

40QAC / 38HDR  
 40QAQ / 38QRR  
 Ceiling—Suspended Duct Free Split System  
 Sizes 018 to 060



# Installation Instruction



40QAC, QAQ Unit



38HDR, QRR Unit



**NOTE:** Read the entire instruction manual before starting the installation.

**⚠ WARNING**

**UNIT OPERATION AND SAFETY HAZARD**

Failure to follow this warning could result in personal injury or equipment damage.

Puron refrigerant systems operate at higher pressures than standard R-22 systems. To avoid damage to the unit or possible personal injury, do not use R-22 service equipment or components on Puron refrigerant equipment.

## SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may cause death, personal injury, or property damage. Consult a qualified installer, service agency, or your distributor or branch for information or assistance. The qualified installer or agency must use factory-authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with the kits or accessories when installing.

Follow all safety codes. Wear safety glasses, protective clothing, and work gloves. Use quenching cloth for brazing operations. Have fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions included in literature and attached to the unit. Consult local building codes and current editions of the National Electrical Code ( NEC ) NFPA 70. In Canada, refer to current editions of the Canadian electrical code CSA 22.1.

Recognize safety information. This is the safety-alert symbol **⚠**. When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury. Understand these signal words; DANGER, WARNING, and CAUTION. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies hazards which **could** result in personal injury or death. CAUTION is used to identify unsafe practices which **would** result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

**⚠ WARNING**

**ELECTRICAL SHOCK HAZARD**

Failure to follow this warning could result in personal injury or death.

Before installing, modifying, or servicing system, main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.

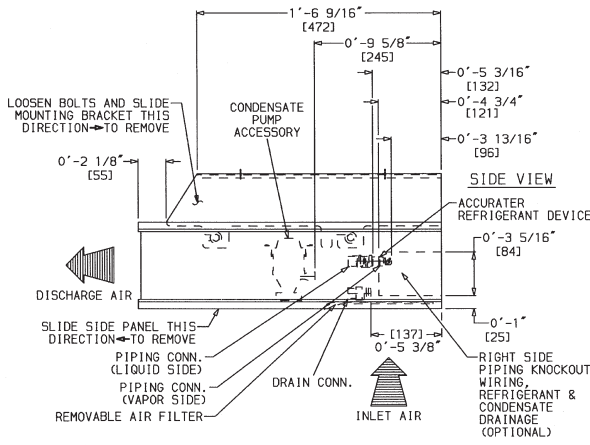
**⚠ CAUTION**

**PERSONAL INJURY AND EQUIPMENT DAMAGE HAZARD**

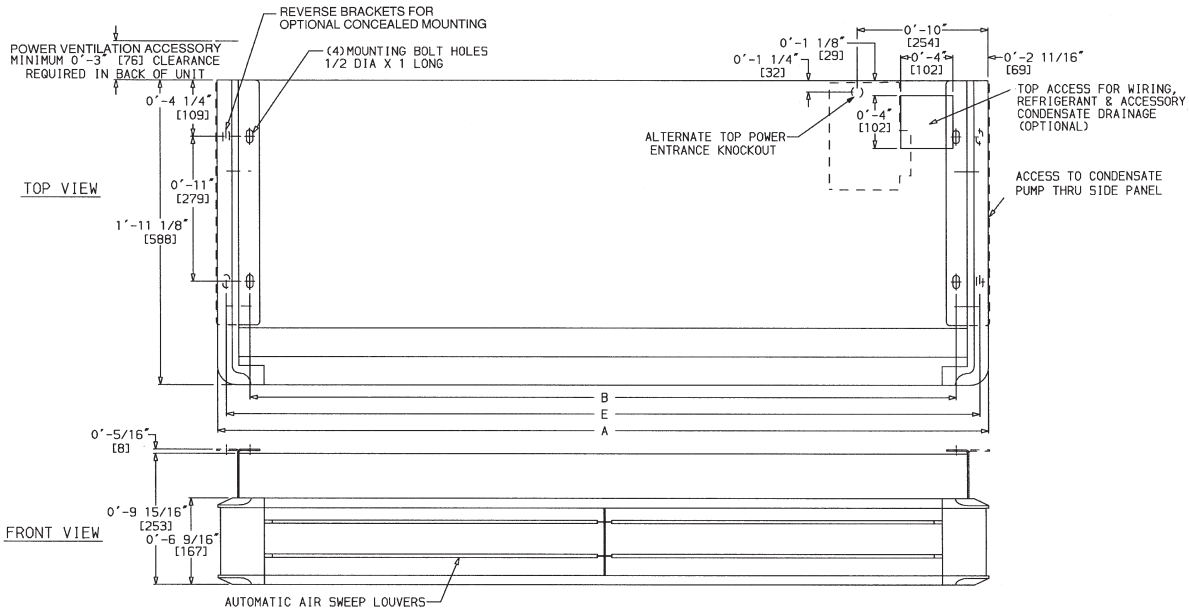
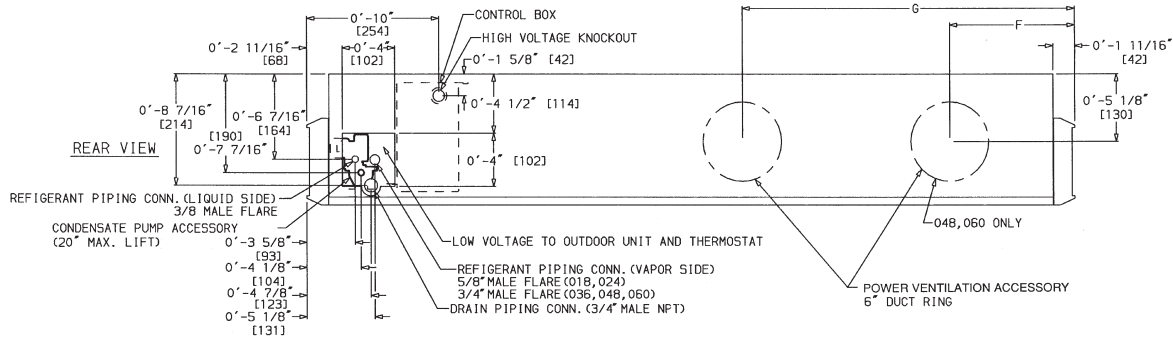
Failure to follow this caution may result in personal injury and / or equipment damage.

**DO NOT** operate the unit without a filter or with grille removed.

# DIMENSIONS - INDOOR



- NOTES:**
1. Dimensions in [ ] are in millimeters.
  2. Direction of airflow.
  3. Standard unit clearances are as follows:
    - 0 in. on top and rear
    - 3 in. on left side
    - 12 in. on right side
    - 36 in. on bottom
 (When facing unit discharge.)



40QAC/38HDR -- 40QAO/38QRR

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UNIT SIZE	WEIGHT (lb)		A		B		E		F		G	
	Cooling Only	Heat Pump	ft-in.	mm	ft-in.	mm	ft-in.	mm	ft-in.	mm	ft-in.	mm
024	108	110	4-215/16	1294	3-10	1169	4-15/8	1260	—	—	1-95/8	549
036	117	119	4-1013/16	1493	4-57/8	1368	4-91/2	1459	—	—	2-11/2	648
048	149	151	5-119/16	1817	5-65/8	1692	5-101/4	1783	1-97/8	555	3-31/16	992
060	179	181	7-8	2336	7-3	2211	7-65/8	2302	1-115/8	601	4-119/16	1512

Fig. 1 - 40QA Dimensions

UNIT	SERIES	ELECTRICAL CHARACTERISTICS	A	B	C	D	E	F	G	H	J	K	L	M	N	P	OPERATING WEIGHT(lbs)	SHIPPING WEIGHT(lbs)	SHIPPING DIMENSIONS (L x W x H)			
38HDR018	1	X	0	0	25 1/8"	36 15/16"	14 9/16"	16"	23 7/16"	17 3/16"	17 1/8"	17 1/8"	22"	13"	6 5/8"	11 1/4"	5/8"	2 15/16"	6"	155	171	42 9/10" x 18" x 28 1/10"
38HDR024	1,2	X	0	0	31 1/8"	36 15/16"	14 9/16"	16"	23 7/16"	17 3/16"	23 1/8"	23 1/8"	28"	14"	6 3/4"	11 5/8"	5/8"	2 15/16"	6"	180	198	42 9/10" x 18" x 34 1/10"
38HDR030	1	0	0	0	37 3/16"	44 9/16"	17 1/16"	18 7/16"	30 1/2"	30 1/2"	19 5/8"	29 3/16"	34 1/16"	13 11/16"	8 1/8"	15 7/8"	3/4"	3 7/16"	6 1/2"	200	223	50 1/2" x 20 1/2" x 40 2/10"
38HDR036	1	X	0	0	37 3/16"	44 9/16"	17 1/16"	18 7/16"	30 1/2"	30 1/2"	19 5/8"	29 3/16"	34 1/16"	13 11/16"	8 1/8"	15 7/8"	3/4"	3 7/16"	6 1/2"	218	240	50 1/2" x 20 1/2" x 40 2/10"
38HDR048	1,2	X	0	0	43 3/16"	44 9/16"	17 1/16"	18 7/16"	30 1/2"	30 1/2"	19 5/8"	29 3/16"	34 1/16"	13 11/16"	8 1/8"	15 7/8"	3/4"	3 7/16"	6 1/2"	284	309	50 1/2" x 20 1/2" x 46 2/10"
38HDR060	1,2	X	0	0	43 3/16"	44 9/16"	17 1/16"	18 7/16"	30 1/2"	30 1/2"	19 5/8"	29 3/16"	34 1/16"	13 11/16"	8 1/8"	15 7/8"	3/4"	3 7/16"	6 1/2"	294	319	50 1/2" x 20 1/2" x 46 2/10"

208-230-160	230-160	208/230-360	460-360
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X = YES  
O = NO

- REQUIRED CLEARANCES: WITH COIL FACING WALL; ALLOW 6" MIN CLEARANCE ON COIL SIDE AND COIL END AND 36" MIN CLEARANCE ON COMPRESSOR END AND FAN SIDE. WITH FAN FACING WALL; ALLOW 8" MIN CLEARANCE ON FAN SIDE AND COIL END AND 36" MIN CLEARANCE ON COMPRESSOR END AND COIL SIDE. WITH MULTI UNIT APPLICATION; ARRANGE UNITS SO DISCHARGE OF ONE DOES NOT ENTER INLET OF ANOTHER.
- MINIMUM OUTDOOR OPERATING AMBIENT IN COOLING MODE IS 55°F, MAX. 125°F.
- SERIES DESIGNATION IS THE 13TH POSITION OF THE UNIT MODEL NUMBER.
- CENTER OF GRAVITY 
- ALL DIMENSIONS ARE IN "INCHES" UNLESS NOTED.

UNIT SIZE	MINIMUM MOUNTING PAD DIMENSIONS
18,24	23" x 42"
30,36,48,60	24" x 50"

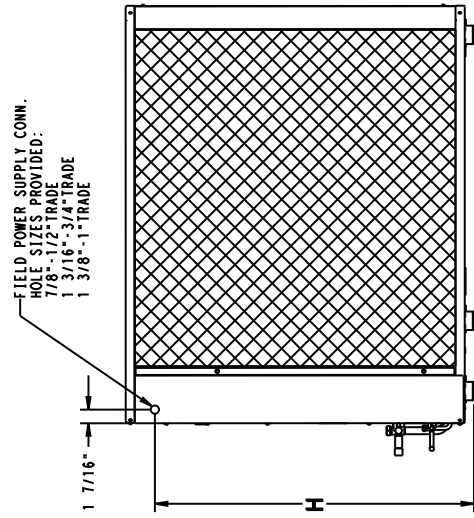
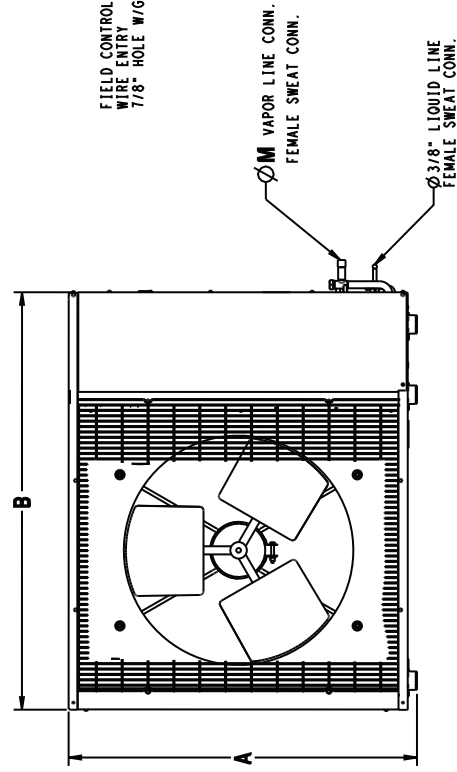
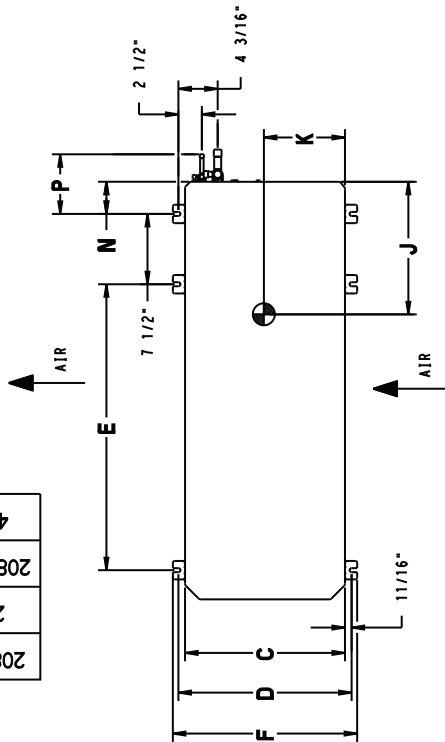


