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## 40RUM Packaged Air Handler Units – 50Hz



Quality Assurance  
Certificate Reg. No:  
04 100 950420



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Manufacturer's Name: Saudi Airconditioning Manufacturing Co. Ltd.

Country of origin : Jeddah, Saudi Arabia

Nearest port of embarkation: Jeddah Islamic port

Product classification: Commercial and Residential

Product Data Catalog

## 40RUM Packaged Air Handler Units – 50Hz

**Nominal Cooling Capacity 6.0 – 15.0 Tons**  
**HFC R-410A Refrigerant**

The 40RUM Series air-handling units are the best choice for packaged air handlers. Model 40RUM units have direct-expansion coils. All models offer excellent fan performance, a unique combination of indoor air quality features, easy installation, and affordable prices. Their versatility and state-of-the-art features will provide economical performance now and in the future.

Contact your local Carrier representative for additional reference materials.

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## FEATURES / BENEFITS

Every compact one-piece unit arrives fully assembled, charged, tested, and ready to run.

Carrier's air-cooled air conditioning split systems:

- Provide a logical solution for commercial needs
- Have a rugged, dependable construction
- Are available in single and circuit scroll compressor capacity control
- Have cooling capability up to 125°F (52°C) ambient and down to 40°F (4°C) ambient standard

### **Constructed for long life**

The 38AUMZ single circuit and 38AUMD dual circuit, scroll compressor models are designed and built to last. The high efficient designed outdoor coil construction allows for a more efficient design in a smaller cabinet size that utilizes an overall reduction in refrigerant charge. Where conditions require, special coil coating coil protection option is available. Cabinets are constructed of pre-painted galvanized steel, delivering unparalleled protection from the environment. Inside and outside surfaces are protected to ensure long life, good looks, and reliable operation. Safety controls are used for enhanced system protection and reliability.

### **Efficient operation**

These air cooled condensing units will provide EER's up to 12.2 which meets ASHRAE 90.1 efficiency levels. The 38AUMD dual compressor models provide two (2) stages of cooling for remarkable partial load performance. This high efficiency will help reduce overall operating cost and energy consumption.

### **Innovative Carrier 40RUM packaged air handlers are custom matched to 38AUMZ/D condensing units**

Information on matching 40RUM DX packaged air handler follows for convenience. See separate product data for more details. The 40RUM Series has excellent fan performance, efficient direct-expansion (DX) coils, a unique combination of indoor-air quality features, and is easy to install. Its versatility and state-of-the-art features help to ensure economical performance of the split system both now and in the future.

### **Rugged dependability**

The 40RUM series units are made to last. The die-formed galvanized steel panels ensure structural integrity under all operating conditions. Galvanized steel fan housings are securely mounted to a die-formed galvanized steel fan deck. Rugged pillow-block bearings (40RUM14 and 40RUM16) are securely fastened to the solid steel fan shaft with split collets and clamp locking devices. Smaller unit sizes have spider-type bearings.

### **Controls for performance dependability**

The 38AUM condensing units offer operating controls and components designed for performance dependability. The high efficiency hermetic scroll compressor is engineered for long life and durability. The compressors include vibration isolation for quiet operation. The high-pressure switch protects the entire refrigeration system from abnormally high operating pressures. A low-pressure switch protects the system from loss of charge. These units also include anti-short-cycling protection, which helps to protect the units against compressor failure.

All units include a crankcase heater to eliminate liquid slugging at start-up. Each unit comes standard with the Comfort Alert control system. This provides:

- System Go LED indicator
- Fault LED indicator
- Compressor fault LED indicator
- Phase loss protection
- Phase reversal protection
- Safety pressure indicator
- Anti-short cycle protection

### **Indoor-Air Quality (IAQ) features**

The unique combination of IAQ features in the 40RUM Series air handlers help to ensure that only clean, fresh, conditioned air is delivered to the occupied space. Direct-expansion (DX) 4 row cooling coils prevent the build-up of humidity in the room, even during part-load conditions.

Standard 1-in (25.4mm) aluminum filters remove dust and airborne particles from the occupied space for cleaner air. The pitched, non-corroding drain pan can be adjusted for a right-hand or left-hand connection to suit many applications and provide positive drainage and prevent standing condensate.

### **Economy**

The 40RUM Series packaged air handlers provide reduced installation expense and energy-efficient performance.

Quick installation is ensured by the multi-poise design. Units can be installed in either the horizontal or vertical configuration without modifications. Fan motors and contactors are pre-wired and thermostatic expansion valves (TXVs) are factory-installed on all 40RUM models.

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

### **Coil flexibility**

Model 40RUM direct-expansion coils have galvanized steel casings; inlet and outlet connections are on the same end. The coils are designed for use with Puron (R-410A) refrigerant and have 3/8-in. diameter copper tubes mechanically bonded to aluminum sine-wave fins. The coils include matched, factory-installed thermostatic expansion valves (TXVs) with matching distributor nozzles and offers a removable power element and extended connections.

### **Easier installation and service**

The multi-poise design and component layout ensures quick unit installation and operation. Units can be converted from horizontal to vertical operation by simply repositioning the unit. Drain pan connections are duplicated on both sides of the unit. The filters, motor, drive, TXVs, and coil connections are all easily accessed by removing a single side panel.

# MODEL NUMBER NOMENCLATURE - 40RUM- R410A SERIES

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
4	0	R	U	M	-	0	7	A	9	A	1	-	0	A	0	A	0

**Model Type**  
40RUM = Commercial Packaged Air Handler

**Refig. System Options**  
— = Direct Expansion

**Nominal Ton**  
07 - 6.0 Ton  
08 - 7.5 Ton  
12 - 10 Ton  
14 - 12.5 Ton  
16 - 15.0 Ton

**Factory Assigned**  
A = Default

**Power Supply (V/Ph/Hz)**  
9 = 400/3/50

**Indoor Coil Options**  
A = Al/Cu  
F = Cu/Cu

**Indoor Fan Options**  
1 = Standard Static Option  
2 = Medium Static Option  
3 = High Static Option

**Design Review**  
- = Factory Assigned

**Panel Option**  
0 = Standard

**Type of Coil**  
A = Standard 4 Row

**Service Options**  
0 = None

**Electrical Options**  
A = None

**Brand/Packaging**  
0 = Standard

# AHRI CAPACITY RATING

Unit	Cooling Stages	Compressors	Nominal Capacity (Tons)	Net Cooling Capacity (MBH)	Total Power (kW)	EER
38AUMZ07 / 40RUM07	1	1	5.1	61.0	5.2	11.8
38AUMZ08 / 40RUM08	1	1	6.9	83.0	7.0	11.9
38AUMD12 / 40RUM12	2	2	8.9	107.0	8.8	12.2
38AUMD14 / 40RUM14	2	2	10.8	130.0	11.6	11.2
38AUMD16 / 40RUM16	2	2	13.7	164.0	13.8	11.9

**Legend:**

AHRI - Air Conditioning, Heating and Refrigeration Institute

EER - Energy Efficiency Ratio

**Notes:**

1. Rated in accordance with AHRI Standards 340/360.
2. Ratings are net values, reflecting the effects of circulating fan heat.
3. Rating are based on:
  - Cooling Standard: 80 F db, 67 wb indoor entering-air temperature and 95 F db air entering outdoor unit.

## SOUND POWER LEVELS, dB

Unit	Outdoor Sound (dB)							
	A-Weighted	63	125	250	500	1000	2000	4000
40RUM07	86.3	93.2	89.2	85.2	84.2	80.2	78.2	74.2
40RUM08	88.3	95.3	91.3	87.3	86.3	82.3	80.3	76.3
40RUM12	91.6	98.6	94.6	90.6	89.6	85.6	83.6	79.6
40RUM14	91.1	97.3	93.3	89.3	90.3	84.3	82.3	78.3
40RUM16	92.7	98.9	94.9	90.9	91.9	85.9	83.9	79.9

**Legend:**

dB - Decibel

ASHRAE - American Society of Heating, Refrigerating and Air Conditioning, Inc.

**Notes:**

1. The above estimated sound power levels are based upon the ASHRAE calculation approach from the ASHRAE 1987 HVAC Systems and Applications handbook, Chapter 52.
2. Since this data is calculated, these sound power levels may be different than the actual sound power levels.
3. The acoustic center of the unit is located at the geometric center of the unit.

## UNIT PHYSICAL DATA (ENGLISH UNITS)

Unit 40RUM	07	08	12	14	16
Nominal Capacity	6.0	7.5	10.0	12.5	15.0
<b>Operating Weight (lb)</b>					
Base Unit with TXV (4 Rows)	399	404	425	695	713
Plenum	175		225		
<b>Fans</b>					
Qty / Diameter (in)	1 / 15			2 / 15	
Nominal Airflow (cfm)	2400	3000	4000	5000	6000
Airflow Range (cfm)	1800-3000	2250-3750	3000-5000	3750-6250	4500-7500
Nominal Motor HP (Std. Motor)	2.4		2.9		
Motor Speed (rpm)	1425				
<b>Refrigerant</b>	Puron® (R-410A)				
Operating Charge (lb)	12.8	13.7	11.66 / 11.66	15.4 / 16.3	20.9 / 19.2
Initial Charge (lb)	7.7	8.2	7.0 / 7.0	9.0 / 9.7	12.5 / 11.5
<b>Piping Connections</b>					
Suction line - Qty. / Size (in)	1 / 7/8		2 / 7/8		
Liquid line - Qty. / Size (in)	1 / 3/8	1 / 1/2	2 / 3/8		2 / 1/2
<b>Filters</b>	Washable - Aluminum				
Qty. / Size (in)	4 / 16x24x1			8 / 16x24x1	
<b>Direct Expansion Coils</b>	Enhanced Copper Tubes, Aluminum Double Wavy Fins				
Face Area (sq ft)	6.67	8.33	10.01	13.25	17.67
Max Working Pressure (psig)	650				
Fins/Inch	15				
No. of Rows	4				

## UNIT PHYSICAL DATA (SI UNITS)

Unit 40RUM	07	08	12	14	16
Nominal Capacity	6.0	7.5	10.0	12.5	15.0
<b>Operating Weight (kg)</b>					
Base Unit with TXV (4 Rows)	181	183	193	315	323
Plenum	80		102		
<b>Fans</b>					
Qty / Diameter (mm)	1 / 381			2 / 381	
Nominal Airflow (L/s)	1133	1604	1888	2360	2831
Airflow Range (L/s)	850-1416	1203-2006	1416-2360	1770-2949	2124-3539
Nominal Motor kW (Std. Motor)	1.79		2.16		
Motor Speed (r/s)	23.8				
<b>Refrigerant</b>	Puron (R-410A)				
Operating Charge (kg)	5.8	6.2	5.29 / 5.29	6.99 / 7.39	9.5 / 8.75
Initial Charge (kg)	3.5	3.7	3.2 / 3.2	4.1 / 4.4	5.7 / 5.25
<b>Piping Connections</b>					
Suction line - Qty. / Size (mm)	1 / 22		2 / 22		
Liquid line - Qty. / Size (mm)	1 / 9.5	1 / 12.7	2 / 9.5		2 / 12.7
<b>Filters</b>	Washable - Aluminum				
Qty. / Size (mm)	4 / 406x610x25.4			8 / 406x610x25.4	
<b>Direct Expansion Coil</b>	Enhanced Copper Tubes, Aluminum Double Wavy Fins				
Face Area (sq m)	0.62	0.77	0.93	1.23	1.64
Max Working Pressure (kPag)	4481				
Fins/meter	591				
No. of Rows	4				

## OPTIONS AND ACCESSORIES

ITEM	OPTION*	ACCESSORY♦
Alternate Fan Motors	X	
Alternate Drives	X	
Condensate Drain Trap		X
Discharge Plenum		X
Electric Heater		X
Overhead Suspension Package		X
Programmable Thermostats		X
Return Air Grille		X
Sub-base		X
UV-C Germicidal Lamp**		X

\* Factory-installed option.

♦ Field-installed accessory.

\*\* Contact application engineer

### 40RUM Factory-Installed Options

Coil Description	Environment			
	Std Non-Corrosive	Mild Coastal	Moderate Coastal	Severe Coastal
Al Fins / Cu Tube	X			
Cu Fins / Cu Tube			X	X

### 40RUM factory-installed options

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

### 40RUM field-installed accessories

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

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

**Sub-base** provides a stable, raised platform and room for condensate drain connection for floor-mounted units. This accessory is available unpainted or painted.

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

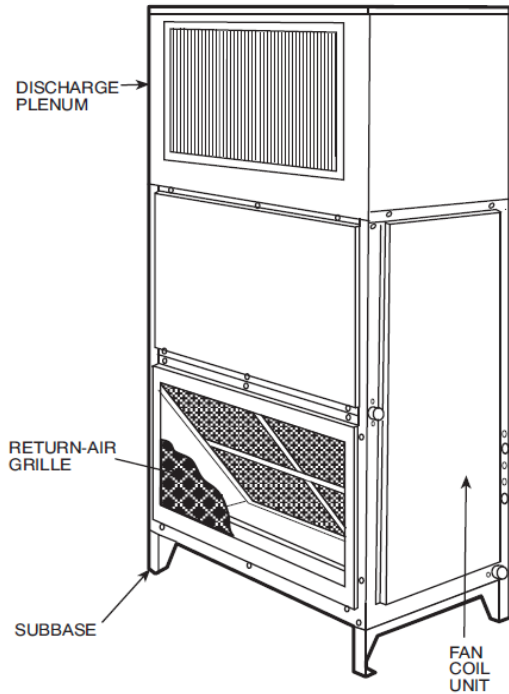
**Condensate drain trap** includes an overflow shutoff switch that can be wired to turn off the unit if the trap becomes plugged. The kit also includes a wire harness that can be connected to an alarm if desired. The transparent trap is designed for easy service and maintenance.

**Electric resistance heat coils** have an open-wire design and are mounted in a rigid frame. Safety cutouts for high temperature conditions are standard. Terminal block for single-point power connections is included.

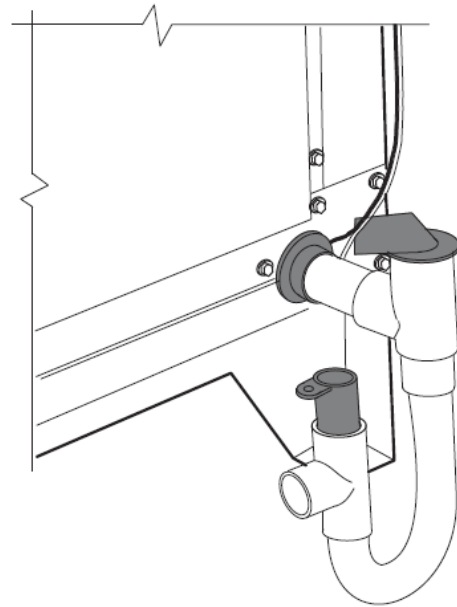
## OPTIONS AND ACCESSORIES (cont.)

