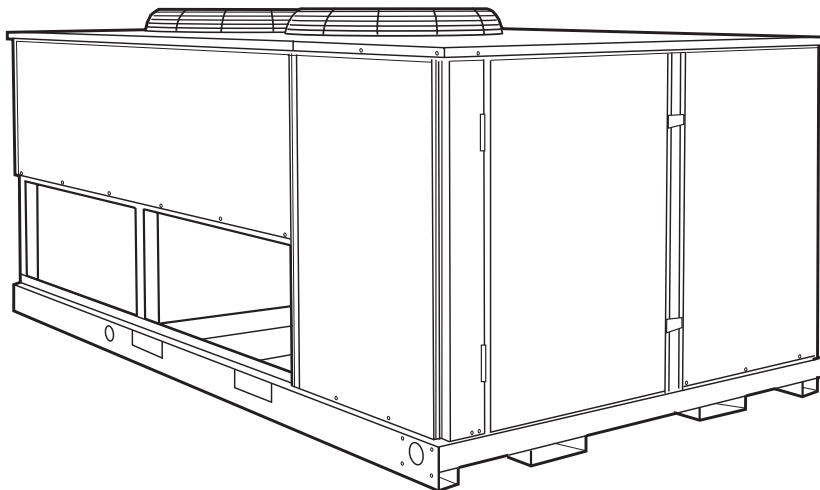




# Product Data

## **GEMINI™ 38AKS028-044 Commercial Air-Cooled Split Systems 50/60 Hz**

25 to 40 Nominal Tons  
(82.8 to 127.0 kW)



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

- Pre-painted galvanized steel cabinet
- Optional E-coated air coil
- Compressor unloading capability
- UL and UL, Canada approvals

### **Features/Benefits**

**The 38AKS units offer high unit EERs (Energy Efficiency Ratios), providing greater efficiency than similar units in the marketplace. This translates into year-round operating savings.**

#### **Constructed for long life**

The 38AKS 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.

**ASHRAE  
90.1  
COMPLIANT**

# Features/Benefits (cont)



## Reliability

The 38AKS 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

## Constant volume and variable air volume

The 38AKS condensing units feature one compressor and one refrigeration circuit. These units can be matched with a single air handler.

Standard units are designed for constant volume control (CV). A standard

CV unit can be field converted to a variable air volume (VAV) unit by changing from pressure to electric unloading and adding an accumulator.

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.

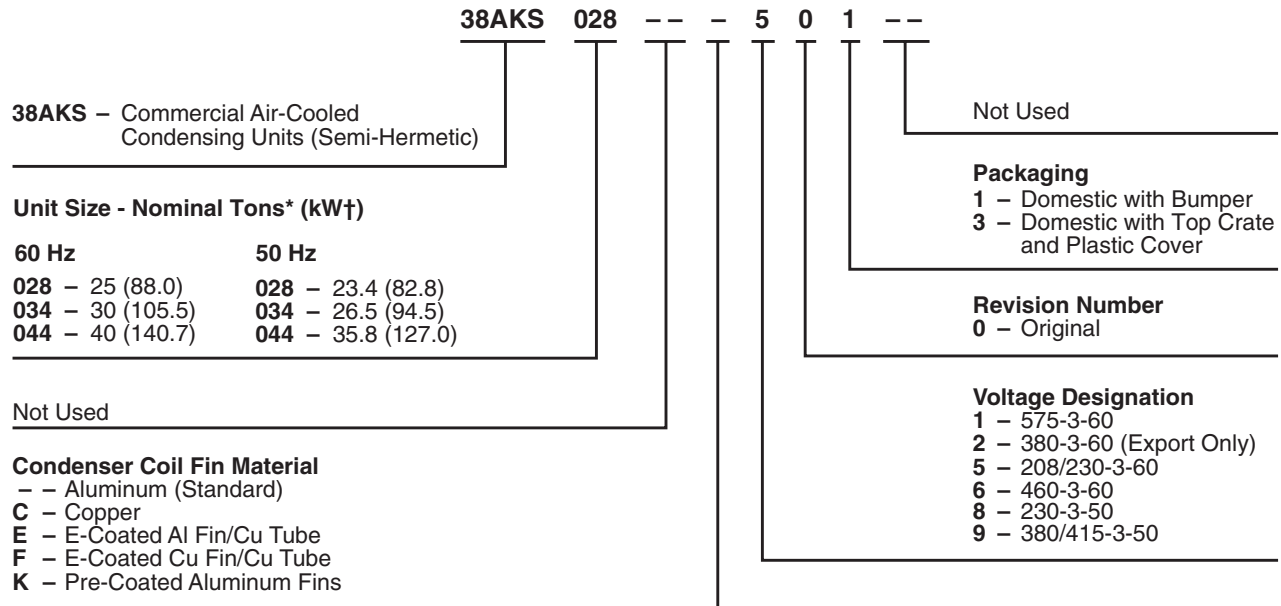
## Ease of installation and service

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

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# Model number nomenclature



**LEGEND**

- Al** — Aluminum
- Cu** — Copper

\*Gross capacity based on 95 F air temperature entering condenser and 45 F saturated suction temperature.

†Gross capacity based on 36 C air temperature entering condenser and 8 C saturated suction temperature.

## Quality Assurance

Certified to ISO 9001:2000

# Capacity ratings



## 38AKS028-044 UNITS — 60 Hz

38AKS UNIT SIZE	AIR HANDLER/ INDOOR COIL	SYSTEM				CONDENSING UNIT ONLY*			
		Net Capacity		EER	IPLV	Net Capacity		EER	IPLV
		Btuh	kW			Btuh†	kW**		
028	40RM024H	282,000	82.6	8.8	11.0	330,000	96.7	10.2	12.1
	40RM028H	300,000	87.9	9.0	11.2				
	40RM034H	316,000	92.6	8.9	11.0				
034	40RM028H	332,000	97.3	8.6	10.6	370,000	108.4	10.1	13.1
	40RM034H	345,000	101.1	8.8	10.6				
044††	—	—	—	—	—	506,000	148.3	10.1	13.0

### LEGEND

ARI — Air Conditioning and Refrigeration Institute  
 EER — Energy Efficiency Ratio  
 IPLV — Integrated Part Load Value  
 SST — Saturated Suction Temperature

\*Unit performance is rated in accordance with ARI Standard 365.  
 †Condensing unit only ratings are at 45 F SST and 95 F entering-air temperature.  
 \*\*Condensing unit only ratings are at 8 C SST and 36 C entering-air temperature.  
 ††38AKS044 units combine with 39 Series air handlers. For capacity ratings on these units refer to **AHUBuilder®** software.

## 38AKS028-044 UNITS — 50 Hz

38AKS CONDENSING UNIT	40RM AIR-HANDLING UNIT	AIR-HANDLING UNIT AIRFLOW		SYSTEM GROSS CAPACITY (Standard 3-Row Coil)		SYSTEM GROSS CAPACITY (High-Capacity 4-Row Coil)		CONDENSING UNIT ONLY**			
		L/s	Cfm	kW*	Btuh†	kW*	Btuh†	GROSS CAPACITY		EER	IPLV
								kW††	Btuh***		
028	024	3800	8,000	75.6	256,000	83.8	285,800	82.8	281,000	10.3	13.5
	028	4700	10,000	80.4	273,000	84.3	287,700				
	034	5650	12,000	84.6	288,000	88.7	302,800				
034	028	4700	10,000	88.2	298,000	89.9	306,800	94.5	320,000	10.5	12.9
	034	5650	12,000	93.1	316,000	94.8	323,500				
044	034	5650	12,000	113.8	385,000	111.8	381,600	127.0	429,000	10.4	12.0

### LEGEND

ARI — Air Conditioning and Refrigeration Institute  
 db — Dry Bulb  
 EER — Energy Efficiency Ratio  
 IPLV — Integrated Part Load Value  
 SST — Saturated Suction Temperature  
 wb — Wet Bulb

\*System gross capacities are rated according to indoor unit airflow, 35 C air temperature entering condenser, and 20 C wb air temperature entering evaporator.  
 †System gross capacities are rated according to indoor unit airflow, 95 F air temperature entering condenser, and 67 F wb air temperature entering evaporator.  
 \*\*Unit performance is rated in accordance with ARI Standard 365.  
 ††Condensing unit gross capacity based on 36 C air temperature entering condenser and 8 C SST.  
 \*\*\*Condensing unit gross capacity based on 95 F air temperature entering condenser and 45 F SST.

# Physical data



## 38AKS028-044 UNITS — 60 Hz, ENGLISH

UNIT 38AKS	028	034	044
<b>NOMINAL CAPACITY (tons)</b>	25	30	40
<b>OPERATING WEIGHTS (lb)</b>			
With Aluminum-Fin Coils (standard)	1650	1803	2437
With Copper-Fin Coils (optional)	1804	2009	2745
<b>REFRIGERANT*</b>		R-22	
Operating Charge, Typical (lb)†	30.5	43.5	65.0
<b>COMPRESSOR</b>		Reciprocating, Semi-Hermetic	
Qty...Model	1...06E9265	1...06E9275	1...06E9299
Oil Charge (pt)	20	20	19
No. Cylinders	6	6	6
Speed (rpm)		1750	
Capacity Steps (%)		100, 66, 33	
Unloader Setting (psig)			
No. 1 Load		76	
Unload		58	
No. 2 Load		78	
Unload		60	
Crankcase Heater Watts		180	
<b>CONDENSER FANS</b>		Propeller Type — Direct Drive	
Qty...Rpm		2...1140	3...1140
Diameter (in.)		30	
Nominal Hp		1.0	
Nominal Airflow (cfm total)	15,700	15,700	23,700
Watts (total)	1490	1750	1520
<b>CONDENSER COIL</b>		Enhanced Copper Tubes, Lanced Aluminum Fins	
Rows...Fins/in.	2...19	3...17	3...17
Face Area (sq ft)	39.2	39.2	58.4
Storage Capacity (lb)**	37.7	56.6	84.4
<b>CONTROLS</b>			
Pressurestat (psig)			
High-Pressure			
Open		426 ± 7	
Close		320 ± 20	
Low-Pressure			
Open		27 ± 3	
Close		44 ± 5	
Oil Pressure (psi)			
Open		6.2	
Close		9.0	
<b>FAN CYCLING CONTROLS</b>			
Operating Pressure (psig)			
No. 2 Fan, Close		255 ± 10	
Open		160 ± 10	
<b>PRESSURE RELIEF</b>		Fusible Plug	
Location		Liquid and Suction Line	
Temperature (F)		210	
<b>PIPING CONNECTIONS (in. ODM)</b>			
Suction	1 <sup>5</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>8</sub>
Liquid		7 <sup>7</sup> / <sub>8</sub>	
Hot Gas Stub		5 <sup>5</sup> / <sub>8</sub>	

### LEGEND

**ODM** — Outside Diameter, Male

\*Unit is factory-supplied with nitrogen 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.

# Physical data (cont)



## 38AKS028-044 UNITS — 50 Hz, ENGLISH

UNIT 38AKS	028	034	044
<b>NOMINAL CAPACITY (tons)*</b>	23.4	26.5	35.8
<b>OPERATING WEIGHTS (lb)</b>			
With Aluminum-Fin Coils (Standard)	1650	1803	2437
With Copper-Fin Coils (Optional)	1804	2009	2745
<b>REFRIGERANT†</b>		R-22	
Operating Charge, Typical (lb)**	30.5	43.5	65.0
<b>COMPRESSOR</b>		Reciprocating, Semi-Hermetic	
Qty...Model	1...06E9265	1...06E9275	1...06E9299
No. Cylinders (ea)	6	6	6
Speed (rpm)		1450	
Oil Charge (pt)	20.0	20.0	19.0
Capacity Steps		100%, 66%, 33%	
Unloader Setting (psig)			
No. 1 Load		76	
Unload		58	
No. 2 Load		78	
Unload		60	
Crankcase Heater Watts		180	
<b>CONDENSER FANS</b>		Propeller Type — Direct Drive	
Qty...Speed (Rpm)		2...950	3...950
Diameter (in.)		30	
Nominal Hp		1.0	
Nominal Airflow (cfm total)	15,700	15,700	23,700
Watts (Total)	1490	1750	1520
<b>CONDENSER COIL</b>		Enhanced Copper Tubes, Lanced Aluminum Fins	
Rows...Fins/in.	2...19	3...17	3...17
Face Area (sq ft)	39.2	39.2	58.4
Storage Capacity (lb)††	37.7	56.6	84.4
<b>CONTROLS</b>			
Pressurestat (psig)			
High-Pressure Switch			
Open		426 ± 7	
Close		320 ± 20	
Low-Pressure Switch			
Open		27 ± 3	
Close		44 ± 5	
Oil Pressure Switch			
Open		6.2	
Close		9.0	
<b>FAN CYCLING CONTROLS</b>			
Operating Pressure (psig)			
No. 2 Fan, Close		255 ± 10	
Open		160 ± 10	
<b>PRESSURE RELIEF</b>		Fusible Plug	
Location		Liquid and Suction Line	
Temperature (F)		210	
<b>PIPING CONNECTIONS (in. ODM)</b>			
Suction	1 <sup>5</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>8</sub>
Liquid		7 <sup>7</sup> / <sub>8</sub>	
Hot Gas Stub		5 <sup>5</sup> / <sub>8</sub>	

### LEGEND

ODM — Outside Diameter, Male

\*Based on operation at 45 F saturated suction temperature and 95 F outdoor ambient.

†Unit is factory-supplied with nitrogen holding charge only.

\*\*Typical operating charge with 25 ft of interconnecting piping.

††Storage capacity of condenser coil with coil 80% full of liquid R-22 at 125 F.



### 38AKS028-044 UNITS — 50 Hz, SI

UNIT 38AKS	028	034	044
<b>NOMINAL CAPACITY (kW)*</b>	82.8	94.5	127.0
<b>OPERATING WEIGHTS (kg)</b> With Aluminum-Fin Coils (Standard) With Copper-Fin Coils (Optional)	748 818	818 911	1106 1246
<b>REFRIGERANT†</b> Operating Charge, Typical (kg)**	13.8	R-22 19.7	29.5
<b>COMPRESSOR</b> Qty...Model No. Cylinders (ea) Speed (r/s) Oil Charge (L) Capacity Steps Unloader Settings (kPag) No. 1 Load Unload No. 2 Load Unload Crankcase Heater Watts	1...06E9265 6 9	Reciprocating, Semi-Hermetic 1...06E9275 6 24.2 9 100%, 66%, 33% 524 400 538 414 180	1...06E9299 6 9.5
<b>CONDENSER FANS</b> Qty...r/s Diameter (mm) Nominal kW Nominal Airflow (L/s total) Watts (Total)	7400 1490	Propeller Type — Direct Drive 2...16 762 0.75 7400 1750	3...16 11,180 1520
<b>CONDENSER COIL</b> Rows...Fins/m Face Area (sq m) Storage Capacity (kg)††	2...748 3.6 17	Enhanced Copper Tubes, Lanced Aluminum Fins 3...670 3.6 26	3...670 5.4 38
<b>CONTROLS</b> Pressurestat (kPag) High-Pressure Switch Cutout Cut-in Low-Pressure Switch Cutout Cut-in Oil Pressure Switch Cutout Cut-in		2940 ± 50 2200 ± 40 185 ± 20 300 ± 35 43 62	
<b>FAN CYCLING CONTROLS</b> Operating Pressure (kPag) No. 2 Fan, Close Open		1760 ± 70 1100 ± 70	
<b>PRESSURE RELIEF</b> Location Temperature (C)		Fusible Plug Liquid and Suction Line 100	
<b>PIPING CONNECTIONS (in. ODM)</b> Suction Liquid Hot Gas Stub	15/8	21/8 7/8 5/8	21/8

**LEGEND**

**ODM** — Outside Diameter, Male

\*Based on operation at 8 C saturated suction temperature and 36 C outdoor ambient temperature.

†Unit is factory-supplied with nitrogen holding charge only.

\*\*Typical operating charge with 7.6 m of interconnecting piping.

††Storage capacity of condenser coil with coil 80% full of liquid R-22 at 51.7 C.

# Options and accessories



ITEM	FACTORY-INSTALLED OPTION	FIELD-INSTALLED ACCESSORY
Enviro-Shield™ Condenser Options	X	
-20 F (-29 C) Low-Ambient Controls		X
Gage Panel Package		X
PremierLink™ Controller		X
Electric Unloader Package		X
ModuPanel™ Control		X
Hot-Gas Bypass Kit		X
Suction Line Accumulator		X
Part-Winding-Start Timing Relay		X

## 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.

## Field-installed accessories

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

**Motormaster® -20 F (-29 C) low-ambient controls** 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.

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

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

**Suction line accumulator** can be provided for VAV, VVT® (variable volume and temperature), or long line CV applications.

**PremierLink controller** is a field-retrofit split system control compatible with the Carrier Comfort Network® (CCN) system.

