Installation, Start-up and Service Instructions

CONTENTS

SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock or other conditions which may cause 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 and work gloves. Use quenching cloths for brazing operations and have a fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions attached to the unit. Consult local building codes and appropriate national electrical codes (in

U.S.A., ANSI/NFPA70, National Electrical Code (NEC); in Canada, CSA C22.1) for special requirements.

It is important to 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 the signal words DANGER, WARNING, CAUTION, and NOTE. 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 **may** 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.

⚠ DANGER

ELECTRICAL SHOCK HAZARD

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

Before performing service or maintenance operations on unit, turn off main power switch to unit and install lock(s) and lockout tag(s). Ensure electrical service to rooftop unit agrees with voltage and amperage listed on the unit rating plate. Unit may have more than one power switch.

⚠ WARNING

UNIT OPERATION AND SAFETY HAZARD

Failure to follow this warning could cause personal injury, death and/or equipment damage.

R-454B is an A2L refrigerant. All service equipment or components must be A2L refrigerant rated. Do not use non-A2L rated equipment or components on R-454B refrigerant equipment.

⚠ WARNING

UNIT OPERATION AND SAFETY HAZARD

Failure to follow this warning could cause personal injury, death and/or equipment damage.

These air handling units are dedicated voltages. Unlike older air handler units the voltage of these units cannot be changed in the field.

⚠ WARNING

PERSONAL INJURY AND ENVIRONMENTAL HAZARD

Failure to follow this warning could cause personal injury or death.

Relieve pressure and recover all refrigerant before system repair or final unit disposal.

Wear safety glasses and gloves when handling refrigerants. Keep torches and other ignition sources away from refrigerants and oils.

⚠ 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, safety glasses, and gloves when handling parts and servicing units.

⚠ CAUTION

UNIT OPERATION HAZARD

Failure to follow this caution could cause equipment damage.

Ensure voltage listed on unit data plate agrees with electrical supply provided for the unit.

⚠ WARNING

RISK OF FIRE — FLAMMABLE REFRIGERANT

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

Do not pierce or burn.

Be aware that refrigerants may not contain an odor.

Unit Label Safety Symbols

	WARNING	This symbol shows that the appliance used a flammable refrigerant. If the refrigerant is leaked and exposed to an ignition source, there is a risk of fire.
	CAUTION	This symbol shows that the operation manual should be read carefully.
	CAUTION	This symbol shows that the service personnel should be handling the equipment with reference to the installation manual.
	CAUTION	This symbol shows that the information is available such as the operating manual or installation manual.

Detection of Flammable Refrigerants

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector utilizing a naked flame) shall not be used.

The following leak detection methods are deemed acceptable for all refrigerant systems.

Electronic leak detectors may be used to detect refrigerant leaks, but in the case of flammable refrigerants the sensitivity may not be adequate, or may need recalibration. Detection equipment shall be calibrated in a refrigerant-free area. Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25% max.) is confirmed.

Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

Examples of leak detection fluids:

- Bubble method.
- Fluorescent method agents.

If a leak is suspected, all naked flames shall be removed/extinguished. If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Removal of refrigerant shall be according to the following section.

Ignition Source Mitigation

No person carrying out work on an appliance containing A2L refrigerants which involves exposing any pipe work shall use any sources of ignition in such a way that can lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, must be kept sufficiently far away from the site of work. This includes, but is not limited to, installation, repair, removal, and disposal of equipment.

Work shall be performed under a controlled procedure so as to minimize the risk of flammable gas or vapors being present while work is performed.

Ventilation Requirements

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree ventilation shall continue during the period that work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it external atmosphere. Should an auxiliary ventilation system be present, check that it is operating correctly and no outlets are obstructed.

Evacuation, Removal, and Recovery

When breaking into the refrigerant circuit to make repairs - or for any other purpose - conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed, since flammability is a consideration.

The following procedure shall be adhered to:

1. Safely remove refrigerant following local and national regulations.
2. Evacuate.
3. Purge the circuit with inert gas (optional for A2L).
4. Evacuate (optional for A2L refrigerants).
5. Continuously flush or purge with inert gas when using flame to open circuit.
6. Open the circuit.

For appliances containing flammable refrigerants, purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process may need to be repeated several times until the system is free from refrigerant. When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant. Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of the flammable refrigerant. If in doubt, the manufacturer should be consulted. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect coupling and in good condition. The recovered refrigerant shall be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer not arranged. Do not mix refrigerants in recovery units, and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. When oil is drained from a system, it shall be carried out safely.

At no point during this process should the outlet for the vacuum pump be close to any potential ignition sources, and ventilation shall be available.

Charging

In addition to conventional charging procedures, the following requirements shall be followed.

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders shall be kept in an appropriate position according to the instructions.
- Ensure that the refrigerating system is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the refrigerating system.

Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

PRE-INSTALLATION

1. The power supply (v, Ph, and Hz) must correspond to that specified on unit rating plate.
2. The electrical supply provided by the utility must be sufficient to handle load imposed by this unit.
3. Refer to Installation, General section (page 4) and Fig. 3 40RL 07-12 Base Unit Dimensions (pages 6-7) for locations of electrical inlets, condensate drain, duct connections, and required clearances before setting unit in place.
4. This installation must conform with local building codes and with the NEC (National Electrical Code) or ANSI (American National Standards Institute)/NFPA (National Fire Protection Association) latest revision. Refer to provincial and local plumbing or wastewater codes and other applicable local codes.

Moving and Storage

To transfer unit from truck to storage site, use a fork truck. Do not stack units more than 2 high during storage. If unit is to be stored for more than 2 weeks before installation, choose a level, dry storage site free from vibration. Do not remove plastic wrap or skid from unit until final installation.

Rigging

All 40RL Series units can be rigged by using the shipping skid. Units are shipped fully assembled. Do not remove shipping skids or protective covering until unit is ready for final placement; damage to bottom panels can result. Use slings and spreader bars as applicable to lift unit.

Checks to Refrigerating Equipment

The following checks shall be made to installations using A2L refrigerants:

- The actual charge is in accordance with the room size within which the refrigerant containing parts are installed.
- Supplementary ventilation machinery and outlets are operating adequately and are not obstructed.

- For appliances utilizing indirect refrigeration, the secondary circuit shall be checked for the presence of refrigerant.
- Warning markings on the equipment is visible and legible, with those that are not being either replaced or corrected.
- Refrigerant piping or components are installed in a position where they are unlikely to be exposed to any substance which may corrode them, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against said corrosion.

INSTALLATION

General

Allow the following clearances for service access and airflow:

- Rear: 2-1/2 ft (762 mm)
  NOTE: Units equipped with accessory electric heat may require additional rear clearance to allow service access.
- Front: 2-1/2 ft (762 mm)
- Right Side: 2-1/2 ft (762 mm)
- Left Side: 2-1/2 ft (762 mm)

For units equipped with an economizer, refer to the accessory installation instructions for additional clearance requirements. Be sure floor, wall, or ceiling can support unit weight (Tables 1-3). See Fig. 3 for dimensions.

Uncrating

Move unit as near as possible to final location before removing shipping skid.

Remove metal banding, top skid, and plastic wrap. Examine unit for shipping damage. If shipping damage is evident, file claim with transportation agency. Remove base skid just prior to actual installation.

Check nameplate information against available power supply and model number descriptions in Fig. 1 and 2.

NOTE: Be sure to remove the foam shipping pad from the thermostatic expansion valve (TXV). Verify that it has been removed. See Fig. 4 for determining foam pad location.

Accessories

Refer to instructions shipped with each accessory for specific information.

Position:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Example:	4	0	R	L	A	A	1	2	A	2	A	6	–	U	A	0	A	0

Model Type
40RL = Vane Axial Fan Packaged Air-Handling Puron Advance™ R-454B Refrigerant

Type of Coil
A = Standard 4 Row DX
S = Chilled Water Coil

Refrigeration Options
A = None
N = Single Circuit Cooling with Adaptive Dehumidification[1]
U = Dual Circuit Cooling with Adaptive Dehumidification[1,2]

Nominal Tonage
07 = 6.0 Ton[1]
08 = 7.5 Ton
10 = 8.5 Ton[3]
12 = 10.0 Ton

Fan Motor Speed Controller
A = Two Speed Direct Drive - EcoBlue™ Vane Axial Fan

Indoor Fan Motor Options — ECM Motor
2 = Medium Static
3 = High Static

Coil Options
A = Standard Aluminum Fin/Copper Tube

Packaging Compliance
0 = Standard

Future Use
A = Standard

Cabinet Paint
0 = None
1 = Painted

Future Use
A = Standard

Control Box
U = Electromechanical Unit Control Board

Design Revision
– = Factory Design Revision

Voltage
1 = 575-3-60
5 = 208/230-3-60
6 = 460-3-60

NOTE(S):
1. 40RLA units only.
2. Size 12 only.
3. 40RLS units only.

Fig. 1 — 40RLA/S Model Number Nomenclature

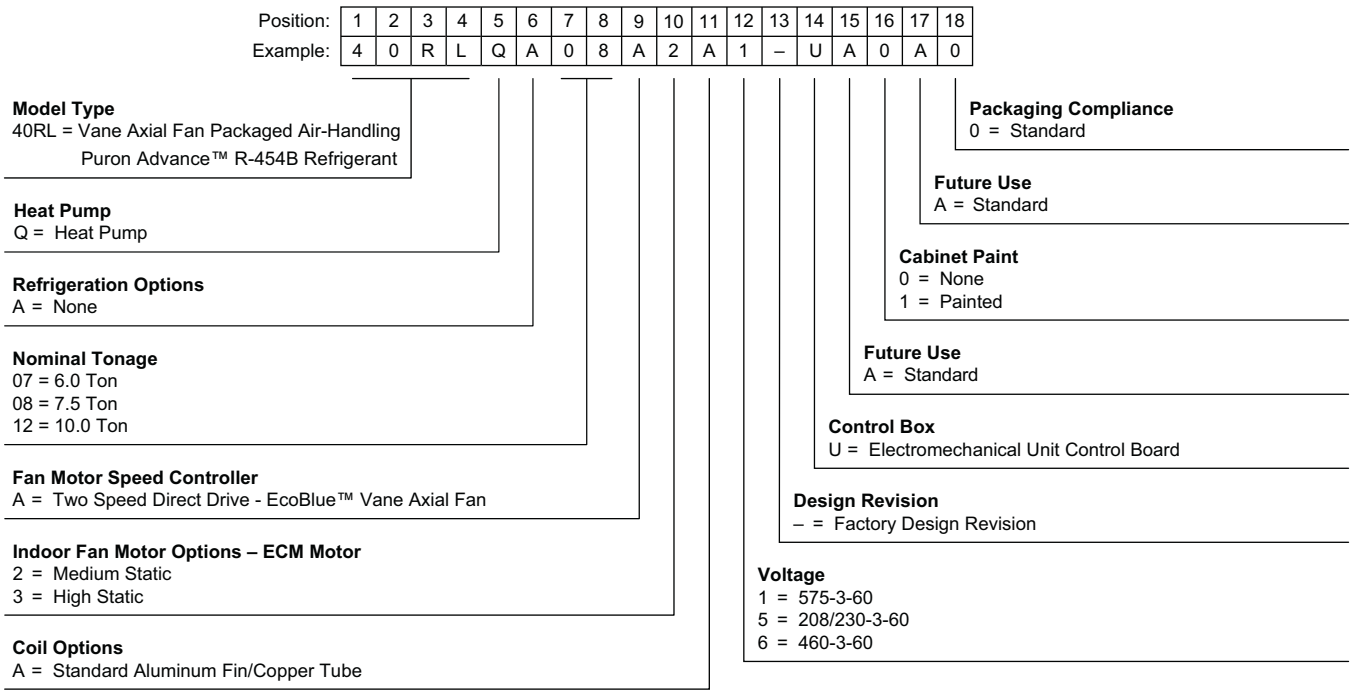
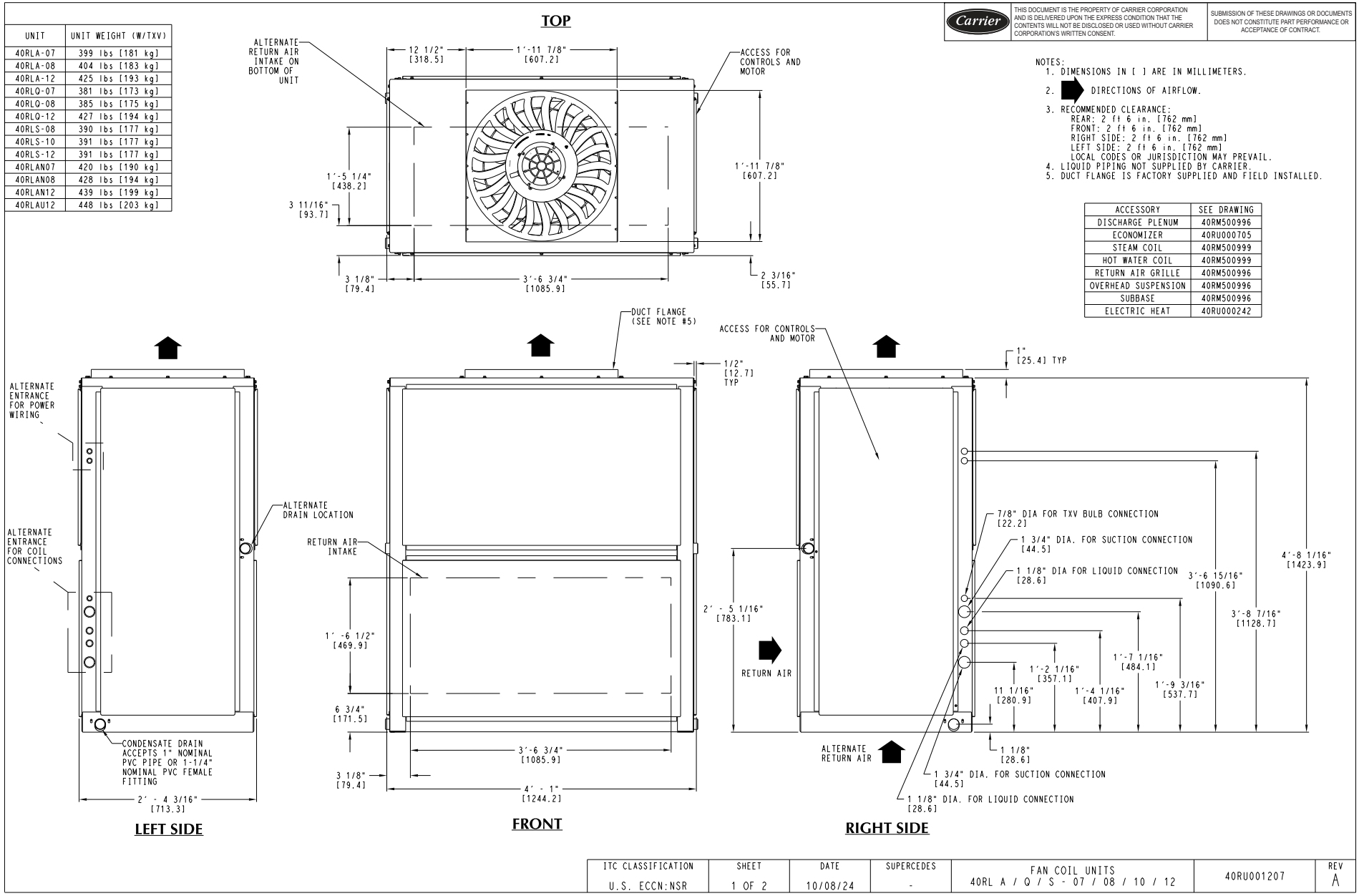


Fig. 2 — 40RLQ Model Number Nomenclature

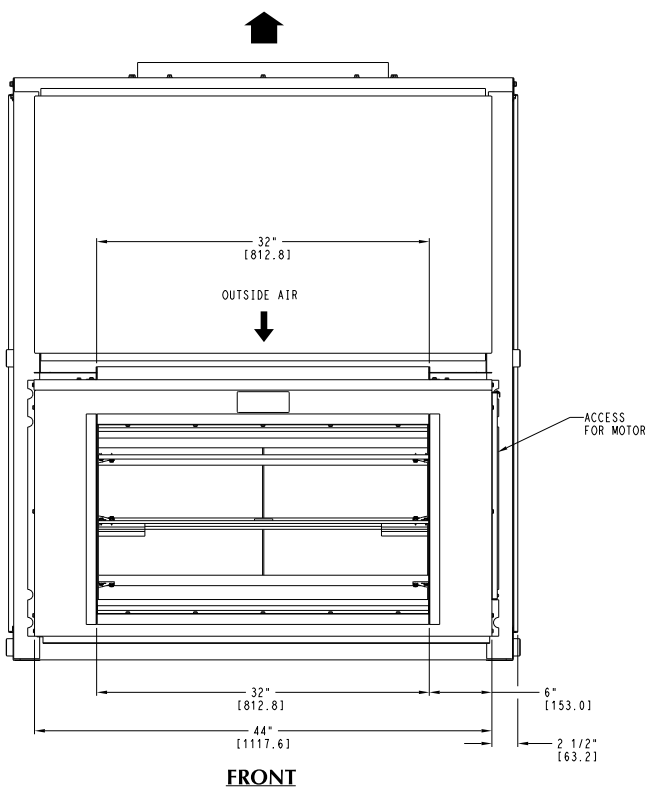
UNIT	UNIT WEIGHT (W/TXV)
40RLA-07	399 lbs [181 kg]
40RLA-08	404 lbs [183 kg]
40RLA-12	425 lbs [193 kg]
40RLQ-07	381 lbs [173 kg]
40RLQ-08	385 lbs [175 kg]
40RLQ-12	427 lbs [194 kg]
40RLS-08	390 lbs [177 kg]
40RLS-10	391 lbs [177 kg]
40RLS-12	391 lbs [177 kg]
40RLAN07	420 lbs [190 kg]
40RLAN08	428 lbs [194 kg]
40RLAN12	439 lbs [199 kg]
40RLAU12	448 lbs [203 kg]



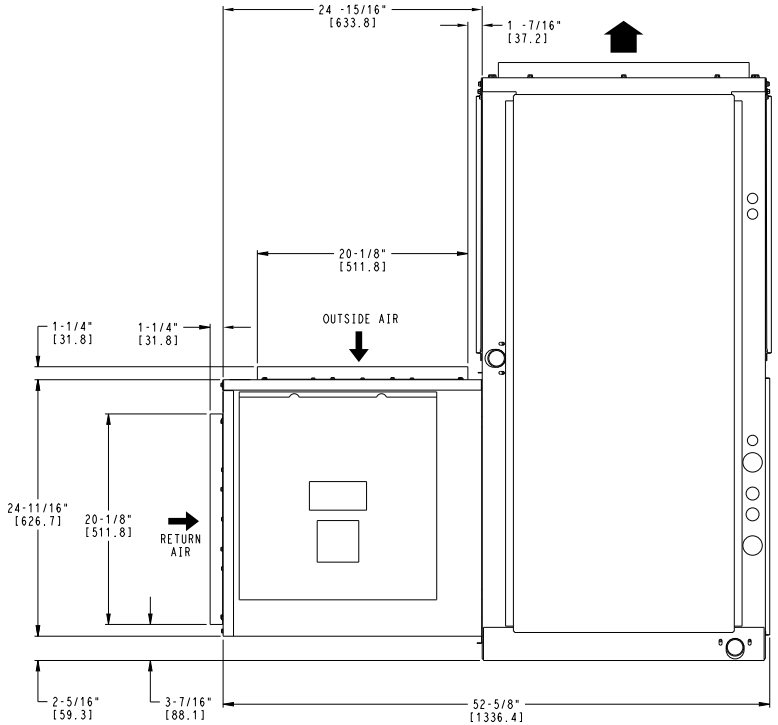
ACCESSORY	SEE DRAWING
DISCHARGE PLENUM	40RM500996
ECONOMIZER	40RU000705
STEAM COIL	40RM500999
HOT WATER COIL	40RM500999
RETURN AIR GRILLE	40RM500996
OVERHEAD SUSPENSION	40RM500996
SUBBASE	40RM500996
ELECTRIC HEAT	40RU000242

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES		40RU001207	REV
U.S. ECCN:NSR	1 OF 2	10/08/24	-	FAN COIL UNITS 40RL A / Q / S - 07 / 08 / 10 / 12		A

Fig. 3 — 40RL 07-12 Base Unit Dimensions



FRONT



RIGHT SIDE

UNIT WITH ECONOMIZER

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES	FAN COIL UNITS		REV
U.S. ECCN;NSR	2 OF 2	10/08/24	-	40RL A / Q / S - 07 / 08 / 10 / 12	40RU001207	A

Fig. 3 — 40RL 07-12 Base Unit Dimensions (cont)