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

**Carrier's line of thermostat provides** both programmable and non-programmable capability with the new Debonair® line of commercial programmable thermostats. The TEMP System controls offer communication capability with staged heating and cooling, and the Commercial Electronic thermostats provide 7-day programmable capability for economical applications.



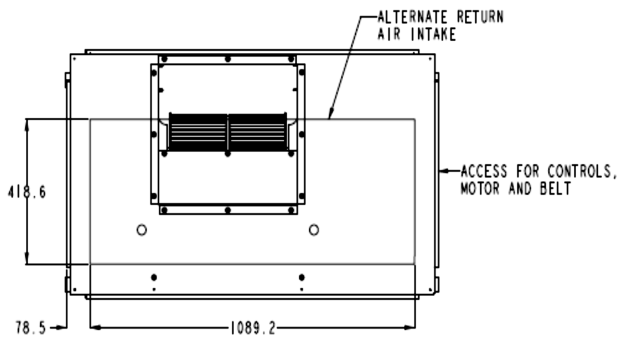
40RUM WITH DISCHARGE PLENUM GRILLE AND SUBBASE



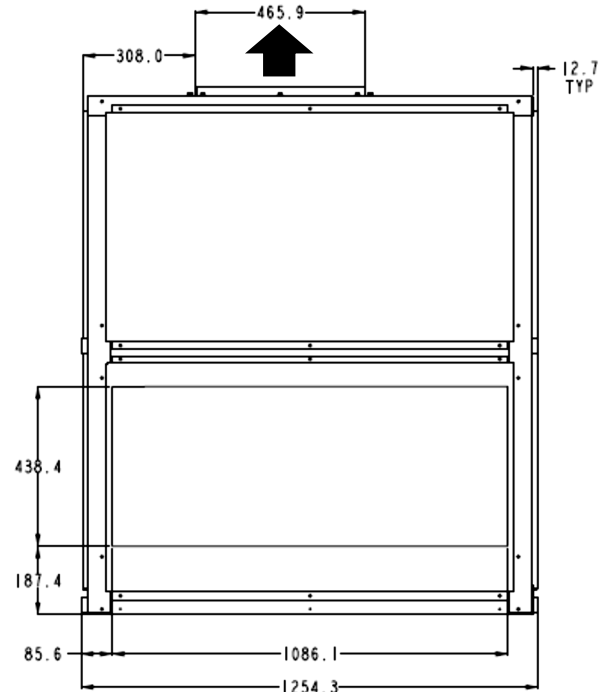
40RUM WITH CONDENSATE TRAP



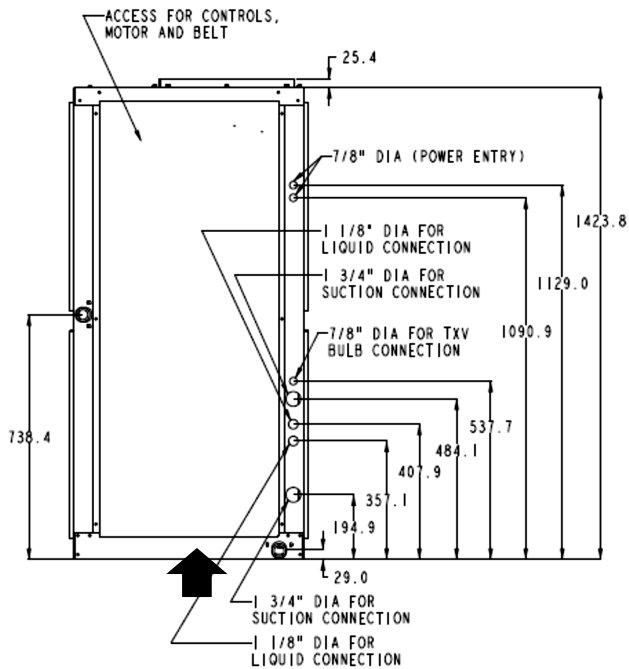
# BASE UNIT DIMENSIONS – 40RUM Series Size 07-12



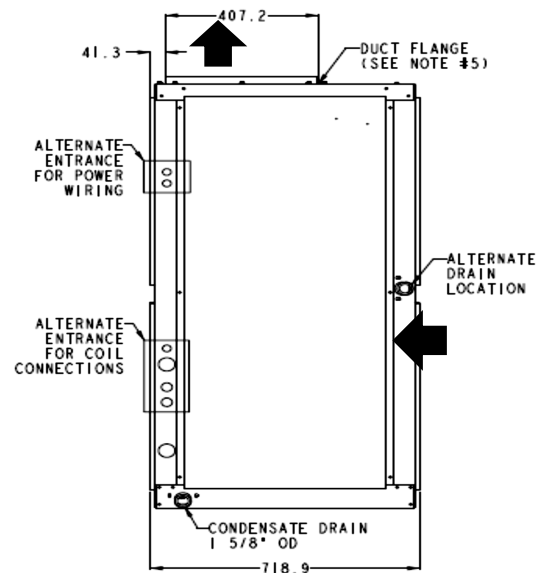
**Top**



**Front**



**Right Side**

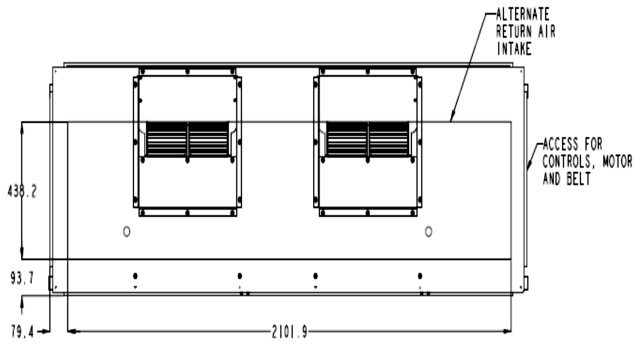


**Left Side**

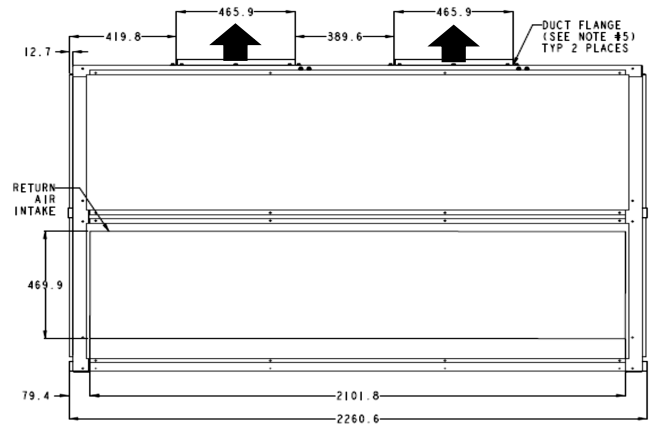
## Notes:

1. Dimensions are in millimeter (mm).
2. ➡ Direction of airflow.
3. Recommended clearance:  
Rear: 3.0 in (76.2mm)  
Front: 2.0ft 6.0in (762mm)  
Right Side: 2.0ft 6.0in (762mm)  
Left Side: 2.0ft 6.0in (762mm)
4. Liquid piping not supplied by Carrier.
5. Duct flange is factory installed.

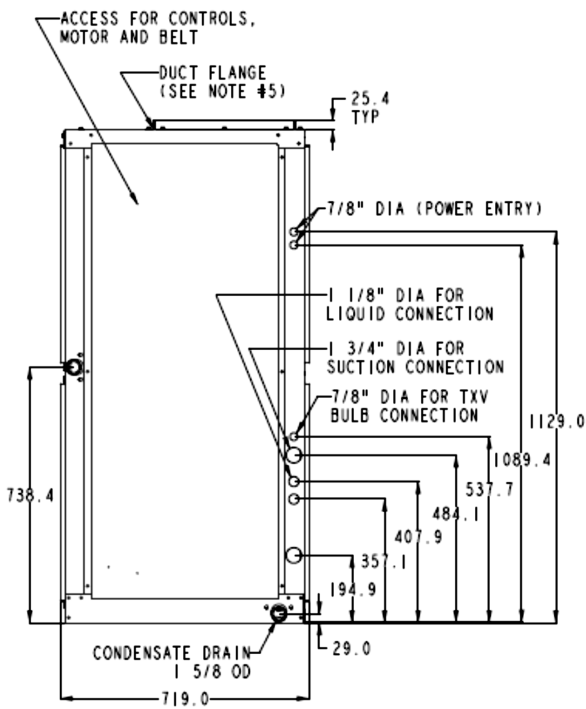
# BASE UNIT DIMENSIONS – 40RUM Series Size 14 - 16



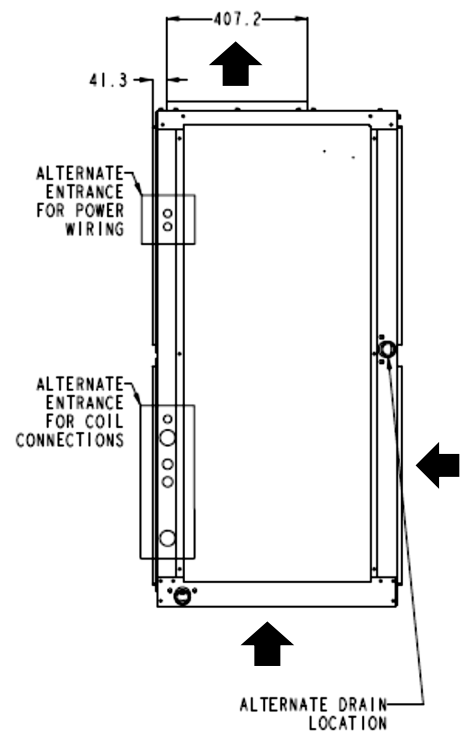
**Top**



**Front**



**Right Side**

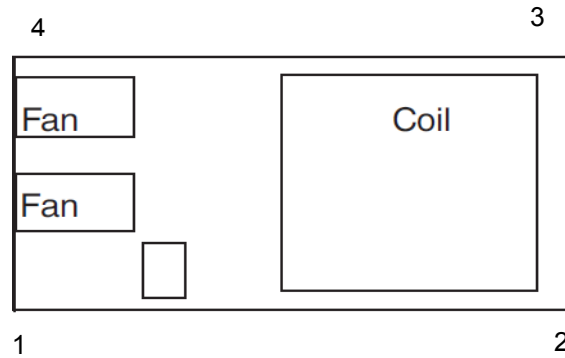


**Left Side**

## Notes:

1. Dimensions are in millimeter (mm).
2. ➡ Direction of airflow.
3. Recommended clearance:
  - Rear: 3.0 in (76.2mm)
  - Front: 2.0ft 6.0in (762mm)
  - Right Side: 2.0ft 6.0in (762mm)
  - Left Side: 2.0ft 6.0in (762mm)
4. Liquid piping not supplied by Carrier.
5. Duct flange is factory installed.

# DIMENSIONS – CORNER WEIGHTS



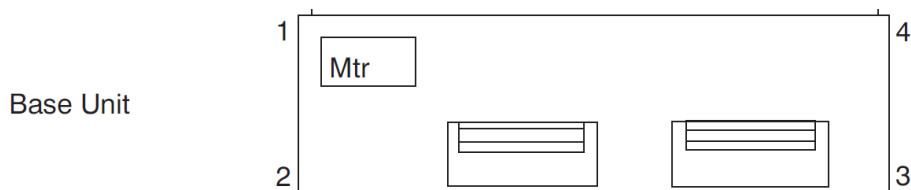
CORNER WEIGHTS - HORIZONTAL POSITION

## 40RUM - SI

40RUM UNIT SIZE	UNIT OR ACCESSORY NAME	UNIT OR ACCESSORY WEIGHT - (kg)	Corner Number (Weight In kg)			
			1	2	3	4
07	Fan Coil Base Unit	181	49.6	48.1	41.1	42.3
08	Fan Coil Base Unit	183	50.1	48.6	41.5	42.8
12	Fan Coil Base Unit	193	52.9	51.3	43.8	45.2
14	Fan Coil Base Unit	315	86.3	83.7	71.5	73.7
16	Fan Coil Base Unit	323	88.5	85.9	73.3	75.6

## 40RUM - English

40RUM UNIT SIZE	UNIT OR ACCESSORY NAME	UNIT OR ACCESSORY WEIGHT - (lb)	Corner Number (Weight In lb)			
			1	2	3	4
07	Fan Coil Base Unit	399	109.3	106.1	90.6	93.4
08	Fan Coil Base Unit	404	110.7	107.5	91.7	94.5
12	Fan Coil Base Unit	425	116.4	113	96.5	99.4
14	Fan Coil Base Unit	695	224	177.7	129.8	163.7
16	Fan Coil Base Unit	713	229.8	182.3	133.2	167.9



Note: Plenum is on top of positions 1,2,3,4

## 40RUM - SI

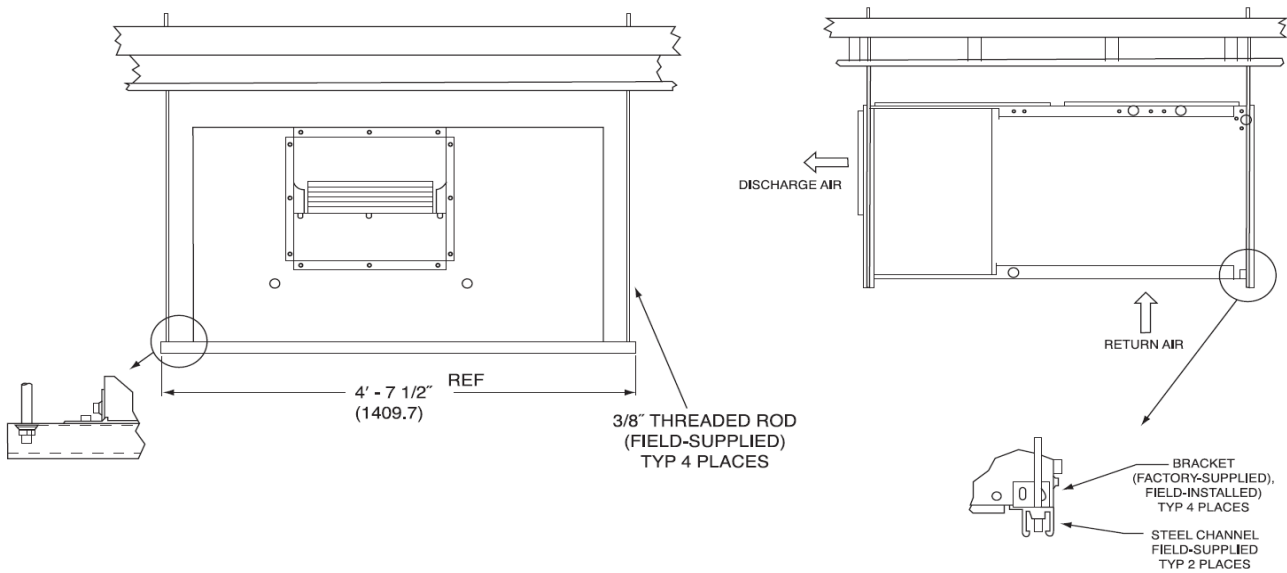
40RUM UNIT SIZE	UNIT OR ACCESSORY NAME	UNIT OR ACCESSORY WEIGHT (kg)	Corner Number (Weight In kg)				
			1	2	3	4	
07	Fan Coil Base Unit	181	45.5	52.3	44.4	38.8	
08	Fan Coil Base Unit	183	46.0	52.7	44.9	39.4	
12	Fan Coil Base Unit	193	48.5	55.6	47.4	41.5	
07 -16	Plenum	Add	80	23.3	16.8	16.8	23.3
14	Fan Coil Base Unit	315	86.6	95.5	69.8	63.3	
16	Fan Coil Base Unit	323	88.9	97.9	71.6	64.9	
14 - 16	Plenum	Add	102	32.9	18.1	18.1	32.9

