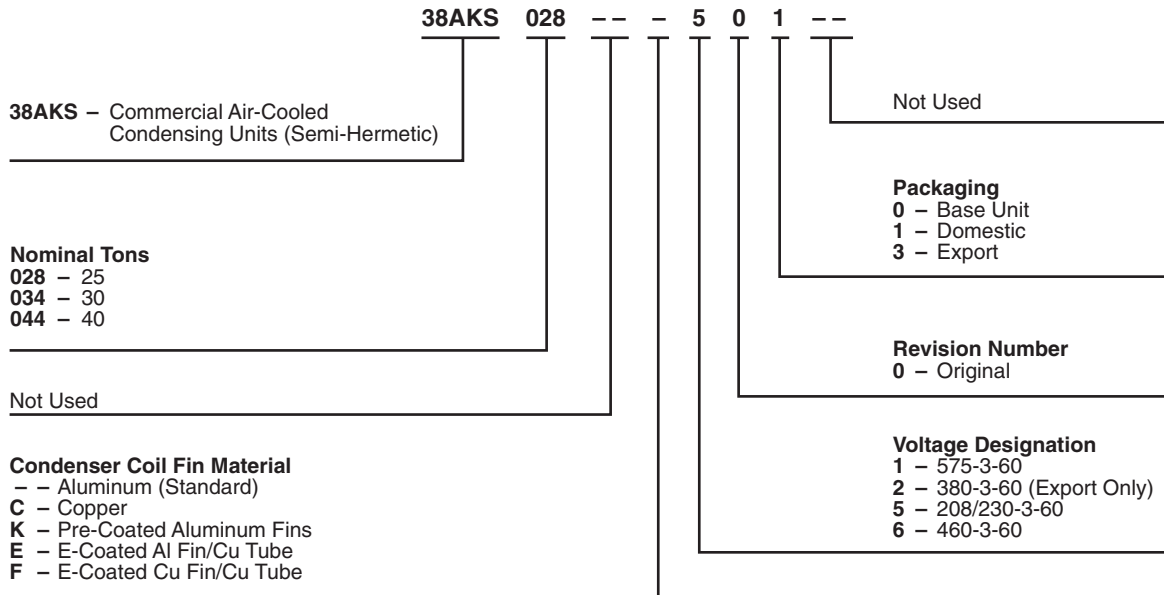
* - MULTIPLE BLINKS ARE A SERIES OF ON/OFF FLASHES OF EQUAL DURATION FOLLOWED BY 1 SECOND OFF.

- ATS** — Air Temperature Switch
C — Contactor, Compressor
CB — Circuit Breaker
CH — Crankcase Heater
CM — Control Module
COMP — Compressor
COTP — Compressor Overtemperature Protection
CR — Control Relay
EQUIP — Equipment
FC — Fan Contactor
FM — Fan Motor
FR — Fan Relay
FU — Fuseblock
GND — Ground
HPS — High-Pressure Switch
IFC — Indoor-Fan Contactor
LLSV — Liquid Line Solenoid Valve
LPS — Low-Pressure Switch
MPR — ModuPanel™ Relay
OPS — Oil Pressure Switch
PL — Plug Assembly
TB — Terminal Block

LEGEND

- TRAN** — Transformer
U — Unloader
VAV — Variable Air Volume
 Plug
 Receptacle
 Terminal Block Connection
 Marked Terminal
 Unmarked Terminal
 Marked Splice
 Unmarked Splice
 Factory Wiring
 Field Control Wiring
 Field Power Wiring
 Indicates Common Potential, Does Not Represent Wiring

Model number nomenclature — 38AKS units



LEGEND
 Al — Aluminum
 Cu — Copper

Quality Assurance

Certified to ISO 9001:2000

38AKS028-044

Physical data



38AKS028-044 UNITS

38AKS028-044

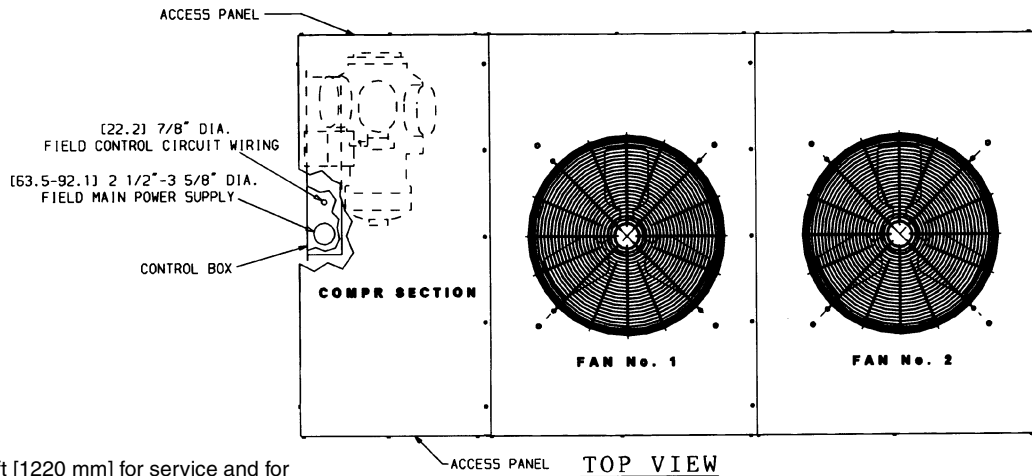
| UNIT 38AKS | 028 | 034 | 044 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------|-------------------------------|
| NOMINAL CAPACITY (tons) | 25 | 30 | 40 |
| OPERATING WEIGHTS (lb) With Aluminum-Fin Coils (standard) With Copper-Fin Coils (optional) | 1650 1804 | 1803 2009 | 2437 2745 |
| REFRIGERANT* Operating Charge, Typical (lb)† Shipping Charge (lb) | 30.5 3 | R-22 43.5 4 | 65.0 5 |
| COMPRESSOR Qty...Model Oil Charge (pt) No. Cylinders Speed (rpm) Capacity Steps (%) Unloader Setting (psig) Unloader No. 1 Load Unloader No. 1 Unload Unloader No. 2 Load Unloader No. 2 Unload Crankcase Heater Watts | 1...06E9265 20 6 | Reciprocating, Semi-Hermetic 1...06E9275 20 6 1750 100, 66, 33 76 58 78 60 180 | 1...06E9299 19 6 |
| CONDENSER FANS Qty...Rpm Diameter (in.) Nominal Hp Nominal Airflow (cfm total) Watts (total) | 1490 | Propeller Type — Direct Drive 2...1140 30 1.0 15,700 1750 | 3...1140 1520 |
| CONDENSER COIL Rows...Fins/in. Face Area (sq ft) Storage Capacity (lb)** | 2...19 39.2 37.7 | Enhanced Copper Tubes, Lanced Aluminum Fins 3...17 39.2 56.6 | 3...17 58.4 84.4 |
| CONTROLS Pressurestat (psig) High-Pressure Open Close Low-Pressure Open Close Oil Pressure (psi) Open Close | | 426 ± 7 320 ± 20 27 ± 3 44 ± 5 6.2 9.0 | |
| FAN CYCLING CONTROLS Operating Pressure (psig) No. 2 Fan, Close Open | | 255 ± 10 160 ± 10 | |
| PRESSURE RELIEF Location Temperature (F) | | Fusible Plug Liquid and Suction Line 210 | |
| PIPING CONNECTIONS (in. ODM) Suction Liquid Hot Gas Stub | 1 ⁵ / ₈ | 2 ¹ / ₈ 7 ⁷ / ₈ 5 ⁵ / ₈ | 2 ¹ / ₈ |

*Unit is factory-supplied with holding charge only.

†Typical operating charge with 25 ft of interconnected piping. Operating charge is approximate for maximum system capacity.

**Storage capacity is 80% full at liquid saturated temperature of 125 F.

38AKS028, 034



NOTES:

1. There must be 4 ft [1220 mm] for service and for unrestricted airflow on all sides of unit.
2. There must be minimum 8 ft [2440 mm] clear air space above unit.
3. The approximate operating weight of the unit is:

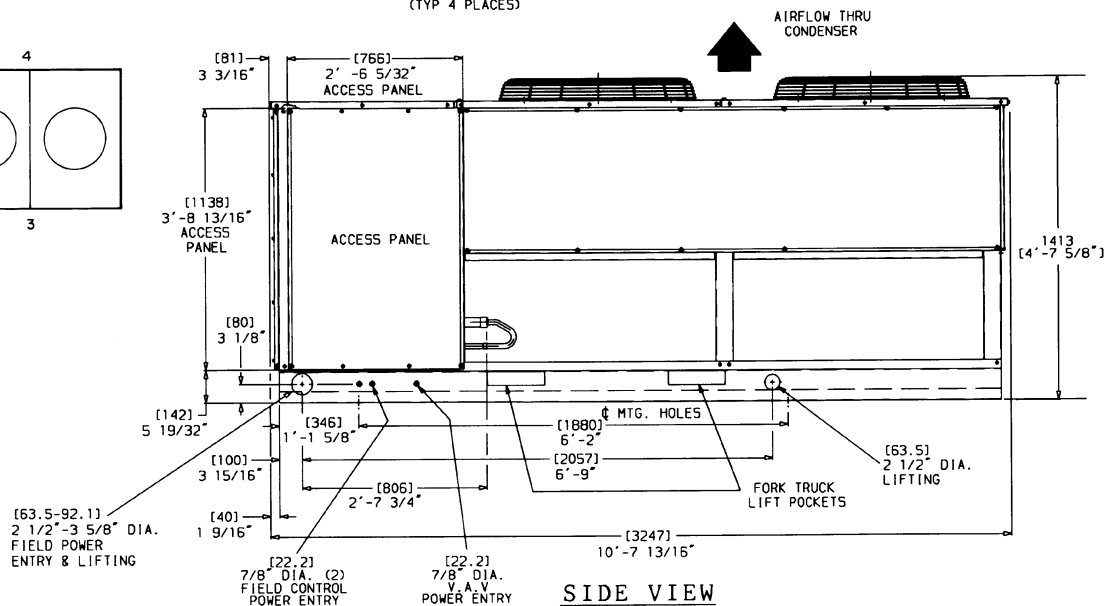
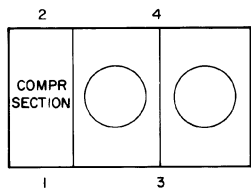
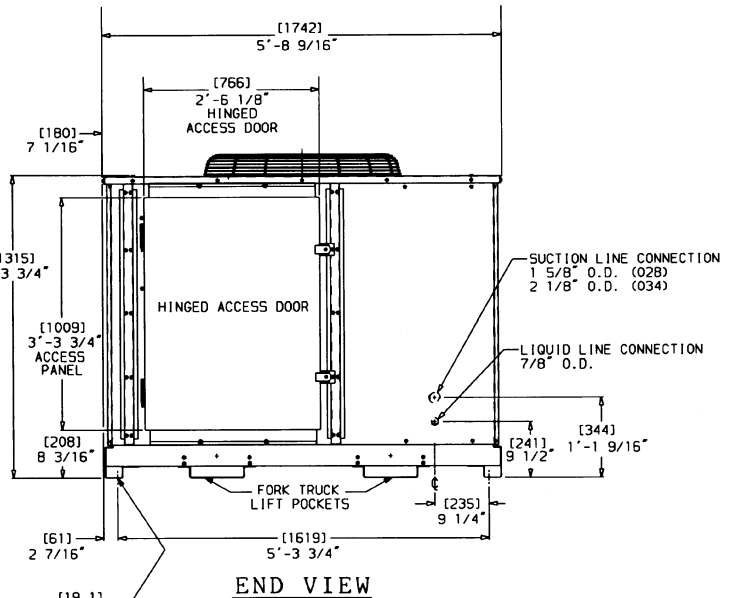
| UNIT 38AKS | WEIGHT (lb) | WEIGHT (kg) |
|---------------|----------------|----------------|
| 028 | 1650 | 748 |
| 028C | 1804 | 818 |
| 034 | 1803 | 818 |
| 034C | 2009 | 911 |

NOTE: A "C" in model number indicates unit has optional factory-installed copper-fin coil.

**APPROX. OPER. WT (lb)
AT SUPPORT POINTS***

| UNIT 38AKS | 1 | 2 | 3 | 4 | TOTAL |
|---------------|-----|-----|-----|-----|-------|
| 028 | 418 | 626 | 242 | 364 | 1650 |
| 034 | 459 | 673 | 272 | 399 | 1803 |

*Standard copper tube aluminum-fin coil.



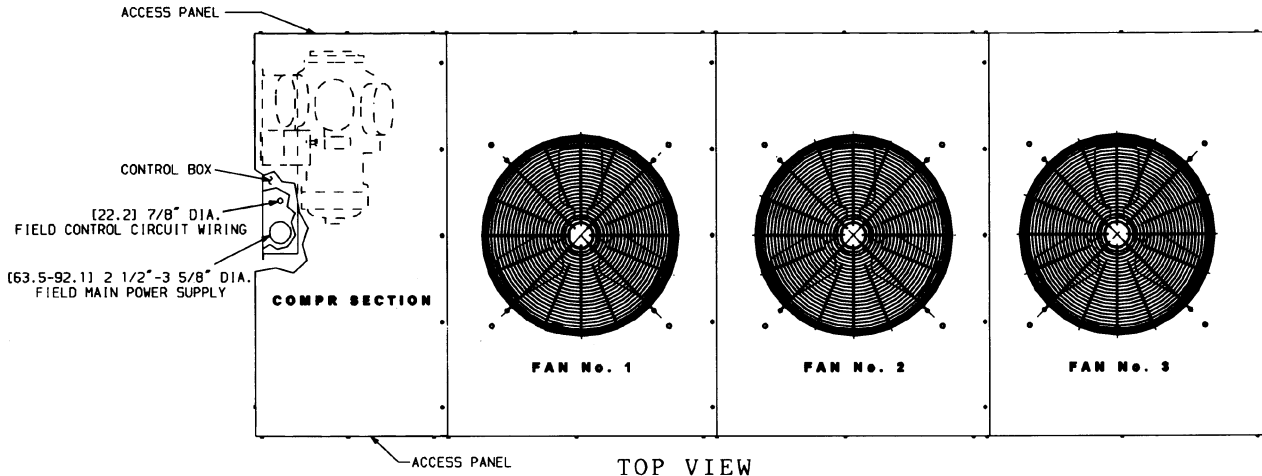
38AKS028-044

Dimensions (cont)



38AKS028-044

38AKS044



NOTES:

1. There must be 4 ft [1220 mm] for service and for unrestricted airflow on all sides of unit.
2. There must be minimum 8 ft [2440 mm] clear air space above unit.
3. The approximate operating weight of the unit is:

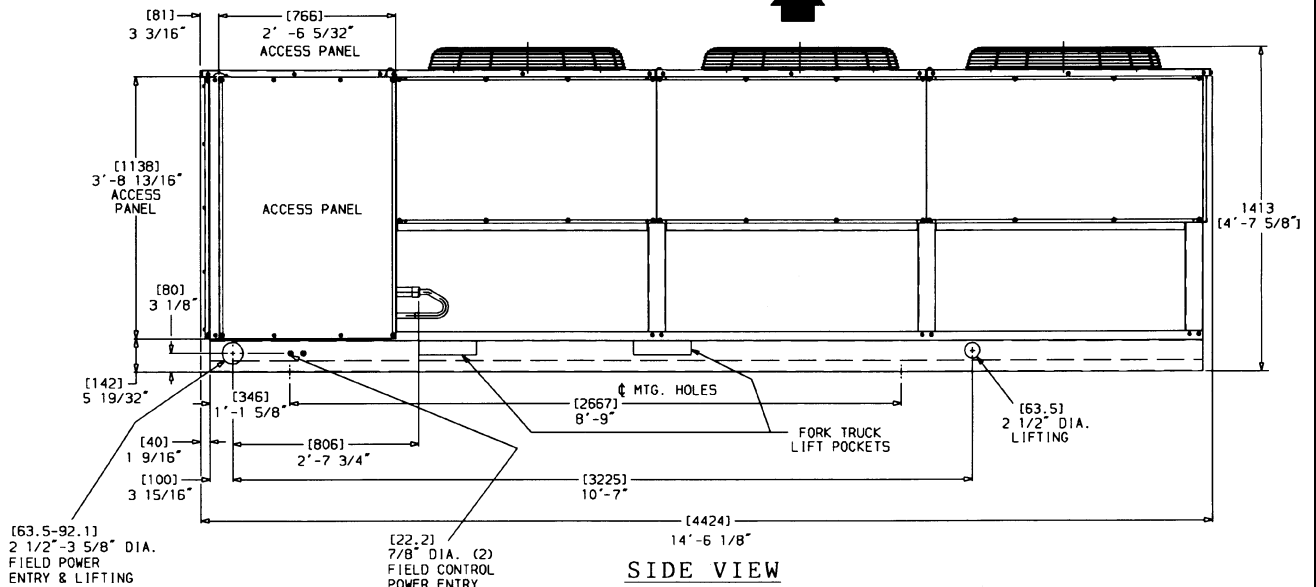
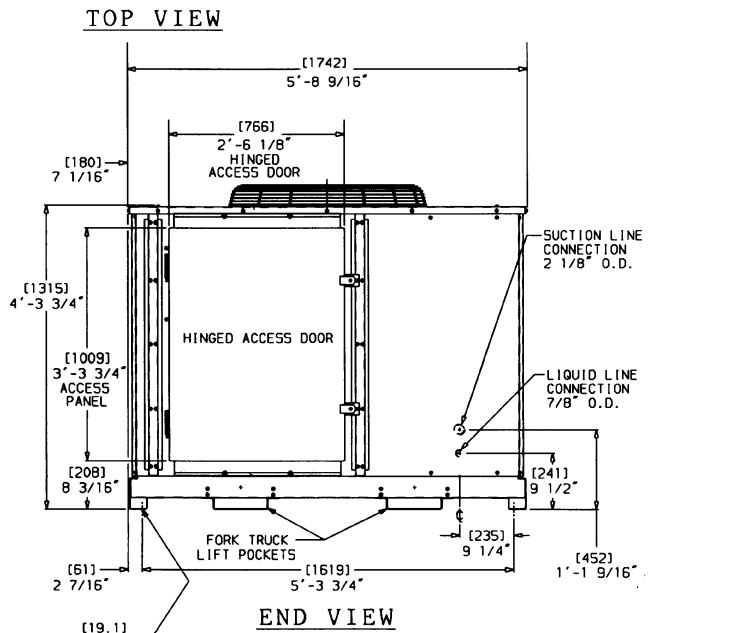
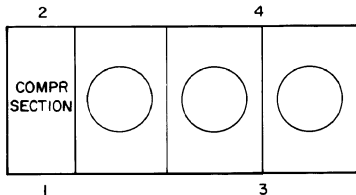
| UNIT | WEIGHT (lb) | WEIGHT (kg) |
|-------|-------------|-------------|
| 38AKS | | |
| 044 | 2437 | 1106 |
| 044C | 2745 | 1246 |

NOTE: A "C" in model number indicates unit has optional factory-installed copper-fin coil.

APPROX. OPER. WT (lb) AT LIFTING HOLES*

| UNIT 38AKS | 1 | 2 | 3 | 4 | TOTAL |
|------------|-----|-----|-----|-----|-------|
| 044 | 720 | 900 | 455 | 362 | 2437 |

*Standard copper tube aluminum-fin coil.



Performance data



CONDENSING UNIT RATINGS

| 38AKS028 | | | | | | | |
|------------|-----|----------------------------------------|------|------|------|------|------|
| SST (F) | | Air Temperature Entering Condenser (F) | | | | | |
| | | 80 | 85 | 95 | 100 | 105 | 115 |
| 25 | TC | 238 | 230 | 213 | 204 | 196 | 180 |
| | kW | 21.9 | 22.2 | 23.2 | 23.7 | 24.1 | 24.9 |
| | SDT | 107 | 111 | 120 | 124 | 129 | 138 |
| 30 | TC | 269 | 261 | 242 | 233 | 224 | 206 |
| | kW | 23.3 | 23.6 | 24.8 | 25.4 | 25.9 | 26.8 |
| | SDT | 110 | 114 | 123 | 127 | 131 | 140 |
| 35 | TC | 300 | 292 | 271 | 261 | 252 | 232 |
| | kW | 24.7 | 25.0 | 26.4 | 27.0 | 27.6 | 28.7 |
| | SDT | 112 | 117 | 125 | 130 | 134 | 143 |
| 40 | TC | 333 | 323 | 301 | 290 | 279 | 258 |
| | kW | 26.1 | 26.4 | 28.0 | 28.7 | 29.3 | 30.6 |
| | SDT | 115 | 120 | 128 | 133 | 137 | 145 |
| 45 | TC | 365 | 354 | 330 | 319 | 307 | 284 |
| | kW | 27.3 | 27.8 | 29.5 | 30.3 | 31.1 | 32.4 |
| | SDT | 118 | 123 | 131 | 135 | 140 | 148 |
| 50 | TC | 398 | 386 | 361 | 348 | 336 | 312 |
| | kW | 28.8 | 29.3 | 31.2 | 32.0 | 32.9 | 34.4 |
| | SDT | 121 | 126 | 134 | 138 | 142 | 151 |

| 38AKS034 | | | | | | | |
|------------|-----|----------------------------------------|------|------|------|------|------|
| SST (F) | | Air Temperature Entering Condenser (F) | | | | | |
| | | 80 | 85 | 95 | 100 | 105 | 115 |
| 25 | TC | 268 | 260 | 241 | 232 | 223 | 205 |
| | kW | 25.0 | 25.1 | 26.2 | 26.6 | 27.0 | 27.7 |
| | SDT | 106 | 110 | 119 | 124 | 128 | 137 |
| 30 | TC | 302 | 293 | 273 | 264 | 254 | 234 |
| | kW | 26.5 | 26.6 | 27.9 | 28.4 | 28.9 | 29.8 |
| | SDT | 109 | 113 | 122 | 126 | 131 | 140 |
| 35 | TC | 337 | 326 | 305 | 295 | 284 | 263 |
| | kW | 27.9 | 28.1 | 29.6 | 30.2 | 30.8 | 31.9 |
| | SDT | 112 | 116 | 125 | 129 | 133 | 142 |
| 40 | TC | 371 | 359 | 337 | 326 | 314 | 292 |
| | kW | 29.3 | 29.6 | 31.3 | 32.1 | 32.8 | 34.0 |
| | SDT | 115 | 119 | 128 | 132 | 136 | 145 |
| 45 | TC | 405 | 393 | 369 | 357 | 345 | 321 |
| | kW | 30.7 | 31.1 | 33.0 | 33.9 | 34.7 | 36.1 |
| | SDT | 117 | 122 | 130 | 135 | 139 | 147 |
| 50 | TC | 440 | 428 | 402 | 390 | 377 | 351 |
| | kW | 32.3 | 32.7 | 34.8 | 35.7 | 36.6 | 38.2 |
| | SDT | 120 | 125 | 133 | 138 | 142 | 150 |

LEGEND

- kW — Compressor Power
- SDT — Saturated Discharge Temperature at Compressor (F)
- SST — Saturated Suction Temperature (F)
- TC — Gross Cooling Capacity (1000 Btuh)

| 38AKS044 | | | | | | | |
|------------|-----|----------------------------------------|------|------|------|------|------|
| SST (F) | | Air Temperature Entering Condenser (F) | | | | | |
| | | 80 | 85 | 95 | 100 | 105 | 115 |
| 25 | TC | 362 | 352 | 330 | 319 | 308 | 287 |
| | kW | 33.6 | 34.0 | 35.5 | 36.2 | 36.8 | 38.0 |
| | SDT | 103 | 107 | 117 | 122 | 126 | 136 |
| 30 | TC | 410 | 398 | 374 | 362 | 350 | 326 |
| | kW | 35.6 | 36.0 | 37.8 | 38.6 | 39.4 | 40.8 |
| | SDT | 105 | 110 | 119 | 124 | 129 | 138 |
| 35 | TC | 456 | 444 | 417 | 404 | 391 | 36 |
| | kW | 37.6 | 37.1 | 40.1 | 41.0 | 41.9 | 43.5 |
| | SDT | 109 | 113 | 122 | 126 | 131 | 140 |
| 40 | TC | 503 | 490 | 461 | 447 | 433 | 405 |
| | kW | 40.0 | 40.2 | 42.4 | 43.5 | 44.4 | 46.2 |
| | SDT | 111 | 115 | 124 | 129 | 133 | 142 |
| 45 | TC | 551 | 536 | 505 | 489 | 474 | 444 |
| | kW | 41.5 | 42.2 | 44.7 | 45.9 | 47.0 | 49.0 |
| | SDT | 114 | 118 | 127 | 131 | 136 | 145 |
| 50 | TC | 599 | 584 | 550 | 534 | 518 | 485 |
| | kW | 43.6 | 44.4 | 47.1 | 48.3 | 49.6 | 51.8 |
| | SDT | 116 | 120 | 129 | 134 | 138 | 147 |

38AKS028-044

Performance data (cont)



COMBINATION RATINGS

UNIT 38AKS028

38AKS028-044

| 38AKS028/40RM024 WITH STANDARD 3-ROW COIL | | | | | | | | | | |
|------------------------------------------------|--------------------------|-------|-------|-------|-------|-------|--------|-------|-------|--|
| Temp (F) Air Entering Condenser (Edb) | Evaporator Air — Cfm | | | | | | | | | |
| | 6000 | | | 8000 | | | 10,000 | | | |
| | Evaporator Air — Ewb (F) | | | | | | | | | |
| | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 | |
| 85 TC | 305.1 | 279.8 | — | 320.3 | 295.8 | — | 330.3 | 305.7 | 279.5 | |
| 85 SHC | 150.5 | 184.8 | — | 167.6 | 213.3 | — | 183.0 | 239.4 | 279.5 | |
| 85 kW | 25.59 | 24.45 | — | 26.28 | 25.17 | — | 26.73 | 25.62 | 24.44 | |
| 95 TC | 292.8 | 268.8 | — | 306.8 | 283.5 | 257.9 | 315.7 | 292.9 | 269.6 | |
| 95 SHC | 145.8 | 180.3 | — | 162.7 | 208.1 | 257.9 | 177.8 | 233.6 | 269.6 | |
| 95 kW | 27.58 | 26.34 | — | 28.30 | 27.09 | 25.77 | 28.76 | 27.58 | 26.38 | |
| 100 TC | 286.3 | 262.5 | 237.6 | 300.0 | 276.8 | 252.2 | 308.6 | 286.1 | 263.9 | |
| 100 SHC | 143.3 | 177.7 | 227.0 | 160.3 | 205.3 | 252.2 | 175.3 | 230.5 | 263.9 | |
| 100 kW | 28.50 | 27.18 | 25.81 | 29.25 | 27.97 | 26.61 | 29.72 | 28.49 | 27.26 | |
| 105 TC | 279.8 | 256.7 | 232.8 | 292.9 | 270.3 | 247.1 | 300.9 | 279.4 | 258.6 | |
| 105 SHC | 140.8 | 175.3 | 222.8 | 157.7 | 202.5 | 247.1 | 172.6 | 227.4 | 258.6 | |
| 105 kW | 29.35 | 27.86 | 26.33 | 30.19 | 28.74 | 27.35 | 30.71 | 29.32 | 27.99 | |
| 115 TC | 266.8 | 245.0 | 223.2 | 278.7 | 257.4 | 236.9 | 285.7 | 265.9 | 248.0 | |
| 115 SHC | 135.9 | 170.5 | 214.4 | 152.6 | 197.1 | 236.9 | 167.3 | 221.3 | 248.0 | |
| 115 kW | 31.21 | 29.70 | 28.19 | 32.03 | 30.56 | 29.14 | 32.52 | 31.15 | 29.91 | |

| 38AKS028/40RM024 WITH HIGH-CAPACITY 4-ROW COIL | | | | | | | | | | |
|------------------------------------------------|--------------------------|-------|-------|-------|-------|-------|--------|-------|-------|--|
| Temp (F) Air Entering Condenser (Edb) | Evaporator Air — Cfm | | | | | | | | | |
| | 6000 | | | 8000 | | | 10,000 | | | |
| | Evaporator Air — Ewb (F) | | | | | | | | | |
| | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 | |
| 85 TC | 341.7 | 312.2 | 284.6 | 364.1 | 333.8 | 304.9 | 377.8 | 347.4 | 318.6 | |
| 85 SHC | 133.1 | 175.5 | 216.7 | 149.5 | 203.1 | 255.5 | 164.0 | 228.6 | 290.8 | |
| 85 kW | 28.00 | 26.64 | 25.34 | 29.05 | 27.67 | 26.34 | 29.67 | 28.31 | 26.97 | |
| 95 TC | 327.7 | 299.3 | 272.7 | 347.9 | 318.9 | 291.2 | 360.7 | 331.7 | 303.8 | |
| 95 SHC | 128.9 | 170.8 | 211.9 | 144.6 | 198.3 | 250.0 | 159.7 | 223.9 | 284.9 | |
| 95 kW | 29.94 | 28.46 | 27.02 | 31.03 | 29.51 | 28.04 | 31.68 | 30.19 | 28.73 | |
| 100 TC | 320.6 | 292.8 | 266.6 | 339.7 | 311.4 | 284.4 | 352.3 | 323.8 | 296.9 | |
| 100 SHC | 126.7 | 168.7 | 209.4 | 142.6 | 196.0 | 247.7 | 157.7 | 221.7 | 282.1 | |
| 100 kW | 30.92 | 29.38 | 27.88 | 32.01 | 30.43 | 28.91 | 32.71 | 31.14 | 29.64 | |
| 105 TC | 313.3 | 286.0 | 260.4 | 331.5 | 303.9 | 277.5 | 343.6 | 315.8 | 289.8 | |
| 105 SHC | 124.6 | 166.3 | 207.0 | 140.4 | 193.6 | 245.1 | 155.5 | 219.3 | 278.9 | |
| 105 kW | 31.91 | 30.29 | 28.72 | 33.00 | 31.37 | 29.85 | 33.73 | 32.09 | 30.54 | |
| 115 TC | 298.4 | 272.2 | 247.5 | 315.0 | 288.7 | 267.1 | 326.2 | 299.3 | 274.4 | |
| 115 SHC | 120.2 | 161.6 | 202.0 | 136.1 | 189.0 | 240.9 | 151.4 | 214.7 | 274.4 | |
| 115 kW | 33.79 | 32.01 | 30.30 | 34.90 | 33.16 | 31.22 | 35.66 | 33.87 | 32.16 | |

| 38AKS028/40RM028 WITH STANDARD 3-ROW COIL | | | | | | | | | | |
|------------------------------------------------|--------------------------|-------|-------|--------|-------|-------|--------|-------|-------|--|
| Temp (F) Air Entering Condenser (Edb) | Evaporator Air — Cfm | | | | | | | | | |
| | 7500 | | | 10,000 | | | 12,500 | | | |
| | Evaporator Air — Ewb (F) | | | | | | | | | |
| | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 | |
| 85 TC | 330.8 | 305.4 | 277.1 | 344.8 | 318.8 | 293.3 | 353.4 | 329.1 | 307.4 | |
| 85 SHC | 168.9 | 212.4 | 270.1 | 189.8 | 245.6 | 293.3 | 209.5 | 275.9 | 307.3 | |
| 85 kW | 26.75 | 25.61 | 24.33 | 27.39 | 26.21 | 25.06 | 27.77 | 26.67 | 25.69 | |
| 95 TC | 316.6 | 292.0 | 266.5 | 329.6 | 304.5 | 282.3 | 337.3 | 314.4 | 295.9 | |
| 95 SHC | 163.7 | 207.0 | 260.4 | 184.4 | 239.8 | 282.3 | 204.1 | 269.5 | 295.9 | |
| 95 kW | 28.81 | 27.54 | 26.22 | 29.48 | 28.18 | 27.03 | 29.88 | 28.69 | 27.73 | |
| 100 TC | 309.7 | 285.0 | 260.4 | 322.5 | 297.3 | 276.3 | 329.8 | 307.2 | 289.9 | |
| 100 SHC | 161.2 | 204.2 | 254.8 | 181.9 | 236.8 | 276.3 | 201.6 | 266.4 | 289.9 | |
| 100 kW | 29.79 | 28.42 | 27.07 | 30.49 | 29.10 | 27.94 | 30.90 | 29.65 | 28.69 | |
| 105 TC | 302.3 | 277.9 | 254.8 | 314.5 | 289.8 | 270.4 | 321.4 | 299.5 | 283.8 | |
| 105 SHC | 158.4 | 201.3 | 249.7 | 179.1 | 233.7 | 270.4 | 198.8 | 263.0 | 283.7 | |
| 105 kW | 30.80 | 29.23 | 27.75 | 31.58 | 29.99 | 28.75 | 32.03 | 30.62 | 29.61 | |
| 115 TC | 287.5 | 264.0 | 243.6 | 298.6 | 274.9 | 258.7 | 304.6 | 284.3 | 271.5 | |
| 115 SHC | 153.0 | 195.7 | 239.4 | 173.5 | 227.6 | 258.7 | 193.2 | 256.4 | 271.5 | |
| 115 kW | 32.64 | 31.01 | 29.60 | 33.41 | 31.77 | 30.65 | 33.83 | 32.42 | 31.53 | |