**Part-winding-start timing relay** reduces inrush 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
028 034 044	Note 1	Note 2	Note 3	Note 2

**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. 04-581006-01 for more information.



## 38AKS028,034 UNITS

### LEGEND

- NEC** — National Electrical Code  
**VAV** — Variable Air Volume

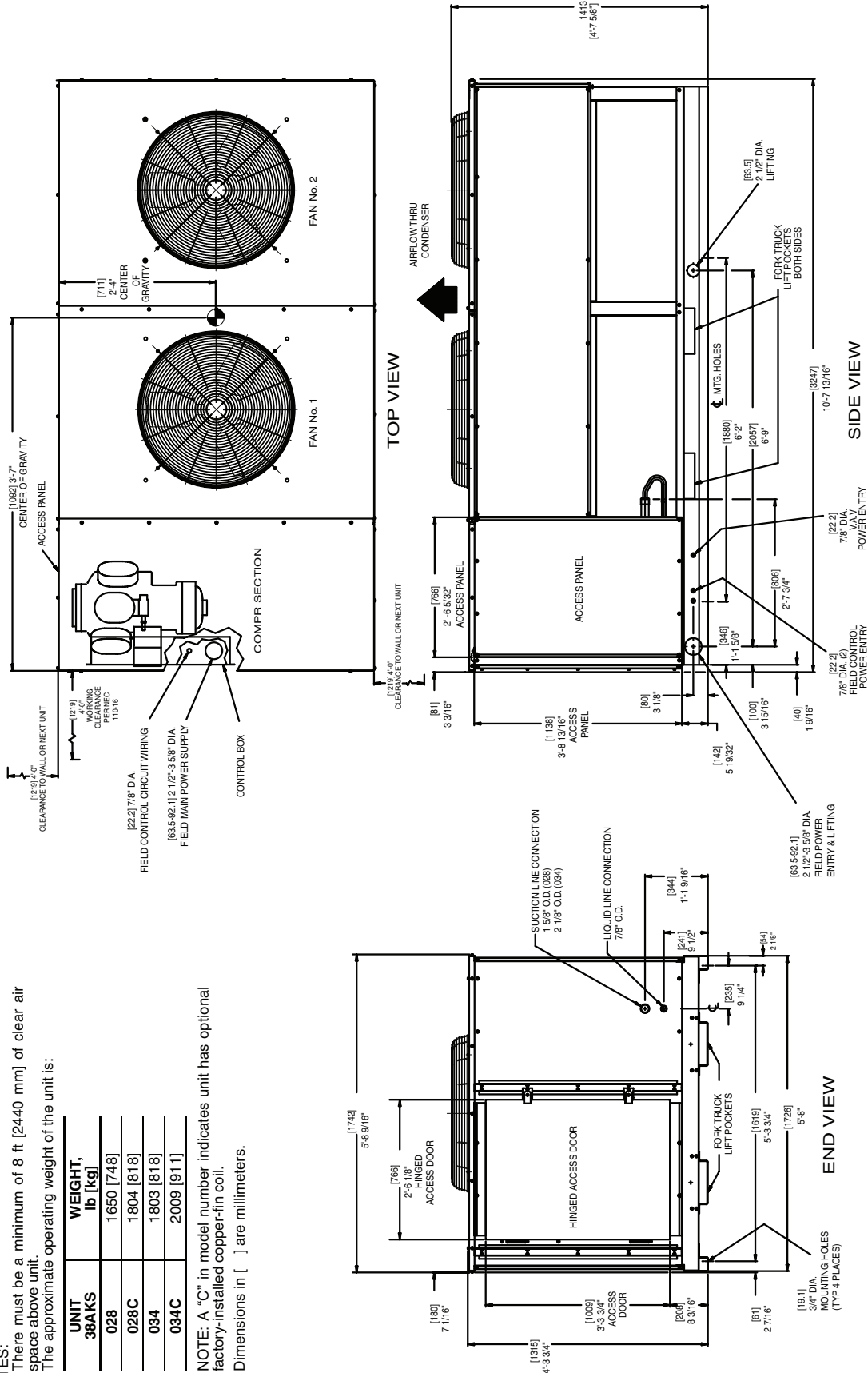
### NOTES:

- There must be a minimum of 8 ft [2440 mm] of clear air space above unit.
- The approximate operating weight of the unit is:

UNIT	WEIGHT, lb. [kg]
38AKS 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.

- Dimensions in [ ] are millimeters.



# Dimensions (cont)



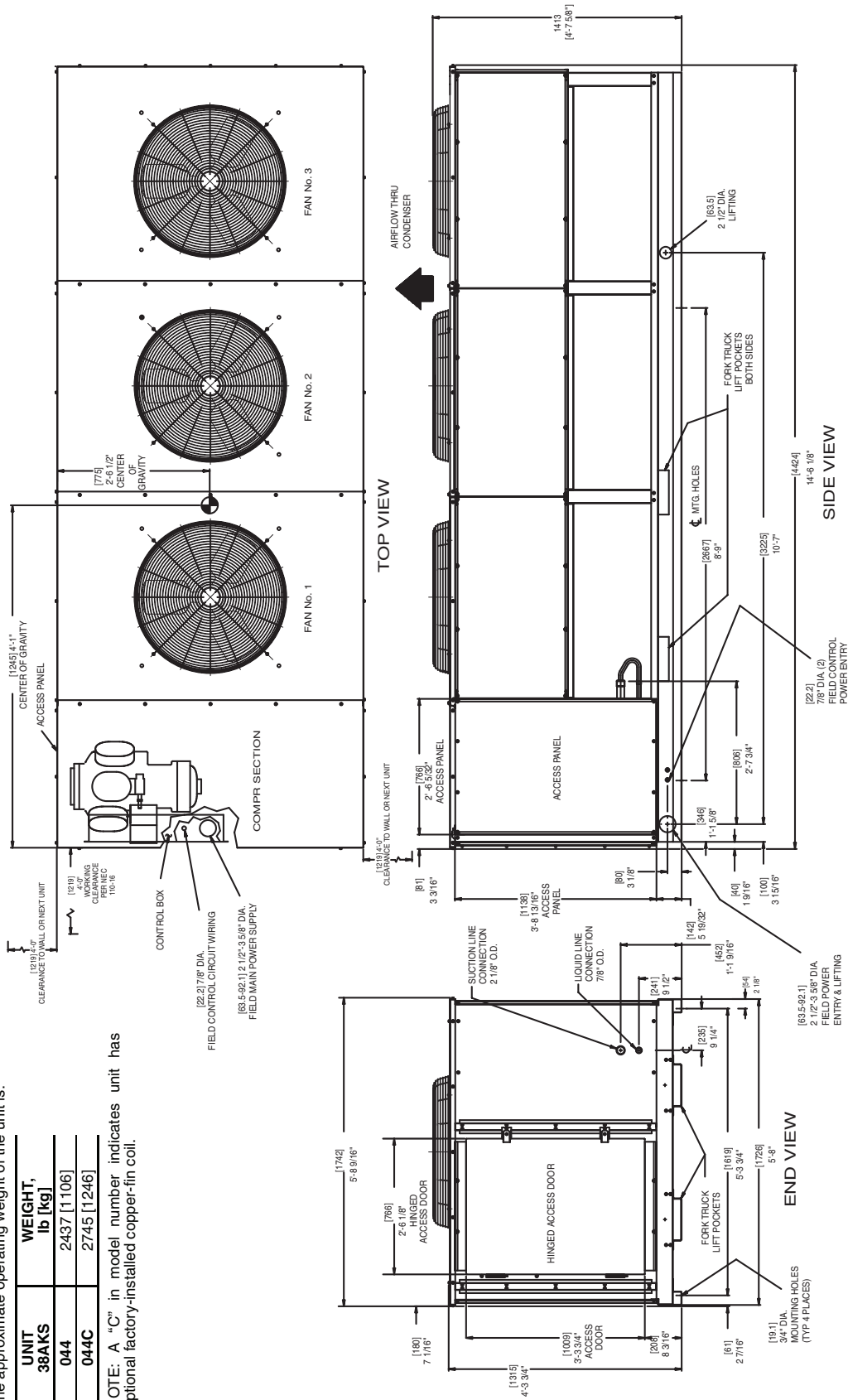
## 38AKS044 UNIT

**NOTES:**

- There must be a minimum of 8 ft [2440 mm] of clear air space above unit.
- The approximate operating weight of the unit is:

UNIT	WEIGHT, lb [kg]
38AKS	2437 [1106]
044	2745 [1246]

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



# Selection procedure



NOTE: See the Performance Data section for combination ratings for 38AKS028-044 units and matching 40RM air handlers. If the 38AKS 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 the Performance Data section this book against the P702 performance in the P702 product data book. If the 38AKS condensing units are matched with an independent air handling unit, cross-plot for performance ratings or contact Carrier Application Engineering for assistance.

## English Example:

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

Given:

Total Cooling Capacity	
Required (TC) . . . . .	300,000 Btuh
Sensible Heat Capacity	
Required (SHC) . . . . .	195,000 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 60 Hz 38AKS028 matched with a 40RM024 (high capacity). (See Condensing Unit Combination Ratings table on page 13.) This condensing unit-air handler combination provides 318,900 Btuh of total cooling capacity and 198,300 Btuh of sensible capacity at the given conditions. If the same condensing unit were matched to the 38AKS028 standard 3 row coil unit, the total capacity would be lower and sensible capacity would be higher than what is required. 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 Piping Sizes table on page 33. The sizes shown are based on a linear length of pipe. For this example, note in the linear length column that the proper pipe size is  $7/8$  in. for the liquid lines and  $2^{1/8}$  in. for the suction lines.

A dual suction riser will be needed if the evaporator is installed below the condensing unit. Check the layout of the condensing unit with respect to the air-handling unit to determine if a dual suction riser is needed.

## SI Example:

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

Given:

Total Cooling Capacity	
Required (TC) . . . . .	60 kW
Sensible Heat Capacity	
Required (SHC) . . . . .	48 kW
Temperature Air Entering	
Condenser (Edb) . . . . .	36 C
Temperature Air Entering	
Evaporator (db/wb) . . . . .	26.7 C db, 20 C wb
Evaporator Air Quantity . . . . .	3800 L/s
External Static Pressure . . . . .	150 Pa
Length of Interconnecting	
Refrigerant Piping . . . . .	18 m (Linear)

### II Select condensing unit air-handler combination.

For this example, select a 50 Hz 38AKS028 matched with a 40RM024. This 38AKS028/40RM024 condensing unit-air handler combination provides 74.9 kW of total cooling capacity and 54.8 kW 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 on page 33. The sizes shown are based on an equivalent length of pipe. For this example, note in the linear length column that the proper pipe size is  $7/8$  in. for the liquid lines and  $2^{1/8}$  in. for the suction lines.

# Performance data



## CONDENSING UNIT RATINGS — 60 Hz, ENGLISH

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

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

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)



## CONDENSING UNIT COMBINATION RATINGS — 60 Hz, ENGLISH

### 38AKS028 UNIT

38AKS028/40RM024 WITH STANDARD 3-ROW COIL																														
Temp (F) Air Entering Condenser (Edb)	Evaporator Air — Cfm									TC SHC kW																				
	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	SHC	150.5	184.8	—	167.6	213.3	—	183.0	239.4	279.5	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	SHC	145.8	180.3	—	162.7	208.1	257.9	177.8	233.6	269.6	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	SHC	143.3	177.7	227.0	160.3	205.3	252.2	175.3	230.5	263.9	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	SHC	140.8	175.3	222.8	157.7	202.5	247.1	172.6	227.4	258.6	kW	29.35	27.86	26.33	30.19	28.74	27.25	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	SHC	135.9	170.5	214.4	152.6	197.1	236.9	167.3	221.3	248.0	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									TC SHC kW																				
	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	SHC	133.1	175.5	216.7	149.5	203.1	255.5	164.0	228.6	290.8	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	SHC	128.9	170.8	211.9	144.6	198.3	250.0	159.7	223.9	284.9	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	SHC	126.7	168.7	209.4	142.6	196.0	247.7	157.7	221.7	282.1	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	SHC	124.6	166.3	207.0	140.4	193.6	245.1	155.5	219.3	278.9	kW	31.91	30.29	28.72	33.00	31.37	29.78	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	SHC	120.2	161.6	202.0	136.1	189.0	240.9	151.4	214.7	274.4	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									TC SHC kW																				
	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	SHC	168.9	212.4	270.1	189.8	245.6	293.3	209.5	275.9	307.3	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	SHC	163.7	207.0	260.4	184.4	239.8	282.3	204.1	269.5	295.9	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	SHC	161.2	204.2	254.8	181.9	236.8	276.3	201.6	266.4	289.9	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	SHC	158.4	201.3	249.7	179.1	233.7	270.4	198.8	263.0	283.7	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	SHC	153.0	195.7	239.4	173.5	227.6	258.7	193.2	256.4	271.5	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									TC SHC kW																				
	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	SHC	175.1	191.4	240.3	159.4	222.4	283.2	176.6	251.7	320.4	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	SHC	137.2	187.0	236.4	155.2	217.9	277.2	172.5	247.2	307.1	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	SHC	135.2	184.7	233.1	153.1	215.6	274.5	170.5	245.0	301.0	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	SHC	133.2	182.4	230.4	151.1	213.4	273.1	168.5	242.8	294.3	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	SHC	128.6	177.8	225.3	147.0	209.0	266.4	164.5	238.0	281.4	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									TC SHC kW																				
	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	SHC	186.0	238.4	293.9	212.4	276.3	318.4	234.9	311.5	374.7	kW	27.80	26.53	25.37	28.40	27.13	26.19	28.74	27.63	28.92
95	TC	337.9	310.6	288.0	350.0	323.1	305.6	356.7	333.7	327.6	SHC	179.9	232.4	282.8	206.6	269.8	305.6	228.9	304.2	309.3	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	SHC	177.2	229.4	276.8	204.0	266.7	299.1	226.3	300.9	325.3	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	SHC	174.0	226.2	270.9	210.0	263.4	292.3	223.1	297.1	341.4	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	SHC	167.7	220.0	259.2	195.0	256.7	278.7	—	289.6	369.4	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									TC SHC kW																				
	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	SHC	156.7	216.0	273.5	178.5	253.1	320.9	199.3	288.0	345.4	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	SHC	152.3	211.2	268.2	174.3	248.5	314.4	195.2	283.0	331.7	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	SHC	150.2	208.9	265.5	172.3	246.2	306.7	193.1	280.5	324.8	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	SHC	148.1	206.7	262.0	170.2	243.8	300.6	190.8	277.8	318.0	kW	33.40	31.76	30.17	34.24	32.58	31.16	34.75	33.09	32.21
115	TC	321.1	294.7	269.6	333.7	306.8	287.6	341.8	314.9	303.4	SHC	143.7	201.8	256.8	165.9	238.8	287.6	186.7	272.7	303.4	kW	35.31	33.57	31.85	36.14	34.37	33.07	36.69	34.91	34.12

#### LEGEND

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

#### 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:

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

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

$$h_{\text{Lwb}} = h_{\text{ewb}} - \frac{\text{total capacity (Btu/h)}}{4.5 \times \text{cfm}}$$

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

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

# Performance data (cont)



## CONDENSING UNIT COMBINATION RATINGS — 60 Hz, ENGLISH (cont)

### 38AKS034 UNIT

38AKS034/40RM028 WITH STANDARD 3-ROW COIL											
Temp (F) Air Entering Condenser (Edb)	Evaporator Air — Cfm									TC SHC kW	
	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	

38AKS034/40RM028 WITH HIGH-CAPACITY 4-ROW COIL											
Temp (F) Air Entering Condenser (Edb)	Evaporator Air — Cfm									TC SHC kW	
	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	34.67	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 STANDARD 3-ROW COIL											
Temp (F) Air Entering Condenser (Edb)	Evaporator Air — Cfm									TC SHC kW	
	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	

38AKS034/40RM034 WITH HIGH-CAPACITY 4-ROW COIL											
Temp (F) Air Entering Condenser (Edb)	Evaporator Air — Cfm									TC SHC kW	
	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	

#### 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

#### 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<sub>ewb</sub> = enthalpy of air entering coil.

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



### 38AKS CONDENSING UNIT RATINGS — 50 Hz, ENGLISH

38AKS028								
SST (F)		Air Temperature Entering Condenser (F)						
		85	95	100	105	115	120	125
20	TC	181.0	167.0	161.0	154.0	141.0	134.0	128.0
	kW	17.4	18.3	18.6	19.0	19.6	19.8	20.0
	SDT	108.0	117.0	122.0	126.0	136.0	141.0	145.0
25	TC	202.0	187.0	180.0	173.0	159.0	152.0	145.0
	kW	18.5	19.4	19.8	20.2	20.9	21.2	21.5
	SDT	110.0	119.0	124.0	128.0	137.0	142.0	146.0
30	TC	225.0	209.0	201.0	193.0	178.0	171.0	163.0
	kW	19.5	20.6	21.0	21.5	22.3	22.7	23.0
	SDT	112.0	121.0	126.0	130.0	139.0	143.0	148.0
35	TC	249.0	231.0	223.0	215.0	198.0	190.0	182.0
	kW	20.6	21.7	22.3	22.8	23.7	24.2	24.6
	SDT	115.0	123.0	128.0	132.0	141.0	145.0	150.0
40	TC	274.0	256.0	246.0	237.0	220.0	211.0	202.0
	kW	21.6	23.0	23.6	24.1	25.2	25.7	26.2
	SDT	117.0	126.0	130.0	135.0	143.0	148.0	152.0
45	TC	301.0	281.0	271.0	261.0	242.0	233.0	224.0
	kW	22.8	24.2	24.9	25.5	26.7	27.3	27.8
	SDT	120.0	129.0	133.0	137.0	146.0	150.0	154.0
50	TC	329.0	307.0	297.0	287.0	266.0	256.0	246.0
	kW	23.9	25.5	26.2	26.9	28.3	28.9	29.5
	SDT	123.0	131.0	136.0	140.0	148.0	152.0	157.0

38AKS044								
SST (F)		Air Temperature Entering Condenser (F)						
		85	95	100	105	115	120	125
20	TC	271.0	252.0	243.0	234.0	216.0	208.0	199.0
	kW	27.3	28.5	29.0	29.5	30.3	30.7	31.0
	SDT	109.0	119.0	124.0	129.0	139.0	144.0	149.0
25	TC	305.0	284.0	274.0	264.0	245.0	235.0	225.0
	kW	28.6	30.0	30.7	31.3	32.3	32.8	33.2
	SDT	109.0	119.0	124.0	129.0	139.0	144.0	149.0
30	TC	341.0	319.0	308.0	297.0	275.0	265.0	254.0
	kW	29.9	31.5	32.3	33.0	34.2	34.8	35.3
	SDT	109.0	119.0	124.0	129.0	139.0	144.0	149.0
35	TC	377.0	355.0	343.0	332.0	309.0	297.0	286.0
	kW	31.3	33.1	33.9	34.7	36.1	36.8	37.4
	SDT	111.0	120.0	125.0	129.0	139.0	144.0	149.0
40	TC	415.0	391.0	379.0	367.0	343.0	331.0	319.0
	kW	32.9	34.8	35.7	36.6	38.2	38.9	39.6
	SDT	113.0	122.0	126.0	131.0	140.0	145.0	150.0
45	TC	455.0	429.0	416.0	403.0	377.0	365.0	352.0
	kW	34.5	36.6	37.6	38.6	40.3	41.1	41.9
	SDT	115.0	124.0	128.0	133.0	142.0	147.0	151.0
50	TC	497.0	468.0	455.0	441.0	413.0	400.0	386.0
	kW	36.1	38.4	39.5	40.6	42.5	43.5	44.3
	SDT	117.0	126.0	131.0	135.0	144.0	149.0	153.0