40RUM - English

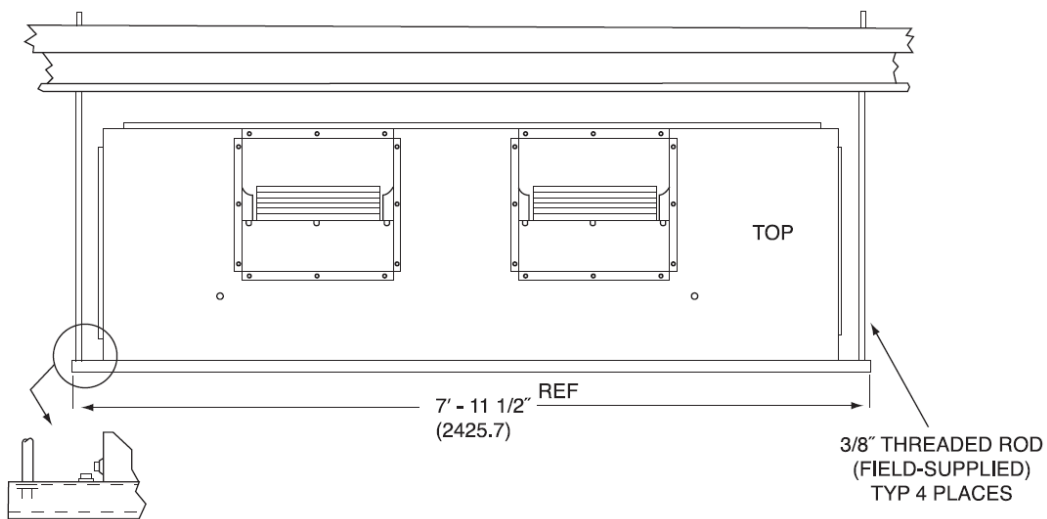
40RUM UNIT SIZE	UNIT OR ACCESSORY NAME		UNIT OR ACCESSORY WEIGHT (lb)	Corner Number (Weight In lb)			
				1	2	3	4
07	Fan Coil Base Unit		399	100.5	114.9	98	85.8
08	Fan Coil Base Unit		404	101.7	116.3	99.1	86.9
12	Fan Coil Base Unit		425	107.6	122.3	108	87.1
07 -16	Plenum	Add	175	38.9	-	-	37.1
14	Fan Coil Base Unit		695	191.2	210.5	153.8	139.5
16	Fan Coil Base Unit		713	196.2	216	157.8	143.1
14 - 16	Plenum	Add	225	72.5	40	40	72.5

## ACCESSORY DIMENSIONS

### Overhead Suspension Accessory



Unit Sizes 07-12 (FRONT)

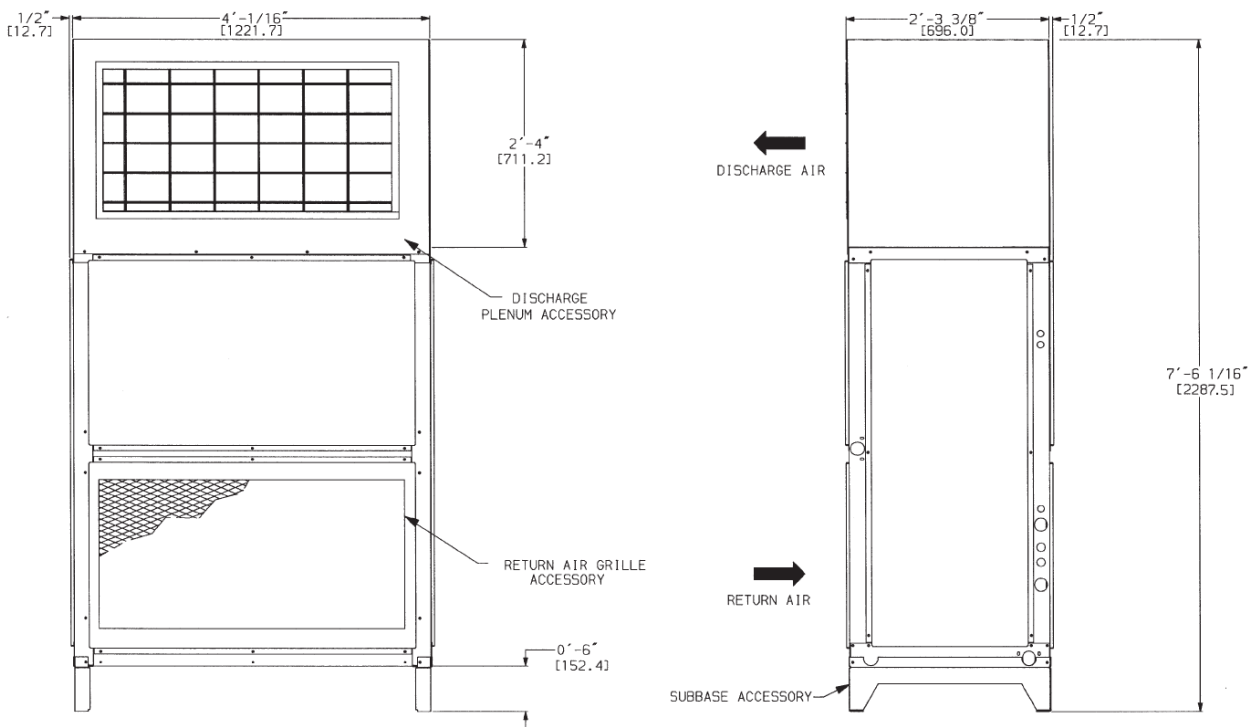


Unit Sizes 14-16 (FRONT)

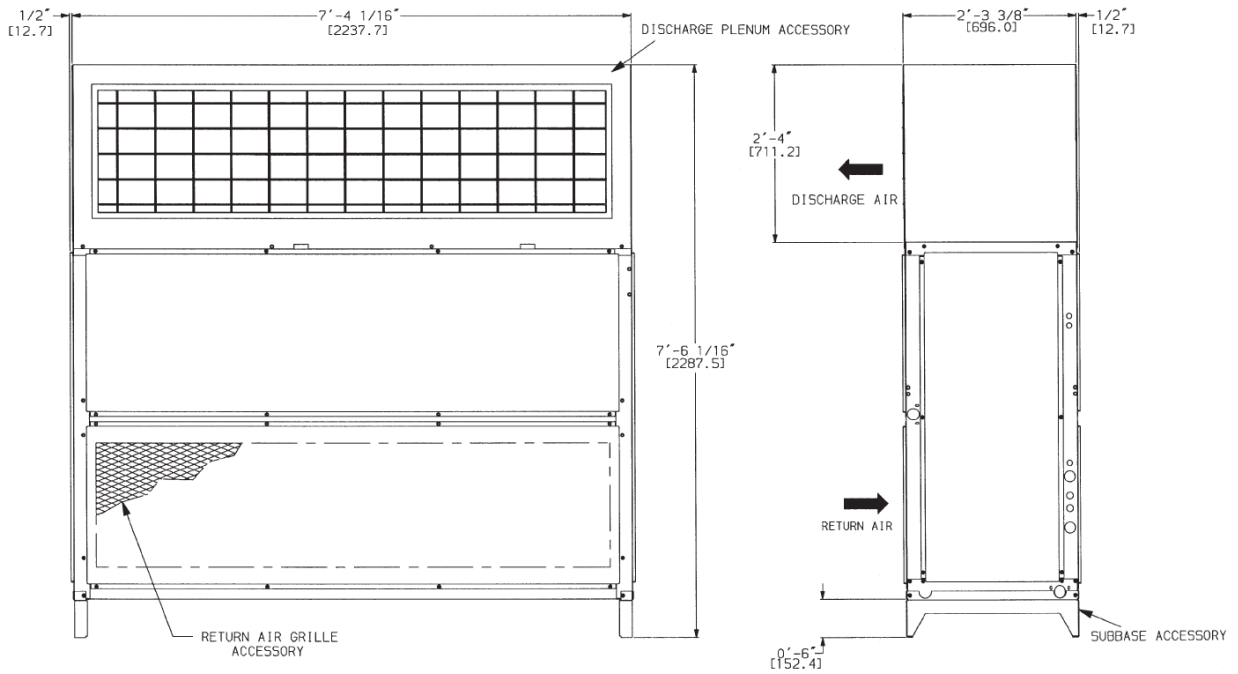
Note: Dimensions in ( ) are millimeters.

# ACCESSORY DIMENSIONS (cont.)

## Plenum, Return-Air Grille, and Subbase Accessories



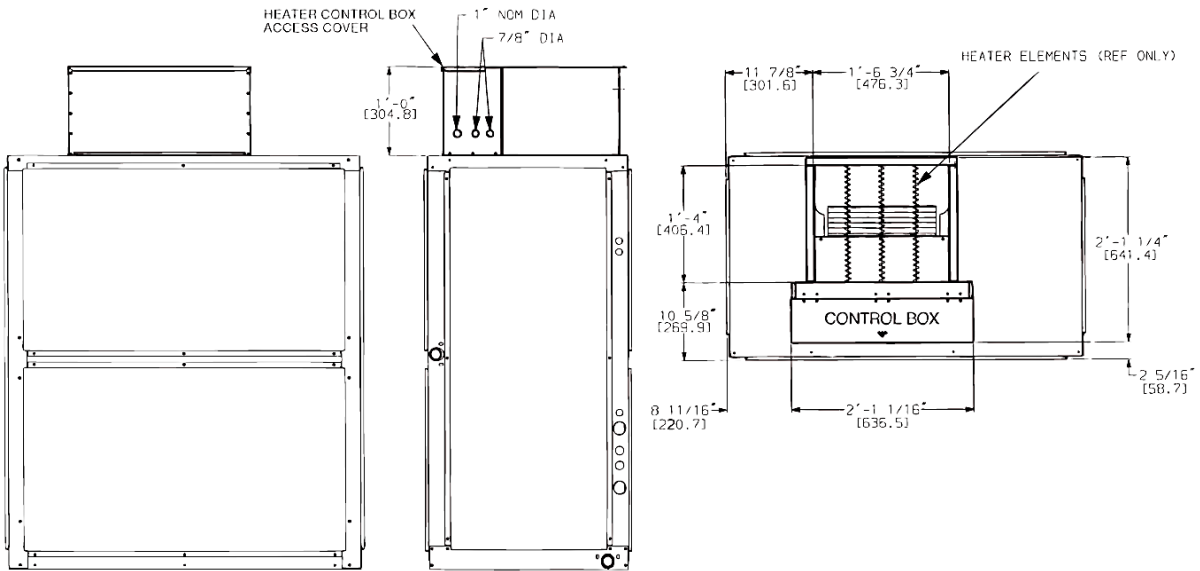
Unit Sizes 07-12



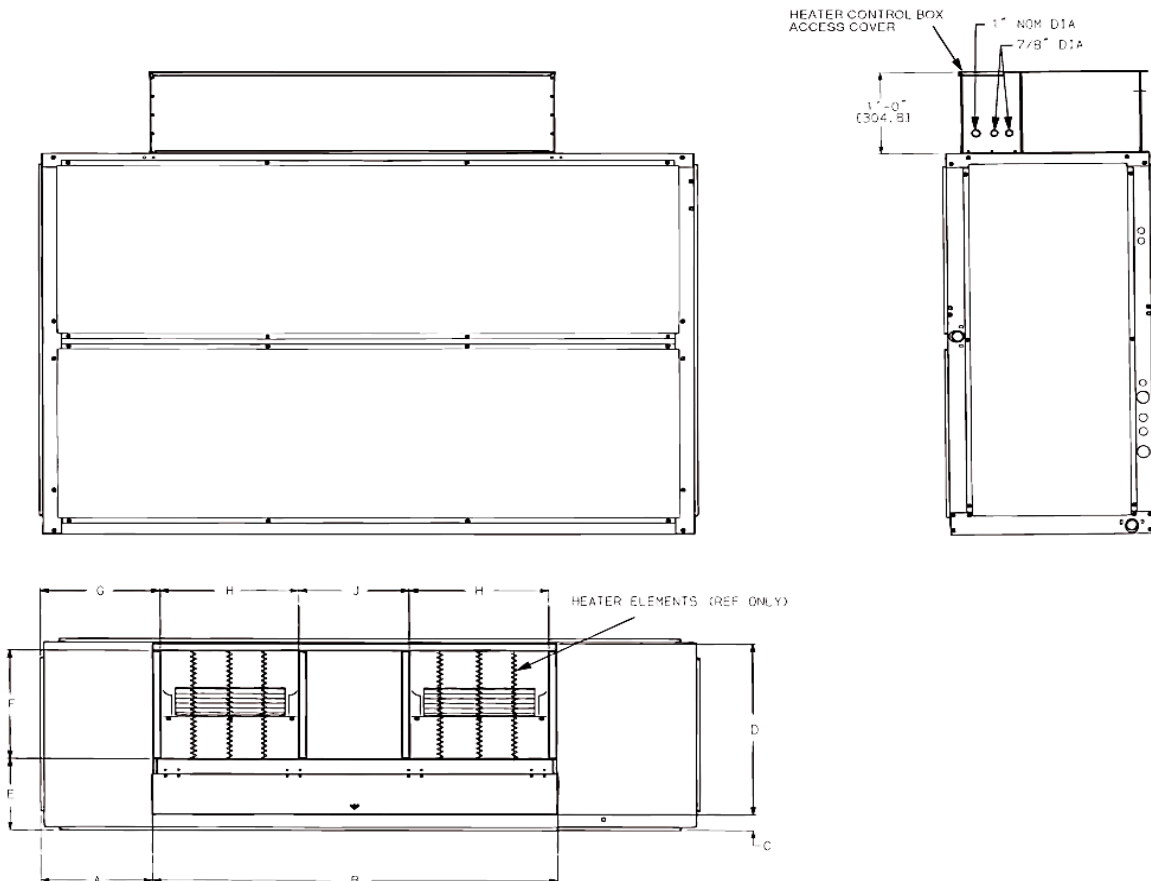
Unit Sizes 14-16

Note: Dimensions in [ ] are millimeters.