Table 1 — 40RLA 6-10 Ton Direct Expansion with Puron Advance™ Refrigerant Units

UNIT	40RLA*07	40RLA*08	40RLA*12
NOMINAL CAPACITY (Tons)	6	7.5	10
OPERATING WEIGHT (lb)			
Base Unit with TXV (4 Row)	399	404	425
Adaptive Dehumidification System	420	428	439/448[a]
Plenum	175	175	175
Economizer	185	185	185
Hot Water Coil[b]	195	195	195
Steam Coil[b]	215	215	215
FANS			
Qty...Diam. (in.)	1…23	1…23	1…23
Nominal Airflow (cfm)	2400	3000	4000
Airflow Range (cfm)	1800-3000	2250-3750	3000-5000
Nominal Motor HP (Standard Motor)[c]			
208/230-3-60 and 460-3-60	2.4	2.4	2.4
575-3-60	2.4	2.4	2.4
Motor Speed (rpm)			
208/230-3-60 and 460-3-60	2000	2000	2000
575-3-60	2000	2000	2000
REFRIGERANT[d]	Puron Advance™ (R-454B)	Puron Advance™ (R-454B)	Puron Advance™ (R-454B)
Shipping Charge (lb)	Nitrogen Purge	Nitrogen Purge	Nitrogen Purge
Metering Device	TXV	TXV	TXV
Operating Charge (lb) (approx per circuit)	3.0	3.0	1.5/1.5
DIRECT-EXPANSION COIL	Enhanced Copper Tubes, Aluminum Sine-Wave Fins		
Max Working Pressure (psig)	650	650	650
Material (Tube / Fin)	Al / Cu	Al / Cu	Al / Cu
Coil Type	RTPF	RTPF	RTPF
Face Area (sq ft)	6.67	8.33	10.01
No. of Splits	1	1	2
Split Type...Percentage	—	—	Face...50/50
No. of Circuits per Split	12	15	9
Rows...Fins/in.	4...15	4...15	4...15
ADAPTIVE DEHUMIDIFICATION COIL	Enhanced Copper Tubes, Aluminum Sine-Wave Fins		
Max Working Pressure (psig)	650	650	650
Material (Tube / Fin)	Al / Cu	Al / Cu	Al / Cu
Coil Type	RTPF	RTPF	RTPF
Face Area (sq ft)	6.46	7.52	8.57
No. of Splits	1	1	2
Split Type...Percentage	—	—	Face...50/50
No. of Circuits per Split	6	7	4
Rows...Fins/in.	2...17	2...17	2...17
STEAM COIL[b]			
Max Working Press. (psig at 260°F)	20	20	20
Total Face Area (sq ft)	6.67	6.67	6.67
Rows...Fins/in.	1...9	1...9	1...9
HOT WATER COIL[b]			
Max Working Pressure (psig)	150	150	150
Total Face Area (sq ft)	6.67	6.67	6.67
Rows...Fins/in.	2...8.5	2...8.5	2...8.5
Water Volume			
(gal)	8.3	8.3	8.3
(ft^3)	1.1	1.1	1.1
PIPING CONNECTIONS			
Quantity...Size (in.)			
DX Coil — Suction (ODF)	1...1-1/8	1...1-1/8	2...1-1/8
DX Coil — Liquid Refrig, (ODF)	1...5/8	1...5/8	2...5/8
Steam Coil, In (MPT)	1...2-1/2	1...2-1/2	1...2-1/2
Steam Coil, Out (MPT)	1...1-1/2	1...1-1/2	1...1-1/2
Hot Water Coil, In (MPT)	1...1-1/2	1...1-1/2	1...1-1/2
Hot Water Coil, Out (MPT)	1...1-1/2	1...1-1/2	1...1-1/2
Condensate (PVC)	1...5/8 ODM / 1-1/4 IDF		

Table 1 — 40RLA 6-10 Ton Direct Expansion with Puron Advance™ Refrigerant Units (cont)

UNIT	40RLA*07	40RLA*08	40RLA*12
FILTERS	Throwaway — Factory-Supplied		
Quantity...Size (in.)	4...16 x 24 x 2		
Access Location	Right or Left Side		

NOTE(S):

a. Weights listed for refrigerant options N/U, respectively.
b. Field-installed accessory only.
c. 40RL units are medium static option.
d. Units are shipped without refrigerant charge.

LEGEND

DX — Direct Expansion
IDF — Inside Diameter, Female
ODF — Outside Diameter, Female
ODM — Outside Diameter, Male
TXV — Thermostatic Expansion Valve

Table 2 — 40RLQ 6-10 Ton Heat Pump Units

UNIT	40RLQA07	40RLQA08	40RLQA12
NOMINAL CAPACITY (Tons)	6	7.5	10
OPERATING WEIGHT (lb)			
Base Unit with TXV	381	385	427
Plenum	175	175	175
FANS			
Qty...Diam. (in.)	1…23	1…23	1…23
Nominal Airflow (cfm)	2400	2625	3000
Airflow Range (cfm)	1800-3000	2250-3750	3000-5000
Nominal Motor HP (Standard Motor)[a]			
208/230-3-60 and 460-3-60	2.4	2.4	2.4
575-3-60	2.4	2.4	2.4
Motor Speed (rpm)			
208/230-3-60 and 460-3-60	2000	2000	2000
575-3-60	2000	2000	2000
REFRIGERANT	Puron Advance™ (R-454B)	Puron Advance™ (R-454B)	Puron Advance™ (R-454B)
Operating Charge (lb) (approx per circuit)[b]	3.0	3.0	2.0/2.0
DIRECT-EXPANSION COIL			
Max Working Pressure (psig)	650	650	650
Face Area (sq ft)	8.33	8.33	10.0
No. of Splits	1	1	2
No. of Circuits per Split	12	12	9
Split Type...Percentage	Face...100	Face...100	Face...50/50
Rows...Fins/in.	4...15	4...15	4...15
PIPING CONNECTIONS			
Quantity...Size (in.)			
DX Coil — Suction (ODF)	1...1-1/8	1...1-1/8	2...1-1/8
DX Coil — Liquid Refrigerant (ODF)	1...5/8	1...5/8	2...5/8
Steam Coil, In (MPT)	1...2-1/2	1...2-1/2	1...2-1/2
Steam Coil, Out (MPT)	1...1-1/2	1...1-1/2	1...1-1/2
Hot Water Coil, In (MPT)	1...1-1/2	1...1-1/2	1...1-1/2
Hot Water Coil, Out (MPT)	1...1-1/2	1...1-1/2	1...1-1/2
Condensate (PVC)	1...5/8 ODM / 1-1/4 IDF		
FILTERS			
Quantity...Size (in.)	4...16 x 24 x 2	4...16 x 24 x 2	4...16 x 24 x 2
Access Location	Either Side	Either Side	Either Side
STEAM COIL[c]			
Max Working Pressure (psig at 260°F)	20	20	20
Total Face Area (sq ft)	6.67	6.67	6.67
Rows...Fins/in.	1...9	1...9	1...9
HOT WATER COIL[c]			
Max Working Pressure (psig)	150	150	150
Total Face Area (sq ft)	6.67	6.67	6.67
Rows...Fins/in.	2...8.5	2...8.5	2...8.5
Water Volume			
(gal)	8.3	8.3	8.3
(ft^3)	1.1	1.1	1.1

NOTE(S):

a. 40RL units are medium static option.
b. Units are shipped without refrigerant charge.
c. Field installed accessory only.

LEGEND

DX — Direct Expansion
IDF — Inside Diameter, Female
ODF — Outside Diameter, Female
ODM — Outside Diameter, Male
TXV — Thermostatic Expansion Valve

Table 3 — 40RLS Physical Data — Chilled Water Units

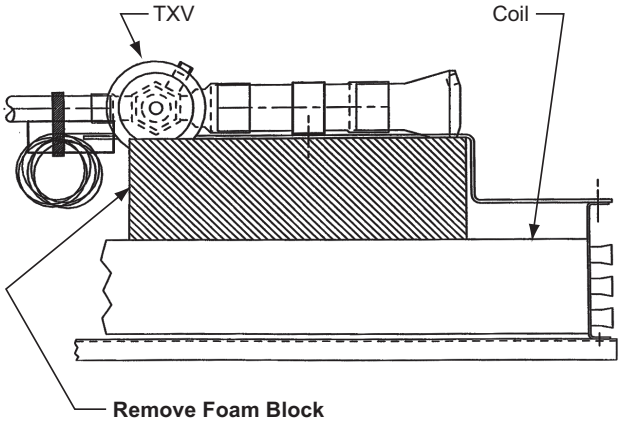
UNIT	40RLSA08	40RLSA10	40RLSA12
NOMINAL CAPACITY (Tons)	7.5	8.5	10
OPERATING WEIGHT (lb)			
Base Unit (3 Row)	390	391	391
Plenum	175	175	175
Economizer	185	185	185
Hot Water Coil[a]	195	195	195
Steam Coil[a]	215	215	215
FANS			
Qty...Diam. (in.)	1…23	1…23	1…23
Nominal Airflow (cfm)	3000	3400	4000
Airflow Range (cfm)	2250-3750	2250-4250	3000-5000
Nominal Motor HP (Standard Motor)[b]			
208/230-3-60 and 460-3-60	2.4	2.4	2.4
575-3-60	2.4	2.4	2.4
Motor Speed (rpm)			
208/230-3-60 and 460-3-60	2000	2000	2000
575-3-60	2000	2000	2000
CHILLED WATER COIL	Enhanced Copper Tubes, Aluminum Sine-Wave Fins		
Max Working Pressure (psig)	435	435	435
Face Area (sq ft) — Upper	8.3	9.0	9.8
Face Area (sq ft) — Lower	—	—	—
Rows...Fins/in.	3...15	3...15	3...15
Water Volume			
(gal)	3.0	3.3	3.5
(ft^3)	0.40	0.47	0.46
STEAM COIL[a]			
Max Working Pressure			
(psig at 260°F)	20	20	20
Total Face Area (sq ft)	6.67	6.67	6.67
Rows...Fins/in.	1...9	1...9	1...9
HOT WATER COIL[a]			
Max Working Press. (in. wg)	150	150	150
Total Face Area (sq ft)	6.67	6.67	6.67
Rows...Fins/in.	2...8.5	2...8.5	2...8.5
Water Volume			
(gal)	8.3	8.3	8.3
(ft^3)	1.1	1.1	1.1
PIPING CONNECTIONS			
Quantity...Size (in.)			
Chilled Water — In	1...1-3/8 ODF	1...1-3/8 ODF	1...1-3/8 ODF
Chilled Water—Out	1...1-3/8 ODF	1...1-3/8 ODF	1...1-3/8 ODF
Steam Coil, In (MPT)	1...2-1/2	1...2-1/2	1...2-1/2
Steam Coil, Out (MPT)	1...1-1/2	1...1-1/2	1...1-1/2
Hot Water Coil, In (MPT)	1...1-1/2	1...1-1/2	1...1-1/2
Hot Water Coil, Out (MPT)	1...1-1/2	1...1-1/2	1...1-1/2
Condensate (PVC)	1...5/8 ODM / 1-1/4 IDF		
FILTERS	Throwaway — Factory-Supplied		
Quantity...Size (in.)	4...16 x 24 x 2		
Access Location	Right or Left Side		

NOTE(S):

a. Field installed accessory only.
b. 40RL units are medium static option.

LEGEND

IDF — Inside Diameter, Female
ODF — Outside Diameter, Female
ODM — Outside Diameter, Male



LEGEND
TXV — Thermostatic Expansion Valve

Fig. 4 — Foam Block Location

Rated Indoor Airflow (cfm)

Tables 4-6 list the rated indoor airflow used for the AHRI (Air-Conditioning, Heating, and Refrigeration Institute) efficiency rating for the units covered in this document.

Table 4 — 38AXZ with 40RLA

MODEL NUMBER	FULL LOAD AIRFLOW (CFM)
38AXZM/N07 — 40RLA*07	2400
38AXZM/N08 — 40RLA*08	3000
38AXZM/N12 — 40RLA*12	4000

Table 5 — 38AXD with 40RLA

MODEL NUMBER	FULL LOAD AIRFLOW (CFM)
38AXDT/U12 — 40RLA*12	4000

Table 6 — 38AXQ with 40RLQ

MODEL NUMBER	FULL LOAD COOLING AIRFLOW (CFM)	FULL LOAD HEATING AIRFLOW (CFM)
38AXQM/N07 — 40RLQ*07	2400	2400
38AXQM/N08 — 40RLQ*08	3000	3000
38AXQM/N12 — 40RLQ*12[a]	3500	3000

NOTE(S):

a. The 38AXQM/N12 — 40RLQ*12 has different rated airflows for heating and cooling. Set airflow while unit is in cooling mode, when unit switches to heating, the controls will automatically adjust airflow.

Unit Positioning

The unit can be mounted on the floor for vertical application with return air entering the face of the unit and supply air discharging vertically through the top of the unit. The unit can also be applied in a horizontal arrangement with return air entering horizontally and the supply air discharging horizontally. When applying the unit in a horizontal arrangement, ensure the condensate drain pan is located at the bottom center of the unit for adequate condensate disposal. See Fig. 5 for condensate connections for each unit position.

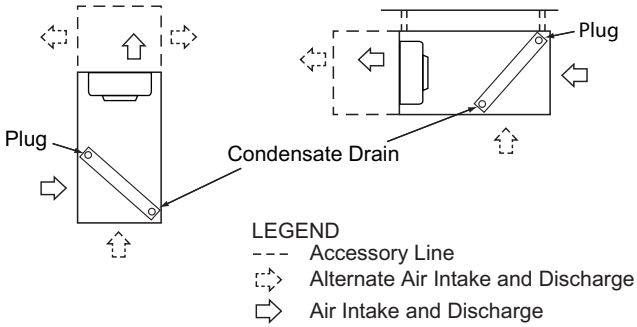


Fig. 5 — Typical Unit Positioning

IMPORTANT: Do NOT attempt to install unit with return air entering top panel of unit. Condensate will not drain from unit.

Typical positioning and alternate return air locations are shown in Fig. 5. Alternate return air locations can be used by moving the unit panel from the alternate return air location to the standard return air location. Refer to overhead suspension accessory drawing (see Fig. 6) for preferred suspension technique. The unit needs support underneath to prevent sagging.

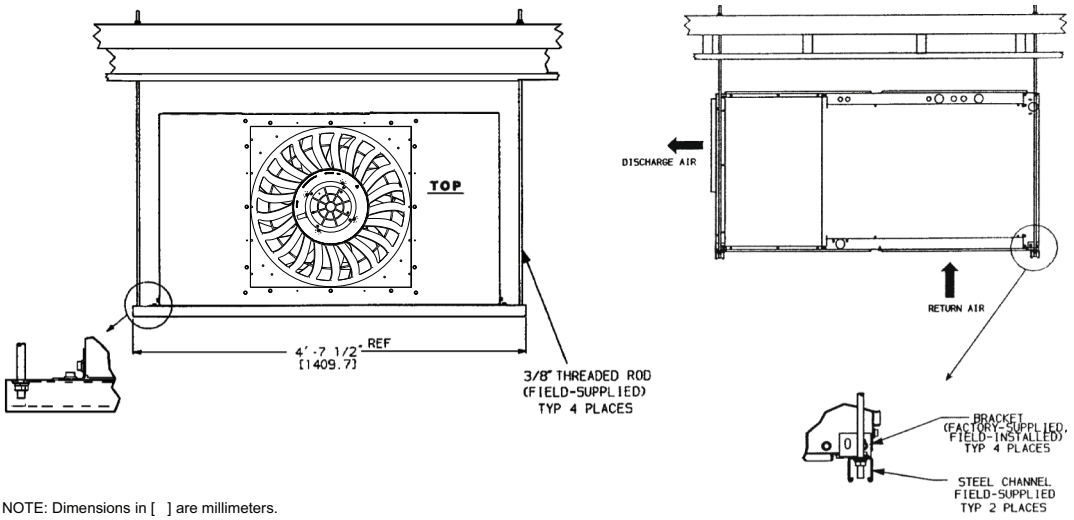
Unit Isolation

Where extremely quiet operation is essential, install isolators between floor and base of unit, or between ceiling and top section of unit.

Be sure that unit is level and adequately supported. Use channels at front and sides of unit for reference points when leveling.

IMPORTANT: Do not bury refrigerant piping underground.

OVERHEAD SUSPENSION ACCESSORY
UNIT SIZE 6-10 TONS



NOTE: Dimensions in [ ] are millimeters.

Fig. 6 — Preferred Suspension Technique

Refrigerant Piping

See Tables 1-3 for refrigerant pipe connection sizes. For ease in brazing, it is recommended that all internal solder joints be made before unit is placed in final position.

The 40RL direct-expansion units have internal factory-installed thermostatic expansion valves (TXVs), distributors, and nozzles for use with R-454B. See Table 7 for part numbers. Knockouts are provided in the unit corner posts for 40RL refrigerant piping. See Fig. 7, which also lists recommended knockouts and access holes to use for each 40RL unit size. Recommended fittings are listed in Table 8.

The sensor bulb capillary tubes must be routed from the TXVs inside the unit through one of the piping access holes. Clamp the TXV sensor bulb on a vertical portion of the suction line, outside the unit. (See Fig. 8.)

Requirements of A2L Refrigerant Piping

The following must be adhered to for refrigerant piping:

- Installation of pipe-work must be kept to a minimum, with minimum piping lengths whenever possible.
- Connecting joints shall only be made in easily accessible locations for service purposes.
- There shall be no bends in pipe-work lines with a centerline bend radius less than 2.5 times the external diameter.
- Pipework must be protected from potential damage during normal operation, service or maintenance.

Refrigerant and Chilled Water Piping Access

The 40RL Series units come with standard knockouts for refrigerant and chilled water piping. These knockouts are located on both sides of the unit for installation flexibility. The standard knockouts provide sufficient access to the unit's coils for all 40RLA*07, 08, and 12 and 40RLQ*07, 08, and 12 units. 40RLS*08 and units require additional holes that must be field-fabricated to accommodate the piping. See Fig. 7 for the positions and dimensions of the additional access holes required for 40RLS units. Recommended access hole use is also listed for all units. Note that Fig. 7 shows the access holes on the control-box side of the unit; this is the side of the unit with the coil headers, so it is used most often for piping access.

NOTE: Be sure to remove the foam shipping pad from the TXV. Verify that it has been removed. (See Fig. 4.)

IMPORTANT: Never attach the sensor to the suction manifold. Do NOT mount the sensor on a trapped portion of the suction line.

The 40RL Series evaporator coils have a face-split design. Ensure that lower circuit of coil is first on/last off when connected to the condensing unit and/or system controls. (See Fig. 9.)

External TXV equalizer connections are provided and factory-brazed into the coil suction manifolds.

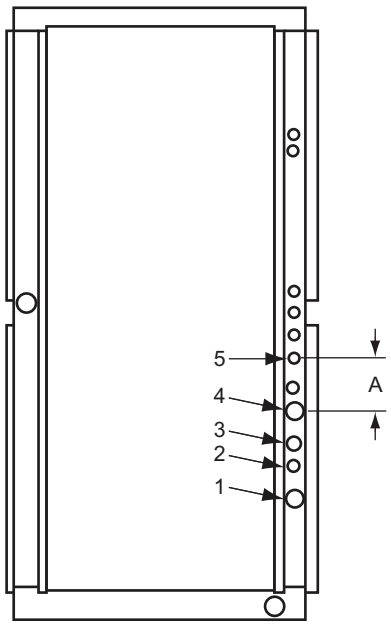
If suction line must be horizontal, clamp bulb to suction line at least 45 degrees above bottom, at approximately the 4 o'clock or 8 o'clock position. (See Fig. 10.)

Table 7 — Factory-Installed Nozzle and Distributor Data

UNIT	COIL TYPE STD	TXV QTY...PART NO.	DISTRIBUTOR QTY... PART NO.	FEEDER TUBES PER DISTRIBUTOR[a] QTY...SIZE (in.)	NOZZLE QTY...PART NO.
40RLA*07	4 Row	1...BBIZE—4—GA	1...1135	12...1/4	1...G4
40RLQ*07	4 Row	1...BBIZE—4—GA	1...1136	15...1/4	1...G5
40RLA*08	4 Row	1...BBIZE—6—GA	1...1136	15...1/4	1...G5
40RLQ*08	4 Row	1...BBIZE—8—GA	1...1113	12...3/16	1...G5
40RLA*12	4 Row	2...HXAE-5-KX	2...1135	9...1/4	2...G3
40RLQ*12	4 Row	2...BBIZE—5—GA	2...1113	9...3/16	2...G3

NOTE(S):

a. Feeder tube size is 1/4 in. (6.35 mm).



Field-Fabricated Access Holes

UNIT	USE HOLE NUMBERS[a]	FIELD-FABRICATED HOLE DIAMETERS in. (mm)			FIELD-FABRICATED HOLE POSITION DIMENSIONS, in. (mm)		
		NO. 5	NO. 6	NO.7	A	B	C
40RLA*07, 08 40RLQ*07,08	1, 3	—	—	—	—	—	—
40RLA*12 40RLQ*12	1, 2, 3, 4	—	—	—	—	—	—
40RLS*08, 10, 12	4, 5	1-3/4 (44.5)	—	—	6.25 (158.8)	—	—

NOTE(S):

a. Access hole knockouts 1-4 are factory-supplied.