| 38AKS028/40RM028 WITH HIGH-CAPACITY 4-ROW COIL | | | | | | | | | | |
|------------------------------------------------|--------------------------|-------|-------|--------|-------|-------|--------|-------|-------|--|
| Temp (F) Air Entering Condenser (Edb) | Evaporator Air — Cfm | | | | | | | | | |
| | 7500 | | | 10,000 | | | 12,500 | | | |
| | Evaporator Air — Ewb (F) | | | | | | | | | |
| | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 | |
| 85 TC | 348.1 | 319.4 | 292.1 | 365.9 | 336.7 | 309.1 | 377.1 | 347.9 | 320.4 | |
| 85 SHC | 175.1 | 191.4 | 240.3 | 159.4 | 222.4 | 283.2 | 176.6 | 251.7 | 320.4 | |
| 85 kW | 28.21 | 26.89 | 25.61 | 29.06 | 27.71 | 26.42 | 29.55 | 28.22 | 26.94 | |
| 95 TC | 333.1 | 305.7 | 282.5 | 349.1 | 321.3 | 294.5 | 359.6 | 331.8 | 307.1 | |
| 95 SHC | 137.2 | 187.0 | 236.4 | 155.2 | 217.9 | 277.2 | 172.5 | 247.2 | 307.1 | |
| 95 kW | 30.13 | 28.70 | 27.14 | 30.98 | 29.52 | 28.10 | 31.52 | 30.08 | 28.78 | |
| 100 TC | 325.6 | 298.6 | 272.9 | 340.7 | 313.8 | 287.7 | 350.8 | 323.7 | 301.0 | |
| 100 SHC | 135.2 | 184.7 | 233.1 | 153.1 | 215.6 | 274.5 | 170.5 | 245.0 | 301.0 | |
| 100 kW | 31.11 | 29.61 | 28.12 | 31.95 | 30.47 | 28.97 | 32.52 | 31.01 | 29.75 | |
| 105 TC | 318.0 | 291.4 | 266.0 | 332.3 | 305.8 | 281.0 | 342.1 | 315.5 | 294.3 | |
| 105 SHC | 133.2 | 182.4 | 230.4 | 151.1 | 213.4 | 271.3 | 168.5 | 242.8 | 294.3 | |
| 105 kW | 32.10 | 30.50 | 28.94 | 32.94 | 31.37 | 29.86 | 33.53 | 31.97 | 30.66 | |
| 115 TC | 301.6 | 276.8 | 252.8 | 315.2 | 290.1 | 266.4 | 324.3 | 298.7 | 281.4 | |
| 115 SHC | 128.6 | 177.8 | 225.3 | 147.0 | 209.0 | 266.4 | 164.5 | 238.0 | 281.4 | |
| 115 kW | 33.93 | 32.22 | 30.56 | 34.83 | 33.14 | 31.51 | 35.45 | 33.73 | 32.52 | |

| 38AKS028/40RM034 WITH STANDARD 3-ROW COIL | | | | | | | | | | |
|------------------------------------------------|--------------------------|-------|-------|--------|-------|-------|--------|-------|-------|--|
| Temp (F) Air Entering Condenser (Edb) | Evaporator Air — Cfm | | | | | | | | | |
| | 9000 | | | 12,000 | | | 15,000 | | | |
| | Evaporator Air — Ewb (F) | | | | | | | | | |
| | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 | |
| 85 TC | 353.9 | 325.8 | 300.2 | 367.2 | 339.2 | 318.4 | 374.7 | 350.2 | 328.8 | |
| 85 SHC | 186.0 | 238.4 | 293.9 | 212.4 | 276.3 | 318.4 | 234.9 | 311.5 | 272.3 | |
| 85 kW | 27.80 | 26.53 | 25.37 | 28.40 | 27.13 | 26.19 | 28.74 | 27.63 | 26.92 | |
| 95 TC | 337.9 | 310.6 | 288.0 | 350.0 | 323.1 | 305.6 | 356.7 | 333.7 | 327.6 | |
| 95 SHC | 179.9 | 232.4 | 282.8 | 206.6 | 269.8 | 305.6 | 228.9 | 304.2 | 309.3 | |
| 95 kW | 29.91 | 28.50 | 27.33 | 30.53 | 29.14 | 28.24 | 30.88 | 29.69 | 29.37 | |
| 100 TC | 330.6 | 303.1 | 281.4 | 342.4 | 315.4 | 299.1 | 348.8 | 326.0 | 305.6 | |
| 100 SHC | 177.2 | 229.4 | 276.8 | 204.0 | 266.7 | 299.1 | 226.3 | 300.9 | 325.3 | |
| 100 kW | 30.94 | 29.42 | 28.23 | 31.59 | 30.10 | 29.20 | 31.94 | 30.69 | 29.56 | |
| 105 TC | 322.2 | 295.2 | 274.9 | 333.4 | 307.1 | 292.3 | 339.4 | 317.4 | 283.3 | |
| 105 SHC | 174.0 | 226.2 | 270.9 | 210.0 | 263.4 | 292.3 | 223.1 | 297.1 | 341.4 | |
| 105 kW | 32.08 | 30.34 | 29.04 | 32.80 | 31.10 | 30.15 | 33.19 | 31.77 | 29.57 | |
| 115 TC | 305.6 | 279.5 | 262.0 | 315.7 | 290.5 | 278.7 | — | 300.4 | 244.7 | |
| 115 SHC | 167.7 | 220.0 | 259.2 | 195.0 | 256.7 | 278.7 | — | 289.6 | 369.4 | |
| 115 kW | 33.90 | 32.09 | 30.88 | 34.59 | 32.85 | 32.04 | — | 33.54 | 29.68 | |

| 38AKS028/40RM034 WITH HIGH-CAPACITY 4-ROW COIL | | | | | | | | | | |
|------------------------------------------------|--------------------------|-------|-------|--------|-------|-------|--------|-------|-------|--|
| Temp (F) Air Entering Condenser (Edb) | Evaporator Air — Cfm | | | | | | | | | |
| | 9000 | | | 12,000 | | | 15,000 | | | |
| | Evaporator Air — Ewb (F) | | | | | | | | | |
| | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 | |
| 85 TC | 371.5 | 341.2 | 312.3 | 387.9 | 357.4 | 328.9 | 398.8 | 368.1 | 345.4 | |
| 85 SHC | 156.7 | 216.0 | 273.5 | 178.5 | 253.1 | 320.9 | 199.3 | 288.0 | 345.4 | |
| 85 kW | 29.39 | 28.01 | 26.68 | 30.14 | 28.78 | 27.45 | 30.66 | 29.27 | 28.19 | |
| 95 TC | 354.9 | 325.8 | 298.2 | 370.2 | 341.0 | 314.4 | 380.1 | 350.5 | 331.7 | |
| 95 SHC | 152.3 | 211.2 | 268.2 | 174.3 | 248.5 | 314.4 | 195.2 | 283.0 | 331.7 | |
| 95 kW | 31.39 | 29.87 | 28.42 | 32.18 | 30.69 | 29.27 | 32.69 | 31.18 | 30.17 | |
| 100 TC | 346.6 | 318.1 | 291.3 | 361.3 | 332.5 | 306.7 | 370.6 | 341.7 | 324.8 | |
| 100 SHC | 150.2 | 208.9 | 265.5 | 172.3 | 246.2 | 306.7 | 193.1 | 280.5 | 324.8 | |
| 100 kW | 32.39 | 30.82 | 29.31 | 33.23 | 31.64 | 30.17 | 33.72 | 32.15 | 31.18 | |
| 105 TC | 338.1 | 310.4 | 283.7 | 352.2 | 324.0 | 300.6 | 361.0 | 332.7 | 318.0 | |
| 105 SHC | 148.1 | 20 | | | | | | | | |



COMBINATION RATINGS (cont)

UNIT 38AKS034

| 38AKS034/40RM028 WITH STANDARD 3-ROW COIL | | | | | | | | | | |
|------------------------------------------------|--------------------------|-------|-------|--------|-------|-------|--------|-------|-------|-------|
| Temp (F) Air Entering Condenser (Edb) | Evaporator Air — Cfm | | | | | | | | | |
| | 7500 | | | 10,000 | | | 12,500 | | | |
| | Evaporator Air — Ewb (F) | | | | | | | | | |
| | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 | |
| 85 | TC | 352.5 | 326.2 | — | 368.2 | 341.0 | 310.1 | 378.3 | 351.7 | 324.8 |
| | SHC | 176.9 | 220.8 | — | 198.0 | 254.7 | 310.1 | 217.8 | 285.8 | 324.8 |
| | kW | 29.31 | 28.15 | — | 30.01 | 28.81 | 27.44 | 30.45 | 29.28 | 28.09 |
| 95 | TC | 339.4 | 313.7 | 283.7 | 354.1 | 327.7 | 300.1 | 363.2 | 338.1 | 314.4 |
| | SHC | 172.1 | 215.8 | 276.1 | 193.0 | 249.3 | 300.1 | 212.7 | 279.9 | 314.4 |
| | kW | 31.43 | 30.06 | 28.47 | 32.21 | 30.80 | 29.34 | 32.69 | 31.36 | 30.10 |
| 100 | TC | 332.6 | 307.3 | 278.7 | 346.8 | 320.8 | 294.9 | 355.4 | 331.0 | 308.9 |
| | SHC | 169.6 | 213.2 | 271.5 | 190.4 | 246.4 | 294.9 | 210.1 | 276.8 | 308.9 |
| | kW | 32.48 | 31.01 | 29.35 | 33.30 | 31.80 | 30.29 | 33.81 | 32.39 | 31.11 |
| 105 | TC | 325.3 | 299.8 | 272.2 | 339.1 | 313.1 | 288.5 | 347.5 | 323.3 | 302.6 |
| | SHC | 166.9 | 210.2 | 265.6 | 187.8 | 243.3 | 288.5 | 207.5 | 273.4 | 302.6 |
| | kW | 33.49 | 31.93 | 30.24 | 34.34 | 32.74 | 31.24 | 34.85 | 33.37 | 32.10 |
| 115 | TC | 311.0 | 286.2 | 261.5 | 323.8 | 298.6 | 277.4 | 331.2 | 308.5 | 291.0 |
| | SHC | 161.6 | 204.7 | 255.8 | 182.4 | 237.3 | 277.4 | 202.1 | 267.0 | 290.9 |
| | kW | 35.38 | 33.58 | 31.79 | 36.30 | 34.48 | 32.94 | 36.84 | 35.20 | 33.92 |

| 38AKS034/40RM034 WITH STANDARD 3-ROW COIL | | | | | | | | | | |
|------------------------------------------------|--------------------------|-------|-------|--------|-------|-------|--------|-------|-------|-------|
| Temp (F) Air Entering Condenser (Edb) | Evaporator Air — Cfm | | | | | | | | | |
| | 9000 | | | 12,000 | | | 15,000 | | | |
| | Evaporator Air — Ewb (F) | | | | | | | | | |
| | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 | |
| 85 | TC | 378.5 | 349.4 | 319.1 | 393.6 | 364.1 | 338.1 | 402.6 | 375.7 | 354.0 |
| | SHC | 195.3 | 247.7 | 311.0 | 221.4 | 286.4 | 338.1 | 244.2 | 322.7 | 354.0 |
| | kW | 30.46 | 29.18 | 27.84 | 31.13 | 29.83 | 28.68 | 31.52 | 30.34 | 29.38 |
| 95 | TC | 363.6 | 335.2 | 307.9 | 377.5 | 349.0 | 326.3 | 385.6 | 360.2 | 341.7 |
| | SHC | 189.7 | 242.1 | 300.8 | 215.9 | 280.3 | 326.3 | 238.5 | 315.9 | 341.7 |
| | kW | 32.71 | 31.20 | 29.75 | 33.45 | 31.94 | 30.73 | 33.88 | 32.53 | 31.55 |
| 100 | TC | 355.9 | 327.8 | 302.0 | 369.2 | 341.3 | 320.2 | 376.8 | 352.2 | 335.3 |
| | SHC | 186.7 | 239.2 | 295.5 | 213.1 | 277.1 | 320.2 | 235.6 | 312.4 | 335.3 |
| | kW | 33.83 | 32.21 | 30.71 | 34.61 | 32.99 | 31.76 | 35.05 | 33.62 | 32.64 |
| 105 | TC | 348.1 | 319.8 | 295.0 | 361.1 | 333.1 | 313.3 | 368.4 | 344.1 | 328.4 |
| | SHC | 183.8 | 236.0 | 289.2 | 210.4 | 273.8 | 313.3 | 232.8 | 308.8 | 328.4 |
| | kW | 34.89 | 33.16 | 31.64 | 35.69 | 33.97 | 32.75 | 36.14 | 34.64 | 33.70 |
| 115 | TC | 331.9 | 304.5 | 282.6 | 343.8 | 316.8 | 300.3 | 350.2 | 327.4 | 314.8 |
| | SHC | 177.7 | 229.9 | 277.9 | 204.5 | 267.3 | 300.3 | 226.7 | 301.5 | 314.8 |
| | kW | 36.89 | 34.90 | 33.32 | 37.75 | 35.80 | 34.60 | 38.22 | 36.57 | 35.65 |

LEGEND

- — Out of Range
- Edb — Entering Dry Bulb
- Ewb — Entering Wet Bulb
- kW — Compressor Motor Power Input
- SHC — Sensible Heat Capacity (1000 Btuh) Gross
- TC — Total Capacity (1000 Btuh) Gross

| 38AKS034/40RM028 WITH HIGH-CAPACITY 4-ROW COIL | | | | | | | | | | |
|------------------------------------------------|--------------------------|-------|-------|--------|-------|-------|--------|-------|-------|-------|
| Temp (F) Air Entering Condenser (Edb) | Evaporator Air — Cfm | | | | | | | | | |
| | 7500 | | | 10,000 | | | 12,500 | | | |
| | Evaporator Air — Ewb (F) | | | | | | | | | |
| | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 | |
| 85 | TC | 368.7 | 338.3 | 309.5 | 387.9 | 357.4 | 328.0 | 401.1 | 370.3 | 340.7 |
| | SHC | 147.1 | 197.7 | 247.2 | 165.2 | 229.0 | 290.7 | 182.6 | 258.3 | 328.6 |
| | kW | 30.30 | 28.87 | 27.47 | 31.20 | 29.77 | 28.38 | 31.83 | 30.38 | 28.99 |
| 95 | TC | 353.9 | 324.5 | 299.7 | 371.8 | 342.6 | 314.2 | 383.7 | 354.0 | 325.2 |
| | SHC | 142.9 | 193.1 | 243.2 | 161.1 | 224.3 | 285.4 | 178.3 | 253.6 | 325.2 |
| | kW | 32.14 | 30.57 | 28.88 | 33.09 | 31.57 | 30.02 | 33.72 | 32.15 | 30.61 |
| 100 | TC | 346.0 | 317.4 | 290.1 | 363.4 | 334.7 | 307.1 | 374.7 | 345.7 | 318.5 |
| | SHC | 140.7 | 190.8 | 239.7 | 158.9 | 221.9 | 282.5 | 176.2 | 251.2 | 318.5 |
| | kW | 33.07 | 31.42 | 29.84 | 34.05 | 32.43 | 30.84 | 34.62 | 33.05 | 31.49 |
| 105 | TC | 338.2 | 310.3 | 283.5 | 354.8 | 326.6 | 299.5 | 365.6 | 337.3 | 311.5 |
| | SHC | 138.6 | 188.4 | 237.2 | 156.7 | 219.5 | 279.5 | 174.0 | 248.8 | 311.5 |
| | kW | 34.00 | 32.30 | 30.65 | 35.00 | 33.30 | 31.64 | 35.63 | 33.95 | 32.37 |
| 115 | TC | 326.3 | 300.2 | 269.7 | 337.0 | 310.2 | 284.6 | 347.0 | 320.1 | 298.1 |
| | SHC | 135.6 | 185.1 | 231.9 | 152.3 | 214.7 | 273.2 | 169.8 | 244.2 | 298.1 |
| | kW | 36.68 | 33.80 | 32.15 | 36.79 | 34.96 | 33.19 | 37.47 | 35.65 | 34.14 |

| 38AKS034/40RM034 WITH HIGH-CAPACITY 4-ROW COIL | | | | | | | | | | |
|------------------------------------------------|--------------------------|-------|-------|--------|-------|-------|--------|-------|-------|-------|
| Temp (F) Air Entering Condenser (Edb) | Evaporator Air — Cfm | | | | | | | | | |
| | 9000 | | | 12,000 | | | 15,000 | | | |
| | Evaporator Air — Ewb (F) | | | | | | | | | |
| | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 | |
| 85 | TC | 392.5 | 360.8 | 330.6 | 410.5 | 378.6 | 348.0 | 422.4 | 390.3 | 362.6 |
| | SHC | 162.3 | 221.7 | 279.7 | 183.6 | 258.3 | 329.0 | 204.0 | 292.9 | 362.6 |
| | kW | 31.43 | 29.95 | 28.53 | 32.26 | 30.78 | 29.35 | 32.80 | 31.34 | 30.03 |
| 95 | TC | 376.4 | 345.9 | 316.5 | 392.9 | 362.3 | 333.5 | 403.9 | 373.2 | 349.2 |
| | SHC | 157.8 | 217.0 | 274.5 | 179.2 | 253.6 | 322.5 | 199.7 | 288.3 | 349.2 |
| | kW | 33.35 | 31.75 | 30.17 | 34.23 | 32.60 | 31.08 | 34.80 | 33.19 | 31.92 |
| 100 | TC | 368.0 | 338.0 | 309.4 | 383.9 | 353.9 | 325.7 | 394.5 | 364.6 | 342.2 |
| | SHC | 155.5 | 214.5 | 271.7 | 177.0 | 251.2 | 318.6 | 197.7 | 285.8 | 342.2 |
| | kW | 34.32 | 32.64 | 30.99 | 35.19 | 33.52 | 31.93 | 35.81 | 34.14 | 32.87 |
| 105 | TC | 359.2 | 330.1 | 302.1 | 374.7 | 345.4 | 317.9 | 385.1 | 355.5 | 335.2 |
| | SHC | 153.2 | 212.0 | 268.9 | 174.9 | 248.8 | 317.9 | 195.6 | 283.3 | 335.2 |
| | kW | 35.26 | 33.53 | 31.82 | 36.18 | 34.45 | 32.79 | 36.81 | 35.05 | 33.84 |
| 115 | TC | 341.5 | 313.7 | 287.3 | 355.9 | 328.0 | 303.4 | 365.1 | 336.8 | 320.5 |
| | SHC | 148.6 | 207.0 | 263.2 | 170.5 | 244.0 | 303.4 | 191.0 | 278.0 | 320.5 |
| | kW | 37.09 | 35.20 | 33.39 | 38.06 | 36.19 | 34.50 | 38.66 | 36.78 | 35.67 |

NOTES:

1. Direct interpolation is permissible. Do not extrapolate.
2. Evaporator fan heat not deducted from ratings.
3. Ratings based on approximately 12 F superheat leaving coil.
4. Formulas:

$$\text{Leaving db} = \text{entering db} - \frac{\text{sensible heat capacity (Btuh)}}{1.1 \times \text{cfm}}$$

$$\text{Leaving wb} = \text{wet-bulb temperature corresponding to enthalpy of air leaving coil (h}_{\text{wb}}\text{)}$$

$$h_{\text{wb}} = h_{\text{ewb}} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

Where h_{ewb} = enthalpy of air entering coil.

5. SHC is based on 80 F db temperature of air-entering evaporator coil.

38AKS028-044

Electrical data



38AKS028-044

| UNIT 38AKS | NOMINAL VOLTAGE (3 Ph, 60-Hz) | VOLTAGE RANGE* | | FLA | COMPRESSOR | | FAN MOTORS | | POWER SUPPLY | | |
|---------------|-------------------------------------|-------------------|-----|-------|------------|-----|------------|-------------|--------------|-------|-------|
| | | Min | Max | | RLA | LRA | Qty | FLA (ea) | MCA | MOCP† | ICF |
| 028 | 208/230 | 187 | 254 | 102.2 | 89.8 | 446 | 2 | 6.2 | 124.6 | 200 | 452.2 |
| | 380** | 342 | 418 | 53.3 | 45.5 | 247 | | 3.9 | 64.7 | 110 | 250.9 |
| | 460 | 414 | 508 | 49.8 | 43.6 | 223 | | 3.1 | 60.7 | 100 | 226.1 |
| | 575 | 518 | 632 | 43.3 | 36.5 | 164 | | 3.4 | 52.5 | 80 | 167.4 |
| 034 | 208/230 | 187 | 254 | 118.4 | 106.5 | 506 | 2 | 6.2 | 145.5 | 250 | 512.2 |
| | 380** | 342 | 418 | 60.4 | 52.6 | 280 | | 3.9 | 72.5 | 125 | 283.9 |
| | 460 | 414 | 508 | 56.2 | 50.0 | 253 | | 3.1 | 68.7 | 110 | 256.1 |
| | 575 | 518 | 632 | 45.3 | 38.5 | 176 | | 3.4 | 54.9 | 90 | 179.4 |
| 044 | 208/230 | 187 | 254 | 165.6 | 147.5 | 690 | 3 | 6.2 | 203.0 | 350 | 702.4 |
| | 380** | 342 | 418 | 91.2 | 79.5 | 382 | | 3.9 | 111.1 | 175 | 389.8 |
| | 460 | 414 | 508 | 74.7 | 65.4 | 345 | | 3.1 | 91.0 | 150 | 351.2 |
| | 575 | 518 | 632 | 67.3 | 57.1 | 276 | | 3.4 | 81.5 | 125 | 282.8 |

LEGEND

- FLA** — Full Load Amps
- HACR** — Heating, Air Conditioning, and Refrigeration
- ICF** — Maximum Instantaneous Current Flow during starting. (The point in the starting sequence where the sum of the LRA for the starting compressor, plus the total RLA for all running compressors, plus the total FLA for all running motors is maximum.)
- LRA** — Locked Rotor Amps
- MCA** — Minimum Circuit Amps (Complies with National Electrical Code [NEC], Section 430-24)
- MOCP** — Maximum Overcurrent Protection
- RLA** — Rated Load Amps
- UL** — Underwriters' Laboratories

*Units are suitable for use on electrical systems where voltage supplied to the unit terminals is not below or above the listed minimum and maximum limits.

†Fuse or HACR circuit breaker.

**The 380-v units are export models not listed with UL or UL, Canada.



38AKS028-044

Application data — 38AKS028-044



Installation

Select equipment to match or to be slightly less than peak load. This provides better humidity control, less unit cycling, and less part-load operation.

When selecting vapor line sizes, oil return should be evaluated, particularly at part-load conditions.

The indoor fan must always be operating when outdoor fan is operating.

Unit cycles should be limited to 3 or less per hour.

Multiple outdoor units may be used with a single indoor unit; this involves multiple refrigeration circuits.

IMPORTANT: When application is in a variable air volume (VAV) system, total building load is not the sum of the individual peak loads. If individual peak loads are summed, the equipment tends to be oversized for the load.

To minimize return-air temperature extremes, use the equipment room as a return-air plenum when applying VAV systems with supply-to-return air recycle as used with Carrier VVT® Control Systems.

IMPORTANT: Condensing units applied in VVT or VAV systems must have field-supplied and installed accumulators. Order part number 38AK500410 from Service Parts.

Indoor equipment should be selected at no less than 300 cfm/ton.

OPERATING LIMITS

| | |
|--------------------------------------------------------|------------------------------------------------------------------------------|
| Maximum Outdoor Ambient | 115 F |
| Minimum Outdoor Ambient | Additional head pressure control may be required below 35 F outdoor ambient. |
| Minimum Return-Air Temperature | 55 F |
| Maximum Return-Air Temperature | 95 F |
| Normal Acceptable Saturation Suction Temperature Range | 30 to 55 F |
| Maximum Discharge Temperature | 295 F |
| Minimum Discharge Superheat | 60 F |

MINIMUM OUTDOOR-AIR OPERATING TEMPERATURE (F)

| UNIT 38AKS | COMPR CAP. (%) | COND TEMP (F) | MIN OUTDOOR TEMP | | |
|------------|----------------|---------------|------------------|---------------------|--|
| | | | Standard Unit | Low Ambient Control | |
| 028 | 100 | 90 | 31 | -20 | |
| | 67 | 80 | 35 | | |
| | 33 | 70 | 43 | | |
| 034 | 100 | 90 | 30 | | |
| | 67 | 80 | 34 | | |
| | 33 | 70 | 42 | | |
| 044 | 100 | 90 | 25 | | |
| | 67 | 80 | 30 | | |
| | 33 | 70 | 35 | | |

MAXIMUM LIQUID LIFT

| UNIT 38AKS | FT |
|------------|----|
| 028 | 76 |
| 034 | 67 |
| 044 | 76 |

REFRIGERANT PIPING SIZES

SINGLE SUCTION RISERS

| UNIT 38AKS | LENGTH OF INTERCONNECTING PIPING, (Ft) | | | | | | | | | |
|------------|----------------------------------------|-------|-------|--------|-------|--------|--------|--------|---------|--------|
| | 16-25 | | 26-50 | | 51-75 | | 76-100 | | 101-200 | |
| | L | S | L | S | L | S | L | S | L | S |
| 028 | 7/8 | 1 5/8 | 7/8 | 2 1/8* | 7/8 | 2 1/8* | 7/8 | 2 1/8* | 7/8 | 2 1/8* |
| 034 | 7/8 | 2 1/8 | 7/8 | 2 1/8 | 7/8 | 2 1/8 | 1 1/8 | 2 1/8 | 1 1/8 | 2 5/8* |
| 044 | 7/8 | 2 1/8 | 7/8 | 2 1/8 | 1 1/8 | 2 5/8* | 1 1/8 | 2 5/8* | 1 1/8 | 2 5/8* |

LEGEND

- L — Liquid Line
- S — Suction Line

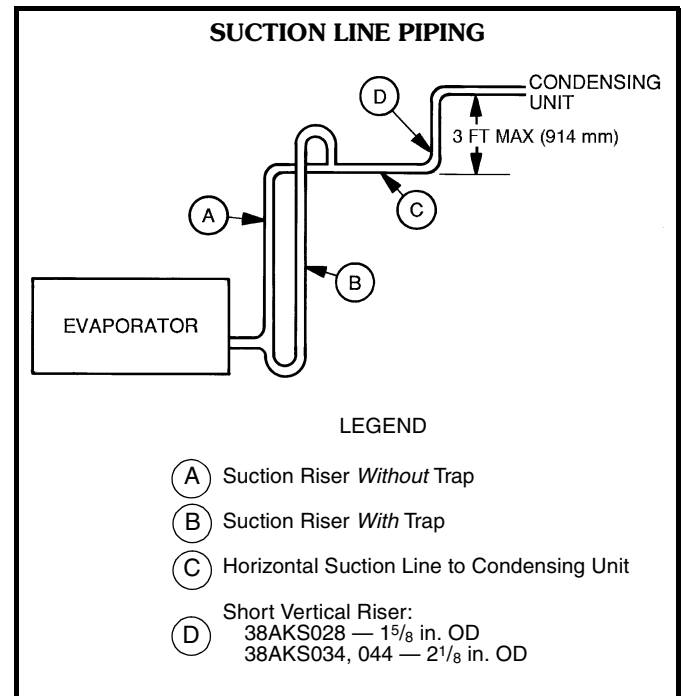
NOTE: Liquid and suction line sizes are OD (in.)

* **IMPORTANT:** Requires a double suction riser, if evaporator is below condensing unit. See table below.

DOUBLE SUCTION RISERS

| UNIT 38AKS | LENGTH OF INTERCONNECTING PIPING, (Ft) | | | | | | | | | |
|------------|----------------------------------------|-------|-------|-------|-------|-------|--------|-------|---------|--|
| | 26-50 | | | 51-75 | | | 76-100 | | 101-200 | |
| | A | B | C | A | B | C | A | B | C | |
| 028 | 1 3/8 | 1 5/8 | 2 1/8 | 1 3/8 | 1 5/8 | 2 1/8 | 1 3/8 | 1 5/8 | 2 1/8 | |
| 034 | — | — | — | — | — | — | — | — | — | |
| 044 | — | — | — | 1 5/8 | 2 1/8 | 2 5/8 | 1 5/8 | 2 1/8 | 2 5/8 | |

NOTE: A, B, and C dimensions relate to reference diagram below.



Do NOT bury refrigerant piping underground.

Field-supplied Refrigerant Specialty parts are shown in the table on the following page.

38AKS028-044

Application data — 38AKS028-044 (cont)



REFRIGERANT SPECIALTIES PART NUMBERS

| UNIT | LIQUID LINE SIZE (in.) | LIQUID LINE SOLENOID VALVE (LLSV) | SIGHT GLASS | FILTER DRIER |
|----------|------------------------|-----------------------------------|-------------|--------------|
| 38AKS028 | 7/8 | * | AMI-1TT7 | C-487 |
| 38AKS034 | 7/8 | * | AMI-1TT7 | C-487 |
| | 1 1/8 | * | AMI-1TT9 | C-969 |
| 38AKS044 | 7/8 | * | AMI-1TT7 | C-967 |
| | 1 1/8 | * | AMI-1TT9 | C-969 |

*Shipped loose with the condensing unit for field installation.

E-coated coils

E-coated aluminum-fin coils have a flexible and durable epoxy coating uniformly applied to all coil surfaces. Unlike brittle phenolic dip and bake coatings, E-coating

provides superior protection with unmatched flexibility, edge coverage, metal adhesion, thermal performance, and most importantly, corrosion resistance.

E-coated coils provide this protection since all coil surfaces are completely encapsulated from environmental contamination. This coating is especially suitable in industrial environments.

E-coated copper-fin coils have the same flexible and durable epoxy coating as E-coated aluminum-fin coils. However, this option combines the natural salt and environmental resistance of all-copper construction with high levels of corrosion protection. This coating is recommended in harsh combinations of coastal and industrial environments.

38AKS028-044

Multiple condensing unit arrangements*

PERPENDICULAR

END-TO-END

SIDE-BY-SIDE

Space for Service and Airflow

*For clearances between controls and grounded surfaces, check local codes.
†Observe minimum recommended space requirements.

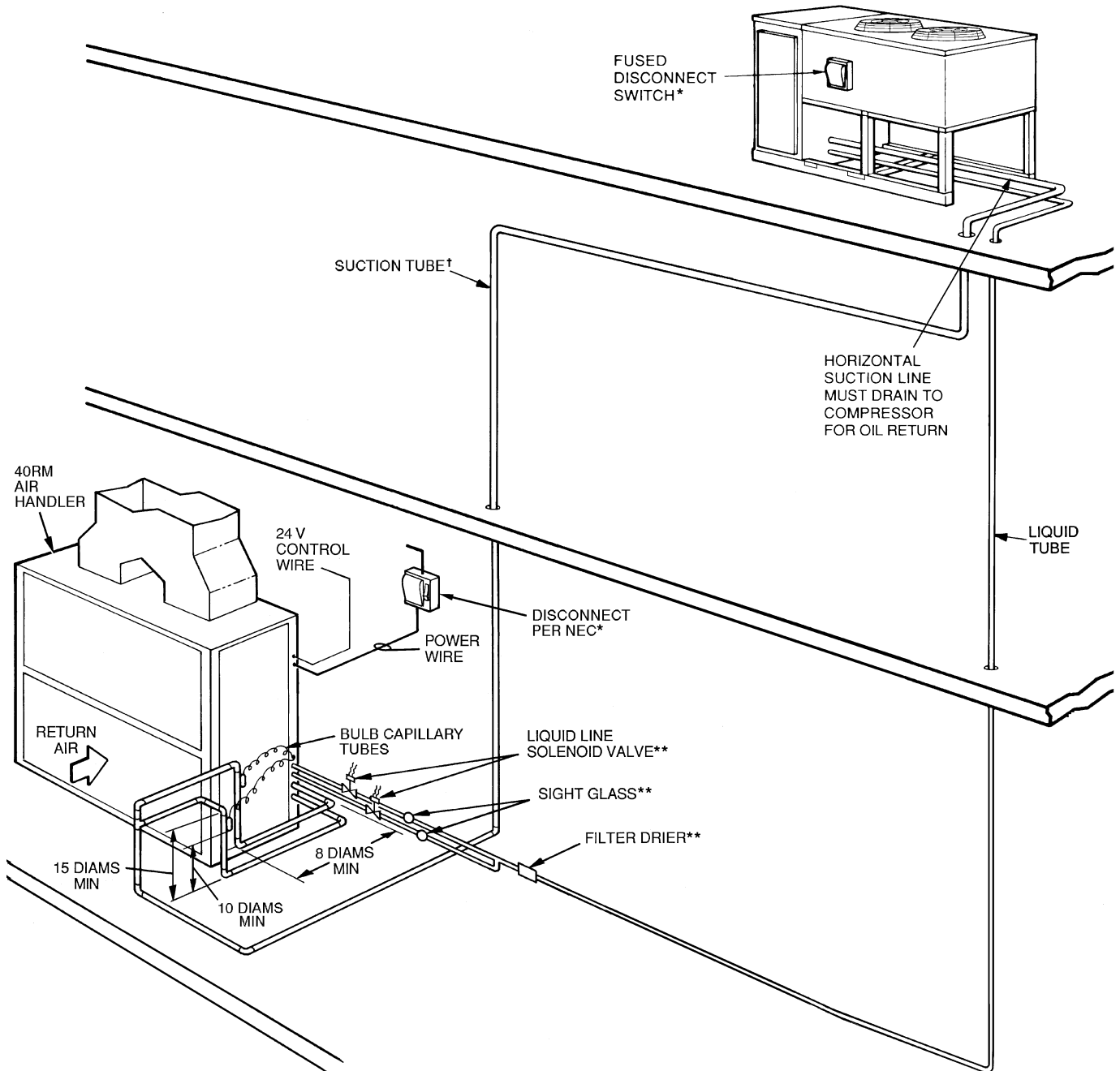
| 38AKS | DIMENSIONS (ft) | |
|---------|-----------------|---|
| | A | B |
| 028-044 | 4 | 4 |

Typical piping and wiring



ROOFTOP INSTALLATION — 38AKS028-044

38AKS028-044



LEGEND

- NEC — National Electrical Code
- TXV — Thermostatic Expansion Valve
- Piping

*Field supplied.

†Double riser may be required. Consult Application section for details.