# ACCESSORY DIMENSIONS (cont.)



Unit Sizes 07-12



Unit Sizes 14-16

40RUA UNIT SIZE	A	B	C	D	E	F	G	H	J
14 - 16	1'-31/4" [387.4]	4'-63/8" [1381.1]	25/16" [58.7]	2'-11/4" [641.4]	105/8" [269.9]	1'-4" [406.4]	1'-45/16" [414.3]	1'-63/4" [476.3]	1-7/8" [327.0]

Note: Dimensions in [ ] are millimeters.

# SELECTION PROCEDURE

Combination ratings for 38AUMZ/D units matched with 40RUM Series air handlers are in this book. If unit is used with an air handler, use the Carrier Electronic Catalog selection program to obtain combined ratings.

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

Given:

Total Cooling Capacity - Required (TC) . . . . . 121,000 Btuh  
Sensible Heat Capacity - Required (SHC) . . . . . 95,000 Btuh  
Compressor - Type . . . . . Scroll  
Temperature Air Entering - Condenser (Edb) . . . . . 95\_F  
Temperature Air Entering - Evaporator (db/wb) . . . . . 80\_F db, 67\_F wb  
Evaporator Air Quantity . . . . . 4,000 cfm  
External Static Pressure . . . . . 0.4 in. wg  
Length of Interconnecting - Refrigerant Piping . . . . . 25 ft (Linear)  
Power Supply (V-Ph-Hz) . . . . . 400-3-50

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

For this example, select a 38AUMD12 matched with a 40RUM12 coil. This 38AUMD12/40RUM12 condensing unit air-handler combination provides 122,000 Btuh of total cooling capacity and 97,200 Btuh of sensible capacity at the given conditions. If other temperatures or airflow values are required, interpolate the values from the combination ratings.

## III. Determine sizes of liquid and suction lines.

Enter Refrigerant Piping Sizes table. The sizes shown are based on an equivalent length of pipe. This equivalent length is equal to the linear length of pipe indicated at the top of each sizing column, plus a 50% allowance for fitting losses. (For a more accurate determination of actual equivalent length in place of using the estimated 50% value, refer to Carrier System Design Manual.) For this example, note in the linear length column that the proper pipe size is 1/2 in. for the liquid line and 13/8 in. for the suction line.

For extended line lengths over 100 feet, contact your Carrier representative or application engineer.

## IV. Determine fan rpm and bhp (brake horsepower).

Refer to the 40RUM Air Handler Catalog – Fan Performance table. Enter the Air Handler Fan Performance table at 40RU12 at 4000 cfm and move to the External Static Pressure (ESP) column. Note that the conditions require 803 rpm at 1.77 bhp.

## V. Determine motor and drive.

Enter the Fan Motor Data tables and find the standard motor for 40RU12 unit rated at 2.4 Hp. Since the bhp required is 1.77, a standard motor satisfies the requirement and should be used.

Next, find the type of drive that satisfies the 803 rpm requirement in the Drive Data tables. For the 40RU012 unit, the Standard Drive table shows an rpm range of 666-863. Since the rpm required is 803, the standard drive satisfies the requirement and should be used.

# CONTROLS

## Operating sequences

When the wall thermostat calls for cooling, terminals G and Y1 are energized. As a result, the indoor fan contactor (IFC) and the compressor contactor (C1) are energized, causing the indoor fan motor (IFM), compressor #1, and outdoor fans (OFM) to start. The field-supplied and field-installed liquid line valve also opens, allowing the system to function in Cooling mode.

If the unit has 2 stages of cooling, the wall thermostat will additionally energize Y2. The Y2 signal will energize compressor contactor #2 (C2), causing compressor #2 to start.

Regardless of the number of stages, the field-supplied liquid line valve shall opens and the outdoor fan motors(OFM) runs continuously while unit is cooling.

When cooling demand decrease, the thermostat will de-energize Y2. Y2 signal will de-energize compressor contactor #2 (C2), causing compressor #2 to stop. When cooling demand has been satisfied, the thermostat will de-energize Y1, and G terminals. Y1 and G signal will de-energize compressor contactor #1 (C1), causing compressor #1 to stop. If the wall thermostat is set to continuous (CONT), the indoor fan motor will continue to operate. Otherwise, the indoor fan motor will stop.

The outdoor fan motors (OFM) will turn off and field-supplied liquid line valve shall close , minimizing the potential for refrigerant migration.

# COOLING CAPACITIES - English

Unit 40RUM	Evaporator Air		Coil Refrigerant Temp (°F)									
	Airflow (Cfm) BPF	Ewb (°F)	30		35		40		45		50	
			TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
7	1,800	72	124	60	113	55	101	49	87	43	71	37
		67	104	64	93	59	81	53	67	47	52	40
	0.06	62	86	68	75	62	63	56	49	49	42	42
		72	143	69	131	64	117	58	101	52	83	44
	2,400	67	121	76	108	70	94	64	78	57	60	50
		0.1	62	101	83	88	76	73	69	60	60	51
	3,000	72	158	77	144	71	129	65	111	58	92	51
67		134	86	121	80	105	73	87	66	67	58	
0.12	62	113	95	98	88	82	80	70	70	59	59	
	2,250	72	150	72	136	66	122	59	104	52	86	44
67		126	77	112	71	98	64	80	57	62	49	
0.06	62	104	82	91	75	75	68	60	60	50	50	
	3,000	72	173	83	158	77	141	70	122	62	100	54
67		146	92	131	85	114	77	95	69	72	60	
0.1	62	122	100	106	92	89	83	73	73	62	62	
	3,750	72	190	93	174	86	156	79	134	71	111	61
67		162	104	146	97	127	89	105	79	81	70	
0.12	62	136	115	118	106	100	97	84	84	72	72	
	3,000	72	207	99	188	91	166	82	143	72	117	62
67		174	107	155	99	134	89	111	78	86	68	
0.05	62	145	116	125	105	104	95	85	85	71	71	
	4,000	72	235	115	215	105	191	96	164	86	134	73
67		200	128	180	118	155	107	128	96	99	84	
0.07	62	167	139	146	128	123	117	102	102	87	87	
	5,000	72	258	127	235	118	211	108	181	97	148	84
67		221	145	198	134	171	123	143	111	109	97	
0.12	62	185	160	161	148	137	134	117	117	99	99	
	3,750	72	258	124	234	113	207	102	178	89	144	76
67		216	132	192	121	165	109	137	97	105	83	
0.06	62	179	142	154	129	128	116	103	103	86	86	
	5,000	72	297	143	270	131	239	119	205	106	166	90
67		251	158	224	145	193	131	159	117	122	102	
0.08	62	208	171	181	157	150	142	124	124	105	105	
	6,250	72	328	159	298	147	265	135	227	119	185	104
67		278	179	248	165	215	151	177	136	137	118	
0.1	62	232	197	201	182	168	164	143	143	121	121	
	4,500	72	313	151	283	137	251	123	216	109	175	93
67		262	161	233	146	201	132	166	117	128	101	
0.03	62	217	170	188	155	155	139	122	122	103	103	
	6,000	72	364	176	332	162	294	146	252	129	207	111
67		307	193	273	176	237	160	196	142	150	123	
0.05	62	256	208	222	191	185	171	150	150	126	126	
	7,500	72	404	198	369	183	328	165	282	147	231	128
67		343	220	307	203	265	185	220	165	168	144	
0.08	62	287	241	249	222	208	199	173	173	146	146	

**Legend:**

BPF — Bypass Factor  
Ewb — Entering Wet-Bulb

SHC — Sensible Heat Capacity (1000 Btuh) Gross  
TC — Total Capacity (1000 Btuh) Gross

**Notes:**

- Direct interpolation is permissible. Do not extrapolate.
- The following formulas may be used.  

$$tdb = tedb - \frac{\text{sensible capacity (Btuh)}}{1.10 \times cfm}$$

$$tlwb = \text{Wet-bulb temperature corresponding to enthalpy of air leaving evaporator coil (hlwb)}.$$

$$hlwb = hewb - \frac{\text{total capacity (Btuh)}}{4.5 \times cfm}$$

Where: hewb = Enthalpy of air entering evaporator coil.

- The SHC is based on 80 F edb temperature of air entering evaporator coil.  
 - Below 80 F edb, subtract (corr factor x cfm) from SHC.  
 - Above 80 F edb, add (corr factor x cfm) to SHC.

BF	ENTERING AIR DRY-BULB TEMP (F)					
	79	78	77	76	75	under 75
	81	82	83	84	85	over 85
	Correction Factor					
0.05	1.04	2.07	3.11	4.14	5.18	Use formula shown below.*
0.10	0.98	1.96	2.94	3.92	4.90	
0.20	0.87	1.74	2.62	3.49	4.36	
0.30	0.76	1.53	2.29	3.05	3.82	

- Interpolation is permissible.

\*Correction Factor = 1.10 x (1 - BF) x (edb - 80).

- Cooling capacities are gross and do not include deductions for indoor fan motor heat.
- Variable Air Volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited to edb and ewb conditions.



# COOLING CAPACITIES - SI

Unit 40RUM	Evaporator Air		Coil Refrigerant Temp (°C)									
	Airflow (Cfm) BPF	Ewb (°C)	-1		2		4		7		10	
			TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
7	850	22	36	18	33	16	29	14	25	13	21	11
		19	30	19	27	17	24	15	20	14	15	12
	0.06	17	25	20	22	18	18	16	14	14	12	12
		22	42	20	38	19	34	17	29	15	24	13
	1130	19	35	22	32	20	27	19	23	17	18	15
		17	29	24	26	22	21	20	18	18	15	15
	1420	22	46	22	42	21	38	19	32	17	27	15
19		39	25	35	23	31	21	25	19	20	17	
0.12	17	33	28	29	26	24	23	20	20	17	17	
8	1060	22	44	21	40	19	36	17	31	15	25	13
		19	37	23	33	21	29	19	23	17	18	14
	0.06	17	31	24	27	22	22	20	18	18	15	15
		22	51	24	46	23	41	20	36	18	29	16
	1420	19	43	27	38	25	33	23	28	20	21	18
		17	36	29	31	27	26	24	22	22	18	18
	1770	22	56	27	51	25	46	23	39	21	33	18
19		48	31	43	28	37	26	31	23	24	20	
0.12	17	40	34	35	31	29	28	25	25	21	21	
12	1420	22	60	29	55	27	49	24	42	21	34	18
		19	51	31	45	29	39	26	32	23	25	20
	0.05	17	42	34	37	31	31	28	25	25	21	21
		22	69	34	63	31	56	28	48	25	39	21
	1890	19	59	37	53	34	45	31	37	28	29	24
		17	49	41	43	37	36	34	30	30	25	25
	2360	22	76	37	69	34	62	32	53	28	43	24
19		65	42	58	39	50	36	42	32	32	28	
0.12	17	54	47	47	43	40	39	34	34	29	29	
14	1770	22	75	36	69	33	61	30	52	26	42	22
		19	63	39	56	35	48	32	40	28	31	24
	0.06	17	52	41	45	38	38	34	30	30	25	25
		22	87	42	79	38	70	35	60	31	49	26
	2360	19	73	46	66	42	57	38	47	34	36	30
		17	61	50	53	46	44	41	36	36	31	31
	2980	22	96	47	87	43	78	39	66	35	54	30
19		81	52	73	48	63	44	52	40	40	35	
0.1	17	68	58	59	53	49	48	42	42	35	35	
16	2120	22	92	44	83	40	74	36	63	32	51	27
		19	77	47	68	43	59	39	49	34	37	30
	0.03	17	63	50	55	45	45	41	36	36	30	30
		22	107	52	97	48	86	43	74	38	61	32
	2830	19	90	56	80	52	69	47	57	42	44	36
		17	75	61	65	56	54	50	44	44	37	37
	3540	22	118	58	108	53	96	48	83	43	68	37
19		100	64	90	59	78	54	64	48	49	42	
0.08	17	84	71	73	65	61	58	51	51	43	43	

**Legend:**

BPF — Bypass Factor  
Ewb — Entering Wet-Bulb

SHC — Sensible Heat Capacity (1000 Btuh) Gross  
TC — Total Capacity (1000 Btuh) Gross

**Notes:**

- Direct interpolation is permissible. Do not extrapolate.
- The following formulas may be used.  

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$$hlwb = hewb - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{cfm}}$$

Where: hewb = Enthalpy of air entering evaporator coil.

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BF	ENTERING AIR DRY-BULB TEMP (F)					
	79	78	77	76	75	under 75
	81	82	83	84	85	over 85
Correction Factor						
0.05	1.04	2.07	3.11	4.14	5.18	Use formula shown below.*
0.10	0.98	1.96	2.94	3.92	4.90	
0.20	0.87	1.74	2.62	3.49	4.36	
0.30	0.76	1.53	2.29	3.05	3.82	

- Interpolation is permissible.

\*Correction Factor = 1.10 x (1 - BF) x (edb - 80).

4. Cooling capacities are gross and do not include deductions for indoor fan motor heat.

5. Variable Air Volume units will operate down to 70 cfm/ton. Performance at 70 cfm/ton is limited to unloaded operation and may be additionally limited to edb and ewb conditions.