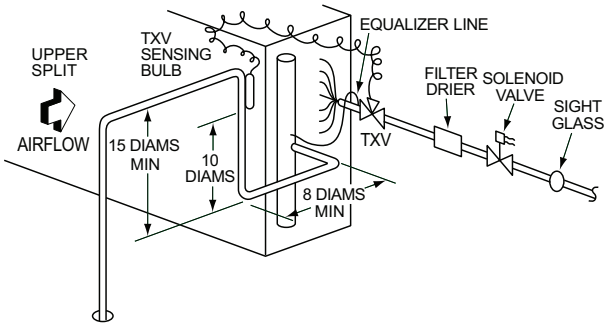
Fig. 7 — Refrigerant and Chilled Water Piping Access Holes

Table 8 — Fitting Requirements

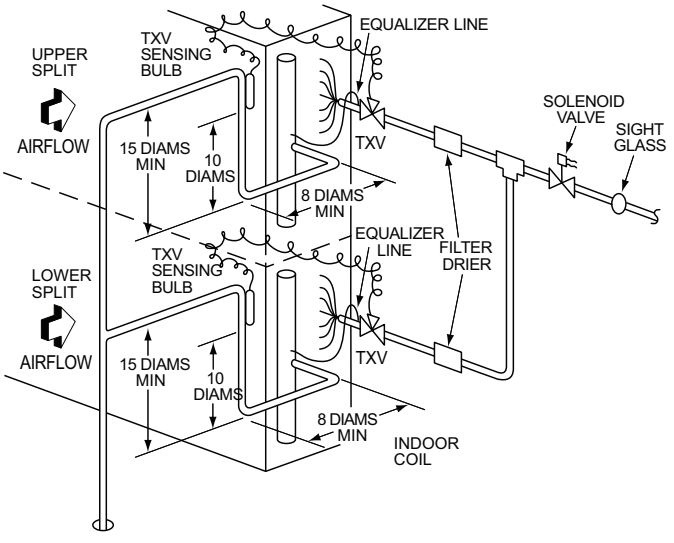
UNIT	ACCESS HOLE NO.[a]	CONNECTION TYPE	CIRCUIT	FITTING REQUIRED[b] (in.)
40RLA*07 40RLQ*07	1	Suction	—	1-1/8 Street Elbow 1-1/8 Nipple, 10-5/8 L 1-1/8 Long Radius Elbow
	3	Liquid	—	5/8 Street Elbow 5/8 Nipple, 8-5/8 L 5/8 Long Radius Elbow
40RLA*08 40RLQ*08	1	Suction	—	1-1/8 Street Elbow 1-1/8 Nipple, 8-5/8 L 1-1/8 Long Radius Elbow
	3	Liquid	—	5/8 Street Elbow 5/8 Nipple, 8-5/8 L 5/8 Long Radius Elbow
40RLS*08 40RLS*10 40RLS*12	4	Return	—	1-3/8 Nipple, 4-3/8 L 1-3/8 Long Radius Elbow 1-3/8 Nipple, 7-3/8 L 1-3/8 Long Radius Elbow
	5	Supply	—	1-3/8 Nipple, 6-5/8 L 1-3/8 Long Radius Elbow
40RLA*12	1	Suction	Lower	(2) 1-1/8 Street Elbow
	2	Liquid	Lower	5/8 Street Elbow 5/8 Nipple, 8-1/2 L 5/8 Long Radius Elbow
	3	Liquid	Upper	5/8 Street Elbow 5/8 Nipple, 13-1/2 L 5/8 Long Radius Elbow
	4	Suction	Upper	1-1/8 Nipple, 5-3/4 L 1-1/8 Long Radius Elbow 1-1/8 Nipple, 12 L 1-1/8 Long Radius Elbow
40RLQ*12	1	Suction	Lower	(2) 1-1/8 Street Elbow
	2	Liquid	Lower	5/8 Street Elbow 5/8 Nipple, 5-1/2 L 5/8 Long Radius Elbow
	3	Liquid	Upper	5/8 Street Elbow 5/8 Nipple, 10-1/2 L 5/8 Long Radius Elbow
	4	Suction	Upper	1-1/8 Nipple, 5-5/8 L 1-1/8 Long Radius Elbow 1-1/8 Nipple, 12 L 1-1/8 Long Radius Elbow

NOTE(S):

a. See Fig. 7 for access hole location by number.
b. Fittings are listed in order from header or tee stub connection out to access hole in corner support post.



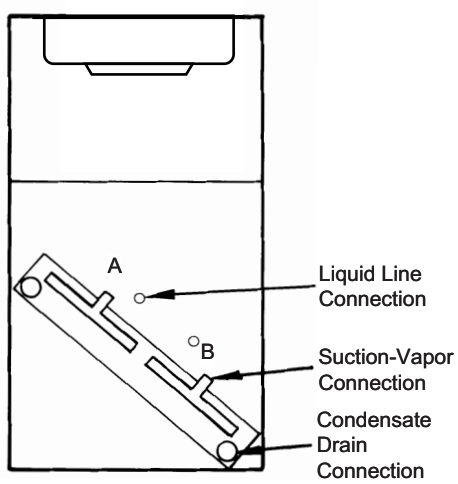
Single Circuit Coil Piping Configuration - 6-7.5 ton units
For single compressor condensing units.



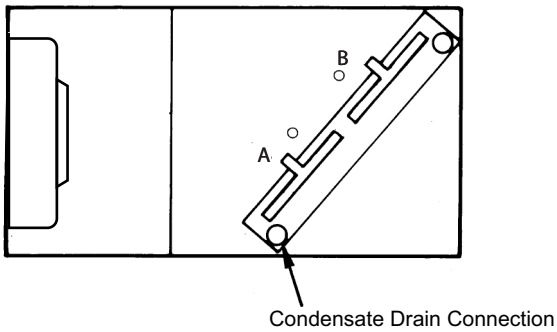
Dual Circuit Coil Piping Configuration - 10 ton units
For single compressor condensing units

LEGEND
TXV — Thermostatic Expansion Valve
NOTE: Component location arrangement shown for field installation of sight glasses, solenoid valves, filter driers, and TXV sensing bulbs. The TXVs and equalizer lines are factory-installed.

Fig. 8 — Face-Split Coil and Liquid Line Piping (Typical)

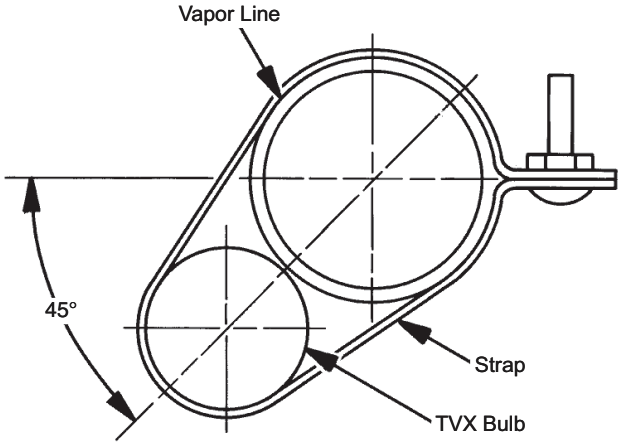


First On/Last Off = B
Vertical Installation



First On/Last Off = A
Horizontal Installation

Fig. 9 — Typical Evaporator Coil Connections (40RL)



LEGEND

TXV — Thermostatic Expansion Valve

NOTE: The 8 o'clock position is shown above.

Fig. 10 — TXV Sensing Bulb Location

Chilled Water Piping

See Table 3 for chilled water connection sizes. For ease in brazing, it is recommended that all internal solder joints be made before unit is placed in final position.

Knockouts are provided in the unit corner posts for 40RLS refrigerant piping. Additional field-fabricated access holes are required for 40RLS chilled water piping. See Fig. 7, which lists recommended knockouts and access holes to use for each 40RLS unit size.

To size, design, and install chilled water piping, consult the Carrier System Design manual. See Fig. 11 for an example of a typical installation. Recommended fittings are listed in Table 8.

To access 40RLS coil vents and drains, remove the unit side panel over the coil header. Vent and drain plugs are on the top and bottom of header, respectively. See the Service section for information on preventing coil freeze-up during winter.

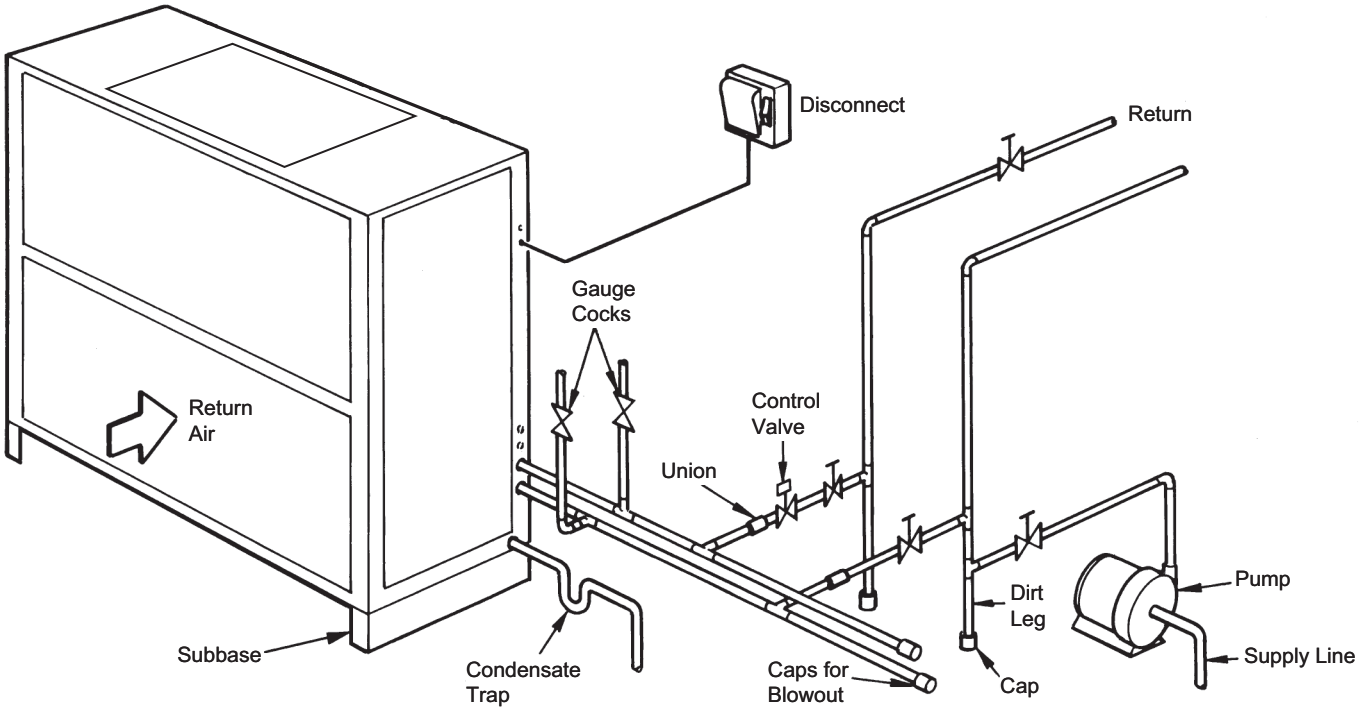


Fig. 11 — Typical 40RLS Chilled Water Piping

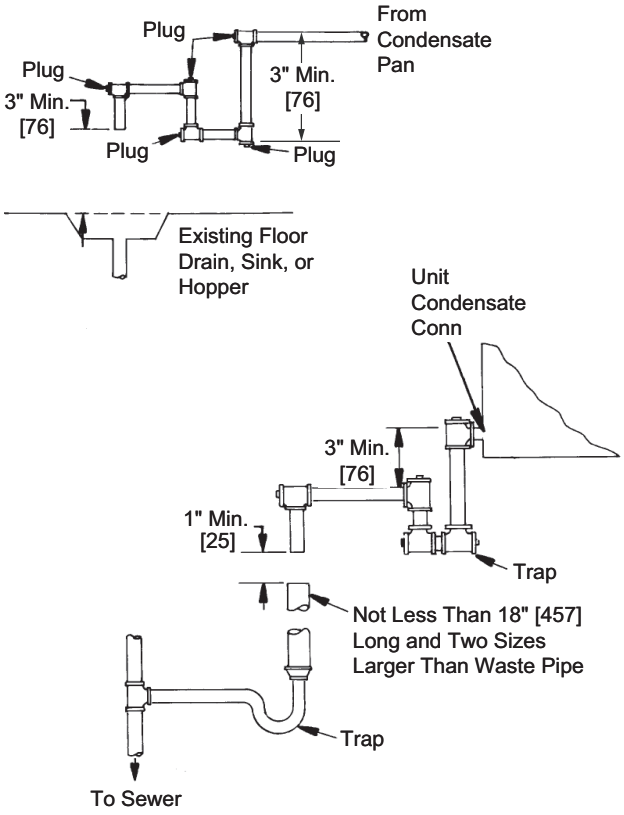
Condensate Drain

Install a trapped condensate drain line to unit connection as shown in Fig. 12. The unit drain connection is a PVC stub. (See Fig. 13.) Some areas may require an adapter to connect to either galvanized steel or copper pipe. For these applications, install a field-supplied threaded PVC adapter.

NOTE: A trap must be installed in the condensate drain line to ensure that the static pressure of fans is balanced with the water column in the drain line and that condensate can drain completely from pan. Without a trap, air can be drawn up drain line until water level in condensate pan becomes equal to static pressure created by fans, preventing complete drainage. Conditions will worsen as filters become dirty.

Install clean-out plugs in trap. Pitch drain line downward to an open floor drain or sump. Provide service clearance around drain line to permit removal of unit panels. Observe all local sanitary codes.

As shipped, the unit's condensate drain pan is NOT sloped towards the drain connection. The pan slope must be changed to pitch towards the side of the unit with the drain connection. (See Fig. 13.) Loosen the 2 screws next to the drain outlet at both ends of the unit, push drain pan down in the slots near the drain connection, and up in the slots on the opposite end. Re-tighten screws. The pan should have a pitch of at least 1/4 in. over its length toward the drain connection.



NOTE: Dimensions in [ ] are in millimeters

Fig. 12 — Condensate Drain

Fan Motors and Drives

Motor and drive packages are factory installed in all units. The motor and drive packages consist of the following items:

1 — ECM fan motor

1 — EcoBlue™ direct drive vane axial fan system

For instructions on setting the fan speed see Supply Fan (Direct Drive) on page 31.

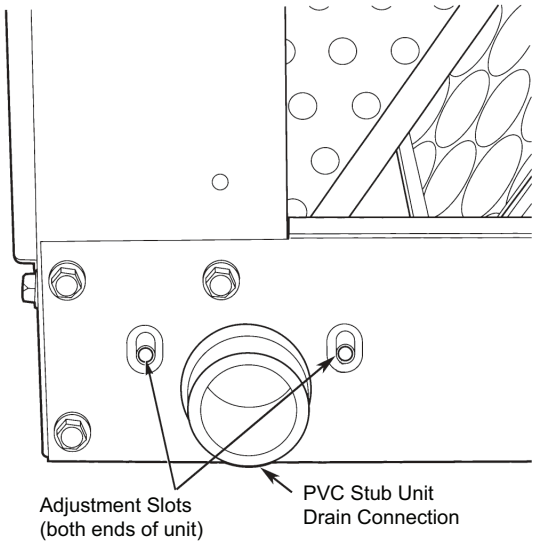


Fig. 13 — Drain Pan Slope Adjustment

Power Supply and Wiring

Check the unit data plate to ensure that available power supply matches electrical characteristics of the unit. Provide a disconnect switch with an integrated lock-out feature of size required to provide adequate fan motor starting current. See Table 9 for unit electrical data. See Table 10 for recommended torque of the ground lug screw when using approved electrical wire for the electrical ground. Route the field power wiring in through the opening designated in Fig. 15.

⚠ WARNING

ELECTRICAL SHOCK HAZARD

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

Do not use gas piping as an electrical ground. Unit cabinet must have an uninterrupted, unbroken electrical ground to minimize the possibility of personal injury if an electrical fault should occur. This ground may consist of electrical wire connected to unit ground lug in control compartment, or conduit approved for electrical ground when installed in accordance with NEC (National Electrical Code); ANSI/NFPA 70, latest edition (in Canada, Canadian Electrical Code CSA [Canadian Standards Association] C22.1), and local electrical codes.

⚠ WARNING

FIRE HAZARD

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

Do not connect aluminum wire between disconnect switch and fan coil unit. Use only copper wire. (See Fig. 14.)

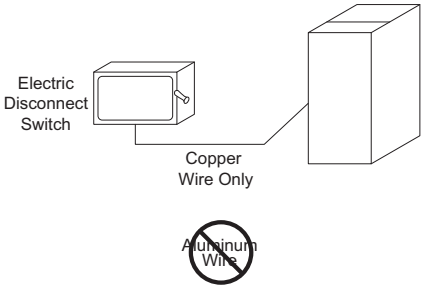


Fig. 14 — Disconnect Switch and Unit

Table 9 — Electrical Data, Standard Motors — Two Speed

UNIT	NOMINAL V-PH-Hz	IFM TYPE	UNIT VOLTAGE RANGE		FAN MOTOR			POWER SUPPLY	
			Min.	Max.	Hp	kW	FLA	Minimum Circuit Amps (MCA)	Maximum Overcurrent Protection (MOCP)
40RLA*07 40RLQ*07	208/230-3-60	MED	187	253	2.4	1.76	6.4/5.8	8/8	15/15
		HIGH	187	253	3.0	2.24	7.5/6.7	10/9	15/15
	460-3-60	MED	414	506	2.4	1.76	3.0	4	15
		HIGH	414	506	3.0	2.24	3.5	5	15
	575-3-60	MED	518	632	2.4	1.76	2.5	4	15
		HIGH	518	632	3.0	2.24	3.0	4	15
40RLA*08 40RLS*08 40RLQ*08	208/230-3-60	MED	187	253	2.4	1.76	6.4/5.8	8/8	15/15
		HIGH	187	253	3.0	2.24	7.5/6.7	10/9	15/15
	460-3-60	MED	414	506	2.4	1.76	3.0	4	15
		HIGH	414	506	3.0	2.24	3.5	5	15
	575-3-60	MED	518	632	2.4	1.76	2.5	4	15
		HIGH	518	632	3.0	2.24	3.0	4	15
40RLS*10	208/230-3-60	MED	187	253	2.4	1.76	6.4/5.8	8/8	15/15
		HIGH	187	253	3.0	2.24	7.5/6.7	10/9	15/15
	460-3-60	MED	414	506	2.4	1.76	3.0	4	15
		HIGH	414	506	3.0	2.24	3.5	5	15
	575-3-60	MED	518	632	2.4	1.76	2.5	4	15
		HIGH	518	632	3.0	2.24	3.0	4	15
40RLA*12 40RLS*12 40RLQ*12	208/230-3-60	MED	187	253	2.4	1.76	6.4/5.8	8/8	15/15
		HIGH	187	253	3.0	2.24	7.5/6.7	10/9	15/15
	460-3-60	MED	414	506	2.4	1.76	3.0	4	15
		HIGH	414	506	3.0	2.24	3.5	5	15
	575-3-60	MED	518	632	2.4	1.76	2.5	4	15
		HIGH	518	632	3.0	2.24	3.0	4	15

LEGEND

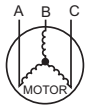
FLA — Full Load Amps

NOTES:

1. Minimum circuit amps (MCA) and maximum overcurrent protection (MOCP) values are calculated in accordance with The NEC. Article 440.
2. Motor FLA values are established in accordance with Underwriters Laboratories (UL) Standard 60335-2-40.
3. Unbalanced 3-Phase Supply Voltage
   Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the formula in the example (see column to the right) to determine the percentage of voltage imbalance.
4. Installation with Accessory Electric Heaters
   Size the Field Power Wiring between the heater TB1 and the 40RL indoor fan motor per NEC Article 430-28 (1) or (2) (depends on length of conduit between heater enclosure and 40RL power entry location). Install wires in field-installed conduit.

$$\text{\% Voltage Imbalance} = 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Example: Supply voltage is 230-3-60



AB = 224 v
BC = 231 v
AC = 226 v

$$\text{Average Voltage} = \frac{(224 + 231 + 226)}{3} = \frac{681}{3} = 227$$

Determine maximum deviation from average voltage.

(AB) 227-224 = 3 v

(BC) 231-227 = 4 v

(AC) 227-226 = 1 v

Maximum deviation is 4 v.

Determine percent of voltage imbalance.

$$\text{\% Voltage Imbalance} = 100\text{x} \frac{4}{227} = 1.78\%$$

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 immediately.

Table 10 — Recommended Torque of Ground Lug Field Connection

AWG	TORQUE (in.-lb)
16	35±4
14	35±4
12	35±4
10	35±4
8	40±5
6	45±5.5
4	45±5.5
2	50±6
0	50±6
00	50±6

Install disconnect switch and power wiring in accordance with all applicable local codes. See Fig. 14-16 and the unit wiring diagram labels (Fig. 20 and 21). For units with motor sizes less than 5 Hp (3.7 kW), connect power wiring to unit with no. 10 ring terminal. For units with motor sizes of 5 Hp (3.7 kW) or more, connect power wiring with 1/4 in. ring terminal.