Fig. 2 - 38HDR Outdoor Unit Dimensions - English

# 40QAC/38HDR -- 40QAC/38QRR

UNIT SERIES	ELECTRICAL CHARACTERISTICS		A	B	C	D	E	F	G	H	J	K	L	M	N	P	OPERATING WEIGHT(KG)	SHIPPING WEIGHT(KG)	SHIPPING DIMENSIONS (L x W x H)
38HDR018	1	X	0	638.2	938.2	369.9	406.4	595.3	436.6	435.0	330.2	168.3	285.8	15.9	74.6	152.4	70.4	77.7	1090.2 X 457.7 X 714.3
38HDR024	1,2	X	0	790.6	938.2	369.9	406.4	595.3	436.6	587.4	355.6	171.5	295.3	15.9	74.6	152.4	81.8	90.0	1090.2 X 457.7 X 866.7
38HDR030	1	X	0	944.6	1131.9	433.4	468.3	774.7	498.5	741.4	347.7	206.4	403.2	19.0	87.3	165.1	90.9	101.4	1282.7 X 520.7 X 1020.7
38HDR036	1	X	0	944.6	1131.9	433.4	468.3	774.7	498.5	741.4	347.7	206.4	403.2	19.0	87.3	165.1	99.0	109.0	1282.7 X 520.7 X 1020.7
38HDR048	1,2	X	0	1097.0	1131.9	433.4	468.3	774.7	498.5	893.8	368.3	215.9	479.4	22.2	87.3	165.1	129.0	140.4	1282.7 X 520.7 X 1173.1
38HDR060	1,2	X	0	1097.0	1131.9	433.4	468.3	774.7	498.5	893.8	368.3	215.9	479.4	22.2	87.3	165.1	133.6	145.0	1282.7 X 520.7 X 1173.1

- REQUIRED CLEARANCES: WITH COIL FACING WALL; ALLOW 152.4 MIN CLEARANCE TO THE COIL FACING WALL AND 91.4 MIN CLEARANCE TO THE COMPRESSOR END AND FAN SIDE. WITH FAN FACING WALL, ALLOW 203.2 MIN CLEARANCE ON FAN SIDE AND COIL END AND 91.4 MIN CLEARANCE ON COMPRESSOR END AND COIL SIDE. WITH MULTI UNIT APPLICATION, ARRANGE UNITS SO DISCHARGE OF ONE DOES NOT ENTER INLET OF ANOTHER.
- MINIMUM OUTDOOR OPERATING AMBIENT IN COOLING MODE IS 12.8°C, MAX. 51.7°C.
- SERIES DESIGNATION IS THE 13TH POSITION OF THE UNIT MODEL NUMBER.
- CENTER OF GRAVITY
- ALL DIMENSIONS ARE IN "MM" UNLESS NOTED.

UNIT SIZE	MINIMUM MOUNTING PAD DIMENSIONS
18.24	584.2 X 1066.8
30.36, 48.60	609.6 X 1270.0

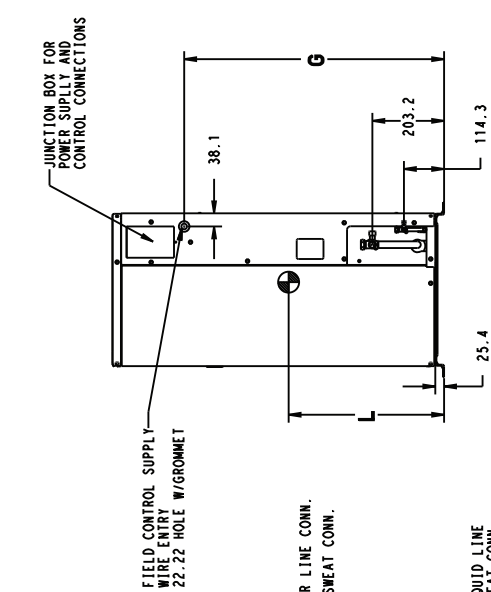
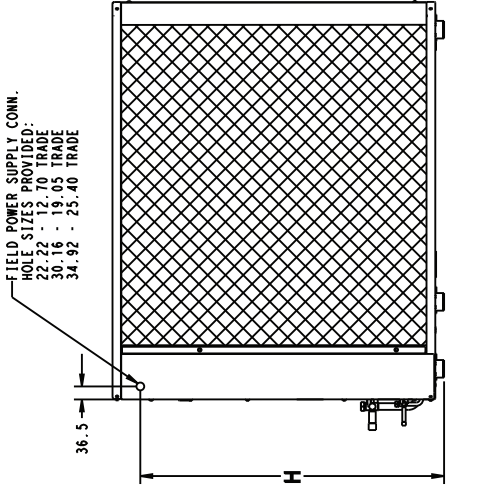
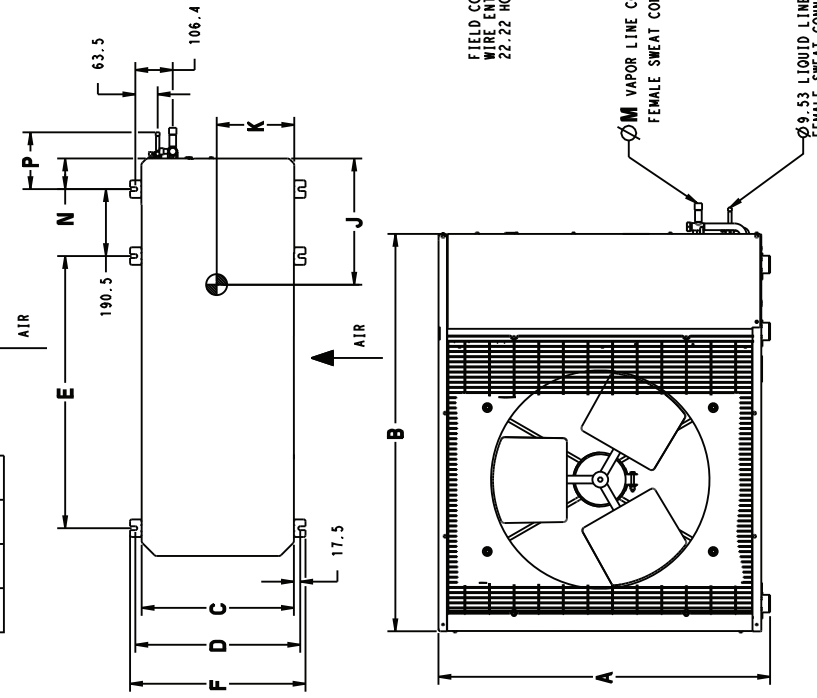


Fig. 3 - 38HDR Outdoor Unit Dimensions - SI

UNIT SERIES	ELECTRICAL CHARACTERISTICS	A	B	C	D	E	F	G	H	J	K	L	M	N	P	OPERATING WEIGHT(lbs)	SHIPPING WEIGHT(lbs)	SHIPPING DIMENSIONS (L x W x H)
380RR018	0	X	0	0	25 1/8"	36 15/16"	14 9/16"	16"	23 7/16"	17 3/16"	17 1/8"	17 1/8"	5/8"	2 15/16"	6"	183	42 9/10"	X 18" X 28 1/10"
380RR024	0	X	0	0	31 1/8"	36 15/16"	14 9/16"	16"	23 7/16"	17 3/16"	17 1/8"	17 1/8"	5/8"	2 15/16"	6"	176	42 9/10"	X 18" X 34 1/10"
380RR030	0	X	0	0	37 3/8"	44 9/16"	17 1/16"	18 7/16"	30 1/2"	19 5/8"	29 3/16"	34 1/16"	3/4"	3 7/16"	6 1/2"	210	50 1/2"	X 20 1/2" X 40 2/10"
380RR036	0	X	0	X	37 3/8"	44 9/16"	17 1/16"	18 7/16"	30 1/2"	19 5/8"	29 3/16"	34 1/16"	3/4"	3 7/16"	6 1/2"	232	50 1/2"	X 20 1/2" X 40 2/10"
380RR048	0	X	0	X	43 3/16"	44 9/16"	17 1/16"	18 7/16"	30 1/2"	19 5/8"	29 3/16"	34 1/16"	3/4"	3 7/16"	6 1/2"	278	50 1/2"	X 20 1/2" X 46 2/10"
380RR060	0	X	0	X	43 3/16"	44 9/16"	17 1/16"	18 7/16"	30 1/2"	19 5/8"	29 3/16"	34 1/16"	3/4"	3 7/16"	6 1/2"	306	50 1/2"	X 20 1/2" X 46 2/10"

1. REQUIRED CLEARANCES: WITH COIL FACING WALL; ALLOW 6" MIN CLEARANCE FOR COIL SIDE AND COIL END AND 36" MIN CLEARANCE FOR COMPRESSOR FAN SIDE AND COIL END AND 36" MIN CLEARANCE FOR COMPRESSOR END AND COIL SIDE WITH MULTI UNIT APPLICATION; ARRANGE UNITS SO DISCHARGE OF ONE DOES NOT ENTER INLET OF ANOTHER.

2. MINIMUM OUTDOOR OPERATING AMBIENT IN COOLING MODE IS 55°F, MAX. 125°F.

3. SERIES DESIGNATION IS THE 13TH POSITION OF THE UNIT MODEL NUMBER.

4. CENTER OF GRAVITY

5. ALL DIMENSIONS ARE IN " INCHES" UNLESS NOTED.

UNIT SIZE	MINIMUM MOUNTING PAD DIMENSIONS
18, 24	23" X 42"
30, 36, 48, 60	24" X 50"

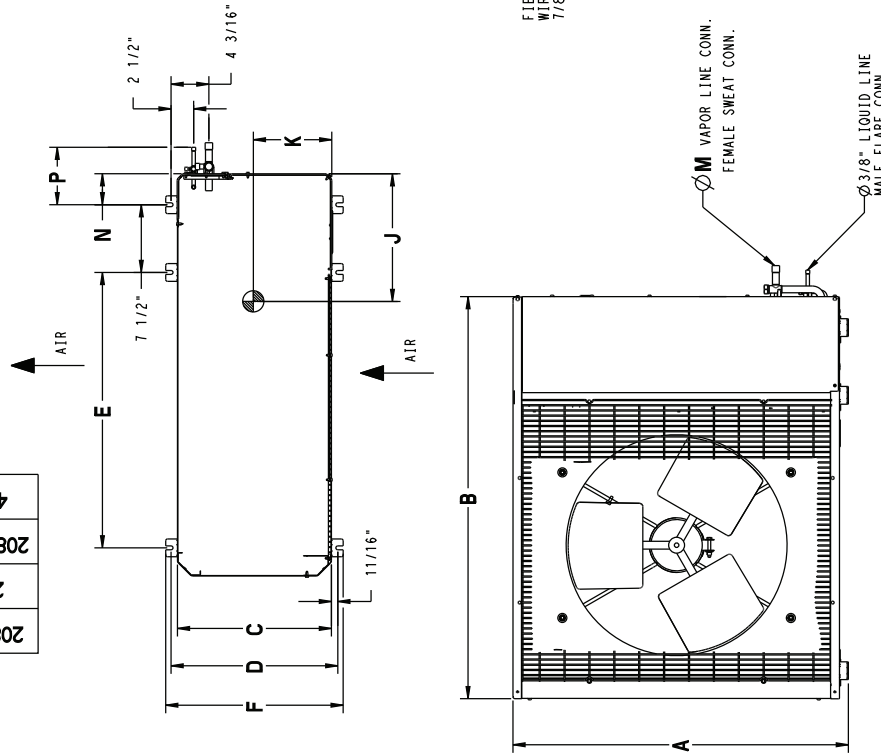


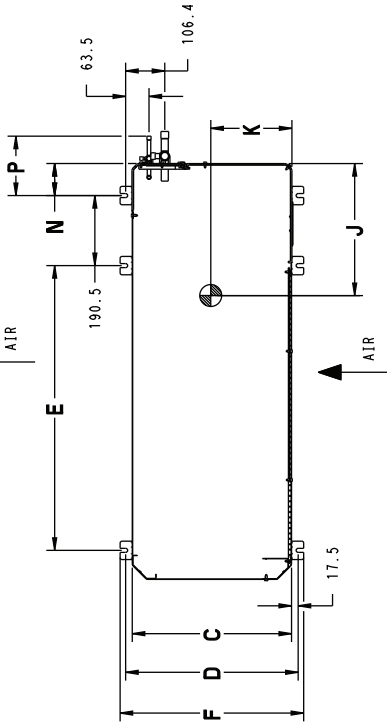
Fig. 4 - 38QRR Outdoor Unit Dimensions - English

**40QAC/38HDR -- 40QAQ/38QRR**

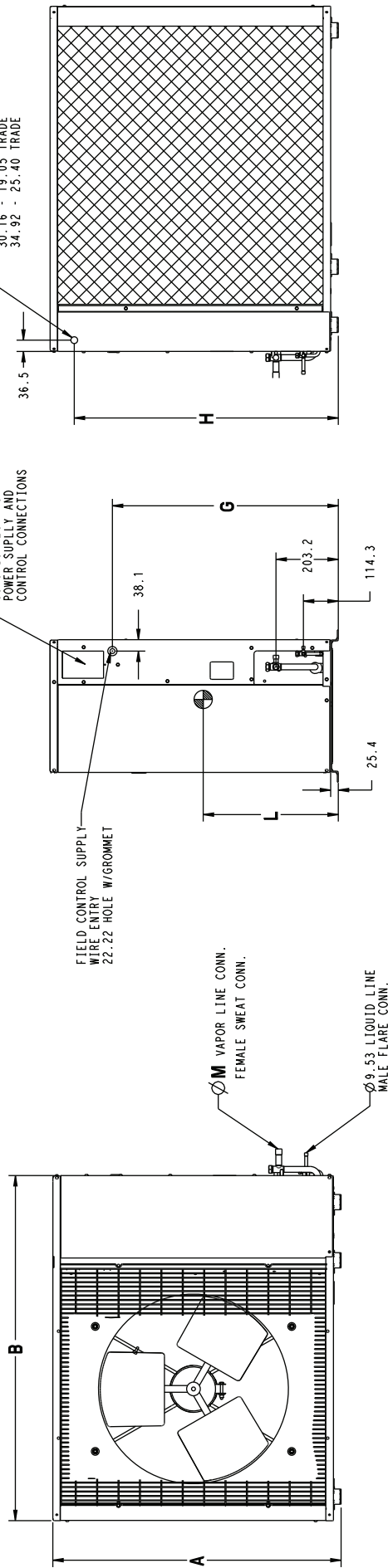
UNIT	SERIES	ELECTRICAL CHARACTERISTICS	A	B	C	D	E	F	G	H	J	K	L	M	N	P	OPERATING WEIGHT(KG)	SHIPPING WEIGHT(KG)	SHIPPING DIMENSIONS (L x W x H)							
380RR018	0	X	0	0	0	638.2	938.2	369.9	406.4	595.3	436.6	435.0	558.8	330.2	168.3	285.8	15.9	74.6	152.4	83.2	1090.2	X	457.7	X	714.3	
380RR024	0	X	0	0	790.6	938.2	369.9	406.4	595.3	436.6	587.4	587.4	711.2	355.6	171.5	293.3	15.9	74.6	152.4	88.2	1090.2	X	457.7	X	866.7	
380RR030	0	X	0	0	944.6	1131.9	433.4	488.3	774.7	498.5	741.4	865.2	741.4	403.2	347.7	206.4	403.2	19.0	87.3	165.1	95.4	1282.7	X	520.7	X	1020.7
380RR036	0	X	0	X	944.6	1131.9	433.4	488.3	774.7	498.5	741.4	865.2	741.4	403.2	347.7	206.4	403.2	19.0	87.3	165.1	105.4	1282.7	X	520.7	X	1020.7
380RR048	0	X	0	X	1097.0	1131.9	433.4	488.3	774.7	498.5	893.8	1017.6	479.4	22.2	87.3	165.1	126.4	137.7	185.1	139.0	150.4	1282.7	X	520.7	X	1173.1
380RR060	0	X	0	X	1097.0	1131.9	433.4	488.3	774.7	498.5	893.8	1017.6	479.4	22.2	87.3	165.1	126.4	137.7	185.1	139.0	150.4	1282.7	X	520.7	X	1173.1