**Refer to Refrigerant Specialties table.

NOTES:

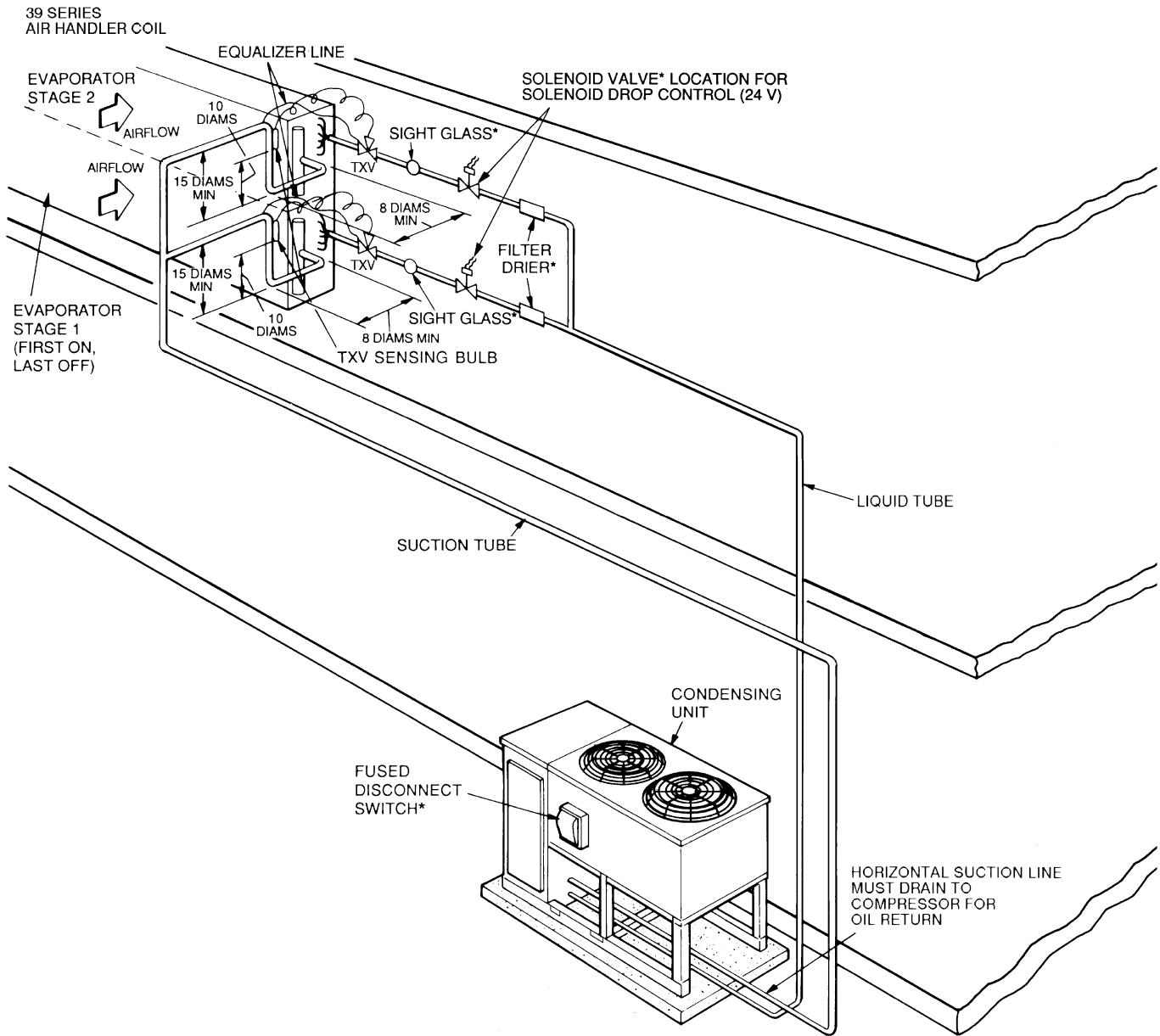
1. All piping must follow standard refrigerant piping techniques. Refer to Carrier System Design Manual for details.
2. All wiring must comply with the applicable local and national codes.
3. Wiring and piping shown are general points-of-connection guides only and are not intended for, or to include all details for, a specific installation.
4. Liquid line solenoid valve (solenoid drop control) is recommended to prevent refrigerant migration to the compressor.
5. Internal factory-supplied TXVs not shown.

Typical piping and wiring (cont)



GROUND-LEVEL INSTALLATION — 38AKS028-044

38AKS028-044



LEGEND

TXV — Thermostatic Expansion Valve

Piping

*Field supplied.

NOTES:

1. All piping must follow standard refrigerant piping techniques. Refer to Carrier System Design Manual for details.
2. All wiring must comply with the applicable local and national codes.
3. Wiring and piping shown are general points-of-connection guides only and are not intended for, or to include all details for, a specific installation.
4. Liquid line solenoid valve (solenoid drop control) is recommended to prevent refrigerant migration to the compressor.

Commercial Air-Cooled Condensing Units

HVAC Guide Specifications

Size Range: **25 to 40 Tons, Nominal**

Carrier Model Number: **38AKS**

Part 1 — General

1.01 SYSTEM DESCRIPTION

Outdoor-mounted, air-cooled condensing unit suitable for on-the-ground or rooftop installation. Unit shall consist of a semi-hermetic reciprocating compressor, an air-cooled coil, propeller-type condenser fans, and a control box. Unit shall discharge supply air upward as shown on contract drawings. Unit shall be used in a refrigeration circuit to match a packaged fan coil unit.

1.02 QUALITY ASSURANCE

- A. Unit shall be rated in accordance with ARI Standard 365, latest edition and shall be certified and listed in the latest ARI directory.
- B. Unit shall be manufactured in a facility registered to the ISO 9001:2000 manufacturing quality standard.
- C. Unit construction shall comply with latest edition of ANSI/ASHRAE and with NEC.
- D. Unit shall be constructed in accordance with UL standards and shall carry the UL and UL, Canada label of approval.
- E. Unit cabinet shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).
- F. Air-cooled condenser coils shall be leak tested at 150 psig and pressure tested at 450 psig.

1.03 DELIVERY, STORAGE AND HANDLING

Unit shall be shipped as single package only, and shall be stored and handled per unit manufacturer's recommendations.

1.04 WARRANTY (FOR INCLUSION BY SPECIFYING ENGINEER.)

Part 2 — Products

2.01 EQUIPMENT

A. General:

Factory assembled, single piece, air-cooled condensing unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, compressor, holding charge (R-22), and special features required prior to field start-up.

B. Unit Cabinet:

1. Unit cabinet shall be constructed of galvanized steel, bonderized and coated with a prepainted, baked enamel finish.
2. End unit access panel shall be hinged for compressor and control box service access.
3. Lifting holes shall be provided to facilitate rigging.

C. Fans:

1. Condenser fans shall be direct-drive propeller type, discharging air vertically upward.
2. Condenser fan motors shall be totally enclosed, 3-phase type with class B insulation and permanently lubricated bearings.
3. Shafts shall have inherent corrosion resistance.
4. Fan blades shall be statically and dynamically balanced.
5. Condenser fan openings shall be equipped with PVC-coated steel wire safety guards.

D. Compressor:

1. Compressor shall be serviceable, reciprocating, semi-hermetic type.
2. Compressor shall be equipped with an automatically reversible oil pump, operating oil charge, suction and discharge shutoff valves, and an insert-type, factory-sized crankcase heater to control oil dilution.
3. Compressor shall be mounted on spring vibration isolators with an isolation efficiency of no less than 95%.
4. Compressor speed shall not exceed 1750 rpm.
5. Compressor shall unload using suction cutoff unloading (electrical solenoid unloading shall be available as an accessory).

E. Condenser Coil:

1. Condenser coil shall be air cooled, circuited for integral subcooler.
2. Coil shall be constructed of aluminum fins mechanically bonded to internally grooved, seamless copper tubes which are then cleaned, dehydrated, and sealed.
3. Coil shall be protected by a sheet metal casing to eliminate the need for wind baffles for low ambient temperature operation.
4. Coil shall be protected to avoid damage due to the elements and vandalism.

F. Refrigeration Components:

Refrigeration circuit components shall include hot gas muffler, high-side pressure relief device, liquid line shut-off valve, suction and discharge shutoff valves, holding charge of refrigerant R-22, and compressor oil.

G. Controls and Safeties:

1. Minimum control functions shall include:
 - a. Power and control terminal blocks.
 - b. Three-minute anti-short-cycling timer to prevent compressor short-cycling.
 - c. Lockout on auto-reset safety until reset from thermostat.



- d. Capacity control on the compressor shall be by suction cutoff unloaders in response to compressor suction pressure. Electric solenoid unloading shall be available as an accessory.
- e. A 115-v solenoid shall be provided for solenoid drop control.
- f. Head pressure control to 35 F by fan cycling. One condenser fan shall be cycled by discharge pressure to maintain proper head pressure.
- g. Winter start control to prevent nuisance trip-outs at low ambient temperatures.

2. Minimum safety devices shall include:

Automatic reset (after resetting first at control circuit power supply)

- a. High discharge-pressure cutout.
- b. Low suction-pressure cutout.
- c. Condenser fan motors to be protected against overload or single-phase condition by internal overloads.

Manual reset at the unit

- a. Low oil-pressure cutout.
- b. Compressor electrical overload protection through the use of definite-purpose contactors and calibrated, ambient-compensated, magnetic-trip circuit breakers. Circuit breakers shall open all 3 phases in the event of an overload in any one of the phases or a single-phase condition.

H. Operating Characteristics:

- 1. The capacity of the condensing unit shall meet or exceed _____ Btuh at a suction temperature of _____ F. The power consumption at full load shall not exceed _____ kW.
- 2. The combination of the condensing unit and the evaporator or fan coil unit shall have a total net cooling capacity of _____ Btuh or greater at conditions of: _____ cfm entering-air temperature at the evaporator at _____ F wet bulb and _____ F dry bulb, and air entering the condensing unit at _____ F.
- 3. The system shall have an EER of _____ Btuh/Watt or greater at standard ARI conditions.

I. Electrical Requirements:

- 1. Nominal unit electrical characteristics shall be _____ v, 3-ph, 60 Hz. The unit shall be capable of satisfactory operation within voltage limits of _____ v to _____ v.
- 2. Unit electrical power shall be single point connection.
- 3. Unit control circuit shall contain a 24-v transformer for unit control, with capacity to operate an indoor fan interlock.

J. Special Features:

1. Low-Ambient Control:

Control shall regulate fan motor speed in response to the saturated condensing temperature of the unit. The control shall be capable of maintaining a condensing temperature of 100 F ± 10° F with outdoor temperatures at -20 F (motor change required).

2. Electric Solenoid Unloader:

Unloader valve piston, coil, and hardware shall be supplied to convert any pressure-operated compressor unloader to 115-v electric unloading. Control box or field-supplied step controller shall be provided for electrical unloading.

3. Hot-Gas Bypass:

A hot-gas bypass valve and a 115-v pilot line solenoid valve shall be provided for low-load operation of the refrigeration system.

4. Part-Winding Start:

Part-winding start shall be provided to reduce inrush current and locked rotor amps on start-up.

5. Gage Panel:

A gage panel package shall be provided which includes a suction and discharge pressure gage for the refrigerant circuit.

6. Control Box:

Control box shall be provided to allow system to operate as a VAV system.

7. Optional Condenser Coil Materials:

a. Pre-Coated Aluminum-Fin Coils:

Shall have a durable epoxy-phenolic coating to provide protection in mildly corrosive coastal environments. Coating shall be applied to the aluminum fin stock prior to the fin stamping process to create an inert barrier between the aluminum fin and copper tube. Epoxy-phenolic barrier shall minimize galvanic action between dissimilar metals.

b. Copper-Fin Coils:

Shall be constructed of copper-fins mechanically bonded to copper-tubes and copper tube sheets. Galvanized steel tube sheets shall not be acceptable. A polymer strip shall prevent coil assembly from contacting sheet metal coil pan to minimize potential for galvanic corrosion between the coil and pan. All copper construction shall provide protection in moderate coastal environments.



c. E-Coated Aluminum-Fin Coils:

Shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins. Coating process shall ensure complete coil encapsulation. Color shall be high gloss black with gloss requirements of 60° of 65 to 90% per ASTM D523-89. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges. Superior hardness characteristics of 2H per ASTM D3363-92A and cross hatch adhesion of 4B-5B per ASTM D3359-93. Impact resistance shall be up to 160 in./lb (ASTM D2794-93). Humidity and water immersion resistance shall be up to a minimum of 1000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92). Corrosion durability shall be confirmed through testing to no less than 1000 hours salt spray per ASTM B117-90. Coil construction shall be aluminum fins mechanically bonded to copper tubes.

d. E-Coated Copper-Fin Coils:

Shall have a flexible epoxy polymer coating uniformly applied to all coil surface areas without material bridging between fins. Coating process shall ensure complete coil encapsulation. Color shall be high gloss black with gloss requirements of 60° of 65 to 90% per ASTM D523-89. Uniform dry film thickness from 0.8 to 1.2 mil on all surface areas including fin edges. Superior hardness characteristics of 2H per ASTM D3363-92A and cross hatch adhesion of 4B-5B per ASTM D3359-93. Impact resistance shall be up to 160 in./lb (ASTM

D2794-93). Humidity and water immersion resistance shall be up to a minimum of 1000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92). Corrosion durability shall be confirmed through testing to no less than 1000 hours salt spray per ASTM B117-90. Coil construction shall be copper-fins mechanically bonded to copper-tubes with copper tube sheets. Galvanized steel tube sheets shall not be acceptable. A polymer strip shall prevent coil assembly from contacting sheet metal coil pan to maintain coating integrity and minimize corrosion potential between the coil and pan.

8. Thermostat Controls:

- a. Programmable multi-stage thermostat with 7-day clock, holiday scheduling, large backlit display, remote sensor capability, and Title 24 compliance.
- b. Commercial Electronic Thermostat with 7-day timeclock, auto-changeover, multi-stage capability, and large LCD temperature display.
- c. Non-programmable thermostat with fan switch subbase.
- d. Carrier PremierLink™ Controller:

This control will function with CCN and ComfortVIEW™ software. It shall also be compatible with ComfortLink™ controllers. It shall be ASHRAE 62-99 compliant and Internet ready. It shall accept a CO₂ sensor in the conditioned space and be Demand Control Ventilation (DCV) ready. The communication rate must be 38.4K or faster. It shall include an integrated economizer controller.

38AKS028-044

Model number nomenclature — 38AH024-034



38AH — 024 — — — 6 0 1 A A

38AH — Commercial Air-Cooled
Condensing Unit

Not Used

Nominal Tons

- 024 — 20
- 028 — 25
- 034 — 30

Not Used

Condenser Coil Fin Material

- — Aluminum (Standard)
- C — Copper
- K — Pre-Coated Aluminum
- E — E-Coated Al Fin/Cu Tubes
- F — E-Coated Cu Fin/Cu Tubes

Voltage Designation

- 1 — 575-3-60
- 2 — 380-3-60 (Export Only)
- 5 — 208/230-3-60
- 6 — 460-3-60

Compressors

- A — Standard Compressors - One Suction Pressure-Actuated Unloader on Lead Compressor
- C — Variable Air Volume (VAV) Option - Includes 2 Electric Unloaders on Lead Compressor and Control Box Modifications

Fan Motors and Labels

- A — Standard Condenser Fan Motors and Labels

Packaging

- 1 — Domestic
- 3 — Export

Revision Number

- 0 — Original Model

LEGEND

- Al — Aluminum
- Cu — Copper

38AH024-034

Quality Assurance

Certified to ISO 9001:2000

Physical data



38AH024-034 UNITS

| UNIT 38AH | 024 | | 028 | | 034 | |
|-----------------------------------|---------------------------------------------|-------------|-------------|-------------|-------------|-------------|
| | Ckt 1 | Ckt 2 | Ckt 1 | Ckt 2 | Ckt 1 | Ckt 2 |
| NOMINAL CAPACITY (tons)* | 20 | | 25 | | 30 | |
| OPERATING WEIGHT (lb) | | | | | | |
| With Aluminum-Fin Coil (standard) | 1760 | | 1820 | | 1880 | |
| With Copper-Fin Coil (optional) | 1923 | | 1982 | | 2097 | |
| REFRIGERANT, TYPE† | R-22 | | | | | |
| Operating Charge, Typical (lb) | 20 | 20 | 20 | 20 | 25 | 25 |
| Shipping Charge (lb) | 3 | 3 | 3 | 3 | 3 | 3 |
| COMPRESSOR | Reciprocating Semi-Hermetic | | | | | |
| Qty...Model | 1...06DH824 | 1...06DA824 | 1...06DH328 | 1...06DA328 | 1...06DH328 | 1...06DA537 |
| No. Cylinders (per circuit) | 6 | 6 | 6 | 6 | 6 | 6 |
| Speed (rpm) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Oil Charge Per Circuit (pt) | 10 | | | | | |
| Capacity Steps (%) | 67**,33†† | — | 67**,33†† | — | 67**,33†† | — |
| Unloader Setting (psig) | Factory Installed | | | | | |
| Load | 76 | — | 76 | — | 76 | — |
| Unload | 58 | — | 58 | — | 58 | — |
| CONDENSER FANS | Propeller Type — Direct Driven | | | | | |
| Qty...RPM | 2...1140 | | | | | |
| Diameter (in.) | 30 | | 30 | | 30 | |
| Nominal Hp | 1.0 | | 1.0 | | 1.0 | |
| Nominal Airflow (cfm) | 16,700 | | 16,700 | | 15,700 | |
| Watts (total) | | | 1550 | | | |
| CONDENSER COIL | Enhanced Copper Tubes, Lanced Aluminum Fins | | | | | |
| Rows...Fins/in. | 2...19 | | 2...19 | | 3...17 | |
| Face Area (sq ft) | 39.20 | | 39.20 | | 39.20 | |
| Storage Cap. (lb)*** | 37.7 | | 37.7 | | 56.6 | |
| CONTROLS | | | | | | |
| Pressurestat (psig) | | | | | | |
| High Pressure | | | | | | |
| Open | 426 ± 7 | | | | | |
| Close | 320 ± 20 | | | | | |
| Low Pressure | | | | | | |
| Open | 27 ± 3 | | | | | |
| Close | 44 ± 5 | | | | | |
| Oil Pressure | Manual Reset | | | | | |
| Open | 6.0 | | | | | |
| Close | 8.8 | | | | | |
| FAN CYCLING CONTROLS | | | | | | |
| No. 2 Fan: | | | | | | |
| Temp Close (F) | 70 ± 3 | | | | | |
| Temp Open (F) | 60 ± 3 | | | | | |
| PRESSURE RELIEF | | | | | | |
| Location | Liquid Line, Suction Line, Compressor | | | | | |
| Temperature (F) | 210 | | | | | |
| PIPING CONNECTIONS (in. ODM) | | | | | | |
| Suction — in. OD | 1 ³ / ₈ | | | | | |
| Liquid — in. OD | 5 ⁸ / ₈ | | | | | |
| Hot Gas Bypass — in. OD | 5 ⁸ / ₈ | | | | | |

LEGEND

FIOF — Factory-Installed Option

*Rating conditions are 80 F db, 67 F wb at 95 F ambient temperature.

†Typical operating charge with 25 ft of interconnecting piping. Operating charge is approximate for maximum system capacity.

**Standard unit — single suction pressure-actuated unloader on compressor no. 1.

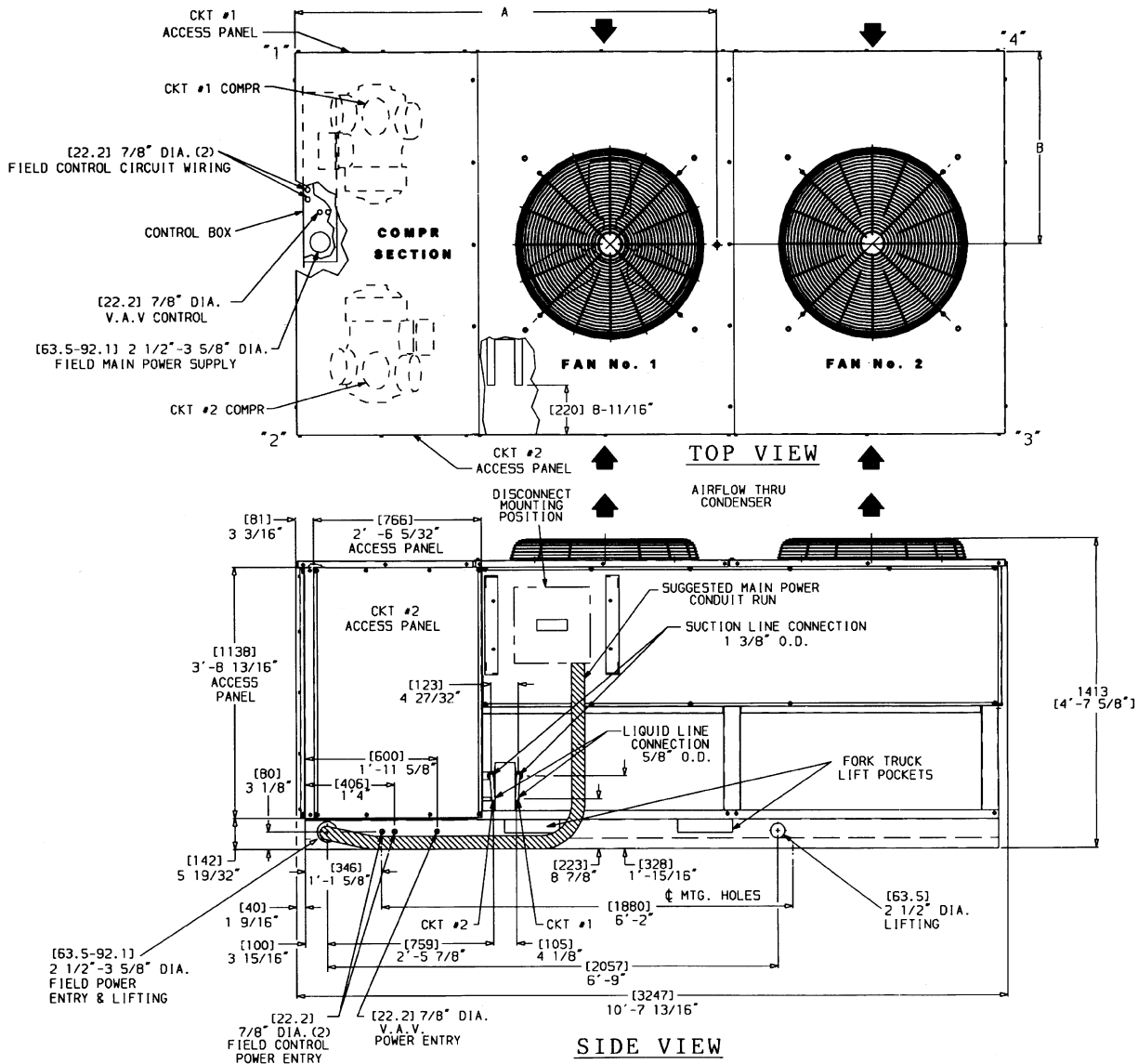
††VAV FIOF — two electrically actuated unloaders on compressor no. 1.

***Condenser 80% full of liquid R-22 at 120 F.

NOTE: Refer to Unloading Sequences table, page 44 for additional capacity step data.

38AH024-034

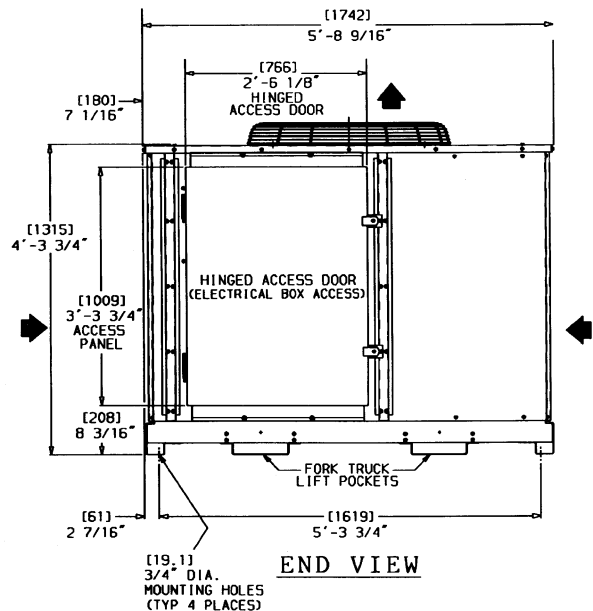
Dimensions



NOTES:

1. There must be 4 ft [1220 mm] for service and for unrestricted airflow on all sides of unit.
2. There must be minimum 8 ft [2440 mm] clear air space above unit.
3. "C" in the package number indicates copper coils.
4. Dimensions in [] are in millimeters.
5. The approximate operating weight of the unit is shown below.
6. Certified dimensional drawing is available on request.

| UNIT 38AH | CORNER WEIGHT — lb [kg] | | | | CENTER OF GRAVITY | | TOTAL UNIT WT lb [kg] |
|--------------|-------------------------|------------------|------------------|------------------|-----------------------|-----------------------|-----------------------------|
| | "1" | "2" | "3" | "4" | A Dim. in. [mm] | B Dim. in. [mm] | |
| 024 | 631.6 [286.5] | 577.6 [262.0] | 263.1 [119.3] | 287.7 [130.5] | 40.00 [1016] | 32.75 [832] | 1760 [798.3] |
| 024C | 666.5 [302.3] | 609.5 [276.5] | 309.0 [140.2] | 337.9 [153.3] | 43.00 [1092] | | 1923 [872.3] |
| 028 | 658.7 [298.8] | 602.4 [273.3] | 267.0 [121.1] | 291.9 [132.4] | 39.25 [997] | | 1820 [825.6] |
| 028C | 693.0 [314.3] | 633.8 [287.5] | 313.0 [142.0] | 342.2 [155.2] | 42.25 [1073] | | 1982 [899.0] |
| 034 | 667.0 [302.5] | 610.0 [276.7] | 288.0 [130.7] | 315.0 [142.9] | 41.00 [1041] | | 1880 [853.0] |
| 034C | 718.3 [325.8] | 656.8 [297.9] | 344.8 [156.4] | 377.0 [171.0] | 44.00 [1117] | | 2097 [951.2] |



38AH024-034

Performance data



CONDENSING UNIT RATINGS

38AH024

| SST (F) | | Air Temp Ent Condenser (F) | | | | |
|------------|-----|----------------------------|------|------|------|------|
| | | 85 | 95 | 100 | 105 | 115 |
| 20 | TC | 157 | 143 | 136 | 129 | 115 |
| | kW | 14.1 | 14.9 | 15.2 | 15.5 | 16.0 |
| | SDT | 105 | 115 | 120 | 125 | 135 |
| 25 | TC | 178 | 163 | 156 | 149 | 134 |
| | kW | 14.7 | 15.6 | 16.0 | 16.4 | 17.0 |
| | SDT | 106 | 116 | 121 | 126 | 135 |
| 30 | TC | 198 | 183 | 176 | 168 | 153 |
| | kW | 15.3 | 16.3 | 16.8 | 17.3 | 18.1 |
| | SDT | 107 | 117 | 121 | 126 | 135 |
| 35 | TC | 221 | 205 | 197 | 189 | 173 |
| | kW | 15.9 | 17.1 | 17.6 | 18.1 | 19.1 |
| | SDT | 109 | 118 | 123 | 128 | 137 |
| 40 | TC | 244 | 227 | 219 | 210 | 193 |
| | kW | 16.6 | 17.9 | 18.5 | 19.0 | 20.1 |
| | SDT | 111 | 120 | 125 | 129 | 138 |
| 45 | TC | 270 | 251 | 243 | 233 | 215 |
| | kW | 17.2 | 18.6 | 19.3 | 19.9 | 21.1 |
| | SDT | 113 | 122 | 127 | 131 | 140 |
| 50 | TC | 295 | 276 | 266 | 257 | 237 |
| | kW | 17.8 | 19.4 | 20.1 | 20.8 | 22.1 |
| | SDT | 116 | 125 | 129 | 133 | 142 |

38AH028

| SST (F) | | Air Temp Ent Condenser (F) | | | | |
|------------|-----|----------------------------|------|------|------|------|
| | | 85 | 95 | 100 | 105 | 115 |
| 20 | TC | 187 | 173 | 167 | 160 | 147 |
| | kW | 17.1 | 18.1 | 18.6 | 19.1 | 19.9 |
| | SDT | 107 | 116 | 121 | 126 | 135 |
| 25 | TC | 209 | 194 | 187 | 180 | 166 |
| | kW | 17.9 | 19.1 | 19.6 | 20.1 | 21.1 |
| | SDT | 109 | 118 | 123 | 127 | 137 |
| 30 | TC | 231 | 216 | 208 | 200 | 185 |
| | kW | 18.7 | 20.0 | 20.6 | 21.2 | 22.2 |
| | SDT | 111 | 120 | 124 | 129 | 138 |
| 35 | TC | 256 | 239 | 231 | 223 | 206 |
| | kW | 19.5 | 20.9 | 21.6 | 22.2 | 23.4 |
| | SDT | 113 | 122 | 126 | 131 | 140 |
| 40 | TC | 282 | 263 | 254 | 245 | 228 |
| | kW | 20.3 | 21.9 | 22.6 | 23.3 | 24.6 |
| | SDT | 115 | 124 | 128 | 133 | 142 |
| 45 | TC | 310 | 290 | 280 | 271 | 252 |
| | kW | 21.1 | 22.8 | 23.6 | 24.4 | 25.9 |
| | SDT | 118 | 126 | 131 | 135 | 144 |
| 50 | TC | 338 | 317 | 306 | 296 | 275 |
| | kW | 22.0 | 23.8 | 24.6 | 25.5 | 27.1 |
| | SDT | 120 | 129 | 133 | 138 | 146 |

38AH034

| SST (F) | | Air Temp Ent Condenser (F) | | | | |
|------------|-----|----------------------------|------|------|------|------|
| | | 85 | 95 | 100 | 105 | 115 |
| 20 | TC | 223 | 206 | 199 | 190 | 175 |
| | kW | 21.2 | 22.5 | 23.1 | 23.7 | 24.8 |
| | SDT | 107 | 117 | 122 | 127 | 137 |
| 25 | TC | 249 | 232 | 224 | 215 | 209 |
| | kW | 22.2 | 23.6 | 24.2 | 24.9 | 26.2 |
| | SDT | 109 | 118 | 123 | 128 | 137 |
| 30 | TC | 276 | 258 | 249 | 241 | 222 |
| | kW | 23.1 | 24.7 | 25.4 | 26.2 | 27.6 |
| | SDT | 110 | 119 | 124 | 129 | 138 |
| 35 | TC | 307 | 287 | 277 | 267 | 248 |
| | kW | 24.2 | 25.9 | 26.7 | 27.6 | 29.0 |
| | SDT | 112 | 121 | 126 | 130 | 140 |
| 40 | TC | 336 | 314 | 305 | 294 | 274 |
| | kW | 25.3 | 27.1 | 28.0 | 28.9 | 30.5 |
| | SDT | 115 | 123 | 128 | 132 | 141 |
| 45 | TC | 369 | 346 | 335 | 324 | 302 |
| | kW | 26.3 | 28.3 | 29.3 | 30.3 | 32.0 |
| | SDT | 117 | 126 | 136 | 135 | 144 |
| 50 | TC | 402 | 378 | 366 | 354 | 330 |
| | kW | 27.4 | 29.6 | 30.6 | 31.7 | 33.6 |
| | SDT | 120 | 128 | 133 | 137 | 146 |

LEGEND

- kW — Compressor Power
- SDT — Saturated Discharge Temperature at Compressor (F)
- SST — Saturated Suction Temperature (F)
- TC — Gross Cooling Capacity (1000 Btuh)

38AH024-034

Performance data (cont)



CONDENSING UNIT RATINGS (cont)

| 38AH024 — CIRCUIT NO. 1 OR 2* | | | | | | |
|-------------------------------|-----|----------------------------|------|------|------|------|
| SST (F) | | Air Temp Ent Condenser (F) | | | | |
| | | 85 | 95 | 100 | 105 | 115 |
| 20 | TC | 78 | 71 | 68 | 65 | 58 |
| | kW | 7.03 | 7.44 | 7.61 | 7.76 | 8.01 |
| | SDT | 105 | 115 | 120 | 125 | 135 |
| 25 | TC | 89 | 82 | 78 | 74 | 67 |
| | kW | 7.34 | 7.80 | 8.01 | 8.20 | 8.52 |
| | SDT | 106 | 116 | 121 | 126 | 135 |
| 30 | TC | 99 | 92 | 88 | 84 | 77 |
| | kW | 7.65 | 8.17 | 8.41 | 8.63 | 9.03 |
| | SDT | 107 | 117 | 121 | 126 | 135 |
| 35 | TC | 111 | 103 | 99 | 95 | 87 |
| | kW | 7.96 | 8.55 | 8.82 | 9.07 | 9.54 |
| | SDT | 109 | 118 | 123 | 128 | 137 |
| 40 | TC | 122 | 114 | 109 | 105 | 97 |
| | kW | 8.28 | 8.93 | 9.23 | 9.52 | 10.0 |
| | SDT | 111 | 120 | 125 | 129 | 138 |
| 45 | TC | 135 | 126 | 121 | 117 | 108 |
| | kW | 8.59 | 9.30 | 9.64 | 9.96 | 10.6 |
| | SDT | 113 | 122 | 127 | 131 | 140 |
| 50 | TC | 148 | 138 | 133 | 128 | 119 |
| | kW | 8.90 | 9.68 | 10.0 | 10.4 | 11.1 |
| | SDT | 116 | 125 | 129 | 133 | 142 |

| 38AH034 — CIRCUIT NO. 1 | | | | | | |
|-------------------------|-----|----------------------------|------|------|------|------|
| SST (F) | | Air Temp Ent Condenser (F) | | | | |
| | | 85 | 95 | 100 | 105 | 115 |
| 20 | TC | 93 | 85 | 82 | 78 | 71 |
| | kW | 8.69 | 9.26 | 9.53 | 9.78 | 10.2 |
| | SDT | 105 | 115 | 120 | 125 | 135 |
| 25 | TC | 105 | 97 | 93 | 89 | 81 |
| | kW | 9.02 | 9.64 | 9.94 | 10.2 | 10.8 |
| | SDT | 106 | 116 | 121 | 125 | 135 |
| 30 | TC | 117 | 109 | 105 | 101 | 92 |
| | kW | 9.34 | 10.0 | 10.3 | 10.7 | 11.3 |
| | SDT | 107 | 116 | 121 | 126 | 135 |
| 35 | TC | 131 | 122 | 117 | 113 | 104 |
| | kW | 9.70 | 10.5 | 10.8 | 11.2 | 11.8 |
| | SDT | 109 | 118 | 123 | 127 | 137 |
| 40 | TC | 144 | 134 | 130 | 125 | 116 |
| | kW | 10.1 | 10.9 | 11.3 | 11.7 | 12.4 |
| | SDT | 111 | 120 | 124 | 129 | 138 |
| 45 | TC | 159 | 148 | 143 | 138 | 128 |
| | kW | 10.4 | 11.3 | 11.7 | 12.2 | 12.9 |
| | SDT | 113 | 122 | 127 | 131 | 140 |
| 50 | TC | 174 | 163 | 157 | 152 | 141 |
| | kW | 10.8 | 11.8 | 12.2 | 12.7 | 13.5 |
| | SDT | 116 | 124 | 129 | 133 | 142 |

| 38AH028 — CIRCUIT NO. 1 OR 2* | | | | | | |
|-------------------------------|-----|----------------------------|------|------|------|------|
| SST (F) | | Air Temp Ent Condenser (F) | | | | |
| | | 85 | 95 | 100 | 105 | 115 |
| 20 | TC | 93 | 87 | 83 | 80 | 74 |
| | kW | 8.55 | 9.07 | 9.31 | 9.54 | 9.97 |
| | SDT | 107 | 116 | 121 | 126 | 135 |
| 25 | TC | 104 | 97 | 94 | 90 | 83 |
| | kW | 8.95 | 9.53 | 9.80 | 10.1 | 10.5 |
| | SDT | 109 | 118 | 123 | 127 | 137 |
| 30 | TC | 116 | 108 | 104 | 100 | 93 |
| | kW | 9.35 | 9.99 | 10.3 | 10.6 | 11.1 |
| | SDT | 111 | 120 | 124 | 129 | 138 |
| 35 | TC | 128 | 120 | 116 | 111 | 103 |
| | kW | 9.76 | 10.5 | 10.8 | 11.1 | 11.7 |
| | SDT | 113 | 122 | 126 | 131 | 140 |
| 40 | TC | 141 | 132 | 127 | 123 | 114 |
| | kW | 10.2 | 10.9 | 11.3 | 11.6 | 12.3 |
| | SDT | 115 | 124 | 128 | 133 | 142 |
| 45 | TC | 155 | 145 | 140 | 135 | 126 |
| | kW | 10.6 | 11.4 | 11.8 | 12.2 | 12.9 |
| | SDT | 118 | 126 | 131 | 135 | 144 |
| 50 | TC | 169 | 158 | 153 | 148 | 138 |
| | kW | 11.0 | 11.9 | 12.3 | 12.7 | 13.5 |
| | SDT | 120 | 129 | 133 | 138 | 146 |

| 38AH034 — CIRCUIT NO. 2 | | | | | | |
|-------------------------|-----|----------------------------|------|------|------|------|
| SST (F) | | Air Temp Ent Condenser (F) | | | | |
| | | 85 | 95 | 100 | 105 | 115 |
| 20 | TC | 130 | 121 | 117 | 112 | 104 |
| | kW | 12.5 | 13.2 | 13.6 | 13.9 | 14.6 |
| | SDT | 109 | 118 | 123 | 128 | 138 |
| 25 | TC | 144 | 135 | 131 | 126 | 117 |
| | kW | 13.2 | 14.0 | 14.3 | 14.7 | 15.4 |
| | SDT | 111 | 120 | 124 | 129 | 139 |
| 30 | TC | 159 | 149 | 144 | 140 | 130 |
| | kW | 13.8 | 14.7 | 15.1 | 15.5 | 16.3 |
| | SDT | 113 | 122 | 126 | 131 | 140 |
| 35 | TC | 176 | 165 | 160 | 154 | 144 |
| | kW | 14.5 | 15.4 | 15.9 | 16.4 | 17.2 |
| | SDT | 115 | 124 | 128 | 133 | 142 |
| 40 | TC | 192 | 180 | 175 | 169 | 158 |
| | kW | 15.2 | 16.2 | 16.7 | 17.2 | 18.1 |
| | SDT | 118 | 126 | 131 | 135 | 144 |
| 45 | TC | 210 | 198 | 192 | 186 | 174 |
| | kW | 15.9 | 17.0 | 17.6 | 18.1 | 19.1 |
| | SDT | 120 | 129 | 133 | 138 | 147 |
| 50 | TC | 228 | 215 | 209 | 202 | 189 |
| | kW | 16.6 | 17.8 | 18.4 | 19.0 | 20.1 |
| | SDT | 123 | 132 | 136 | 140 | 149 |

LEGEND

- kW — Compressor Power
- SDT — Saturated Discharge Temperature at Compressor (F)
- SST — Saturated Suction Temperature (F)
- TC — Gross Cooling Capacity (1000 Btuh)

*Circuits no. 1 and 2 on 38AH024 and 028 have identical capacities.