# FAN PERFORMANCE DATA - English

Unit 40RUM	Airflow (Cfm)	External Static Pressure (in. wg)													
		0.0		0.2		0.4		0.6		0.8		1.0		1.2	
		Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
7	1,800	<b>399</b>	<b>0.19</b>	454	0.24	548	0.35	<u>634</u>	<u>0.47</u>	713	<u>0.6</u>	785	0.74	850	<u>0.89</u>
	2,100	446	0.28	497	0.34	583	0.46	<u>660</u>	<u>0.59</u>	733	<u>0.73</u>	<u>802</u>	<u>0.88</u>	<u>867</u>	<u>1.05</u>
	2,400	498	0.40	541	0.47	<u>622</u>	<u>0.60</u>	<u>693</u>	<u>0.74</u>	<u>760</u>	<u>0.89</u>	<u>824</u>	<u>1.05</u>	<u>885</u>	<u>1.22</u>
	2,700	544	0.55	588	0.63	<u>663</u>	<u>0.78</u>	<u>730</u>	<u>0.93</u>	<u>792</u>	<u>1.09</u>	<u>851</u>	<u>1.26</u>	<u>909</u>	<u>1.44</u>
	3,000	594	0.73	<u>635</u>	<u>0.82</u>	<u>707</u>	<u>0.99</u>	<u>770</u>	<u>1.15</u>	<u>828</u>	<u>1.32</u>	<u>883</u>	1.50	<u>937</u>	<u>1.69</u>
8	2,250	<b>273</b>	<b>0.08</b>	<b>493</b>	<b>0.37</b>	580	0.49	656	0.62	<u>727</u>	<u>0.76</u>	794	0.92	858	1.08
	2,600	<b>322</b>	<b>0.15</b>	540	0.52	<u>622</u>	0.66	<u>693</u>	<u>0.81</u>	<u>757</u>	<u>0.96</u>	<u>819</u>	<u>1.12</u>	<u>878</u>	<u>1.29</u>
	3,000	552	0.65	595	0.73	673	0.91	<u>740</u>	<u>1.07</u>	<u>800</u>	<u>1.24</u>	<u>856</u>	<u>1.41</u>	<u>910</u>	<u>1.60</u>
	3,400	615	0.91	653	1.01	<u>726</u>	<u>1.21</u>	<u>789</u>	<u>1.40</u>	<u>846</u>	<u>1.59</u>	<u>899</u>	<u>1.78</u>	<u>950</u>	<u>1.97</u>
	3,750	671	1.20	<u>706</u>	<u>1.31</u>	<u>773</u>	<u>1.53</u>	<u>834</u>	<u>1.74</u>	<u>889</u>	<u>1.95</u>	<u>940</u>	<u>2.16</u>	<u>988</u>	<u>2.37</u>
12	3,000	<b>399</b>	<b>0.29</b>	<b>573</b>	<b>0.69</b>	654	0.86	722	1.03	784	1.19	<u>841</u>	<u>1.37</u>	<u>896</u>	<u>1.55</u>
	3,500	<b>604</b>	<b>0.92</b>	641	1.02	714	1.22	780	1.42	<u>838</u>	<u>1.61</u>	<u>892</u>	<u>1.81</u>	<u>942</u>	<u>2.01</u>
	4,000	680	1.33	713	1.45	778	1.68	<u>839</u>	<u>1.91</u>	<u>896</u>	<u>2.14</u>	<u>947</u>	<u>2.36</u>	<u>995</u>	<u>2.58</u>
	4,500	756	1.86	<u>787</u>	<u>1.99</u>	<u>845</u>	<u>2.26</u>	<u>901</u>	<u>2.52</u>	<u>955</u>	<u>2.78</u>	<u>1005</u>	<u>3.03</u>	<u>1051</u>	<u>3.28</u>
	5,000	<u>834</u>	<u>2.51</u>	<u>861</u>	<u>2.67</u>	<u>914</u>	<u>2.96</u>	<u>966</u>	<u>3.25</u>	<u>1016</u>	<u>3.54</u>	<u>1064</u>	<u>3.82</u>	<u>1109</u>	<u>4.11</u>
14	3,750	<b>394</b>	<b>0.40</b>	<b>453</b>	<b>0.52</b>	558	0.80	643	1.10	<u>717</u>	<u>1.39</u>	<u>785</u>	<u>1.71</u>	<u>848</u>	<u>2.04</u>
	4,300	<b>436</b>	<b>0.57</b>	<b>487</b>	<b>0.70</b>	586	1.00	670	1.34	<u>742</u>	<u>1.67</u>	<u>806</u>	<u>2.01</u>	<u>867</u>	<u>2.36</u>
	5,000	<b>492</b>	<b>0.86</b>	<b>535</b>	<b>0.99</b>	623	1.31	<u>704</u>	<u>1.69</u>	<u>775</u>	<u>2.08</u>	<u>838</u>	<u>2.47</u>	<u>896</u>	<u>2.86</u>
	5,700	550	1.23	587	1.37	664	1.71	<u>740</u>	<u>2.11</u>	<u>809</u>	<u>2.55</u>	<u>872</u>	<u>2.99</u>	<u>929</u>	<u>3.43</u>
	6,250	596	1.59	630	1.74	<u>700</u>	<u>2.09</u>	<u>770</u>	<u>2.51</u>	<u>837</u>	<u>2.97</u>	<u>899</u>	<u>3.45</u>	<u>955</u>	<u>3.94</u>
16	4,500	<b>428</b>	<b>0.59</b>	<b>475</b>	<b>0.70</b>	570	0.99	656	1.33	<u>730</u>	<u>1.68</u>	<u>796</u>	<u>2.02</u>	<u>856</u>	<u>2.38</u>
	5,300	<b>488</b>	<b>0.92</b>	<b>528</b>	<b>1.04</b>	609	1.34	689	1.71	<u>762</u>	<u>2.11</u>	<u>827</u>	<u>2.51</u>	<u>886</u>	<u>2.92</u>
	6,000	542	1.29	578	1.43	649	1.74	<u>721</u>	<u>2.11</u>	<u>791</u>	<u>2.55</u>	<u>855</u>	<u>3.00</u>	<u>914</u>	<u>3.46</u>
	6,800	604	1.83	637	1.99	<u>700</u>	<u>2.32</u>	<u>763</u>	<u>2.70</u>	<u>826</u>	<u>3.15</u>	<u>888</u>	<u>3.64</u>	<u>946</u>	<u>4.15</u>
	7,500	660	2.42	690	2.59	<u>747</u>	<u>2.95</u>	<u>804</u>	<u>3.34</u>	<u>861</u>	<u>3.79</u>	<u>919</u>	<u>4.29</u>	<u>975</u>	<u>4.83</u>

Unit 40RUM	Airflow (Cfm)	External Static Pressure (in. wg)											
		1.4		1.6		1.8		2.0		2.2		2.4	
		Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp	Rpm	Bhp
7	1,800	910	1.04	965	1.20	1016	1.36	<b>1065</b>	<b>1.52</b>	1111	<b>1.69</b>	<b>1155</b>	<b>1.86</b>
	2,100	<u>927</u>	<u>1.21</u>	<u>983</u>	<u>1.38</u>	<u>1035</u>	<u>1.56</u>	<b>1084</b>	<b>1.74</b>	<b>1131</b>	<b>1.92</b>	<b>1175</b>	<b>2.11</b>
	2,400	<u>944</u>	<u>1.41</u>	<u>999</u>	<u>1.59</u>	<b>1052</b>	<b>1.78</b>	<b>1101</b>	<b>1.98</b>	<b>1149</b>	<b>2.18</b>	<b>1193</b>	<b>2.38</b>
	2,700	964	<u>1.63</u>	<u>1018</u>	<u>1.82</u>	<b>1069</b>	<b>2.03</b>	<b>1118</b>	<b>2.24</b>	<b>1165</b>	<b>2.45</b>	—	—
	3,000	<u>989</u>	<u>1.89</u>	<u>1039</u>	<u>2.10</u>	<b>1089</b>	<b>2.31</b>	<b>1136</b>	<b>2.53</b>	<b>1183</b>	<b>2.76</b>	—	—
8	2,250	918	1.26	975	1.43	1029	1.62	1079	1.80	1126	1.99	<b>1172</b>	<b>2.18</b>
	2,600	<u>936</u>	<u>1.48</u>	<u>991</u>	<u>1.67</u>	<u>1044</u>	<u>1.87</u>	<u>1094</u>	<u>2.07</u>	<b>1142</b>	<b>2.28</b>	<b>1188</b>	<b>2.49</b>
	3,000	<u>963</u>	<u>1.79</u>	<u>1014</u>	<u>1.99</u>	<u>1064</u>	<u>2.20</u>	<u>1113</u>	<u>2.42</u>	<b>1159</b>	<b>2.64</b>	—	—
	3,400	998	<u>2.18</u>	<u>1045</u>	<u>2.39</u>	<u>1092</u>	<u>2.61</u>	<u>1137</u>	<u>2.83</u>	<b>1182</b>	<b>3.07</b>	—	—
	3,750	<u>1034</u>	<u>2.58</u>	<u>1078</u>	<u>2.80</u>	<u>1122</u>	<u>3.03</u>	<b>1164</b>	<b>3.27</b>	—	—	—	—
12	3,000	949	1.74	1000	1.93	1050	2.14	1099	2.36	1147	2.58	1192	2.81
	3,500	<u>990</u>	<u>2.21</u>	<u>1037</u>	<u>2.42</u>	<u>1083</u>	<u>2.64</u>	1128	2.86	1172	3.1	—	—
	4,000	<u>1040</u>	<u>2.80</u>	<u>1084</u>	<u>3.03</u>	<u>1126</u>	<u>3.26</u>	1167	3.50	—	—	—	—
	4,500	<u>1094</u>	<u>3.53</u>	<u>1136</u>	<u>3.78</u>	<u>1176</u>	<u>4.03</u>	—	—	—	—	—	—
	5,000	<u>1151</u>	<u>4.39</u>	<u>1191</u>	<u>4.66</u>	—	—	—	—	—	—	—	—
14	3,750	909	2.37	968	2.74	1026	3.12	<b>1080</b>	<b>3.51</b>	<b>1131</b>	<b>3.92</b>	<b>1181</b>	<b>4.32</b>
	4,300	<u>925</u>	<u>2.73</u>	<u>980</u>	<u>3.11</u>	<u>1034</u>	<u>3.52</u>	<b>1084</b>	<b>3.92</b>	<b>1135</b>	<b>4.35</b>	<b>1184</b>	<b>4.78</b>
	5,000	<u>950</u>	<u>3.26</u>	<u>1002</u>	<u>3.67</u>	<b>1052</b>	<b>4.09</b>	<b>1101</b>	<b>4.53</b>	<b>1148</b>	<b>4.98</b>	<b>1190</b>	<b>5.44</b>
	5,700	981	<u>3.88</u>	<u>1031</u>	<u>4.33</u>	<b>1079</b>	<b>4.79</b>	<b>1125</b>	<b>5.25</b>	<b>1169</b>	<b>5.73</b>	—	—
	6,250	<u>1007</u>	<u>4.42</u>	<b>1057</b>	<b>4.91</b>	<b>1103</b>	<b>5.4</b>	<b>1148</b>	<b>5.90</b>	<b>1191</b>	<b>6.40</b>	—	—
16	4,500	912	2.75	967	3.13	<b>1019</b>	<b>3.52</b>	<b>1070</b>	<b>3.92</b>	<b>1120</b>	<b>4.35</b>	<b>1168</b>	<b>4.79</b>
	5,300	<u>940</u>	<u>3.33</u>	<u>992</u>	<u>3.75</u>	<b>1041</b>	<b>4.18</b>	<b>1088</b>	<b>4.61</b>	<b>1134</b>	<b>5.06</b>	<b>1179</b>	<b>5.52</b>
	6,000	<u>968</u>	<u>3.92</u>	<u>1018</u>	<u>4.38</u>	<b>1066</b>	<b>4.85</b>	<b>1112</b>	<b>5.32</b>	<b>1156</b>	<b>5.80</b>	<b>1198</b>	<b>6.29</b>
	6,800	<u>1000</u>	<u>4.67</u>	<b>1050</b>	<b>5.19</b>	<b>1097</b>	<b>5.71</b>	<b>1142</b>	<b>6.23</b>	<b>1185</b>	<b>6.76</b>	—	—
	7,500	<b>1028</b>	<b>5.39</b>	<b>1078</b>	<b>5.97</b>	<b>1125</b>	<b>6.54</b>	<b>1170</b>	<b>7.11</b>	—	—	—	—

## LEGEND

Bhp — Brake Horsepower Input to Fan

ESP — External Static Pressure

**Bold** indicates field-supplied drive or motor is required. Plain type indicates standard motor and standard drive.

Underline indicates a different motor and drive combination other than the standard motor and standard drive combination is required. Refer to fan motor and drive tables to complete selection.

## NOTES:

Maximum allowable fan speed is 1200 rpm for all sizes. Fan performance is based on deductions for wet coil, clean 1-in. filters, and unit casing. See table below for factory-supplied filter pressure drop.

# FAN PERFORMANCE DATA (cont.) - SI

Unit 40RUM	Airflow (L/s)	External Static Pressure (Pa)													
		0		50		100		150		200		250		300	
		r/s	kW	r/s	kW	r/s	kW	r/s	kW	r/s	kW	r/s	kW	r/s	kW
7	850	<b>6.64</b>	<b>0.14</b>	7.56	0.18	9.13	0.26	<u>10.56</u>	<u>0.35</u>	11.88	0.45	13.08	0.55	14.16	0.66
	990	7.43	0.21	8.28	0.25	9.71	0.34	<u>11.00</u>	<u>0.44</u>	<u>12.22</u>	<u>0.54</u>	13.37	0.66	14.44	0.78
	1130	8.30	0.30	9.02	0.35	<u>10.36</u>	<u>0.45</u>	<u>11.55</u>	<u>0.55</u>	<u>12.67</u>	<u>0.66</u>	<u>13.73</u>	<u>0.78</u>	<u>14.76</u>	<u>0.91</u>
	1270	9.06	0.41	9.79	0.47	<u>11.06</u>	<u>0.58</u>	<u>12.17</u>	<u>0.69</u>	<u>13.2</u>	<u>0.81</u>	<u>14.19</u>	<u>0.94</u>	<u>15.14</u>	<u>1.07</u>
	1420	9.91	0.55	<u>10.58</u>	<u>0.61</u>	<u>11.78</u>	<u>0.74</u>	<u>12.83</u>	<u>0.86</u>	<u>13.8</u>	<u>0.99</u>	<u>14.72</u>	<u>1.12</u>	<u>15.61</u>	<u>1.26</u>
8	1060	<b>4.55</b>	<b>0.06</b>	<b>8.21</b>	<b>0.27</b>	9.67	0.37	10.93	0.46	12.11	0.57	13.23	0.68	14.30	0.81
	1230	<b>5.37</b>	<b>0.11</b>	8.99	0.38	10.37	0.49	<u>11.55</u>	<u>0.6</u>	<u>12.62</u>	<u>0.71</u>	<u>13.65</u>	<u>0.84</u>	<u>14.64</u>	<u>0.96</u>
	1420	9.21	0.48	9.92	0.55	11.22	0.67	<u>12.33</u>	<u>0.8</u>	<u>13.33</u>	<u>0.92</u>	<u>14.27</u>	<u>1.05</u>	<u>15.17</u>	<u>1.19</u>
	1600	10.25	0.68	10.89	0.75	<u>12.09</u>	<u>0.90</u>	<u>13.15</u>	<u>1.04</u>	<u>14.1</u>	<u>1.18</u>	<u>14.99</u>	<u>1.33</u>	<u>15.83</u>	<u>1.47</u>
	1770	11.18	0.90	<u>11.76</u>	<u>0.98</u>	<u>12.88</u>	<u>1.14</u>	<u>13.90</u>	<u>1.30</u>	<u>14.82</u>	<u>1.45</u>	<u>15.67</u>	<u>1.61</u>	<u>16.46</u>	<u>1.77</u>
12	1420	<b>6.65</b>	<b>0.22</b>	<b>9.55</b>	<b>0.51</b>	10.89	0.64	12.04	0.77	13.06	0.89	<u>14.02</u>	<u>1.02</u>	<u>14.93</u>	<u>1.15</u>
	1650	<b>10.06</b>	<b>0.68</b>	10.69	0.76	11.9	0.91	13.00	1.06	<u>13.97</u>	<u>1.20</u>	<u>14.86</u>	<u>1.35</u>	<u>15.7</u>	<u>1.50</u>
	1890	11.33	0.99	11.88	1.08	12.96	1.25	<u>13.99</u>	<u>1.43</u>	<u>14.93</u>	<u>1.59</u>	<u>15.78</u>	<u>1.76</u>	<u>16.58</u>	<u>1.92</u>
	2120	12.61	1.38	<u>13.11</u>	<u>1.49</u>	<u>14.08</u>	<u>1.68</u>	<u>15.02</u>	<u>1.88</u>	<u>15.92</u>	<u>2.07</u>	<u>16.74</u>	<u>2.26</u>	<u>17.51</u>	<u>2.44</u>
	2360	13.90	1.87	<u>14.36</u>	<u>1.99</u>	<u>15.23</u>	<u>2.21</u>	<u>16.10</u>	<u>2.42</u>	<u>16.94</u>	<u>2.64</u>	<u>17.73</u>	<u>2.85</u>	<u>18.48</u>	<u>3.06</u>
14	1770	<b>6.57</b>	<b>0.30</b>	<b>7.54</b>	<b>0.39</b>	9.31	0.60	10.72	0.82	11.95	1.04	13.09	1.27	14.13	1.52
	2030	<b>7.27</b>	<b>0.43</b>	<b>8.11</b>	<b>0.52</b>	9.76	0.75	11.16	1.00	12.36	1.25	13.44	1.50	14.45	1.76
	2360	<b>8.20</b>	<b>0.64</b>	<b>8.92</b>	<b>0.74</b>	10.38	0.98	<u>11.73</u>	<u>1.26</u>	<u>12.91</u>	<u>1.55</u>	<u>13.97</u>	<u>1.84</u>	<u>14.93</u>	<u>2.13</u>
	2690	9.16	0.92	9.79	1.02	11.07	1.27	<u>12.33</u>	<u>1.58</u>	<u>13.48</u>	<u>1.90</u>	<u>14.53</u>	<u>2.23</u>	<u>15.48</u>	<u>2.56</u>
	2950	9.93	1.18	10.50	1.30	11.66	1.56	<u>12.83</u>	<u>1.87</u>	<u>13.95</u>	<u>2.22</u>	<u>14.98</u>	<u>2.58</u>	<u>15.92</u>	<u>2.94</u>
16	2120	<b>7.13</b>	<b>0.44</b>	<b>7.91</b>	<b>0.52</b>	9.50	0.74	10.94	0.99	<u>12.17</u>	<u>1.25</u>	<u>13.26</u>	<u>1.51</u>	<u>14.26</u>	<u>1.77</u>
	2500	<b>8.13</b>	<b>0.68</b>	<b>8.80</b>	<b>0.78</b>	10.15	1.00	11.48	1.27	<u>12.7</u>	<u>1.57</u>	<u>13.78</u>	<u>1.87</u>	<u>14.76</u>	<u>2.18</u>
	2830	9.03	0.96	9.63	1.07	10.81	1.30	<u>12.01</u>	<u>1.58</u>	<u>13.18</u>	<u>1.90</u>	<u>14.25</u>	<u>2.24</u>	<u>15.23</u>	<u>2.58</u>
	3210	10.07	1.37	10.62	1.48	<u>11.66</u>	<u>1.73</u>	<u>12.71</u>	<u>2.01</u>	<u>13.77</u>	<u>2.35</u>	<u>14.8</u>	<u>2.71</u>	<u>15.76</u>	<u>3.09</u>
	3540	10.99	1.81	11.50	1.93	<u>12.45</u>	<u>2.20</u>	<u>13.40</u>	<u>2.49</u>	<u>14.35</u>	<u>2.83</u>	<u>15.31</u>	<u>3.20</u>	<u>16.24</u>	<u>3.60</u>