38AKS034								
SST (F)		Air Temperature Entering Condenser (F)						
		85	95	100	105	115	120	125
20	TC	203.0	187.0	178.0	170.0	153.0	145.0	136.0
	kW	20.0	20.8	21.1	21.4	21.8	21.8	21.8
	SDT	110.0	120.0	125.0	130.0	140.0	145.0	150.0
25	TC	230.0	212.0	204.0	195.0	176.0	167.0	158.0
	kW	21.0	22.0	22.4	22.8	23.4	23.6	23.7
	SDT	110.0	120.0	125.0	130.0	140.0	145.0	150.0
30	TC	256.0	239.0	230.0	221.0	202.0	192.0	182.0
	kW	22.0	23.2	23.7	24.1	24.9	25.3	25.5
	SDT	112.0	121.0	126.0	130.0	140.0	145.0	150.0
35	TC	283.0	265.0	256.0	247.0	228.0	218.0	208.0
	kW	23.1	24.4	25.0	25.5	26.5	26.9	27.2
	SDT	114.0	123.0	127.0	132.0	141.0	146.0	150.0
40	TC	311.0	292.0	282.0	273.0	253.0	243.0	233.0
	kW	24.3	25.7	26.4	27.0	28.1	28.6	29.0
	SDT	117.0	125.0	130.0	134.0	143.0	147.0	152.0
45	TC	340.0	320.0	310.0	300.0	279.0	269.0	259.0
	kW	25.4	27.0	27.8	28.5	29.7	30.3	30.8
	SDT	119.0	128.0	132.0	136.0	145.0	149.0	154.0
50	TC	371.0	350.0	339.0	328.0	307.0	296.0	285.0
	kW	26.6	28.4	29.2	30.0	31.4	32.1	32.7
	SDT	122.0	130.0	135.0	139.0	148.0	152.0	156.0

#### LEGEND

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



# Performance data (cont)



## CONDENSING UNIT COMBINATION RATINGS — 3-ROW COILS — 50 Hz, ENGLISH

### 38AKS028 UNIT

38AKS028/40RM024 WITH STANDARD 3-ROW COIL										
Temp (F) Air Entering Condenser (Edb)		Evaporator Air — Cfm								
		6,000			8,000			10,000		
		Evaporator Air — Ewb (F)								
		72	67	62	72	67	62	72	67	62
85	TC	276.7	254.2	231.0	289.4	267.4	245.0	297.0	276.2	256.3
	SHC	139.7	174.3	221.2	156.4	201.3	245.0	171.3	226.0	256.3
	KW	21.72	20.72	19.69	22.28	21.30	20.31	22.62	21.70	20.81
95	TC	265.3	244.1	222.8	276.9	256.1	236.3	283.6	264.4	247.1
	SHC	135.3	170.1	214.1	151.9	196.6	236.3	166.5	220.6	247.1
	KW	22.43	22.43	21.41	24.00	23.00	22.05	24.32	23.41	22.57
100	TC	259.0	238.0	217.3	270.4	249.7	230.7	276.7	258.0	241.6
	SHC	132.9	167.6	209.2	149.5	193.8	230.7	164.1	217.6	241.6
	KW	24.28	23.18	22.11	24.87	23.79	22.81	25.20	24.22	23.37
105	TC	253.0	232.6	212.8	263.8	243.7	226.0	269.7	251.7	236.6
	SHC	130.6	165.4	205.4	147.1	191.3	226.0	161.6	214.8	236.6
	KW	25.03	23.85	22.69	25.66	24.49	23.46	26.01	24.96	24.08
115	TC	240.9	222.0	204.1	250.7	231.9	216.6	255.6	239.4	226.7
	SHC	126.0	161.1	197.7	142.4	186.3	216.6	156.7	209.2	226.7
	KW	26.63	25.34	24.11	27.29	26.01	24.97	27.63	26.52	25.65
125	TC	—	210.5	193.6	—	219.8	206.1	—	—	216.1
	SHC	—	156.4	188.6	—	181.2	206.1	—	—	216.1
	KW	—	26.82	25.59	—	27.50	26.50	—	—	27.23

38AKS028/40RM028 WITH STANDARD 3-ROW COIL										
Temp (F) Air Entering Condenser (Edb)		Evaporator Air — Cfm								
		7,500			10,000			12,500		
		Evaporator Air — Ewb (F)								
		72	67	62	72	67	62	72	67	62
85	TC	298.5	274.6	252.4	310.3	286.1	267.8	316.9	295.7	280.8
	SHC	157.1	200.0	247.5	177.6	232.2	267.8	197.3	261.4	280.8
	KW	22.69	21.63	20.64	23.21	22.14	21.32	23.51	22.56	21.90
95	TC	285.4	262.5	242.8	296.2	273.1	257.5	302.0	282.2	270.0
	SHC	152.2	195.1	238.6	172.6	226.9	257.5	192.3	255.5	270.0
	KW	24.41	23.31	22.36	24.93	23.82	23.07	25.21	24.26	23.67
100	TC	278.8	255.7	236.9	289.3	266.2	251.7	294.9	275.3	264.2
	SHC	149.8	192.4	233.2	170.2	224.0	251.7	190.0	252.5	264.2
	KW	25.31	24.10	23.13	25.85	24.65	23.90	26.14	25.13	24.55
105	TC	271.9	249.3	231.7	281.9	259.3	246.2	287.1	268.2	258.4
	SHC	147.3	189.8	228.5	167.6	221.2	246.2	187.4	249.4	258.4
	KW	26.13	24.82	23.79	26.72	25.40	24.64	27.02	25.92	25.35
115	TC	258.1	236.6	221.4	267.2	245.8	235.3	271.6	254.2	246.9
	SHC	142.2	184.7	219.0	162.4	215.6	235.3	182.2	243.3	246.9
	KW	27.80	26.33	25.30	28.41	26.96	26.24	28.72	27.53	27.03
125	TC	—	224.0	210.2	—	—	224.3	—	—	—
	SHC	—	179.5	208.8	—	—	224.3	—	—	—
	KW	—	27.80	26.80	—	—	27.82	—	—	—

38AKS028/40RM034 WITH STANDARD 3-ROW COIL										
Temp (F) Air Entering Condenser (Edb)		Evaporator Air — Cfm								
		9,000			12,000			15,000		
		Evaporator Air — Ewb (F)								
		72	67	62	72	67	62	72	67	62
85	TC	317.8	291.3	271.9	328.5	302.8	289.0	334.2	312.9	302.9
	SHC	172.3	224.7	268.2	199.4	261.6	289.0	221.4	295.1	302.9
	KW	23.55	22.37	21.51	24.02	22.88	22.27	24.28	23.33	22.88
95	TC	302.9	277.5	260.7	312.6	288.1	277.0	317.6	297.8	290.3
	SHC	166.7	219.2	258.0	194.0	255.7	277.0	215.9	288.5	290.3
	KW	25.25	24.03	23.22	25.72	24.54	24.01	25.95	25.01	24.64
100	TC	295.9	270.3	254.3	305.4	280.8	270.7	310.1	290.5	284.0
	SHC	164.0	216.4	252.3	191.5	252.8	270.7	213.4	285.3	284.0
	KW	26.20	24.86	24.03	26.69	25.41	24.89	26.93	25.92	25.58
105	TC	288.2	263.1	248.3	297.1	273.2	264.4	301.5	282.6	277.3
	SHC	161.1	213.5	246.8	188.7	249.7	264.4	210.5	281.8	277.3
	KW	27.08	25.62	24.76	27.61	26.21	25.70	27.86	26.76	26.45
115	TC	—	248.9	236.5	—	258.1	251.7	—	—	263.9
	SHC	—	207.9	236.1	—	243.6	251.7	—	—	263.9
	KW	—	27.17	26.32	—	27.80	27.36	—	—	28.20
125	TC	—	—	224.6	—	—	—	—	—	—
	SHC	—	—	224.5	—	—	—	—	—	—
	KW	—	—	27.84	—	—	—	—	—	—

#### LEGEND

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

#### NOTES:

1. Direct interpolation is permissible. Do not extrapolate.
2. SHC is based on 80 F db air entering indoor coil.
3. Formulas:

$$Ldb F = Edb F - \frac{SHC_{Btuh}}{1.10 \times cfm}$$

Lwb = wet-bulb temperature corresponding to enthalpy air leaving indoor coil (h<sub>lwb</sub>)

$$Ldb F: h_{lwb} = h_{ewb} - \frac{TC_{Btuh}}{4.5 \times cfm}$$

where h<sub>ewb</sub> = enthalpy of air entering evaporator coil (Btuh/lb).

4. Capacities are based on 25 actual ft (40 equivalent ft) of interconnecting piping sized to the outdoor unit field connections. (Equivalent length is equal to the actual length plus a 50% allowance for fitting losses.) For other equivalent lengths, refer to the Carrier System Design Manual, Part 3, for line losses.





CONDENSING UNIT COMBINATION RATINGS — 3-ROW COILS — 50 Hz, ENGLISH (cont)

38AKS034 UNIT

38AKS034/40RM028 WITH STANDARD 3-ROW COIL										
Temp (F) Air Entering Condenser (Edb)		Evaporator Air — Cfm								
		7,500			10,000			12,500		
		Evaporator Air — Ewb (F)								
		72	67	62	72	67	62	72	67	62
85	TC	322.9	298.4	272.1	336.1	311.1	287.8	344.0	321.0	301.3
	SHC	166.0	209.6	265.5	186.7	242.5	287.8	206.3	272.4	301.3
	kW	24.75	23.82	22.82	25.25	24.30	23.42	25.55	24.68	23.93
95	TC	310.6	286.4	262.1	323.0	298.4	277.7	330.3	308.1	291.0
	SHC	161.5	204.7	256.4	182.1	237.3	277.6	201.8	266.8	291.0
	kW	26.56	25.44	24.31	27.14	26.00	25.03	27.48	26.45	25.65
100	TC	304.2	279.9	256.5	316.5	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	27.51	26.29	25.12	28.12	26.89	25.90	28.47	27.38	26.57
105	TC	297.9	274.0	251.9	309.6	285.5	267.2	316.2	295.0	280.3
	SHC	159.7	199.7	247.0	177.4	231.9	267.2	197.1	261.1	280.3
	kW	28.38	27.06	25.83	29.03	27.69	26.68	29.40	28.22	27.40
115	TC	284.2	260.6	204.7	295.2	271.5	255.9	301.2	280.9	268.6
	SHC	151.8	194.4	236.7	172.3	226.2	255.9	192.1	254.9	268.6
	kW	30.02	28.57	27.34	30.70	29.34	28.28	31.06	29.82	29.06
125	TC	271.2	247.3	229.1	281.7	257.8	244.4	287.2	267.3	257.2
	SHC	147.0	189.0	226.1	167.6	220.6	244.4	187.4	249.0	257.2
	kW	31.64	29.99	28.73	32.37	30.72	29.79	32.75	31.37	30.67

38AKS034/40RM034 WITH STANDARD 3-ROW COIL										
Temp (F) Air Entering Condenser (Edb)		Evaporator Air — Cfm								
		9,000			12,000			15,000		
		Evaporator Air — Ewb (F)								
		72	67	62	72	67	62	72	67	62
85	TC	344.6	317.4	294.0	356.9	330.1	311.5	363.8	340.6	326.0
	SHC	182.5	235.1	288.2	209.0	272.7	311.5	231.3	307.3	326.0
	kW	25.57	24.55	23.65	26.04	25.02	24.32	26.30	25.42	24.87
95	TC	331.0	304.2	282.8	342.5	316.2	300.1	348.8	326.6	314.3
	SHC	177.3	229.8	278.1	204.1	267.1	300.1	226.3	301.1	314.3
	kW	27.51	26.27	25.27	28.05	26.82	26.08	28.34	27.31	26.74
100	TC	324.3	297.3	276.8	335.5	309.2	294.1	341.6	319.6	308.3
	SHC	174.8	227.1	272.6	201.7	264.2	294.1	223.9	298.0	308.3
	kW	28.51	27.16	26.14	29.08	27.76	27.00	29.38	28.28	27.72
105	TC	317.1	290.6	271.3	327.8	302.1	288.4	333.5	312.2	302.3
	SHC	172.0	224.4	267.7	199.1	261.4	288.4	221.2	294.8	302.3
	kW	29.45	27.98	26.91	30.05	28.62	27.85	30.36	29.18	28.63
115	TC	302.2	276.0	258.9	312.1	286.9	275.7	317.2	296.8	289.3
	SHC	166.4	218.6	256.4	193.8	255.2	275.6	215.7	288.0	289.3
	kW	31.12	29.51	28.46	31.74	30.19	29.49	32.05	30.80	30.33
125	TC	288.3	261.8	246.5	—	272.5	263.3	—	282.5	276.9
	SHC	161.1	213.0	245.1	—	249.4	263.3	—	281.7	276.9
	kW	32.83	30.99	29.93	—	31.73	31.10	—	32.43	32.04

38AKS044 UNIT

38AKS044/40RM034 WITH STANDARD 3-ROW COIL										
Temp (F) Air Entering Condenser (Edb)		Evaporator Air — Cfm								
		9,000			12,000			15,000		
		Evaporator Air — Ewb (F)								
		72	67	62	72	67	62	72	67	62
85	TC	413.7	382.6	344.5	432.1	399.8	364.9	443.5	412.4	382.2
	SHC	208.7	260.9	334.0	234.4	300.7	364.9	257.8	338.8	382.2
	kW	32.85	31.60	30.08	33.58	32.29	30.89	34.04	32.80	31.59
95	TC	399.2	368.7	333.6	416.4	384.9	353.6	426.9	397.2	370.5
	SHC	203.2	255.4	324.2	229.1	294.7	353.6	252.3	332.2	370.5
	kW	35.19	33.74	32.08	36.00	34.51	33.03	36.50	35.10	33.83
100	TC	391.8	361.5	328.0	408.3	377.3	347.7	418.3	389.4	364.4
	SHC	200.4	252.5	319.0	226.4	291.7	347.7	249.4	328.7	364.4
	kW	36.36	34.80	33.08	37.21	35.61	34.09	37.72	36.24	34.95
105	TC	384.2	354.1	322.2	400.1	369.5	341.7	409.6	381.5	358.2
	SHC	197.5	249.6	313.8	223.6	288.5	341.7	246.5	325.2	358.2
	kW	37.55	35.88	34.11	38.44	36.74	35.20	38.97	37.41	36.11
115	TC	368.5	339.0	310.2	383.1	353.5	329.2	391.7	365.1	345.2
	SHC	191.5	243.6	302.9	217.8	282.1	329.2	240.6	318.1	345.2
	kW	39.77	37.95	36.17	40.68	38.85	37.35	41.21	39.57	38.33
125	TC	352.6	323.3	297.2	366.4	337.2	316.0	374.3	348.7	331.7
	SHC	185.5	237.4	291.1	212.2	275.5	316.0	234.8	310.8	331.7
	kW	41.94	39.90	38.08	42.91	40.87	39.39	43.45	41.67	40.48

LEGEND

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

NOTES:

1. Direct interpolation is permissible. Do not extrapolate.
2. SHC is based on 80 F db air entering indoor coil.
3. Formulas:

$$Ldb F = Edb F - \frac{SHCBtuh}{1.10 \times cfm}$$

Lwb = wet-bulb temperature corresponding to enthalpy air leaving indoor coil (h<sub>lwb</sub>)

$$Ldb F: h_{lwb} = h_{ewb} - \frac{TCBtuh}{4.5 \times cfm}$$

where h<sub>ewb</sub> = enthalpy of air entering evaporator coil (Btuh/lb).

4. Capacities are based on 25 actual ft (40 equivalent ft) of interconnecting piping sized to the outdoor unit field connections. (Equivalent length is equal to the actual length plus a 50% allowance for fitting losses.) For other equivalent lengths, refer to the Carrier System Design Manual, Part 3, for line losses.

# Performance data (cont)



## CONDENSING UNIT COMBINATION RATINGS — 4-ROW HIGH-CAPACITY COILS — 50 Hz, ENGLISH

### 38AKS028 UNIT — HIGH CAPACITY

38AKS028/40RM024 WITH 4-ROW HIGH-CAPACITY COILS										
Temp (F) Air Entering Condenser (Edb)		Evaporator Air — Cfm								
		6,000			8,000			10,000		
		Evaporator Air — Ewb (F)								
		62	67	72	62	67	72	62	67	72
85	TC	257.4	282.2	308.4	274.1	299.2	325.8	284.9	310.4	337.3
	SHC	205.5	164.8	123.1	243.4	191.9	138.8	275.4	217.4	153.8
	kW	21.83	22.91	24.02	22.58	23.64	24.76	23.05	24.14	25.26
95	TC	245.9	269.7	295.2	261.5	285.8	311.3	272.0	295.7	321.5
	SHC	201.1	160.7	119.4	238.5	188.0	135.0	272.0	213.4	150.2
	kW	23.31	24.51	25.75	24.13	25.32	26.55	24.63	25.80	27.05
100	TC	240.1	263.5	288.4	254.7	278.9	303.9	265.3	288.3	313.7
	SHC	198.8	158.6	117.4	235.6	185.9	133.2	265.3	211.4	148.3
	kW	24.04	25.28	26.58	24.85	26.12	27.40	25.39	26.60	27.92
105	TC	234.4	257.2	281.4	248.5	271.8	296.3	260.1	280.8	305.5
	SHC	196.7	156.6	115.5	233.7	183.9	131.2	260.1	209.2	146.4
	kW	24.80	26.11	27.46	25.62	26.96	28.31	26.27	27.46	28.81
115	TC	222.7	244.6	267.5	235.9	257.4	280.9	248.8	265.9	289.4
	SHC	192.3	152.5	111.5	228.2	179.7	127.5	248.8	204.9	142.6
	kW	26.26	27.68	29.15	27.11	28.52	29.99	27.95	29.06	30.52

38AKS028/40RM034 WITH 4-ROW HIGH-CAPACITY COILS										
Temp (F) Air Entering Condenser (Edb)		Evaporator Air — Cfm								
		9,000			12,000			15,000		
		Evaporator Air — Ewb (F)								
		62	67	72	62	67	72	62	67	72
85	TC	279.7	305.5	332.1	296.4	318.0	345.0	312.8	326.3	353.3
	SHC	259.7	204.9	146.4	296.4	241.8	168.3	312.8	275.6	189.0
	kW	22.84	23.92	25.03	23.51	24.46	25.57	24.21	24.82	25.92
95	TC	267.2	291.2	317.0	284.9	302.8	328.6	299.8	310.6	336.3
	SHC	255.4	200.8	142.6	284.9	237.5	164.4	299.8	271.3	185.4
	kW	24.40	25.59	26.84	25.26	26.15	27.39	25.98	26.54	27.76
100	TC	260.4	284.0	309.4	278.9	295.1	320.4	293.4	302.8	327.9
	SHC	252.0	198.9	140.9	278.9	235.3	162.6	293.4	268.8	183.6
	kW	25.14	26.38	27.70	26.10	26.97	28.27	26.84	27.38	28.66
105	TC	253.7	276.7	301.3	272.8	287.5	312.1	286.8	294.6	319.3
	SHC	248.4	196.7	139.0	272.8	233.2	160.9	286.8	266.0	181.8
	kW	25.92	27.22	28.58	26.99	27.83	29.18	27.77	28.24	29.59
115	TC	241.1	262.0	285.5	260.3	272.1	295.5	273.6	278.4	301.9
	SHC	241.1	192.4	135.2	260.3	228.8	157.2	273.6	260.8	177.9
	kW	27.44	28.82	30.28	28.68	29.46	30.91	29.54	29.85	31.32

#### LEGEND

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

1. Direct interpolation is permissible. Do not extrapolate.
2. SHC is based on 80 F db air entering indoor coil.
3. Formulas:

$$\text{Ldb F} = \text{Edb F} - \frac{\text{SHCBtuh}}{1.10 \times \text{cfm}}$$

Lwb = wet-bulb temperature corresponding to enthalpy air leaving indoor coil (h<sub>lwb</sub>)

$$\text{Ldb F: } h_{lwb} = h_{ewb} - \frac{\text{TCBtuh}}{4.5 \times \text{cfm}}$$

where h<sub>ewb</sub> = enthalpy of air entering evaporator coil (Btuh/lb).