38AH024-034



COMBINATION RATINGS

38AH024/40RM016 STANDARD 3-ROW COIL

| Temp (F) Air Entering Condenser (Edb) | | Evaporator Air — Cfm/BF | | | | | | | | |
|------------------------------------------------|-----|--------------------------|-------|-------|-----------|-------|-------|-----------|-------|-------|
| | | 4500/0.03 | | | 6000/0.05 | | | 7500/0.08 | | |
| | | Evaporator Air — Ewb (F) | | | | | | | | |
| | | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 |
| 85 | TC | 231.9 | 209.9 | — | 244.2 | 223.5 | 203.7 | 252.5 | 232.4 | 213.2 |
| | SHC | 113.4 | 139.3 | — | 127.0 | 161.0 | 203.7 | 138.6 | 179.7 | 213.2 |
| | kW | 16.32 | 15.81 | — | 16.61 | 16.13 | 15.67 | 16.80 | 16.33 | 15.89 |
| 95 | TC | 222.4 | 202.0 | — | 233.6 | 214.6 | 196.4 | 241.3 | 222.8 | 205.5 |
| | SHC | 110.0 | 135.8 | — | 123.0 | 156.7 | 196.3 | 134.6 | 174.9 | 205.5 |
| | kW | 17.77 | 17.17 | — | 18.09 | 17.54 | 17.01 | 18.32 | 17.78 | 17.27 |
| 100 | TC | 217.8 | 197.6 | 179.2 | 228.6 | 210.0 | 192.1 | 236.2 | 218.0 | 201.3 |
| | SHC | 108.4 | 133.8 | 171.6 | 121.1 | 154.4 | 192.1 | 132.8 | 172.5 | 201.3 |
| | kW | 18.46 | 17.79 | 17.17 | 18.82 | 18.20 | 17.60 | 19.07 | 18.47 | 17.91 |
| 105 | TC | 212.4 | 193.1 | 175.3 | 222.6 | 204.9 | 187.9 | 229.9 | 212.5 | 196.8 |
| | SHC | 106.5 | 131.8 | 168.2 | 118.9 | 152.0 | 187.9 | 130.5 | 169.7 | 196.8 |
| | kW | 19.09 | 18.34 | 17.64 | 19.49 | 18.80 | 18.13 | 19.78 | 19.10 | 18.48 |
| 115 | TC | 202.0 | 183.9 | 167.1 | 211.3 | 194.8 | 179.0 | 218.2 | 201.9 | 187.8 |
| | SHC | 102.8 | 127.6 | 161.0 | 114.6 | 147.1 | 179.0 | 126.4 | 164.4 | 187.7 |
| | kW | 20.51 | 19.68 | 18.92 | 20.93 | 20.18 | 19.46 | 21.25 | 20.50 | 19.86 |

38AH024/40RM016 HIGH-CAPACITY 4-ROW COILS

| Temp (F) Air Entering Condenser (Edb) | | Evaporator Air — Cfm | | | | | | | | |
|------------------------------------------------|-----|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | 4500 | | | 6000 | | | 7500 | | |
| | | Evaporator Air — Ewb (F) | | | | | | | | |
| | | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 |
| 85 | TC | 247.3 | 247.3 | 225.7 | 262.2 | 240.8 | 220.7 | 273.0 | 251.1 | 230.1 |
| | SHC | 117.0 | 117.0 | 140.5 | 128.9 | 159.5 | 189.5 | 139.3 | 176.7 | 211.9 |
| | kW | 16.43 | 16.43 | 15.89 | 16.77 | 16.27 | 15.77 | 17.02 | 16.52 | 16.00 |
| 95 | TC | 236.5 | 215.9 | 196.4 | 250.6 | 230.0 | 212.4 | 260.3 | 239.4 | 219.4 |
| | SHC | 112.5 | 136.1 | 158.6 | 123.9 | 154.8 | 185.2 | 134.8 | 172.1 | 206.1 |
| | kW | 17.90 | 17.27 | 16.64 | 18.34 | 17.72 | 17.13 | 18.59 | 17.99 | 17.38 |
| 100 | TC | 233.0 | 212.9 | 191.9 | 244.7 | 226.5 | 206.8 | 253.8 | 233.5 | 213.9 |
| | SHC | 111.1 | 135.0 | 156.5 | 121.7 | 153.6 | 183.7 | 132.2 | 169.6 | 203.2 |
| | kW | 18.95 | 18.22 | 17.26 | 19.09 | 18.74 | 17.98 | 19.37 | 18.72 | 18.05 |
| 105 | TC | 225.4 | 205.9 | 187.3 | 240.9 | 218.8 | 199.8 | 247.3 | 227.5 | 208.4 |
| | SHC | 108.1 | 131.5 | 154.3 | 120.4 | 150.0 | 179.4 | 130.0 | 167.2 | 200.3 |
| | kW | 19.35 | 18.62 | 17.88 | 20.14 | 19.10 | 18.38 | 20.13 | 19.42 | 18.71 |
| 115 | TC | 218.0 | 202.5 | 177.8 | 226.1 | 207.3 | 196.3 | 234.2 | 215.4 | 197.3 |
| | SHC | 105.2 | 130.3 | 149.9 | 114.8 | 145.6 | 178.7 | 125.4 | 162.5 | 193.4 |
| | kW | 21.36 | 19.93 | 19.10 | 21.27 | 20.46 | 19.60 | 21.61 | 20.82 | 20.02 |

38AH024/40RM024 STANDARD 3-ROW COIL

| Temp (F) Air Entering Condenser (Edb) | | Evaporator Air — Cfm/BF | | | | | | | | |
|------------------------------------------------|-----|--------------------------|-------|-------|-----------|-------|-------|-------------|-------|-------|
| | | 6000/0.03 | | | 8000/0.06 | | | 10,000/0.07 | | |
| | | Evaporator Air — Ewb (F) | | | | | | | | |
| | | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 |
| 85 | TC | 258.1 | 236.6 | 215.6 | 269.7 | 248.5 | 229.3 | 276.2 | 257.0 | 240.4 |
| | SHC | 132.6 | 167.1 | 207.7 | 149.3 | 193.3 | 229.3 | 163.9 | 217.2 | 240.4 |
| | kW | 16.93 | 16.43 | 15.94 | 17.19 | 16.70 | 16.26 | 17.34 | 16.90 | 16.52 |
| 95 | TC | 246.6 | 226.4 | 207.2 | 257.1 | 237.2 | 220.4 | 262.7 | 245.2 | 231.0 |
| | SHC | 128.2 | 162.9 | 200.5 | 144.8 | 188.6 | 220.4 | 159.2 | 211.8 | 230.9 |
| | kW | 18.47 | 17.88 | 17.32 | 18.78 | 18.20 | 17.71 | 18.94 | 18.43 | 18.02 |
| 100 | TC | 241.5 | 221.5 | 202.7 | 251.9 | 232.0 | 215.9 | 257.2 | 239.9 | 226.4 |
| | SHC | 126.2 | 160.9 | 196.5 | 142.8 | 186.4 | 215.9 | 157.3 | 209.4 | 226.4 |
| | kW | 19.25 | 18.58 | 17.96 | 19.59 | 18.93 | 18.40 | 19.77 | 19.20 | 18.75 |
| 105 | TC | 235.1 | 215.8 | 197.9 | 244.9 | 225.7 | 210.8 | 249.8 | 233.3 | 221.1 |
| | SHC | 123.8 | 158.5 | 192.4 | 140.3 | 183.7 | 210.8 | 154.6 | 206.4 | 221.1 |
| | kW | 19.98 | 19.23 | 18.53 | 20.37 | 19.61 | 19.03 | 20.56 | 19.91 | 19.43 |
| 115 | TC | 223.2 | 204.7 | 188.3 | 232.3 | 213.8 | 200.8 | 236.5 | 221.1 | 210.9 |
| | SHC | 119.3 | 154.0 | 184.0 | 135.8 | 178.7 | 200.8 | 150.0 | 200.8 | 210.9 |
| | kW | 21.47 | 20.63 | 19.89 | 21.89 | 21.04 | 20.45 | 22.08 | 21.38 | 20.91 |

38AH024/40RM024 HIGH-CAPACITY 4-ROW COILS

| Temp (F) Air Entering Condenser (Edb) | | Evaporator Air — Cfm | | | | | | | | |
|------------------------------------------------|-----|--------------------------|-------|-------|-------|-------|-------|--------|-------|-------|
| | | 6000 | | | 8000 | | | 10,000 | | |
| | | Evaporator Air — Ewb (F) | | | | | | | | |
| | | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 |
| 85 | TC | 275.6 | 252.5 | 230.6 | 289.0 | 265.9 | 244.2 | 298.1 | 274.5 | 254.5 |
| | SHC | 132.9 | 166.6 | 208.6 | 148.2 | 191.3 | 231.4 | 162.5 | 214.1 | 254.5 |
| | kW | 17.12 | 16.60 | 16.07 | 17.40 | 16.91 | 16.42 | 17.61 | 17.11 | 16.64 |
| 95 | TC | 263.1 | 241.1 | 220.0 | 275.7 | 253.5 | 232.8 | 289.8 | 261.1 | 244.3 |
| | SHC | 128.2 | 161.5 | 193.8 | 143.4 | 186.4 | 225.4 | 159.6 | 208.9 | 244.3 |
| | kW | 18.72 | 18.10 | 17.45 | 19.06 | 18.47 | 17.85 | 19.99 | 18.67 | 18.19 |
| 100 | TC | 256.7 | 235.2 | 214.7 | 269.0 | 247.0 | 226.7 | 276.4 | 254.4 | 239.0 |
| | SHC | 125.7 | 159.2 | 191.3 | 141.1 | 183.9 | 222.2 | 155.1 | 206.5 | 239.0 |
| | kW | 19.49 | 18.82 | 18.13 | 19.88 | 19.21 | 18.54 | 20.08 | 19.43 | 18.95 |
| 105 | TC | 250.3 | 229.3 | 209.3 | 261.9 | 240.3 | 220.7 | 269.0 | 247.5 | 233.8 |
| | SHC | 123.4 | 156.8 | 188.8 | 138.6 | 181.3 | 220.7 | 152.6 | 203.8 | 233.8 |
| | kW | 20.27 | 19.53 | 18.79 | 20.66 | 19.93 | 19.21 | 20.88 | 20.18 | 18.70 |
| 115 | TC | 237.4 | 217.2 | 197.7 | 247.6 | 227.0 | 210.1 | 254.0 | 233.7 | 222.7 |
| | SHC | 118.5 | 151.9 | 183.3 | 133.6 | 176.3 | 210.1 | 147.6 | 198.5 | 222.7 |
| | kW | 21.78 | 20.95 | 20.07 | 22.18 | 21.35 | 20.62 | 22.43 | 21.63 | 21.16 |

38AH024-034

LEGEND

- BF — Bypass Factor
- Edb — Entering Dry Bulb
- Ewb — Entering Wet Bulb
- kW — Compressor Motor Power Input
- SHC — Sensible Heating Capacity (1000 Btu/h)
- TC — Total Capacity (1000 Btu/h)

NOTES:

1. Direct interpolation is permissible. Do not extrapolate.
2. The SHC is based on 80 F dry-bulb temperature of air entering evaporator coil. Below 80 F dry-bulb, subtract (correction factor x cfm) from SHC. Above 80 F dry bulb, add (correction factor x cfm) to SHC.

| BYPASS FACTOR | ENTERING-AIR DRY-BULB TEMP (F) | | | | | |
|-------------------|--------------------------------|------|------|------|------|--------------------|
| | 79 | 78 | 77 | 76 | 75 | under 75 |
| | 81 | 82 | 83 | 84 | 85 | over 85 |
| Correction Factor | | | | | | |
| 0.10 | 0.99 | 1.98 | 2.97 | 3.96 | 4.95 | Use formula below. |
| 0.20 | 0.88 | 1.76 | 2.64 | 3.52 | 4.40 | |
| 0.30 | 0.77 | 1.54 | 2.31 | 3.08 | 3.85 | |

Interpolation is permissible.
Correction Factor = 1.1 x (1 - BF) x (db - 80).

3. Gross capacities shown do not include a deduction for evaporator fan motor heat.

4. Formulas:

$$t_{db} = t_{edb} - \frac{\text{sensible heat capacity (Btu/h)}}{1.1 \times \text{cfm}}$$

$$t_{wb} = \text{wet-bulb temperature corresponding to enthalpy of air leaving evaporator coil (} h_{wb} \text{)}$$

$$h_{wb} = h_{ewb} - \frac{\text{total capacity (Btu/h)}}{4.51 \times \text{cfm}}$$

5. Combination ratings are based on a 2° F line loss. For a close-coupled system (less than 15 ft), add 2% to ratings. Piping sizes in Refrigerant Pipe Sizes table on page 44 are based on 2° F line loss. All combination ratings are based on R-22.

Performance data (cont)



COMBINATION RATINGS (cont)

38AH024/40RM028 STANDARD 3-ROW COIL

| Temp (F) Air Entering Condenser (Edb) | Evaporator Air — Cfm/BF | | | | | | | | | |
|------------------------------------------------|--------------------------|-------|-------|-------------|-------|-------|-------------|-------|-------|-------|
| | 7500/0.04 | | | 10,000/0.06 | | | 12,500/0.08 | | | |
| | Evaporator Air — Ewb (F) | | | | | | | | | |
| | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 | |
| 85 | TC | 278.4 | 254.6 | 235.5 | 289.1 | 265.4 | 250.7 | 294.9 | 274.8 | 263.5 |
| | SHC | 149.6 | 191.9 | 232.0 | 170.2 | 223.7 | 250.7 | 190.0 | 252.2 | 263.5 |
| | kW | 17.39 | 16.85 | 16.40 | 17.64 | 17.09 | 16.75 | 17.77 | 17.31 | 17.05 |
| 95 | TC | 265.2 | 242.4 | 225.7 | 275.0 | 252.3 | 240.3 | 279.9 | 261.3 | 252.5 |
| | SHC | 144.8 | 187.0 | 223.0 | 165.2 | 218.3 | 240.3 | 185.0 | 246.4 | 252.2 |
| | kW | 19.01 | 18.35 | 17.86 | 19.30 | 18.64 | 18.29 | 19.44 | 18.90 | 18.64 |
| 100 | TC | 259.8 | 237.0 | 220.9 | 269.4 | 246.7 | 235.6 | 274.2 | 255.7 | 247.8 |
| | SHC | 142.8 | 184.8 | 218.6 | 163.2 | 216.0 | 235.6 | 183.1 | 243.9 | 247.8 |
| | kW | 19.86 | 19.10 | 18.56 | 20.18 | 19.42 | 19.05 | 20.34 | 19.72 | 19.46 |
| 105 | TC | 252.5 | 230.2 | 215.4 | 261.6 | 239.5 | 229.7 | 266.1 | 248.3 | 241.6 |
| | SHC | 140.1 | 182.1 | 213.5 | 160.5 | 213.1 | 229.7 | 180.4 | 240.7 | 241.6 |
| | kW | 20.66 | 19.79 | 19.21 | 21.02 | 20.15 | 19.77 | 21.19 | 20.50 | 20.24 |
| 115 | TC | 239.5 | 217.6 | 204.7 | 248.0 | 226.4 | 218.8 | 251.8 | 235.0 | 230.3 |
| | SHC | 135.4 | 177.0 | 203.7 | 155.7 | 207.7 | 218.7 | 175.6 | 234.9 | 230.3 |
| | kW | 22.21 | 21.22 | 20.63 | 22.60 | 21.62 | 21.27 | 22.77 | 22.01 | 21.80 |

38AH028/40RM024 STANDARD 3-ROW COIL

| Temp (F) Air Entering Condenser (Edb) | Evaporator Air — Cfm/BF | | | | | | | | | |
|------------------------------------------------|--------------------------|-------|-------|-----------|-------|-------|-------------|-------|-------|-------|
| | 6000/0.03 | | | 8000/0.06 | | | 10,000/0.07 | | | |
| | Evaporator Air — Ewb (F) | | | | | | | | | |
| | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 | |
| 85 | TC | 281.6 | 258.4 | — | 294.8 | 272.1 | 248.7 | 302.9 | 281.2 | 260.2 |
| | SHC | 141.5 | 176.0 | — | 158.4 | 203.3 | 248.7 | 173.3 | 228.3 | 260.2 |
| | kW | 20.29 | 19.63 | — | 20.66 | 20.02 | 19.35 | 20.90 | 20.28 | 19.68 |
| 95 | TC | 270.0 | 247.7 | 225.1 | 282.4 | 260.5 | 239.2 | 289.7 | 269.3 | 250.5 |
| | SHC | 137.1 | 171.6 | 216.1 | 153.9 | 198.4 | 239.2 | 168.7 | 222.8 | 250.5 |
| | kW | 22.13 | 21.39 | 20.64 | 22.55 | 21.82 | 21.11 | 22.79 | 22.11 | 21.48 |
| 100 | TC | 264.3 | 242.6 | 221.0 | 276.1 | 254.8 | 234.7 | 283.0 | 263.4 | 245.8 |
| | SHC | 134.9 | 169.5 | 212.5 | 151.6 | 196.0 | 234.7 | 166.3 | 220.1 | 245.8 |
| | kW | 23.00 | 22.16 | 21.33 | 23.45 | 22.63 | 21.86 | 23.71 | 22.96 | 22.28 |
| 105 | TC | 258.7 | 237.2 | 216.1 | 270.4 | 249.1 | 229.9 | 276.9 | 257.6 | 240.9 |
| | SHC | 132.8 | 167.3 | 208.2 | 149.5 | 193.6 | 229.8 | 164.2 | 217.5 | 240.9 |
| | kW | 23.88 | 22.97 | 22.08 | 24.37 | 23.47 | 22.66 | 24.65 | 23.83 | 23.13 |
| 115 | TC | 247.3 | 227.1 | 207.8 | 257.8 | 237.8 | 220.9 | 263.4 | 245.8 | 231.5 |
| | SHC | 128.4 | 163.2 | 201.0 | 145.0 | 188.8 | 220.9 | 159.4 | 212.1 | 231.5 |
| | kW | 25.64 | 24.55 | 23.50 | 26.21 | 25.13 | 24.22 | 26.52 | 25.57 | 24.79 |

LEGEND

- BF — Bypass Factor
- Edb — Entering Dry Bulb
- Ewb — Entering Wet Bulb
- kW — Compressor Motor Power Input
- SHC — Sensible Heating Capacity (1000 Btu/h)
- TC — Total Capacity (1000 Btu/h)

NOTES:

1. Direct interpolation is permissible. Do not extrapolate.
2. The SHC is based on 80 F dry-bulb temperature of air entering evaporator coil. Below 80 F dry-bulb, subtract (correction factor x cfm) from SHC. Above 80 F dry-bulb, add (correction factor x cfm) to SHC.

| BYPASS FACTOR | ENTERING-AIR DRY-BULB TEMP (F) | | | | | |
|-------------------|--------------------------------|------|------|------|------|-----------------------|
| | 79 | 78 | 77 | 76 | 75 | under 75 |
| | 81 | 82 | 83 | 84 | 85 | over 85 |
| Correction Factor | | | | | | |
| 0.10 | 0.99 | 1.98 | 2.97 | 3.96 | 4.95 | Use formula below. |
| 0.20 | 0.88 | 1.76 | 2.64 | 3.52 | 4.40 | |
| 0.30 | 0.77 | 1.54 | 2.31 | 3.08 | 3.85 | |

Interpolation is permissible.
Correction Factor = 1.1 x (1 - BF) x (db - 80).

38AH024/40RM028 HIGH-CAPACITY 4-ROW COILS

| Temp (F) Air Entering Condenser (Edb) | Evaporator Air — Cfm | | | | | | | | | |
|------------------------------------------------|--------------------------|-------|-------|--------|-------|-------|--------|-------|-------|-------|
| | 7600 | | | 10,000 | | | 12,500 | | | |
| | Evaporator Air — Ewb (F) | | | | | | | | | |
| | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 | |
| 85 | TC | 299.4 | 275.5 | 245.2 | 309.9 | 285.9 | 258.0 | 311.2 | 287.3 | 272.9 |
| | SHC | 157.5 | 204.4 | 225.2 | 177.5 | 236.5 | 258.0 | 180.7 | 241.5 | 272.9 |
| | kW | 17.65 | 17.15 | 16.46 | 17.86 | 17.37 | 16.74 | 17.88 | 17.40 | 17.08 |
| 95 | TC | 291.4 | 262.2 | 233.1 | 295.0 | 271.9 | 247.6 | 296.4 | 273.2 | 261.4 |
| | SHC | 154.7 | 199.1 | 219.3 | 172.3 | 230.9 | 247.6 | 175.6 | 235.9 | 261.4 |
| | kW | 20.15 | 18.72 | 17.91 | 19.58 | 18.99 | 18.31 | 19.62 | 19.03 | 18.71 |
| 100 | TC | 278.1 | 255.5 | 227.4 | 287.6 | 265.0 | 242.4 | 288.9 | 266.3 | 255.6 |
| | SHC | 150.1 | 196.8 | 216.7 | 169.7 | 228.2 | 242.4 | 173.1 | 233.2 | 255.6 |
| | kW | 20.16 | 19.49 | 18.59 | 20.43 | 19.78 | 19.08 | 20.46 | 19.82 | 19.48 |
| 105 | TC | 270.8 | 248.7 | 221.6 | 280.0 | 257.9 | 237.0 | 281.2 | 259.1 | 249.7 |
| | SHC | 147.6 | 194.1 | 213.8 | 167.5 | 225.7 | 237.0 | 170.7 | 230.6 | 249.7 |
| | kW | 20.96 | 20.24 | 19.28 | 21.25 | 20.56 | 19.84 | 21.29 | 20.60 | 20.26 |
| 115 | TC | 256.2 | 235.0 | 209.6 | 264.8 | 243.4 | 225.8 | 265.7 | 244.1 | 237.9 |
| | SHC | 142.5 | 188.8 | 206.8 | 162.1 | 219.9 | 225.8 | 165.3 | 224.5 | 237.9 |
| | kW | 22.53 | 21.71 | 20.64 | 22.87 | 22.05 | 21.30 | 22.91 | 22.08 | 21.84 |

38AH028/40RM024 HIGH-CAPACITY 4-ROW COILS

| Temp (F) Air Entering Condenser (Edb) | Evaporator Air — Cfm | | | | | | | | | |
|------------------------------------------------|--------------------------|-------|-------|-------|-------|-------|--------|-------|-------|-------|
| | 6000 | | | 8000 | | | 10,000 | | | |
| | Evaporator Air — Ewb (F) | | | | | | | | | |
| | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 | |
| 85 | TC | 302.4 | 277.4 | 253.6 | 318.8 | 293.3 | 269.1 | 329.4 | 303.6 | 279.9 |
| | SHC | 143.6 | 177.3 | 209.7 | 159.1 | 202.7 | 243.6 | 173.3 | 225.5 | 272.3 |
| | kW | 20.63 | 19.94 | 19.25 | 21.07 | 20.40 | 19.71 | 21.33 | 20.68 | 20.02 |
| 95 | TC | 290.0 | 266.0 | 243.1 | 304.9 | 280.5 | 257.5 | 320.2 | 290.1 | 267.4 |
| | SHC | 138.7 | 172.3 | 204.6 | 154.0 | 197.1 | 238.1 | 170.5 | 219.9 | 267.4 |
| | kW | 22.43 | 21.63 | 20.83 | 22.91 | 22.11 | 21.33 | 24.02 | 22.44 | 21.68 |
| 100 | TC | 283.8 | 260.1 | 237.5 | 298.0 | 274.1 | 251.1 | 307.3 | 283.3 | 261.9 |
| | SHC | 136.2 | 169.7 | 202.1 | 151.5 | 194.5 | 234.9 | 165.7 | 217.5 | 261.9 |
| | kW | 23.32 | 22.45 | 21.58 | 23.82 | 22.96 | 22.11 | 24.14 | 23.31 | 22.51 |
| 105 | TC | 277.3 | 258.7 | 231.9 | 290.9 | 267.4 | 245.4 | 300.0 | 276.4 | 255.9 |
| | SHC | 133.6 | 169.2 | 199.5 | 148.9 | 192.0 | 232.2 | 163.1 | 214.9 | 255.9 |
| | kW | 24.19 | 22.96 | 22.33 | 24.71 | 23.80 | 22.90 | 25.06 | 24.15 | 23.32 |
| 115 | TC | 263.8 | 241.8 | 226.3 | 276.4 | 254.2 | 233.6 | 284.5 | 262.0 | 244.9 |
| | SHC | 128.5 | 162.0 | 197.5 | 143.7 | 186.8 | 226.1 | 157.9 | 209.5 | 244.9 |
| | kW | 25.94 | 24.91 | 23.87 | 26.53 | 25.51 | 24.53 | 26.90 | 25.87 | 25.05 |

3. Gross capacities shown do not include a deduction for evaporator fan motor heat.

4. Formulas:

$$t_{db} = t_{edb} - \frac{\text{sensible heat capacity (Btu/h)}}{1.1 \times \text{cfm}}$$

$$t_{lwb} = \text{wet-bulb temperature corresponding to enthalpy of air leaving evaporator coil (} h_{lwb} \text{)}$$

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btu/h)}}{4.51 \times \text{cfm}}$$

5. Combination ratings are based on a 2° F line loss. For a close-coupled system (less than 15 ft), add 2% to ratings. Piping sizes in Refrigerant Pipe Sizes table on page 44 are based on 2° F line loss. All combination ratings are based on R-22.