X = YES  
O = NO

- REQUIRED CLEARANCES: WITH COIL FACING WALL; ALLOW 152.4 MIN CLEARANCE ON COIL SIDE AND COIL END AND 914.4 MIN CLEARANCE ON COMPRESSOR END AND FAN SIDE. WITH FAN FACING WALL; ALLOW 203.2 MIN CLEARANCE ON FAN SIDE AND COIL END AND 914.4 MIN CLEARANCE ON COMPRESSOR END AND COIL SIDE. WITH MULTI UNIT APPLICATION; ARRANGE UNITS SO DISCHARGE OF ONE DOES NOT ENTER INLET OF ANOTHER.
- MINIMUM OUTDOOR OPERATING AMBIENT IN COOLING MODE IS 12.8°C. MAX. 51.7°C.
- SERIES DESIGNATION IS THE 13TH POSITION OF THE UNIT MODEL NUMBER.
- CENTER OF GRAVITY
- ALL DIMENSIONS ARE IN "MM" UNLESS NOTED.



UNIT SIZE	MINIMUM MOUNTING PAD DIMENSIONS
18,24	584.2 X 1066.8
30,36,48,60	609.6 X 1210.0



**Fig. 5 - 38QRR Outdoor Unit Dimensions - SI**



These installation instructions cover the installation of the matched systems listed in table 2.

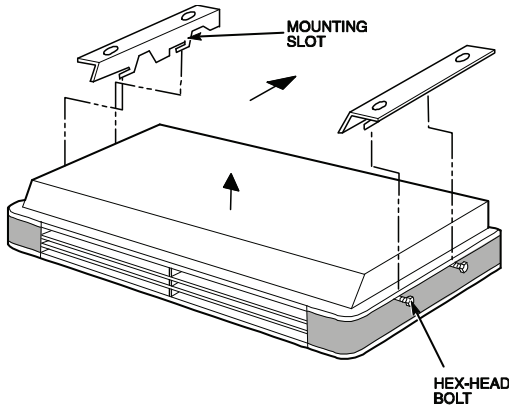
## Parts List

### Indoor Unit

The following items are included with the indoor unit:

**Table 1 – Installation Materials**

Part No.	Name of Part	Qty.
1	Side Panels	2
2	Hex Head Bolts	4
3	Mounting Bracket	2
4	Pistons	1
5	Adapter Tubes	2

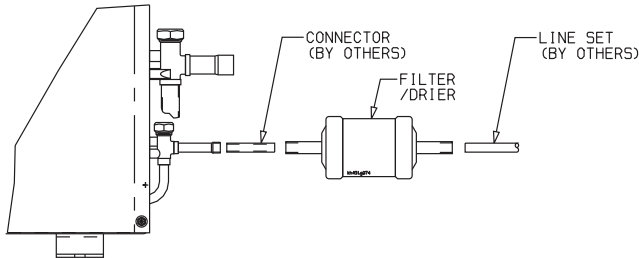


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**Fig. 6 - Hanging Fan Coil Unit**

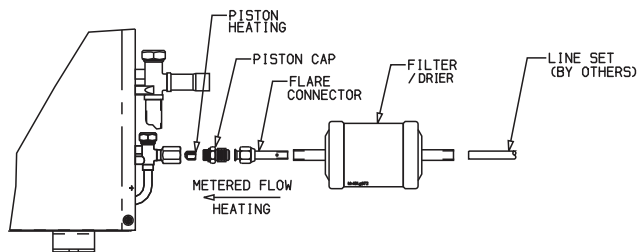
### Outdoor Unit

The following items are included with the outdoor unit:



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**Fig. 7 - 38HDR018-036**



A09537

**Fig. 8 - 38QRR018-036**

Model	Filter Drier	Piston Cap	Pistons	Flare Connector
38HDR	✓	-	-	-
38QRR	✓	✓	✓	✓

**Table 2 – Matched Systems**

System Type	Nominal Capacity	Outdoor Unit	Indoor Unit
Cooling	018	38HDR018---3	40QAC024---3*
	024	38HDR024---3	40QAC024---3
	030	38HDR030---3	40QAC036---3
	036	38HDR036---3/5/6	40QAC036---3
	048	38HDR048---3/5/6	40QAC048---3
	060	38HDR060---3/5/6	40QAC060---3
Heat Pumps	018	38QRR018---3	40QAQ024---3
	024	38QRR024---3	40QAQ024---3
	030	38QRR030---3	40QAQ036---3
	036	38QRR036---3/5/6	40QAQ036---3
	048	38QRR048---3/5/6	40QAQ048---3
	060	38QRR060---3/5/6	40QAQ060---3

\* Units must be configured for 1-1/2 ton operation. Refer to instructions on page 9.

## SYSTEM REQUIREMENTS

### Clearances

Allow sufficient space around the indoor and outdoor unit for proper airflow circulation and servicing. Refer to Fig. 1 through Fig. 5 for minimum required clearances.

**Piping:** Piping and insulation is field supplied.

### Piping Lengths

The minimum length between the indoor and outdoor units is 10 ft (3 m). Refer to table 3 for the maximum lengths allowed.

**Table 3 – Maximum Refrigerant Line Lengths**

Unit Size	Max Line Length ft(m)	Max Elevation (ID over OD) ft(m)	Max Elevation (OD over OD) ft(m)
18K	200 (61)	65 (19.8)	200 (61)
24K	200 (61)	65 (19.8)	200 (61)
30K	200 (61)	65 (19.8)	200 (61)
36K	200 (61)	65 (19.8)	200 (61)
48K	200 (61)	65 (19.8)	200 (61)
60K	200 (61)	65 (19.8)	200 (61)

**Note:** For lengths greater than 25 ft (7.6 m), refer to the *Duct Free Long Line Guide*.

### Pipe Sizes

Refer to table 4 for pipe sizes.

**Table 4 – Pipe Sizes**

Unit Size	PIPE SIZES (in)		
	Liquid Phase	Vapor	
		38HDR	38QRR
18	3/8	5/8	5/8
24	3/8	5/8	5/8
30	3/8	3/4	3/4
36	3/8	3/4	3/4
48	3/8	7/8	3/4
60	3/8	7/8	3/4

**Note:** On heat pumps, both lines need to be insulated using at least 1/2 inch closed foam insulation.

40QAC/38HDR – 40QAQ/38QRR

## Refrigerant Charge

The 38HDR and 38QRR units can be matched with multiple outdoor units and thus additional charge might be required when matched with the 40QAC or 40QAQ units.

**Table 5 – Additional Charge**

Unit Size	Additional Charge lb. (kg.)	
	38HDR	38QRR
018	0.7 (0.32)	0.7 (0.32)
024	1.3 (0.59)	0.8 (0.36)
030	1.4 (0.64)	0
036	0.2 (0.1)	0.5 (0.23)
048	0.2 (0.1)	0
060	0.5 (0.23)	0

**Note:** The above additional charge is required amount for line lengths up to 25 ft (7.6 m). For line lengths exceeding 25 ft (7.6 m), additional charge will be required. Refer to the *Duct Free Splits Long Line Guide*.

## Metering Device

The 40QAC and 40QAQ units use an accumulator or a TXV as shown in Table 6.

**Table 6 – Accumulator Sizes**

Unit Size	Cooling Only	Heat Pumps	
	40QAC	40QAQ	38QRR
018	TVX	49	40
024	TVX	55	43
030	TVX	65	55
036	TVX	70	63
048	TVX	80	73
060	TVX	TXV	80

**NOTE:** Pistons are supplied with either the indoor or outdoor units.

## Power and Connecting Cables - Field Supplied

### Power:

- The main power is supplied to both the indoor and outdoor units.
- Consult local building codes, NEC (National Electric Code) or CEC (Canadian Electric Code) for any special requirements.
- Use Table 7 for the electrical requirements for the outdoor units and Table 8 for the indoor units to correctly size the cables and disconnect switches.

### Control Wiring

Thermostat wires should be used for control wiring between the indoor and outdoor units. A two conductor cable is required for the cooling only units and a seven conductor cable is required on heat pumps. 18 AWG is recommended for any length up to 200 ft (61.0 m).

### User Interface - Finished Goods Accessory

Any of the following three thermostats can be used depending on the type of system on hand and the desired features. Refer to Table 9 to select the proper thermostat.

**Table 7 – 38HDR / QRR Electrical Requirements**

UNIT SIZE	V – PH – Hz	38HDR		38QRR	
		MIN CKT AMPS	FUSE/HACR BKR AMPS	MIN CKT AMPS	FUSE/HACR BKR AMPS
018	208/230-1-60	12.1	20	12.1	20
024	208/230-1-60	17.7	25	18.8	30
030	208/230-1-60	19.1	30	17.5	30
036	208/230-1-60	19.1	30	20.9	30
	208/230-3-60	13.0	20	14.1	20
	460-3-60	7.9	10	7.9	10
048	208/230-1-60	26.4	40	34.6	50
	208/230-3-60	17.9	25	22.4	30
	460-3-60	8.4	15	10.0	15
060	208/230-1-60	34.5	60	34.5	60
	208/230-3-60	21.5	30	23.6	40
	460-3-60	10.6	15	10.6	15

**Table 8 – 40QAC / QAQ Electrical Requirements**

UNIT	VOLTAGE V – Ph – 60 Hz	40QAC		40QAQ	
		MCA	MOCP	MCA	MOCP
024	208/230-1	0.63	15.0	9.29	15.0
036	208/230-1	1.60	15.0	17.70	20.0
048	208/230-1	2.00	15.0	23.80	25.0
060	208/230-1	3.30	15.0	28.70	30.0

**Table 9 – Thermostat Selection**

Features	Model Number	System Type		
		Cooling Only & HP 53DFS250-SL	Cooling Only 53DFS250-FS	Cooling Only 53DFST2-NP
	7 Day Programmable	√	√	-
	5+1+1 Day Programmable	-	-	√
	Remote Room Sensor	√	√	
	Dry Contact Equipped	√	√	-



## Operating Range

Ensure that the system operates within the application guidelines shown in the following tables.

### Cooling operating range:

	Maximum		Minimum	
	DB °F (°C)	WB °F (°C)	DB °F (°C)	WB °F (°C)
Outdoor Unit	125 (51.7)	—	55 (12.8)	—
Indoor Unit	95 (35)	71 (21.7)	67 (19.4)	57 (13.9)

### Heating operating range:

	Maximum		Minimum	
	DB °F (°C)	WB °F (°C)	DB °F (°C)	WB °F (°C)
Outdoor Unit	75 (23.9)	67 (19.4)	-20 (-28.9)	—
Indoor Unit	80 (26.7)	71 (21.7)	55 (12.8)	—

## Accessories

An extensive list of field installed accessories is available for both indoor and outdoor units. Identify what accessories, if any, are required for the application at hand and consult the separate installation instructions for the accessories. Some of the accessories, especially on the indoor units, can be installed much easier if planned ahead.

## INSTALLATION

### Complete Pre-installation Checks

1. **Unpack Unit** - Store the indoor and outdoor units in the original packaging until it is moved to the final site for installation.
2. **Inspect Shipment** - Upon receipt of shipment, check the indoor and outdoor units for damage. If there is any damage, forward claim papers directly to the transportation company. Manufacturer is not responsible for damage incurred in transit.
3. **Inspect Parts Supplied With Units** - Check all items against parts list (see page 7). If any items are missing, notify your distributor or Carrier office. To prevent loss or damage, leave all parts in original packages until installation.

### Consider System Requirements

1. Consult local building codes and NEC for special installation requirements.
2. When deciding the location of the indoor and outdoor units, ensure that the piping run does not exceed the allowed distances listed in Table 3.
3. Make sure the indoor and outdoor units are easily accessible to electrical power.
4. Allow sufficient clearances for airflow, wiring, refrigerant piping, and servicing the unit. See Fig.1 through Fig. 5.
5. Condensate piping can be directed through the inside wall to an approved drain or straight outside.

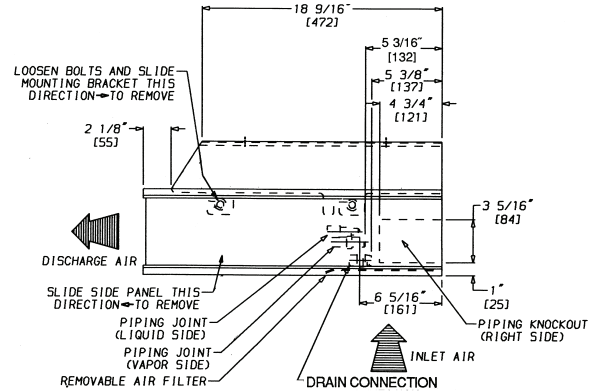
## INSTALL INDOOR UNIT

Plan the installation carefully before you begin.

1. Select indoor unit location. If possible, place the unit adjacent to an outside wall if fresh air is required, and ensure that the location allows for complete air distribution.