4. Capacities are based on 25 actual ft (40 equivalent ft) of interconnecting piping sized to the outdoor unit field connections. (Equivalent length is equal to the actual length plus a 50% allowance for fitting losses.) For other equivalent lengths, refer to the Carrier System Design Manual, Part 3, for line losses.

38AKS028/40RM028 WITH 4-ROW HIGH-CAPACITY COILS										
Temp (F) Air Entering Condenser (Edb)		Evaporator Air — Cfm								
		7,500			10,000			12,500		
		Evaporator Air — Ewb (F)								
		62	67	72	62	67	72	62	67	72
85	TC	263.5	287.8	313.2	277.6	301.7	327.2	290.9	310.7	336.6
	SHC	229.3	181.2	131.6	269.1	212.1	149.7	290.9	241.2	167.2
	kW	22.01	23.07	24.15	22.65	23.67	24.75	23.20	24.06	25.15
95	TC	251.6	274.7	299.0	264.8	287.7	312.1	279.3	295.6	320.4
	SHC	224.7	177.1	127.8	264.8	208.0	146.1	279.3	236.9	163.5
	kW	23.52	24.68	25.87	24.18	25.34	26.51	24.90	25.71	26.92
100	TC	245.7	268.3	292.0	258.5	280.4	304.7	273.5	288.1	312.3
	SHC	222.5	175.1	126.0	258.5	206.1	144.4	273.5	234.7	161.7
	kW	24.25	25.47	26.71	24.94	26.12	27.39	25.75	26.52	27.77
105	TC	239.6	261.6	284.7	253.0	273.0	296.6	267.5	280.4	304.1
	SHC	220.0	173.1	124.1	253.0	204.1	142.6	267.5	232.5	159.7
	kW	25.01	26.27	27.57	25.76	26.93	28.24	26.61	27.34	28.65
115	TC	227.1	248.2	270.3	241.9	258.4	280.7	255.1	265.3	287.7
	SHC	215.1	169.0	120.5	241.9	199.8	138.9	255.1	228.1	156.2
	kW	26.45	27.84	29.26	27.41	28.49	29.92	28.27	28.94	30.35



**CONDENSING UNIT COMBINATION RATINGS — 4-ROW HIGH-CAPACITY COILS — 50 Hz, ENGLISH (cont)**

**38AKS034 UNIT — HIGH CAPACITY**

38AKS034/40RM028 WITH 4-ROW HIGH-CAPACITY COILS										
Temp (F) Air Entering Condenser (Edb)		Evaporator Air — Cfm								
		7,500			10,000			12,500		
		Evaporator Air — Ewb (F)								
		62	67	72	62	67	72	62	67	72
85	TC	280.1	305.6	332.5	294.8	320.8	347.7	307.1	331.0	357.9
	SHC	235.6	187.1	137.0	276.9	217.7	154.8	307.1	246.9	172.1
	kW	23.75	24.89	26.04	24.40	25.54	26.70	24.96	25.98	27.15
95	TC	267.9	292.7	318.7	282.5	306.8	332.7	295.4	316.4	342.2
	SHC	230.9	182.8	133.3	271.9	213.6	151.0	295.4	242.9	168.4
	kW	25.19	26.45	27.75	25.93	27.17	28.43	26.59	27.65	28.90
100	TC	261.8	286.0	311.1	276.0	299.7	325.0	289.5	308.7	334.2
	SHC	228.6	180.6	131.1	268.8	211.6	149.2	289.5	240.7	166.7
	kW	25.88	27.20	28.55	26.67	27.94	29.27	27.39	28.43	29.76
105	TC	255.7	279.2	303.7	268.8	292.5	317.1	283.4	300.9	325.8
	SHC	226.3	178.5	129.1	268.8	209.5	147.4	283.4	238.5	164.8
	kW	26.61	27.98	29.38	27.39	28.74	30.13	28.22	29.23	30.63
115	TC	243.0	265.3	288.7	256.2	277.4	301.1	271.0	285.0	308.7
	SHC	221.5	174.2	125.2	256.2	205.3	143.6	271.0	234.0	160.8
	kW	27.99	29.48	31.00	28.88	30.27	31.81	29.86	30.76	32.29

38AKS034/40RM034 WITH 4-ROW HIGH-CAPACITY COILS										
Temp (F) Air Entering Condenser (Edb)		Evaporator Air — Cfm								
		9,000			12,000			15,000		
		Evaporator Air — Ewb (F)								
		62	67	72	62	67	72	62	67	72
85	TC	297.9	324.3	352.1	312.9	338.8	366.7	330.1	347.7	375.8
	SHC	267.9	210.7	151.5	312.9	247.8	173.3	330.1	282.1	194.1
	kW	24.55	25.70	26.90	25.21	26.34	27.53	25.95	26.72	27.91
95	TC	284.9	310.5	337.1	300.9	323.5	350.5	317.7	331.8	358.8
	SHC	262.5	206.5	147.7	300.9	243.5	169.7	317.7	277.4	190.2
	kW	26.07	27.35	28.66	26.87	27.99	29.32	27.72	28.39	29.73
100	TC	278.3	303.5	329.5	295.0	315.7	342.2	311.0	323.8	350.3
	SHC	260.2	204.5	145.9	295.0	241.3	167.8	311.0	275.1	188.5
	kW	26.81	28.15	29.51	27.69	28.80	30.17	28.56	29.21	30.58
105	TC	271.7	296.2	321.7	289.0	307.8	333.7	304.3	315.7	341.5
	SHC	257.6	202.4	143.9	289.0	239.1	165.8	304.3	272.9	186.6
	kW	27.57	28.97	30.40	28.55	29.63	31.06	29.42	30.06	31.49
115	TC	257.9	280.9	305.5	276.5	291.8	316.4	290.6	299.1	323.6
	SHC	251.0	198.0	139.9	276.5	234.5	161.9	290.6	267.7	182.7
	kW	28.99	30.49	32.08	30.21	31.18	32.75	31.11	31.66	33.21

**38AKS044 UNIT — HIGH CAPACITY**

38AKS044/40RM034 WITH 4-ROW HIGH-CAPACITY COILS										
Temp (F) Air Entering Condenser (Edb)		Evaporator Air — Cfm								
		9,000			12,000			15,000		
		Evaporator Air — Ewb (F)								
		62	67	72	62	67	72	62	67	72
85	TC	347.6	378.8	411.3	367.0	398.3	431.0	380.2	410.6	443.5
	SHC	287.1	228.1	167.7	338.3	265.2	189.3	380.2	300.0	209.8
	kW	33.03	34.90	36.81	34.20	36.06	38.02	34.97	36.77	38.73
95	TC	334.0	363.8	395.1	351.4	381.6	412.9	365.8	393.1	424.4
	SHC	282.2	223.4	163.4	331.7	260.3	184.7	365.8	295.2	205.3
	kW	34.80	36.76	38.83	35.94	37.95	40.03	36.90	38.70	40.79
100	TC	327.2	356.3	386.8	344.0	373.1	403.6	359.2	384.3	414.8
	SHC	279.4	221.0	161.2	328.7	257.8	182.5	359.2	292.8	203.2
	kW	35.71	37.74	39.87	36.87	38.91	41.05	37.96	39.69	41.83
105	TC	319.9	348.7	378.4	336.6	364.6	394.3	352.0	375.4	405.0
	SHC	276.5	218.5	159.0	325.2	255.4	180.2	352.0	290.3	201.0
	kW	36.56	38.69	40.89	37.78	39.85	42.05	38.93	40.65	42.84
115	TC	305.3	332.4	360.5	320.5	347.2	375.3	337.6	357.2	385.3
	SHC	271.1	213.5	153.9	320.5	250.4	175.6	337.6	285.1	196.5
	kW	38.19	40.43	42.74	39.46	41.63	43.95	40.85	42.46	44.79

LEGEND

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

1. Direct interpolation is permissible. Do not extrapolate.
2. SHC is based on 80 F db air entering indoor coil.
3. Formulas:

$$Ldb\ F = Edb\ F - \frac{SHC_{Btuh}}{1.10 \times cfm}$$

Lwb = wet-bulb temperature corresponding to enthalpy air leaving indoor coil (h<sub>lwb</sub>)

$$Ldb\ F: h_{lwb} = h_{ewb} - \frac{TC_{Btuh}}{4.5 \times cfm}$$

where h<sub>ewb</sub> = enthalpy of air entering evaporator coil (Btuh/lb).

4. Capacities are based on 25 actual ft (40 equivalent ft) of interconnecting piping sized to the outdoor unit field connections. (Equivalent length is equal to the actual length plus a 50% allowance for fitting losses.) For other equivalent lengths, refer to the Carrier System Design Manual, Part 3, for line losses.

# Performance data (cont)



## 38AKS CONDENSING UNIT RATINGS — 50 Hz, SI

38AKS028								
SST (C)		Air Temperature Entering Condenser (C)						
		28	32	36	40	44	48	52
-6	TC	55.3	52.4	49.5	46.6	43.8	41.0	38.3
	kW	17.4	18.0	18.6	19.1	19.6	20.0	20.4
	SDT	41.2	44.8	48.5	52.1	55.8	59.6	63.3
-4	TC	60.4	57.3	54.2	51.1	48.1	45.2	42.3
	kW	18.2	18.9	19.5	20.1	20.6	21.1	21.5
	SDT	42.1	45.7	49.3	52.9	56.5	60.2	63.8
-2	TC	64.4	61.1	57.8	54.7	51.5	48.5	45.4
	kW	18.8	19.5	20.3	20.9	21.5	22.0	22.4
	SDT	42.9	46.4	50.0	53.6	57.1	60.7	64.4
0	TC	69.9	66.4	62.9	59.6	56.3	53.0	49.7
	kW	19.6	20.4	21.2	21.9	22.6	23.1	23.7
	SDT	43.9	47.4	50.9	54.5	58.0	61.6	65.1
2	TC	75.6	71.9	68.3	64.7	61.2	57.7	54.3
	kW	20.5	21.3	22.2	23.0	23.7	24.3	24.9
	SDT	45.0	48.5	52.0	55.4	59.0	62.5	66.0
4	TC	80.2	76.3	72.5	68.7	65.0	61.4	57.8
	kW	21.1	22.0	22.9	23.8	24.5	25.2	25.9
	SDT	45.9	49.3	52.8	56.2	59.7	63.2	66.7
6	TC	86.4	82.3	78.3	74.3	70.3	66.5	62.7
	kW	22.0	23.0	23.9	24.8	25.7	26.5	27.2
	SDT	47.1	50.5	53.9	57.3	60.8	64.2	67.7
8	TC	91.2	87.0	82.8	78.6	74.5	70.5	66.5
	kW	22.6	23.7	24.7	25.7	26.6	27.4	28.2
	SDT	48.0	51.4	54.8	58.2	61.6	65.0	68.4
10	TC	97.9	93.5	89.0	84.6	80.3	76.0	71.7
	kW	23.5	24.6	25.7	26.8	27.8	28.7	29.5
	SDT	49.3	52.7	56.0	59.4	62.8	66.1	69.5

38AKS044								
SST (C)		Air Temperature Entering Condenser (C)						
		28	32	36	40	44	48	52
-6	TC	82.8	78.8	74.8	70.9	67.1	63.3	59.5
	kW	27.3	28.1	29.0	29.7	30.4	31.0	31.5
	SDT	41.4	45.3	49.3	53.3	57.3	61.3	65.3
-4	TC	90.9	86.5	82.3	78.0	73.9	69.8	65.7
	kW	28.3	29.3	30.3	31.1	31.9	32.6	33.2
	SDT	41.3	45.3	49.3	53.3	57.3	61.3	65.3
-2	TC	97.3	92.7	88.2	83.7	79.4	75.0	70.7
	kW	29.0	30.1	31.2	32.2	33.0	33.8	34.5
	SDT	41.4	45.3	49.3	53.3	57.3	61.3	65.3
0	TC	106.0	101.0	96.5	91.7	87.1	82.4	77.8
	kW	30.0	31.2	32.4	33.5	34.5	35.4	36.2
	SDT	41.8	45.6	49.4	53.4	57.3	61.3	65.3
2	TC	115.0	110.0	105.0	99.9	95.1	90.2	85.3
	kW	31.2	32.5	33.7	34.9	36.0	37.0	37.9
	SDT	42.5	46.2	50.0	53.7	57.5	61.4	65.4
4	TC	121.0	116.0	111.0	106.0	101.0	96.1	91.1
	kW	32.1	33.5	34.8	36.0	37.2	38.2	39.2
	SDT	43.2	46.9	50.5	54.2	58.0	61.7	65.5
6	TC	130.0	125.0	120.0	114.0	109.0	104.0	98.8
	kW	33.3	34.8	36.2	37.6	38.8	40.0	41.1
	SDT	44.2	47.8	51.5	55.1	58.7	62.4	66.1
8	TC	138.0	132.0	127.0	121.0	116.0	110.0	105.0
	kW	34.2	35.8	37.3	38.8	40.1	41.3	42.5
	SDT	45.0	48.6	52.2	55.8	59.4	63.0	66.7
10	TC	148.0	142.0	136.0	130.0	124.0	118.0	113.0
	kW	35.5	37.2	38.8	40.4	41.8	43.2	44.4
	SDT	46.1	49.7	53.2	56.8	60.4	64.0	67.6

38AKS034								
SST (C)		Air Temperature Entering Condenser (C)						
		28	32	36	40	44	48	52
-6	TC	62.4	58.9	55.3	51.7	48.1	44.5	40.8
	kW	20.0	20.6	21.2	21.6	21.9	22.2	22.2
	SDT	42.1	46.0	50.0	54.1	58.0	62.0	66.1
-4	TC	68.7	65.0	61.3	57.6	53.7	49.9	46.1
	kW	20.7	21.4	22.2	22.7	23.2	23.5	23.7
	SDT	42.2	46.1	50.1	54.1	58.1	62.1	66.1
-2	TC	73.3	69.7	66.0	62.1	58.2	54.3	50.3
	kW	21.3	22.1	22.9	23.5	24.1	24.5	24.8
	SDT	42.7	46.4	50.2	54.1	58.1	62.0	66.1
0	TC	79.5	75.8	72.1	68.3	64.3	60.3	56.1
	kW	22.1	23.0	23.9	24.6	25.2	25.8	26.2
	SDT	43.6	47.2	50.8	54.5	58.3	62.1	66.1
2	TC	85.9	82.1	78.2	74.3	70.3	66.3	62.1
	kW	23.0	24.0	24.9	25.7	26.4	27.1	27.6
	SDT	44.6	48.1	51.7	55.2	58.9	62.5	66.2
4	TC	90.9	87.0	83.0	79.0	74.9	70.8	66.6
	kW	23.7	24.7	25.7	26.6	27.4	28.1	28.7
	SDT	45.4	48.9	52.5	56.0	59.5	63.1	66.6
6	TC	97.8	93.6	89.5	85.3	81.0	76.8	72.4
	kW	24.6	25.7	26.8	27.8	28.6	29.4	30.1
	SDT	46.6	50.1	53.5	57.0	60.5	64.0	67.5
8	TC	103.0	98.8	94.5	90.2	85.8	81.4	76.9
	kW	25.2	26.4	27.6	28.6	29.6	30.5	31.2
	SDT	47.5	50.9	54.4	57.8	61.3	64.7	68.2
10	TC	110.0	106.0	101.0	96.9	92.3	87.7	83.0
	kW	26.2	27.4	28.7	29.8	30.9	31.9	32.7
	SDT	48.8	52.2	55.6	59.0	62.4	65.8	69.2

### LEGEND

- — Out of Range
- kW — Compressor Power
- SDT — Saturated Discharge Temperature at Compressor (C)
- SST — Saturated Suction Temperature (C)
- TC — Gross Cooling Capacity (kW)



**CONDENSING UNIT COMBINATION RATINGS — 3-ROW COILS — 50 Hz, SI**  
**38AKS028 UNIT**

38AKS028/40RM024 WITH STANDARD 3-ROW COIL										
Temp (C) Air Entering Condenser (Edb)		Evaporator Air — L/s								
		2900			3800			4700		
		Evaporator Air — Ewb (C)								
		22	20	16	22	20	16	22	20	16
20	TC	86.6	81.7	73.9	90.6	84.8	77.6	93.1	87.7	80.5
	SHC	44.0	51.5	73.9	48.9	59.2	77.6	53.4	65.8	80.5
	kW	19.70	19.31	18.70	20.01	19.55	18.99	20.20	19.78	19.22
28	TC	81.9	77.1	70.0	85.6	80.0	73.6	87.8	82.7	76.4
	SHC	42.2	49.6	70.0	47.1	57.1	73.6	51.6	63.5	76.4
	kW	21.44	20.84	19.95	21.90	21.20	20.39	22.18	21.54	20.75
32	TC	79.4	74.6	67.8	82.9	77.5	71.3	85.0	80.0	74.1
	SHC	41.2	48.6	67.8	46.1	55.9	71.3	50.6	62.2	74.1
	kW	22.57	21.85	20.84	23.09	22.28	21.36	23.41	22.66	21.78
36	TC	77.0	72.2	65.8	80.2	74.9	69.2	82.2	77.4	71.9
	SHC	40.2	47.6	65.8	45.2	54.8	69.2	49.6	61.0	71.9
	kW	23.66	22.81	21.67	24.23	23.30	22.28	24.59	23.74	22.76
40	TC	74.4	69.7	63.7	77.4	72.4	67.0	79.3	74.7	69.6
	SHC	39.2	46.6	63.7	44.2	53.6	67.0	48.6	59.8	69.6
	kW	24.82	23.84	22.58	25.45	24.39	23.27	25.84	24.87	23.82
44	TC	71.8	67.1	61.4	74.6	69.7	64.6	76.4	71.9	67.2
	SHC	38.2	45.5	61.4	43.2	52.4	64.6	47.6	58.5	67.2
	kW	26.02	25.01	23.79	26.63	25.57	24.49	27.01	26.04	25.04
48	TC	69.7	64.3	58.1	72.8	67.2	61.8	74.8	69.6	64.7
	SHC	37.3	44.4	58.1	42.5	51.3	61.8	47.0	58.5	64.7
	kW	27.31	25.93	24.73	28.10	26.68	25.30	28.61	27.30	26.04
52	TC	—	61.9	56.1	—	64.8	59.7	—	—	62.5
	SHC	—	43.4	56.1	—	50.2	59.7	—	—	62.5
	kW	—	26.99	25.46	—	27.74	26.40	—	—	27.15