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COMBINATION RATINGS (cont)

38AH028/40RM028 STANDARD 3-ROW COIL

| Temp (F) Air Entering Condenser (Edb) | | Evaporator Air — Cfm/BF | | | | | | | | |
|------------------------------------------------|-----|--------------------------|-------|-------|-------------|-------|-------|-------------|-------|-------|
| | | 7500/0.04 | | | 10,000/0.06 | | | 12,500/0.08 | | |
| | | Evaporator Air — Ewb (F) | | | | | | | | |
| | | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 |
| 85 | TC | 304.2 | 279.9 | 256.5 | 316.4 | 291.8 | 272.1 | 323.5 | 301.5 | 285.4 |
| | SHC | 159.1 | 202.1 | 251.2 | 179.8 | 234.5 | 272.1 | 199.5 | 263.9 | 285.4 |
| | kW | 20.93 | 20.24 | 19.57 | 21.28 | 20.58 | 20.02 | 21.48 | 20.86 | 20.40 |
| 95 | TC | 291.5 | 267.4 | 246.2 | 303.0 | 278.7 | 261.6 | 309.3 | 288.3 | 274.6 |
| | SHC | 154.4 | 197.1 | 241.7 | 175.0 | 229.2 | 261.6 | 194.8 | 258.2 | 274.6 |
| | kW | 22.85 | 22.05 | 21.34 | 23.23 | 22.42 | 21.85 | 23.44 | 22.74 | 22.29 |
| 100 | TC | 284.9 | 261.3 | 241.3 | 295.9 | 272.2 | 256.4 | 301.9 | 281.6 | 269.2 |
| | SHC | 152.0 | 194.6 | 237.3 | 172.6 | 226.5 | 256.4 | 192.3 | 255.2 | 269.2 |
| | kW | 23.79 | 22.88 | 22.11 | 24.21 | 23.30 | 22.69 | 24.44 | 23.66 | 23.18 |
| 105 | TC | 279.0 | 255.3 | 236.1 | 289.8 | 266.0 | 251.3 | 295.6 | 275.4 | 264.0 |
| | SHC | 149.9 | 192.2 | 232.5 | 170.4 | 224.0 | 251.3 | 190.2 | 252.5 | 264.0 |
| | kW | 27.74 | 23.74 | 22.92 | 25.20 | 24.19 | 23.57 | 25.44 | 24.59 | 24.11 |
| 115 | TC | 265.8 | 243.1 | 226.3 | 275.7 | 253.0 | 240.9 | 280.7 | 262.0 | 253.1 |
| | SHC | 145.0 | 187.3 | 223.5 | 165.4 | 218.6 | 240.9 | 185.2 | 246.7 | 253.1 |
| | kW | 26.65 | 25.42 | 24.51 | 27.18 | 25.95 | 25.30 | 27.45 | 26.44 | 25.96 |

38AH028/40RM034 STANDARD 3-ROW COIL

| Temp (F) Air Entering Condenser (Edb) | | Evaporator Air — Cfm/BF | | | | | | | | |
|------------------------------------------------|-----|--------------------------|-------|-------|-------------|-------|-------|-------------|-------|-------|
| | | 9000/0.04 | | | 12,000/0.06 | | | 15,000/0.08 | | |
| | | Evaporator Air — Ewb (F) | | | | | | | | |
| | | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 |
| 85 | TC | 324.3 | 297.3 | 276.8 | 335.5 | 309.2 | 294.1 | 341.6 | 319.6 | 289.1 |
| | SHC | 174.8 | 227.1 | 272.6 | 201.7 | 264.2 | 294.1 | 223.9 | 298.0 | 337.2 |
| | kW | 21.51 | 20.74 | 20.15 | 21.83 | 21.08 | 20.65 | 22.00 | 21.37 | 20.50 |
| 95 | TC | 310.3 | 283.6 | 265.2 | 320.8 | 295.0 | 282.3 | 326.2 | 305.1 | 253.1 |
| | SHC | 169.4 | 221.6 | 262.1 | 196.7 | 258.5 | 282.3 | 218.7 | 291.7 | 363.3 |
| | kW | 23.48 | 22.59 | 21.97 | 23.83 | 22.96 | 22.54 | 24.01 | 23.30 | 21.57 |
| 100 | TC | 302.8 | 276.7 | 259.5 | 312.8 | 287.6 | 276.3 | 317.9 | 297.5 | 237.4 |
| | SHC | 166.6 | 218.9 | 257.0 | 194.0 | 255.5 | 276.3 | 216.0 | 288.4 | 374.6 |
| | kW | 24.48 | 23.47 | 22.81 | 24.86 | 23.89 | 23.46 | 25.06 | 24.27 | 21.96 |
| 105 | TC | 296.6 | 270.3 | 253.9 | 306.4 | 281.1 | 270.7 | 311.3 | 291.1 | 221.1 |
| | SHC | 164.3 | 216.4 | 251.9 | 191.9 | 252.9 | 270.7 | 213.8 | 285.5 | 386.4 |
| | kW | 25.48 | 24.37 | 23.68 | 25.90 | 24.83 | 24.39 | 26.10 | 25.25 | 22.29 |
| 115 | TC | 281.8 | 256.6 | 242.6 | 290.5 | 266.6 | 258.6 | 294.7 | 276.0 | 195.2 |
| | SHC | 158.6 | 210.9 | 241.6 | 186.5 | 247.0 | 258.6 | 208.2 | 278.9 | 405.2 |
| | kW | 27.51 | 26.15 | 25.39 | 27.99 | 26.69 | 26.26 | 28.21 | 27.20 | 22.83 |

LEGEND

- BF — Bypass Factor
- Edb — Entering Dry Bulb
- Ewb — Entering Wet Bulb
- kW — Compressor Motor Power Input
- SHC — Sensible Heating Capacity (1000 Btuh)
- TC — Total Capacity (1000 Btuh)

NOTES:

- Direct interpolation is permissible. Do not extrapolate.
- The SHC is based on 80 F dry-bulb temperature of air entering evaporator coil. Below 80 F dry-bulb, subtract (correction factor x cfm) from SHC. Above 80 F dry bulb, add (correction factor x cfm) to SHC.

| BYPASS FACTOR | ENTERING-AIR DRY-BULB TEMP (F) | | | | | |
|------------------|--------------------------------|------|------|------|------|-----------------------|
| | 79 | 78 | 77 | 76 | 75 | under 75 |
| | 81 | 82 | 83 | 84 | 85 | over 85 |
| | Correction Factor | | | | | |
| 0.10 | 0.99 | 1.98 | 2.97 | 3.96 | 4.95 | Use formula below. |
| 0.20 | 0.88 | 1.76 | 2.64 | 3.52 | 4.40 | |
| 0.30 | 0.77 | 1.54 | 2.31 | 3.08 | 3.85 | |

Interpolation is permissible.

$$\text{Correction Factor} = 1.1 \times (1 - \text{BF}) \times (\text{db} - 80).$$

38AH028/40RM028 HIGH-CAPACITY 4-ROW COILS

| Temp (F) Air Entering Condenser (Edb) | | Evaporator Air — Cfm | | | | | | | | |
|------------------------------------------------|-----|--------------------------|-------|-------|-------|-------|-------|--------|-------|-------|
| | | 6000 | | | 8000 | | | 10,000 | | |
| | | Evaporator Air — Ewb (F) | | | | | | | | |
| | | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 |
| 85 | TC | 321.7 | 295.1 | 270.3 | 336.2 | 309.9 | 285.1 | 346.1 | 319.6 | 297.8 |
| | SHC | 156.6 | 197.5 | 236.7 | 174.2 | 226.5 | 274.6 | 190.8 | 253.4 | 297.8 |
| | kW | 21.19 | 20.49 | 19.79 | 21.56 | 20.90 | 20.23 | 21.83 | 21.16 | 20.55 |
| 95 | TC | 307.6 | 282.6 | 258.5 | 321.4 | 296.3 | 281.0 | 330.3 | 304.8 | 286.4 |
| | SHC | 151.0 | 191.9 | 231.1 | 168.9 | 221.1 | 272.5 | 185.7 | 247.5 | 286.4 |
| | kW | 23.04 | 22.24 | 21.42 | 23.49 | 22.71 | 21.99 | 23.76 | 22.98 | 22.36 |
| 100 | TC | 300.4 | 276.2 | 252.6 | 314.0 | 289.2 | 265.9 | 322.5 | 297.4 | 280.7 |
| | SHC | 148.4 | 189.3 | 228.4 | 166.4 | 218.4 | 265.9 | 183.0 | 245.0 | 280.7 |
| | kW | 23.95 | 23.10 | 22.22 | 24.43 | 23.58 | 22.71 | 24.71 | 23.86 | 23.26 |
| 105 | TC | 293.5 | 274.5 | 246.8 | 306.3 | 282.0 | 260.1 | 314.4 | 289.8 | 274.9 |
| | SHC | 145.8 | 188.5 | 225.7 | 163.8 | 215.7 | 260.1 | 180.3 | 242.1 | 274.9 |
| | kW | 24.86 | 23.67 | 23.01 | 25.34 | 24.44 | 23.55 | 25.63 | 24.74 | 24.15 |
| 115 | TC | 279.3 | 256.5 | 234.4 | 290.7 | 267.5 | 248.8 | 298.1 | 274.8 | 262.8 |
| | SHC | 140.5 | 181.5 | 219.8 | 158.4 | 210.2 | 248.8 | 174.9 | 236.3 | 262.8 |
| | kW | 26.71 | 25.68 | 24.64 | 27.22 | 26.19 | 25.30 | 27.54 | 26.52 | 25.96 |

38AH028/40RM034 HIGH-CAPACITY 4-ROW COILS

| Temp (F) Air Entering Condenser (Edb) | | Evaporator Air — Cfm | | | | | | | | |
|------------------------------------------------|-----|--------------------------|-------|-------|--------|-------|-------|--------|-------|-------|
| | | 9000 | | | 12,000 | | | 15,000 | | |
| | | Evaporator Air — Ewb (F) | | | | | | | | |
| | | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 |
| 85 | TC | 341.1 | 313.9 | 288.0 | 354.8 | 327.1 | 303.5 | 363.5 | 323.2 | 320.5 |
| | SHC | 170.3 | 219.8 | 266.7 | 191.9 | 254.3 | 303.5 | 211.1 | 280.6 | 320.5 |
| | kW | 21.75 | 21.06 | 20.38 | 22.10 | 21.41 | 20.75 | 22.31 | 20.07 | 21.22 |
| 95 | TC | 326.4 | 299.9 | 274.8 | 338.7 | 312.1 | 292.1 | 347.0 | 320.4 | 307.8 |
| | SHC | 165.1 | 214.3 | 260.7 | 186.2 | 248.6 | 292.1 | 205.9 | 279.6 | 307.8 |
| | kW | 23.72 | 22.89 | 22.07 | 24.08 | 23.27 | 22.62 | 24.34 | 23.54 | 23.11 |
| 100 | TC | 318.7 | 292.7 | 268.4 | 330.6 | 304.6 | 286.4 | 338.6 | 312.6 | 301.4 |
| | SHC | 162.3 | 211.5 | 257.6 | 183.5 | 245.8 | 286.4 | 203.1 | 276.8 | 301.4 |
| | kW | 24.65 | 23.77 | 22.89 | 25.05 | 24.18 | 23.53 | 25.32 | 24.46 | 24.05 |
| 105 | TC | 310.9 | 291.1 | 262.1 | 322.4 | 297.0 | 280.3 | 330.2 | 304.9 | 294.9 |
| | SHC | 159.6 | 210.8 | 254.3 | 180.5 | 242.9 | 280.3 | 200.5 | 273.8 | 294.9 |
| | kW | 25.59 | 24.32 | 23.70 | 26.00 | 25.08 | 24.43 | 26.30 | 25.38 | 24.98 |
| 115 | TC | 295.2 | 271.0 | 248.8 | 306.0 | 281.6 | 268.0 | 313.1 | 288.2 | 282.0 |
| | SHC | 154.2 | 203.3 | 248.8 | 175.4 | 237.2 | 268.0 | 195.0 | 267.0 | 282.0 |
| | kW | 27.49 | 26.44 | 25.40 | 27.96 | 26.92 | 26.27 | 28.27 | 27.21 | 26.91 |

3. Gross capacities shown do not include a deduction for evaporator fan motor heat.

4. Formulas:

$$t_{db} = t_{edb} - \frac{\text{sensible heat capacity (Btuh)}}{1.1 \times \text{cfm}}$$

$$t_{wb} = \text{wet-bulb temperature corresponding to enthalpy of air leaving evaporator coil (} h_{wb} \text{)}$$

$$h_{wb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.51 \times \text{cfm}}$$

5. Combination ratings are based on a 2° F line loss. For a close-coupled system (less than 15 ft), add 2% to ratings. Piping sizes in Refrigerant Pipe Sizes table on page 44 are based on 2° F line loss. All combination ratings are based on R-22.

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Performance data (cont)



COMBINATION RATINGS (cont)

38AH034/40RM028 STANDARD 3-ROW COIL

| Temp (F) Air Entering Condenser (Edb) | Evaporator Air — Cfm/BF | | | | | | | | | |
|------------------------------------------------|--------------------------|-------|-------|-------------|-------|-------|-------------|-------|-------|-------|
| | 7500/0.04 | | | 10,000/0.06 | | | 12,500/0.08 | | | |
| | Evaporator Air — Ewb (F) | | | | | | | | | |
| | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 | |
| 85 | TC | 338.9 | 312.7 | 282.3 | 353.8 | 326.9 | 299.0 | 363.1 | 337.4 | 313.5 |
| | SHC | 171.9 | 215.4 | 274.9 | 192.9 | 248.9 | 299.0 | 212.7 | 279.6 | 313.5 |
| | kW | 25.39 | 24.59 | 23.67 | 25.84 | 25.02 | 24.18 | 26.12 | 25.34 | 24.62 |
| 95 | TC | 325.5 | 299.5 | 271.5 | 339.6 | 313.0 | 288.1 | 348.2 | 323.5 | 302.4 |
| | SHC | 167.0 | 210.0 | 265.0 | 187.9 | 243.3 | 288.1 | 207.7 | 273.5 | 302.4 |
| | kW | 27.53 | 26.56 | 25.51 | 28.06 | 27.06 | 26.13 | 28.38 | 27.46 | 26.66 |
| 100 | TC | 319.5 | 294.4 | 268.1 | 332.8 | 307.2 | 284.1 | 340.8 | 317.3 | 297.9 |
| | SHC | 164.7 | 208.0 | 261.8 | 185.5 | 240.9 | 284.1 | 205.3 | 270.8 | 297.9 |
| | kW | 28.63 | 27.54 | 26.40 | 29.21 | 28.10 | 27.09 | 29.55 | 28.53 | 27.69 |
| 105 | TC | 312.6 | 287.4 | 262.1 | 325.7 | 300.0 | 278.2 | 333.4 | 310.2 | 292.0 |
| | SHC | 162.2 | 205.2 | 256.3 | 183.1 | 237.9 | 278.2 | 202.8 | 267.7 | 292.0 |
| | kW | 29.77 | 28.59 | 27.41 | 30.38 | 29.18 | 28.16 | 30.74 | 29.66 | 28.81 |
| 115 | TC | 281.0 | 257.3 | 237.8 | 291.8 | 268.1 | 253.0 | 297.7 | 277.5 | 265.8 |
| | SHC | 150.6 | 193.0 | 234.1 | 171.1 | 224.8 | 253.0 | 190.9 | 253.4 | 265.8 |
| | kW | 32.40 | 31.04 | 29.91 | 33.03 | 31.66 | 30.79 | 33.37 | 32.20 | 31.52 |

38AH034/40RM028 HIGH-CAPACITY 4-ROW COILS

| Temp (F) Air Entering Condenser (Edb) | Evaporator Air — Cfm | | | | | | | | | |
|------------------------------------------------|--------------------------|-------|-------|--------|-------|-------|--------|-------|-------|-------|
| | 7500 | | | 10,000 | | | 12,500 | | | |
| | Evaporator Air — Ewb (F) | | | | | | | | | |
| | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 | |
| 85 | TC | 376.4 | 346.1 | 317.3 | 393.3 | 362.8 | 334.3 | 404.4 | 373.6 | 350.1 |
| | SHC | 185.9 | 234.4 | 281.1 | 207.1 | 269.0 | 322.7 | 226.9 | 300.8 | 350.1 |
| | kW | 26.61 | 25.60 | 24.61 | 27.19 | 26.18 | 25.21 | 27.55 | 26.55 | 25.72 |
| 95 | TC | 361.0 | 335.7 | 307.7 | 376.4 | 347.0 | 321.1 | 386.5 | 357.1 | 336.8 |
| | SHC | 180.1 | 230.3 | 276.8 | 201.2 | 262.9 | 313.4 | 220.8 | 294.4 | 336.8 |
| | kW | 28.71 | 27.60 | 26.33 | 29.32 | 28.19 | 27.14 | 29.71 | 28.60 | 27.75 |
| 100 | TC | 353.0 | 324.4 | 297.3 | 367.7 | 339.0 | 314.5 | 377.6 | 348.8 | 330.1 |
| | SHC | 177.2 | 225.4 | 271.3 | 198.2 | 259.8 | 308.5 | 217.9 | 291.3 | 330.1 |
| | kW | 29.75 | 28.55 | 27.37 | 30.36 | 29.18 | 28.11 | 30.79 | 29.60 | 28.76 |
| 105 | TC | 344.9 | 317.0 | 290.5 | 359.0 | 331.0 | 307.9 | 368.5 | 340.3 | 326.4 |
| | SHC | 174.2 | 222.5 | 267.9 | 195.2 | 256.7 | 303.7 | 214.9 | 288.0 | 326.3 |
| | kW | 30.80 | 29.55 | 28.30 | 31.44 | 30.20 | 29.10 | 31.87 | 30.63 | 29.50 |
| 115 | TC | 328.2 | 301.8 | 276.7 | 341.3 | 320.1 | 294.0 | 350.0 | 323.0 | 312.6 |
| | SHC | 168.0 | 216.4 | 262.1 | 189.1 | 253.1 | 294.0 | 208.7 | 281.1 | 312.6 |
| | kW | 32.88 | 31.50 | 30.14 | 33.55 | 32.23 | 31.05 | 33.99 | 32.63 | 31.78 |

38AH034/40RM034 STANDARD 3-ROW COIL

| Temp (F) Air Entering Condenser (Edb) | Evaporator Air — Cfm/BF | | | | | | | | | |
|------------------------------------------------|--------------------------|-------|-------|-------------|-------|-------|-------------|-------|-------|-------|
| | 9000/0.04 | | | 12,000/0.06 | | | 15,000/0.08 | | | |
| | Evaporator Air — Ewb (F) | | | | | | | | | |
| | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 | |
| 85 | TC | 363.5 | 334.5 | 306.8 | 377.7 | 348.6 | 325.5 | 385.9 | 360.0 | 417.3 |
| | SHC | 189.6 | 241.8 | 299.8 | 216.0 | 280.1 | 325.5 | 238.6 | 315.8 | 444.4 |
| | kW | 26.13 | 25.25 | 24.41 | 26.56 | 25.68 | 24.98 | 26.81 | 26.03 | 27.76 |
| 95 | TC | 348.8 | 319.9 | 294.7 | 362.1 | 333.5 | 313.2 | 369.6 | 344.7 | 362.7 |
| | SHC | 184.0 | 236.0 | 288.8 | 210.7 | 274.0 | 313.2 | 233.2 | 309.1 | 283.9 |
| | kW | 28.40 | 27.32 | 26.37 | 28.90 | 27.83 | 27.07 | 29.19 | 28.25 | 28.93 |
| 100 | TC | 341.4 | 313.6 | 290.1 | 353.9 | 326.4 | 308.0 | 360.8 | 337.2 | 337.8 |
| | SHC | 181.3 | 233.5 | 284.7 | 207.9 | 271.2 | 308.0 | 230.3 | 305.8 | 302.0 |
| | kW | 29.58 | 28.37 | 27.35 | 30.12 | 28.93 | 28.13 | 30.42 | 29.40 | 29.42 |
| 105 | TC | 334.2 | 306.1 | 283.6 | 346.4 | 318.8 | 301.6 | 353.1 | 329.6 | 315.0 |
| | SHC | 178.5 | 230.6 | 278.8 | 205.4 | 268.1 | 301.6 | 227.7 | 302.5 | 318.5 |
| | kW | 30.77 | 29.47 | 28.41 | 31.34 | 30.06 | 29.25 | 31.66 | 30.56 | 29.88 |
| 115 | TC | 298.7 | 272.4 | 255.8 | 308.5 | 283.3 | 272.6 | 313.5 | 293.2 | 226.5 |
| | SHC | 165.1 | 217.2 | 253.6 | 192.6 | 253.8 | 272.6 | 214.5 | 286.5 | 382.5 |
| | kW | 33.42 | 31.91 | 30.95 | 33.99 | 32.54 | 31.92 | 34.28 | 33.11 | 29.26 |

38AH034/40RM034 HIGH-CAPACITY 4-ROW COILS

| Temp (F) Air Entering Condenser (Edb) | Evaporator Air — Cfm | | | | | | | | | |
|------------------------------------------------|--------------------------|-------|-------|--------|-------|-------|--------|-------|-------|-------|
| | 9000 | | | 12,000 | | | 15,000 | | | |
| | Evaporator Air — Ewb (F) | | | | | | | | | |
| | 72 | 67 | 62 | 72 | 67 | 62 | 72 | 67 | 62 | |
| 85 | TC | 385.1 | 353.5 | 323.6 | 402.4 | 370.6 | 342.0 | 413.9 | 381.8 | 358.4 |
| | SHC | 188.1 | 238.2 | 286.2 | 210.3 | 274.3 | 330.0 | 230.9 | 307.4 | 358.4 |
| | kW | 26.95 | 25.92 | 24.91 | 27.52 | 26.50 | 25.52 | 27.90 | 26.89 | 26.05 |
| 95 | TC | 369.4 | 352.8 | 310.0 | 385.2 | 354.6 | 329.8 | 395.8 | 365.3 | 344.7 |
| | SHC | 182.2 | 243.8 | 279.9 | 204.3 | 268.0 | 321.7 | 224.8 | 301.2 | 344.7 |
| | kW | 29.08 | 28.20 | 26.76 | 29.68 | 28.53 | 27.45 | 30.09 | 28.97 | 28.09 |
| 100 | TC | 365.2 | 346.0 | 303.2 | 376.3 | 346.5 | 321.8 | 386.7 | 356.9 | 337.8 |
| | SHC | 180.6 | 241.9 | 276.7 | 201.1 | 265.0 | 315.4 | 221.8 | 298.0 | 337.8 |
| | kW | 29.73 | 29.28 | 27.69 | 30.76 | 29.55 | 28.48 | 31.20 | 30.00 | 29.13 |
| 105 | TC | 356.5 | 337.7 | 296.3 | 367.6 | 338.4 | 315.0 | 377.6 | 348.2 | 331.1 |
| | SHC | 177.6 | 238.7 | 273.3 | 198.2 | 261.8 | 310.5 | 218.8 | 294.7 | 331.1 |
| | kW | 30.99 | 30.30 | 28.63 | 31.85 | 30.57 | 29.48 | 32.30 | 31.03 | 30.18 |
| 115 | TC | 335.8 | 311.7 | 282.5 | 349.7 | 324.0 | 300.7 | 358.7 | 332.7 | 317.4 |
| | SHC | 169.9 | 221.3 | 266.8 | 192.1 | 254.0 | 300.7 | 212.6 | 288.7 | 317.4 |
| | kW | 33.27 | 31.09 | 30.50 | 33.99 | 32.59 | 31.43 | 34.44 | 33.05 | 32.30 |

38AH024-034

LEGEND

- BF — Bypass Factor
- Edb — Entering Dry Bulb
- Ewb — Entering Wet Bulb
- kW — Compressor Motor Power Input
- SHC — Sensible Heating Capacity (1000 Btu/h)
- TC — Total Capacity (1000 Btu/h)

NOTES:

- Direct interpolation is permissible. Do not extrapolate.
- The SHC is based on 80 F dry-bulb temperature of air entering evaporator coil. Below 80 F dry-bulb, subtract (correction factor x cfm) from SHC. Above 80 F dry-bulb, add (correction factor x cfm) to SHC.

| BYPASS FACTOR | ENTERING-AIR DRY-BULB TEMP (F) | | | | | |
|-------------------|--------------------------------|------|------|------|------|--------------------|
| | 79 | 78 | 77 | 76 | 75 | under 75 |
| | 81 | 82 | 83 | 84 | 85 | over 85 |
| Correction Factor | | | | | | |
| 0.10 | 0.99 | 1.98 | 2.97 | 3.96 | 4.95 | Use formula below. |
| 0.20 | 0.88 | 1.76 | 2.64 | 3.52 | 4.40 | |
| 0.30 | 0.77 | 1.54 | 2.31 | 3.08 | 3.85 | |

Interpolation is permissible.

$$\text{Correction Factor} = 1.1 \times (1 - \text{BF}) \times (\text{db} - 80)$$

3. Gross capacities shown do not include a deduction for evaporator fan motor heat.

4. Formulas:

$$t_{\text{ldb}} = t_{\text{edb}} - \frac{\text{sensible heat capacity (Btu/h)}}{1.1 \times \text{cfm}}$$

t_{lwb} = wet-bulb temperature corresponding to enthalpy of air leaving evaporator coil (h_{lwb})

$$h_{\text{lwb}} = h_{\text{ewb}} - \frac{\text{total capacity (Btu/h)}}{4.51 \times \text{cfm}}$$

5. Combination ratings are based on a 2° F line loss. For a close-coupled system (less than 15 ft), add 2% to ratings. Piping sizes in Refrigerant Pipe Sizes table on page 44 are based on 2° F line loss. All combination ratings are based on R-22.

Electrical data



38AH024-034 UNITS

| UNIT 38AH | NOMINAL VOLTAGE | VOLTAGE RANGE* | | COMPRESSOR | | | | FAN MOTORS† | | POWER SUPPLY | | |
|-----------|-----------------|----------------|-----|------------|-------|-------|-------|-------------|-----------------|--------------|--------|-------|
| | | | | RLA | | LRA | | Qty | FLA (ea) | MCA | MOCP** | ICF |
| | | | | Ckt 1 | Ckt 2 | Ckt 1 | Ckt 2 | | | | | |
| 024 | 208/230 | 187 | 254 | 39.3 | 39.3 | 198 | 198 | 2 | (1) 5.5 (2) 6.6 | 100.5 | 125 | 249.7 |
| | 380†† | 342 | 418 | 24.0 | 24.0 | 93 | 93 | | 3.9 | | | |
| | 460 | 414 | 508 | 19.6 | 19.6 | 99 | 99 | | (1) 2.8 (2) 3.3 | | | |
| | 575 | 518 | 632 | 15.7 | 15.7 | 79 | 79 | | 3.4 | | | |
| 028 | 208/230 | 187 | 254 | 43.6 | 43.6 | 228 | 228 | 2 | (1) 5.5 (2) 6.6 | 110.2 | 150 | 284.0 |
| | 380†† | 342 | 418 | 26.4 | 26.4 | 104 | 104 | | 3.9 | | | |
| | 460 | 414 | 508 | 22.1 | 22.1 | 114 | 114 | | (1) 2.8 (2) 3.3 | | | |
| | 575 | 518 | 632 | 19.7 | 19.7 | 91 | 91 | | 3.4 | | | |
| 034 | 208/230 | 187 | 254 | 43.6 | 63.6 | 228 | 266 | 2 | (1) 5.5 (2) 6.6 | 135.2 | 175 | 322.0 |
| | 380†† | 342 | 418 | 26.4 | 34.3 | 104 | 145 | | 3.9 | | | |
| | 460 | 414 | 508 | 22.1 | 30.0 | 114 | 120 | | (1) 2.9 (2) 3.3 | | | |
| | 575 | 518 | 632 | 17.9 | 22.9 | 91 | 96 | | 3.4 | | | |

LEGEND

- FLA** — Full Load Amps
- HACR** — Heating, Air Conditioning and Refrigeration
- ICF** — Maximum Instantaneous Current Flow during starting (the point in the starting sequence where the sum of the LRA for the starting compressor, plus the total RLA for all running compressors, plus the total FLA for all running fan motors is maximum).
- LRA** — Locked Rotor Amps
- MCA** — Minimum Circuit Amps (complies with National Electrical Code [NEC], Section 430-24)
- MOCP** — Maximum Overcurrent Protection
- RLA** — Rated Load Amps
- UL** — Underwriters' Laboratories

*Units are suitable for use on electrical systems where voltage supplied to unit terminals is not below or above listed minimum and maximum limits.

†All fans are protected by a single circuit breaker.

**Fuse or HACR circuit breaker.

††380-v units are export models.

NOTE: The 208/230-v, 460-v and 575-v base units are UL and UL, Canada approved.



38AH024-034

Application data — 38AH024-034



Installation

Select equipment to match or to be slightly less than peak load. This provides better humidity control, less unit cycling, and less part-load operation.

When selecting vapor line sizes, oil return must be evaluated, particularly at part-load conditions.

The indoor fan must always be operating when outdoor unit is operating.

IMPORTANT: When application is in a VAV (variable air volume) system, total building load is not the sum of the individual peak loads. If individual peak loads are summed, the equipment tends to be oversized for the load.

To minimize return-air temperature extremes, use the equipment room as a return-air plenum when applying VVT® (variable volume and temperature) systems with supply-to-return air recycle as used with Carrier VVT control systems.

Ductwork should be sized according to unit size, not building load.

To minimize the possibility of air recirculation, avoid the use of concentric supply/return grilles.

Indoor equipment should be selected at no less than 300 cfm/ton.

Do NOT bury refrigerant piping underground.

IMPORTANT: Condensing units applied in VVT or VAV systems must have field-supplied and installed accumulators. Order part number --KH--73LZ-001 from Service Parts.

OPERATING LIMITS

| | |
|--------------------------------------------------------|---------------------------------------------------------------|
| Maximum Outdoor Ambient | 115 F |
| Minimum Outdoor Ambient | See Minimum Outdoor-Air Operating Temperature table at right. |
| Minimum Return-Air Temperature | 55 F |
| Maximum Return-Air Temperature | 95 F |
| Normal Acceptable Saturation Suction Temperature Range | 20 to 50 F |
| Maximum Discharge Temperature | 275 F |
| Minimum Discharge Superheat | 60 F |

UNLOADING SEQUENCES

| UNIT 38AH | CAPACITY/STAGE (%) | |
|-----------|----------------------|-------------------------|
| | CV Units (Standard)* | VAV Units (Optional) |
| 024 | 100, 83, 50, 33 | 100, 83, 67, 50, 33, 17 |
| 028 | 100, 83, 50, 33 | 100, 83, 67, 50, 33, 17 |
| 034 | 100, 85, 43, 28 | 100, 85, 71, 43, 28, 14 |

LEGEND

CV — Constant Volume
VAV — Variable Air Volume

*Additional unloading available with field-installed accessory unloader.

NOTE: Capacities are based on 45 F saturated suction temperature and 95 F outdoor air temperature.

→ MINIMUM OUTDOOR-AIR OPERATING TEMPERATURE AND UNLOADING SEQUENCES

| UNIT 38AH | QUANTITY OF LOADED COMPRESSOR CYLINDERS | | | SYSTEM CAPACITY (%) | MINIMUM OUTDOOR-AIR TEMP | |
|-----------|-----------------------------------------|-------|-------|---------------------|--------------------------|---------------------------------|
| | Ckt A | Ckt B | Total | | With Standard Fans (F) | With Motormaster® V Control (F) |
| 024 | 6 | 6 | 12 | 100 | 53 | -20 |
| | 4 | 6 | 10 | 83 | | -20 |
| | 2 | 6 | 8 | 67* | | -20† |
| | 6 | 0 | 6 | 50 | | -20 |
| | 4 | 0 | 4 | 33 | | -20 |
| 028 | 6 | 6 | 12 | 100 | 53 | -20 |
| | 4 | 6 | 10 | 83 | | -20 |
| | 2 | 6 | 8 | 67* | | -20† |
| | 6 | 0 | 6 | 50 | | -20 |
| | 4 | 0 | 4 | 33 | | -20 |
| 034 | 6 | 6 | 12 | 100 | 53 | -20 |
| | 4 | 6 | 10 | 85 | | -20 |
| | 2 | 6 | 8 | 71* | | -20† |
| | 6 | 0 | 6 | 43 | | -20 |
| | 4 | 0 | 4 | 28 | | -20 |
| | 2 | 0 | 2 | 14* | | -20† |

*VAV or accessory unloader on Circuit 1.

†Motormaster® V cannot be used with 2 unloaders when unit is connected to 2 separate air handlers.

NOTE: Minimum outdoor-air operating temperature is based on 90 F saturated condensing temperature and 100% capacity.

REFRIGERANT PIPE SIZES SINGLE SUCTION RISERS

| UNIT 38AH | | LENGTH OF INTERCONNECTING PIPING, FOR EACH CIRCUIT (Ft) | | | | | | | | | |
|-----------|-------|---------------------------------------------------------|-------|-------|-------|-------|--------|--------|--------|---------|---------|
| | | 0-25 | | 25-50 | | 50-75 | | 75-100 | | 100-200 | |
| | | L | S | L | S | L | S | L | S | L | S |
| 024 | Ckt 1 | 1/2 | 1 1/8 | 5/8 | 1 3/8 | 5/8 | 1 3/8 | 5/8 | 1 5/8* | 7/8 | 1 5/8* |
| | Ckt 2 | 1/2 | 1 1/8 | 5/8 | 1 3/8 | 5/8 | 1 3/8 | 5/8 | 1 5/8† | 7/8 | 1 5/8† |
| 028 | Ckt 1 | 1/2 | 1 1/8 | 5/8 | 1 3/8 | 5/8 | 1 3/8 | 7/8 | 1 5/8* | 7/8 | 2 1/8** |
| | Ckt 2 | 1/2 | 1 1/8 | 5/8 | 1 3/8 | 5/8 | 1 3/8 | 7/8 | 1 5/8† | 7/8 | 2 1/8** |
| 034 | Ckt 1 | 1/2 | 1 1/8 | 5/8 | 1 3/8 | 5/8 | 1 5/8* | 7/8 | 1 5/8* | 7/8 | 2 1/8** |
| | Ckt 2 | 1/2 | 1 3/8 | 5/8 | 1 5/8 | 7/8 | 1 5/8 | 7/8 | 1 5/8 | 7/8 | 2 1/8† |

LEGEND

L — Liquid Line
S — Suction Line

*Double suction riser required if evaporator is below condensing unit and 2 unloaders are used on that circuit.

†Double suction riser required if evaporator is below condensing unit and compressor is equipped with 2 unloaders. Note the only time circuit no. 2 may be equipped with 2 unloaders is if it is serving its own air handler and the unit does not require low ambient operation (Motormaster® III control).

**Double suction riser required if evaporator is below condensing unit and compressor has one or more unloader(s).

NOTES:

- All line sizes are inches OD.
- Standard unit comes with one pressure-operated unloader on circuit no. 1. If unit serves one air handler, an additional unloader may be field installed on circuit no. 1 compressor only. If the unit serves 2 separate air handlers and low ambient operation is required (Motormaster III control), each circuit's compressor may only be equipped with *one* unloader.

DOUBLE SUCTION RISERS

| UNIT 38AH | | LENGTH OF INTERCONNECTING PIPING (Ft) | | | | | | | | |
|-----------|-------|---------------------------------------|-------|-------|--------|-------|-------|---------|-------|-------|
| | | 50-75 | | | 75-100 | | | 100-200 | | |
| | | A | B | C | A | B | C | A | B | C |
| 024 | Ckt 1 | — | — | — | 1 1/8 | 1 3/8 | 1 5/8 | 1 1/8 | 1 3/8 | 1 5/8 |
| | Ckt 2 | — | — | — | 1 1/8 | 1 3/8 | 1 5/8 | 1 3/8 | 1 3/8 | 1 5/8 |
| 028 | Ckt 1 | — | — | — | 1 1/8 | 1 3/8 | 1 5/8 | 1 3/8 | 1 5/8 | 2 1/8 |
| | Ckt 2 | — | — | — | 1 1/8 | 1 3/8 | 1 5/8 | 1 3/8 | 1 5/8 | 2 1/8 |
| 034 | Ckt 1 | 1 1/8 | 1 3/8 | 1 5/8 | 1 1/8 | 1 3/8 | 1 5/8 | 1 3/8 | 1 5/8 | 2 1/8 |
| | Ckt 2 | — | — | — | — | — | — | 1 3/8 | 1 5/8 | 2 1/8 |

NOTE: Refer to figure on page 45 for A, B, and C dimensions.