**NOTE: If unit is not installed adjacent to an outside wall and fresh air is required, a power ventilation kit accessory is available.**

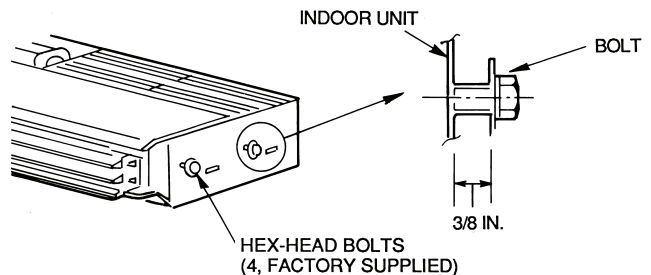
2. Remove the indoor unit from the carton and place it upside down and perform the following steps:
  - a. Remove side panels by sliding forward, then away from sides of the unit. See Fig. 9.



A09525

Fig. 9 - Removal of Mounting Brackets from Indoor Unit

- b. Remove air filters from inlet grilles; then remove and retain screws securing inlet grilles to indoor unit.
- c. Remove inlet grilles from indoor unit by sliding forward.
- d. If a size 024 indoor unit is to be matched with a size 018 outdoor unit, switch the Molex plug on the motor. The Molex plugs are labeled as 018 or 024.
- e. Loosen hex bolts on the side of the unit and remove the mounting brackets by sliding them out in direction shown in Fig. 10. Allow approximately 3/8 inch space between the bolt head and the unit as shown in Fig. 10.

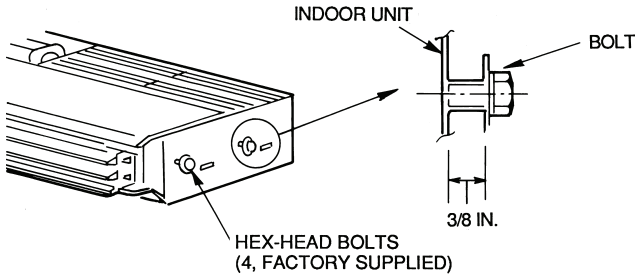


A09527

Fig. 10 - Installing Hex-Head Mounting Bolts in Fan Coil Unit

- f. If piping is going to be run from the right hand side, open knock-out by removing the pre-split portion in the rear of the right hand side panel with a saw or cutter knife.

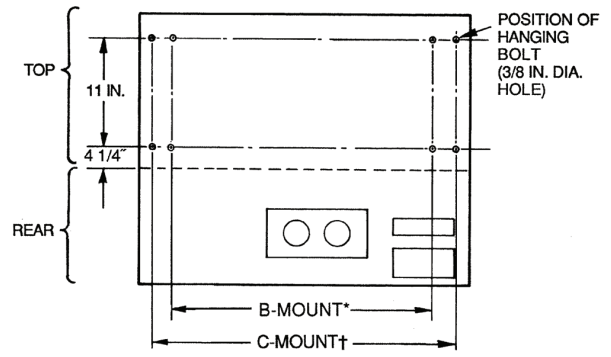
3. Mount Unit - the installation location should have already been identified taking into account the piping length, wiring and piping connections, and clearances. See Fig. 11 and Fig. 12.



Unit Size	DIMENSIONS in. (cm)		
	A	B	C
024	50-15/16 (129.4)	46 (116.8)	49-5/8 (126.0)
036	58-13/16 (149.4)	53-7/8 (136.8)	57-1/2 (146.1)
048	71-9/16 (181.8)	66-5/8 (169.2)	70-1/4 (178.4)
060	92 (233.7)	87 (221)	90-5/8 (230.2)

Fig. 11 - Fan Coil Unit Hanging Dimensions

A09528



Unit Size	DIMENSIONS in. (cm)	
	B	C
024	46 (116.8)	49-5/8 (126.0)
036	53-7/8 (136.8)	57-1/2 (146.1)
048	66-5/8 (169.2)	70-1/4 (178.4)
060	87 (221)	90-5/8 (230.2)

\* - Concealed mounting holes

† - Exposed mounting holes.

A09046

Fig. 12 - Mounting Included with Fan Coil Unit

NOTE: If fresh air is required, a minimum of 3 inch (76.2 mm) clearance is required in back of unit.

g. Mount hanging brackets on ceiling (see Fig. 13) for either concealed or exposed bolt hanging position.

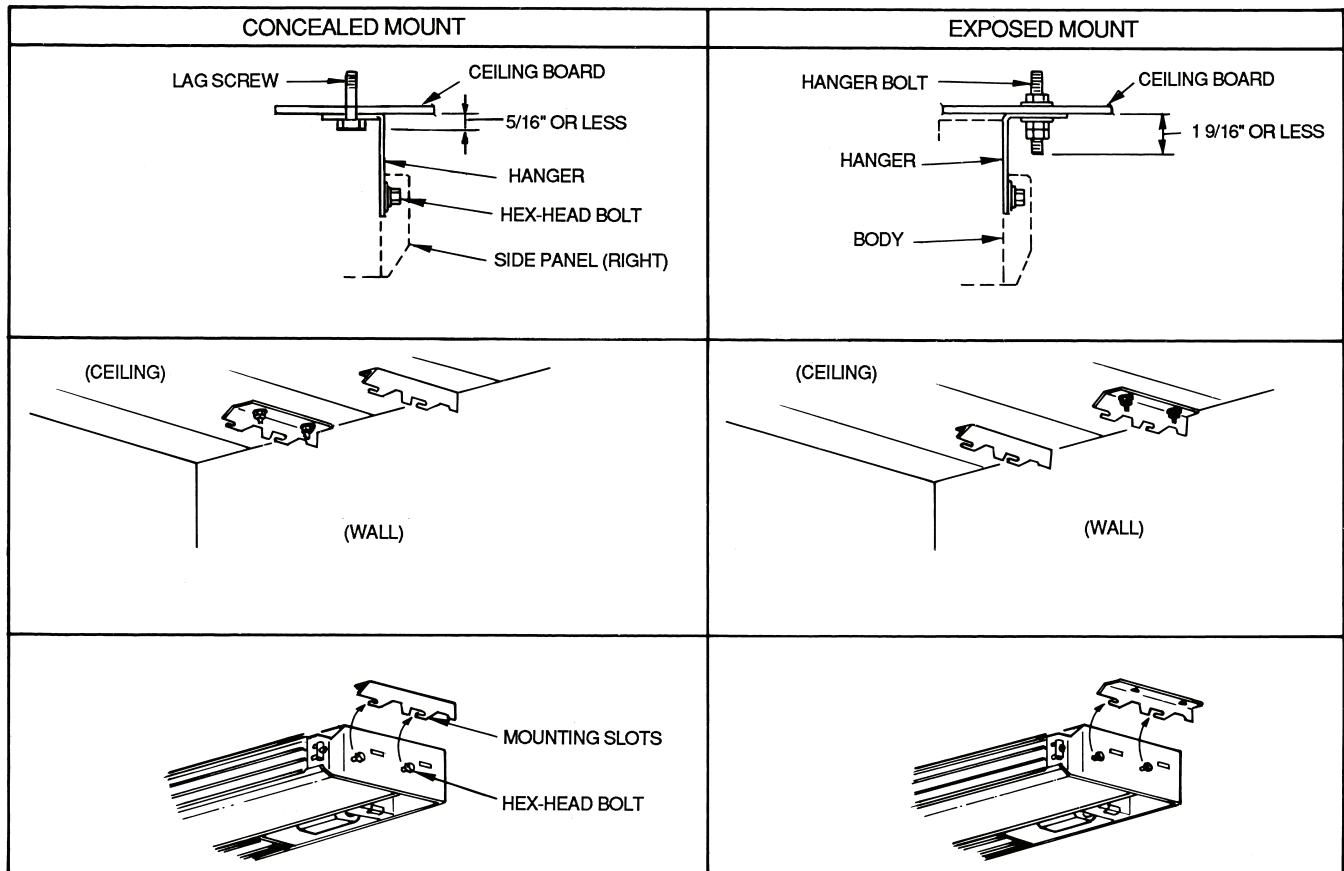


Fig. 13 - Mounting Hanging Brackets

A09530

When mounting brackets, select the proper type of hardware from the guidelines below. See Fig. 14

## ⚠ CAUTION

**PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD**

Failure to follow this caution may result in personal injury and / or equipment damage.  
Solid structure in ceiling **MUST** be used due to weight of the unit.

**Wooden Structure:**

Install hanging bolts on a square wooden piece placed over beams.

**Newly Built Concrete Slab:**

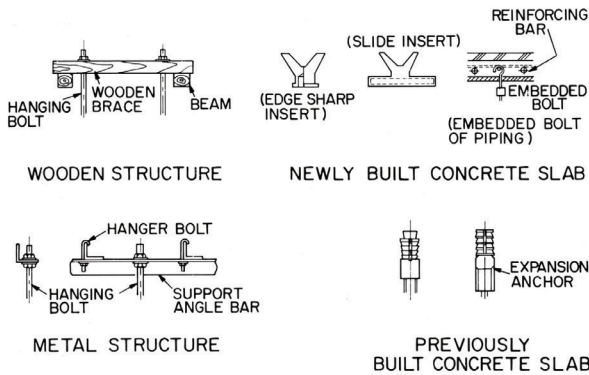
Install hanging bolts with inserts, embedded bolts, etc.

**Metal Structure:**

Install hanging bolts utilizing an existing angle or by installing a new support angle.

**Previously Built Concrete Slab:**

Install hanging bolts with expansion anchor.



**Fig. 14 - Fan Coil Unit Mounting Methods (hardware is field-supplied)**

- h. Drill holes for routing refrigerant lines, condensate line and electrical and control connections.
- i. Lift the unit into place, and fit the hex-head bolts on sides of indoor unit into mounting slots of mounting brackets. Ensure unit is mounted with a slight tilt to the rear side for proper drainage.
- j. Tighten indoor unit hex-head bolts securely.

**INSTALL OUTDOOR UNIT**

The outdoor units can be installed on the ground, on the roof, or mounted on a wall.

**NOTE:** Install the unit so that the coil does not face into prevailing winds. If this is not possible and constant wind winds above 25 mph are expected, use accessory wind baffle. See installation instructions provided with accessory kit. Wind baffles should also be used on all units with accessory low ambient temperature control.

**Mounting on Ground**

1. Mount unit on a solid level concrete pad.
2. If a heat pump is being installed, use a field- provided snow stand or ice rack where prolonged subfreezing temperatures or heavy snow occurs.
3. Position unit so water or ice from roof does not fall directly onto unit.
4. On cooling only units, an accessory stacking kit can be used when units are to be stacked. See installation instructions provided with the accessory kit.

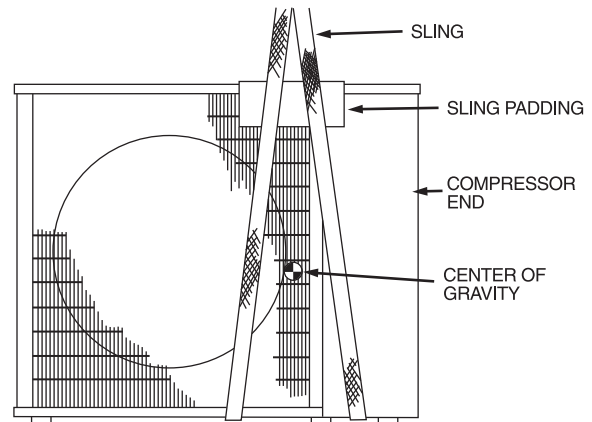
**Mounting on Roof**

## ⚠ CAUTION

**PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD**

Failure to follow this caution may result in personal injury and / or equipment damage.  
Be sure unit panels are securely in place prior to rigging.

1. Rig the unit. Keep the unit upright and lift using a sling. Use cardboard or padding under the sling, and spreader bars to prevent sling damage to the unit. See Fig 15. See Fig. 2 through Fig. 5 for center of gravity reference
2. Mount unit on a solid concrete pad or platform.
3. Isolate unit and piping from structure
4. If a heat pump is being installed, use a field- provided snow stand or ice rack where prolonged subfreezing temperatures or heavy snow occurs.
5. On cooling only units, an accessory stacking kit can be used when units are to be stacked. See installation instructions provided with accessory kit.



**Fig. 15 - Lifting Unit with Sling**

**Mounting Unit on Wall**

The units can also be mounted on the wall using the accessory mounting kit.

40QAC/38HDR -- 40QAC/38QRF

## Complete Outdoor Refrigerant Piping Connections

Follow the following general guidelines:

1. Use refrigerant grade field – supplied tubing. Refer to Table 4 for the correct line sizes.
2. Do not use less than 10 ft (93.05 m) of interconnecting tubing.



### CAUTION

#### UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

If any section of pipe is buried, there must be a 6 in. (152.4 mm) vertical rise to the valve connections on the outdoor unit. If more than the recommended length is buried, refrigerant may migrate to cooler, buried section during extended periods of system shutdown. This causes refrigerant slugging and could possibly damage the compressor at start-up.

When more than 80 ft (24.4 m) of interconnecting tubing is used, consult the Duct-Free Split System Long Line Application Guide for required accessories.

3. On cooling only units, insulate the liquid line. On heat pumps, insulate both lines. A minimum of 1/2 inch foam pipe insulation is recommended.
4. Run the refrigerant tubes as directly as possible and avoid unnecessary turns and bends.
5. Suspend refrigerant tubes to avoid damage to insulation or tubes so they do not transmit vibration to the structure.
6. When passing refrigerant tubes through the wall, seal the opening so rain and insects do not enter the structure. Leave some slack in refrigerant tubes between structure and outdoor unit to absorb vibration.

**NOTE:** A fusible plug is located in unit suction line; do not cap this plug. If local codes require additional safety devices, install as directed.

#### Connection at Outdoor Unit



### CAUTION

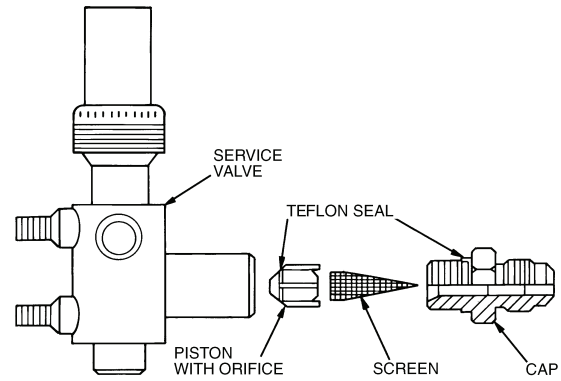
#### UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

To prevent damage to unit or service valves observe the following:

- A brazing shield **MUST** be used.
- Wrap service valves with wet cloth or use a heat sink material.