38AKS028/40RM028 WITH STANDARD 3-ROW COIL										
Temp (C) Air Entering Condenser (Edb)		Evaporator Air — L/s								
		3500			4700			5900		
		Evaporator Air — Ewb (C)								
		22	20	16	22	20	16	22	20	16
20	TC	93.2	89.7	80.1	96.9	90.7	83.9	99.0	93.5	87.1
	SHC	49.1	57.0	80.1	55.3	67.5	83.9	61.2	75.4	87.1
	kW	20.21	19.94	19.18	20.50	20.02	19.48	20.67	20.24	19.74
28	TC	88.2	83.8	75.7	91.4	85.4	79.4	93.2	88.0	82.6
	SHC	47.3	55.3	75.7	53.4	65.2	79.4	59.2	72.9	82.6
	kW	22.22	21.68	20.65	22.62	21.87	21.13	22.85	22.20	21.52
32	TC	85.5	80.7	73.3	88.5	82.5	77.0	90.2	85.1	80.1
	SHC	46.3	54.4	73.3	52.4	64.0	77.0	58.2	71.6	80.1
	kW	23.48	22.76	21.66	23.92	23.03	22.21	24.18	23.42	22.68
36	TC	82.8	77.6	71.0	85.5	79.7	74.6	87.1	82.2	77.7
	SHC	45.3	53.6	71.0	51.3	62.8	74.6	57.1	70.3	77.7
	kW	24.70	23.77	22.60	25.18	24.14	23.25	25.46	24.59	23.79
40	TC	80.0	74.5	68.6	82.4	76.7	72.2	83.9	79.2	75.2
	SHC	44.2	52.7	68.6	50.2	61.5	72.2	56.1	69.0	75.2
	kW	26.00	24.83	23.61	26.50	25.31	24.36	26.81	25.82	24.98
44	TC	77.3	71.3	66.1	79.4	73.8	69.7	80.8	76.2	72.6
	SHC	43.2	51.8	66.1	49.2	60.3	69.7	55.0	67.7	72.6
	kW	27.19	25.91	24.80	27.66	26.45	25.56	27.95	26.96	26.20
48	TC	—	68.5	63.3	—	71.7	67.3	—	—	70.7
	SHC	—	51.0	63.3	—	59.4	67.3	—	—	70.7
	kW	—	27.02	25.68	—	27.83	26.71	—	—	27.56
52	TC	—	65.6	61.0	—	—	65.0	—	—	—
	SHC	—	50.2	61.0	—	—	65.0	—	—	—
	kW	—	27.96	26.75	—	—	27.81	—	—	—

38AKS028/40RM034 WITH STANDARD 3-ROW COIL										
Temp (C) Air Entering Condenser (Edb)		Evaporator Air — L/s								
		4250			5650			7050		
		Evaporator Air — Ewb (C)								
		22	20	16	22	20	16	22	20	16
24	TC	99.5	92.5	85.7	102.5	95.8	90.0	104.3	98.7	93.5
	SHC	54.0	65.4	85.7	61.7	75.3	90.0	68.7	84.4	93.5
	kW	20.71	20.16	19.62	20.94	20.42	19.96	21.09	20.54	20.24
28	TC	93.9	86.8	80.8	96.4	90.0	85.0	98.0	92.7	88.4
	SHC	51.9	63.0	80.8	59.6	72.7	85.0	66.6	81.7	88.4
	kW	22.94	22.05	21.30	23.25	22.45	21.82	23.45	22.78	22.25
32	TC	91.0	83.8	78.2	93.3	86.9	82.3	94.8	89.5	85.7
	SHC	50.8	61.8	78.2	58.5	71.4	82.3	65.5	80.3	85.7
	kW	24.29	23.22	22.38	24.64	23.68	23.00	24.86	24.08	23.51
36	TC	87.9	80.8	75.6	90.0	83.8	79.6	91.4	86.3	83.0
	SHC	49.6	60.5	75.6	57.3	70.0	79.6	64.4	78.9	83.0
	kW	25.61	24.34	23.42	25.98	24.87	24.14	26.22	25.32	24.73
40	TC	84.8	77.7	73.0	86.6	80.6	76.9	87.9	83.0	80.1
	SHC	48.4	59.2	73.0	56.1	68.6	76.9	63.2	77.4	80.1
	kW	27.00	25.50	24.52	27.38	26.11	25.34	27.64	26.62	26.02
44	TC	81.8	74.6	70.2	—	77.4	74.1	—	79.8	77.3
	SHC	47.3	57.9	70.2	—	67.2	74.1	—	76.0	77.3
	kW	28.17	26.62	25.68	—	27.23	26.52	—	27.74	27.20
48	TC	—	72.5	67.8	—	—	72.2	—	—	—
	SHC	—	57.1	67.8	—	—	72.2	—	—	—
	kW	—	28.03	26.82	—	—	27.96	—	—	—
52	TC	—	—	65.3	—	—	—	—	—	—
	SHC	—	—	65.3	—	—	—	—	—	—
	kW	—	—	27.88	—	—	—	—	—	—

**LEGEND**

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

**NOTES:**

1. Direct interpolation is permissible. Do not extrapolate.
2. SHC is based on 26.7 C db air entering indoor coil.
3. Formulas:

$$Ldb\ C = Edb\ C - \frac{SHC_{kW} \times 1000}{1.23 \times L/s}$$

Lwb = wet-bulb temperature corresponding to enthalpy air leaving indoor coil (h<sub>lwb</sub>)

$$Ldb\ C: h_{lwb} = h_{ewb} - \frac{TC_{kW} \times 1000}{1.20 \times L/s}$$

where h<sub>ewb</sub> = enthalpy of air entering evaporator coil (kJ/kg).

4. Capacities are based on 7.6 actual m (12.2 equivalent m) of interconnecting piping sized to the outdoor unit field connections. (Equivalent length is equal to the actual length plus a 50% allowance for fitting losses.) For other equivalent lengths, refer to the Carrier System Design Manual, Part 3, for line losses.

# Performance data (cont)



## CONDENSING UNIT COMBINATION RATINGS — 3-ROW COILS — 50 Hz, SI (cont)

### 38AKS034 UNIT

38AKS034/40RM028 WITH STANDARD 3-ROW COIL										
Temp (C) Air Entering Condenser (Edb)		Evaporator Air — L/s								
		3500			4700			5900		
		Evaporator Air — Ewb (C)								
		22	20	16	22	20	16	22	20	16
24	TC	100.5	98.5	86.7	104.9	98.6	90.5	107.4	101.6	93.8
	SHC	51.9	59.4	86.7	58.1	71.0	90.5	64.0	78.9	93.8
	kW	22.37	22.22	21.34	22.69	22.23	21.63	22.88	22.45	21.87
28	TC	95.4	92.3	82.0	99.2	93.0	85.8	101.5	95.9	89.1
	SHC	49.9	57.7	82.0	56.1	68.6	85.8	62.0	76.4	89.1
	kW	24.32	23.96	22.78	24.77	24.05	23.22	25.02	24.38	23.59
32	TC	92.8	89.1	79.5	96.4	90.2	83.4	98.6	93.0	86.6
	SHC	49.0	55.8	79.5	55.2	67.3	83.4	61.0	75.1	86.6
	kW	25.59	25.09	23.80	26.08	25.24	24.32	26.37	25.62	24.76
36	TC	90.2	86.1	77.3	93.6	87.5	81.1	95.6	90.2	84.3
	SHC	48.0	56.0	77.3	54.2	66.1	81.1	60.0	73.9	84.3
	kW	26.91	25.25	24.85	27.45	26.57	25.46	27.77	26.91	25.97
40	TC	87.5	82.9	74.9	90.7	84.6	78.7	92.5	87.3	81.9
	SHC	47.0	55.1	74.9	53.1	64.9	78.7	59.0	72.6	81.9
	kW	28.16	27.41	26.10	26.68	27.68	26.72	28.98	28.12	27.24
44	TC	84.7	79.6	72.4	87.7	81.6	76.1	89.4	84.2	79.3
	SHC	46.0	54.2	72.4	52.1	63.6	76.1	57.9	71.2	79.3
	kW	29.38	28.32	26.80	29.99	28.72	27.59	30.35	29.28	28.25
48	TC	82.8	76.3	68.8	86.0	79.0	73.1	88.0	82.0	76.8
	SHC	45.3	53.2	68.8	51.5	62.5	73.1	57.5	70.3	76.8
	kW	30.70	29.30	27.66	31.40	29.87	28.60	31.83	30.53	29.39
52	TC	80.1	73.1	66.4	83.0	76.0	70.7	84.9	79.0	74.3
	SHC	44.3	52.3	66.4	50.5	61.2	70.7	56.4	68.9	74.3
	kW	31.95	30.27	28.65	32.65	30.98	29.69	33.11	31.70	30.56

38AKS034/40RM034 WITH STANDARD 3-ROW COIL										
Temp (C) Air Entering Condenser (Edb)		Evaporator Air — L/s								
		4250			5650			7050		
		Evaporator Air — Ewb (C)								
		22	20	16	22	20	16	22	20	16
24	TC	107.5	100.9	92.9	111.2	104.4	97.3	113.4	107.4	100.9
	SHC	57.1	68.9	92.9	64.7	79.0	97.3	71.7	88.3	100.9
	kW	22.89	22.40	21.81	23.16	22.66	22.13	23.33	22.88	22.40
28	TC	101.9	95.0	87.8	105.1	98.4	92.1	107.0	101.3	95.7
	SHC	55.0	66.4	87.8	62.6	76.4	92.1	69.6	85.5	95.7
	kW	25.07	24.27	23.44	25.44	24.66	23.94	25.66	25.00	24.36
32	TC	99.1	92.0	85.1	102.1	95.3	89.5	104.0	98.2	93.0
	SHC	53.9	65.2	85.1	61.5	75.1	89.5	68.6	84.2	93.0
	kW	26.44	25.48	24.56	26.85	25.94	25.14	27.10	26.32	25.62
36	TC	96.2	89.0	82.7	98.9	92.3	86.9	100.7	95.1	90.4
	SHC	52.8	64.0	82.7	60.4	73.8	86.9	67.5	82.8	90.4
	kW	27.87	26.73	25.71	28.31	27.25	26.39	28.59	27.70	26.95
40	TC	93.3	86.0	80.0	95.8	89.2	84.2	97.4	92.0	87.7
	SHC	51.7	62.7	80.0	59.3	72.4	84.2	66.4	81.4	87.7
	kW	29.10	27.91	26.94	29.51	28.44	27.63	29.78	28.89	28.19
44	TC	90.2	82.8	77.3	92.5	86.0	81.5	94.0	88.7	84.9
	SHC	50.5	61.4	77.3	58.2	71.0	81.5	65.3	79.9	84.9
	kW	30.52	28.98	27.82	31.00	29.64	28.70	31.31	30.20	29.41
48	TC	89.0	80.3	74.1	91.6	84.0	79.0	93.4	87.1	83.0
	SHC	50.0	60.3	74.1	57.9	70.1	79.0	65.0	79.2	83.0
	kW	32.05	30.15	28.82	32.61	30.96	29.88	32.99	32.64	30.74
52	TC	—	77.2	71.5	—	80.8	76.3	—	83.8	80.2
	SHC	—	59.0	71.5	—	68.7	76.3	—	77.7	80.2
	kW	—	31.25	29.88	—	32.12	31.04	—	32.85	31.98

### 38AKS044 UNIT

38AKS044/40RM034 WITH STANDARD 3-ROW COIL										
Temp (C) Air Entering Condenser (Edb)		Evaporator Air — L/s								
		4250			5650			7050		
		Evaporator Air — Ewb (C)								
		22	20	16	22	20	16	22	20	16
24	TC	125.9	118.7	105.4	132.8	123.7	111.1	136.7	128.1	115.8
	SHC	64.2	76.3	105.4	72.2	87.5	111.1	79.4	97.5	115.8
	kW	29.60	29.04	28.01	30.14	29.43	28.45	30.44	29.77	28.82
28	TC	121.1	114.0	102.1	127.1	118.6	107.5	130.6	122.6	112.0
	SHC	62.4	74.3	102.1	70.3	85.2	107.5	77.4	95.1	112.0
	kW	32.30	31.50	30.16	32.98	32.02	30.77	33.36	32.47	31.27
32	TC	118.8	112.0	101.3	124.2	116.3	106.3	127.2	119.9	110.4
	SHC	61.5	73.5	101.3	69.2	84.2	106.3	76.2	93.9	110.4
	kW	33.92	32.94	31.41	34.68	33.55	32.13	35.12	34.08	32.72
36	TC	115.9	108.8	98.4	120.9	113.0	103.5	123.9	116.7	107.7
	SHC	60.3	72.1	98.4	68.1	82.8	103.5	75.2	92.4	107.7
	kW	35.55	34.43	32.81	36.35	35.10	33.61	36.81	35.68	34.26
40	TC	112.3	104.9	95.0	117.1	109.1	100.1	119.9	112.7	104.3
	SHC	59.0	70.5	95.0	66.8	81.1	100.1	73.8	90.6	104.3
	kW	37.31	36.03	34.35	38.13	36.75	35.22	38.61	37.38	35.94
44	TC	109.3	101.6	92.2	113.9	105.8	97.3	116.6	109.4	101.5
	SHC	57.8	69.2	92.2	65.7	79.6	97.3	72.7	89.2	101.5
	kW	38.86	37.43	35.68	39.71	38.21	36.63	40.21	38.88	37.41
48	TC	106.5	97.9	88.3	111.2	102.4	93.9	114.0	106.3	98.4
	SHC	56.8	67.6	88.3	64.7	78.2	93.9	71.9	87.8	98.4
	kW	40.58	38.61	36.43	41.64	39.64	37.69	42.28	40.53	38.72
52	TC	103.5	94.7	85.7	107.9	99.2	91.2	110.5	103.0	95.7
	SHC	55.6	66.3	85.7	63.6	76.7	91.2	70.7	86.3	95.7
	kW	42.27	40.10	37.87	43.34	41.19	39.22	43.99	42.13	40.33

#### LEGEND

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

#### NOTES:

1. Direct interpolation is permissible. Do not extrapolate.
2. SHC is based on 26.7 C db air entering indoor coil.
3. Formulas:

$$\text{Ldb C} = \text{Edb C} - \frac{\text{SHC}_{\text{kW}} \times 1000}{1.23 \times \text{L/s}}$$

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

$$\text{Ldb C: } h_{\text{lwb}} = h_{\text{ewb}} - \frac{\text{TC}_{\text{kW}} \times 1000}{1.20 \times \text{L/s}}$$

where  $h_{\text{ewb}}$  = enthalpy of air entering evaporator coil (kJ/kg).

4. Capacities are based on 7.6 actual m (12.2 equivalent m) of interconnecting piping sized to the outdoor unit field connections. (Equivalent length is equal to the actual length plus a 50% allowance for fitting losses.) For other equivalent lengths, refer to the Carrier System Design Manual, Part 3, for line losses.