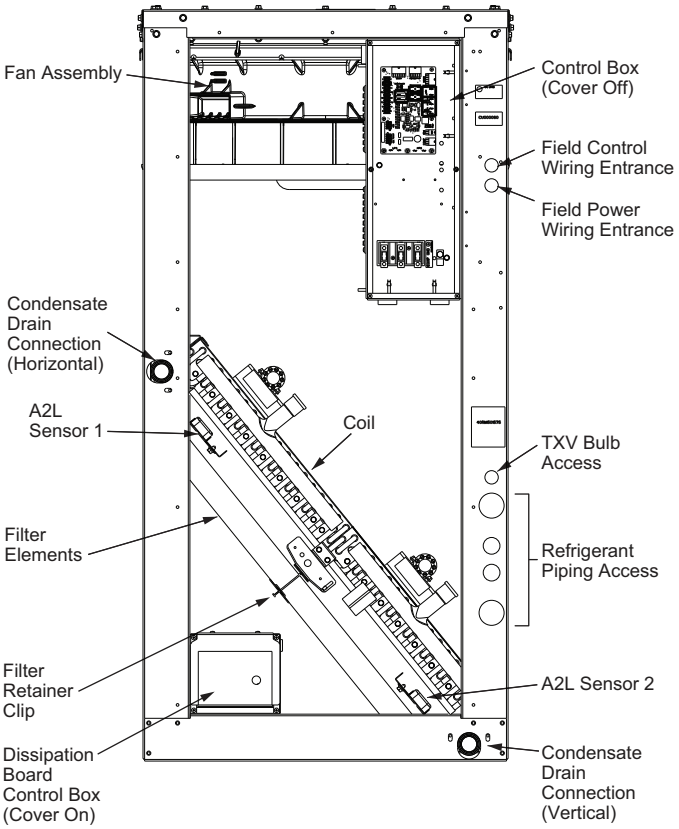


Fig. 15 — Wiring and Service Access (Side Panel Removed)

Fan motors are factory-installed on all units.

The control box contains a Unit Control Board (UCB) that receives thermostat commands from the thermostat (through the Thermostat Connection Board) and, outputs these commands to the condensing unit (through the Indoor Connection Board) as well as a high voltage terminal block.

Complete 24-v control circuit wiring. Wire the thermostat to the Thermostat Connection Board terminal strip (TSTAT CB), according to Fig. 16 and the unit wiring diagram label (see Fig. 20). If the air handler is part of a split system, complete the wiring from the condensing unit to the Indoor Connection Board terminal strip (IDCB). Refer to Fig. 16 and the unit wiring diagram label. Route the field control wiring in through the opening designated in Fig. 15.

NOTE: The control box may have some additional components; see Fig. 17-19.

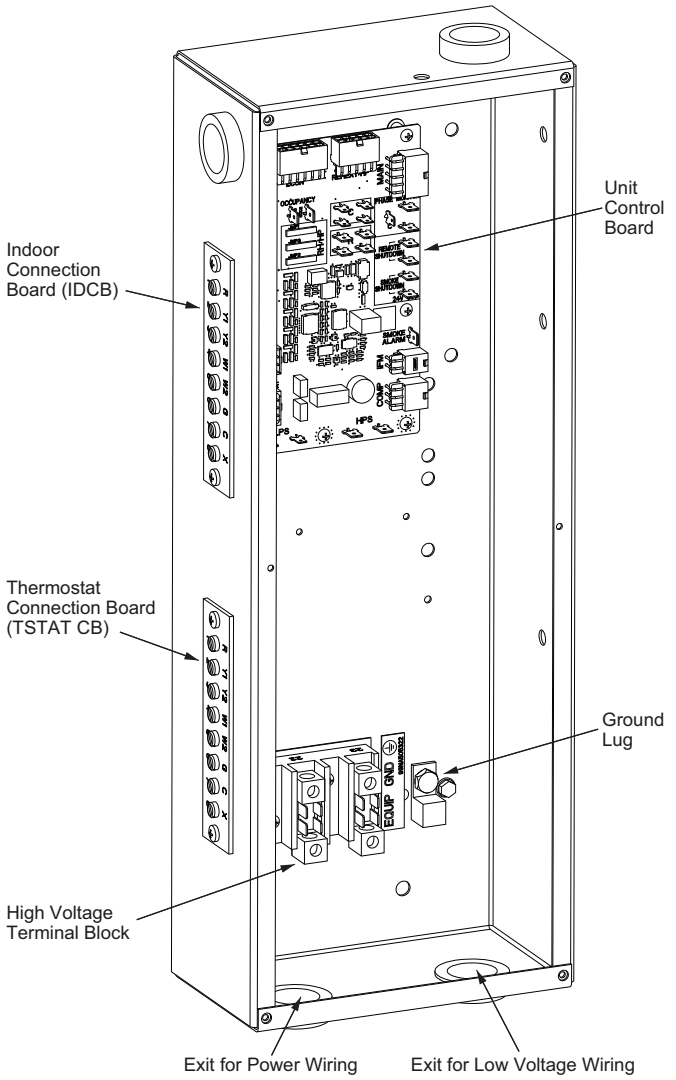


Fig. 16 — Unit Control Box

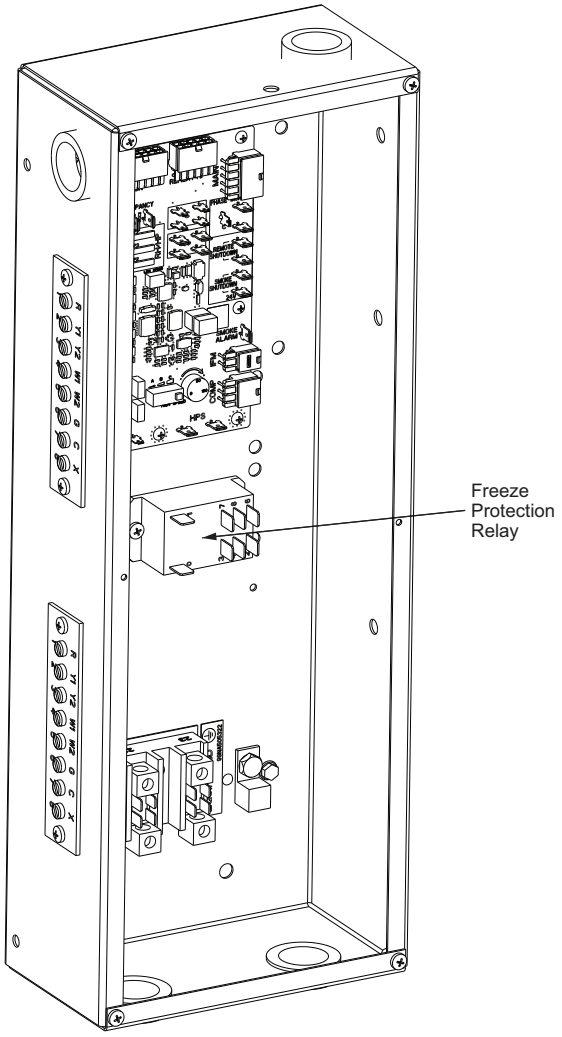


Fig. 17 — Unit Control Box with Freeze Protection Relay

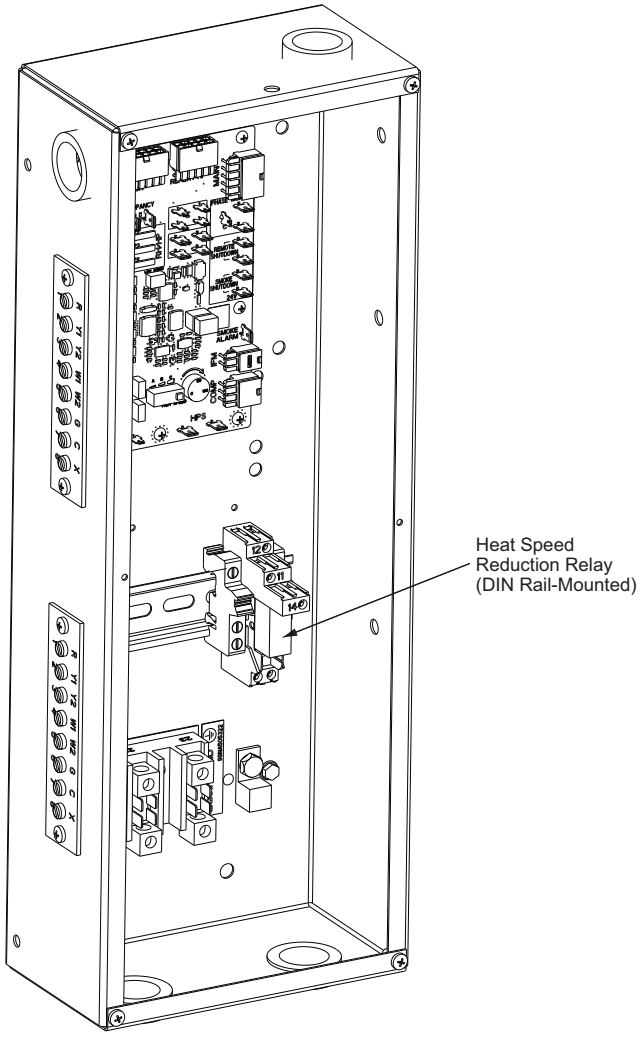


Fig. 18 — Unit Control Box with Heat Speed Reduction Relay (DIN Rail Mounted)

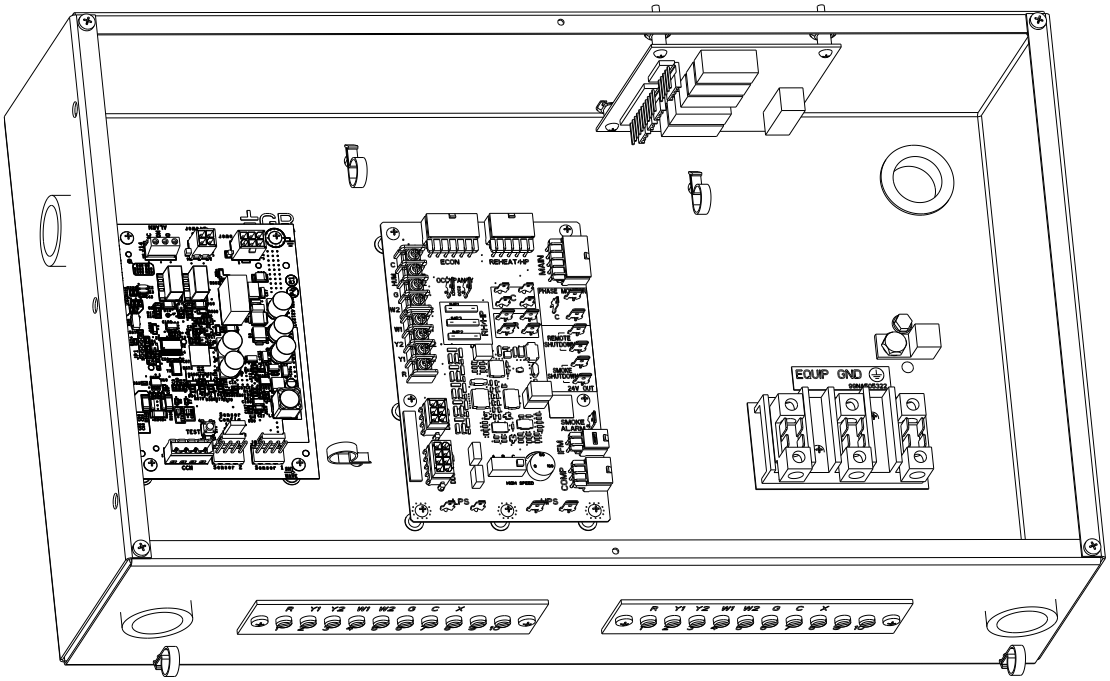


Fig. 19 — Unit Control Box with Adaptive Dehumidification

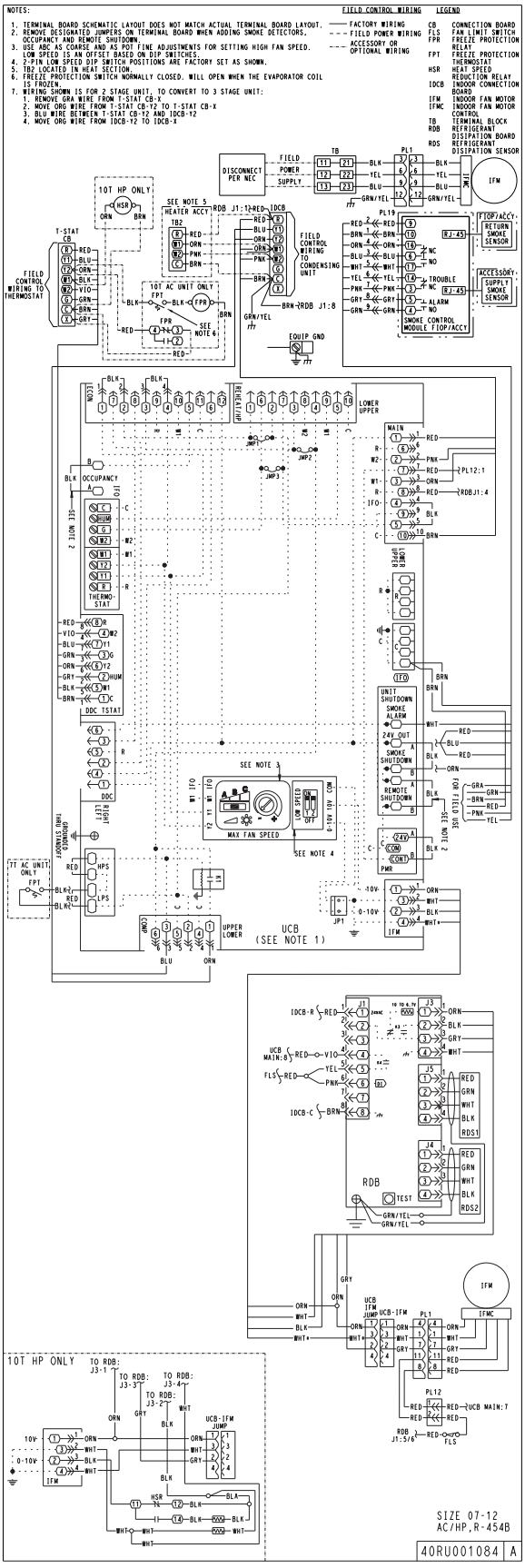


Fig. 20 — Unit Wiring Diagram

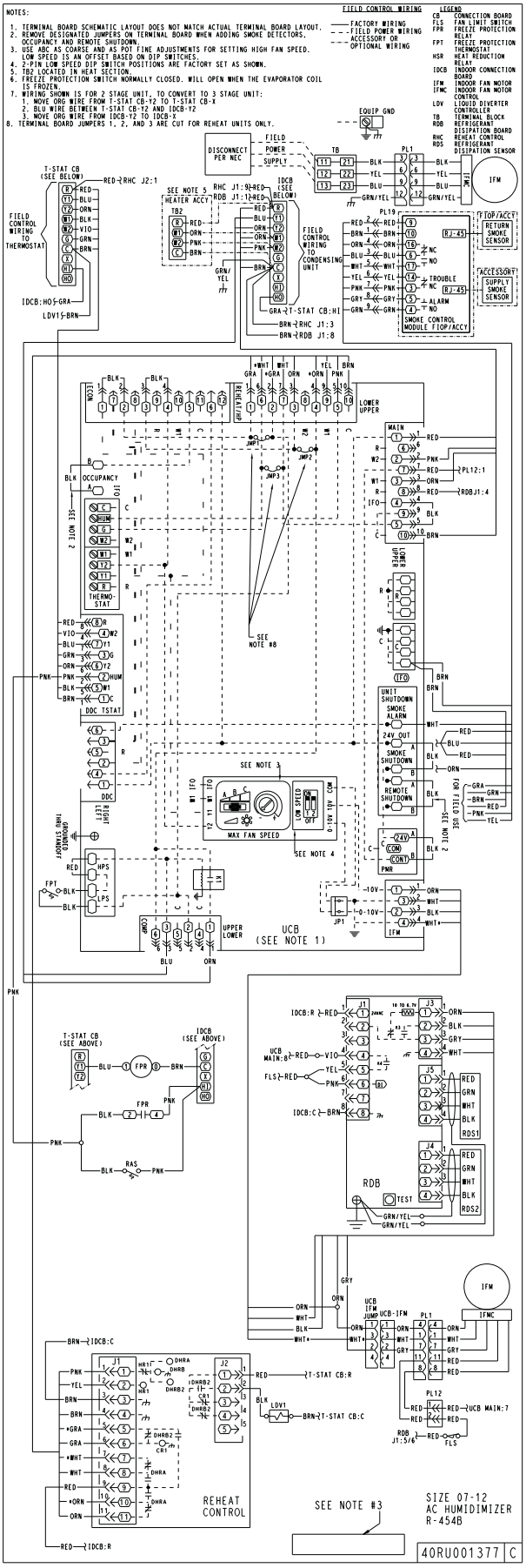


Fig. 21 — Unit Wiring Diagram with Adaptive Dehumidification

THREE STAGE OPERATION

All units are factory shipped for 2-stage cooling operation. To convert a unit to 3-stage operation, see Fig. 22 and adjust the following wires between the control board and two terminal strips on the side of the control box:

1. Remove gray wire at Thermostat CB terminal X and insulate.
2. Move orange wire from Thermostat CB terminal Y2 to terminal X.
3. Make connections of blue wire included in factory harness. Connect one end to Thermostat CB terminal Y2 and the other to Indoor Connection Board terminal Y2.
4. Move orange wire from Indoor Connection Board terminal Y2 to terminal X.

The 3-stage system will run the fan at low speed with a G, Y1, and Y1+Y2 call, and at high speed with a call for Y1, Y2, and Y3.

A thermostat with 3 cooling stage capability is required for this system configuration.

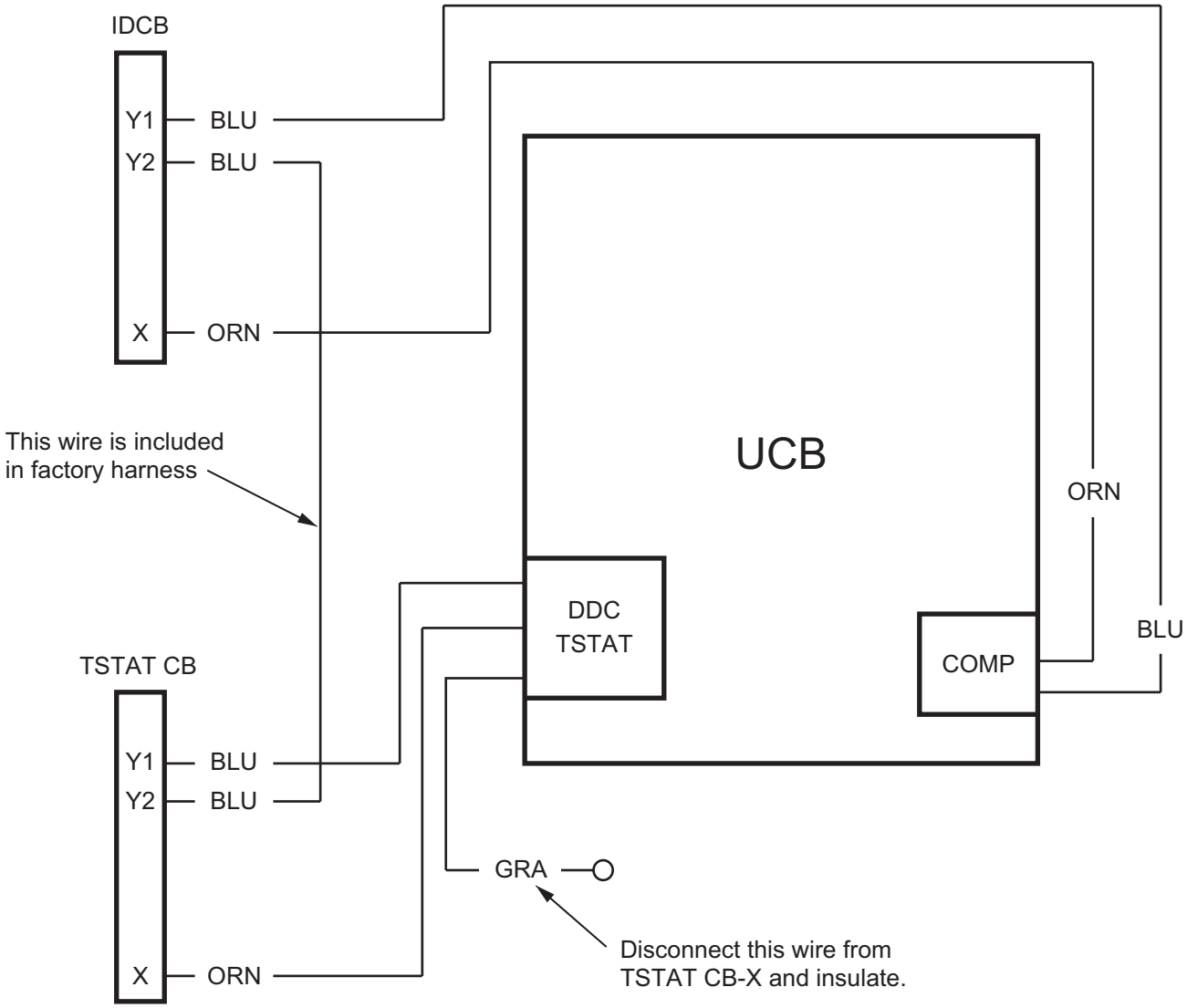


Fig. 22 — Three Stage Wiring

Leak Dissipation System

40RL units use R-454B refrigerant. These units are equipped with a factory installed R-454B leak dissipation system to ensure safe operation in the event of a refrigerant leak. This systems consists of two A2L sensors and the dissipation control board (Fig. 23) which are located in the return (indoor entering) section of the unit. The A2L sensors are located between the indoor coil and the air filters. See Fig. 25 for a more detailed view of the dissipation control box.