1. Braze the connector tubes (field supplied for the 38HDR units and factory supplied for the 38QRR units) to the inlet of the factory supplied filter drier. If a cooling only unit is being installed move to step 3 (see Fig. 8).
2. Remove the plastic cap from the liquid and suction service valve on the 38QRR unit and assemble the heating piston and piston cap supplied with the outdoor unit as shown in Fig. 16.



**NOTE:** Teflon Seal must face toward the outdoor heat pump unit.

A09538

**Fig. 16 - AccuRater Metering Device at Service Valve (Bypass Type Components), Heat Pump Systems Only**

**NOTE:** The Teflon seal on the piston should point towards the liquid service valve.

The size of the factory supplied piston might have to be adjusted for long line applications (over 80 ft / 24.4 m). Refer to the Duct Free Long Line Application Guide for additional information.

3. On 38HDR units, remove the plastic caps on the liquid and suction service valves. Braze the completed filter drier assembly (from Step 1) to the liquid service valve. On the 38QRR unit, connect the completed filter drier assembly (from Step 1) to the piston cap.
4. Braze the field supplied line set to the filter drier assembly and to the suction valve.
5. Insulate any exposed areas between the filter drier and the liquid valve.

## Complete Outdoor Power and Control Wiring



### WARNING

#### ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

The unit cabinet must have an uninterrupted or unbroken ground to minimize personal injury if an electrical fault should occur. The ground may consist of electrical wire or metal conduit when installed in accordance with existing electrical codes.



### CAUTION

#### UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

Unit failure as a result of operation on improper line voltage or excessive phase imbalance constitutes abuse and may cause damage to electrical components. Such operation could void any applicable Carrier warranty.



# WARNING

## ELECTRICAL SHOCK HAZARD

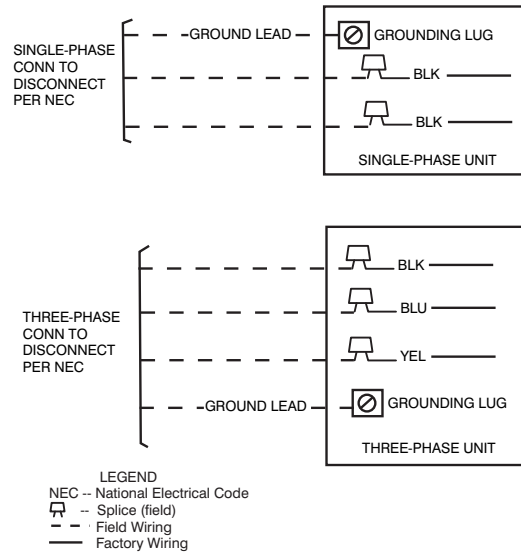
Failure to follow this warning could result in personal injury or death.

Before performing service or maintenance, be sure indoor unit main power switch is turned OFF and indoor blower has stopped.

Lock out and tag switch with suitable warning label.

### Power Wiring

1. Mount outdoor power disconnect. The unit is factory wired for the voltage shown on the unit nameplate. The fused disconnect switch must be provided within sight of the unit, readily accessible, but out of reach of children. Provisions for locking the disconnect switch on the OFF (open) position is advisable. The disconnect switch must comply with NEC and local codes. Protect the unit and wiring using only the recommended fuse/circuit breaker size. See Table 10..
2. Run power wiring from main box to disconnect per NEC and local codes.
3. Run power wiring from the disconnect switch to outdoor unit. Use only minimum 60°C copper conductors between the disconnect switch and the unit for field power connection.
4. Route the field power wires through the conduit connection opening in the unit side panel and connect in junction box as shown in Fig 17. The unit and power wiring must be grounded.



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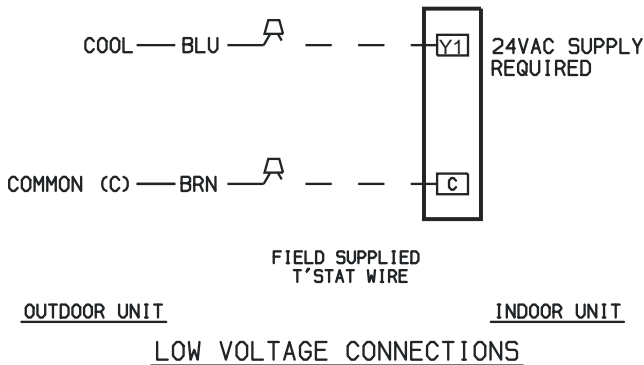
Fig. 17 - Line Power Connections

**NOTE: Operating unit on improper line voltage constitutes abuse and could affect Carrier warranty. DO NOT install unit in a system where voltage may fluctuate above or below permissible limits.**

### Control Wiring

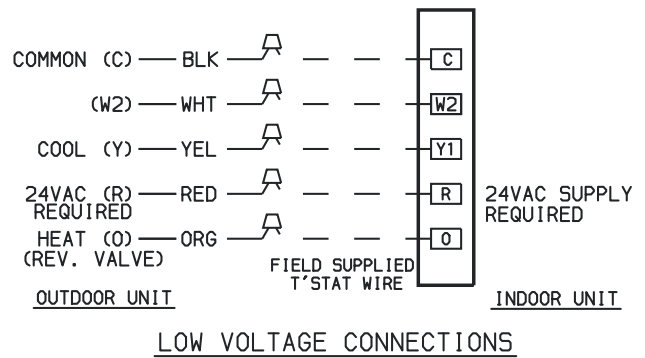
The control circuit is 24 volts AC (minimum 40VA) supplied from the indoor unit.

1. Make sure you have enough control wires to cover the distance between the indoor and outdoor unit.
2. Route one end of the control wiring through the opening provided in the unit side panel and connect to the control terminal strip using either Fig. 18 for 38HDR units and Fig. 19 for 38QRR units.



A09603

Fig. 18 - 38HDR Typical Control Circuit Connections



A09509

Fig. 19 - 38QRR Typical Control Circuit Connections

**NOTE:** Use No. 18 AWG color-coded, insulated (35°C minimum) wire. If the distance between the indoor and outdoor unit is greater than 100 ft. (30.5 m), as measured along the control voltage wires, use No. 16 AWG color-coded wire to avoid excessive voltage drop.

40QAC/38HDR -- 40QAQ/38QRR

# ELECTRICAL DATA

Table 10 – 38HDR Electrical Data

38HDR UNIT SIZE	V-PH-Hz	VOLTAGE RANGE*		COMPRESSOR		OUTDOOR FAN MOTOR			MIN CKT AMPS	FUSE/CKT BKR AMPS
		Min	Max	RLA	LRA	FLA	NEC Hp	kW Out		
018-31	208/230-1-60	187	253	9.0	48.0	0.8	0.125	0.09	12.1	20
024-32	208/230-1-60	187	253	13.5	58.3	0.8	0.125	0.09	17.7	25
030-31	208/230-1-60	187	253	14.1	73.0	1.5	0.250	0.19	19.1	30
036-31	208/230-1-60	187	253	14.1	77.0	1.5	0.250	0.19	19.1	30
	208/230-3-60	187	253	9.2	71.0	1.5	0.250	0.19	13.0	20
	460-3-60	414	506	5.6	38.0	0.8	0.250	0.19	7.9	10
048-32	208/230-1-60	187	253	19.9	109.0	1.5	0.250	0.19	26.4	40
	208/230-3-60	187	253	13.1	83.1	1.5	0.250	0.19	17.9	25
	460-3-60	414	506	6.1	41.0	0.8	0.250	0.19	8.4	15
060-32	208/230-1-60	187	253	26.4	134.0	1.5	0.250	0.19	34.5	60
	208/230-3-60	187	253	16.0	110.0	1.5	0.250	0.19	21.5	30
	460-3-60	414	506	7.8	52.0	0.8	0.250	0.19	10.6	15

Table 11 – 38QRR Electrical Data

38QRR UNIT SIZE	V-PH-Hz	VOLTAGE RANGE*		COMPRESSOR		OUTDOOR FAN MOTOR			WIRE GAUGE 60°C/75°C	WIRE LENGTH 60°C/75°C	MIN CKT AMPS	FUSE/HACR CKT AMPS
		Min	Max	RLA	LRA	FLA	NEC Hp	kW Out				
018	208/230-1-60	187	253	9.0	48.0	0.80	0.125	0.09	14/14	61/62	12.1	20
024	208/230-1-60	187	253	14.4	58.3	0.80	0.125	0.09	14/14	41/39	18.8	30
030	208/230-1-60	187	253	12.8	64.0	1.5	0.25	0.19	14/14	44/42	17.5	30
036	208/230-1-60	187	253	15.5	77.0	1.5	0.25	0.19	12/12	60/57	20.9	30
	208/230-3-60	187	253	10.1	71.0	1.5	0.25	0.19	14/14	53/50	14.1	20
	460-3-60	414	506	5.6	38.0	0.80	0.25	0.19	14/14	98/94	7.9	10
048	208/230-1-60	187	253	26.5	117.0	1.5	0.25	0.19	8/10	89/54	34.6	50
	208/230-3-60	187	253	16.7	83.1	1.5	0.25	0.19	12/12	55/52	22.4	30
	460-3-60	414	506	7.3	41.0	0.80	0.25	0.19	14/14	79/75	10.0	15
060	208/230-1-60	187	253	26.4	134.0	1.5	0.25	0.19	8/10	89/54	34.5	60
	208/230-3-60	187	253	17.7	110.0	1.5	0.25	0.19	12/12	52/50	23.6	40
	460-3-60	414	506	7.8	52.0	.80	0.25	0.19	14/14	72/68	10.6	15

Table 12 – 40QAC/QAQ Electrical Data

UNIT	VOLTAGE V-Ph-60 Hz	VOLTAGE RANGE*		FAN FLA	HEATER		POWER			MINIMUM WIRE SIZE (AWG)
		MIN.	MAX.		kW	FLA	MCA	MOCP	FLA	
40QAC024-3	208/230-1	187	253	0.50	—	—	0.63	15.0	0.50	14
40QAC036-3	208/230-1	187	253	1.30	—	—	1.60	15.0	1.30	14
40QAC048-3	208/230-1	187	253	1.60†	—	—	2.00	15.0	1.60	14
40QAC060-3	208/230-1	187	253	2.60‡	—	—	3.30	15.0	2.60	14
40QAQ024-3	208/230-1	187	253	0.50	2.00	8.66	9.29	15.0	11.29	14
40QAQ036-3	208/230-1	187	253	1.30	3.00	13.00	17.70	20.0	14.30	14
40QAQ048-3	208/230-1	187	253	1.60†	4.00	17.40	23.80	25.0	19.00	12
40QAQ060-3	208/230-1	187	253	2.60†	5.00	21.70	28.70	30.0	24.30	10

**LEGEND**

- FLA – Full Load Amps
- LRA – Locked Rotor Amps
- MCA – Minimum Circuit Amps
- RLA – Rated Load Amps

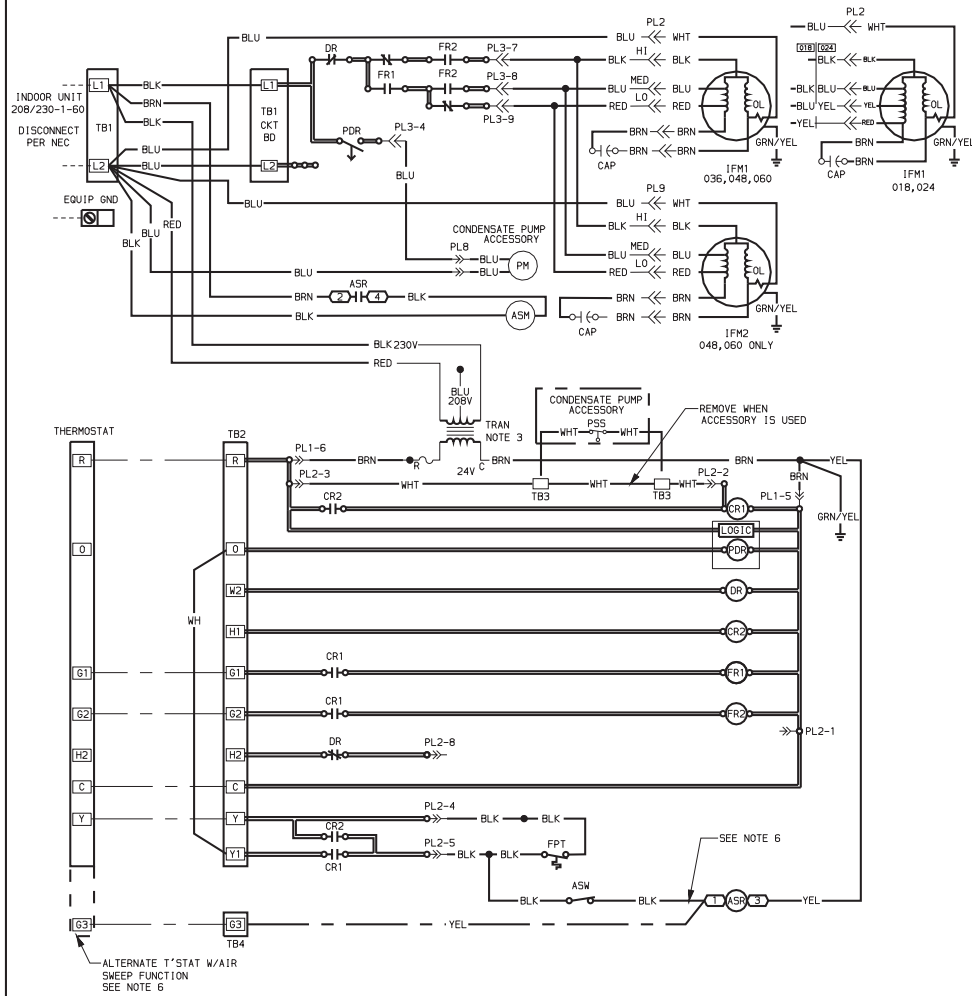
**NOTES**

- \* Permissible limits of the voltage range at which the unit will operate satisfactorily
- † One fan is 1.1 amps, the second fan is 0.5 amps.
- ‡ Two fans each operating at 1.3 amps.