**CONDENSING UNIT COMBINATION RATINGS — 4-ROW HIGH-CAPACITY COILS — 50 Hz, SI**  
**38AKS028 UNIT — HIGH CAPACITY**

38AKS028/40RM024 WITH 4-ROW HIGH-CAPACITY COILS										
Temp (C) Air Entering Condenser (Edb)		Evaporator Air — L/s								
		2830			3780			4720		
		Evaporator Air — Ewb (C)								
		17	19	22	17	19	22	17	19	22
29	TC	75.4	82.6	90.3	80.3	87.6	95.4	83.4	90.9	98.8
	SHC kW	60.2 21.83	48.3 22.91	36.1 24.02	71.3 22.58	56.2 23.64	40.6 24.76	80.6 23.05	63.7 24.14	45.0 25.26
35	TC	72.0	79.0	86.4	76.6	83.7	91.1	79.6	86.6	94.1
	SHC kW	58.9 23.31	47.0 24.51	34.9 25.75	69.8 24.13	55.0 25.32	39.5 26.55	79.6 24.63	62.5 25.80	44.0 27.05
38	TC	70.3	77.2	84.4	74.6	81.7	89.0	77.7	84.4	91.8
	SHC kW	58.2 24.04	46.4 25.28	34.4 26.58	69.0 24.85	54.4 26.12	39.0 27.40	77.7 25.39	61.9 26.60	43.4 27.92
41	TC	68.6	75.3	82.4	72.8	79.6	86.8	76.2	82.2	89.5
	SHC kW	57.6 24.80	45.8 26.11	33.8 27.46	68.4 25.62	53.8 26.96	38.4 28.31	76.2 26.27	61.2 27.46	42.9 28.81
46	TC	65.2	71.6	78.3	69.1	75.4	82.2	72.8	77.8	84.7
	SHC kW	56.3 26.26	44.7 27.68	32.6 29.15	66.8 27.11	52.6 28.52	37.3 29.99	72.8 27.95	60.0 29.06	41.7 30.52

38AKS028/40RM028 WITH 4-ROW HIGH-CAPACITY COILS										
Temp (C) Air Entering Condenser (Edb)		Evaporator Air — L/s								
		3540			4720			5900		
		Evaporator Air — Ewb (C)								
		17	19	22	17	19	22	17	19	22
29	TC	77.1	84.3	91.7	81.3	88.3	95.8	85.2	91.0	98.6
	SHC kW	67.1 22.01	53.1 23.07	38.5 24.15	78.8 22.65	62.1 23.67	43.8 24.75	85.2 23.20	70.6 24.06	48.9 25.15
35	TC	73.7	80.4	87.6	77.5	84.2	91.4	81.8	86.6	93.8
	SHC kW	65.8 23.52	51.8 24.68	37.4 25.87	77.5 24.18	60.9 25.34	42.8 26.51	81.8 24.90	69.4 25.71	47.9 26.92
38	TC	71.9	78.6	85.5	75.7	82.1	89.2	80.1	84.4	91.4
	SHC kW	65.1 24.25	51.3 25.47	36.9 26.71	75.7 24.94	60.3 26.12	42.3 27.39	80.1 25.75	68.7 26.52	47.4 27.77
41	TC	70.2	76.6	83.4	74.1	80.0	86.8	78.3	82.1	89.0
	SHC kW	64.4 25.01	50.7 26.27	36.3 27.57	74.1 25.76	59.7 26.93	41.7 28.24	78.3 26.61	68.1 27.34	46.8 28.65
46	TC	66.5	72.7	79.1	70.8	75.7	82.2	74.7	77.7	84.2
	SHC kW	63.0 26.45	49.5 27.84	35.3 29.26	70.8 27.41	58.5 28.49	40.7 29.92	74.7 28.27	66.8 28.94	45.7 30.35

38AKS028/40RM034 WITH 4-ROW HIGH-CAPACITY COILS										
Temp (C) Air Entering Condenser (Edb)		Evaporator Air — L/s								
		4250			5660			7080		
		Evaporator Air — Ewb (C)								
		17	19	22	17	19	22	17	19	22
29	TC	81.9	89.4	97.2	86.8	93.1	101.0	91.6	95.6	103.4
	SHC kW	76.0 22.84	60.0 23.92	42.9 25.03	86.8 23.51	70.8 24.46	49.3 25.57	91.6 24.21	80.7 24.82	55.3 25.92
35	TC	78.2	85.3	92.8	83.4	88.7	96.2	87.8	91.0	98.5
	SHC kW	74.8 24.40	58.8 25.59	41.8 26.84	83.4 25.26	69.5 26.15	48.1 27.39	87.8 25.98	79.4 26.54	54.3 27.76
38	TC	76.2	83.1	90.6	81.7	86.4	93.8	85.9	88.7	96.0
	SHC kW	73.8 25.14	58.2 26.38	41.3 27.70	81.7 26.10	68.9 26.97	47.6 28.27	85.9 26.84	78.7 27.38	53.7 28.66
41	TC	74.3	81.0	88.2	79.9	84.2	91.4	84.0	86.3	93.5
	SHC kW	72.7 25.92	57.6 27.22	40.7 28.58	79.9 26.99	68.3 27.83	47.1 29.18	84.0 27.77	77.9 28.24	53.2 29.59
46	TC	70.6	76.7	83.6	76.2	79.7	86.5	80.1	81.5	88.4
	SHC kW	70.6 27.44	56.3 28.82	39.6 30.28	76.2 28.68	67.0 29.46	46.0 30.91	80.1 29.54	76.4 29.85	52.1 31.32

**LEGEND**

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

**NOTES:**

1. Direct interpolation is permissible. Do not extrapolate.
2. SHC is based on 26.7 C db air entering indoor coil.
3. Formulas:

$$Ldb\ C = Edb\ C - \frac{SHC_{kW} \times 1000}{1.23 \times L/s}$$

Lwb = wet-bulb temperature corresponding to enthalpy air leaving indoor coil (h<sub>lwb</sub>)

$$Ldb\ C: h_{lwb} = h_{ewb} - \frac{TC_{kW} \times 1000}{1.20 \times L/s}$$

where h<sub>ewb</sub> = enthalpy of air entering evaporator coil (kJ/kg).

4. Capacities are based on 7.6 actual m (12.2 equivalent m) of interconnecting piping sized to the outdoor unit field connections. (Equivalent length is equal to the actual length plus a 50% allowance for fitting losses.) For other equivalent lengths, refer to the Carrier System Design Manual, Part 3, for line losses.

# Performance data (cont)



## CONDENSING UNIT COMBINATION RATINGS — 4-ROW HIGH-CAPACITY COILS — 50 Hz, SI (cont)

### 38AKS034 UNIT — HIGH CAPACITY

38AKS034/40RM028 WITH 4-ROW HIGH-CAPACITY COILS										
Temp (C) Air Entering Condenser (Edb)		Evaporator Air — L/s								
		3540			4720			5900		
		Evaporator Air — Ewb (C)								
		17	19	22	17	19	22	17	19	22
29	TC	82.0	89.5	97.4	86.3	93.9	101.8	89.9	96.9	104.8
	SHC	69.0	54.8	40.1	81.1	63.7	45.3	89.9	72.3	50.4
	kW	23.75	24.89	26.04	24.40	25.54	26.70	24.96	25.98	27.15
35	TC	78.5	85.7	93.3	82.7	89.8	97.4	86.5	92.6	100.2
	SHC	67.6	53.5	39.0	79.6	62.5	44.2	86.5	71.1	49.3
	kW	25.19	26.45	27.75	25.93	27.17	28.43	26.59	27.65	28.90
38	TC	76.7	83.8	91.1	80.8	87.8	95.2	84.8	90.4	97.8
	SHC	66.9	52.9	38.4	78.7	62.0	43.7	84.8	70.5	48.8
	kW	25.88	27.20	28.55	26.67	27.94	29.27	27.39	28.43	29.76
41	TC	74.9	81.8	88.9	78.7	85.6	92.9	83.0	88.1	95.4
	SHC	66.3	52.3	37.8	78.7	61.4	43.1	83.0	69.8	48.3
	kW	26.61	27.98	29.38	27.39	28.74	30.13	28.22	29.23	30.63
46	TC	71.2	77.7	84.5	75.0	81.2	88.2	79.4	83.4	90.4
	SHC	64.9	51.0	36.7	75.0	60.1	42.1	79.4	68.5	47.1
	kW	27.99	29.48	31.00	28.88	30.27	31.81	29.86	30.76	32.29

38AKS034/40RM034 WITH 4-ROW HIGH-CAPACITY COILS										
Temp (C) Air Entering Condenser (Edb)		Evaporator Air — L/s								
		4250			5660			7080		
		Evaporator Air — Ewb (C)								
		17	19	22	17	19	22	17	19	22
29	TC	87.2	95.0	103.1	91.6	99.2	107.4	96.6	101.8	110.0
	SHC	78.5	61.7	44.4	91.6	72.5	50.8	96.6	82.6	56.8
	kW	24.55	25.70	26.90	25.21	26.34	27.53	25.95	26.72	27.91
35	TC	83.4	90.9	98.7	88.1	94.7	102.6	93.0	97.2	105.1
	SHC	76.9	60.5	43.3	88.1	71.3	49.7	93.0	81.2	55.7
	kW	26.07	27.35	28.66	26.87	27.99	29.32	27.72	28.39	29.73
38	TC	81.5	88.9	96.5	86.4	92.5	100.2	91.1	94.8	102.6
	SHC	76.2	59.9	42.7	86.4	70.6	49.1	91.1	80.6	55.2
	kW	26.88	28.15	29.51	27.69	28.80	30.17	28.56	29.21	30.58
41	TC	79.6	86.7	94.2	84.6	90.1	97.7	89.1	92.4	100.0
	SHC	75.4	59.3	42.1	84.6	70.0	48.6	89.1	79.9	54.6
	kW	27.57	28.97	30.40	28.55	29.63	31.06	29.42	30.06	31.49
46	TC	75.5	82.2	89.5	81.0	85.4	92.6	85.1	87.6	94.8
	SHC	73.5	58.0	41.0	81.0	68.7	47.4	85.1	78.4	53.5
	kW	28.99	30.49	32.08	30.21	31.18	32.75	31.11	31.66	33.21

### 38AKS044 UNIT — HIGH CAPACITY

38AKS044/40RM034 WITH 4-ROW HIGH-CAPACITY COILS										
Temp (C) Air Entering Condenser (Edb)		Evaporator Air — L/s								
		4250			5660			7080		
		Evaporator Air — Ewb (C)								
		17	19	22	17	19	22	17	19	22
29	TC	101.8	110.9	120.4	107.5	116.6	126.2	111.3	120.2	129.9
	SHC	84.1	66.8	49.1	99.1	77.7	55.4	111.3	87.8	61.4
	kW	33.03	34.90	36.81	34.20	36.06	38.02	34.97	36.77	38.73
35	TC	97.8	106.5	115.7	102.9	111.7	120.9	107.1	115.1	124.3
	SHC	82.6	65.4	47.8	97.1	76.2	54.1	107.1	86.4	60.1
	kW	34.80	36.76	38.83	35.94	37.95	40.03	36.90	38.70	40.79
38	TC	95.8	104.3	113.2	100.7	109.3	118.2	105.2	112.5	121.4
	SHC	81.8	64.7	47.2	96.2	75.5	53.4	105.2	85.7	59.5
	kW	35.71	37.74	39.87	36.87	38.91	41.05	37.96	39.69	41.83
41	TC	93.7	102.1	110.8	98.6	106.8	115.5	103.1	109.9	118.6
	SHC	81.0	64.0	46.5	95.2	74.8	52.8	103.1	85.0	58.8
	kW	36.56	38.69	40.89	37.78	39.85	42.05	38.93	40.65	42.84
46	TC	89.4	97.3	105.6	93.8	101.7	109.9	98.8	104.6	112.8
	SHC	79.4	62.5	45.1	93.8	73.3	51.4	98.8	83.5	57.5
	kW	38.19	40.43	42.74	39.46	41.63	43.95	40.85	42.46	44.79

#### LEGEND

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

#### NOTES:

1. Direct interpolation is permissible. Do not extrapolate.
2. SHC is based on 26.7 C db air entering indoor coil.
3. Formulas:

$$\text{Ldb C} = \text{Edb C} - \frac{\text{SHC}_{\text{kW}} \times 1000}{1.23 \times \text{L/s}}$$

Lwb = wet-bulb temperature corresponding to enthalpy air leaving indoor coil (h<sub>lwb</sub>)

$$\text{Ldb C: } h_{\text{lwb}} = h_{\text{ewb}} - \frac{\text{TC}_{\text{kW}} \times 1000}{1.20 \times \text{L/s}}$$

where h<sub>ewb</sub> = enthalpy of air entering evaporator coil (kJ/kg).

4. Capacities are based on 7.6 actual m (12.2 equivalent m) of interconnecting piping sized to the outdoor unit field connections. (Equivalent length is equal to the actual length plus a 50% allowance for fitting losses.) For other equivalent lengths, refer to the Carrier System Design Manual, Part 3, for line losses.





**38AKS028-044 UNIT ESTIMATED RADIATED SOUND POWER LEVELS, dB — 60 Hz**

UNIT	OCTAVE BAND								dBA
	63	125	250	500	1000	2000	4000	8000	
<b>38AKS028</b>	95	95	93	90	89	84	82	81	93.5
<b>38AKS034</b>	96	96	94	91	90	85	83	83	94.6
<b>38AKS044</b>	99	99	96	93	92	88	86	86	96.9

NOTES:

- Estimated sound power levels, dB re 1 Picowatt.
- 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.
- Since this data is estimated, the sound power levels should not be guaranteed or certified as being the actual sound power levels.
- The acoustic center of the unit is located at the geometric center of the unit.

**38AKS028-034 UNIT ESTIMATED RADIATED SOUND POWER LEVELS, dB — 50 Hz**

UNIT	OCTAVE BAND CENTER FREQUENCY, Hz								dB(A)
	63	125	250	500	1000	2000	4000	8000	
<b>38AKS028</b>	97.7	93.3	91.0	88.7	88.4	84.5	77.8	74.0	92.4
<b>38AKS034</b>	98.5	94.1	91.8	89.5	89.2	85.3	78.6	74.8	93.2
<b>38AKS044</b>	101.5	97.3	94.4	92.1	91.3	87.5	81.5	78.1	95.6

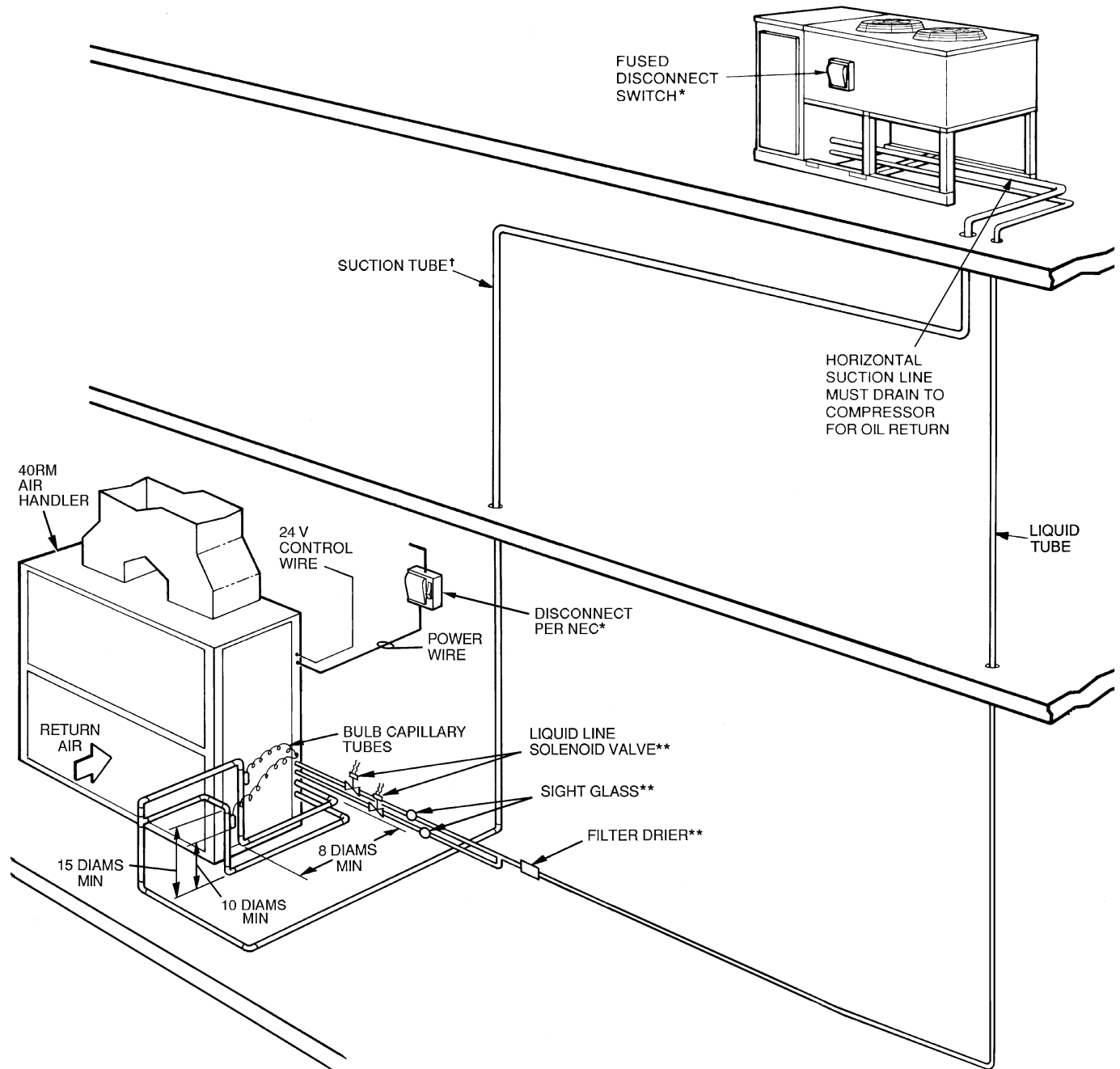
NOTES:

- Estimated sound power levels, dB re 1 Picowatt.  
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 (Air Conditioning and Refrigeration Institute, U.S.A. Standard) standard 370 for large outdoor refrigerating and air conditioning equipment.
- Since this data is estimated, the sound power levels should not be guaranteed or certified as being the actual sound power levels. The acoustic center of the unit is located at the geometric center of the unit.

# Typical piping and wiring



## 38AKS028-044 UNIT ROOFTOP INSTALLATION



### LEGEND

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

\*Field supplied.

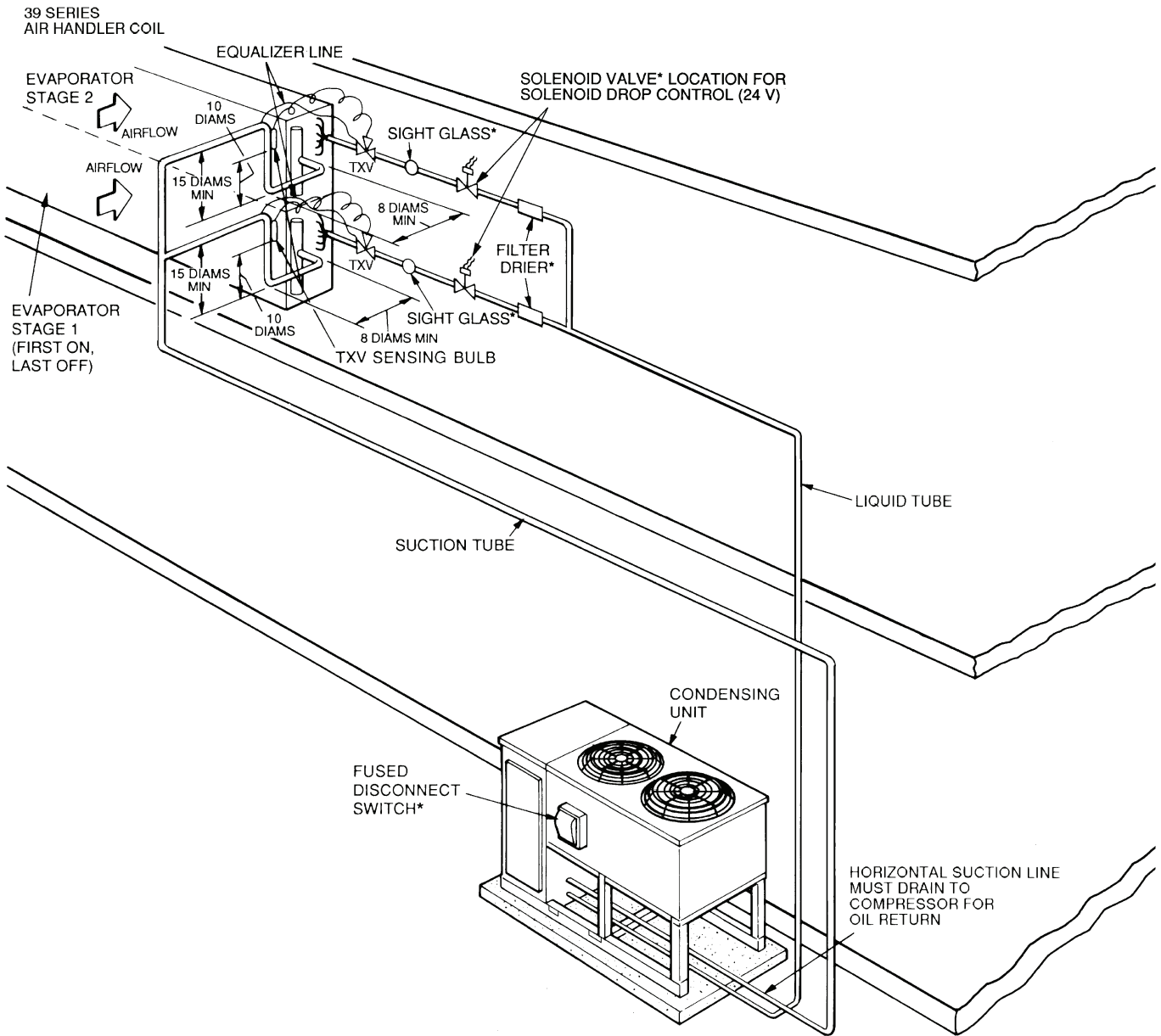
†Double riser may be required. Consult Application section for details.