Unit 40RUM	Airflow (L/s)	External Static Pressure (Pa)											
		350		400		450		500		550		600	
		r/s	kW	r/s	kW	r/s	kW	r/s	kW	r/s	kW	r/s	kW
7	850	<u>15.16</u>	<u>0.78</u>	16.08	0.89	16.94	1.01	17.74	1.13	18.51	1.26	19.25	1.39
	990	<u>15.44</u>	<u>0.90</u>	16.38	1.03	17.25	1.16	18.07	1.30	18.84	1.43	19.58	1.57
	1130	<u>15.73</u>	<u>1.05</u>	16.65	1.19	17.53	1.33	18.36	1.48	19.14	1.62	19.89	1.77
	1270	<u>16.07</u>	<u>1.21</u>	16.96	1.36	17.82	1.51	18.64	1.67	19.42	1.83	—	—
	1420	<u>16.48</u>	<u>1.41</u>	17.32	1.56	18.14	1.72	18.94	1.89	19.71	2.06	—	—
8	1060	15.31	0.94	16.25	1.07	17.14	1.20	17.98	1.34	18.77	1.48	19.53	1.63
	1230	<u>15.60</u>	<u>1.10</u>	16.51	1.24	17.39	1.39	18.23	1.54	19.03	1.70	19.80	1.86
	1420	<u>16.05</u>	<u>1.33</u>	16.9	1.48	17.74	1.64	18.54	1.8	19.32	1.97	—	—
	1600	<u>16.64</u>	<u>1.62</u>	17.42	1.78	18.2	1.94	18.95	2.11	19.69	2.29	—	—
	1770	<u>17.23</u>	<u>1.93</u>	17.97	2.09	18.7	2.26	19.41	2.44	—	—	—	—
12	1420	15.81	1.29	16.67	1.44	17.51	1.60	18.32	1.76	19.11	1.92	19.87	2.09
	1650	<u>16.51</u>	<u>1.65</u>	17.29	1.80	18.05	1.97	18.80	2.13	19.53	2.31	—	—
	1890	<u>17.34</u>	<u>2.09</u>	18.06	2.26	18.77	2.43	19.45	2.61	—	—	—	—
	2120	18.24	2.63	18.93	2.82	19.59	3.00	—	—	—	—	—	—
	2360	19.18	3.27	19.85	3.48	—	—	—	—	—	—	—	—
14	1770	<u>15.15</u>	<u>1.77</u>	16.13	2.04	17.1	2.33	18.00	2.62	18.85	2.92	19.68	3.22
	2030	<u>15.41</u>	<u>2.04</u>	16.34	2.32	17.24	2.62	18.07	2.92	18.92	3.24	19.73	3.56
	2360	<u>15.84</u>	<u>2.43</u>	16.7	2.74	17.54	3.05	18.35	3.38	19.14	3.71	19.83	4.06
	2690	16.36	2.89	17.19	3.23	17.98	3.57	18.75	3.92	19.49	4.27	—	—
	2950	16.79	3.30	17.61	3.66	18.39	4.03	19.13	4.40	19.84	4.77	—	—
16	2120	<u>15.20</u>	<u>2.05</u>	16.12	2.33	16.98	2.62	17.83	2.92	18.67	3.24	19.47	3.57
	2500	<u>15.67</u>	<u>2.49</u>	16.53	2.80	17.35	3.12	18.13	3.44	18.90	3.77	19.65	4.12
	2830	<u>16.13</u>	<u>2.92</u>	16.97	3.27	17.77	3.62	18.53	3.97	19.26	4.33	19.97	4.69
	3210	<u>16.66</u>	<u>3.48</u>	17.50	3.87	18.29	4.26	19.03	4.65	19.75	5.04	—	—
	3540	17.13	4.02	17.97	4.45	18.75	4.88	19.50	5.30	—	—	—	—

## LEGEND

Bhp — Brake Horsepower Input to Fan

ESP — External Static Pressure

**Bold** indicates field-supplied drive or motor is required. Plain type indicates standard motor and standard drive.

Underline indicates a different motor and drive combination other than the standard motor and standard drive combination is required. Refer to fan motor and drive tables to complete selection.

## NOTES:

Maximum allowable fan speed is 20 r/s for all sizes. Fan performance is based on deductions for wet coil, clean 25.4-mm filters, and unit casing. See table below for factory-supplied filter pressure drop.

# PERFORMANCE DATA

Factory-Supplied Filter Pressure Drop — English

Unit 40RUM	Airflow (Cfm)	Pressure Drop (in. wg)
7	1800	0.05
	2400	0.08
	3000	0.11
8	2250	0.07
	3000	0.11
	3750	0.15
12	3000	0.11
	4000	0.17
	5000	0.23
14	3750	0.06
	5000	0.10
	6250	0.13
16	4500	0.08
	6000	0.12
	7500	0.17

Factory-Supplied Filter Pressure Drop — SI

Unit 40RUM	Airflow (L/s)	Pressure Drop (Pa)
7	850	13
	1150	20
	1450	28
8	1000	17
	1400	27
	1800	38
12	1450	28
	1900	42
	2350	56
14	1750	15
	2350	24
	2950	33
16	2100	20
	2800	30
	3500	42

Accessory Plenum Air Throw Data — English (Ft)

Unit 40RUM	Airflow (Cfm)	Vane Deflection		
		Straight	21 °	45°
7	2400	39	33	24
8	3000	45	38	28
12	4000	55	46	33
14	5000	45	38	28
16	6000	50	43	31

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

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

Accessory Plenum Air Throw Data — SI (m)

Unit 40RUM	Airflow (L/s)	Vane Deflection		
		Straight	21 °	45°
7	1150	11.71	9.91	7.20
8	1400	13.87	11.71	8.63
12	1900	16.65	13.93	9.99
14	2350	13.77	11.63	8.57
16	2800	15.41	13.25	9.55

TERMINAL VELOCITY (m/sec)	THROW FACTOR
0.254	X 1.50
0.508	X 0.75
0.762	X 0.50

NOTE: Throw distances shown are for 0.381 m/sec terminal velocity. Use the following multipliers to determine throw values for other terminal velocities.

Accessory Pressure Drop — English (in. wg)

Unit	Airflow (Cfm)	Discharge Plenum	Electric Heater	Return Air Grille
7	1800	0.06	0.04	0.01
	2400	0.10	0.06	0.01
	3000	0.14	0.10	0.02
8	2250	0.09	0.06	0.01
	3000	0.14	0.10	0.02
	3750	0.21	0.15	0.03
12	3000	0.14	0.10	0.02
	4000	0.22	0.17	0.04
	5000	0.32	0.26	0.06
14	3750	0.07	0.04	0.01
	5000	0.12	0.07	0.02
	6250	0.17	0.11	0.02
16	4500	0.10	0.06	0.01
	6000	0.16	0.10	0.02
	7500	0.23	0.15	0.03

Accessory Pressure Drop — SI (Pa)

Unit	Airflow (L/s)	Discharge Plenum	Electric Heater	Return Air Grille
7	850	15	9	2
	1150	25	16	3
	1450	36	26	5
8	1000	20	12	2
	1400	34	24	5
	1800	51	39	8
12	1450	36	26	5
	1900	56	43	10
	2350	79	65	15
14	1750	18	10	2
	2350	29	17	5
	2950	43	26	5
16	2100	24	14	2
	2800	39	24	5
	3500	56	37	7

# ELECTRICAL DATA TABLE

## Standard Motors

Unit	Voltage	Voltage Range	Fan Motor		Power Supply	
			HP (kW)	FLA	MCA	MOCP
40RUM-07	400-3-50	360-440	2.4	2.6	3.3	15
40RUM-08	400-3-50	360-440	2.4	2.6	3.3	15
40RUM-12	400-3-50	360-440	2.9	3.8	4.3	15
40RUM-14	400-3-50	360-440	2.9	3.8	4.3	15
40RUM-16	400-3-50	360-440	2.9	3.8	4.3	15

## Alternate Motors

Unit	Voltage	Voltage Range	Fan Motor		Power Supply	
			HP (kW)	FLA	MCA	MOCP
40RUM-07	400-3-50	360-440	2.4	2.6	3.3	15
40RUM-08	400-3-50	360-440	2.9	3.8	4.8	15
40RUM-12	400-3-50	360-440	5.0	8.0	10.0	15
40RUM-14	400-3-50	360-440	5.0	8.0	10.0	15
40RUM-16	400-3-50	360-440	5.0	8.0	10.0	15

### Legend and Notes for Electrical Data Table

**FLA** - Full Load Amps

**HP** - Horse Power

**kW** - Kilowatt

**MCA** - Minimum Circuit Amps

**MOCP** - Maximum Overcurrent Protection

Application heater kW (Using multiplication factor table in Electric Resistance Heater Data Table)

### Unbalanced 3-Phase Supply Voltage

*Never operate a motor where phase imbalance in supply voltage is greater than 2%.*

Use the following formula to determine the percentage of voltage imbalance

$$= 100 \times \frac{\text{Maximum Deviation From Average Voltage}}{\text{Average Voltage}}$$

Example: Supply Voltage is 400V - 3ph - 60Hz

AB = 392v	Average Voltage = $\frac{392 + 404 + 395}{3}$
BC = 404v	
AC = 395v	$= \frac{1191}{3} = 397V$

Determine maximum deviation from average voltage.

$$(AB) 397 - 392 = 5v$$

$$(BC) 404 - 397 = 7v$$

$$(AC) 457 - 397 = 2v$$

Maximum Deviation is 7v.

Determine Percentage Voltage Imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{7}{397} = 1.76\%$$

This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%

**IMPORTANT:** If the supply voltage phase imbalance is more than 2% contact your local electric utility company

# ELECTRICAL HEATER DATA TABLE

Heater Part No. CAELHEAT	40RUM Size	V-Ph-Hz	Fan Motor			Electric Heater(s)					MCA	MOCP
			Hp	kW	FLA	Nominal Capacity (kW)	Actual Capacity (kW)					
							Stage 1	Stage 2	Total	FLA		
002A00	07-12	400-3-50	2.4	1.79	2.6	5	3.5	—	3.5	5.0	9.5	15
			2.9	2.16	3.4	5	3.5	—	3.5	5.0	10.5	15
			5.0	3.73	7.6	5	3.5	—	3.5	5.0	15.8	20
005A00			2.4	1.79	2.6	10	6.9	—	6.9	10.0	15.8	20
			2.9	2.16	3.4	10	6.9	—	6.9	10.0	16.8	20
			5.0	3.73	7.6	10	6.9	—	6.9	10.0	22.0	25
008A00			2.4	1.79	2.6	15	10.4	—	10.4	15.0	22.0	25
			2.9	2.16	3.4	15	10.4	—	10.4	15.0	23.0	25
			5.0	3.73	7.6	15	10.4	—	10.4	15.0	28.3	30
011A00			2.4	1.79	2.6	25	10.4	6.9	17.4	25.1	34.6	35
			2.9	2.16	3.4	25	10.4	6.9	17.4	25.1	35.6	40
			5.0	3.73	7.6	25	10.4	6.9	17.4	25.1	40.9	45
014A00	08-12	2.4	1.79	2.6	35	13.9	10.4	24.3	35.1	47.1	50	
		2.9	2.16	3.4	35	13.9	10.4	24.3	35.1	48.1	50	
		5.0	3.73	7.6	35	13.9	10.4	24.3	35.1	53.4	60	
017A00		2.9	2.16	3.4	10	6.9	—	6.9	10.0	16.8	20	
		5.0	3.73	8.1	10	6.9	—	6.9	10.0	22.6	25	
		7.5	5.59	11.4	10	6.9	—	6.9	10.0	26.8	30	
		10.0	5.59	15.1	10	6.9	—	6.9	10.0	31.4	35	
020A00		2.9	2.16	3.4	20	13.9	—	13.9	20.0	29.3	30	
		2.9	2.16	3.4	20	13.9	—	13.9	28.9	40.4	45	
		5.0	3.73	8.1	20	13.9	—	13.9	28.9	46.3	50	
		5.0	3.73	8.1	20	13.9	—	13.9	28.9	46.3	50	
		7.5	5.59	11.4	20	13.9	—	13.9	28.9	50.4	60	
023A00	2.9	2.16	3.4	30	13.9	6.9	20.8	30.1	41.9	50		
	5.0	3.73	8.1	30	13.9	6.9	20.8	30.1	47.8	50		
	5.0	3.73	8.1	30	13.9	6.9	20.8	30.1	47.8	50		
	7.5	5.59	11.4	30	13.9	6.9	20.8	30.1	51.9	60		
026A00	16	2.9	2.76	3.4	50	20.8	13.9	34.7	50.1	66.9	70	
		5.0	3.73	8.1	50	20.8	13.9	34.7	50.1	72.8	80	
		7.5	5.59	11.4	50	20.8	13.9	34.7	50.1	76.9	80	