40QAC/38HDR -- 40QAQ/38QRR

**SCHEMATIC - COOLING ONLY**



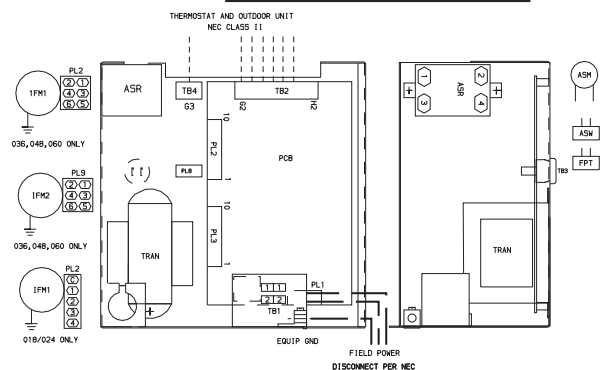
**LEGEND**

- ⊗ TERMINAL (MARKED)
- TERMINAL (UNMARKED)
- SPLICE
- ⊠ TERMINAL BLOCK
- FACTORY WIRING
- - - - FIELD CONTROL WIRING
- - - - FIELD POWER WIRING
- ▬ PRINTED CIRCUIT BOARD
- - - - ACCESSORY OR OPTIONAL WIRING
- ASM AIR SWEEP MOTOR
- ASR AIR SWEEP RELAY
- ASW AIR SWEEP SWITCH
- CAP CAPACITOR
- CR CONTROL RELAY
- DR DEFROST RELAY
- EQUIP. GND. EQUIPMENT GROUND
- FPT FREEZE PROTECTION THERMOSTAT
- FR FAN RELAY
- FU FUSE
- IFM INDOOR FAN MOTOR
- OL OVERLOAD
- PCB PRINTED CIRCUIT BOARD
- PDR PUMP DELAY RELAY
- PL PLUG
- PM PUMP MOTOR
- PSS PUMP SHUT-OFF SWITCH
- SSDR SAFETY SWITCH DELAY RELAY
- TB TERMINAL BLOCK
- TDR TIME DELAY RELAY
- TRAN TRANSFORMER

**NOTES**

1. IF ANY OF THE ORIGINAL WIRE FURNISHED MUST BE REPLACED, IT MUST BE REPLACED WITH TYPE 90°C WIRE OR ITS EQUIVALENT.
2. WIRE IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE (N.E.C.) AND LOCAL CODES.
3. TRANSFORMER IS THERMALLY PROTECTED AND WILL RESET AUTOMATICALLY.
4. IFM(S) ARE INHERENTLY THERMALLY PROTECTED.
5. USE COPPER CONDUCTORS ONLY.
6. WHEN USING THERMOSTAT WITH AIR SWEEP FUNCTION:
  - YELLOW WIRE FROM G3 TO BE CONNECTED TO ASR1.
  - BLACK WIRE TO BE DISCONNECTED FROM ASR1.
  - LEAVE BLACK WIRE TIE-WRAPPED TO YELLOW WIRE.

**COMPONENT ARRANGEMENT**



40QAC/38HDR REV. -

40QAC/38HDR -- 40QAC/38QRFF

**Fig. 20 - 38HDR and 40QAC Cooling System Wiring Diagram**



40QAC/38HDR -- 40QAO/38QRR

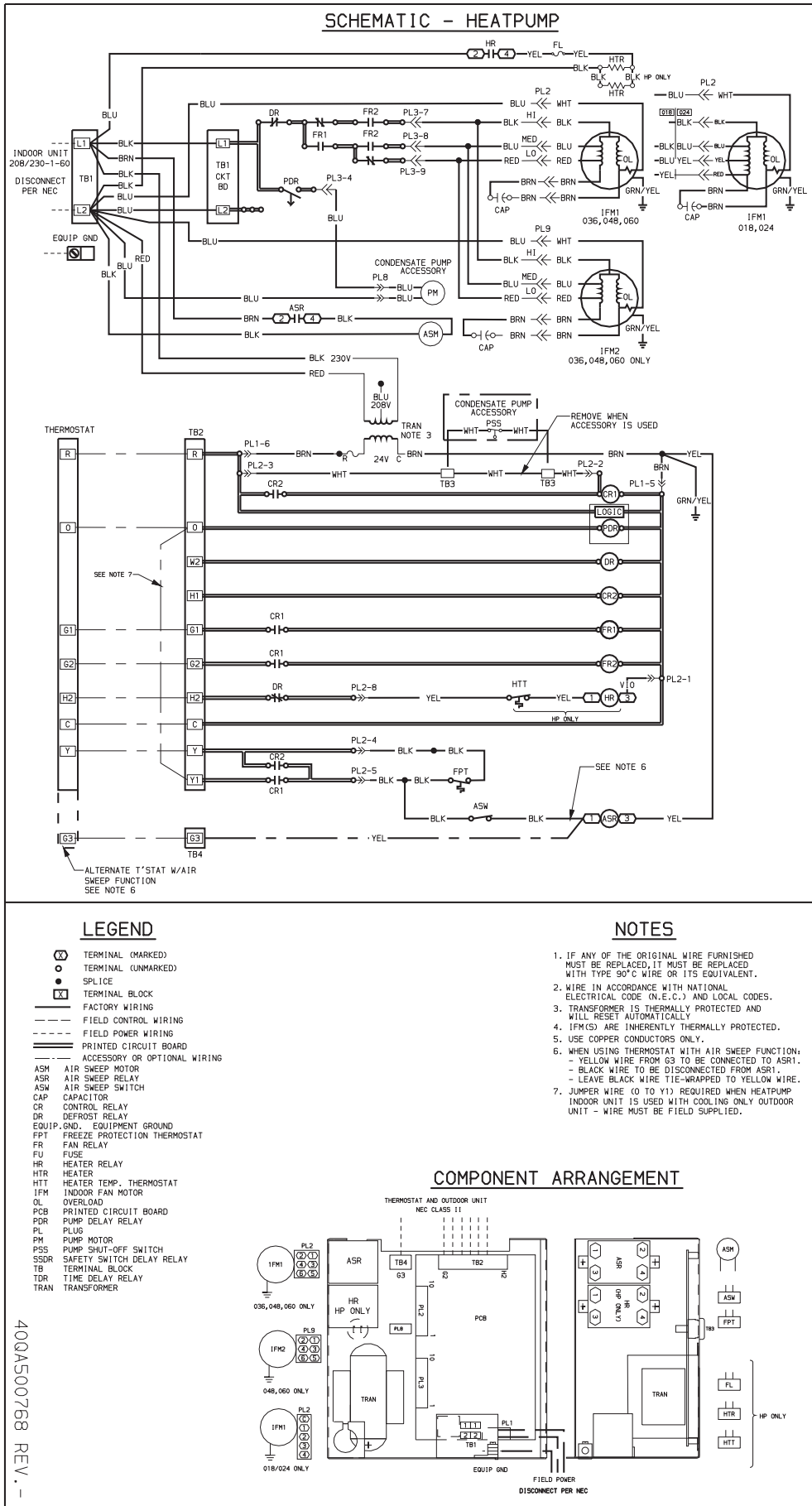


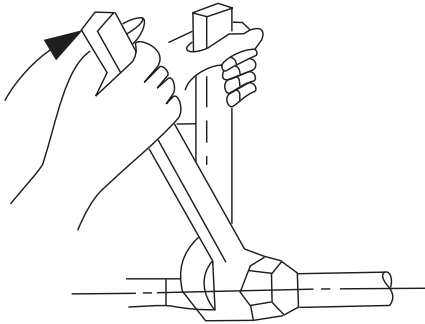
Fig. 21 - 38QRR and 40QAQ Heat Pump System Wiring Diagram

## Complete Indoor Piping

The piping to the indoor unit can be routed from the back, side and top. If the unit is being piped from the top or the side see note below.

1. On heat 40QAQ024 – 048, the cooling piston (indoor) is shipped in the factory installed metering device with the indoor unit. Use Table 6 to verify that you have the correct piston size for the system being installed.
2. Run the line set and the control wiring from the outdoor to the indoor unit through the hole in the wall. Keep the piping general guidelines in mind.
3. Cut the liquid and suction line to the correct length using a tube cutter.
4. Remove the flare nuts from the indoor piping connections. Install them onto the liquid and suction lines and make flare connections.
5. Apply a small amount of refrigerant oil to the flare connection and tubing.
6. Align the tubing with the refrigerant connections on the indoor unit.
7. Tighten the flare nut and finish the installation using two wrenches as shown in Fig. 22.

**NOTE:** When piping is being routed from the top or side, two pipe adaptors are supplied with the unit. Flare the pipe adaptors to the indoor unit connections and sweat the other ends to the line set.



**Fig. 22 - Tighten Flare Nut**

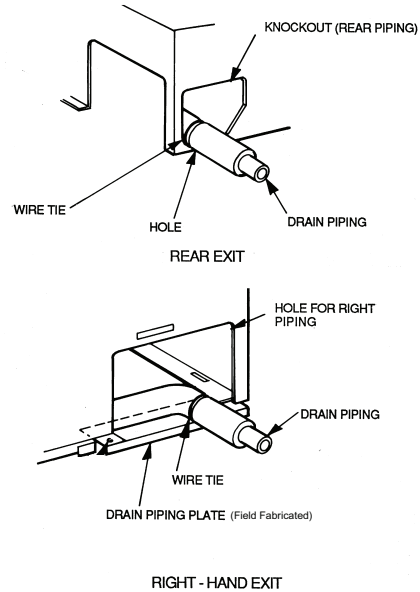
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8. Insulate both connections on the 38QRR and the liquid line connection on the 38HDR units.

## Connect Condensate Drain Line

Observe all local sanitary codes when installing condensate drains. Refer to Fig. 23 for drain pipe connection from indoor unit.

1. Use hard polyvinyl chloride (PVC) pipe material with nominal ID of 3/4 in. to connect at drain line. Use pipe insulation 1/4 in. thick, such as Armaflex insulation, on exposed piping inside the conditioned space.
2. To insure regular flow of condensate water, the drain pipe should be pitched toward an open drain or sump at a downward slope of at least 1/4 in. per ft.
3. If the drain piping is routed through the side of the unit, attach a field fabricated piece of sheet metal to support the drain pipe as shown in Fig. 23.
4. Attach drain pipe with nylon wire tie passing through hole as shown in Fig. 23.



**Fig. 23 - Routing Drain Piping**

A09534

**NOTE:** Do not fasten nylon wire ties tight enough to deform the insulation, as this affects performance.

5. Install an external trap at the end of the condensate line.

**NOTE:** Should the installation require one, a condensate pump may be ordered as a field-installed accessory. It is easier to install pump before hanging the unit.

## Complete Control Wiring

1. Run the control wiring close to the terminal block on the indoor unit.
2. Connect the wires as shown in Fig 18 and Fig. 20 for 38HDR units, and Fig. 19 and Fig. 21 for 38QRR units.

## Complete Power Connection To Indoor Unit

Be sure field wiring complies with local building codes and NEC, and unit voltage is within limits shown in Table 12.

Contact local power company for correction of improper line voltage.



## WARNING

### ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Before installing, modifying, or servicing system, main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.



## CAUTION

### UNIT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

Unit failure as a result of operation on improper line voltage or excessive phase imbalance constitutes abuse and may cause damage to electrical components. Such operation could void any applicable Carrier warranty.

**NOTE:** Use copper wire only between disconnect switch(es) and unit.

**NOTE:** Install branch circuit disconnect of adequate size to handle unit starting current per NEC. Locate disconnect within sight of, and readily accessible from, unit, per section 440-14 of NEC. Some codes allow indoor unit to share disconnect with outdoor unit if disconnect can be locked; check local code before installing in this manner.

1. Route ground and power wires.



## WARNING

### ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

According to NEC and most local codes, the unit must have an uninterrupted, unbroken ground to minimize personal injury if an electric fault should occur. The ground may consist of electrical wire or metal conduit when installed in accordance with existing electrical codes.

2. Route line power leads from inside disconnect to the fan coil. Place wire through the whole on the control box.
3. Connect wire to high voltage terminal board (TB1) and ground screw.

**NOTE:** When routing the wire in the unit, use care to keep the wire away from refrigerant and condensate piping and any sharp edges.

**NOTE:** The 208/230-v units are factory wired for 230-v to 24-v transformer operation, For 208-v to 24-v operation, interchange the blue (208-v) and red (230-v) wires. Cap any unused wires with wire nuts.

## Install Thermostat

These systems use a three speed thermostat. Refer to Table 9 for a list of recommended thermostats.

1. Mount thermostat to a wall in the occupied space using hardware provided with the thermostat. Locate the thermostat, preferably on an interior wall, in an area that is not subjected to drafts or direct sunlight through windows.
2. Run the thermostat wires to the control box of the indoor unit. If running the thermostat through the back of the unit, 3/8 in. space between the unit and the wall is required.
3. Route wires over refrigerant and drain piping as shown in Fig. 24.

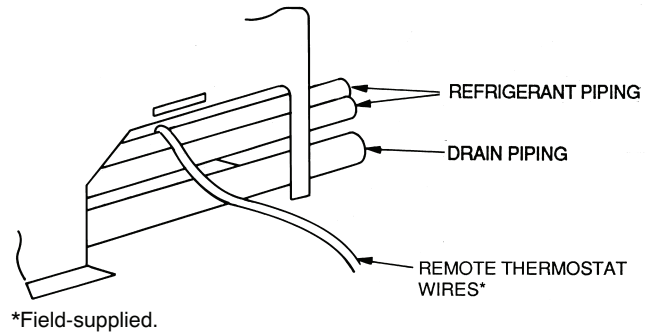


Fig. 24 - Routing Wires Over Piping

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**NOTE:** Do not route wires under the piping, or wires could impede air filter removal.