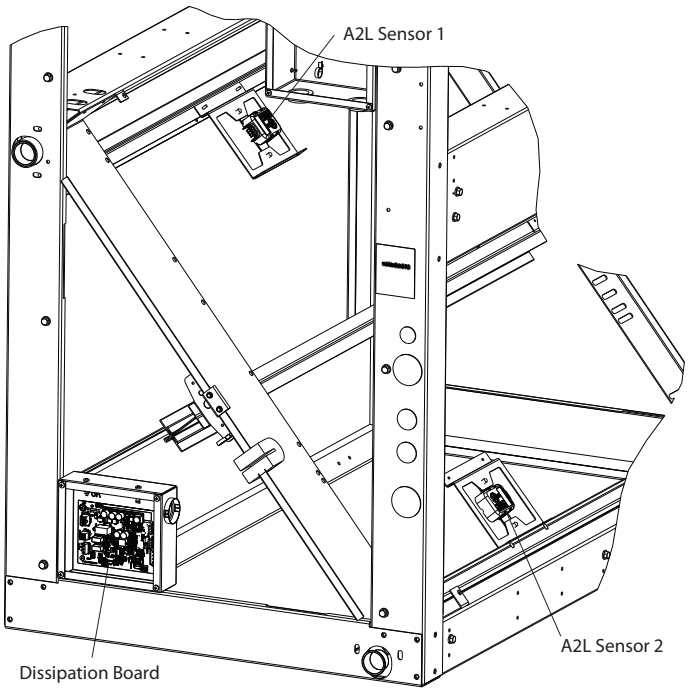


Fig. 23 — Location of A2L Sensors and Dissipation Control Board (Shown with Cover Removed)

The A2L detection sensors communicate via wiring harnesses to the dissipation boards. Each sensor harness is routed directly from the sensor to the dissipation control board through the wire access hole in the sheet metal box. Extra length of harness should be neatly bundled and wire tied.

The drain wire must be properly connected to the ground lug on the dissipation board via the quick connect and ground harness. Failure of proper sensor harness grounding can lead to false dissipation events.

NOTE: Chilled water units do not come with the leak dissipation system.

SEQUENCE OF OPERATION

The control functions as an R-454B refrigerant dissipation system. If either of the refrigerant detection sensors sends a signal indicating a refrigerant leak, the control board will prevent heating and cooling operation and begin dissipating the sensed refrigerant with a blower request. The refrigerant dissipation board will display a flash code from the yellow status LED (see Fig. 24) indicating the sensor that detected the refrigerant. See Fig. 27 — on page 25 for the full text on the Dissipation Control box cover label.

When the sensor signal indicates the refrigerant has dissipated, the dissipation board yellow status LED will display a flash code 3 and return to its normal state and allow unit operations after a 5 minute delay.

LEAK DISSIPATION SYSTEM SELF-TEST

Power on the unit and verify proper functioning of equipment. The yellow Status LED on the dissipation board should be steady (see Fig. 24). If flash codes are present, see Troubleshooting on page 25.

NOTE: Operation of the Test Mode is only possible if no faults exist on the dissipation board.

Remove the cover from the Dissipation control box to access the Test button (see Fig. 26). The Test button is located above the COMM LED.

STATUS CODE DESCRIPTION FOR CONTROL BOARD

STATUS LED (YELLOW)	ERROR MODE
ON	NORMAL OPERATION
OFF	HARDWARE FAILURE
1 Flash	SENSOR 1 R454B leak
2 Flash	SENSOR 1 OPEN
3 Flash	5 MINUTE MITIGATION OFF DELAY
4 Flash	BLOWER OUTPUT NOT OPERATING
5 Flash	SENSOR 1 FAULT
6 Flash	TEST BUTTON STUCK
7 Flash	K1 OR K4 RELAY WIRING INVERTED
8 Flash	K1 OR K4 RELAY WIRING SHORTED
9 Flash	SENSOR 2 R454B LEAK
10 Flash	SENSOR 2 OPEN (Sensor config jumper)
11 Flash	SENSOR 2 FAULT
12 Flash	INCORRECT TEMP SENSOR
13 Flash	EXT SAFETY OVERRIDE

Test Button Operation Notes:
1. Test mode (60 second mitigation test) = Press test button for 1 second
2. Alarm code history (last 7 codes from 1 week history) = Press test button for 10 seconds
3. Clear alarm history = Press test button 3 times consecutively

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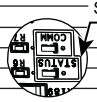


Fig. 24 — Yellow STATUS LED

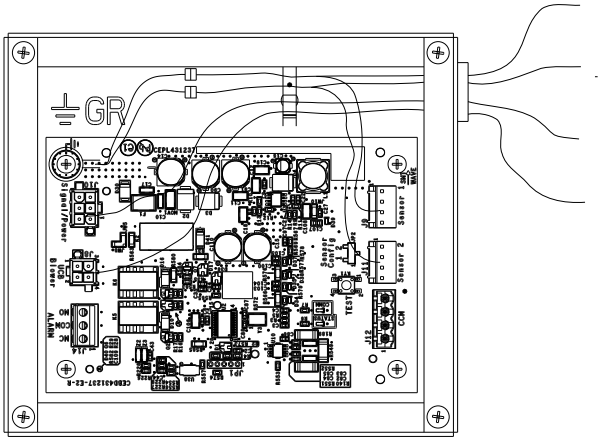


Fig. 25 — Dissipation Control Box

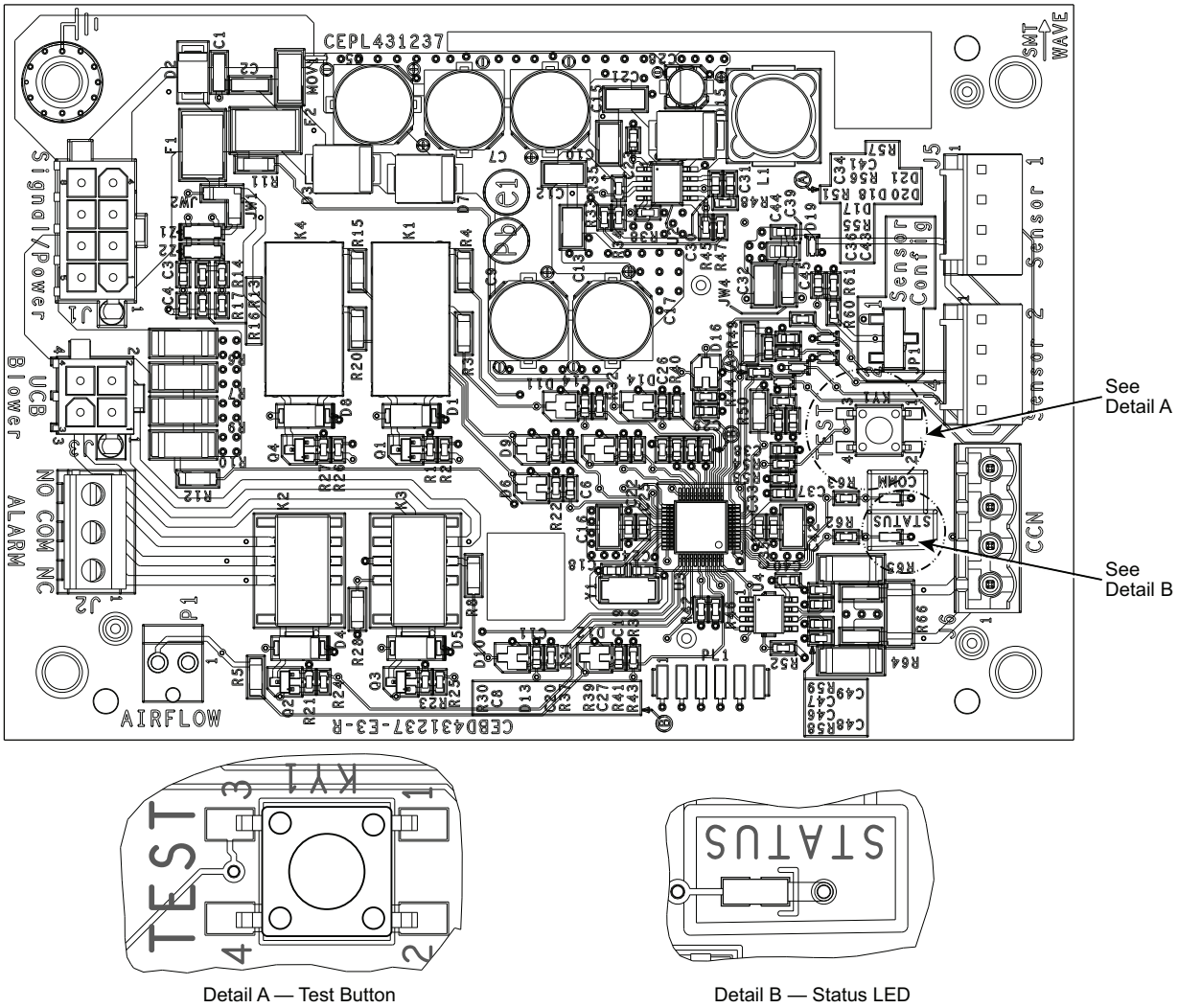


Fig. 26 — Dissipation Control Board — Shown without Dust Cover

Press the Test button on the dissipation system control board to ensure proper dissipation system operation under each test condition listed below. After pressing the Test button, system will enter Dissipation Mode for 60 seconds to help verify correct operation.

IMPORTANT: Press the Test button for roughly ONE SECOND to enter Test Mode. Pressing the Test button for a longer periods enables different functions (see Table 11).

Table 11 — Dissipation Board Test Button Functions

HOLD BUTTON TIME (SEC)	FUNCTION
1-4	Dissipation Mode for 60 seconds
5-29	Display flash code history
30+	Flash code 6
3 Rapid Presses	Clear flash code history

Ensure that the unit is able to meet the minimum required dissipation mode airflows. These required minimum airflow rates during Dissipation Mode are listed in Table 12. Table 12 also shows the minimum required total conditioned room area. Both minimum required airflow and room area are based on the maximum possible charge in the system, calculated from the longest line set for each system listed in the condensing unit installation instructions.

Table 12 — Minimum Dissipation Airflow and Minimum Required Area of Total Conditioned Space Based on Max System Charge

UNIT	MAX ALLOWABLE CHARGE (lb)	AIRFLOW (cfm)	ROOM AREA (ft^2)
38AXZM/N07-40RLA*07	33.5	910	505
38AXZM/N08-40RLA*08	43.2	1170	650
38AXZM/N12-40RLA*12	78.8	2130	1180
38AXDT/U12-40RLA*12	82.5	2230	1240
38AXQM/N07-40RLQ*07	23.0	490	345
38AXQM/N08-40RLQ*08	32.2	660	485
38AXQM/N12-40RLQ*12	34.7	730	520

Table 13 details the required operational checks to ensure proper dissipation system function.

Table 13 — Dissipation System Required Operational Checks

NORMAL OPERATION				
TEST NO.	**UNIT DEMAND**	**COMPRESSOR**	**INDOOR FAN**	**ELECTRIC HEAT**
1	None	Off	Off	Off
2	Cool	On	On	Off
3	Heat	On for 40RLQ	On	On
DISSIPATION ACTIVATED				
4	None	Off	On	Off
5	Cool	Off	On	Off
6	Heat	Off	On	Off

Fig. 27 shows the flash codes displayed on the Dissipation control board.

TROUBLESHOOTING

For all flash codes, first try power cycling the system to remove the code.

No Power

Verify the wiring to/from pins 1 and 8 on the power harness plug. Check the 24V system wiring the IDCB terminal in the main control box.

See Table 14 for details on the operating status and troubleshooting of the Dissipation system for the various flash codes.

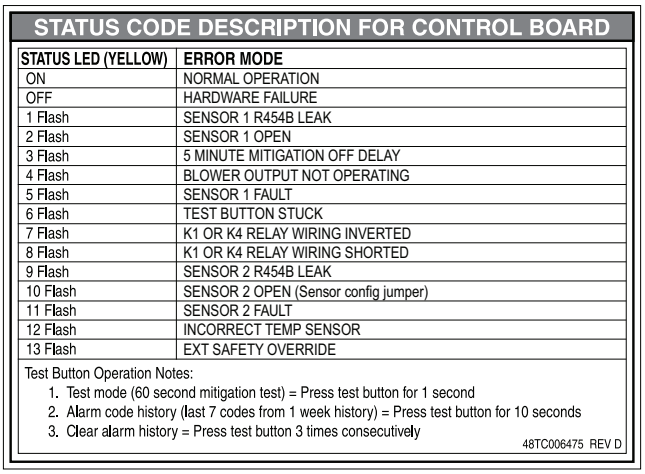


Fig. 27 — Dissipation Control Cover Label

Table 14 — Status LED Troubleshooting Table

STATUS LED	REASON	CONTROL VERBIAGE	MODE
1 Flash	Sensor 1 ≥ 20% LFL	REFRIG DISSIPATION ACTIVE	Dissipation in Process
2 Flash	Sensor 1 Open	REFRIG SENSOR OPEN	Dissipation in Process
3 Flash	5 Minute Blower Operating, Sensor < 20% LFL and sensors are not opened (done after fault 1, 2, 9 and 10)	DISSIPATION OFF DELAY ACTIVE	Dissipation in Process
4 Flash	0 VAC sensed on G output.	BLOWER OUTPUT NOT OPERATING	Dissipation in Process
5 Flash	Fault with the A2L digital sensor	REFRIG SENSOR FAULT	Dissipation in Process
6 Flash	If KY1 is stuck pressed for more than 30 seconds.	TEST BUTTON STUCK	To prevent a shorted KY1 to keep the dissipation running continuously.
7 Flash	Y out switched with Y in or W out switched with W in	Y (K4) OR W (K1) WIRING INVERTED	Normal mode
8 Flash	Y or W shorted (relay detects both sides are high)	Y (K4) OR W (K1) OUTPUT SHORTED TO Y (K4) OR W (K1) INPUT	Normal mode
9 Flash	Sensor 2 ≥ 20% LFL	SENSOR 2 DISSIPATION ACTIVE	Dissipation in Process
10 Flash	Sensor 2 Open	SENSOR 2 OPEN	Dissipation in Process
11 Flash	Fault with the second A2L digital sensor	SENSOR 2 FAULT	Dissipation in Process
12 Flash	High temperature sensor attached on commercial	OVERCURRENT INCORRECT SENSOR	Normal mode
13 Flash	G input signal is lost. Indicates another unit safety will override dissipation.	EXT SAFETY OVERRIDE	Normal mode

LEGEND

LFL — Lower Flammable Limit

Adaptive Dehumidification System Control Connections

ADAPTIVE DEHUMIDIFICATION — SPACE RH CONTROLLER

NOTE: The adaptive dehumidification system is a factory-installed option.

The adaptive dehumidification system requires a field-supplied and installed space relative humidity control device. This device may be a separate humidistat control (contact closes on rise in space RH above control setpoint, see Fig. 28) or a combination thermostat-humidistat control device such as Carrier's Edge® Pro Thermidistat™ device with isolated contact set for dehumidification control (see Fig. 29). The humidistat is normally used in applications where a temperature control is already provided.

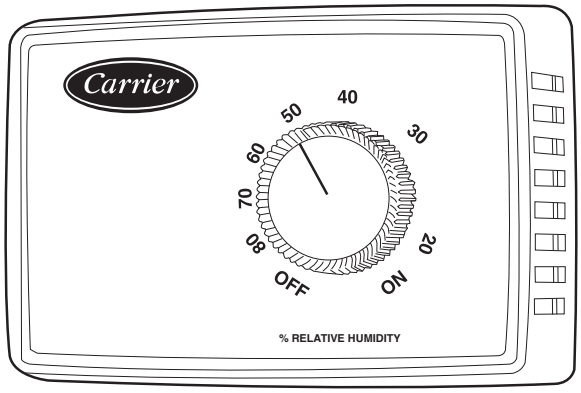


Fig. 28 — Accessory Field-Installed Humidistat

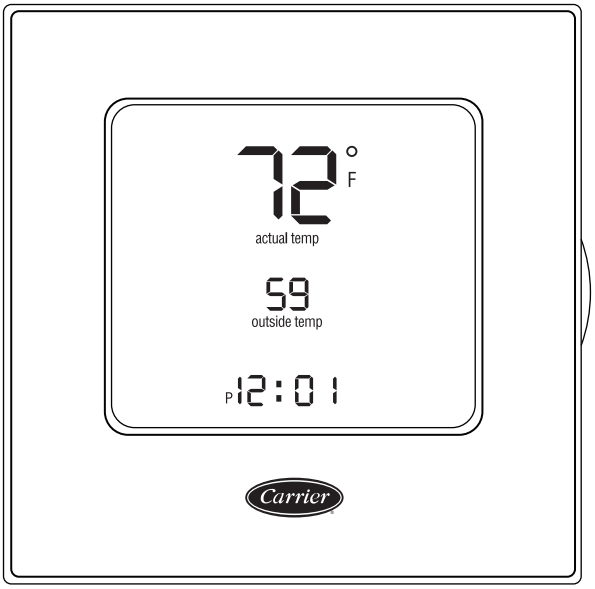


Fig. 29 — Edge® Pro Thermidistat

To connect the Carrier humidistat (HL38MG029):

1. Route the humidistat 2-conductor cable (field-supplied) through hole provided in the unit corner post.
2. Connect one of the leads from the 2-conductor cable to the HI terminal on the IDCB (Indoor Control Board) on the outside of the control Box. Connect the other lead to the R terminal on the IDCB on the outside of the control box as shown in Fig. 30.

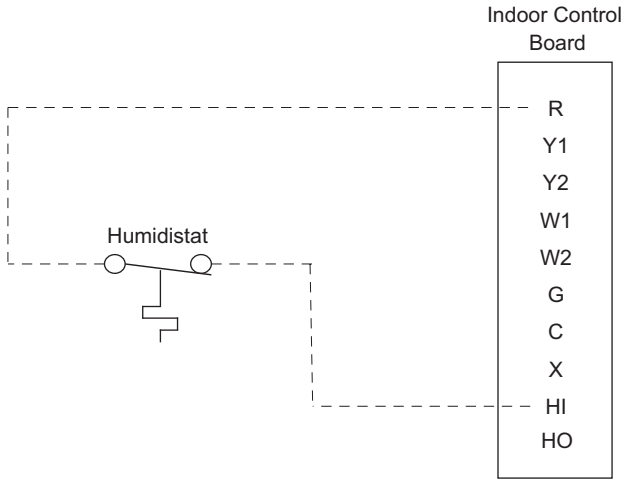


Fig. 30 — Humidistat Connections to IDCB

To connect the Thermidistat device (33CS2PPRH-01):

1. Route the Thermidistat multi-conductor thermostat cable (field-supplied) through hole provided in the unit corner post.
2. The Thermidistat has dry contacts at terminals D1 and D2 for dehumidification operation (shown in Fig. 31 on page 27). Connect D1 to the R terminal on the IDCS. Connect D2 to the HUM terminal on the IDCS. Refer to the installation instructions included with the Carrier Edge® Pro Thermidistat device for more information.

TYPICAL UNIT WIRING DIAGRAMS

See Fig. 20-22 for examples of typical unit control and power wiring diagrams. These wiring diagrams are mounted on the inside of the unit control box. Refer to the wiring diagrams in the unit control box when making field power wiring connections.

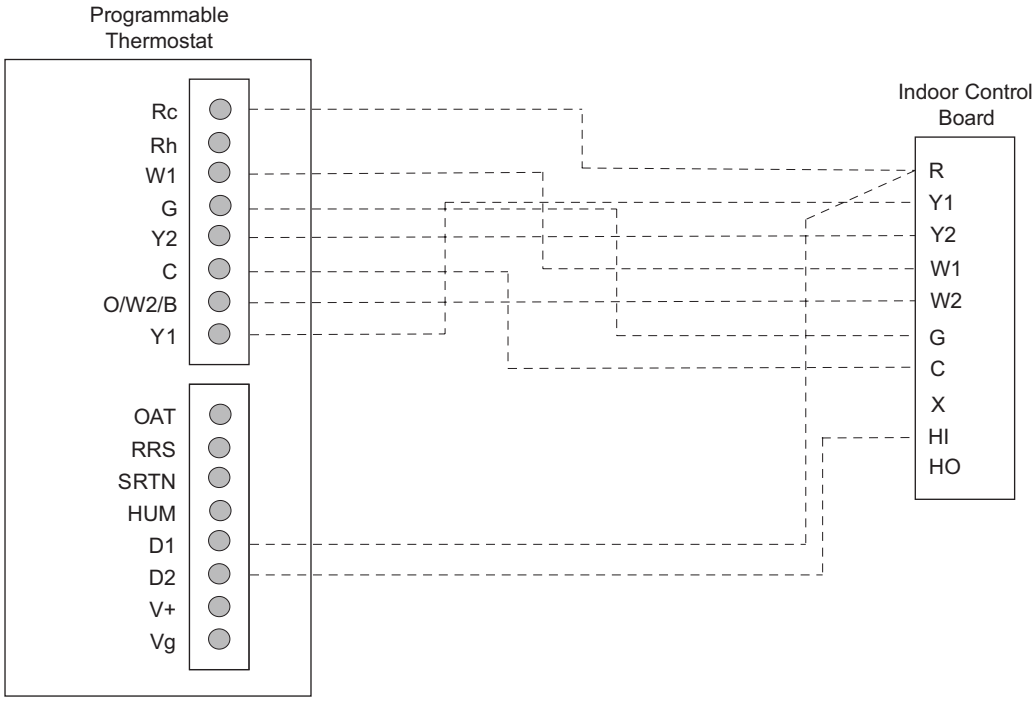


Fig. 31 — 40RL 07-12 Unit with Adaptive Dehumidification System with Edge Pro Thermidistat Device

WIRING A DEHUMIDIFICATION SYSTEM

40RL units with an Adaptive Dehumidification system have 2 additional terminals on the TSTAT CB and IDCB, labeled HI and HO. Reference Fig. 32 for the proper method for wiring a 40RL fan coil and 38AX condensing unit together.