\*\*Refer to Refrigerant Specialties Part Numbers table on page 35.

### 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.

### 38AKS028-044 UNIT GROUND-LEVEL INSTALLATION



**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.

# Electrical data



## 38AKS028-044 UNIT ELECTRICAL DATA — 60 Hz

UNIT 38AKS	NOMINAL VOLTAGE (3 Ph, 60 Hz)	VOLTAGE RANGE*		FLA	COMPRESSOR		FAN MOTORS		POWER SUPPLY		
		Min	Max		RLA	LRA	Qty	FLA (ea)	MCA	MOCPT†	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
- LRA** — Locked Rotor Amps
- MCA** — Minimum Circuit Amps
- MOCPT** — Maximum Overcurrent Protection
- RLA** — Rated Load Amps
- UL** — Underwriters Laboratories

†Fuse or HACR circuit breaker.

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

### NOTES:

1. Maximum instantaneous current flow during starting is 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.
2. Minimum circuit amps complies with National Electrical Code (NEC), Section 430-24.

\*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.

## 38AKS028-044 UNIT ELECTRICAL DATA — 50 Hz

UNIT 38AKS	NOMINAL VOLTAGE* (3 Ph, 50 Hz)	VOLTAGE RANGE†		COMPRESSOR		FAN MOTOR		POWER SUPPLY	
		Min	Max	RLA	LRA	Qty	FLA (ea)	MCA	MOCPT**
028	346	311	380	44.9	155	2	4.4	64.9	100
	230	198	254	76.9	205		6.4	109.0	175
	380/415	342	440	43.6	223		3.0	60.5	100
034	346	311	380	53.9	176	2	4.4	76.1	125
	230	198	254	85.9	220		6.4	120.2	200
	380/415	342	440	50.0	253		3.0	68.5	110
044	346	311	380	79.5	240	3	4.4	112.6	175
	230	198	254	105.1	327		6.4	150.6	250
	380/415	342	440	65.4	345		3.0	90.8	150

### LEGEND

- FLA** — Full Load Amps
- HACR** — Heating, Air Conditioning, Refrigeration
- LRA** — Locked Rotor Amps
- MCA** — Minimum Circuit Amps per NEC Section 430-24
- MOCPT** — Maximum Overcurrent Protection
- NEC** — National Electrical Code (U.S.A. Standard)
- RLA** — Rated Load Amps (Compressor)

\*\*Fuse or HACR circuit breaker.

### NOTES:

1. MCA and MOCPT values are calculated in accordance with NEC (National Electric Code) (U.S.A. Standard), Article 440.
2. Motor FLA and RLA values are established in accordance with UL (Underwriters Laboratories) Standard 1995 (U.S.A. standard).
3. The 230-v and 346-v units are part-wind-start units; the value under compressor LRA is for the first winding energized. The 400-v units are across-the-line-start units; value shown is for all windings energized.

\*Unit voltage 346-3-50 is available through special order only.

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



# Controls



## 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 7 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 (1793 kPag), 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 2½ minutes of operation, the compressor remains operational. If a high-pressure switch (HPS) trips at any time, or the LPS trips after 2½ 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

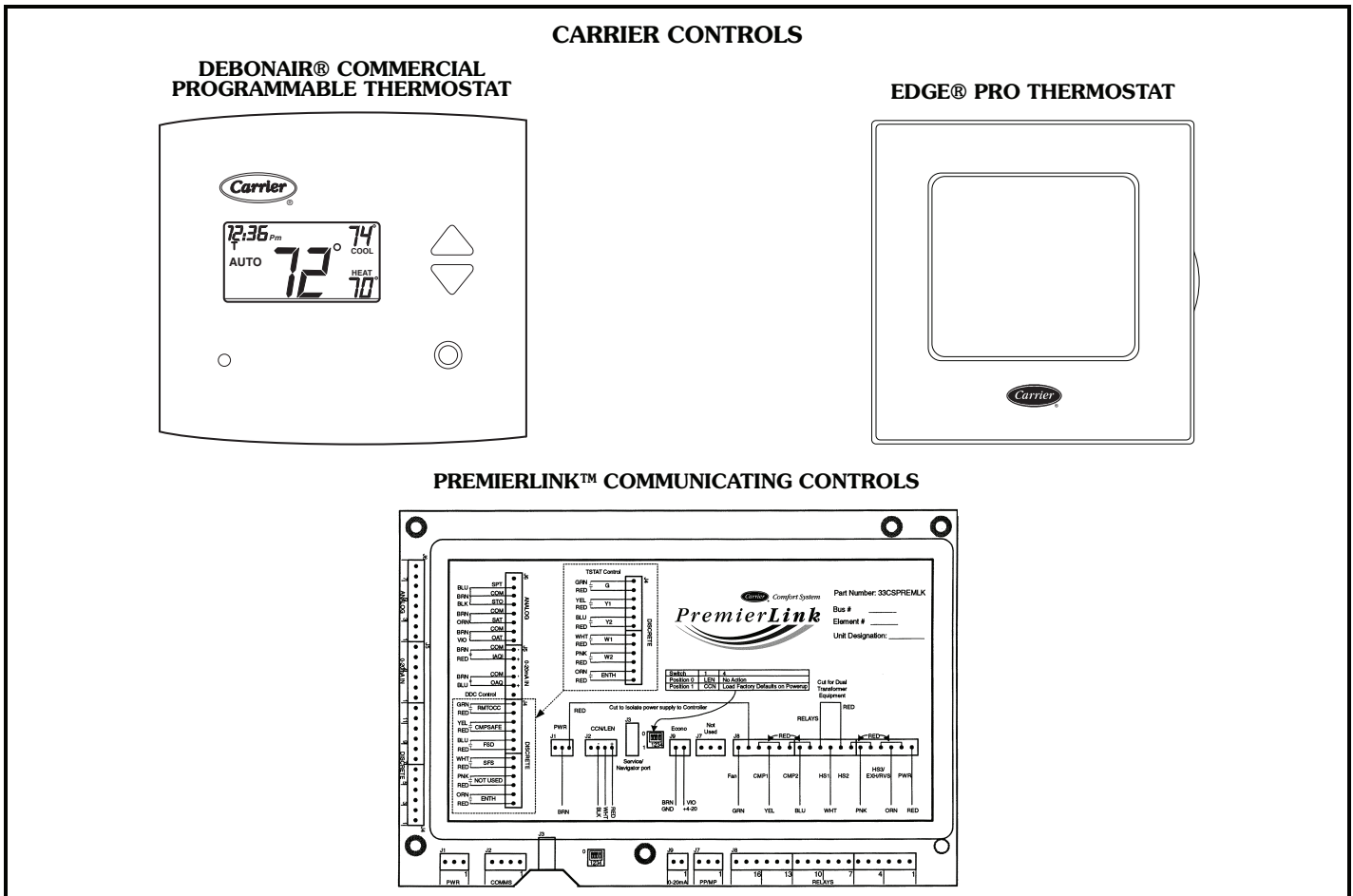
capacity control liquid line solenoid valve to deactivate the second stage coil. The compressor adjusts the number of active cylinders to meet the new load. When the space temperature is satisfied, the first stage of the thermostat opens and the control relay opens. This closes the solenoid drop control 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.

**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:

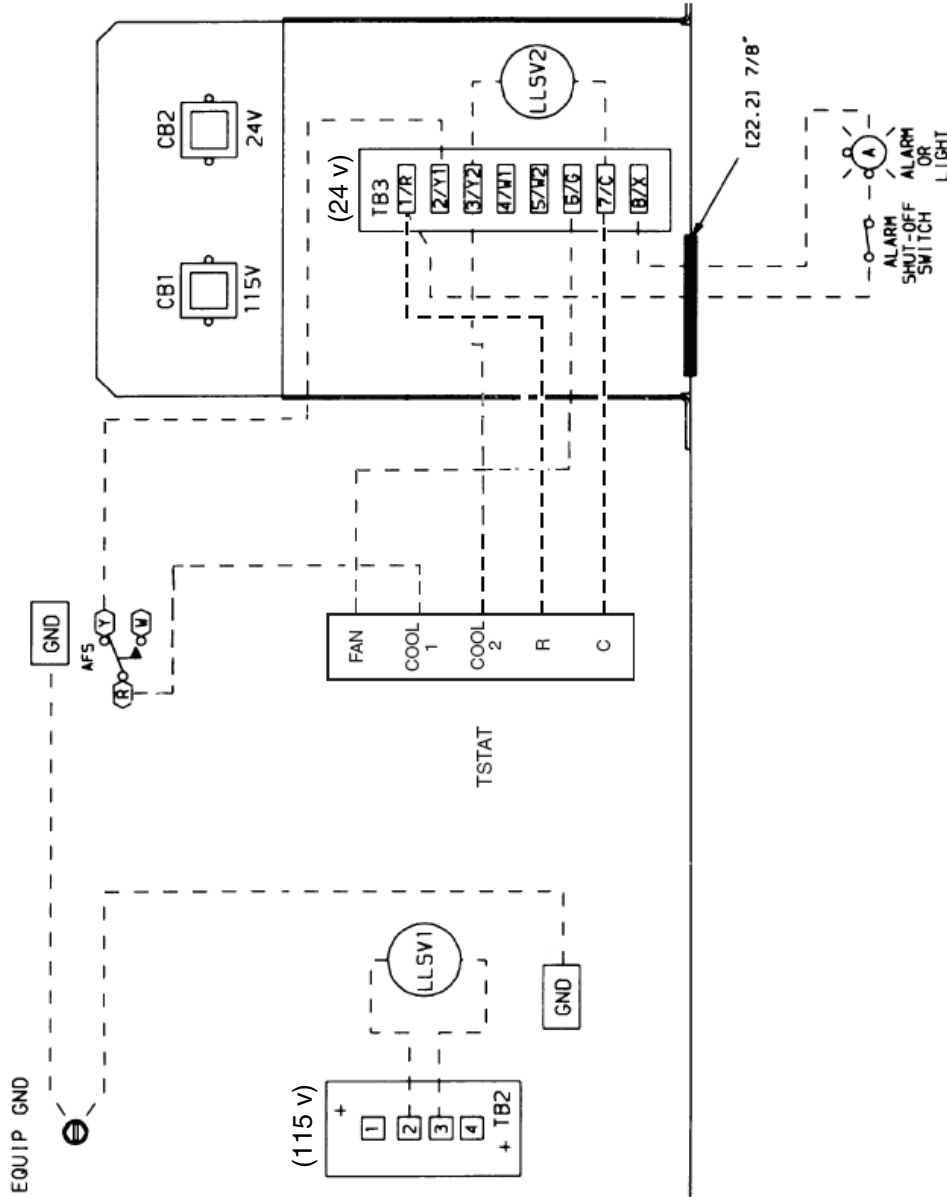
- interruption of supplied power
- open compressor overtemperature protection (COTP)
- compressor electrical overload protection (CB1 or CB2)
- open high-pressure or low-pressure safety switches
- open oil pressure switch



# Typical control wiring schematics

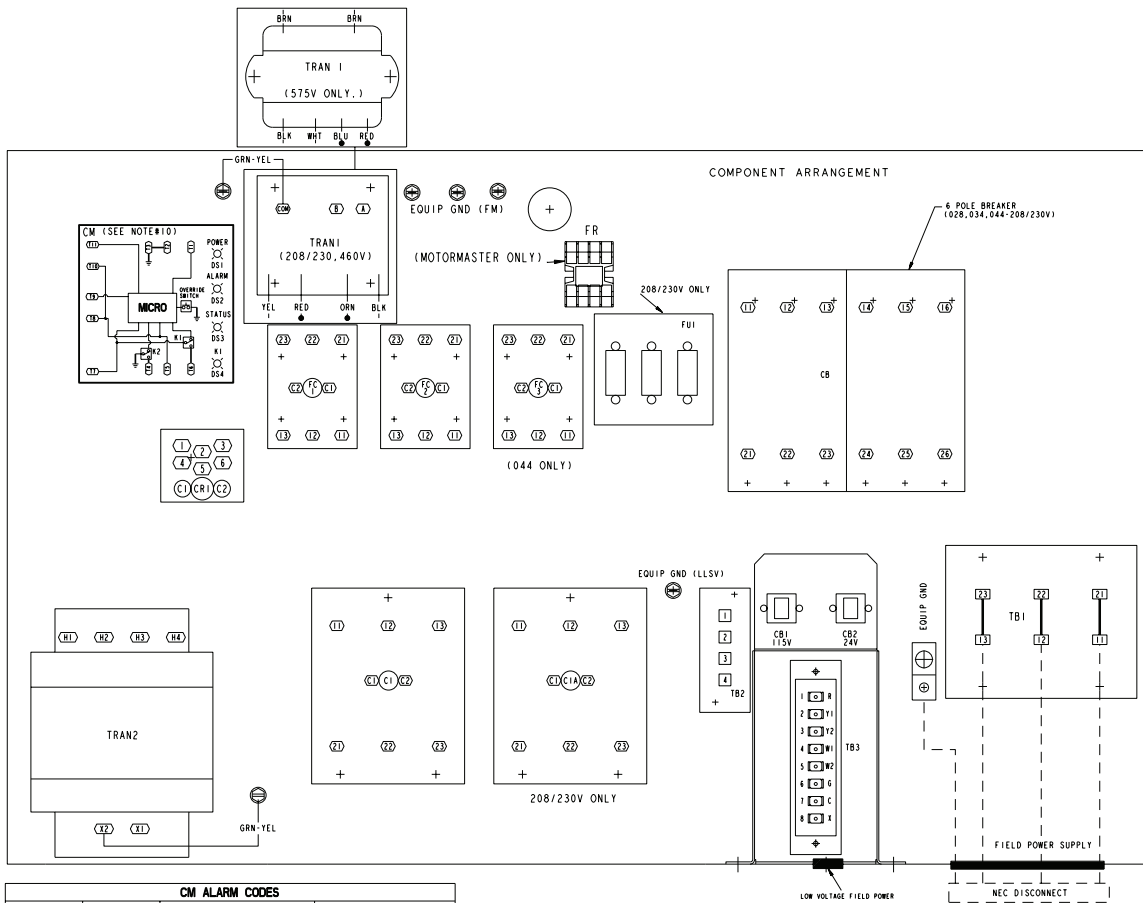


→ TYPICAL 38AKS028-044 UNITS WITH SINGLE AIR HANDLER



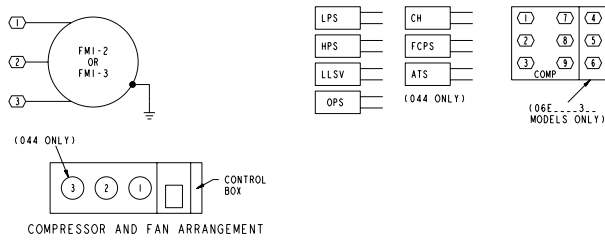
- LEGEND**
- AFS — Airflow Switch
  - CB — Circuit Breaker
  - EQUIP — Equipment
  - GND — Ground
  - LLSV — Liquid Line Solenoid Valve
  - TB — Terminal Block
  - TSTAT — Thermostat
  - Field Control Wiring — — — — —
  - Factory Wiring — — — — —
  - Field Power Wiring — — — — —
- NOTES:**
1. Factory wiring in accordance with NEC (National Electrical Code). Any field modifications or additions must be in compliance with all applicable codes.
  2. All field interlock contacts must have minimum rating of 180-va pilot duty plus capacity required for field-installed equipment. All field interlock contacts in the 24-v control circuit must have minimum rating of 70-va pilot duty plus capacity required for field-installed equipment.
  3. For internal unit wiring, reference wiring book or unit wiring label diagram. TB3 is 115-1-60, TB3 is 24-1-60.
  4. The following components are not located in the 38AKS unit control box: LLS1, LLS2, field control thermostat, AFS, alarm shut-off switch, and alarm or light.

### 38AKS028-044 UNIT — 60 Hz



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

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



#### LEGEND

- ATS** — Air Temperature Switch
  - C** — Contactor, Compressor
  - CB** — Circuit Breaker
  - CH** — Crankcase Heater
  - CM** — Control Module
  - COMP** — Compressor
  - COTP** — Compressor Overtemperature Protection
  - EQUIP** — Equipment
  - FC** — Fan Contactor
  - FCPS** — Fan Cycling Pressure Switch
  - FM** — Fan Motor
  - FR** — Fan Relay
  - FU** — Fuse
  - GND** — Ground
  - HPS** — High Pressure Switch
  - LED** — Light-Emitting Diode
  - LLSV** — Liquid Line Solenoid Valve
  - LPS** — Low Pressure Switch
  - OPS** — Oil Pressure Switch
  - TB** — Terminal Block
  - TRAN** — Transformer
- Terminal Block Connection
  - Marked Terminal
  - Unmarked Terminal
  - Marked Splice
  - Unmarked Splice
  - Factory Wire
  - Field Power Wiring
  - Indicates Common Potential, Does Not Represent Wiring.