MAXIMUM LIQUID LIFT

| UNIT 38AH | MAXIMUM LIQUID LIFT PER CIRCUIT (Ft) |
|-----------|--------------------------------------|
| 024 | 76 |
| 028 | 73 |
| 034 | 100 |

38AH024-034

WIRE SIZES FOR FIELD POWER SUPPLY

| UNIT 38AH | V-Ph-Hz | FIELD POWER WIRE SIZE TB1 WILL ACCEPT |
|-----------|--------------|---------------------------------------|
| 024-034 | 208-230/3/60 | 350 kcmil |
| | 380-3-60 | 2/0 AWG |
| | 460-3-60 | |
| | 375-3-60 | |

LEGEND

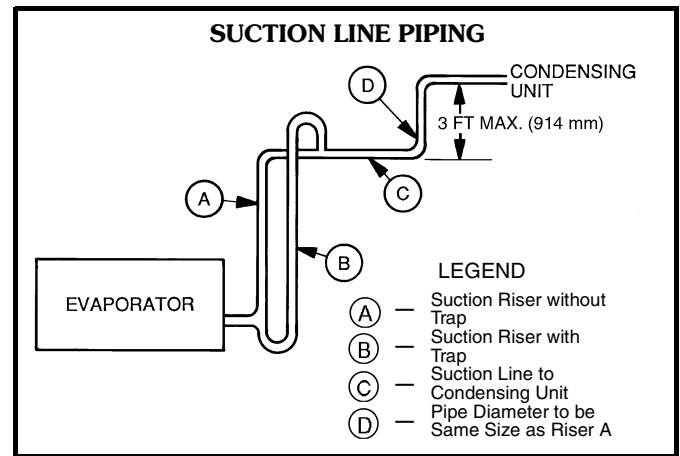
AWG — American Wire Gage
 kcmil — Thousand Circular Mills
 TB — Terminal Block

E-coated coils

E-coated aluminum-fin coils have a flexible and durable epoxy coating uniformly applied to all coil surfaces. Unlike brittle phenolic dip and bake coatings, E-coating provides superior protection with unmatched flexibility, edge coverage, metal adhesion, thermal performance, and most importantly, corrosion resistance.

E-coated coils provide this protection since all coil surfaces are completely encapsulated from environmental contamination. This coating is especially suitable in industrial environments.

E-coated copper-fin coils have the same flexible and durable epoxy coating as E-coated aluminum-fin coils.



However, this option combines the natural salt and environmental resistance of all-copper construction with high levels of corrosion protection. This coating is recommended in harsh combinations of coastal and industrial environments.

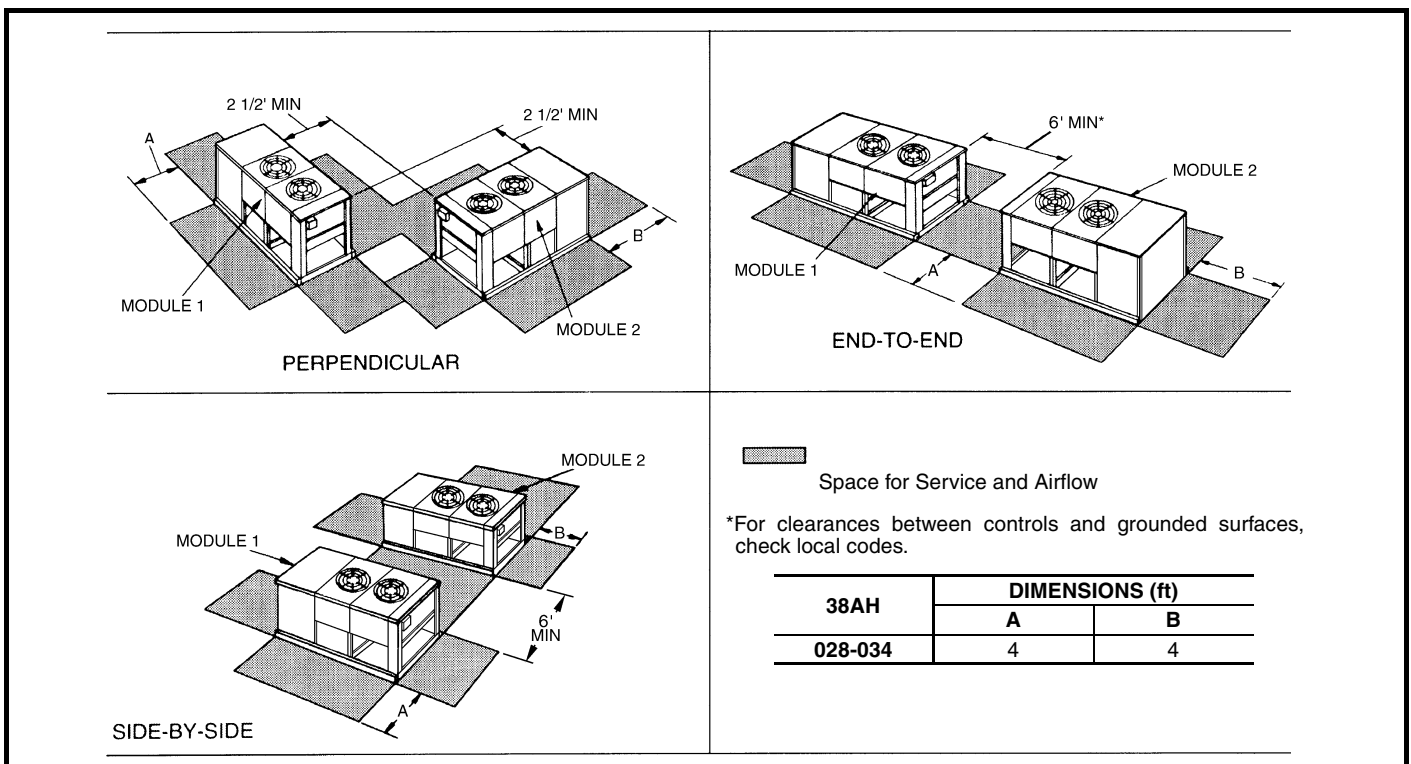
REFRIGERANT SPECIALTIES PART NUMBERS

| UNIT | LIQUID LINE SIZE (in.) | LIQUID LINE SOLENOID VALVE (LLSV) | LLSV COIL | SIGHT GLASS | FILTER DRIER |
|---------|------------------------|-----------------------------------|---------------|----------------|-------------------|
| 38AH024 | 1/2 | 200RB6T4M Qty 2 | AMG/24V Qty 2 | AMI-1TT4 Qty 2 | P502-8304S Qty 2 |
| | 5/8 | 200RB6T5M Qty 2 | AMG/24V Qty 2 | AMI-1TT5 Qty 2 | P502-8305S Qty 2 |
| | 7/8 | 200RB7T7M Qty 2 | AMG/24V Qty 2 | AMI-1TT7 Qty 2 | P502-8307S Qty 2 |
| 38AH028 | 1/2 | 200RB7T4M Qty 2 | AMG/24V Qty 2 | AMI-1TT4 Qty 2 | P502-8305S* Qty 2 |
| | 5/8 | 200RB7T5M Qty 2 | AMG/24V Qty 2 | AMI-1TT5 Qty 2 | P502-8305S Qty 2 |
| | 7/8 | 200RB7T7M Qty 2 | AMG/24V Qty 2 | AMI-1TT7 Qty 2 | P502-8307S Qty 2 |
| 38AH034 | 1/2 | 200RB7T4M Qty 2 | AMG/24V Qty 2 | AMI-1TT4 Qty 2 | P502-8307S* Qty 2 |
| | 5/8 | 200RB7T5M Qty 2 | AMG/24V Qty 2 | AMI-1TT5 Qty 2 | P502-8307S* Qty 2 |
| | 7/8 | 200RB7T7M Qty 2 | AMG/24V Qty 2 | AMI-1TT7 Qty 2 | P502-8307S Qty 2 |

*Bushings required.

38AH024-034

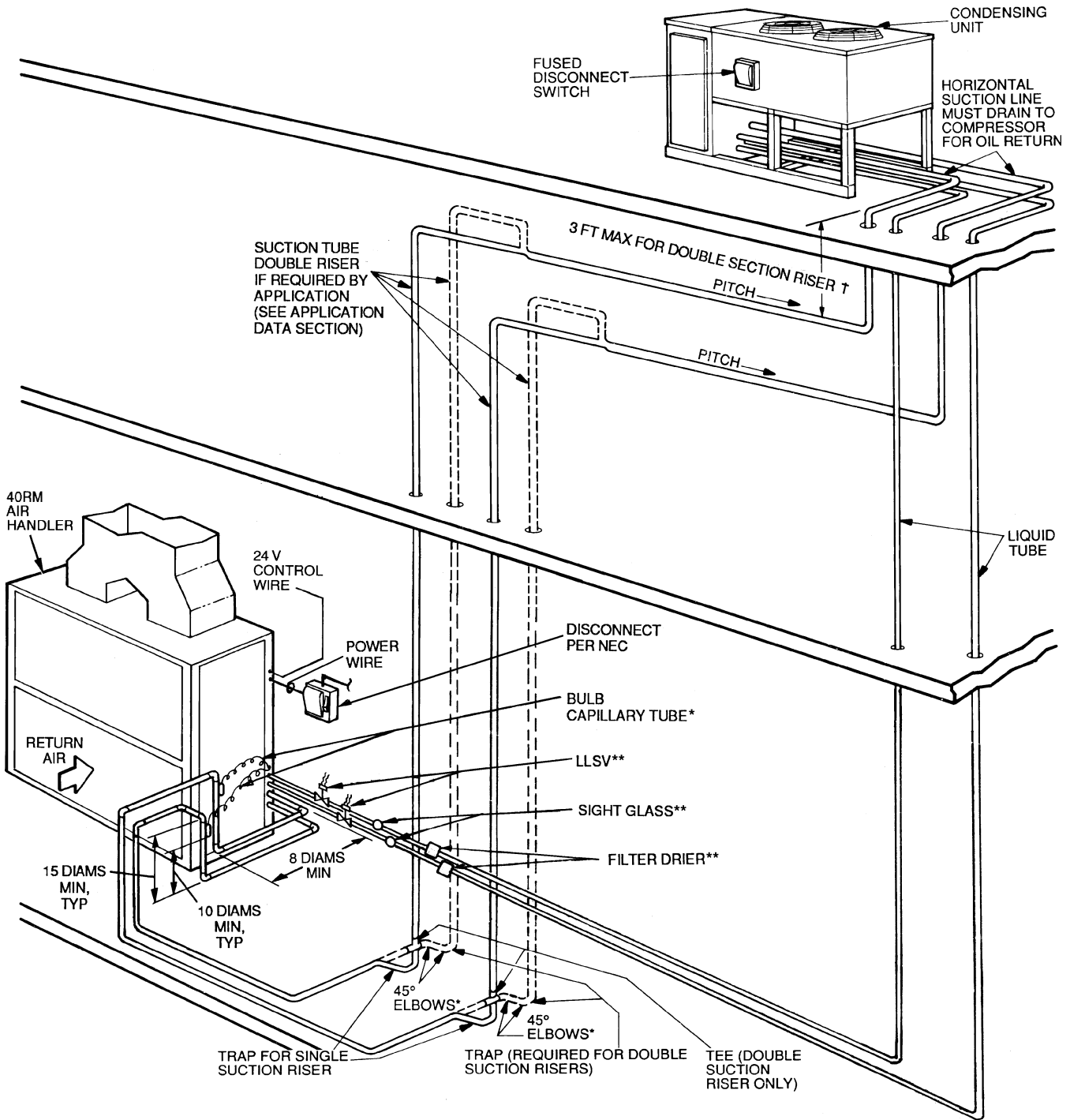
Multiple condensing unit arrangements*



Typical piping and wiring



ROOFTOP INSTALLATION — 38AH024-034



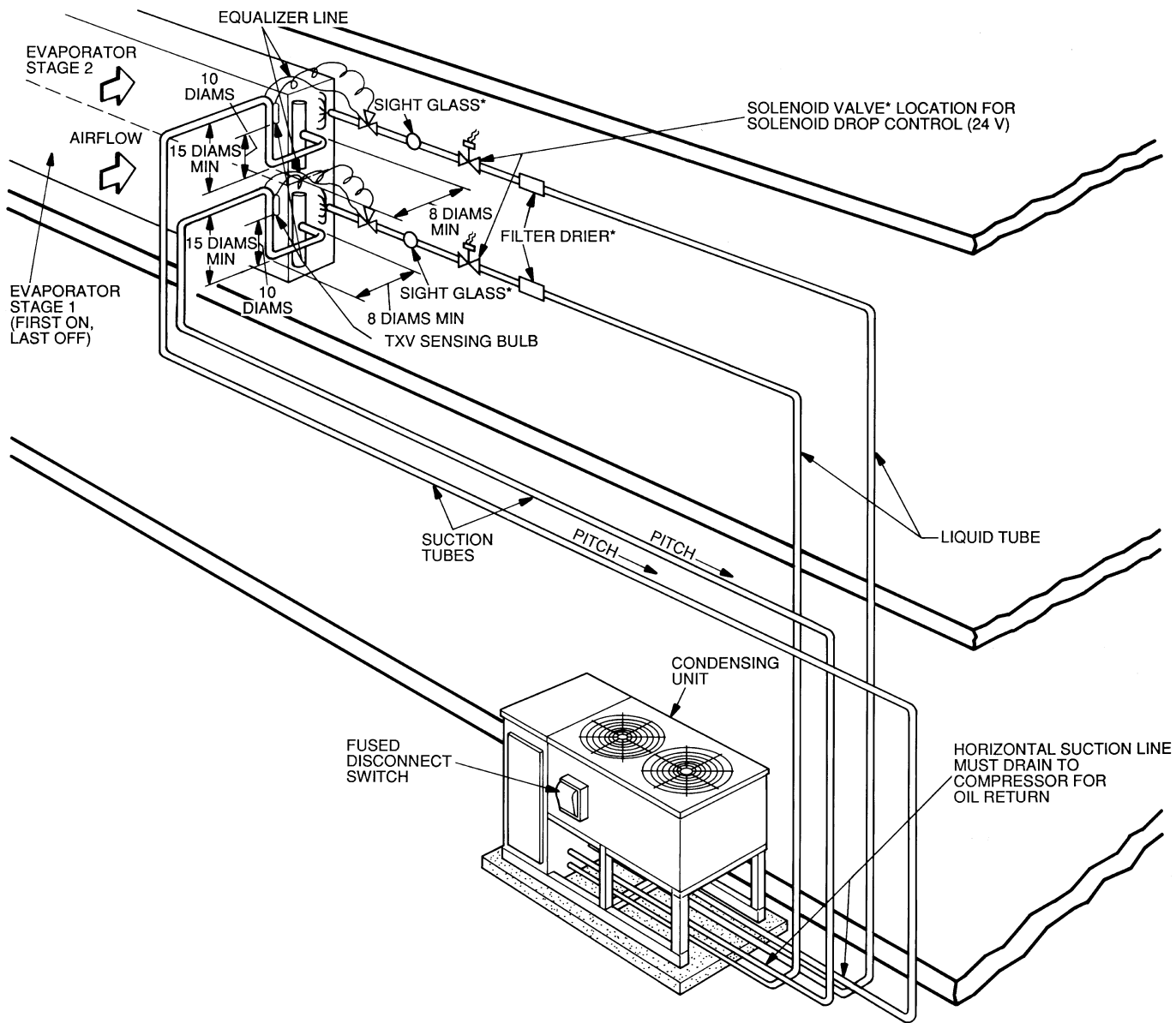
38AH024-034

- LEGEND**
- LLSV — Liquid Line Solenoid Valve
 - NEC — National Electrical Code
 - TXV — Thermostatic Expansion Valve
 - Piping
 - ==== Double Riser Piping (if required)

*Field supplied.
 †If double suction riser is required for piping system, size pipe diameter of 3 ft (maximum) riser according to application data on page 44.
 **See Refrigerant Specialties table.

- NOTES:**
1. All piping must follow standard refrigerant piping techniques. Refer to Carrier System Design Manual for details.
 2. All wiring must comply with the applicable local and national codes.
 3. Wiring and piping shown are general points-of-connection guides only and are not intended for, or to include all details for, a specific installation.
 4. Liquid line solenoid valve (solenoid drop control) is recommended to prevent refrigerant migration to the compressor.
 5. Internal factory-supplied TXVs not shown.

GROUND LEVEL INSTALLATION — 38AH024-034



38AH024-034

LEGEND
TXV — Thermostatic Expansion Valve
 Piping
 *Field supplied.

NOTES:

1. All piping must follow standard refrigerant piping techniques. Refer to Carrier System Design Manual for details.
2. All wiring must comply with the applicable local and national codes.
3. Wiring and piping shown are general points-of-connection guides only and are not intended for, or to include all details for, a specific installation.
4. Liquid line solenoid valve (solenoid drop control) is recommended to prevent refrigerant migration to the compressor.



Commercial Air-Cooled Condensing Units

HVAC Guide Specifications — Section 15675

Size Range: **20 to 30 Tons, Nominal**

Carrier Model Number: **38AH**

Part 1 — General

1.01 SYSTEM DESCRIPTION

- A. Outdoor-mounted, air-cooled condensing unit suitable for on-the-ground or rooftop installation. Unit shall have 2 independent refrigerant circuits. Unit shall consist of semi-hermetic reciprocating compressors, an air-cooled coil, propeller-type condenser fans, and a control box. Unit shall discharge condenser air upward as shown on contract drawings.
- B. Unit shall be used in a refrigeration circuit to match up to Packaged Air Handler Unit(s), Section 15859.

1.02 QUALITY ASSURANCE

- A. Unit shall be rated in accordance with ARI Standard 365, latest edition.
- B. Systems up to 20 tons shall be certified and listed in the latest ARI directory (ARI Standard 360).
- C. Unit construction shall comply with latest edition of ASHRAE and with NEC.
- D. Unit shall be constructed in accordance with UL standards and shall carry the UL and UL, Canada label of approval.
- E. Unit cabinet shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).
- F. Air-cooled condenser coils shall be leak tested at 150 psig and pressure tested at 480 psig.
- G. Unit shall be manufactured in facility registered to the ISO 9001:2000 manufacturing quality standard.

1.03 DELIVERY, STORAGE AND HANDLING

Unit shall be shipped as single package only, and shall be stored and handled per unit manufacturer's recommendations.

1.04 WARRANTY (FOR INCLUSION BY SPECIFYING ENGINEER)

Part 2 — Products

2.01 EQUIPMENT

- A. General:
Factory-assembled, single-piece, air-cooled condensing unit. Contained within the unit enclosure shall be all factory wiring, piping, controls, compressors, holding charge, and special features required prior to field start-up.
- B. Unit Cabinet:
 1. Unit cabinet shall be constructed of galvanized steel, bonderized and coated with a prepainted, baked enamel finish.
 2. Unit access panels shall be hinged for control box service access.

3. Lifting holes shall be provided to facilitate rigging.

C. Fans:

1. Condenser fans shall be direct-driven propeller type, discharging air vertically upward.
2. Condenser fan motors shall be 3-phase type with class B insulation and permanently lubricated bearings.
3. Shafts shall have inherent corrosion resistance.
4. Fan blades shall be statically and dynamically balanced.
5. Condenser fan openings shall be equipped with PVC-coated steel wire safety guards.

D. Compressors:

1. Compressors shall be serviceable, reciprocating, semi-hermetic type.
2. Compressors shall be equipped with an automatically reversible oil pump, operating oil charge, suction and discharge shutoff valves, and an insert-type, factory-installed crankcase heater to control oil dilution.
3. Compressor shall be mounted on spring vibration isolators with an isolation efficiency of no less than 95%.
4. Compressor speed shall not exceed 1750 rpm.
5. Lead compressor shall unload using pressure-operated suction cutoff unloading (electrical solenoid unloading shall be available as an accessory).

E. Condenser Coil:

1. Condenser coil shall be air cooled, circuited for integral subcooler.
2. Coil shall be constructed of aluminum fins (copper fins optional) mechanically bonded to internally grooved, seamless copper tubes which are then cleaned, dehydrated, and sealed.
3. Coil shall be protected by a sheet metal casing to eliminate the need for wind baffles for low ambient temperature operation.
4. Coil shall be protected to avoid damage due to the elements and vandalism.

F. Refrigeration Components:

Refrigeration circuit components shall include hot gas mufflers, hot gas bypass stub tubes, high-side pressure relief devices, liquid line shut-off valves, suction and discharge shutoff valves, holding charge, and compressor oil.

G. Controls and Safeties:

1. Minimum control functions shall include:
 - a. Power and control terminal blocks.
 - b. Three-minute time delay protection to prevent compressor short-cycling.
 - c. Lockout on auto-reset safety until reset from thermostat.



- d. Capacity control on the lead compressor shall be by suction cutoff unloaders in response to compressor suction pressure. Electric solenoid unloading shall be available as an accessory.
 - e. Head pressure control to 53 F by fan cycling. One condenser fan shall be cycled by ambient temperature to maintain proper head pressure.
2. Minimum safety devices shall include:
- a. Compressor oil pressure switches.
 - b. High discharge-pressure cutout.
 - c. Compressor overtemperature cutout.
 - d. Low suction-pressure cutout.
 - e. Condenser-fan motors to be protected against overload or single-phase condition by internal overloads.
 - f. Electrical overload protection through the use of definite-purpose contactors and calibrated, ambient-compensated, magnetic trip circuit breakers. Circuit breakers shall open all 3 phases in the event of an overload in any one of the phases or a single-phase condition.

H. Operating Characteristics:

- 1. The capacity of the condensing unit shall meet or exceed _____ Btuh at a suction temperature of _____ F. The power consumption at full load shall not exceed _____ kW.
- 2. The combination of the condensing unit and the evaporator or fan coil unit shall have a total net cooling capacity of _____ Btuh or greater at conditions of: _____ cfm entering-air temperature at the evaporator at _____ F wet bulb and _____ F dry bulb, and air entering the condensing unit at _____ F.
- 3. The system shall have an EER of _____ Btuh/Watt or greater at standard ARI conditions.

I. Electrical Requirements:

- 1. Nominal unit electrical characteristics shall be _____ v, 3-ph, 60 Hz. The unit shall be capable of satisfactory operation within voltage limits of _____ v to _____ v.
- 2. Unit electrical power shall be single-point connection.
- 3. Unit control circuit shall contain a 24-v transformer for unit control, with capacity to operate an indoor-fan interlock.

J. Special Features:

- 1. Low Ambient Temperature Kit:
Control shall regulate fan motor speed in response to the saturated condensing temperature of the unit. The control shall be capable of maintaining a condensing temperature of 100 F \pm 10° F with outdoor temperatures at -20 F.

2. Electric Solenoid Unloader:

Unloader valve piston, coil, and hardware shall be supplied to convert any pressure-operated compressor unloader to 115-v electric unloading. Accessory control box or field-supplied step controller shall be provided for control of electrical unloading.

3. Gage Panel:

A gage panel package shall be provided which includes a suction and discharge pressure gage. One is required for each refrigerant circuit.

4. Control Box:

Control box shall be provided to allow system to operate as a VAV (variable air volume) system.

5. VAV Option:

A factory-installed variable air volume option shall be supplied to provide unit with 2 electric unloaders and control box modifications necessary to connect to a field-installed control box. (Field supplied accumulators required for each circuit.)

6. Optional Condenser Coil Materials:

a. Pre-Coated Aluminum-Fin Coils:

Shall have a durable epoxy-phenolic coating to provide protection in mildly corrosive coastal environments. Coating shall be applied to the aluminum fin stock prior to the fin stamping process to create an inert barrier between the aluminum fin and copper tube. Epoxy-phenolic barrier shall minimize galvanic action between dissimilar metals.

b. Copper-Fin Coils:

Shall be constructed of copper fins mechanically bonded to copper tubes and copper tube sheets. Galvanized steel tube sheets shall not be acceptable. All copper construction shall provide protection in moderate coastal applications.

A polymer strip shall prevent the coil assembly from contacting the sheet metal coil pan to minimize the potential for galvanic corrosion between the coil and the pan. All copper construction shall provide protection in moderate coastal environments.

c. E-Coated Aluminum-Fin Coils:

Shall be constructed of aluminum fins mechanically bonded to copper tubes. Coating process shall have a flexible epoxy polymer coating uniformly applied to all coil surfaces without material bridging between the fins. The coating process shall ensure complete coil encapsulation. Color shall be high-gloss black with gloss at 60° of 65% to 90% per ASTM D523-89. Uniform dry film thickness shall be 0.8 mil to 1.2 mil on all

38AH024-044



surfaces, including the fin edges. Superior hardness characteristics shall meet those requirements of 2H, per ASTM D3363-92A. Cross-hatch adhesion shall meet the requirements of 4B-5B, per ASTM D3359-93. Impact resistance shall be up to 160 in./lb, per ASTM D2794-93. Humidity resistance shall be up to a minimum of 1000 hours per ASTM D2247-92. Water immersion resistance shall be up to a minimum of 250 hours per ASTM D870-92. Durability shall be confirmed through testing to no less than 1000 hours of salt spray per ASTM B117-90.

d. E-Coated Copper Fin Coils:

Shall be copper fins mechanically bonded to copper tubes with copper tube sheets. Coating process shall have a flexible epoxy polymer coating uniformly applied to all coil surfaces without material bridging between the fins. The coating process shall ensure complete coil encapsulation. Shall be high-gloss black with gloss at 60° of 65% to 90% per ASTM D523-89. Uniform dry film thickness shall be 0.8 mil to 1.2 mil on all surfaces, including the fin edges. Superior hardness characteristics shall meet those requirements of 2H, per ASTM D3363-92A. Cross-hatch adhesion shall meet the requirements of 4B-5B, per ASTM D3359-93. Impact resistance shall be up to

150 in./lb, per ASTM D2794-93. Humidity resistance shall be up to a minimum of 1000 hours per ASTM D2247-92. Water immersion resistance shall be up to a minimum of 250 hours per ASTM D980-92. Durability shall be confirmed through testing to no less than 1000 hours of salt spray per ASTM B117-90.

7. Thermostat Controls:

- a. Programmable multi-stage thermostat with 7-day clock, holiday scheduling, large backlit display, remote sensor capability, and Title 24 compliance.
- b. Commercial Electronic Thermostat with 7-day timeclock, auto-changeover, multi-stage capability, and large LCD temperature display.
- c. Non-programmable thermostat with fan switch subbase.
- d. Carrier PremierLink™ Controller:

This control will function with CCN and ComfortVIEW™ software. It shall also be compatible with *ComfortLink*™ controllers. It shall be ASHRAE 62-99 compliant and Internet ready. It shall accept a CO₂ sensor in the conditioned space and be Demand Control Ventilation (DCV) ready. The communication rate must be 38.4K or faster. It shall include an integrated economizer controller.

Model number nomenclature — 40RM



40RM - 016 -- B 5 0 1 GC

40RM — Commercial Packaged Air Handler

Cooling Coil
-- — Direct Expansion

Nominal Capacity - Tons

016 — 15
024 — 20
028 — 25
034 — 30

Not Used

Expansion Device

B — Thermostatic Expansion Valves
H — High Capacity Coil

Voltage Designation

1 — 575-3-60
5 — 208/230-3-60
6 — 208/230/460-3-60 (size 016 except YC and WD Options)
460-3-60 (size 016 with YC and WD options and all size 024-034 units)

Factory-Installed Options

GC — Unpainted, Standard Motor, and Standard Drive
HC — Unpainted, Standard Motor, and Medium-Static Drive (Not available for size 028)
TC — Unpainted, Alternate Motor, and Medium-Static Drive (size 028 only)
YC — Unpainted, Alternate Motor, and High-Static Drive*
ED — Painted, Standard Motor, and Standard Drive
FD — Painted, Standard Motor, and Medium-Static Drive (Not available for size 028)
RD — Painted, Alternate Motor, and Medium-Static Drive (size 028)
WD — Painted, Alternate Motor, and High-Static Drive*

Packaging

1 — Standard Domestic

Revision Number

0 — Original Model

*Size 034 units use 10 Hp motor only; YC and WD option codes for 034 size designate standard motor and high-static drive.

Quality Assurance

Certified to ISO 9001:2000

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Physical data



40RM016-034 UNITS

| UNIT 40RM | 016 | 024 | 028 | 034 |
|-----------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| NOMINAL CAPACITY (tons) | 15 | 20 | 25 | 30 |
| OPERATING WEIGHTS (lb) | | | | |
| Base Unit with TXV (3-Row/4-Row) | 685/713 | 690/730 | 1020/1050 | 1030/1062 |
| Plenum | 225 | 225 | 325 | 325 |
| FANS | | | | |
| Qty...Diam. (in.) | 2...15 | 2...15 | 2...18 | 2...18 |
| Nominal Airflow (cfm) | 6000 | 8000 | 10,000 | 12,000 |
| Airflow Range (cfm) | 4500-7500 | 6000-10,000 | 7500-12,500 | 9000-15,000 |
| Nominal Hp (Standard Motor) | | | | |
| 208/230-3-60 and 460-3-60 | 3.7 | 5.0 | 7.5 | 10.0 |
| 575-3-60 | 3.0 | 5.0 | 7.5 | 10.0 |
| Speed (rpm) | | | | |
| 208/230-3-60 and 460-3-60 | 1725 | 1745 | 1745 | 1745 |
| 575-3-60 | 1725 | 1745 | 1755 | 1755 |
| REFRIGERANT | | | | |
| Operating charge (lb) | | | | |
| (approx per circuit)* | 2.5/2.5 | 3.5/3.5 | 4.5/4.5 | 5.0/5.0 |
| DIRECT-EXPANSION COIL | | | | |
| Max Working Pressure (psig) | | | | |
| Face Area (sq ft total) | 17.67 | 19.88 | 24.86 | 29.83 |
| No. of Splits | 2 | 2 | 2 | 2 |
| Split Type...Percentage | | | Face...50/50 | |
| No. of Circuits per Split (3 Row/4 Row) | 12/16 | 13/18 | 15/20 | 18/24 |
| Fins/in. | 15 | 17 | 15 | 15 |
| STEAM COIL | | | | |
| Max Working Pressure (psig)† | | | 175 | |
| Face Area (sq ft total) | 13.33 | 13.33 | 15.0 | 15.0 |
| Rows...Fins/in. | 1...10 | 1...10 | 1...10 | 1...10 |
| HOT WATER COIL | | | | |
| Max Working Pressure (psig) | | | 150 | |
| Face Area (sq ft total) | 13.33 | 13.33 | 15.0 | 15.0 |
| Rows...Fins/in. | 2...8.5 | 2...8.5 | 2...12.5 | 2...12.5 |
| Water Volume | | | | |
| (gal) | | 13.9 | | 14.3 |
| (ft ³) | | 1.85 | | 1.90 |
| PIPING CONNECTIONS | | | | |
| Qty...Size (in.) | | | | |
| DX Coil — Suction (ODF) | 2...1 ¹ / ₈ | 2...1 ¹ / ₈ | 2...5 ⁵ / ₈ | 2...1 ³ / ₈ |
| DX Coil — Liquid Refrigerant (ODF) | | | 1...2 ¹ / ₂ | |
| Steam Coil, In (MPT) | | | 1...1 ¹ / ₂ | |
| Steam Coil, Out (MPT) | | | 1...2 | |
| Hot Water Coil, In (MPT) | | | 1...2 | |
| Hot Water Coil, Out (MPT) | | | 1...1 ¹ / ₄ | |
| Condensate (PVC) | | | | |
| FILTERS | | | | |
| Qty...Size (in.) | 4...16 x 20 x 2 | | Throwaway — Factory Supplied | 4...16 x 24 x 2 |
| Access Location | 4...16 x 24 x 2 | | Either Side | 4...20 x 25 x 2 |

LEGEND

TXV — Thermostatic Expansion Valve

*Units are shipped without refrigerant charge.

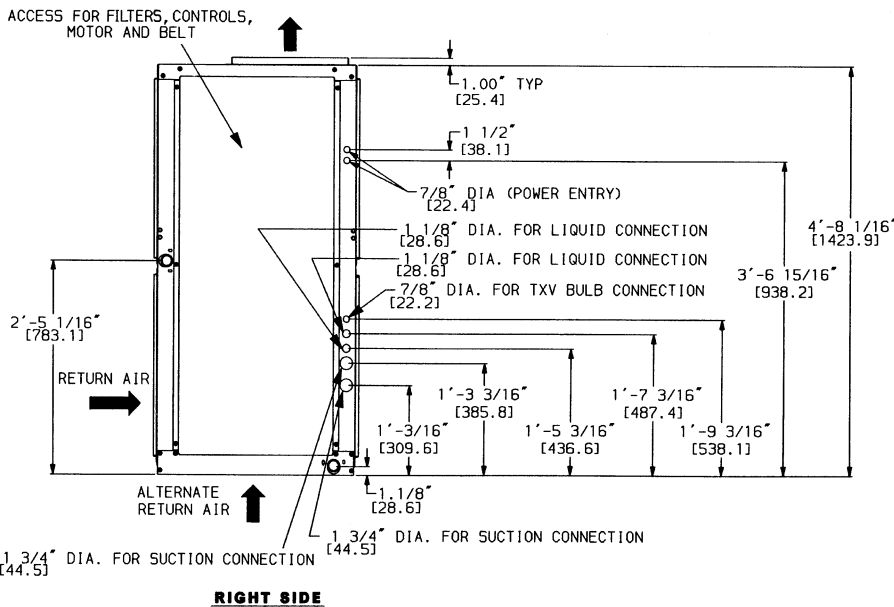
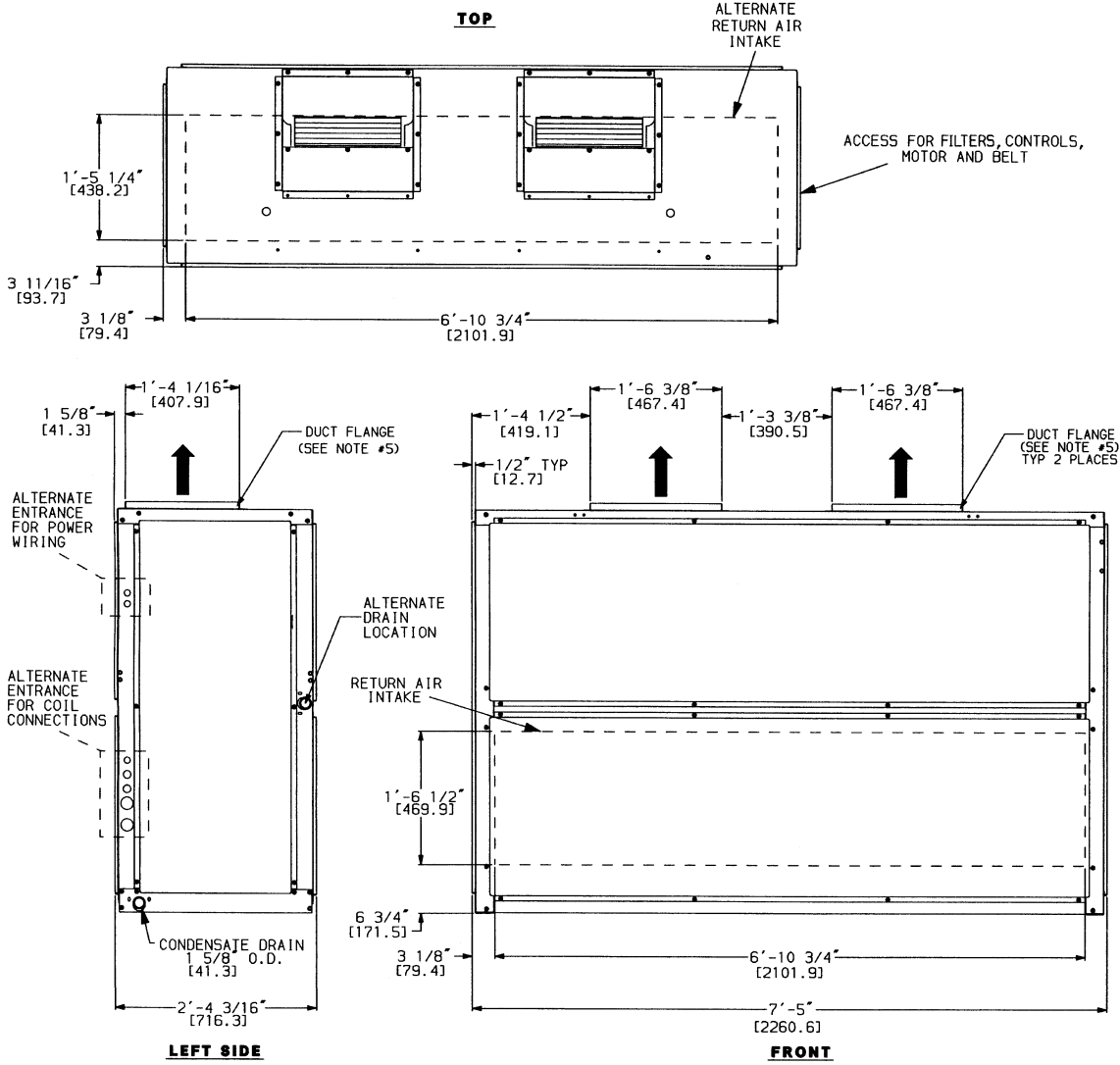
†Maximum working pressure (psig) at 400 F.