## Legend and Notes for Electrical Data Table

**FLA** - Full Load Amps

**HP** - Horse Power

**kW** - Kilowatt

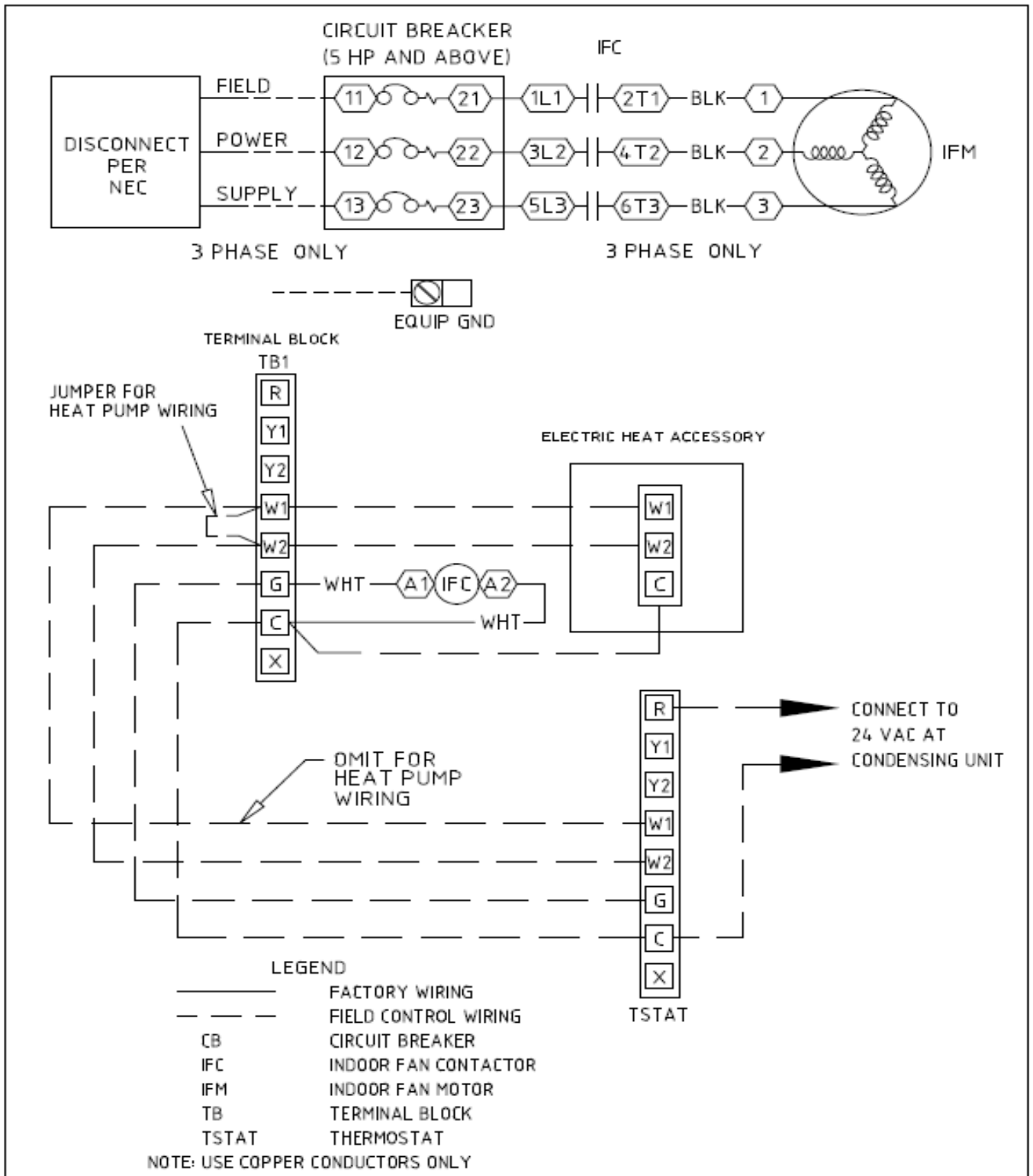
**MCA** - Minimum Circuit Amps

**MOCP** - Maximum Overcurrent Protection



1. Heater contactor coils are 24 v and require 8 va holding current.
2. Electric heaters are tested and ETL approved at maximum total external static pressure of 1.9 in. wg.
3. MCA and MOCP values apply to both standard and alternate factory-supplied motors.
4. Approximate shipping weight for CAELHEAT002A00-014A00 is 55 lb (25 kg) and for CAELHEAT017A00-026A00 is 60 lb (27 kg)

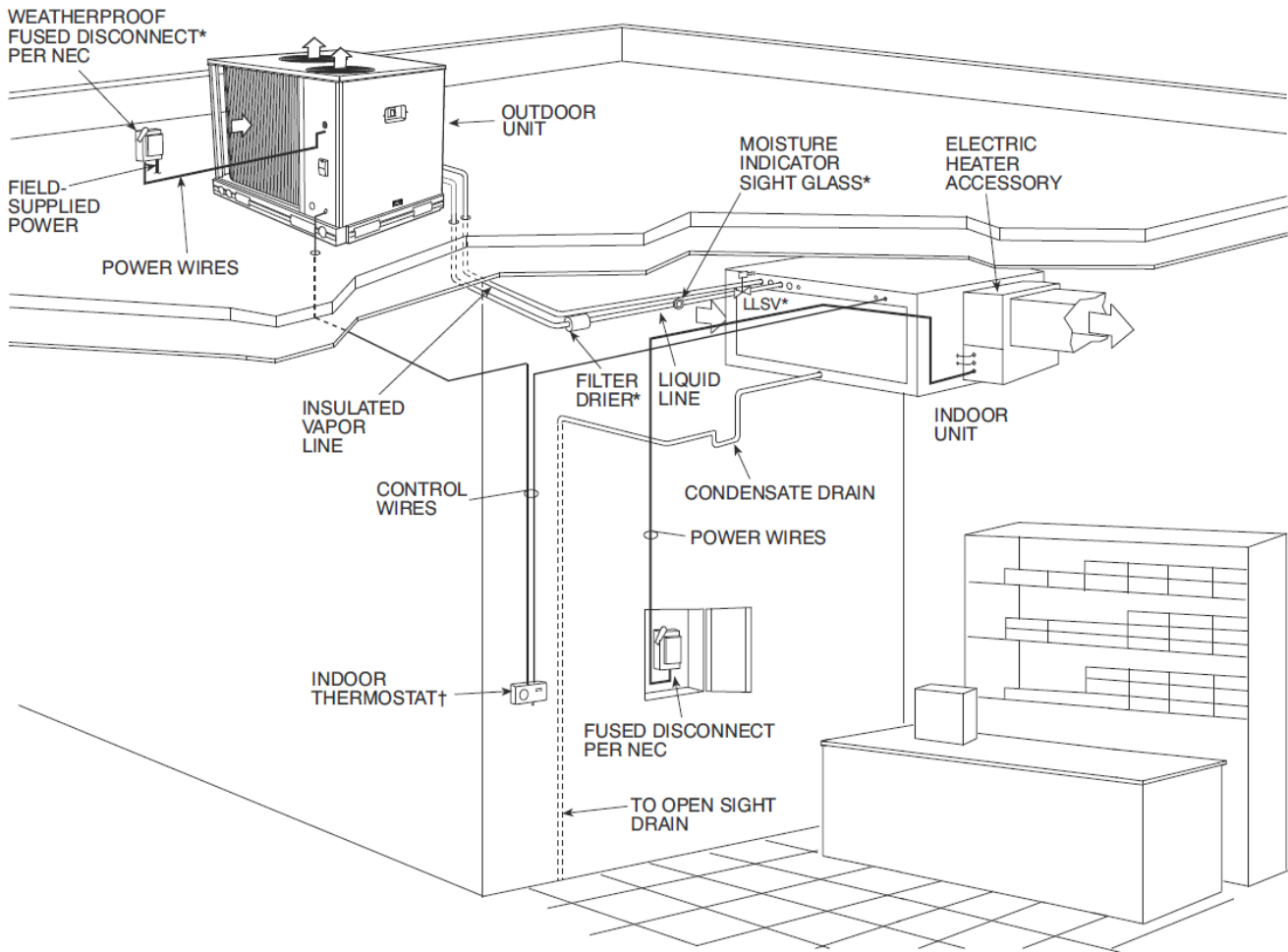
# TYPICAL WIRING SCHEMATIC



40RUM Unit Size 7 – 16

# TYPICAL PIPING AND WIRING

## Roof Installation and a Ceiling-Mounted Fan Coil



### LEGEND:

NEC - National Electrical Code

TXV - Thermostatic Expansion Valve

\* Field -supplied

† Double riser may be required. Consult condensing unit product data catalog for details.

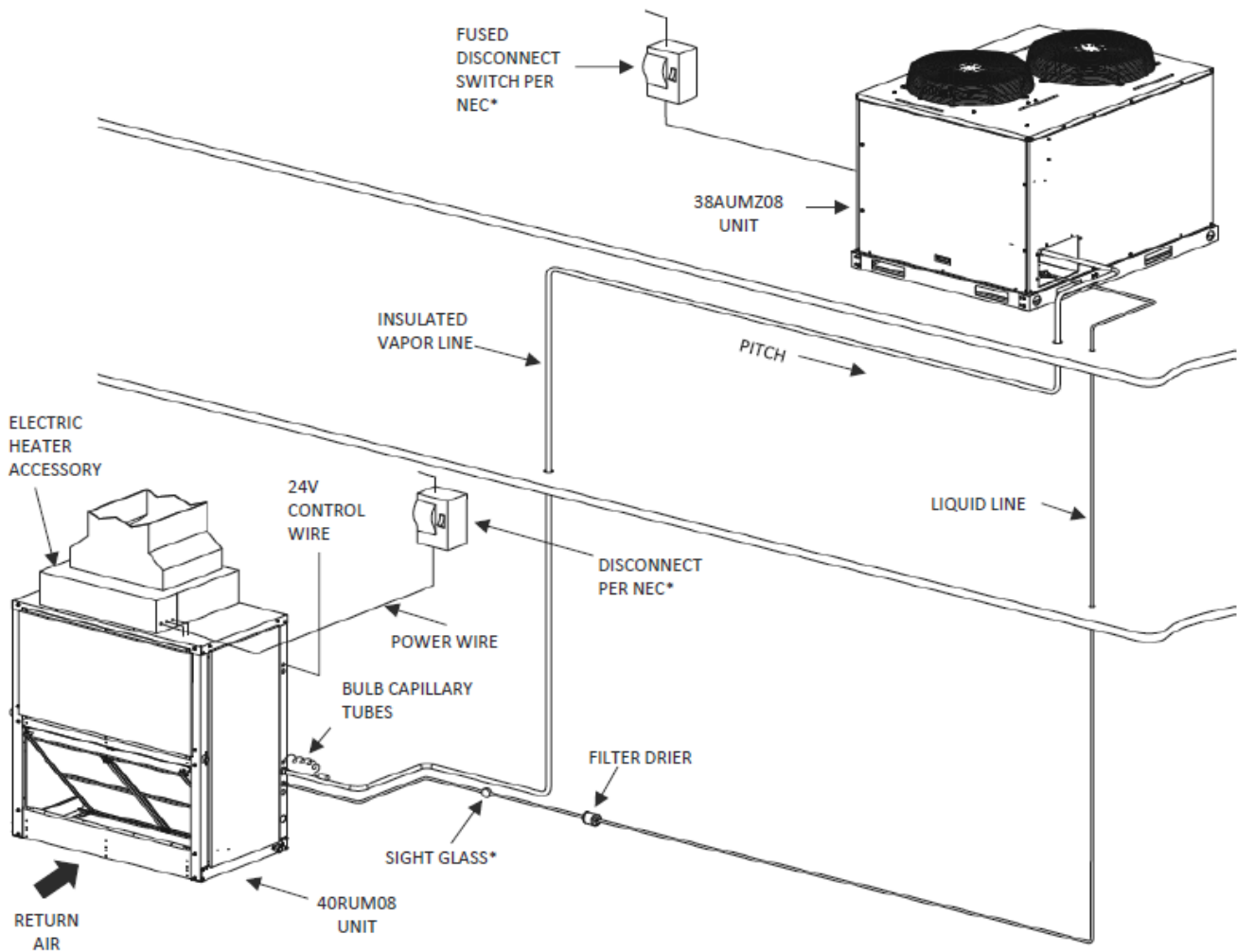
### NOTES:

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. Filter driers must be bi-flow type suited for heat pump duty.
6. Internal factory-supplied TXVs and check valves not shown.