4. Connect the thermostat wires to the indoor unit per Fig 25 for a 40QAC unit and Fig. 26 for a 40QAQ unit.

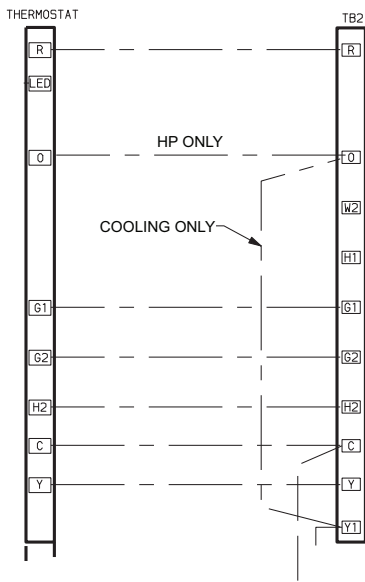


Fig. 25 - Thermostat Wire Connection for 40QAC

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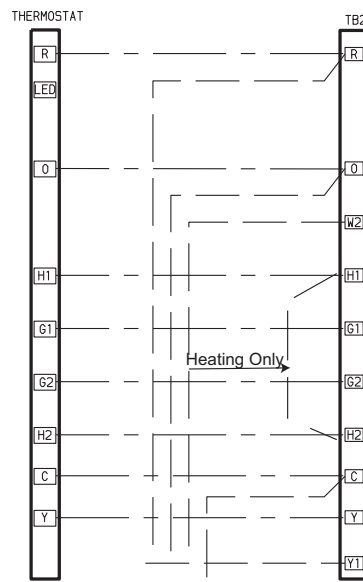


Fig. 26 - Thermostat Wire Connection for 40QQAQ

### Reassemble Indoor Unit

1. Reinstall filters and inlet grilles
2. Reinstall the side panels

### START-UP

#### Preliminary Checks

1. Check condensate drainage system; on the opposite side of the drain connection, insert a water bottle up into the fan coil unit and fill the drain pan (see Fig. 27). Water must flow steadily; if not, check the pipe slope or inspect for any pipe restrictions.

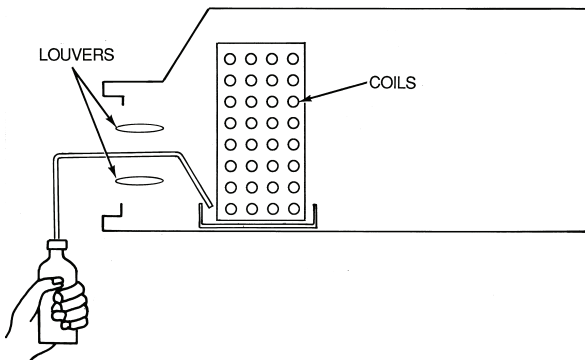


Fig. 27 - Inserting Water Into Drain Pan

A09538

2. Make sure all wiring connections are correct and they are tight.
3. Field electrical power source must agree with unit name plate rating.
4. Check that all barriers, covers, and panels are in place. Ensure that the filters and return-air grilles on the indoor unit have been installed and that the discharge louvers are positioned correctly.
5. All service valves must be closed.
6. On units with crankcase heaters, ensure belly-band heaters are tight around the compressor.

### Evacuate and Dehydrate the System

**⚠ CAUTION**

**UNIT DAMAGE HAZARD**

Failure to follow this caution may result in equipment damage or improper operation.

Never use the system compressor as a vacuum pump.

#### Using Vacuum Pump

1. Completely tighten flare nuts A, B, C, D, connect manifold gage charge hose to a charge port of the low side service valve. (See Fig. 28.)
2. Connect charge hose to vacuum pump.
3. Fully open the low side of manifold gage. (See Fig. 29.)
4. Start vacuum pump
5. Evacuate using either deep vacuum or triple evacuation method.
6. After evacuation is complete, fully close the low side of manifold gage and stop operation of vacuum pump.
7. The factory charge contained in the outdoor unit is good for up to 25 ft. (8 m) of line length. For refrigerant lines longer than 25 ft (8 m), add 0.3 oz. per foot of extra piping up to the maximum allowable length.
8. Disconnect charge hose from charge connection of the low side service valve.
9. Fully open service valves B and A.
10. Securely tighten caps of service valves.

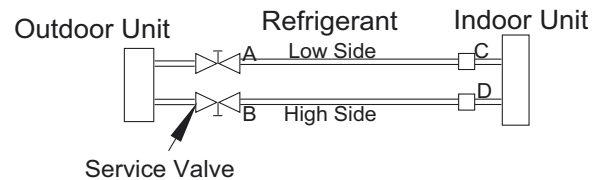
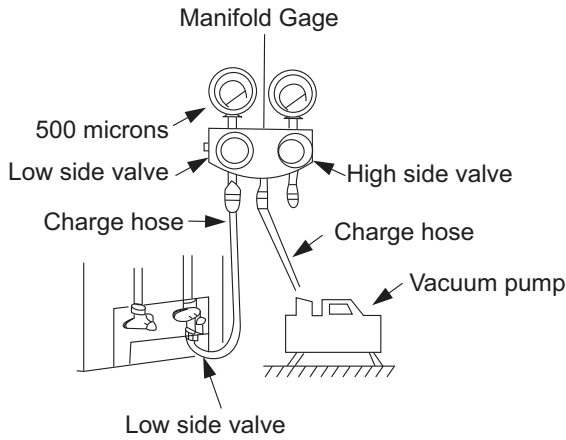


Fig. 28 - Service Valve

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40QAC/38HDR -- 40QQAQ/38QRF

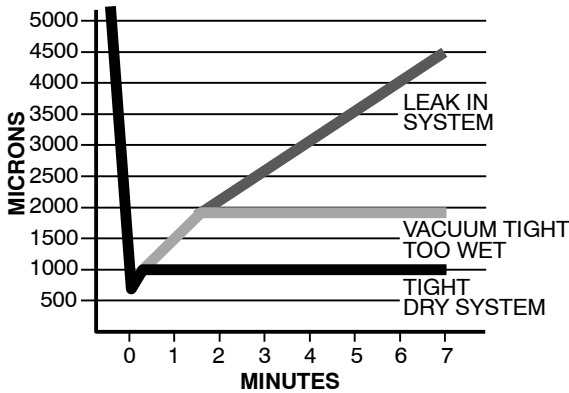


**Fig. 29 - Manifold**

A07361

**Deep Vacuum Method**

The deep vacuum method requires a vacuum pump capable of pulling a vacuum of 500 microns and a vacuum gage capable of accurately measuring this vacuum depth. The deep vacuum method is the most positive way of assuring a system is free of air and liquid water. (See Fig. 30)



**Fig. 30 - Deep Vacuum Graph**

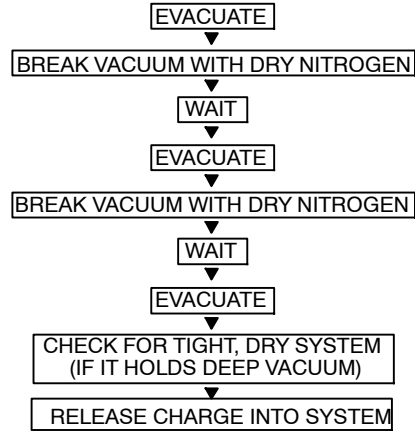
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**Triple Evacuation Method**

The triple evacuation method should only be used when vacuum pump is only capable of pumping down to 28 in. of mercury vacuum and system does not contain any liquid water.

Refer to Fig. 31 and proceed as follows:

1. Pump system down to 28 in. of mercury and allow pump to continue operating for an additional 15 minutes.
2. Close service valves and shut off vacuum pump.
3. Connect a nitrogen cylinder and regulator to system and open until system pressure is 2 psig.
4. Close service valve and allow system to stand for 1 hr. During this time, dry nitrogen will be able to diffuse throughout the system absorbing moisture.
5. Repeat this procedure as indicated in Fig. 31. System will then be free of any contaminants and water vapor.



**Fig. 31 - Triple Evacuation Method**

A95425

**To Start the Unit:**

1. If the outdoor unit is equipped with a crankcase heater, turn on the indoor and outdoor disconnect switches to supply power the system 12 hours before starting the system.
2. Release charge into the system by opening (back-seating) liquid and suction line service valves.
3. Set the wireless remote control or wired remote control below ambient temperature. Operate the unit for 15 minutes.
4. Refer to Table 5 to determine if additional charge is required. Also, if you have a long line application, refer to the Duct Free Long Line Application Guide to determine the additional charge that is required beyond 25 ft (7.6 m).
5. Calculate the total additional charge required and weigh in.
6. Charge should be added as liquid (not gas) slowly and carefully to low side to avoid liquid slugging.

## OPERATING SEQUENCE

Ceiling-suspended fan coil units have a relay board which controls system operation in response to a room thermostat. The user may manually select any one of 3 fan speeds for unit operation. The discharge louvers on the unit can be stationary or swing continuously. A switch located at the bottom of the unit will turn the swing function on and off.

Ceiling-suspended systems may be equipped with an accessory power ventilation kit and/or condensate pump.

**FAN OPERATION** — Fan coils are capable of 3-speed operation. See thermostat instructions for fan speed selection. When the fan(s) is operating in medium or high speed and the unit is equipped with the power ventilation kit, the ventilation fan will operate to provide fresh air.

**COOLING MODE OPERATION** — When the room thermostat senses a demand for cooling, the fan coil relay board is energized. The indoor fan(s) will start in the selected speed (if it is not already operating). The reversing valve (heat pump only) will energize for cooling operation.

The internal condensate pump (if so equipped) runs whenever the reversing valve is energized (heat pump only) and/or the unit is in cooling. As long as the condensate float switch and freeze protection thermostat are closed, the cooling relays in the fan coil unit will close. This energizes the compressor and outdoor fan in the outdoor unit.

The compressor will continue to operate until the room thermostat is satisfied. When the cooling demand is satisfied, the compressor and outdoor fan will stop. If the system is in the AUTO. position, the indoor fan will stop with the compressor.

If the unit has the accessory ventilation kit, the ventilation fan will operate whenever the indoor fan is set for medium or high speed.

**HEAT PUMP OPERATION** — When the room thermostat senses a demand for heating the indoor fan will start in the selected speed (if not already operating), and the reversing valve will not be energized.

The internal condensate pump (if supplied) and freeze protection thermostat are not operated during heating operation. The control relay (CR2) closes, and the compressor and outdoor fan are energized through the defrost board (DFB), which is located in the outdoor unit. The microprocessor logic in the DFB is energized when the compressor starts, and the defrost timer runs. Once every 90 minutes (factory default setting) of compressor run time, the DFB logic checks the defrost thermostat (DFT). If the DFT is open, the unit continues in heating operation. If the DFT is closed, the DFB switches the unit to defrost mode. The timing on the DFB may be set at either 30, 50, or 90 minutes.

**DEFROST (Heat Pump Only)** — The DFB energizes the RVS (reversing valve solenoid), and the reversing valve switches to the cooling position. The K1 relay on the DFB opens and the outdoor fan stops. The W2 contact on the DFB is also energized, which in turn energizes the defrost relay on the fan coil relay board, turns off the electric heater and stops the indoor fan.

The DFB logic checks the 10-minute defrost timer and the DFT. If the DFT opens in less than 10 minutes, the DFB switches the unit back to normal heating operation. If the DFT remains closed, the DFB switches the unit back to heating operation after 10 minutes. When the DFB changes back to heating mode, the RVR (reversing valve relay) is de-energized and the reversing valve switches back to heating operation. Both the outdoor and indoor fans come back on, and if necessary, the electric heater also turns on. **SYSTEM**

**SAFETIES** — The system is equipped with the following safety devices to protect system components: Indoor coil freeze protection thermostat — If a coil temperature of 28°F (-2.22°C) or lower is sensed, the compressor and outdoor fan will be shut down until the coil temperature exceeds 28°F (-2.22°C). The indoor fan will continue to run. Condensate float switch (units equipped with accessory condensate pump, cooling cycle only) — If the level of condensate in the drain pan rises too high, the condensate float switch will turn the system off.

## CLEANING AND MAINTENANCE

### **WARNING**

#### **ELECTRICAL SHOCK HAZARD**

Failure to follow this warning could result in personal injury or death.

Before installing, modifying, or servicing system, main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.

### **CAUTION**

#### **UNIT DAMAGE HAZARD**

Failure to follow this caution may result in equipment damage or improper operation.

To avoid shrinkage, do not wash filter in water over 120°F (48.9°C). To avoid damage, do not expose filter to fire or direct sunlight. Clean the filter more frequently when air is extremely dirty.

For proper system operation, perform the cleaning and maintenance operations in Table 13.

**Lubrication** — The indoor-fan, automatic air sweep, and the outdoor-fan motors are factory lubricated and require no oiling.

## AIR FILTERS

### **CAUTION**

#### **UNIT DAMAGE HAZARD**

Failure to follow this caution may result in equipment damage or improper operation.

Operating the system with dirty air filters may damage the indoor unit and can cause reduced cooling performance, intermittent system operation, frost build-up on the indoor coil, and blown fuses. Inspect and clean or replace the air filters monthly.

**REMOVE AIR FILTERS** — Remove filters by pulling them straight out.

**CLEAN OR REPLACE FILTERS** — Filters can be vacuumed or washed in warm water. Shake filter to remove any excess water, and replace by sliding filter behind grille until filter snaps in place. Refer to Fig. 32. If the filter has begun to break down or is torn, replace it. Replacement filters are available through your dealer.

Table 13 – Cleaning and Maintenance Schedule

TASK	MONTHLY	QUARTERLY	YEARLY
<b>INDOOR UNIT</b>			
Clean Air Filters	X		
Clean Drain Pipe		X	
Clean Condensate Drain Pan			X
Clean Indoor Coil			X
Clean Indoor Unit Front Panel		X	
<b>OUTDOOR UNIT</b>			
Clean the Fins From Outside		X	
Open the Unit and Clean Fins Inside			X
Remove Dust From Electrical Parts			X
Check Electrical Connections are Tight			X
Clean Outdoor Fan			X
Clean Outdoor Coil			X
Check that Outdoor Fan Assembly is Tight			X
Clean Drain Pan		X	

NOTE: Maintenance procedures for the outdoor units are in the individual unit installation instructions.

**CLEAN INDOOR UNIT BOTTOM PANEL** — If the bottom panel of the unit becomes dirty or smudged, wipe the outside of the panel with a soft dry cloth. Use a mild liquid detergent and wipe off carefully with a dry cloth.

**CLEAN INDOOR COIL** — To clean the coil, remove indoor unit bottom panel and vacuum the coil fins, using care not to bend or damage fins.