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Dimensions



40RM016, 024



LEGEND

TXV — Thermostatic Expansion Valve

NOTES:

- Dimensions in [] are in millimeters.
- Direction of airflow.
- Recommended clearance:
 - Rear: 3"
 - Front: 2'-6"
 - Right Side: 2'-6"
 - Left Side: 2'-6"
 - Local codes or jurisdiction may prevail.
- Liquid piping not supplied by Carrier.
- Duct flange is factory supplied and field installed.

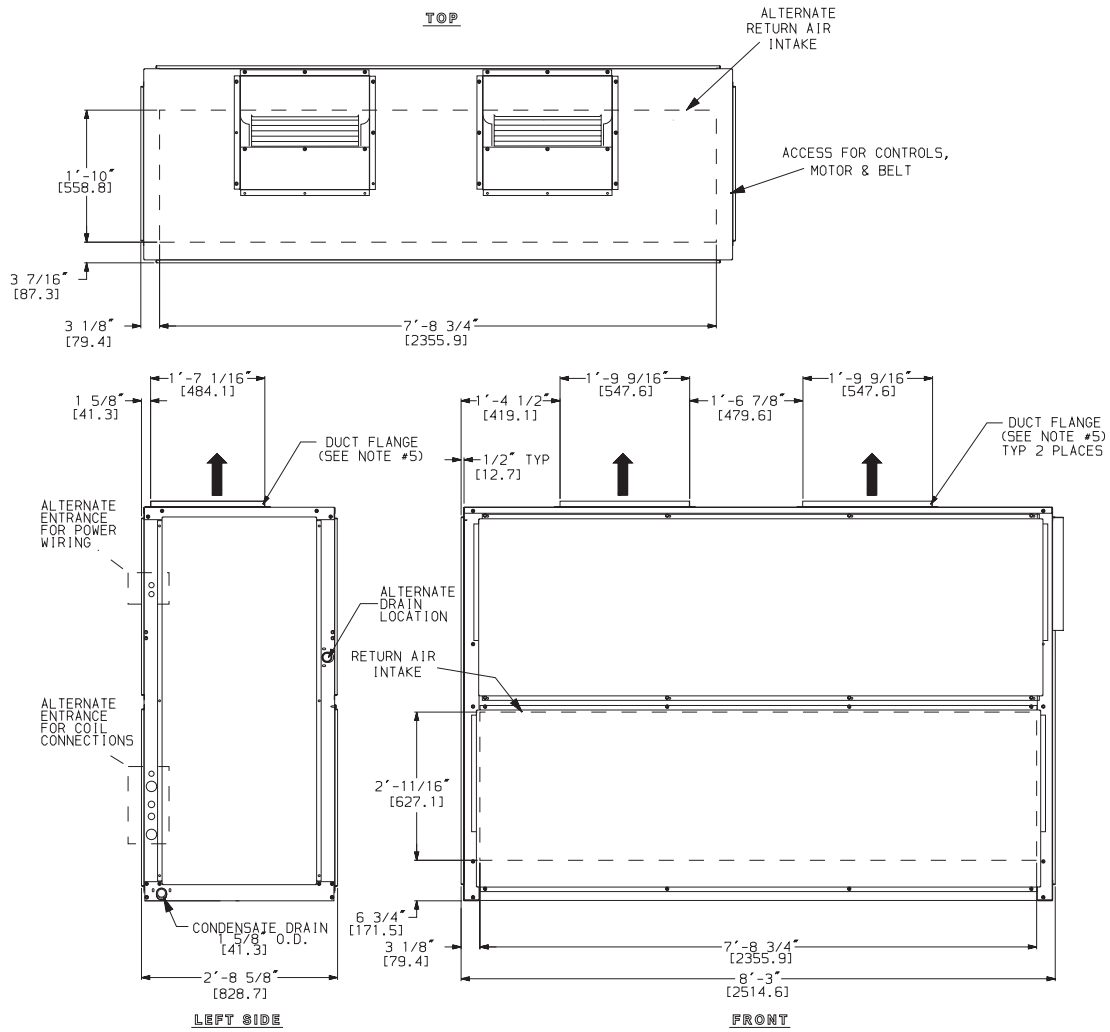
| UNIT 40RM | UNIT WEIGHT (lb) |
|-----------------------------|------------------------|
| STANDARD 3-ROW COIL | 016 685 024 690 |
| HIGH-CAPACITY 4-ROW COIL | 016 713 024 730 |

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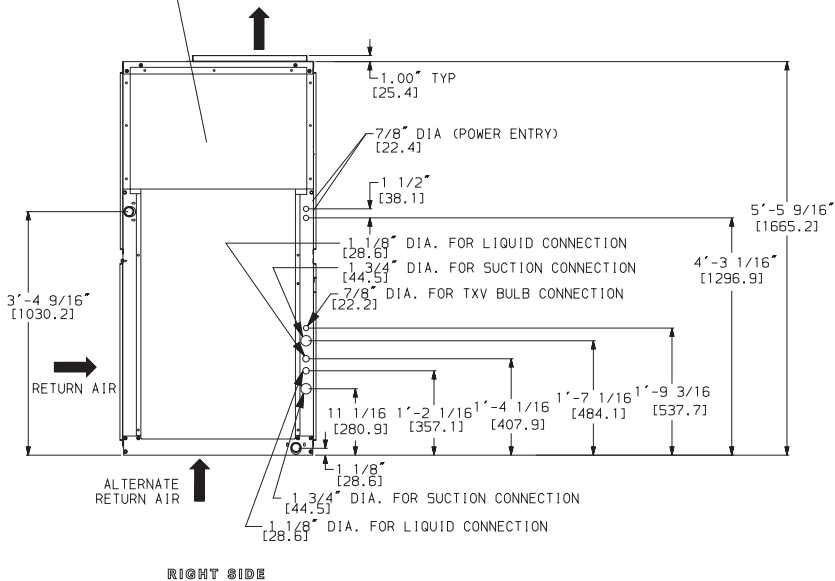
Dimensions (cont)



40RM028, 034



ACCESS FOR CONTROLS,
MOTOR & BELT



LEGEND

TXV — Thermostatic Expansion Valve

NOTES:

- Dimensions in [] are in millimeters.
- Direction of airflow.
- Recommended clearance:
 - Rear: 3"
 - Front: 2'-6"
 - Right Side: 2'-6"
 - Left Side: 2'-6"
 - Local codes or jurisdiction may prevail.
- Liquid piping not supplied by Carrier.
- Duct flange is factory supplied and field installed.

| UNIT 40RM | | UNIT WEIGHT (lb) |
|-----------------------------|-----|------------------------|
| STANDARD 3-ROW COIL | 028 | 1020 |
| | 034 | 1030 |
| HIGH-CAPACITY 4-ROW COIL | 028 | 1050 |
| | 034 | 1062 |

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Performance data



40RM WITH STANDARD 3-ROW COIL FAN PERFORMANCE DATA — 0.0-2.4 ESP

| UNIT 40RM | AIRFLOW (Cfm) | EXTERNAL STATIC PRESSURE (in. wg) | | | | | | | | | | | | | |
|--------------|------------------|-----------------------------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|-------------|------|-------|------|-------|
| | | 0.0 | | 0.2 | | 0.4 | | 0.6 | | 0.8 | | 1.0 | | 1.2 | |
| | | Rpm | Bhp | Rpm | Bhp | Rpm | Bhp | Rpm | Bhp | Rpm | Bhp | Rpm | Bhp | Rpm | Bhp |
| 016 | 4,500 | 428 | 0.59 | 475 | 0.70 | 570 | 0.99 | 656 | 1.33 | 730 | 1.68 | 796 | 2.02 | 856 | 2.38 |
| | 5,300 | 488 | 0.92 | 528 | 1.04 | 609 | 1.34 | 689 | 1.71 | 762 | 2.11 | 827 | 2.51 | 886 | 2.92 |
| | 6,000 | 542 | 1.29 | 578 | 1.43 | 649 | 1.74 | 721 | 2.11 | 791 | 2.55 | 855 | 3.00 | 914 | 3.46 |
| | 6,800 | 604 | 1.83 | 637 | 1.99 | 700 | 2.32 | 763 | 2.70 | 826 | 3.15 | 888 | 3.64 | 946 | 4.15 |
| | 7,500 | 660 | 2.42 | 690 | 2.59 | 747 | 2.95 | 804 | 3.34 | 861 | 3.79 | 919 | 4.29 | 975 | 4.83 |
| 024 | 6,000 | 532 | 1.25 | 569 | 1.39 | 639 | 1.69 | 711 | 2.06 | 781 | 2.48 | 846 | 2.93 | 905 | 3.39 |
| | 7,000 | 608 | 1.93 | 641 | 2.09 | 702 | 2.42 | 763 | 2.80 | 824 | 3.23 | 885 | 3.71 | 943 | 4.23 |
| | 8,000 | 686 | 2.83 | 716 | 3.01 | 770 | 3.38 | 823 | 3.77 | 876 | 4.21 | 930 | 4.70 | 983 | 5.24 |
| | 9,000 | 764 | 3.97 | 791 | 4.18 | 841 | 4.59 | 888 | 5.02 | 935 | 5.47 | 982 | 5.96 | 1030 | 6.51 |
| | 10,000 | 843 | 5.38 | 868 | 5.62 | 914 | 6.09 | 957 | 6.55 | 1000 | 7.02 | 1042 | 7.53 | 1084 | 8.08 |
| 028 | 7,500 | 456 | 1.29 | 490 | 1.47 | 556 | 1.85 | 621 | 2.25 | 678 | 2.64 | 729 | 3.06 | 778 | 3.60 |
| | 8,750 | 521 | 1.98 | 551 | 2.18 | 608 | 2.61 | 664 | 3.07 | 720 | 3.53 | 770 | 3.99 | 816 | 4.45 |
| | 10,000 | 587 | 2.88 | 614 | 3.11 | 664 | 3.59 | 714 | 4.09 | 763 | 4.62 | 812 | 5.15 | 857 | 5.68 |
| | 11,250 | 653 | 4.03 | 678 | 4.29 | 724 | 4.82 | 768 | 5.37 | 812 | 5.95 | 856 | 6.54 | 899 | 7.14 |
| | 12,500 | 720 | 5.46 | 743 | 5.75 | 785 | 6.33 | 825 | 6.93 | 865 | 7.55 | 904 | 8.20 | 944 | 8.86 |
| 034 | 9,000 | 521 | 1.99 | 550 | 2.25 | 616 | 2.77 | 676 | 3.23 | 731 | 3.72 | 782 | 4.20 | 829 | 4.70 |
| | 10,500 | 596 | 3.16 | 623 | 3.40 | 672 | 3.89 | 720 | 4.40 | 767 | 4.94 | 814 | 5.50 | 859 | 6.05 |
| | 12,000 | 673 | 4.63 | 698 | 4.90 | 743 | 5.45 | 785 | 6.02 | 826 | 6.62 | 867 | 7.23 | 908 | 7.87 |
| | 13,500 | 751 | 6.51 | 773 | 6.82 | 815 | 7.44 | 853 | 8.06 | 890 | 8.71 | 927 | 9.38 | 963 | 10.07 |
| | 15,000 | 829 | 8.84 | 850 | 9.19 | 888 | 9.88 | 924 | 10.57 | 958 | 11.27 | 991 | 11.99 | 1024 | 12.73 |

| UNIT 40RM | AIRFLOW (Cfm) | EXTERNAL STATIC PRESSURE (in. wg) | | | | | | | | | | | |
|--------------|------------------|-----------------------------------|-------|------|-------|------|-------|------|-------|------|-------|------|------|
| | | 1.4 | | 1.6 | | 1.8 | | 2.0 | | 2.2 | | 2.4 | |
| | | Rpm | Bhp | Rpm | Bhp | Rpm | Bhp | Rpm | Bhp | Rpm | Bhp | Rpm | Bhp |
| 016 | 4,500 | 912 | 2.75 | 967 | 3.13 | 1019 | 3.52 | 1070 | 3.92 | 1120 | 4.35 | 1168 | 4.79 |
| | 5,300 | 940 | 3.33 | 992 | 3.75 | 1041 | 4.18 | 1088 | 4.61 | 1134 | 5.06 | 1179 | 5.52 |
| | 6,000 | 968 | 3.92 | 1018 | 4.38 | 1066 | 4.85 | 1112 | 5.32 | 1156 | 5.80 | 1198 | 6.29 |
| | 6,800 | 1000 | 4.67 | 1050 | 5.19 | 1097 | 5.71 | 1142 | 6.23 | 1185 | 6.76 | — | — |
| | 7,500 | 1028 | 5.39 | 1078 | 5.97 | 1125 | 6.54 | 1170 | 7.11 | — | — | — | — |
| 024 | 6,000 | 954 | 3.83 | 1005 | 4.27 | 1052 | 4.72 | 1098 | 5.22 | 1142 | 5.67 | — | — |
| | 7,000 | 990 | 4.74 | 1040 | 5.24 | 1090 | 5.80 | 1135 | 6.30 | 1176 | 6.84 | — | — |
| | 8,000 | 1028 | 5.79 | 1078 | 6.38 | 1130 | 7.00 | 1173 | 7.60 | — | — | — | — |
| | 9,000 | 1073 | 7.11 | 1120 | 7.72 | 1169 | 8.37 | — | — | — | — | — | — |
| | 10,000 | 1126 | 8.75 | 1166 | 9.37 | — | — | — | — | — | — | — | — |
| 028 | 7,500 | 831 | 4.41 | 870 | 5.10 | 913 | 5.90 | 950 | 6.88 | 985 | 7.70 | — | — |
| | 8,750 | 859 | 4.97 | 901 | 5.59 | 944 | 6.42 | 980 | 7.20 | 1020 | 8.10 | — | — |
| | 10,000 | 900 | 6.20 | 939 | 6.74 | 976 | 7.33 | 1013 | 8.00 | 1050 | 8.82 | — | — |
| | 11,250 | 941 | 7.73 | 980 | 8.32 | 1017 | 8.90 | 1052 | 9.51 | 1086 | 10.16 | — | — |
| | 12,500 | 984 | 9.53 | 1022 | 10.19 | 1058 | 10.84 | 1093 | 11.49 | — | — | — | — |
| 034 | 9,000 | 866 | 5.20 | 899 | 5.85 | 950 | 6.65 | 989 | 7.38 | 1029 | 8.32 | 1077 | 9.74 |
| | 10,500 | 902 | 6.60 | 942 | 7.14 | 980 | 7.70 | 1016 | 8.31 | 1051 | 8.99 | 1085 | 9.77 |
| | 12,000 | 949 | 8.50 | 988 | 9.14 | 1026 | 9.76 | 1062 | 10.38 | 1095 | 11.01 | — | — |
| | 13,500 | 1000 | 10.78 | 1036 | 11.49 | 1073 | 12.21 | — | — | — | — | — | — |
| | 15,000 | 1057 | 13.49 | 1090 | 14.28 | — | — | — | — | — | — | — | — |

LEGEND

Bhp — Brake Horsepower Input to Fan
ESP — External Static Pressure

Bold indicates special field-supplied drive is required.
 Plain type indicates standard drive and standard motor.
Underline indicates a different motor and drive combination is required.
 Refer to the fan motor and drive tables, pages 61 and 62, to complete the selection.

NOTES:

- Maximum allowable fan speed is 1100 rpm for unit sizes 028 and 034; 1200 rpm for all other sizes.
- Fan performance is based on deductions for wet coil, clean 2-in. filters, and unit casing. See right for factory-supplied filter pressure drop.
- Factory-supplied motor for 034 size is standard 10 Hp motor only; alternate motor not available.

FACTORY-SUPPLIED FILTER PRESSURE DROP (in. wg)

| UNIT 40RM | AIRFLOW (Cfm) | PRESSURE DROP (in. wg) |
|--------------|------------------|---------------------------|
| 016 | 4,500 | 0.08 |
| | 6,000 | 0.12 |
| | 7,500 | 0.17 |
| 024 | 6,000 | 0.12 |
| | 8,000 | 0.19 |
| | 10,000 | 0.26 |
| 028 | 7,500 | 0.15 |
| | 10,000 | 0.22 |
| | 12,500 | 0.30 |
| 034 | 9,000 | 0.19 |
| | 12,000 | 0.29 |
| | 15,000 | 0.40 |

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Performance data (cont)



40RM WITH HIGH-CAPACITY 4-ROW COIL FAN PERFORMANCE DATA — 0.0-2.4 ESP

| UNIT 40RM | AIRFLOW (Cfm) | EXTERNAL STATIC PRESSURE (in. wg) | | | | | | | | | | | | | |
|--------------|------------------|-----------------------------------|------|-----|------|-----|-------|-----|-------|------|-------|------|-------|------|-------|
| | | 0.0 | | 0.2 | | 0.4 | | 0.6 | | 0.8 | | 1.0 | | 1.2 | |
| | | Rpm | Bhp | Rpm | Bhp | Rpm | Bhp | Rpm | Bhp | Rpm | Bhp | Rpm | Bhp | Rpm | Bhp |
| 016 | 4,500 | 437 | 0.61 | 483 | 0.72 | 576 | 1.01 | 660 | 1.35 | 732 | 1.69 | 797 | 2.03 | 856 | 2.38 |
| | 5,300 | 499 | 0.95 | 538 | 1.07 | 617 | 1.37 | 696 | 1.74 | 767 | 2.13 | 830 | 2.53 | 888 | 2.94 |
| | 6,000 | 555 | 1.34 | 590 | 1.48 | 659 | 1.79 | 730 | 2.17 | 798 | 2.59 | 860 | 3.04 | 918 | 3.49 |
| | 6,800 | 620 | 1.91 | 651 | 2.06 | 712 | 2.39 | 774 | 2.78 | 836 | 3.22 | 896 | 3.71 | 952 | 4.21 |
| | 7,500 | 677 | 2.52 | 706 | 2.69 | 761 | 3.04 | 817 | 3.44 | 873 | 3.89 | 929 | 4.39 | 984 | 4.93 |
| 024 | 6,000 | 542 | 1.29 | 577 | 1.42 | 646 | 1.72 | 716 | 2.09 | 785 | 2.51 | 849 | 2.95 | 907 | 3.40 |
| | 7,000 | 620 | 1.99 | 652 | 2.15 | 711 | 2.48 | 771 | 2.85 | 831 | 3.28 | 890 | 3.76 | 947 | 4.27 |
| | 8,000 | 700 | 2.92 | 728 | 3.10 | 781 | 3.46 | 833 | 3.85 | 885 | 4.29 | 938 | 4.78 | 990 | 5.32 |
| | 9,000 | 781 | 4.10 | 806 | 4.30 | 854 | 4.71 | 900 | 5.13 | 946 | 5.58 | 993 | 6.08 | 1039 | 6.62 |
| | 10,000 | 862 | 5.56 | 885 | 5.79 | 929 | 6.24 | 971 | 6.70 | 1012 | 7.18 | 1054 | 7.69 | 1096 | 8.24 |
| 028 | 7,500 | 476 | 1.39 | 510 | 1.58 | 579 | 1.99 | 644 | 2.40 | 701 | 2.81 | 752 | 3.29 | 804 | 3.96 |
| | 8,750 | 545 | 2.14 | 574 | 2.35 | 633 | 2.81 | 691 | 3.29 | 747 | 3.77 | 797 | 4.25 | 842 | 4.76 |
| | 10,000 | 615 | 3.12 | 641 | 3.36 | 692 | 3.87 | 743 | 4.41 | 794 | 4.96 | 843 | 5.51 | 888 | 6.05 |
| | 11,250 | 685 | 4.37 | 709 | 4.64 | 754 | 5.20 | 800 | 5.79 | 845 | 6.40 | 891 | 7.02 | 935 | 7.64 |
| | 12,500 | 756 | 5.92 | 778 | 6.22 | 819 | 6.83 | 860 | 7.47 | 901 | 8.14 | 942 | 8.83 | 983 | 9.52 |
| 034 | 9,000 | 539 | 2.18 | 569 | 2.39 | 626 | 2.85 | 683 | 3.34 | 739 | 3.83 | 791 | 4.32 | 837 | 4.82 |
| | 10,500 | 620 | 3.37 | 646 | 3.62 | 695 | 4.13 | 744 | 4.68 | 793 | 5.25 | 842 | 5.83 | 888 | 6.41 |
| | 12,000 | 701 | 4.94 | 724 | 5.22 | 769 | 5.80 | 811 | 6.40 | 854 | 7.04 | 897 | 7.69 | 940 | 8.36 |
| | 13,500 | 783 | 6.95 | 804 | 7.27 | 844 | 7.91 | 883 | 8.57 | 920 | 9.26 | 958 | 9.97 | 996 | 10.71 |
| | 15,000 | 865 | 9.45 | 884 | 9.81 | 921 | 10.52 | 956 | 11.24 | 991 | 11.98 | 1025 | 12.75 | 1059 | 13.54 |

| UNIT 40RM | AIRFLOW (Cfm) | EXTERNAL STATIC PRESSURE (in. wg) | | | | | | | | | | | |
|--------------|------------------|-----------------------------------|-------|------|-------|------|-------|------|-------|------|------|------|------|
| | | 1.4 | | 1.6 | | 1.8 | | 2.0 | | 2.2 | | 2.4 | |
| | | Rpm | Bhp | Rpm | Bhp | Rpm | Bhp | Rpm | Bhp | Rpm | Bhp | Rpm | Bhp |
| 016 | 4,500 | 912 | 2.75 | 967 | 3.12 | 1019 | 3.52 | 1070 | 3.92 | 1120 | 4.35 | 1168 | 4.79 |
| | 5,300 | 942 | 3.34 | 992 | 3.76 | 1041 | 4.18 | 1088 | 4.61 | 1134 | 5.06 | 1179 | 5.52 |
| | 6,000 | 971 | 3.95 | 1020 | 4.40 | 1067 | 4.86 | 1112 | 5.33 | 1156 | 5.81 | 1198 | 6.29 |
| | 6,800 | 1005 | 4.72 | 1054 | 5.23 | 1101 | 5.75 | 1145 | 6.27 | 1187 | 6.79 | — | — |
| | 7,500 | 1036 | 5.48 | 1084 | 6.04 | 1131 | 6.61 | 1174 | 7.17 | — | — | — | — |
| 024 | 6,000 | 961 | 3.86 | 1011 | 4.31 | 1058 | 4.77 | 1104 | 5.24 | 1147 | 5.71 | — | — |
| | 7,000 | 1000 | 4.79 | 1050 | 5.32 | 1097 | 5.85 | 1142 | 6.38 | 1184 | 6.91 | — | — |
| | 8,000 | 1041 | 5.88 | 1090 | 6.47 | 1137 | 7.07 | 1181 | 7.67 | — | — | — | — |
| | 9,000 | 1086 | 7.21 | 1133 | 7.82 | 1178 | 8.47 | — | — | — | — | — | — |
| | 10,000 | 1138 | 8.83 | 1180 | 9.46 | — | — | — | — | — | — | — | — |
| 028 | 7,500 | 874 | 5.33 | 897 | 5.91 | 940 | 6.80 | 990 | 7.50 | — | — | — | — |
| | 8,750 | 886 | 5.36 | 930 | 6.13 | 982 | 7.32 | 1020 | 8.10 | — | — | — | — |
| | 10,000 | 930 | 6.60 | 969 | 7.20 | 1007 | 7.89 | 1045 | 8.71 | — | — | — | — |
| | 11,250 | 976 | 8.25 | 1014 | 8.86 | 1051 | 9.49 | 1086 | 10.17 | — | — | — | — |
| | 12,500 | 1023 | 10.20 | 1061 | 10.88 | 1097 | 11.56 | — | — | — | — | — | — |
| 034 | 9,000 | 881 | 5.37 | 923 | 6.03 | 967 | 6.89 | 1020 | 8.25 | — | — | — | — |
| | 10,500 | 930 | 6.97 | 970 | 7.55 | 1008 | 8.17 | 1045 | 8.86 | — | — | — | — |
| | 12,000 | 981 | 9.02 | 1021 | 9.67 | 1058 | 10.32 | 1094 | 10.97 | — | — | — | — |
| | 13,500 | 1035 | 11.45 | 1072 | 12.20 | — | — | — | — | — | — | — | — |
| | 15,000 | 1093 | 14.35 | — | — | — | — | — | — | — | — | — | — |

LEGEND

Bhp — Brake Horsepower Input to Fan
ESP — External Static Pressure

Bold indicates special field-supplied drive is required.
Plain type indicates standard drive and standard motor.
Underline indicates a different motor and drive combination is required.
Refer to the fan motor and drive tables, pages 61 and 62, to complete the selection.

NOTES:

- Maximum allowable fan speed is 1100 rpm for unit sizes 028 and 034; 1200 rpm for all other sizes.
- Fan performance is based on deductions for wet coil, clean 2-in. filters, and unit casing. See right for factory-supplied filter pressure drop.
- Factory-supplied motor for 034 size is standard 10 Hp motor only; alternate motor not available.

FACTORY-SUPPLIED FILTER PRESSURE DROP (in. wg)

| UNIT 40RM | AIRFLOW (Cfm) | PRESSURE DROP (in. wg) |
|--------------|------------------|---------------------------|
| 016 | 4,500 | 0.08 |
| | 6,000 | 0.12 |
| | 7,500 | 0.17 |
| 024 | 6,000 | 0.12 |
| | 8,000 | 0.19 |
| | 10,000 | 0.26 |
| 028 | 7,500 | 0.15 |
| | 10,000 | 0.22 |
| | 12,500 | 0.30 |
| 034 | 9,000 | 0.19 |
| | 12,000 | 0.29 |
| | 15,000 | 0.40 |



40RM ACCESSORY PLENUM AIR THROW DATA (ft)

| UNIT 40RM | AIRFLOW (Cfm) | VANE DEFLECTION | | |
|--------------|------------------|-----------------|------|-----|
| | | Straight | 22½° | 45° |
| 016 | 6,000 | 50 | 43 | 31 |
| 024 | 8,000 | 60 | 51 | 37 |
| 028 | 10,000 | 76 | 65 | 47 |
| 034 | 12,000 | 85 | 72 | 52 |

NOTE: Throw distances shown are for 75 fpm terminal velocity. Use the following multipliers to determine throw values for other terminal velocities.

| TERMINAL VELOCITY (Fpm) | THROW FACTOR |
|----------------------------|-----------------|
| 50 | X 1.50 |
| 100 | X 0.75 |
| 150 | X 0.50 |

40RM ACCESSORY PRESSURE DROP (in. wg)

| UNIT 40RM | AIRFLOW (Cfm) | DISCHARGE PLENUM | RETURN AIR GRILLE | HEATING COILS | | | ECONOMIZER |
|--------------|------------------|---------------------|----------------------|---------------|-------|----------|------------|
| | | | | Hot Water | Steam | Electric | |
| 016 | 4,500 | 0.10 | 0.01 | 0.15 | 0.15 | 0.06 | 0.06 |
| | 6,000 | 0.16 | 0.02 | 0.23 | 0.23 | 0.10 | 0.09 |
| | 7,500 | 0.23 | 0.03 | 0.33 | 0.33 | 0.15 | 0.15 |
| 024 | 6,000 | 0.16 | 0.02 | 0.23 | 0.23 | 0.10 | 0.09 |
| | 8,000 | 0.26 | 0.04 | 0.37 | 0.37 | 0.17 | 0.17 |
| | 10,000 | 0.37 | 0.06 | 0.53 | 0.53 | 0.26 | 0.28 |
| 028 | 7,500 | 0.15 | 0.02 | 0.28 | 0.28 | 0.09 | 0.06 |
| | 10,000 | 0.24 | 0.03 | 0.44 | 0.44 | 0.16 | 0.09 |
| | 12,500 | 0.34 | 0.05 | 0.63 | 0.63 | 0.24 | 0.14 |
| 034 | 9,000 | 0.20 | 0.03 | 0.37 | 0.37 | 0.13 | 0.08 |
| | 12,000 | 0.32 | 0.05 | 0.59 | 0.59 | 0.22 | 0.14 |
| | 15,000 | 0.46 | 0.07 | 0.85 | 0.85 | 0.34 | 0.21 |

40RM HYDRONIC HEATING CAPACITIES

| UNIT 40RM | AIRFLOW (Cfm) | 1-ROW STEAM* | | 2-ROW HOT WATER COIL† | | | |
|--------------|------------------|-----------------|-----|--------------------------|-----|------|-----|
| | | Cap. | Ldb | Cap. | Ldb | Gpm | PD |
| 016 | 4,500 | 402 | 141 | 412.0 | 145 | 41.2 | 4.5 |
| | 6,000 | 458 | 129 | 471.0 | 133 | 47.1 | 5.5 |
| | 7,500 | 479 | 118 | 529.0 | 125 | 52.9 | 6.6 |
| 024 | 6,000 | 458 | 129 | 506.0 | 138 | 50.6 | 5.1 |
| | 8,000 | 487 | 115 | 584.0 | 128 | 58.4 | 6.3 |
| | 10,000 | 499 | 105 | 652.0 | 120 | 65.2 | 7.5 |
| 028 | 7,500 | 511 | 122 | 649.0 | 140 | 64.9 | 5.7 |
| | 10,000 | 575 | 112 | 752.0 | 130 | 75.2 | 7.1 |
| | 12,500 | 626 | 106 | 842.0 | 122 | 84.2 | 8.5 |
| 034 | 9,000 | 560 | 117 | 735.0 | 136 | 73.5 | 6.2 |
| | 12,000 | 621 | 107 | 850.0 | 126 | 85.0 | 7.8 |
| | 15,000 | 670 | 101 | 950.0 | 119 | 95.0 | 9.3 |

LEGEND

Cap. — Capacity (Btuh in thousands)
Ldb — Leaving-Air Dry-Bulb Temp (F)
PD — Pressure Drop (ft water)

*Based on 5 psig steam, 60 F entering-air temperature. All steam coils are non-freeze type.

†Based on 200 F entering water, 20 F water temperature drop, 60 F entering-air temperature.

NOTES:

- Maximum operating limits for steam heating coils: 175 psig at 400 F.
- Maximum operating limit for hot water heating coils is 150 psig.

3. Leaving db = ent db (F) + $\frac{\text{Capacity (Btuh)}}{1.1 \times \text{cfm}}$

- See Heating Correction Factors table.

40RM HEATING CORRECTION FACTORS

| HOT WATER COIL | | | | | | |
|---------------------|--------------------|-----------------------|------|------|------|------|
| Water Temp Drop (F) | Ent Water Temp (F) | Entering-Air Temp (F) | | | | |
| | | 40 | 50 | 60 | 70 | 80 |
| 10 | 140 | 0.72 | 0.64 | 0.57 | 0.49 | 0.41 |
| | 160 | 0.89 | 0.81 | 0.74 | 0.66 | 0.58 |
| | 180 | 1.06 | 0.98 | 0.90 | 0.83 | 0.75 |
| | 200 | 1.22 | 1.15 | 1.07 | 1.00 | 0.92 |
| | 220 | 1.39 | 1.32 | 1.24 | 1.17 | 1.09 |
| 20 | 140 | 0.64 | 0.57 | 0.49 | 0.41 | 0.33 |
| | 160 | 0.81 | 0.74 | 0.66 | 0.58 | 0.51 |
| | 180 | 0.98 | 0.91 | 0.83 | 0.75 | 0.68 |
| | 200 | 1.15 | 1.08 | 1.00 | 0.93 | 0.85 |
| | 220 | 1.32 | 1.25 | 1.17 | 1.10 | 1.02 |
| 30 | 140 | 0.56 | 0.49 | 0.41 | 0.33 | 0.24 |
| | 160 | 0.74 | 0.66 | 0.58 | 0.51 | 0.43 |
| | 180 | 0.91 | 0.83 | 0.76 | 0.68 | 0.60 |
| | 200 | 1.08 | 1.00 | 0.93 | 0.85 | 0.78 |
| | 220 | 1.25 | 1.18 | 1.10 | 1.03 | 0.95 |

STEAM COIL

| Steam Pressure (psig) | Entering-Air Temp (F) | | | | |
|-----------------------|-----------------------|------|------|------|------|
| | 40 | 50 | 60 | 70 | 80 |
| 0 | 1.06 | 0.98 | 0.91 | 0.85 | 0.78 |
| 2 | 1.09 | 1.02 | 0.95 | 0.89 | 0.82 |
| 5 | 1.13 | 1.06 | 1.00 | 0.93 | 0.87 |

NOTE: Multiply capacity given in the Hydronic Heating Capacities table by the correction factor for conditions at which unit is actually operating. Correct leaving-air temperature using formula in Note 3 of Hydronic Heating Capacities table.