# TYPICAL PIPING AND WIRING (cont.)

## Roof Installation and a Vertical Discharge Fan Coil



### LEGEND:

NEC - National Electrical Code

TXV - Thermostatic Expansion Valve

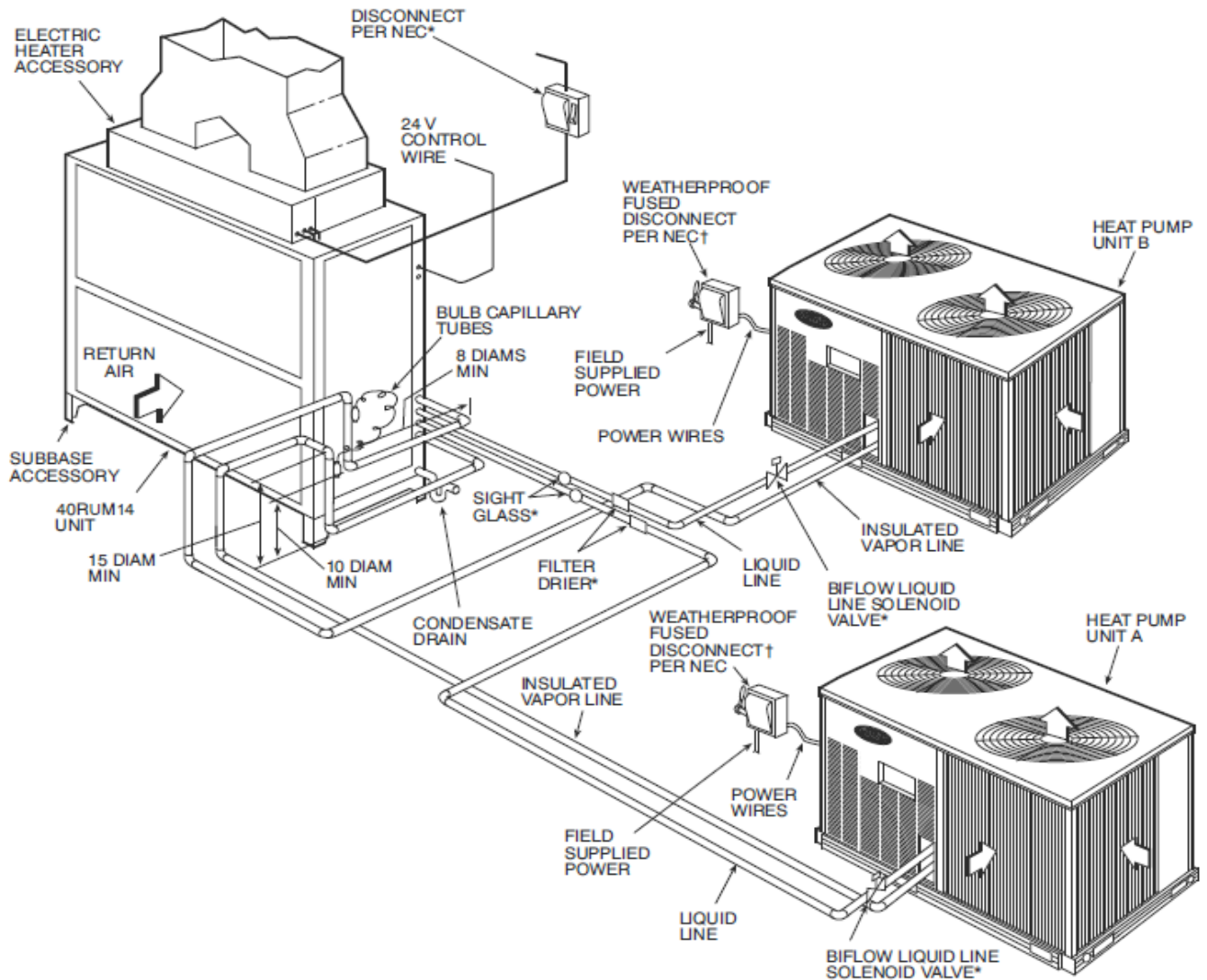
\* Field -supplied

### 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. Filter driers must be bi-flow type suited for heat pump duty.
5. Internal factory-supplied TXVs and check valves not shown.

# TYPICAL PIPING AND WIRING (cont.)

## Dual Condensing Units and a Dual Circuit Fan



### LEGEND:

NEC - National Electrical Code

TXV - Thermostatic Expansion Valve

\* Field -supplied

† Field supplied; not required if FIOP disconnect is 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. Filter driers must be bi-flow type suited for heat pump duty.
5. Heat Pump Unit A should be the first on, last off and be connected to the lower half of the coil.
6. Internal factory-supplied TXVs and check valves not shown.

# APPLICATION DATA

## Operating limits

Maximum fan speed  
40RUM07-16 ..... 1200 RPM (20 R/S)

## General

**IMPORTANT:** Do not bury refrigerant piping underground. Select equipment to match or to be slightly less than peak load. This provides better humidity control, less unit cycling, and less part-load operation. Equipment should be selected to perform at no less than 300 cfm/ton (40 L/s per kW).

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

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

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

## Auxiliary Side Connector Data

40RUM Unit	Carrier P/N	INLET/OUTLET DIAMETER — ODF (in.)
07	EA19BA705	1 - 1/8
08	EA19BA905	1 - 3/8
12	EA19BA705	1 - 1/8
14	EA19BA705	1 - 1/8
16	EA19BA705	1 - 1/8

## Factory-Installed Nozzle And Distributor Data

40RUM Unit	Coil Type	TXV Qty...Part No.	Distributor Qty...Part No.	Feeder Tubes Per Distributor Qty...Size (in.)	Nozzle Qty...Part No.
07	4 Row	1...EA36UC050	1...EA07KC102	12...1/4	1...EA19CY904
08	4 Row	1...EA36UC060	1...EA07KC112	15...1/4	1...EA19CY905
12	4 Row	2...EA36UC040	2...EA07KC116	9...1/4	2...EA19CY903
14	4 Row	2...EA36UC050	2...EA07KC216	12...3/16	2...EA19CY903
16	4 Row	2...EA36UC060	2...EA07KC213	16...3/16	2...EA19CY904

## LEGEND

**TXV** - Thermostatic Expansion Valve

## Standard Drive Data - 50Hz - SI

40RUM Unit	07	08	12	14	16
<b>Motor Drive</b>					
Motor Pulley Pitch - Diameter (mm)	61.0-86.4	71.1-96.5	86.4-111.8	86.4-111.8	86.4-111.8
Pulley Factory Setting Full Turns Open	3.5	1.5	1	2.5	1
<b>Fan Drive</b>					
Pulley Pitch Diameter (mm)	203	203	203	229	229
Pulley Bore (mm)	25.4	25.4	25.4	36.5	36.5
Belt No. - Section	1 - A	1 - A	1 - A	1 - A	1 - A
Belt Pitch (mm)	998	998	1024	1074	1074
<b>Fan Speed (r/s)</b>					
Factory Setting	8.6	9.8	11.6	10.3	10.3
Range	7.1-10.1	8.3-11.3	10.1-13.1	9.0-11.6	9.0-11.6
Max Allowable Speed (r/s)	20	20	20	20	20
Change per 1/2 Turn of Moveable Motor Pulley Flange	0.297	0.297	0.297	0.265	0.265
Max Full Turns from Closed position	5	5	5	5	5
Shafts Center Distance (mm)	265-313	265-313	265-313	265-313	265-313

## APPLICATION DATA (cont.)

### Medium-Static Drive Data - 50Hz - SI

40RUM Unit	07	08	12	14	16
<b>Motor Drive</b>					
Motor Pulley Pitch - Diameter (mm)	86.4-111.8	86.4-111.8	86.4-111.8	86.4-111.8	94.0-119.4
Pulley Factory Setting Full Turns Open	2.5	2.5	2.5	2.5	3
<b>Fan Drive</b>					
Pulley Pitch Diameter (mm)	203	178	152	191	201
Pulley Bore (mm)	25.4	25.4	25.4	36.5	36.5
Belt No. - Section	1 - A	1 - A	1 - A	1 - A	1 - B
Belt Pitch (mm)	1024	1049	947	998	1011
<b>Fan Speed (r/s)</b>					
Factory Setting	11.6	13.2	15.4	12.4	12.6
Range	10.1-13.1	11.5-14.9	13.5-17.4	10.8-13.9	11.1-14.1
Max Allowable Speed (r/s)	20	20	20	20	20
Change per 1/2 Turn of Moveable Motor Pulley Flange	0.297	0.34	0.395	0.317	0.252
Max Full Turns from Closed position	5	5	5	5	5
Shafts Center Distance (mm)	265-313	265-313	265-313	265-313	232-279

### High-Static Drive Data - 50Hz - SI

40RUM Unit	07	08	12	14	16
<b>Motor Drive</b>					
Motor Pulley Pitch - Diameter (mm)	86.4-111.8	86.4-111.8	101.6-127.0	86.4-111.8	101.6-127.0
Pulley Factory Setting Full Turns Open	2.5	2.5	3	2.5	3
<b>Fan Drive</b>					
Pulley Pitch Diameter (mm)	152	140	140	152	178
Pulley Bore (mm)	25.4	25.4	25.4	36.5	36.5
Belt No. - Section	1-A	1-A	1-A	2-A	2-A
Belt Pitch (mm)	947	947	922	922	998
<b>Fan Speed (r/s)</b>					
Factory Setting	15.4	16.8	19.4	15.4	15.3
Range	13.5-17.4	14.7-19.0	17.3-20.0	13.5-17.4	13.6-17.0
Max Allowable Speed (r/s)	20	20	20	20	20
Change per 1/2 Turn of Moveable Motor Pulley Flange	0.395	0.432	0.36	0.395	0.283
Max Full Turns from Closed position	5	5	6	5	6
Shafts Center Distance (mm)	265-313	265-313	234-279	232-279	232-279

# GUIDE SPECIFICATIONS - 40RUM



## Commercial Packaged Air-Handling Unit HVAC Guide Specifications Size Range: 6.0 to 15.0 Nominal Tons

### Part 1 — General

#### 1.01 SYSTEM DESCRIPTION

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

#### 1.02 QUALITY ASSURANCE

- A. Unit shall be rated in accordance with AHRI Standard 360.
- B. Unit construction shall comply with ANSI/ASHRAE 15 safety code latest revision and comply with NEC.
- C. Unit shall be constructed in accordance with UL 1995 standard and shall carry the UL and UL, Canada label.
- D. Unit cabinet shall be capable of withstanding 500-hour salt spray exposure per ASTM B117 (scribed specimen).
- E. Unit shall be manufactured in a facility registered to ISO 9001:2000 manufacturing quality standard.

#### 1.03 DELIVERY, STORAGE, AND HANDLING

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

#### 1.04 WARRANTY (FOR INCLUSION BY SPECIFYING ENGINEER.)

### Part 2 — Products

#### 2.01 EQUIPMENT

Indoor mounted, draw-thru, packaged air-handling unit that can be used in a suspended horizontal configuration or a vertical configuration. Unit shall consist of forward-curved belt-driven centrifugal fan(s), motor and drive assembly, pre-wired fan motor contactor, factory-installed refrigerant metering devices (direct-expansion coil units), cooling coil, 1 –in (25.4-mm) aluminum air filter, and condensate drain pans for vertical or horizontal configurations.

##### A. Base Unit:

- a. Cabinet shall be constructed of mill-galvanized steel.
- b. Cabinet panels shall be fully insulated with 1/2-in. (12.7-mm) fire-retardant material. Insulation shall contain an EPA-registered immobilized antimicrobial agent to effectively resist the growth of bacteria and fungi as proven by tests in accordance with ASTM standards G21 and 22 (U.S.A.).
- c. Unit shall contain non-corroding condensate drain pans for both vertical and horizontal applications. Drain pans shall have connections on right and left sides of unit to facilitate field connection. Drain pans shall have the ability to be sloped toward the right or left side of the unit to prevent standing water from accumulating in pans.
- d. Unit shall have factory-supplied 1 –in (25.4-mm) aluminum air filter installed upstream from the cooling coil. Filter access shall be from either the right or left side of the unit.

##### B. Coils:

DX coil is 4-row and consists of copper tubes with sine-wave aluminum fins bonded to the tubes by mechanical expansion. Suction and liquid line connections or supply and discharge connections shall be made on the same side of the coil.

Direct-expansion coils shall feature factory installed thermostatic expansion valves (TXVs) for refrigerant control. The TXVs shall be Puron® R-410A compatible and capable of external adjustment. Direct-expansion heat pump coils shall have a factory-installed bypass line and check valve assembly around the TXVs to allow liquid flow from the coil to the outdoor unit during the heating mode. Coil tubing shall be internally rifled to maximize heat transfer.

##### C. Operating Characteristics:

Unit shall be capable of providing \_\_\_\_\_ cfm (L/s) airflow at an external static pressure of \_\_\_\_\_ in. wg (kPag).

D. Motor:

- a. Fan motor of the size and electrical characteristics specified on the equipment schedule shall be factory supplied and installed.
- b. Motors rated at 2.4 through 2.9hp (1.79 through 2.16 hp) shall have internal thermal overload protection. Motors rated at 5 hp (3.73 kW) shall be protected by a circuit breaker.
- c. Evaporator-fan motor shall have permanently lubricated, sealed bearings and inherent automatic-reset thermal overload protection or manual reset calibrated circuit breakers. Evaporator motors are designed specifically for Carrier and do not have conventional horsepower (hp) ratings listed on the motor nameplate. Motors are designed and qualified in the "air-over" location downstream of the cooling coil and carry a maximum continuous bhp rating that is the maximum application bhp rating for the motor; no "safety factors" above that rating may be applied.

E. Features:

- a. Alternate Motor and Drive:  
An alternate motor and/or medium-static or high-static drive shall be available to meet the airflow and external static pressure requirements specified on the equipment schedule.
- b. Electric Heaters:  
Heaters shall be factory-supplied for field installation as shown on the equipment drawings. Electric heat assembly shall be ETL (U.S.A.) and ETL, Canada, agency approved, and shall have single-point power wiring. Heater assembly shall include contactors with 24-v coils, power wiring, 24-v control wiring terminal blocks, and a hinged access panel. Electric heaters shall not be used with air discharge plenum.
- c. Air Discharge Plenum:  
Plenum shall be factory-supplied to provide free-blow air distribution for vertical floor-mounted units. A grille with moveable vanes for horizontal or vertical airflow adjustment shall be included. Plenum shall be field-assembled and field-installed on the unit's fan deck for blow-thru air distribution. Plenum shall not be used with electric heaters.
- d. Return-Air Grille:  
Grille shall be factory-supplied for field installation on the unit's return air opening.
- e. Unit Subbase:  
Subbase assembly shall be factory-supplied for field installation. Subbase shall elevate floor-mounted vertical units to provide access for correct condensate drain connection.
- f. Thermostat Controls:
  - i. TEMP System programmable communicating multi-stage thermostat with fan switch, time clock, LCD display, °F/°C capability, and CCN (Carrier Comfort Network®) compatibility.
  - ii. Commercial Electronic Thermostat with 7-day time clock, auto-changeover, multi-stage capability, and large LCD temperature display.
- g. Overhead Suspension Package:  
Package shall include necessary brackets to support units in a horizontal ceiling installation.
- h. Condensate Drain Trap:  
Trap shall have transparent, serviceable design for easy cleaning. Kit shall include overflow shutoff switch and wiring harness for connection to an alarm if desired.
- i. UV-C Germicidal Lamps:
  - i. UV-C emitters and fixtures shall be specifically designed for use inside an HVAC system. An ASME nozzled test apparatus using a 45°F (7.2°C) airstream moving at not less than 400 fpm (189 liters/sec.) shall measure individual lamp output. Lamp output at 253.7 nm shall not be less than 10μW/cm<sup>2</sup> per inch of arc length measured at a distance of one meter.
  - ii. UV-C power supplies shall be high efficiency, electric type which are matched to the emitters and are capable of producing the specified output intensity with an input power no more than 80 watts.
  - iii. Emitters and fixtures shall be installed in sufficient quantity and arranged so as to provide an equal distribution of UV-C energy on the coil and drain pan.
  - iv. The minimum UV-C energy striking the leading edge of the coil fins shall be not less than 820 μW/cm<sup>2</sup> at the closest point and through placement, not less than 60% of that value at the farthest point. Equal amounts are to strike the drain pan, either directly or indirectly through reflection.

## NOTES