**CLEAN OUTDOOR COIL** (Outdoor Unit)

**⚠ CAUTION**

**CUT HAZARD**

Failure to follow this caution may result in personal injury. Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate protective clothing and gloves when cleaning. Clean coil carefully.

**To clean the outdoor coil:**

1. Remove any dirt or obstruction from discharge opening.
2. Use a garden hose to spray water on the coil. Debris that collects between coil fins inhibits heat transfer — direct the water spray between coil fins to flush out debris.

**CLEAN CONDENSATE DRAINS** — Clean all drains and drain pans at the start of each cooling season. Check the flow by pouring water into the drain.

**To clean or replace drain pan:**

1. Place a plastic sheet on the floor to catch any water that may spill from drain pan.
2. Remove the intake grille and distribution assembly (attached).
3. Remove the condensate water in the drain pan by letting water drain into a 3-gallon bucket.

**⚠ CAUTION**

**UNIT DAMAGE HAZARD**

Failure to follow this caution may result in equipment damage.

Do not use a screwdriver to pry drain pan out of assembly - it could damage the pan.

4. Remove the 4 screws holding the drain pan.
5. Carefully hold the drain pan to remove it from the assembly.

**SERVICE**

**⚠ WARNING**

**ELECTRICAL SHOCK HAZARD**

Failure to follow this warning could result in personal injury or death.

Before servicing system, main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.

**⚠ CAUTION**

**ENVIRONMENTAL HAZARD**

Failure to follow this caution may result in environmental damage.

Federal regulations require that you do not vent refrigerant to the atmosphere. Recover during system repair or final unit disposal.

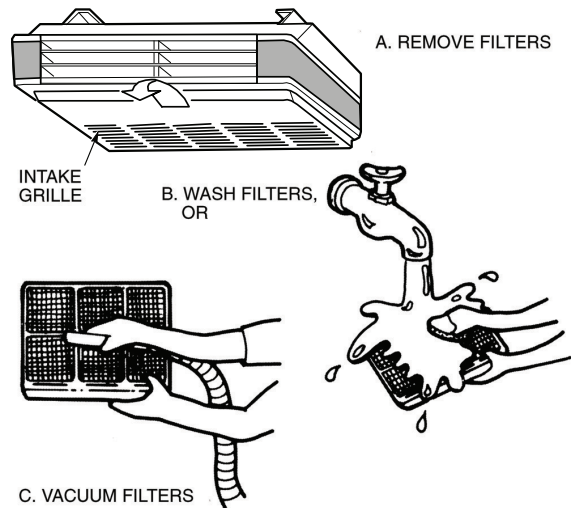


Fig. 32 - Cleaning Filters

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40QAC/38HDR -- 40QAO/38QRR



## Before Calling for Service

Save the cost of a service call by doing the following:

1. Be sure main power to system is turned on.
2. Press Mode button until OFF is displayed. Wait 5 minutes.
3. Press Mode button until either COOL or HEAT is displayed (as desired).
4. Adjust thermostat set point to desired room temperature. If system starts within a few minutes, service may not be necessary. If system does not operate properly, check Table 14 for typical solutions.

IF SYSTEM FAILS TO OPERATE — Be sure:

- unit ON/OFF switch is in ON position
- fuse or circuit breaker is not tripped

## FRESH AIR INSTALLATION OPTION

The units have an installation option, which allows for field installation of fresh air ventilation. Plan the installation carefully. Before beginning, measure carefully and follow acceptable building practices, NEC, and local codes.

**Ventilation-Air Accessory** — Refer to ventilation air accessory installation instructions.

## TROUBLESHOOTING

If the under-ceiling fan coil unit fails to start or operate properly, sometimes the problem is minor and can be handled without a service call. Refer to Table 14 for some common problems, causes, and typical solutions. See Fig. 36 and 37 for additional system troubleshooting details. If the problem cannot be corrected, contact a local dealer for further assistance.

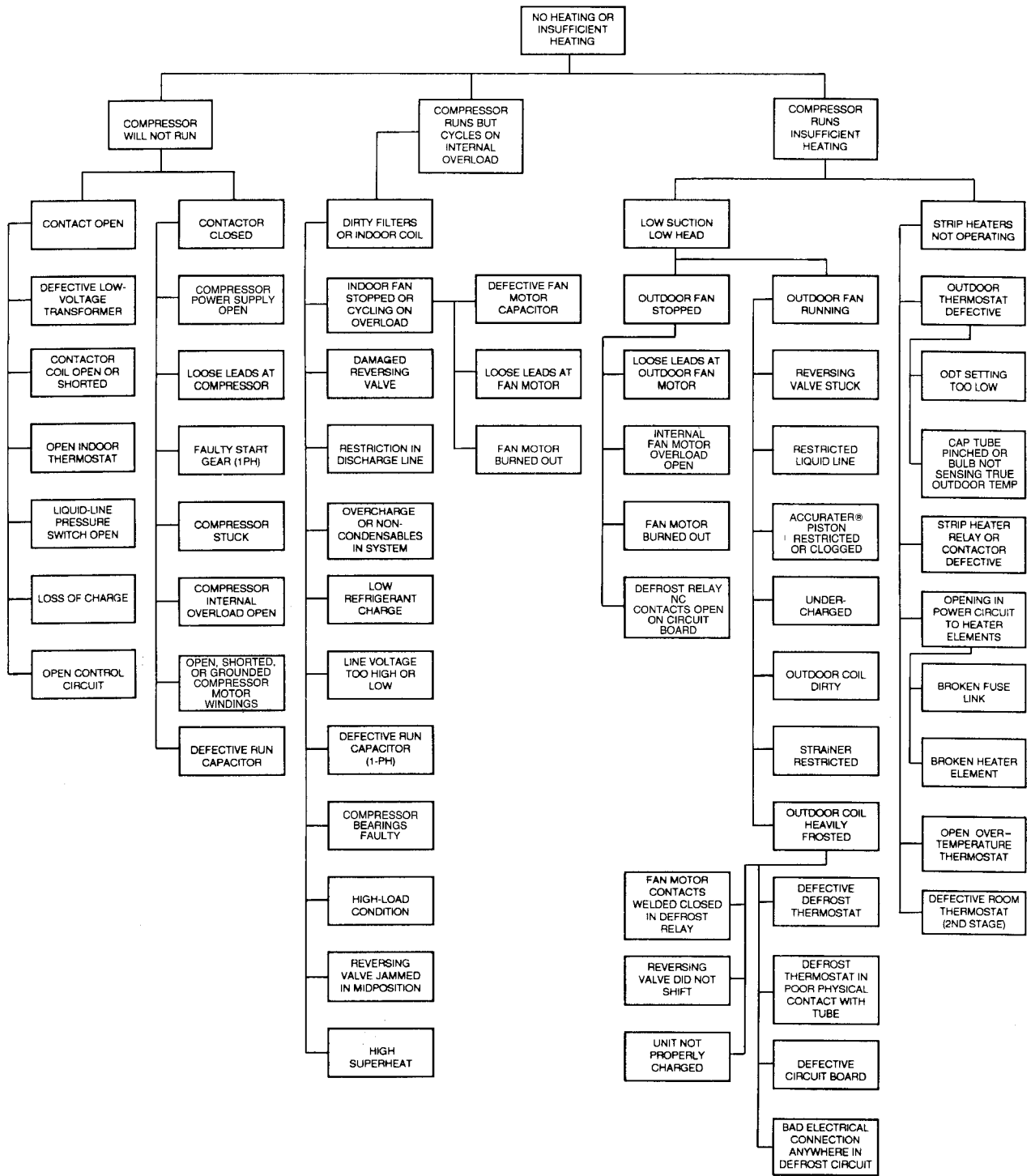
Table 14 – Troubleshooting

PROBLEM	CAUSE	TYPICAL SOLUTION
<b>System Does Not Start.</b>	Blown fuse or circuit breaker tripped at building power entry.	Replace fuse or reset circuit breaker.*
	Indoor and/or outdoor unit disconnect switch is off.	Turn on disconnect switch(es).
	Thermostat is set to night mode.	Cancel mode using Day/Night button on thermostat.
	Power failure.	Restore power.
	Unit is in off mode.	Press Mode button on thermostat until thermostat displays the desired unit mode.
	Three-minute time delay is running.	Wait for 3 minutes.
<b>System Does Not Cool Properly.</b>	Temperature is above or below the selected temperature.	Select new temperature using the thermostat.
	Air filter(s) in indoor unit is dirty or needs to be replaced.	Clean or replace air filter(s).
	Temperature is set too high or too low.	Reset temperature to desired comfort setting using the thermostat.
	Outdoor unit outdoor coil restricted.	Remove obstruction.
<b>System Does not Heat Properly.</b>	Fan speed is set too low.	Adjust fan speed to high or auto. using the Fan button on the thermostat.
	Air filter(s) in indoor unit is dirty or needs to be replaced.	Clean or replace air filter(s).
	Temperature is set too high or too low.	Reset temperature to desired comfort setting using the thermostat.
	Outdoor unit outdoor coil restricted.	Remove obstruction.
	Fan speed is set too low.	Adjust fan speed to high or auto. using the Fan button on the thermostat.
<b>Ice or frost has Formed on Indoor Coil.†</b>	Outdoor unit outdoor coil is frosted up.	Check manual defrost timer setting and adjust as necessary.
	Low outdoor-air temperature.	Run system in fan-only mode until frost is gone.
<b>Insufficient Airflow.</b>	Air filter(s) in indoor unit is dirty or needs to be replaced.	Clean or replace air filter(s).
	Air filter(s) in indoor unit is dirty or needs to be replaced.	Clean or replace air filter(s).
	Fan coil unit coil is blocked.	Clean air discharge louvers.

\* If fuse blows or circuit breaker trips again after first start attempt, DO NOT attempt to start system again. Contact your local dealer for assistance.

† When outdoor temperature is approximately 55°F (12.8°C) or below, indoor coil frosting may occur when system is operated in cooling or maximum dehumidification mode. Units are not intended to operate below 55°F (12.8°C) without appropriate accessories.

40QAC/38HDR -- 40QAC/38QRF



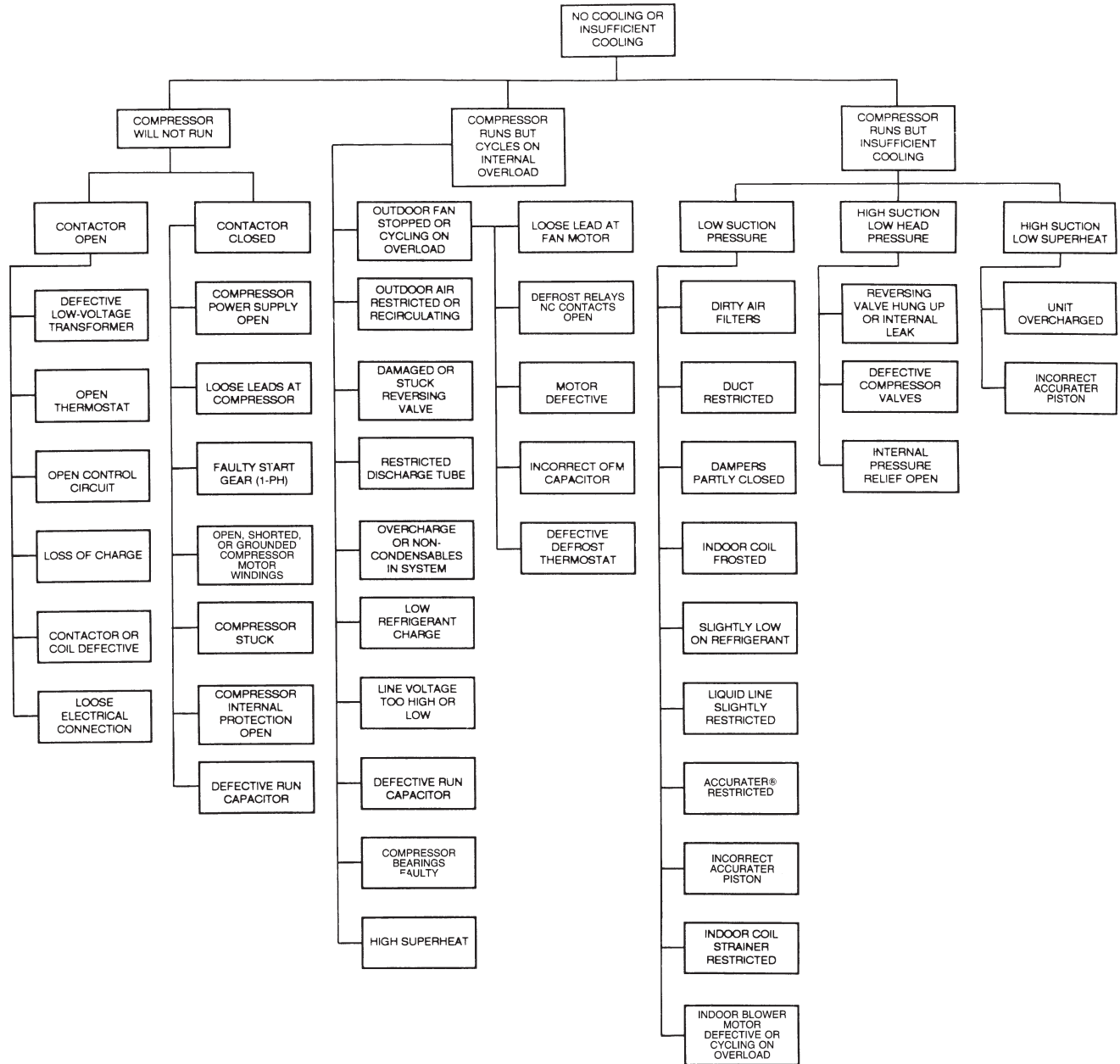
**LEGEND**

NC — Normally Closed  
 ODT — Outdoor Thermostat

**NOTE:** For systems with indoor units equipped with microprocessor control, see separate controls, service, and troubleshooting manual.

**Fig. 33 - Troubleshooting the Heating Cycle**

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40QAC/38HDR -- 40QAC/38QRF

**LEGEND**

- NC — Normally Closed
- ODT — Outdoor Thermostat

**NOTE:** For systems with indoor units equipped with microprocessor control, see separate controls, service, and troubleshooting manual.

**Fig. 34 - Troubleshooting the Cooling Cycle**

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