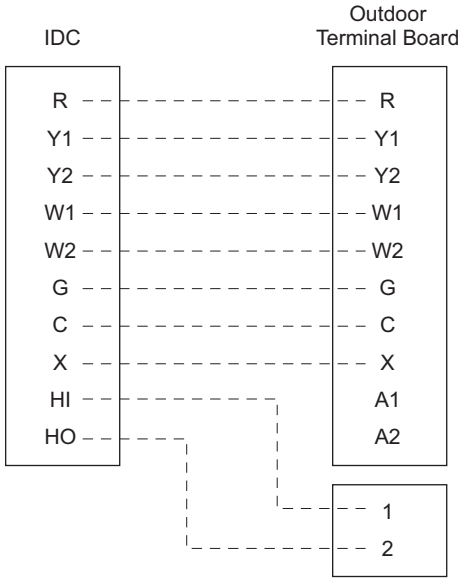


Fig. 32 — Wiring Diagram — 40RL Fan Coil to 38AX Condensing Unit

Connecting Ductwork

Refer to the Carrier System Design Manual for the recommended design and layout of ductwork.

⚠ CAUTION

UNIT OPERATION HAZARD

Failure to follow this caution could cause equipment damage.

Do not operate unit without ductwork or discharge plenum unless fan speed has been adjusted for external static pressure of zero in. wg. Failure to do so may result in motor overload.

DISCHARGE CONNECTION

Duct flanges are factory-supplied; they are shipped inside the unit attached to the hairpin end of the coil tube sheet for field installation. Using the existing screws, install the duct flange on the unit's fan deck. The fan discharge requires 2 flanges; each flange must be bent in the middle to conform to the discharge opening. (See Fig. 33.) After flanges are installed, connect them to the supply duct using a canvas connection to prevent vibration. It is important that this connection be properly fabricated to prevent high air friction losses and air noise.

RETURN CONNECTIONS

When using return-air ductwork, route return-air duct to the unit's return air inlet near the filter rack, using a canvas connection to prevent transmission of unit vibration. If the duct blocks off the unit's access panel, provide a slip joint in the ductwork to permit removal for servicing.

OUTDOOR-AIR INLET CONNECTIONS

Connect outdoor-air inlet to field-installed accessory economizer. Refer to Economizer Installation Instructions.

Return-Air Filters

Type and size of filters are shown in Tables 1-3 and are factory-supplied and factory-installed. In all units with 2 fans, a filter replacement tool (hook) is shipped inside the unit for field use when replacing filters. See the Service section for instructions on filter element replacement.

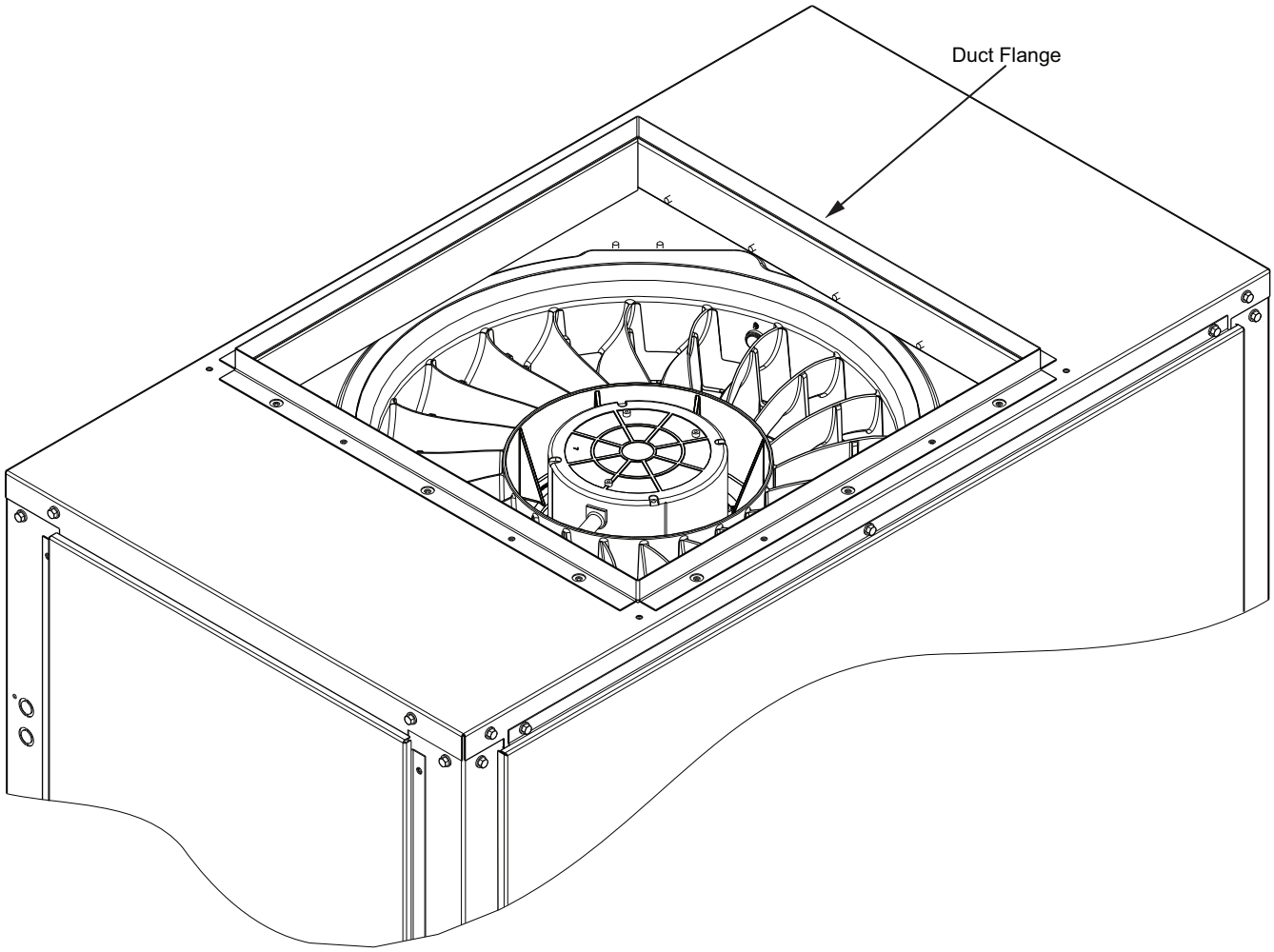


Fig. 33 — Duct Flange Installation

START-UP

Before starting unit, check the following and correct as necessary:

- Is unit solidly supported?
- Are there any loose parts that will rattle or vibrate?
- Is condensate drain pan pitched for correct drainage?
- Are coil baffle plates tight against coil to prevent air bypass?
- Are all panels securely fastened?
- Are all electrical connections correct and tight?
- Are there any loose or disconnected wires in the control box, or wires in contact with sharp edges or moving parts?
- Have all safety, caution, and warning labels been read?

40RLA and 40RLQ ONLY

- Is TXV bulb located on suction tube per Fig. 34?
- Is the capillary tube to the bulb free of kinks and not subject to pinching?
- Is the bulb well secured to the suction tube with strap?

Also refer to condensing unit or outdoor heat pump section instructions before starting a split system. A split system start-up checklist is provided at the end of these instructions.

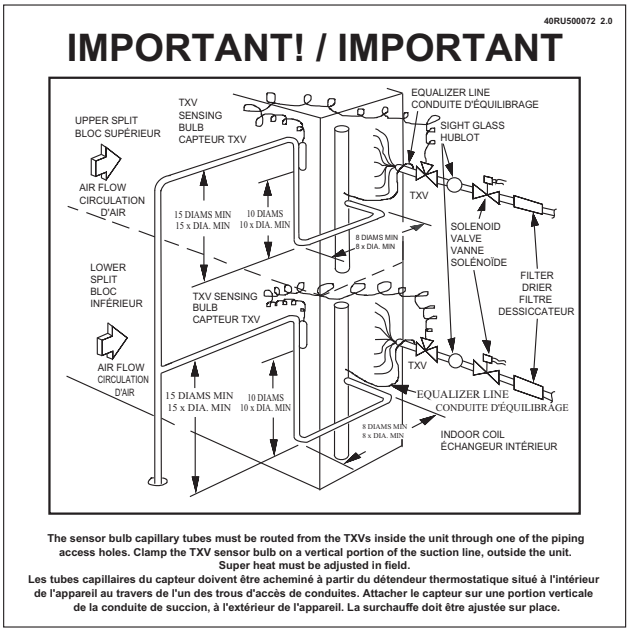


Fig. 34 — TXV Bulb Location Label

Adjusting TXV for Superheat (40RLA and 40RLQ only)

The unit-mounted thermostatic expansion valve(s) is/are factory set to provided superheat at the bulb location in 10°F to 15°F (5.5°C to 8.3°C) range. Actual system load conditions may require adjustment of the factory setting. (See Fig. 35.)

To adjust the TXV superheat setting:

1. Remove the seal cap from the bottom of the TXV body.
2. To increase superheat, turn the stem clockwise. To decrease the superheat, turn the stem counterclockwise. Do not turn the stem more than one full turn.
3. Wait until suction pressure and superheat stabilize. This may take more than 30 minutes.
4. Continue adjustment until superheat reaches 10°F to 15°F (5.5°C to 8.3°C).
5. Replace the seal cap; tighten.

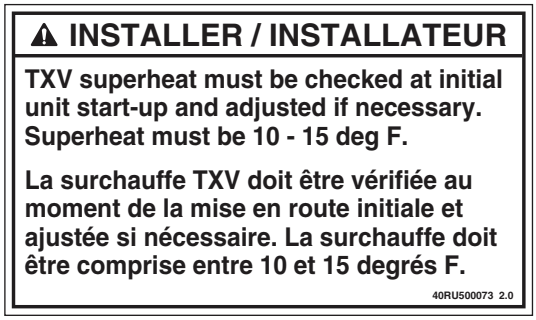


Fig. 35 — TXV Adjustment Label

Fan Performance

See Tables 20-46 for fan performance data, starting on page 41.

1. Interpolation is permissible. Do not extrapolate.
2. External static pressure is the static pressure difference between the return duct and the supply duct plus the static pressure caused by any FIOPs or accessories.
3. Tabular data accounts for pressure loss due to clean filters, unit casing and wet coils.
4. Factory options and accessories may affect static pressure losses. Selection software is available, through your salesperson, to help you select the best motor/drive combination for your application.
5. The fan performance tables (see Tables 20-46) offer motor/drive recommendations. In cases when two motor/drive combinations would work, Carrier recommends the lower horsepower option.
6. The EPACT (Energy Policy Act of 1992) regulates energy requirements for specific types of indoor fan motors. Motors regulated by EPACT include any general purpose, T-frame (three-digit, 143 and larger), single-speed, foot mounted, polyphase, squirrel cage induction motors of NEMA (National Electrical Manufacturers Association) design A and B, manufactured for use in the United States. Ranging from 1 to 200 Hp, these continuous-duty motors operate on 230 and 460 volt, 60 Hz power. If a motor does not fit into these specifications, the motor does not have to be replaced by an EPACT compliant energy-efficient motor. Variable-speed motors are exempt from EPACT compliance requirements.

MAINTENANCE

These items should be part of a routine maintenance program, to be checked every month or two, until a specific schedule for each can be identified for this installation:

Quarterly Inspection (and 30 days after initial start)

INDOOR SECTION

- Condenser coil cleanliness checked.
- Return air filter replacement
- Outdoor hood inlet filters cleaned
- Fan shaft bearing locking collar tightness checked
- Condensate drain checked

Heating

- Power wire connections
- Fuses ready
- Manual-reset limit switch is closed

See Tables 15 and 16 for unit specific maintenance checklists.

Seasonal Maintenance

These items should be checked at the beginning of each season (or more often if local conditions and usage patterns dictate):

AIR CONDITIONING

- Condenser fan motor mounting bolts tightness
- Compressor mounting bolts
- Condenser fan blade positioning
- Control box cleanliness and wiring condition
- Wire terminal tightness
- Refrigerant charge level
- Evaporator coil cleaning
- Evaporator blower motor amperage

Table 15 — Outdoor Unit Maintenance Checklist

MAINTENANCE CHECKLIST[a]	RECOMMENDED INTERVAL[b]	
Outdoor unit specific:	**Monthly**	**Annual**
Clear away debris and vegetation near unit.	X	
Inspect cabinet for damage. Replace components that are damaged or severely rusted.		X
Inspect electrical disconnect for proper function. Repair or replace as necessary.		X
Inspect electrical wiring and connections. Tighten loose connections. Inspect and perform functional test of equipment as needed to ensure proper function. Repair or replace damaged or overheated components and wiring.		X
Check refrigerant system subcooling and superheat.		X
Inspect inside of unit. Clean if debris is present.		X
Inspect condenser coil. Clean if dust, dirt, or debris is present. Rinse unit with fresh water.[c]		X[d]
Inspect motor and fan for damage. Make sure fans spin freely.		X

NOTE(S):

a. The above list may not include all maintenance items. Inspection intervals may vary depending on climate and opening hours. Consult your Carrier dealer about a service contact for seasonal inspections.
b. Monthly maintenance items and outdoor unit rinsing may be performed by the customer. All other maintenance items and all service work must be performed by a qualified service technician. Read all warning labels.
c. Do not use harsh chemicals or high pressure water on coils. More frequent rinsing is required near a sea coast.
d. Monthly rinsing of the condenser coil is recommended if the unit is located in a corrosive climate.

Table 16 — Indoor Unit Maintenance Checklist

MAINTENANCE CHECKLIST[a]	RECOMMENDED INTERVAL[b]	
Indoor unit specific: (for accessories refer to unit specific literature)	**Monthly**	**Annual**
Inspect, clean, or replace air filter if dirty.	X	
Inspect and clean blower assembly (includes blower housing, wheel, and motor).		X
Inspect internal and external cabinet. Clean as needed.		X
Inspect electrical disconnect for proper function. Repair or replace as necessary.		X
Inspect electrical components, wiring, and connections. Tighten loose connections. Repair or replace damaged components and wiring.		X
Inspect evaporator coil. Clean if dust, dirt, or debris is present.[c]		X
Clean condensate pan, trap, and drain lines (more frequent maintenance may be required in humid climates - consult your local HVAC dealer).		X
Inspect motor and fan for damage. Inspect airflow system (ductwork). Check for leaks and repair as needed.		X

NOTE(S):

a. The above list may not include all maintenance items. Inspection intervals may vary depending on climate and opening hours. Consult your Carrier dealer about a service contact for seasonal inspections.
b. Monthly maintenance items and outdoor unit rinsing may be performed by the customer. All other maintenance items and all service work must be performed by a qualified service technician. Read all warning labels.
c. Do not use harsh chemicals or high pressure water on coils. More frequent rinsing is required near a sea coast.

SERVICE

Inspection and maintenance should be performed at regular intervals and should include the following:

- Complete cleaning of cabinet, fan wheel, cooling coil, condensate pan and drain, heating coils, and return-air grille (if present).
- Inspection of panels and sealing of unit against air leakage.
- Cleaning or replacement of filters.
- Testing for cooling/heating system leaks.
- Checking of all electrical connections.

⚠ WARNING

ELECTRICAL SHOCK HAZARD

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

Before performing service or maintenance operations on unit, always turn off main power switch to unit and install lockout tag. Unit may have more than one power switch.

Most unit service can be performed by removing one or both of the unit's side panels. Coil cleaning, removal or insulation cleaning may require removal of a rear, top, or bottom panel, depending on the unit's orientation. When service is completed, replace unit panels.

Panels

Panels are fastened to unit frame with sheet metal screws. Fan and coil compartment must be sealed tightly after service to prevent air from bypassing the cooling coil.

SUPPLY FAN

⚠ WARNING

ELECTRICAL SHOCK HAZARD

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

Before performing service or maintenance operations on unit, LOCKOUT/TAG-OUT the main power switch to unit. Electrical shock and rotating equipment could cause severe injury.

⚠ CAUTION

UNIT OPERATION HAZARD

Failure to follow this caution could cause equipment damage.

Increasing fan speed produces a greater load on motor.

Do not exceed rated capacity of motor.

Supply Fan (Direct-Drive)

All 40RL 6 to 10 ton units have the EcoBlue™ direct drive vane axial fan system. The fan is driven by an ECM motor with speed that is user set through the Unit Control Board (UCB). Speeds are fully configurable from 40% to 100% of motor's maximum speed. See Fig. 36 and 37.

EVALUATING MOTOR SPEED

The direct drive ECM blower motor uses a constant speed design. Motor speed is controlled by a 0-10 vdc signal, where 10 vdc is equal to motor's maximum rpm.

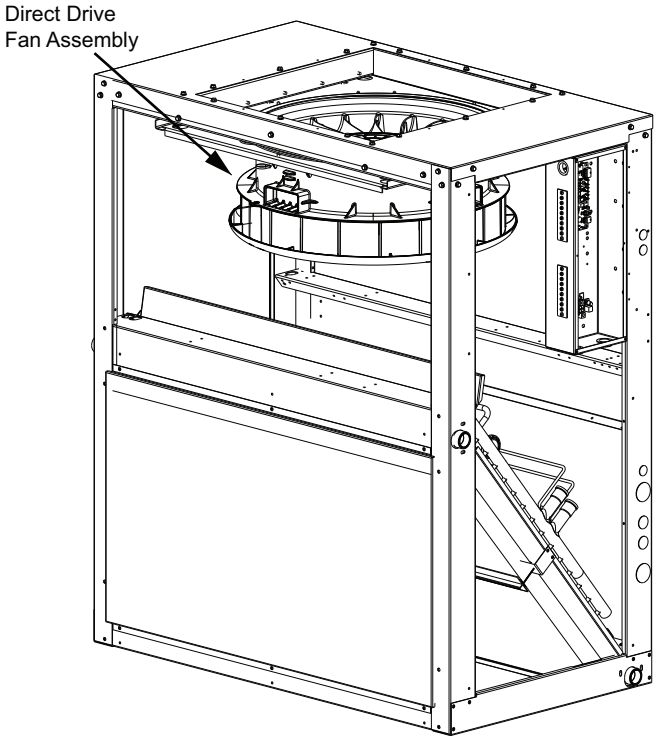


Fig. 36 — Direct-Drive Supply Fan Assembly

SELECTING FAN SPEED

All units come factory-set 8.9 vdc or approximately 89% of the motor's maximum speed. Fan speed should be set per job specification cfm (cubic feet per minute) and ESP (external static pressure) required and per Fan Speed Set Up label mounted on the control box. In some cases, the Fan Speed Set Up label may already include the field setting if unit was previously installed. Check the box on the lower half of the label to see if the field voltage setting was filled in and if so, set fan speed to that voltage. Otherwise see detailed instructions below.

NOTE: Fan Speed Set Up is for full load airflow. If the unit has multiple stages of cooling, low cool and ventilation may operate at lower fan rpms. This offset is factory set and controlled by the UCB. If fan speed verification is being done with a strobe, fan speed should be verified in all unit operation modes.

Units with Electromechanical controls

The Fan Speed Set Up controls are located on the lower section of the Unit Control Board (UCB). See Fig. 38 for location.

1. Check the job specifications for the cfm (cubic feet per minute) and ESP (external static pressure) required.
2. Using the chart on the Fan Speed Set Up labels (see Fig. 39), calculate the vdc from the cfm and ESP for the base unit.
3. If installing any accessories listed at the bottom of the Fan Speed Set Up Label, add accessory vdc to base unit vdc in upper portion of label. For electric heaters use only one adder (ex. 2 stage heater uses only 2 stage adder, not 1 stage plus 2 stage).

NOTE: The Fan Speed Set Up labels are located on the Control Box.

4. Connect a multimeter to the vdc terminals on the UCB.
5. Set the Range Switch to either A, B, or C per the Switch Range table.
6. Using a straight blade screwdriver turn the vdc control dial to fine tune the vdc reading.
7. Record the reading in the Field Setting field.

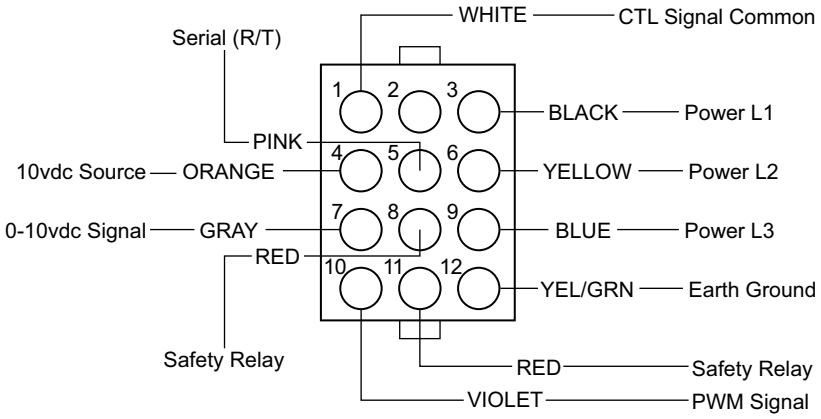


Fig. 37 — ECM Motor Plug Connectors

Low Speed Fan Adjustment

2-Pin DIP Switch

The Low Speed 2-Pin DIP switch is located near the center of the UCB. See Fig. 38.