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Electrical data



40RM STANDARD MOTORS

| UNIT 40RM | V*-PH-Hz | VOLTAGE LIMITS | FAN MOTOR | | POWER SUPPLY | |
|-----------|--------------|----------------|-----------|-----------|--------------|-------|
| | | | Hp | FLA | MCA | MOCP |
| 016 | 208/230-3-60 | 187-253 | 3.7 | 10.2 | 12.8 | 20 |
| | 460-3-60 | 414-506 | 3.7 | 4.8 | 6.0 | 15 |
| | 575-3-60 | 518-632 | 3.0 | 3.8 | 4.8 | 15 |
| 024 | 208/230-3-60 | 187-253 | 5.0 | 15.3/12.8 | 19.1/16.0 | 30/25 |
| | 460-3-60 | 414-506 | 5.0 | 6.4 | 8.0 | 15 |
| | 575-3-60 | 518-632 | 5.0 | 5.1 | 6.4 | 15 |
| 028 | 208/230-3-60 | 187-253 | 7.5 | 21.5/19.4 | 28.0/24.3 | 50/40 |
| | 460-3-60 | 414-506 | 7.5 | 9.7 | 12.1 | 20 |
| | 575-3-60 | 518-632 | 7.5 | 7.8 | 9.8 | 15 |
| 034 | 208/230-3-60 | 187-253 | 10.0 | 28.2/26.8 | 35.3/33.5 | 60/60 |
| | 460-3-60 | 414-506 | 10.0 | 13.4 | 16.8 | 30 |
| | 575-3-60 | 518-632 | 10.0 | 10.3 | 12.9 | 20 |

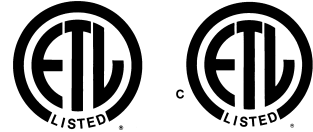
40RM ALTERNATE MOTORS

| UNIT 40RM | V*-PH-Hz | VOLTAGE LIMITS | FAN MOTOR | | POWER SUPPLY | |
|-----------|--------------|----------------|-----------|-----------|--------------|-------|
| | | | Hp | FLA | MCA | MOCP |
| 016 | 208/230-3-60 | 187-253 | 5.0 | 15.3/12.8 | 19.1/16.0 | 30/25 |
| | 460-3-60 | 414-506 | 5.0 | 6.4 | 8.0 | 15 |
| | 575-3-60 | 518-632 | 5.0 | 5.1 | 6.4 | 15 |
| 024 | 208/230-3-60 | 187-253 | 7.5 | 22.5/19.4 | 20.8/24.3 | 50/40 |
| | 460-3-60 | 414-506 | 7.5 | 9.7 | 12.1 | 20 |
| | 575-3-60 | 518-632 | 7.5 | 7.8 | 9.8 | 15 |
| 028 | 208/230-3-60 | 187-253 | 10.0 | 28.2/26.8 | 35.3/33.5 | 60/60 |
| | 460-3-60 | 414-506 | 10.0 | 13.4 | 16.8 | 30 |
| | 575-3-60 | 518-632 | 10.0 | 10.3 | 12.9 | 20 |

LEGEND

- FLA** — Full Load Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection

*Motors are designed for satisfactory operation within 10% of nominal voltages shown. Voltages should not exceed the limits shown in the Voltage Limits column.



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40RM ELECTRIC HEATER DATA

| HEATER PART NO. | UNIT | V-PH-Hz | FAN MOTOR | | | ELECTRIC HEATER(S) | | | | | MCA* | MOCP* |
|-----------------|-------------|----------|-----------|------|------|-----------------------|----------------------|---------|-------|------|-------|-------|
| | | | Hp | kW | FLA | Nominal Capacity (kW) | Actual Capacity (kW) | | | FLA | | |
| | | | | | | | Stage 1 | Stage 2 | Total | | | |
| CAELHEAT016A00 | 40RM016,024 | 208-3-60 | 3.7 | 2.76 | 10.2 | 10 | 7.5 | — | 7.5 | 20.8 | 38.8 | 40 |
| | | | 5.0 | 3.73 | 14.6 | 10 | 7.5 | — | 7.5 | 20.8 | 41.3 | 50 |
| | | | 7.5 | 5.59 | 21.5 | 10 | 7.5 | — | 7.5 | 20.8 | 52.9 | 60 |
| CAELHEAT017A00 | 40RM016,024 | 240-3-60 | 3.7 | 2.76 | 10.2 | 10 | 10.0 | — | 10.0 | 24.1 | 42.8 | 50 |
| | | | 5.0 | 3.73 | 12.8 | 10 | 10.0 | — | 10.0 | 24.1 | 46.1 | 50 |
| | | | 7.5 | 5.59 | 19.4 | 10 | 10.0 | — | 10.0 | 24.1 | 54.4 | 60 |
| CAELHEAT018A00 | 40RM016,024 | 480-3-60 | 3.7 | 2.76 | 4.8 | 10 | 10.0 | — | 10.0 | 12.0 | 21.0 | 25 |
| | | | 5.0 | 3.73 | 6.4 | 10 | 10.0 | — | 10.0 | 12.0 | 23.0 | 25 |
| | | | 7.5 | 5.59 | 9.7 | 10 | 10.0 | — | 10.0 | 12.0 | 27.2 | 30 |
| CAELHEAT019A00 | 40RM016,024 | 575-3-60 | 3.0 | 2.24 | 3.8 | 10 | 10.0 | — | 10.0 | 10.0 | 17.3 | 20 |
| | | | 5.0 | 3.73 | 5.1 | 10 | 10.0 | — | 10.0 | 10.0 | 19.6 | 20 |
| | | | 7.5 | 5.59 | 7.8 | 10 | 10.0 | — | 10.0 | 10.0 | 22.1 | 25 |
| CAELHEAT020A00 | 40RM016,024 | 208-3-60 | 3.7 | 2.76 | 10.2 | 20 | 14.9 | — | 14.9 | 41.5 | 64.6 | 70 |
| | | | 5.0 | 3.73 | 14.6 | 20 | 14.9 | — | 14.9 | 41.5 | 70.1 | 80 |
| | | | 7.5 | 5.59 | 21.5 | 20 | 14.9 | — | 14.9 | 41.5 | 78.7 | 80 |
| CAELHEAT021A00 | 40RM016,024 | 240-3-60 | 3.7 | 2.76 | 10.2 | 20 | 19.9 | — | 19.9 | 47.9 | 72.6 | 80 |
| | | | 5.0 | 3.73 | 12.8 | 20 | 19.9 | — | 19.9 | 47.9 | 75.8 | 80 |
| | | | 7.5 | 5.59 | 19.4 | 20 | 19.9 | — | 19.9 | 47.9 | 84.1 | 80 |
| CAELHEAT022A00 | 40RM016,024 | 480-3-60 | 3.7 | 2.76 | 4.8 | 20 | 20.0 | — | 20.0 | 24.1 | 36.1 | 40 |
| | | | 5.0 | 3.73 | 6.4 | 20 | 20.0 | — | 20.0 | 24.1 | 39.1 | 40 |
| | | | 7.5 | 5.59 | 9.7 | 20 | 20.0 | — | 20.0 | 24.1 | 43.2 | 50 |
| CAELHEAT023A00 | 40RM016,024 | 575-3-60 | 3.0 | 2.24 | 3.8 | 20 | 20.0 | — | 20.0 | 20.1 | 29.9 | 30 |
| | | | 5.0 | 3.73 | 5.1 | 20 | 20.0 | — | 20.0 | 20.1 | 31.5 | 35 |
| | | | 7.5 | 5.59 | 7.8 | 20 | 20.0 | — | 20.0 | 20.1 | 34.9 | 35 |
| CAELHEAT024A00 | 40RM016,024 | 208-3-60 | 3.7 | 2.76 | 10.2 | 30 | 15.0 | 7.5 | 22.5 | 62.5 | 90.9 | 100 |
| | | | 5.0 | 3.73 | 14.6 | 30 | 15.0 | 7.5 | 22.5 | 62.5 | 96.4 | 100 |
| | | | 7.5 | 5.59 | 21.5 | 30 | 15.0 | 7.5 | 22.5 | 62.5 | 105.0 | 110 |
| CAELHEAT024A00 | 40RM016,024 | 240-3-60 | 3.7 | 2.76 | 10.2 | 30 | 20.0 | 10.0 | 30.0 | 72.2 | 103.0 | 110 |
| | | | 5.0 | 3.73 | 12.8 | 30 | 20.0 | 10.0 | 30.0 | 72.2 | 106.2 | 110 |
| | | | 7.5 | 5.59 | 19.4 | 30 | 20.0 | 10.0 | 30.0 | 72.2 | 114.5 | 125 |
| CAELHEAT023A00 | 40RM016,024 | 480-3-60 | 3.7 | 2.76 | 4.8 | 30 | 20.0 | 10.0 | 30.0 | 36.1 | 51.1 | 60 |
| | | | 5.0 | 3.73 | 6.4 | 30 | 20.0 | 10.0 | 30.0 | 36.1 | 53.1 | 60 |
| | | | 7.5 | 5.59 | 9.7 | 30 | 20.0 | 10.0 | 30.0 | 36.1 | 57.2 | 60 |
| CAELHEAT024A00 | 40RM016,024 | 575-3-60 | 3.0 | 2.24 | 3.8 | 30 | 20.0 | 10.0 | 30.0 | 30.1 | 42.4 | 50 |
| | | | 5.0 | 3.73 | 5.1 | 30 | 20.0 | 10.0 | 30.0 | 30.1 | 44.0 | 50 |
| | | | 7.5 | 5.59 | 7.8 | 30 | 20.0 | 10.0 | 30.0 | 30.1 | 47.4 | 50 |

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Electrical data (cont)



40RM ELECTRIC HEATER DATA (cont)

| HEATER PART NO. | UNIT | V-PH-Hz | FAN MOTOR | | | ELECTRIC HEATER(S) | | | | | MCA* | MOCP* |
|-----------------|-------------|----------|-----------|------|------|-----------------------|----------------------|---------|-------|-------|-------|-------|
| | | | Hp | kW | FLA | Nominal Capacity (kW) | Actual Capacity (kW) | | | FLA | | |
| | | | | | | | Stage 1 | Stage 2 | Total | | | |
| CAELHEAT025A00 | 40RM016,024 | 208-3-60 | 3.7 | 2.76 | 10.2 | 50 | 22.6 | 15.0 | 37.6 | 104.3 | 143.1 | 150 |
| | | | 5.0 | 3.73 | 14.6 | 50 | 22.6 | 15.0 | 37.6 | 104.3 | 148.6 | 150 |
| | | | 7.5 | 5.59 | 21.5 | 50 | 22.6 | 15.0 | 37.6 | 104.3 | 157.2 | 175 |
| CAELHEAT026A00 | | 240-3-60 | 3.7 | 2.76 | 10.2 | 50 | 30.0 | 20.0 | 50.0 | 120.3 | 163.1 | 175 |
| | | | 5.0 | 3.73 | 12.8 | 50 | 30.0 | 20.0 | 50.0 | 120.3 | 166.4 | 175 |
| | | | 7.5 | 5.59 | 19.4 | 50 | 30.0 | 20.0 | 50.0 | 120.3 | 174.6 | 200 |
| CAELHEAT027A00 | | 480-3-60 | 3.7 | 2.76 | 4.8 | 50 | 30.0 | 20.0 | 50.0 | 60.1 | 81.2 | 90 |
| | | | 5.0 | 3.73 | 6.4 | 50 | 30.0 | 20.0 | 50.0 | 60.1 | 83.2 | 90 |
| | | | 7.5 | 5.59 | 9.7 | 50 | 30.0 | 20.0 | 50.0 | 60.1 | 87.3 | 90 |
| CAELHEAT028A00 | 575-3-60 | 3.0 | 2.24 | 3.8 | 50 | 30.0 | 20.0 | 50.0 | 50.2 | 67.5 | 70 | |
| | | 5.0 | 3.73 | 5.1 | 50 | 30.0 | 20.0 | 50.0 | 50.2 | 69.1 | 70 | |
| | | 7.5 | 5.59 | 7.8 | 50 | 30.0 | 20.0 | 50.0 | 50.2 | 72.5 | 80 | |
| CAELHEAT029A00 | 40RM028,034 | 208-3-60 | 7.5 | 5.59 | 19.8 | 20 | 14.9 | — | 14.9 | 41.5 | 78.7 | 80 |
| | | | 10.0 | 7.46 | 28.2 | 20 | 14.9 | — | 14.9 | 41.5 | 87.1 | 100 |
| | | 240-3-60 | 7.5 | 5.59 | 19.4 | 20 | 19.9 | — | 19.9 | 47.9 | 81.4 | 90 |
| 10.0 | | | 7.46 | 26.8 | 20 | 19.9 | — | 19.9 | 47.9 | 93.3 | 110 | |
| 480-3-60 | | 7.5 | 5.59 | 9.7 | 20 | 20.0 | — | 20.0 | 24.1 | 42.2 | 50 | |
| | | 10.0 | 7.46 | 13.4 | 20 | 20.0 | — | 20.0 | 24.1 | 46.8 | 50 | |
| 575-3-60 | | 7.5 | 5.59 | 7.8 | 20 | 20.0 | — | 20.0 | 20.1 | 34.9 | 35 | |
| | | 10.0 | 7.46 | 10.3 | 20 | 20.0 | — | 20.0 | 20.1 | 38.0 | 40 | |
| CAELHEAT031A00 | | 208-3-60 | 7.5 | 5.59 | 19.8 | 40 | 15.0 | 15.0 | 30.0 | 83.4 | 131.1 | 150 |
| | | | 10.0 | 7.46 | 28.0 | 40 | 15.0 | 15.0 | 30.0 | 83.4 | 139.5 | 150 |
| CAELHEAT032A00 | | 240-3-60 | 7.5 | 5.59 | 19.4 | 40 | 20.0 | 20.0 | 40.0 | 96.2 | 144.5 | 150 |
| | | | 10.0 | 7.46 | 26.8 | 40 | 20.0 | 20.0 | 40.0 | 96.2 | 153.8 | 175 |
| CAELHEAT033A00 | 480-3-60 | 7.5 | 5.59 | 9.7 | 40 | 20.0 | 20.0 | 40.0 | 47.9 | 71.9 | 80 | |
| | | 10.0 | 7.46 | 13.4 | 40 | 20.0 | 20.0 | 40.0 | 47.9 | 76.6 | 80 | |
| CAELHEAT033A00 | 575-3-60 | 7.5 | 5.59 | 7.8 | 40 | 20.0 | 20.0 | 40.0 | 40.2 | 60.0 | 60 | |
| | | 10.0 | 7.46 | 10.3 | 40 | 20.0 | 20.0 | 40.0 | 40.2 | 63.1 | 70 | |

LEGEND

- FLA — Full Load Amps
- Hp — Horsepower
- MCA — Minimum Circuit Amps
- MOCP — Maximum Overcurrent Protection (Amps)

*Values shown are for single-point connection of electric heat accessory and air handler.

NOTES:

- Electrical resistance heaters are rated at 240 v, 480 v, or 575 v. To determine heater capacity (kW) at unit nameplate multiply the 240-v, 480-v, or 575-v capacity (kW) by the factor shown in the table below for the unit voltage.

| HEATER RATING VOLTAGE | ACTUAL HEATER VOLTAGE | | | | | | | | | | |
|-----------------------|-----------------------|-------|-------|-----|-------|------|-------|-----|-------|-----|-------|
| | 200 | 208 | 230 | 240 | 400 | 440 | 460 | 480 | 550 | 575 | 600 |
| 240 | 0.694 | 0.751 | 0.918 | 1 | — | — | — | — | — | — | — |
| 480 | — | — | — | — | 0.694 | 0.84 | 0.918 | 1 | — | — | — |
| 575 | — | — | — | — | — | — | — | — | 0.915 | 1 | 1.089 |

- The following equation converts kW of heat energy to Btuh:
kW x 3,412 = Btuh.
- Heater contactor coils are 24 v and require 8 va holding current.
- Electric heaters are tested and ETL approved at maximum total external static pressure of 1.9 in. wg.
- MCA and MOCP values apply to both standard and alternate factory-supplied motors.
- Approximate shipping weight for CAELHEAT016A00-027A00 is 60 lb each. Approximate shipping weight for CAELHEAT028A00-033A00 is 75 lb each.



40RM016-034

Application data — 40RM



Operating limits

Maximum fan speed — 40RM016,024 1200 rpm
 Maximum fan speed — 40RM028,034 1100 rpm

General

Select equipment to match or to be slightly less than peak load. This provides better humidity control, less unit cycling, and less part-load operation. Equipment should be selected to perform at no less than 300 cfm/ton.

The air handler fan must always be operating when the condensing unit is operating.

Ductwork should be sized according to unit size, not building load. For larger units with two fans, a split duct transition is recommended at the fan outlets, but a plenum can be used with slight reduction in external static pressure capability.

For variable air volume (VAV) systems with supply-to-return air recycling, use the equipment room as a return air plenum.

FACTORY-INSTALLED NOZZLE AND DISTRIBUTOR DATA

| UNIT | COIL TYPE | TXV Qty...Part No.* | DISTRIBUTOR Qty...Part No.† | FEEDER TUBES PER DISTRIBUTOR Qty...Size (in.) | NOZZLE Qty...Part No. |
|---------|-----------|---------------------|-----------------------------|-----------------------------------------------|-----------------------|
| 40RM016 | 3 Row | 2...TDEBX8 | 2...1116 | 12... ¹ / ₄ | 2...E6 |
| | 4 Row | 2...TDEBX8 | 2...1126 | 16... ¹ / ₄ | 2...C6 |
| 40RM024 | 3 Row | 2...TDEBX11 | 2...1116 | 13... ¹ / ₄ | 2...E8 |
| | 4 Row | 2...TDEBX11 | 2...1126 | 18... ³ / ₁₆ | 2...C8 |
| 40RM028 | 3 Row | 2...TDEBX11 | 2...1126 | 15... ¹ / ₄ | 2...C10 |
| | 4 Row | 2...TDEBX11 | 2...1126 | 20... ³ / ₁₆ | 2...C15 |
| 40RM034 | 3 Row | 2...TDEBX16 | 2...1126 | 18... ¹ / ₄ | 2...C12 |
| | 4 Row | 2...TDEBX16 | 2...1126 | 24... ³ / ₁₆ | 2...C17 |

*Danfoss part numbers shown.

†Sporlan Valve Co. part numbers shown.

NOTE: Hot gas bypass applications require field-supplied auxiliary side connector.

STANDARD FAN MOTOR DATA 208/230-3-60 AND 460-3-60 MOTORS

| UNIT 40RM | 016 | 024 | 028 | 034 |
|-----------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Speed (rpm) | 1725 | 1745 | 1745 | 1745 |
| Hp | 3.7 | 5.0 | 7.5 | 10.0 |
| Frame (NEMA) | 56Y | S184T | S213T | S215T |
| Shaft Dia (in.) | ⁷ / ₈ | ¹ / ₈ | ¹ / ₈ | ¹ / ₈ |

LEGEND

NEMA — National Electrical Manufacturers Association

ALTERNATE FAN MOTOR DATA 208/230-3-60 AND 460-3-60 MOTORS

| UNIT 40RM | 016 | 024 | 028 |
|-----------------|-----------------------------|-----------------------------|-----------------------------|
| Speed (rpm) | 1745 | 1745 | 1750 |
| Hp | 5.0 | 7.5 | 10.0 |
| Frame (NEMA) | S184T | S213T | S215T |
| Shaft Dia (in.) | ¹ / ₈ | ¹ / ₈ | ¹ / ₈ |

LEGEND

NEMA — National Electrical Manufacturers Association

575-3-60 MOTORS

| UNIT 40RM | 016 | 024 | 028 | 034 |
|-----------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Speed (rpm) | 1725 | 1745 | 1755 | 1755 |
| Hp | 3.0 | 5.0 | 7.5 | 10.0 |
| Frame (NEMA) | 56HZ | 184T | S213T | S215T |
| Shaft Dia (in.) | ⁷ / ₈ | ¹ / ₈ | ¹ / ₈ | ¹ / ₈ |

LEGEND

NEMA — National Electrical Manufacturers Association

575-3-60 MOTORS

| UNIT 40RM | 016 | 024 | 028 |
|-----------------|-----------------------------|-----------------------------|-----------------------------|
| Speed (rpm) | 1745 | 1755 | 1750 |
| Hp | 5.0 | 7.5 | 10.0 |
| Frame (NEMA) | 184T | S213T | S215T |
| Shaft Dia (in.) | ¹ / ₈ | ¹ / ₈ | ¹ / ₈ |

LEGEND

NEMA — National Electrical Manufacturers Association

40RM016-034

Application data — 40RM (cont)



STANDARD DRIVE DATA

| UNIT 40RM | 016 | 024 | 028 | 034 |
|-----------------------------------------------------|--------------------------------|--------------------------------|---------------------------------|---------------------------------|
| MOTOR DRIVE | | | | |
| Motor Pulley Pitch Diameter | 2.8-3.8 | 3.7-4.7 | 4.3-5.3 | 4.3-5.3 |
| Pulley Factory Setting Full Turns Open | 2.5 | 3.0 | 3.0 | 3.0 |
| FAN DRIVE | | | | |
| Pulley Pitch Dia (in.) | 9.0 | 9.4 | 11.0 | 11.0 |
| Pulley Bore (in.) | 1 ⁷ / ₁₆ | 1 ⁷ / ₁₆ | 1 ¹⁵ / ₁₆ | 1 ¹⁵ / ₁₆ |
| Belt No. — Section | 1—A | 2—B | 2—B* | 2—B* |
| Belt Pitch (in.) | 42.3 | 41.8 | (2) 42.8 or (2) 43.8 | (2) 42.8 or (2) 43.8 |
| FAN SPEEDS (rpm) | | | | |
| Factory Setting | 632 | 771 | 752 | 752 |
| Range | 537-728 | 679-863 | 682-841 | 674-831 |
| Max Allowable Speed | 1200 | 1200 | 1100 | 1100 |
| Change per 1/2 Turn of Moveable Motor Pulley Flange | 19.1 | 15.3 | 13.1 | 13.1 |
| MAX FULL TURNS FROM CLOSED POSITION | 5 | 6 | 6 | 6 |
| SHAFTS CENTER DISTANCE (in.) | 10.44-12.32 | 9.12-10.99 | 6.67-9.43 | 6.67-9.43 |

*Four belts shipped with unit. Use one set of 2 belts sized according to the pulley setting.

HIGH-STATIC DRIVE DATA

| UNIT 40RM | 016 | 024 | 028 | 034 |
|-----------------------------------------------------|--------------------------------|--------------------------------|---------------------------------|---------------------------------|
| MOTOR DRIVE | | | | |
| Motor Pulley Pitch Diameter | 4.3-5.3 | 4.3-5.3 | 4.3-5.3 | 4.3-5.3 |
| Pulley Factory Setting Full Turns Open | 2.5 | 3.0 | 3.0 | 3.0 |
| FAN DRIVE | | | | |
| Pulley Pitch Dia (in.) | 7.9 | 7.4 | 8.6 | 8.6 |
| Pulley Bore (in.) | 1 ⁷ / ₁₆ | 1 ⁷ / ₁₆ | 1 ¹⁵ / ₁₆ | 1 ¹⁵ / ₁₆ |
| Belt No. — Section | 1—B | 2—B | 2—B | 2—B |
| Belt Pitch (in.) | 39.8 | 36.8 | 37.8 | 37.8 |
| FAN SPEEDS (rpm) | | | | |
| Factory Setting | 1060 | 1118 | 1024 | 1024 |
| Range | 950-1171 | 1014-1200 | 873-1075 | 873-1075 |
| Max Allowable Speed | 1200 | 1200 | 1100 | 1100 |
| Change per 1/2 Turn of Moveable Motor Pulley Flange | 30.8 | 19.4 | 16.7 | 16.7 |
| MAX FULL TURNS FROM CLOSED POSITION | 5 | 6 | 6 | 6 |
| SHAFTS CENTER DISTANCE (in.) | 9.16-10.99 | 8.16-10.02 | 6.67-9.43 | 6.67-9.43 |

MEDIUM-STATIC DRIVE DATA

| UNIT 40RM | 016 | 024 | 028 | 034 |
|-----------------------------------------------------|--------------------------------|--------------------------------|---------------------------------|---------------------------------|
| MOTOR DRIVE | | | | |
| Motor Pulley Pitch Diameter | 3.7-4.7 | 4.3-5.3 | 4.3-5.3 | 4.3-5.3 |
| Pulley Factory Setting Full Turns Open | 3.0 | 3.0 | 3.0 | 3.0 |
| FAN DRIVE | | | | |
| Pulley Pitch Dia (in.) | 8.6 | 9.4 | 9.4 | 9.4 |
| Pulley Bore (in.) | 1 ⁷ / ₁₆ | 1 ⁷ / ₁₆ | 1 ¹⁵ / ₁₆ | 1 ¹⁵ / ₁₆ |
| Belt No. — Section | 1—B | 2—B | 2—B* | 2—B* |
| Belt Pitch (in.) | 41.8 | 41.8 | (2) 38.8 or (2) 39.8 | (2) 38.8 or (2) 39.8 |
| FAN SPEEDS (rpm) | | | | |
| Factory Setting | 842 | 881 | 881 | 881 |
| Range | 742-943 | 798-984 | 798-984 | 798-984 |
| Max Allowable Speed | 1200 | 1200 | 1100 | 1100 |
| Change per 1/2 Turn of Moveable Motor Pulley Flange | 16.7 | 15.3 | 15.3 | 15.3 |
| MAX FULL TURNS FROM CLOSED POSITION | 6 | 6 | 6 | 6 |
| SHAFTS CENTER DISTANCE (in.) | 10.44-12.32 | 9.16-10.99 | 6.67-9.43 | 6.67-9.43 |

*Four belts shipped with unit. Use one set of 2 belts sized according to the pulley setting.

40RM016-034

Commercial Packaged Air-Handling Unit

HVAC Guide Specifications — Section 15859

Size Range: **2,400 to 12,000 Cfm, Nominal Airflow
15 to 30 Tons, Nominal Cooling**

Carrier Model Number: **40RM (Direct-Expansion Coil)**

Part 1 — General

1.01 SYSTEM DESCRIPTION

- A. Indoor, packaged air-handling unit for use in commercial split systems. Unit shall have a multipoise design and shall be capable of horizontal or vertical installation on a floor or in a ceiling, with or without ductwork. (Only vertical units are to be applied without ductwork.)
- B. Unit shall have a direct-expansion coil and shall be used in a refrigerant circuit with a matching air-cooled condensing unit.

1.02 QUALITY ASSURANCE

- A. Coils shall be designed and tested in accordance with ASHRAE 15 Safety Code for Mechanical Refrigeration, latest edition.
- B. Unit shall be constructed in accordance with ETL and ETL, Canada, standards and shall carry the ETL and ETL, Canada, labels.
- C. Unit insulation and adhesive shall comply with NFPA-90A requirements for flame spread and smoke generation. Insulation shall contain an EPA-registered immobilized antimicrobial agent to effectively resist the growth of bacteria and fungi as proven by tests in accordance with ASTM standards G21 and 22.
- D. Unit shall be manufactured in a facility registered to the ISO 9001:2000 manufacturing quality standard.
- E. Direct-expansion coils shall be burst tested at 435 psi and leak tested at 150 psi.

1.03 DELIVERY AND STORAGE

Units shall be stored and handled per manufacturer's recommendations.

Part 2 — Products

2.01 EQUIPMENT

Indoor mounted, draw-thru, packaged air-handling unit that can be used in a suspended horizontal configuration or a vertical configuration. Unit shall consist of forward-curved belt-driven centrifugal fan(s), motor and drive assembly, prewired fan motor contactor, factory-installed refrigerant metering devices, cooling coil, 2-in. disposable air filters, and condensate drain pans for vertical or horizontal configurations.

- A. Base Unit:
 - 1. Cabinet shall be constructed of mill-galvanized steel.
 - 2. Cabinet panels shall be fully insulated with 1/2-in. fire-retardant material.
 - 3. Unit shall contain condensate drain pans for both vertical and horizontal applications. Drain

pans shall have connections on right and left sides of unit to facilitate field connection. Drain pans shall have the ability to be sloped toward the right or left side of the unit to prevent standing water from accumulating in pans.

- 4. Unit shall have factory-supplied 2-in. throw-away-type filters installed upstream from the cooling coil. Filter access shall be from either the right or left side of the unit.

B. Coils:

Coils shall consist of 3 rows of 3/8-in. copper tubes with sine-wave aluminum fins bonded to the tubes by mechanical expansion. Coil tubing shall be internally rifled to maximize heat transfer. Suction and liquid line connections shall be made on the same side of the coil. Direct-expansion coils shall feature factory-installed thermostatic expansion valves (TXVs) for refrigerant control. The TXVs shall be capable of external adjustment.

C. Operating Characteristics:

Unit shall be capable of providing _____ cfm airflow at an external static pressure of _____ in wg.

D. Motor:

Fan motor of the size and electrical characteristics specified on the equipment schedule shall be factory supplied and installed.

E. Special Features:

1. Alternate Motor and Drive:

An alternate motor and medium-static or high-static drive shall be available to meet the air flow and external static pressure requirements specified on the equipment schedule.

2. High-Capacity Coil:

The high-capacity coil consists of 4 rows of 3/8-in. copper tubes with sine-wave aluminum fins bonded to the tubes by mechanical expansion. Coil tubing shall be internally rifled to maximize heat transfer. Suction and liquid line connections shall be made on the same side of the coil. Direct-expansion coils shall feature factory-installed thermostatic expansion valves (TXVs) for refrigerant control. The TXVs shall be capable of external adjustment.

3. External Paint:

Where conditions require, units shall be painted with an American Sterling Gray finish.

4. Hot Water Coil:

Coil shall be 2-row, U-bend coil with copper tubes and aluminum plate fins bonded to the tubes by mechanical expansion. Coil shall be mounted in a galvanized steel housing that shall be fastened to the unit's fan deck for blow-thru heating operation. Coil shall have maximum working pressure of 150 psig.

Guide specifications — 40RM016-034 (cont)



5. Steam Distributing Coil:

Coil shall consist of one row of copper tubes with aluminum plate fins, and shall have inner steam distributing tubes. Coil shall be mounted in a galvanized steel housing and shall be fastened to the unit's fan deck for blow-thru heating operation. Coil shall have maximum working pressure of 20 psig at 260 F.

6. Electric Heaters:

Heaters for nominal 240, 480, or 575-volt, 3-phase, 60 Hz power supply shall be factory-supplied for field installation as shown on the equipment drawings. Electric heat assembly shall be ETL agency approved, and shall have single-point power wiring. Heater assembly shall include contactors with 24-v coils, power wiring, 24-v control wiring terminal blocks, and a hinged access panel.

7. Air Discharge Plenum:

Plenum shall be factory supplied to provide free-blow air distribution for vertical floor-mounted units. A grille with moveable vanes for horizontal or vertical airflow adjustment shall be included. Plenum housing shall be field-installed on the unit's fan deck for blow-thru air distribution.

8. Return-Air Grille:

Grille shall be factory supplied for field installation on the unit's return air opening.

9. Unit Subbase:

Subbase assembly shall be factory supplied for field installation. Subbase shall elevate floor-mounted vertical units to provide access for correct condensate drain connection.

10. Economizer:

Economizer for ventilation or "free" cooling shall be factory provided for field installation. For free cooling applications, economizer shall be compatible with factory-supplied thermostat; economizer dampers shall open when outdoor air enthalpy is suitable for free cooling. Economizer shall be compatible with factory-supplied CO₂ sensor; economizer dampers shall open when indoor CO₂ level rises above predetermined set point.

11. Overhead Suspension Package:

Package shall include necessary brackets to support units in a horizontal ceiling installation.

12. CO₂ Sensor:

Sensor shall provide the ability to signal the economizer to open when the space CO₂ level exceeds the predetermined set point.

13. Condensate Drain Trap:

Trap shall have transparent, serviceable design for easy cleaning. Kit shall include overflow shutoff switch and wiring harness for connection to alarm if desired.

14. UV-C Germicidal Lamps:

- a. UV-C emitters and fixtures shall be specifically designed for use inside an HVAC system. An ASME nozzled test apparatus using a 45 F (7.2 C) airstream moving at not less than 400 fpm (189 liters/sec.) shall measure individual lamp output. Lamp output at 253.7 nm shall not be less than 10μW/cm² per inch of arc length measured at a distance of one meter.
- b. UV-C power supplies shall be high efficiency, electric type which are matched to the emitters and are capable of producing the specified output intensity with an input power no more than 80 watts.
- c. Emitters and fixtures shall be installed in sufficient quantity and arranged so as to provide an equal distribution of UV-C energy on the coil and drain pan.
- d. The minimum UV-C energy striking the leading edge of the coil fins shall be not less than 820 μW/cm² at the closest point and through placement, not less than 60% of that value at the farthest point. Equal amounts are to strike the drain pan, either directly or indirectly through reflection.
- e. Emitters and fixtures shall be installed at right angles to the conforming lines of the coil fins, such that through incident angle reflection, UV-C energy strikes all target surfaces of the coil, drain pan, and the available line of sight airstream.

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