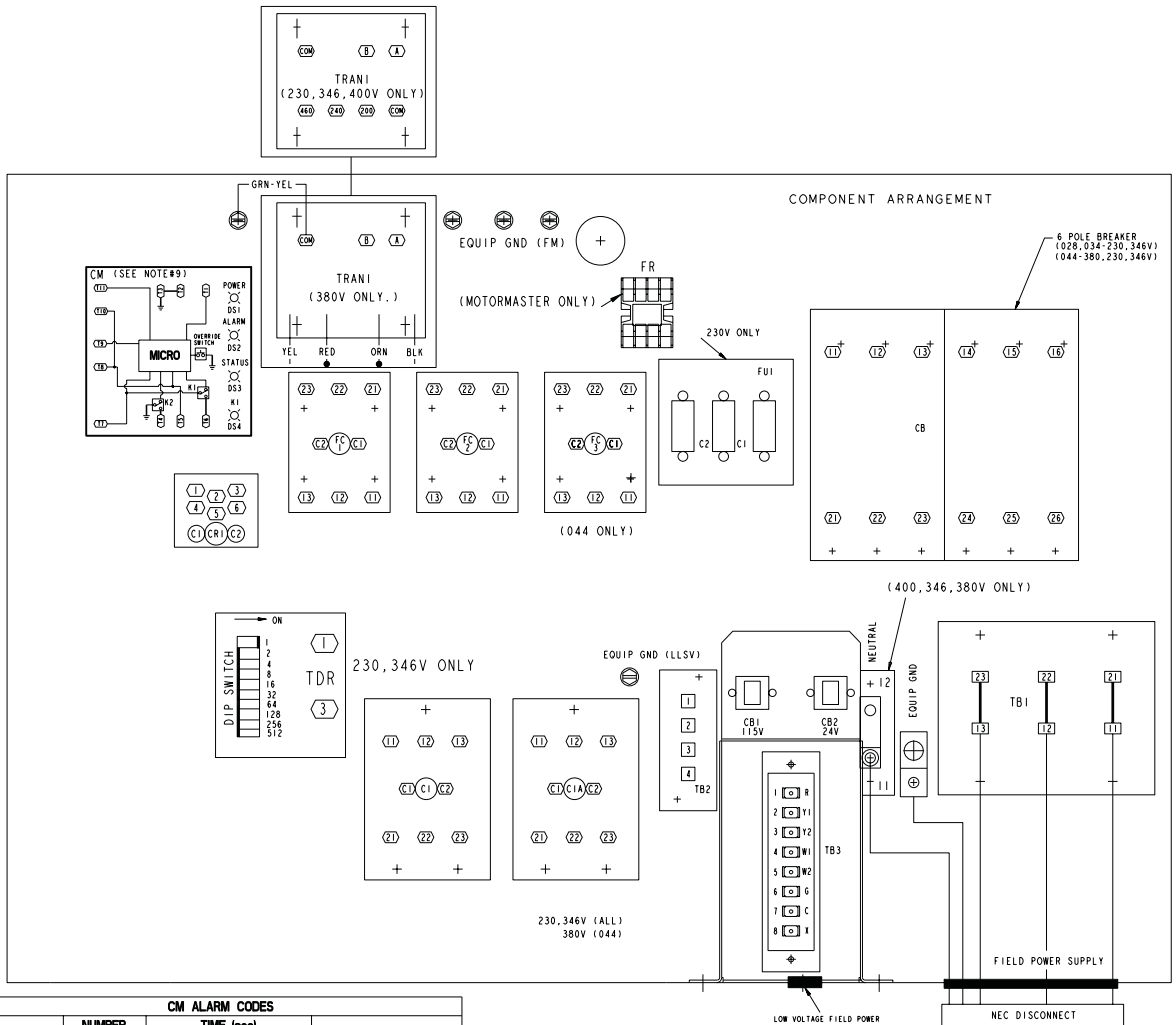
#### NOTES:

- Connect TRAN2 to terminal H3 for 230-v, H4 for 460-v, and H2 for 575-v units. If 208/230-v units are run with a 208-v power supply, connect to terminal H2.
- Connect TRAN1 to ORN lead for 230-v, BLK lead for 460-v, and WHT lead for 575-v units. If 208/230-v units are run with a 208-v power supply, connect to RED lead.
- Compressor and 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). Field modifications or additions must be in compliance with all applicable codes.
- Wiring for field power supply must be rated 60 C. Use copper, copper-clad aluminum or aluminum conductors.
- Terminals G/6, Y/2/3 and C/7 of TB3 are for class 2 (24-v) field external interlock connections. Class 1 field interlock contacts must have minimum rating of 180-va, 220-v, 50/60 Hz pilot duty. Class 2 field interlock contacts must have minimum rating of 70-va, 24-v, 50/60 Hz pilot duty.
- Thermostat for standard units: HH01AD042, HH07AT172 and HH07AT174. Subbase: HH93AZ042, HH93AZ176 and HH93AZ180.
- Control module internal illustrated to indicate components orientational sequence. All items illustrated are theoretically represented as internal to component.
- The factory-supplied LLSV drop control is shipped with the 38AKS unit but field installed at the indoor unit.
- To change fan rotation, interchange fan motor connections 1 and 3.

# Typical control wiring schematics (cont)



## 38AKS028-044 UNITS, 50 Hz



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	1	STEADY		HPS OR COTP OPEN
		1	1/4	LPS OPEN
		2	1/4	OPS OPEN
		3	1/4	LPS/OPS OPEN
DS3 STATUS LED	1	STEADY	STEADY	NO CALL FOR COOLING
		1/4	1/4	3 MIN. CMP DELAY
DS4 'KI' LED	1	STEADY		RELAY K1 CLOSED

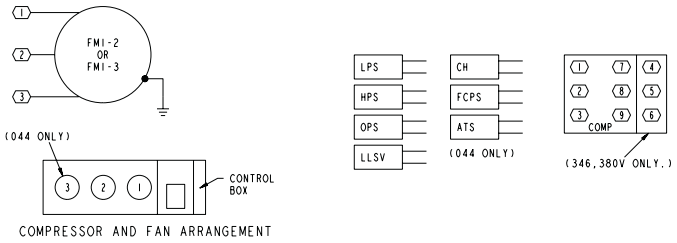
\* - MULTIPLE BLINKS ARE A SERIES OF ON/OFF FLASHES OF EQUAL DURATION FOLLOWED BY 1 SECOND OFF.

### LEGEND

- ATS — Air Temperature Switch
- C — Contactor, Compressor
- CB — Circuit Breaker
- CH — Crankcase Heater
- CM — Control Module
- COMP — Compressor
- CR — Control Relay
- EQUIP — Equipment
- FU — Fan Contactor
- FCPS — Fan Cycling Pressure Switch
- FM — Fan Motor
- FR — Fan Relay
- FM — Fan Motor
- FR — Fan Relay
- FU — Fuse
- GND — Ground
- HPS — High-Pressure Switch
- LLSV — Liquid Line Solenoid Valve
- LPS — Low-Pressure Switch
- NEC — National Electrical Code (U.S.A. Standard)
- OPS — Oil Pressure Switch
- TB — Terminal Block
- TDR — Time Delay Relay
- TRAN — Transformer
- Terminal Block Connection
- Marked Terminal
- Unmarked Terminal
- Marked Splice
- Unmarked Splice
- Factory Wiring
- Field Power Wiring
- Indicates Common Potential, Does Not Represent Wiring

### NOTES:

1. CONNECT TO TRAN1 240V TERMINAL FOR 400 & 230V UNITS, 200V TERMINAL FOR 346V UNITS OR ORN LEAD FOR 380V UNITS.
2. COMPRESSOR & FAN MOTORS THERMALLY PROTECTED. THREE PHASE MOTORS PROTECTED AGAINST PRIMARY SINGLE PHASING CONDITIONS.
3. REPLACEMENT OF ORIGINAL WIRES MUST BE WITH TYPE 90°C WIRE OR ITS EQUIVALENT.
4. LINE # INDICATES LOCATION OF CONTACTS: #1 SIGNIFIES SINGLE POLE DOUBLE THROW CONTACTS; # SIGNIFIES A NORMALLY CLOSED CONTACT; # SIGNIFIES A NORMALLY OPEN CONTACT.
5. FACTORY WIRING IS IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE (NEC).
6. FIELD MODIFICATIONS OR ADDITIONS MUST BE IN COMPLIANCE WITH ALL APPLICABLE CODES. WIRING FOR FIELD POWER SUPPLY MUST BE RATED 60°C. USE COPPER, COPPER-CLAD ALUMINUM OR ALUMINUM CONDUCTORS.
7. TERMINALS G/6, Y2/3 & 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.
8. THERMOSTAT: HH01AD042, HH07AT172 & HH07AT174. SUBBASE: HH93A2042, HH93A2176 & HH93A2180.
9. CONTROL MODULE INTERNAL ILLUSTRATED TO INDICATE COMPONENTS ORIENTATIONAL SEQUENCE. ALL ITEMS ILLUSTRATED ARE THEORETICALLY REPRESENTED AS INTERNAL TO COMPONENT.
10. THE FACTORY SUPPLIED LLSV DROP CONTROL IS SHIPPED WITH THE 38AKS UNIT BUT FIELD INSTALLED AT THE INDOOR UNIT.
11. TO CHANGE FAN ROTATION, INTERCHANGE FAN MOTOR CONNECTIONS 1 & 3.



COMPRESSION AND FAN ARRANGEMENT



# Application data



## 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 VVT® control systems.

**IMPORTANT:** Condensing units applied in VVT or VAV systems must have field-supplied and installed accumulators. Order part number 38AK-5---410 from Service Parts.

Indoor equipment should be selected at no less than 300 cfm/ton (40 L/s per kW).

### OPERATING LIMITS

Maximum Outdoor Ambient	115 F (46 C)
Minimum Outdoor Ambient	Additional head pressure control may be required below 35 F (1.7 C) outdoor ambient.
Minimum Return-Air Temperature	55 F (12.8 C)
Maximum Return-Air Temperature	95 F (35 C)
Normal Acceptable Saturation Suction Temperature Range	30 to 55 F (1.1 to 12.8 C)
Maximum Discharge Temperature	295 F (146 C)
Minimum Discharge Superheat	60 F (15.6 C)

### MINIMUM OUTDOOR-AIR OPERATING TEMPERATURE (F)

UNIT 38AKS	COMPR CAPACITY (%)	STANDARD COND TEMP, F (C)	MIN OUTDOOR TEMP, F (C)	
			Standard Unit	Low Ambient Control
028	100	90 (32)	31 (-0.6)	-20 (-29)
	67	80 (27)	35 (1.7)	
	33	70 (21)	43 (6.1)	
034	100	90 (32)	30 (-1.1)	
	67	80 (27)	34 (1.1)	
	33	70 (21)	42 (3.5)	
044	100	90 (32)	25 (-3.9)	
	67	80 (27)	30 (-1.1)	
	33	70 (21)	35 (1.7)	

## MAXIMUM LIQUID LIFT

UNIT 38AKS	MAX LIFT, ft (m)
028	76 (23)
034	67 (20)
044	76 (23)

## REFRIGERANT PIPING SIZES SINGLE SUCTION RISERS, 60 Hz

UNIT 38AKS	LENGTH OF INTERCONNECTING PIPING, Ft (m)									
	16-25 (4.9-7.6)		26-50 (7.9-15.2)		51-75 (15.5-22.8)		76-100 (23.2-30.5)		101-200 (30.8-60.9)	
	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

\*Requires a double suction riser, if evaporator is below condensing unit. See Double Suction Riser, 60 Hz table below.

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

## DOUBLE SUCTION RISERS, 60 Hz

UNIT 38AKS	LENGTH OF INTERCONNECTING PIPING, Ft (m)											
	26-50 (7.9-15.2)			51-75 (15.5-22.8)			76-100 (23.2-30.5)			101-200 (30.8-60.9)		
	A	B	C	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	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	1 5/8	2 1/8	2 5/8

NOTE: A, B, and C dimensions are referenced in the Suction Line Piping figure.

## SINGLE SUCTION RISERS, 50 Hz

UNIT 38AKS	LENGTH OF INTERCONNECTING PIPING — Ft (m)									
	16-25 (4.9-7.6)		26-50 (7.9-15.2)		51-75 (15.5-22.8)		76-100 (23.2-30.5)		101-200 (30.8-60.9)	
	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

\*Requires a double suction riser, if evaporator is below condensing unit. See Double Suction Riser, 50 Hz table below.

NOTE: All line sizes are inches OD.

\*IMPORTANT — If condensing unit is above air handler, a double suction riser is required. See table below for sizing.

## DOUBLE SUCTION RISERS, 50 Hz

UNIT 38AKS	LENGTH OF INTERCONNECTING PIPING — Ft (m)											
	26-50 (7.9-15.2)			51-75 (15.5-22.8)			76-100 (23.2-30.5)			101-200 (30.8-60.9)		
	A	B	C	A	B	C	A	B	C	A	B	C
028	1 5/8	1 5/8	2 1/8	1 5/8	1 5/8	2 1/8	1 5/8	1 5/8	2 1/8	1 5/8	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	1 5/8	2 1/8	2 5/8

NOTE: A, B, and C dimensions are referenced in the Suction Line Piping figure.

# Application data (cont)



## REFRIGERANT SPECIALTIES PART NUMBERS

38AKS UNIT SIZE	LIQUID LINE SIZE (in.)	LIQUID LINE SOLENOID VALVE (LLSV)	SIGHT GLASS	FILTER DRIER
028	7/8	*	AMI-1TT7	C-487
	1 1/8	*	AMI-1TT9	C-969
034	7/8	*	AMI-1TT7	C-487
	1 1/8	*	AMI-1TT9	C-969
044	7/8	*	AMI-1TT7	C-967
	1 1/8	*	AMI-1TT9	C-969

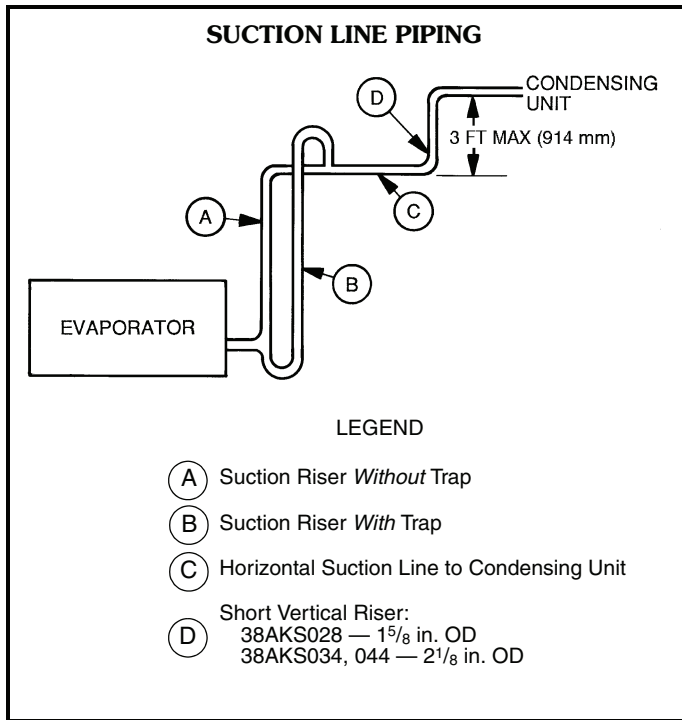
\*Shipped loose with the condensing unit for field installation.

### 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.



Do NOT bury refrigerant piping underground.

Refer to the following table for field-supplied refrigerant specialty part numbers.

### 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.

38AKS	DIMENSIONS, Ft (m)	
	A	B
028-044	4 (1.2)	4 (1.2)

NOTE: Observe minimum recommended space requirements.

# Guide specifications



## Commercial Air-Cooled Condensing Units

### HVAC Guide Specifications

Size Range: **25 to 40 Tons Nominal at 60 Hz**  
**(82.8 to 127.0 kW Nominal at 50 Hz)**

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 air-handling unit.

##### 1.02 QUALITY ASSURANCE

- A. Unit performance shall be rated in accordance with ARI Standard 365, latest edition.
- B. Unit shall be manufactured in a facility registered to the ISO 9001:2000 manufacturing quality standard.
- C. Unit construction shall comply with ANSI/ASHRAE 15 latest revision safety code and comply with NEC (U.S.A. standards).
- 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 (1034 kPa) and pressure tested at 480 psig (3310 kPa).

##### 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, nitrogen 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. 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 (60 Hz units) or 1450 rpm (24.2 r/s) (50 Hz units).
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. Epoxy phenolic fin coating shall be available as an option.
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, nitrogen holding charge, 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.

# Guide specifications (cont)



- 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 (60 Hz units) or 31 F (-6 C) (50 Hz units) by fan cycling. One condenser fan shall be cycled by discharge pressure to maintain proper head pressure.
- g. Winter start control to prevent nuisance trippouts 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 \_\_\_\_\_ at a suction temperature of \_\_\_\_\_. 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 \_\_\_\_\_ or greater at conditions of: \_\_\_\_\_ entering-air temperature at the evaporator at \_\_\_\_\_ wet bulb and \_\_\_\_\_ dry bulb, and air entering the condensing unit at \_\_\_\_\_.
- 3. The system shall have an EER of \_\_\_\_\_ or greater at standard ARI conditions.

## I. Electrical Requirements:

- 1. Nominal unit electrical characteristics shall be \_\_\_\_\_ v, 3-ph, 50 or 60 Hz were applicable. 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  $\pm$  10° F (37.8 C  $\pm$  5.6° C) with outdoor temperatures at -20 F (-28 C) (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 (60 Hz units) or 220-v (50 Hz units) electric unloading. Accessory ModuPanel™ control box or field-supplied step controller shall be provided for electrical unloading.

### 3. Hot-Gas Bypass:

A hot-gas bypass valve and a 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 (208/230-3-60 and 220-3-50 unit voltages only).

### 5. Gage Panel:

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

### 6. ModuPanel Control Box:

Control box shall be provided to allow system to operate as a variable air volume (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. PremierLink™ Controller:

This control will function with CCN (Carrier Comfort Network®) 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 CO<sub>2</sub> sensor in the conditioned space and be demand controlled ventilation (DCV) ready. The communication rate must be 38.4K or faster. It shall include an integrated economizer controller.

9. Suction Line Accumulator:

Accumulator can be provided for VAV, VVT®, or long line CV applications.