When replacing UCB, the board will be shipped as default without a low speed selected. For all units, set both dip switches to "OFF" (0) for Test and Balance. Set both dip switches to "ON" (1) for normal operation. See Table 17. The dip switch positions can also be found on the unit's control label diagram.

Table 17 — Low Speed 2-Pin DIP Switch Settings

LOW SPEED		% OF USER SET FAN SPEED	MODE
DIP1	DIP2		
0	0	100%	Test and Balance
1	1	66%	Normal Operation

FAN FAULT DETECTION

The supply fan assembly is equipped with a relay internal to the motor and a manual limit switch installed on the stator. These components work in tandem to prevent the supply fan from running if the there are electrical issues or high temperatures in the supply air section. If the 40RL is connected to the condensing unit correctly (refer to Power Supply and Wiring), the Unit Control Board will also prevent the thermostat signals from being sent to the condensing unit, preventing compressor(s) from energizing if there is a problem with the supply fan.

FREEZE PROTECTION

On select models (40RLAA07 and 40RLAA12), there is a factory-installed and wired temperature switch (P/N HH18HB016) to protect the compressor(s) in the condensing unit when frost buildup is present on the indoor coil. The temperature switch is used to prevent the compressor(s) from turning on while the indoor coil is frosted. See Fig. 20 — Unit Wiring Diagram for the wiring of this switch.

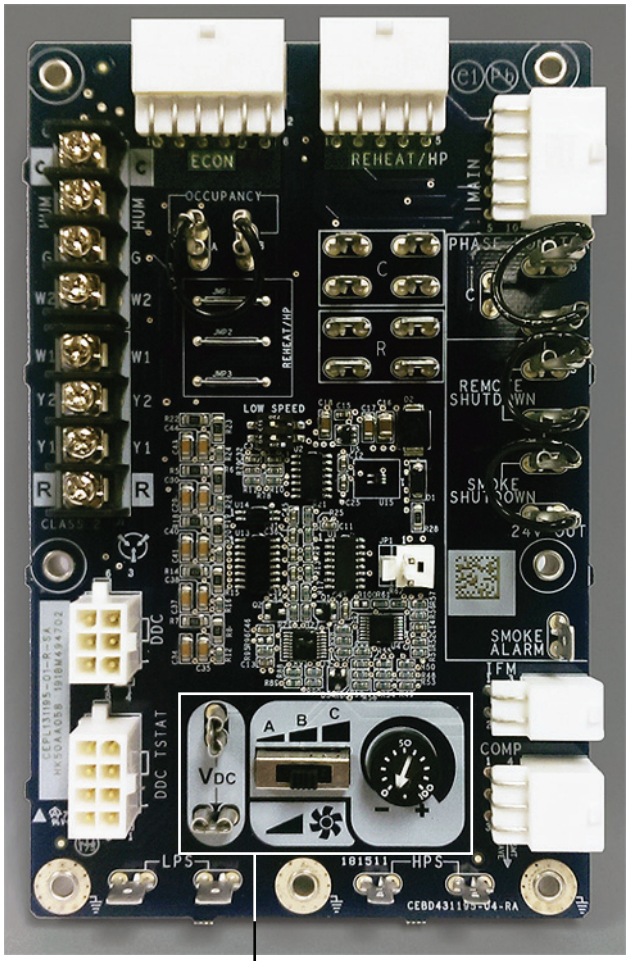
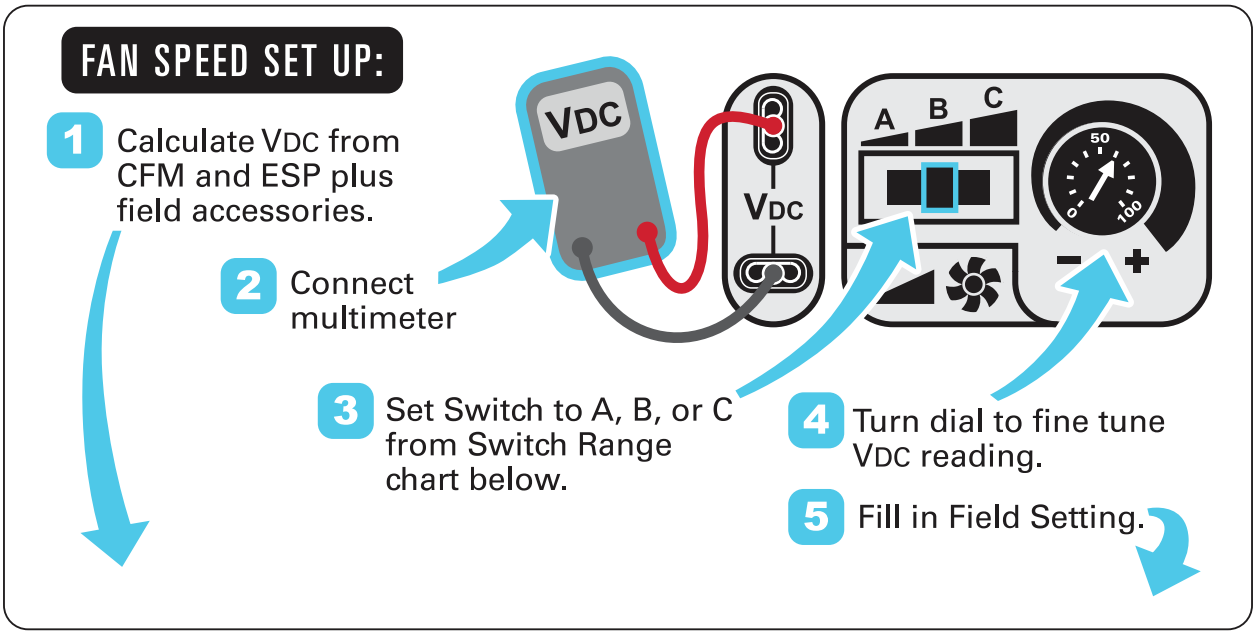


Fig. 38 — UCB Fan Speed Controls



VDC Calculator

UNIT MODEL NUMBER CFM	ESP in. wg 0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0
1500	5.4	6.2	6.9	7.5	8.1	8.6	9.1	9.6		
1625	5.8	6.5	7.1	7.7	8.3	8.8	9.3	9.8		
1750	6.1	6.8	7.4	8.0	8.5	9.0	9.5	9.9		
1875	6.5	7.1	7.7	8.2	8.7	9.2	9.7			
2000	6.8	7.4	7.9	8.5	9.0	9.5	9.9			
2125	7.2	7.7	8.2	8.7	9.2	9.7				
2250	7.6	8.0	8.5	9.0	9.5	10.0				
2375	7.9	8.4	8.8	9.3	9.8					
2500	8.3	8.7	9.2	9.6						
Field Accessories:										
Economizer	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1		
1 Stage E Heat	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2		
2 Stage E Heat	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3		

Factory Setting: 9.0 VDC

Field Setting:

Record field setting here

_____ VDC

Switch Range: *

A	4.1 - 7.5
B	6.9 - 8.7
C	7.7 - 10.0

** Overlap in A, B, C switch range designed for maximum field adjustment potential. For example 7.2 can be set at either A or B.*

NOTE: Values in the Field Accessories section are VDC adders.

Fig. 39 — Example of Fan Speed Set Up Labels for Electromechanical Controls

TROUBLESHOOTING THE ECM MOTOR

EcoBlue™ motors are designed with several built-in protections included in the motor software. If the motor detects a fault it will safely shut down. See Table 18 for a complete list.

Table 18 — Supply Fan Motor Logic and Safety Relays

DESCRIPTION	START DELAY
No Error	—
NTC Over-Temperature Protection	Automatic Reset – Motor starts 12 seconds after the temperature falls below reset limit.
Phase Fault	Automatic Reset – Motor to start after 3 phases present.
Over Current Protection	Automatic Reset – If motor over-current protection trips, motor restarts after 20 seconds off time. If over-current is detected 3 times consecutively, the motor is off for 3 minutes and restarts. Cycle starts again after 20 seconds.
Locked Rotor Protection, Start-up	Automatic Reset – If motor detects locked rotor, it attempts to restart after 5 seconds.
Locked Rotor Protection, Running	If motor detects 3 consecutive faults, the motor waits 3 minutes and restarts. Cycle starts again after 20 seconds.
Over/Under Voltage	Automatic Reset – Motor restarts as soon as input voltage is back within ±10%.
Current Sampling Error	Manual Reset – Power off and wait 2 minutes and restart motor.
Microelectronic (MCU) Fault	Automatic Reset – Motor restarts 3 minutes after fault clears. Manual Reset – Power off and wait 2 minutes and restart motor.

Troubleshooting the motor requires a voltmeter.

1. Disconnect main power to the unit.
2. Disconnect motor plug in supply section of the unit.
3. Restore main unit power.
4. Check for proper line voltage at motor power leads Black (PL1-1), Yellow (PL1-2), and Blue (PL1-3). See the following table.

40RL UNIT VOLTAGE	MOTOR VOLTAGE	MIN-MAX VOLTS
208/230	230	187-253
460	460	360-506
575	575	517-633

5. Disconnect main power.
6. Reconnect motor plug in supply section of unit.
7. Restore main power.
8. Check for proper motor control voltage signal of 9.7 vdc to 10.3 vdc at IFM-1 and IFM-3 on Unit Control Board (UCB). See Fig. 40.
9. Using a jumper wire from TSTAT CB terminals R to G, engage motor operation.
10. Verify control signal from user speed selection switch by placing voltmeter taps in provided terminals marked vdc. Signal should be between 3.8 vdc and 10.3 vdc.
11. If the motor does not start and run, remove the fan assembly and replace the motor with one having the same part number. Do not substitute with an alternate design motor as the voltage/speed programming will not be the same as that on an original factory motor.

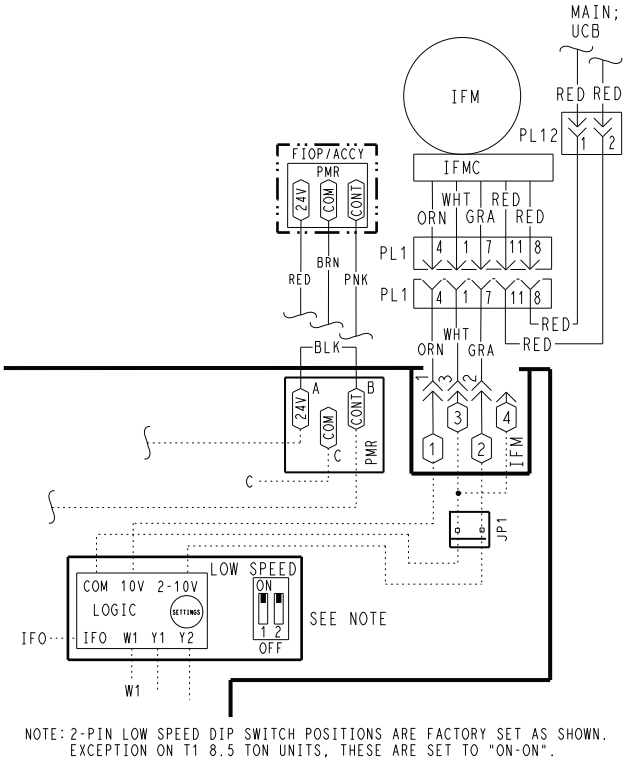


Fig. 40 — Supply Fan Control Wiring Diagram

Service Access for Supply Fan and Motor

HORIZONTAL APPLICATIONS

Removing the Motor and Fan Assembly

NOTE: Due to press fit design of composite Rotor on Motor, it is highly recommended that any time a motor is replaced the fan rotor is replaced as well. The rest of the assembly may be reused.

1. Unplug motor harness from control box harness. See Fig. 41.
2. Unplug connectors from stator temperature limit switch. See Fig. 41.
3. Remove three screws from each of the quarter round stator retention brackets. See Fig. 42.
4. Slide fan assembly out of the panel opening that is being used. Side panel access will require the assembly to be angled to clear the opening. See Fig. 43.

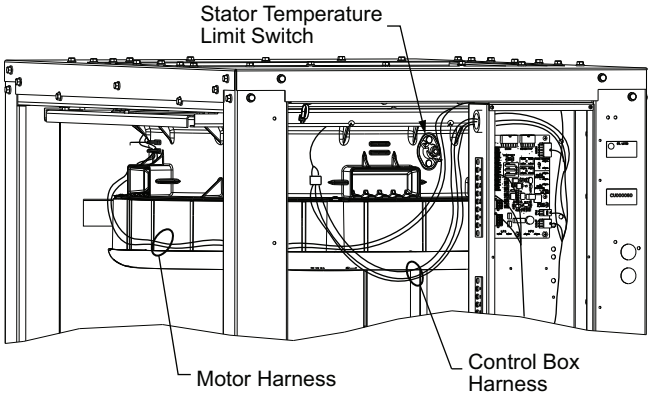


Fig. 41 — Locations of Motor Harness and Stator Temperature Limit Switch

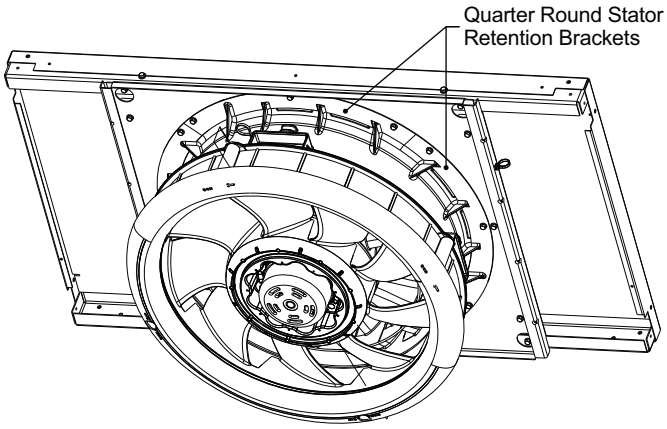


Fig. 42 — Quarter Round Stator Retention Brackets

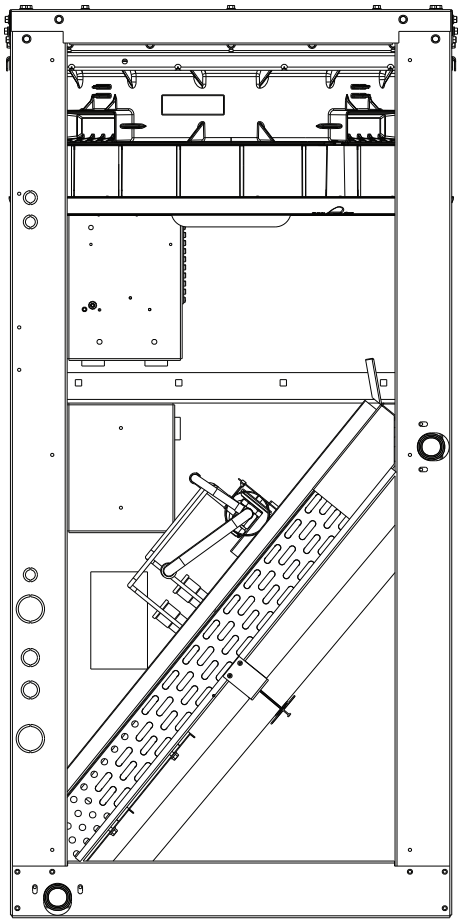


Fig. 43 — Fan Assembly, Side Panel Access (Side Panel Removed)

Disassembling Motor and Fan Assembly

See Fig. 44 for 2.4 Hp motor units; see Fig. 45 for 3.0 Hp motor units.

1. Remove the four bolts that hold the orifice ring to the stator.
2. Remove the orifice ring from the stator.
3. Remove three screws from the top of the fan rotor.
4. Remove the rotor from the motor.
5. Remove the four screws connecting the motor to stator flange.
6. Remove stator from motor.
7. If required, remove stator limit switch on the stator.

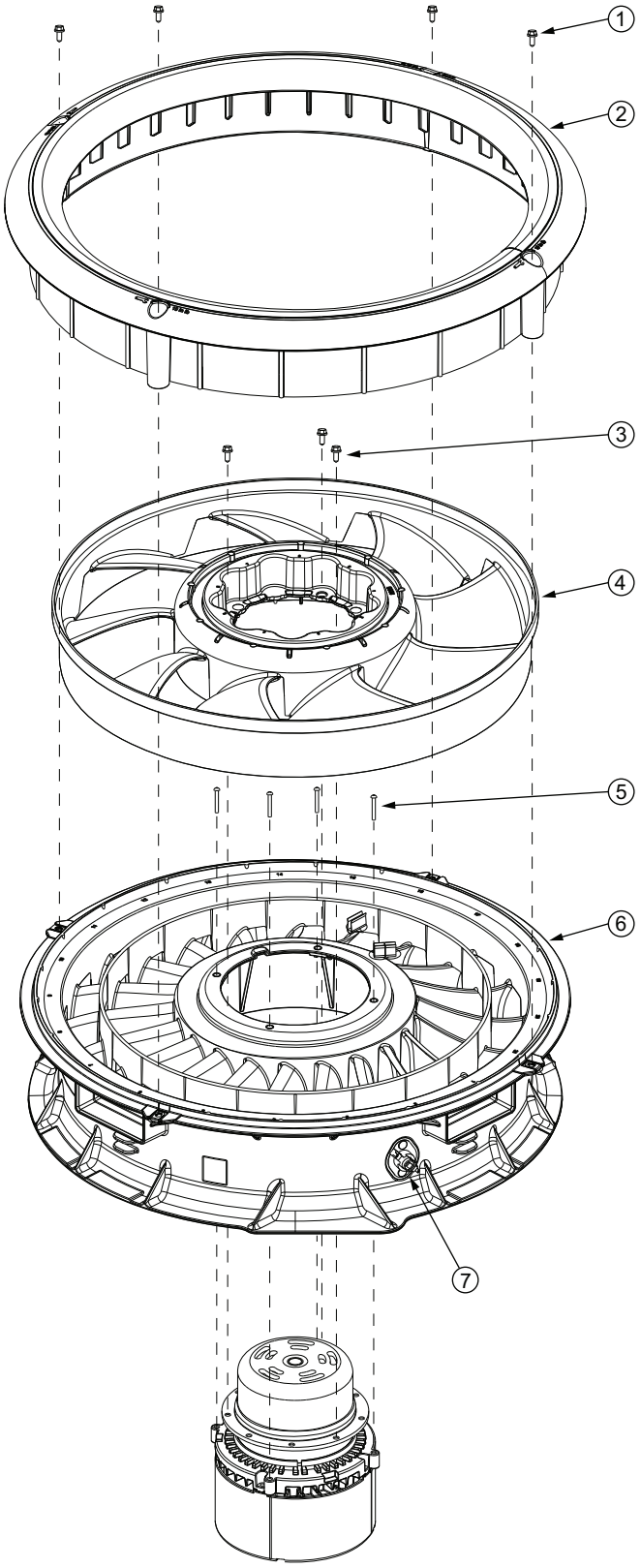


Fig. 44 — Fan Assembly for Units with 2.4 Hp Motor

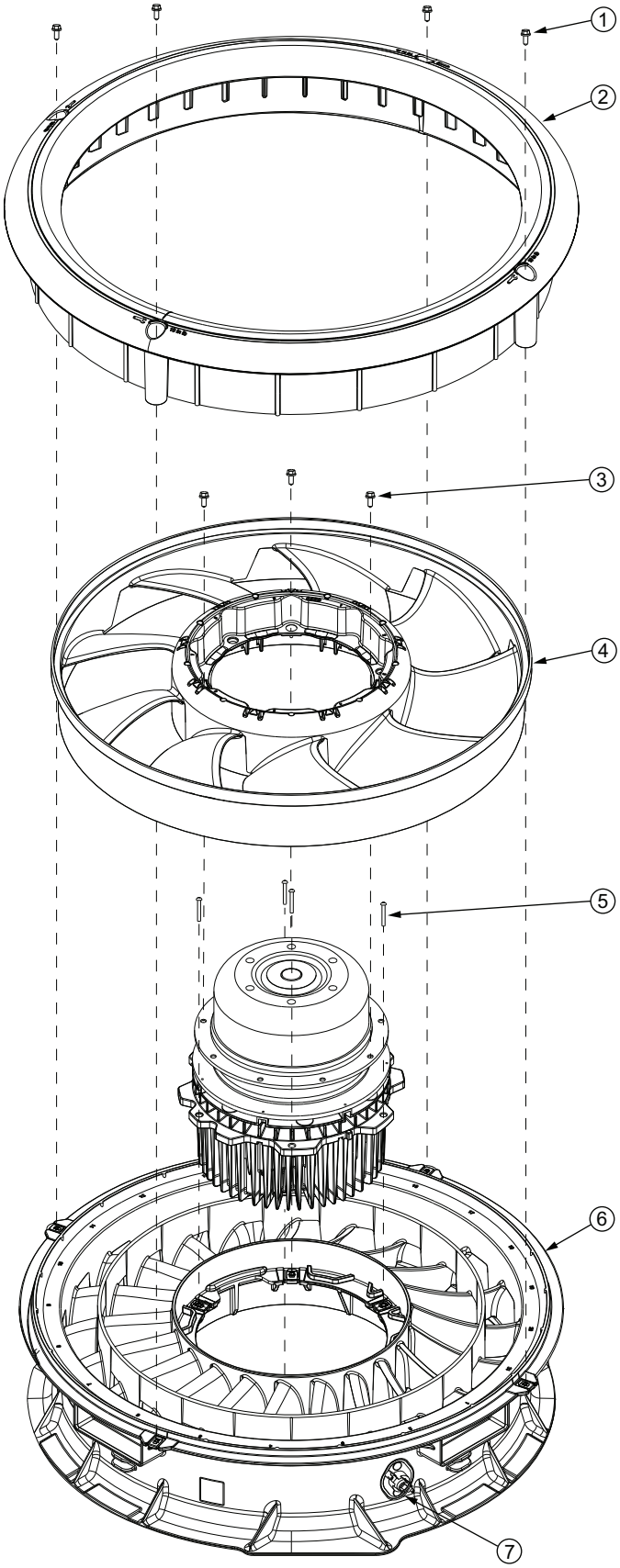


Fig. 45 — Fan Assembly for Units with 3.0 Hp Motor

Reassembly of Motor and Fan Assembly

1. See Fig. 44 for 2.4 Hp motor units; see Fig. 45 for 3.0 Hp motor units. Place motor on flat surface.
2. If required, install stator limit switch on the stator with two plastic push rivets (P/N: HH18HA597).
3. Fit motor wire harness into keyhole feature on the side of the stator and pull wire harness out prior to fixing the motor to the stator. See Fig. 46.

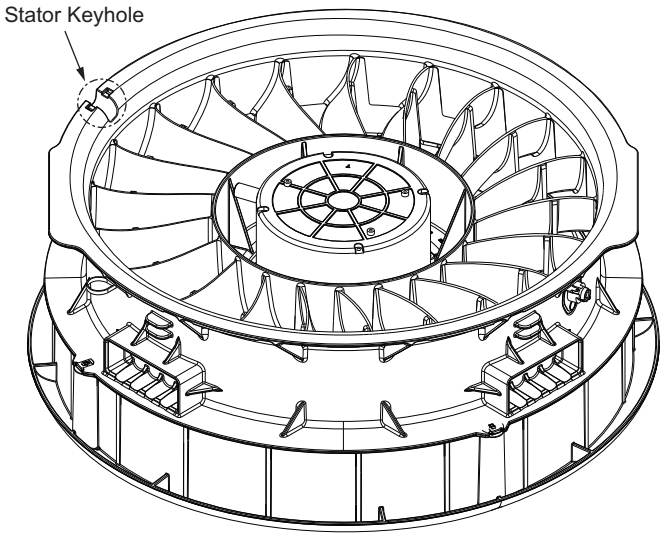


Fig. 46 — Stator Keyhole Location

4. The 2.4 Hp motors attach to the stator from the bottom by setting the stator assembly on the motor. The 3.0 Hp motors attach to the stator from the top and are gently lowered into the recess for the motor.
5. For the 2.4 Hp motor, install four 1/4-20 x 1-in. hex head machine screws (P/N: AC67AP170) to connect stator to motor. Tighten to 50 in.-lb (5.65 Nm).
6. For the 3.0 Hp motor, install six 1/4-20 x 1-in. hex head machine screws (P/N: AC67AP170) to connect stator to motor. Tighten to 30 in.-lb (3.39 Nm).
7. Install rotor on motor by lining up the rotor holes to the motor holes. The rotor has self-aligning features that engage into the motor holes. Press fan rotor down until it is flush with the motor flange.
8. Install three 1/4-20 x 1-in. hex head machine screws (P/N: AC67AP170) through the holes in the rotor. Tighten to 50 in.-lb (5.65 Nm)
9. Align holes of composite fan inlet casing with screw holes on the top flange of the fan stator. Using a socket extension and either a 1/4-in. or 3/8-in. drive socket, install four #10-16 hex head machine screws (P/N: AP13ADAD128) and tighten to 14 in.-lb (1.58 Nm).
10. Final assembly should have a small clearance between top of plastic rotor and underside of casing lip. Spin rotor by hand to ensure no contact or rubbing between these two parts.

Reinstalling Motor and Fan Assembly

1. Re-install the two lower quarter round retainers
2. Align motor harness/grommet aligned with the control box
3. Drop fan assembly down into fan deck opening and slide it so that the lip is in the fan deck recess and is retained by the quarter round brackets.
4. Install the remaining quarter round brackets.
5. Adjust the orientation of the stator so that it aligns with the embossed recess in the fan deck.
6. Reconnect wires for stator temperature limit switch.
7. Pull motor harness tight through grommet and plug it in to the control box harness and secure in the corner with snap-in wire tie.

VERTICAL APPLICATIONS

Removing the Motor and Fan Assembly

NOTE: Due to press fit design of composite Rotor on Motor, it is highly recommended that any time a motor is replaced the fan rotor is replaced as well. The rest of the assembly may be reused.

See Fig. 44 for 2.4 Hp motor units; see Fig. 45 for 3.0 Hp motor units.

1. Unplug motor harness from control box harness. See Fig. 41.
2. Unplug connectors from stator temperature limit switch. See Fig. 41.
3. Remove six screws from the fan deck. See Fig. 47.
4. Allow the fan deck to drop into the slider tracks (careful not to pinch body parts when the fan drops) See Fig. 48.
5. Slide fan deck assembly out of the panel opening that is being used. Side panel access will not be allowed. See Fig. 49.
6. Remove the quarter round plates to free the fan assembly.

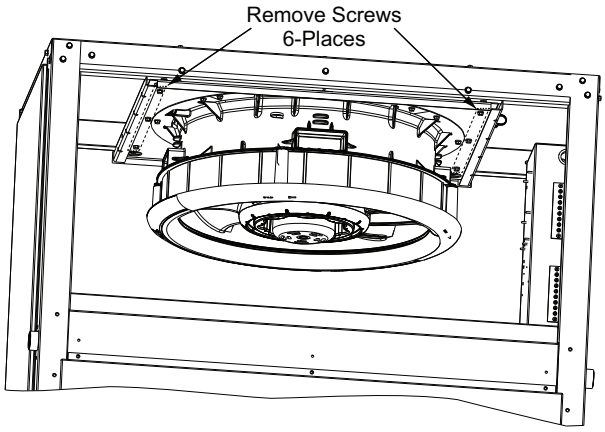


Fig. 47 — Remove Screws from Fan Deck Assembly

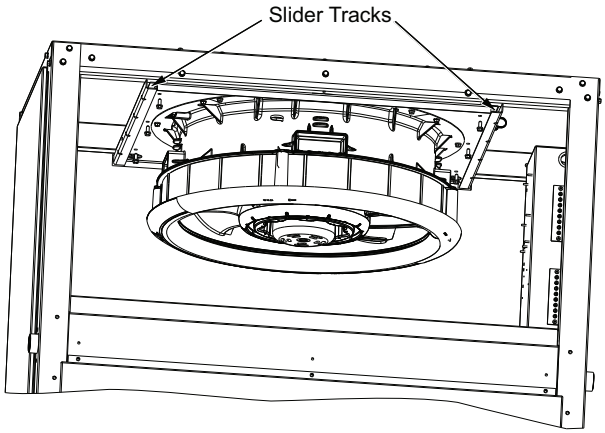


Fig. 48 — Lower Fan Deck Assembly to Slider Tracks

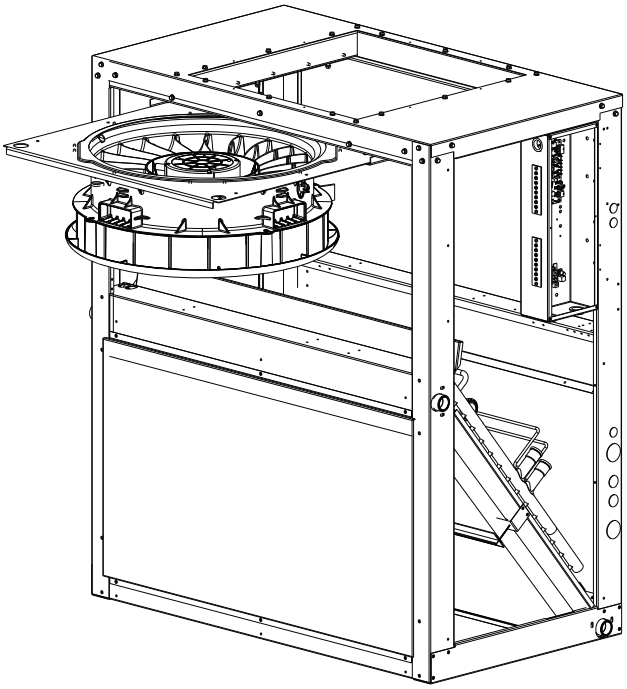


Fig. 49 — Slide Out Fan Deck Assembly

Disassembling Motor and Fan Assembly

See Fig. 44 for 2.4 Hp motor units; see Fig. 45 for 3.0 Hp motor units.

1. Remove the four bolts that hold the orifice ring to the stator.
2. Remove the orifice ring from the stator.
3. Remove three screws from the top of the fan rotor.
4. Remove rotor from motor.
5. Remove four screws connecting motor to stator flange.
6. Remove stator from motor.
7. If required, remove stator limit switch on the stator.

Reassembly of Motor and Fan Assembly

See Fig. 44 for 2.4 Hp motor units; see Fig. 45 for 3.0 Hp motor units.

1. Place motor on flat surface.
2. If required, install stator limit switch on the stator with two plastic push rivets (P/N: HH18HA597).
3. Fit motor wire harness into keyhole feature on the side of the stator and pull wire harness out prior to fixing the motor to the stator.
4. The 2.4 Hp motors attach to the stator from the bottom by setting the stator assembly on the motor. The 3.0 Hp motors attach to the stator from the top and are gently lowered into the recess for the motor.
5. For the 2.4 Hp motor, install four 1/4-20 x 1-in. hex head machine screws (P/N: AC67AP170) to connect stator to motor. Tighten to 50 in.-lb (5.65 Nm).
6. For the 3.0 Hp motor, install six 1/4-20 x 1-in. hex head machine screws (P/N: AC67AP170) to connect stator to motor. Tighten to 30 in.-lb (3.39 Nm).
7. Install rotor on motor by lining up the rotor holes to the motor holes. The rotor has self-aligning features that engage into the motor holes. Press fan rotor down until it is flush with the motor flange.
8. Install three 1/4-20 x 1-in. hex head machine screws (P/N: AC67AP170) through the holes in the rotor. Tighten to 50 in.-lb (5.65 Nm).
9. Align holes of composite fan inlet casing with screw wells on the top flange of the fan stator.
10. Final assembly should have a small clearance between top of plastic rotor and underside of casing lip. Spin rotor by hand to ensure no contact or rubbing between these two parts. Insert four screws (P/N: AP13AD128) and tighten to 14 in.-lb (1.58 Nm).

Reinstalling Motor and Fan Assembly

1. Reassemble the motor assembly to the fan deck.
2. Reinstall the quarter round plates and tighten the screws.
3. Align motor harness/grommet aligned with the control box.
4. Slide the fan deck back into the unit assembly.
5. Re-install the six retainer screws.
6. Reconnect wires for stator temperature limit switch.
7. Pull motor harness tight through grommet and plug it in to the control box harness and secure in the corner with snap-in wire tie.

Condensate Drains

Keep condensate drains free of dirt and foreign matter.

Return-Air Filters

Refer to Replacing Filters section on page 39 for filter accessibility and removal. Replace with clean filters of the sizes listed in Tables 1-3.

Chilled Water Coil Freeze Protection

Shut off water supply to unit. Remove side panel of unit and remove vent and drain plugs in top and bottom of coil header. Drain coil and blow out remaining water. Reinstall plugs and side panel. Alternative freeze protection methods follow:

- Circulate hot water within the water coil's supply main or supplementary space heating.
- Close off supply lines to unit and open a union or field-supplied drain valve in the return line.

IMPORTANT: Draining from return line will not completely drain water from coils.

- After draining as much water as possible from coils, add sufficient antifreeze to prevent residual water in the coil from freezing.
- Add a sufficient quantity of non-corrosive antifreeze to the entire system to prevent all water within the system from freezing.

Coil Removal

Remove unit panels and corner posts as required. Disconnect coil connections and remove fastening screws. Remove coil through end or side sections of unit.

Cleaning Cooling Coil

Remove return-air filters. Remove any heavy dirt that may have accumulated on underside of coil. Coil can be cleaned more easily with a stiff brush, vacuum cleaner, or compressed air when coil is dry. If coil is wet or if water is to be used for cleaning, guard against splashing water on electrical components or damaging surrounding area. Clean coil baffles as applicable and check for tight fit to be sure air does not bypass coil.

Cleaning Insulation

The insulation contains an immobilized antimicrobial agent that helps inhibit the growth of bacteria and fungi. Clean the inner surface of the insulation according to the separate maintenance instructions shipped with the unit.

Replacing Filters

Filters can be removed and installed from either side of the unit. Install new filters in units that have one fan as follows:

1. Remove the side access panel (retain screws).
2. Remove the filter retainer clip (see Fig. 50).
3. Remove old filters by lifting and tilting them out of the filter track. (See Fig. 15 and 51.)
4. Reverse the procedure to install new filters.

To install new filters in larger units that have 2 fans, follow the preceding steps, but use the factory-supplied filter hook to slide filters within reach for removal. The filter hook is shipped inside the unit in the filter track.

⚠ CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this CAUTION can result in premature wear and damage to equipment.

DO NOT OPERATE THE UNIT WITHOUT THE RETURN AIR FILTERS IN PLACE.

Dirt and debris can collect on heat exchangers and coils possibly resulting in a small fire. Dirt buildup on components can cause excessive current used resulting in motor failure.

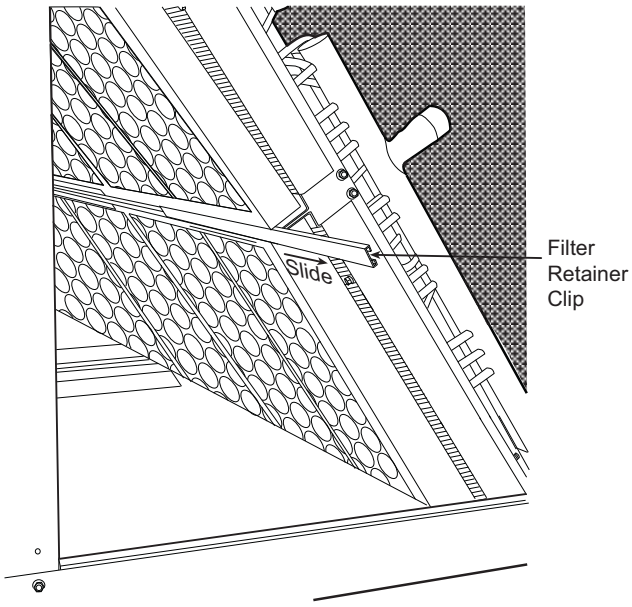


Fig. 50 — Remove Filter Retainer Clip

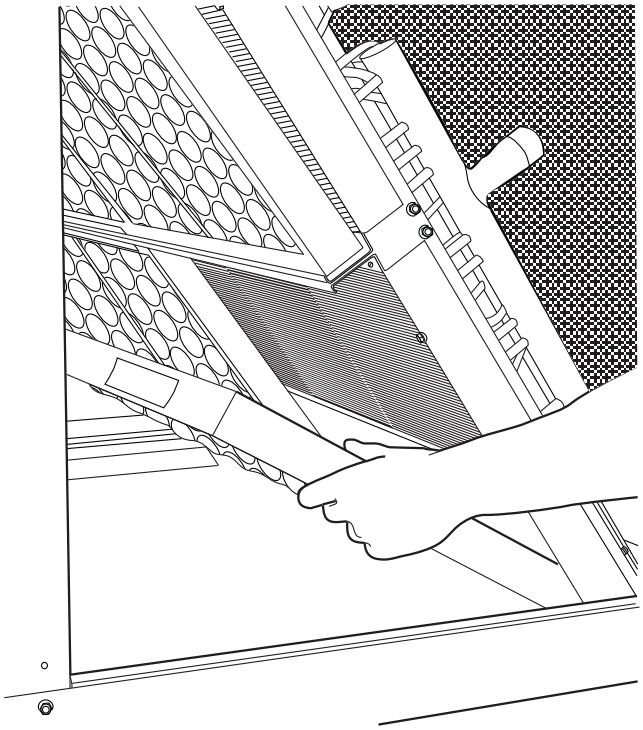


Fig. 51 — Filter Removal/Replacement

Adaptive Dehumidification System (Optional)

Units with the factory-installed adaptive dehumidification system option are capable of providing multiple modes of improved dehumidification as a variation of the normal cooling cycle. The adaptive dehumidification system option includes an additional valve in the liquid line of the refrigerant circuit and a reheat coil downstream of the evaporator. Adaptive dehumitification system operation requires the installation and configuration of a relative humidity switch input or a space relative humidity sensor. These provide the dehumidification demand to the control.

With defumidification system units there is one additional HVAC modes available for the user: Dehum/Mech Cooling. Selection of the Dehum/Mech Cooling mode is determined by the dehumidification demand and the cooling demand. Table 19 shows the corresponding circuit mode and output status for the different demand combinations.

NORMAL COOLING

This mode is the standard rated cooling system performance, and occurs when there is cooling demand without dehumidification demand.

For 38AX/40RL 07-12 units, refrigerant flows from the outdoor condenser through the de-energized 3-Way Liquid Diverter Valve (LDV) to the expansion device bypassing the reheat condenser coil, as shown in Fig. 52.

DEHUM/MECH COOLING (SUBCOOLING) MODE

This mode increases the latent heat removal and decreases sensible cooling compared to normal cooling. This occurs when there is a cooling and dehumidification demands.

For 38AX/40RL 07-12 units, refrigerant flows from the outdoor condenser, through the energized 3-Way LDV and through the reheat condenser coil to the expansion device, as shown in Fig. 53.

REHEAT CONTROL

When there is only a cooling demand, the unit will operate in normal cooling mode. When there is both cooling demand and

dehumidification demand, the unit will operate in Dehum/Mech Cooling mode (Subcooling). When there is only a dehumidification demand, the unit will operate in Dehum/Mech Cooling mode (Subcooling). The unit will operate in this mode until the humidity setting is met, or the supply air is below 60°F. During Dehum/Mech cooling mode, the unit will run all cooling stages.

Table 19 — Adaptive Dehumidification System Control Modes

DEMAND AND MODE			OUTPUTS	LDV Valve 3-WAY
Space Humidity	Circuit Cooling Demand	Circuit Mode	Circuit Compressor	
—	—	No power	Off	Off
Low	No	Off	Off	Off
	Yes	Cool	On	Off
High	Yes	Dehum/Mech Cooling	On	On
	No	Dehum/Mech Cooling	On	On

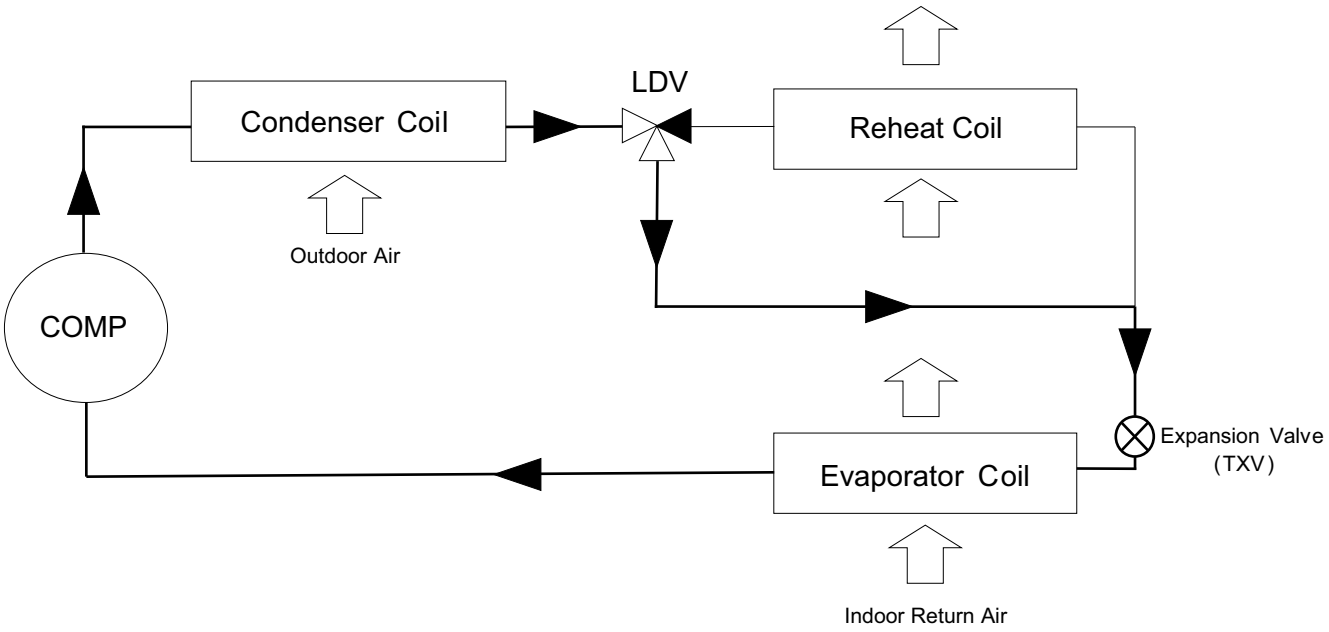


Fig. 52 — Normal Cooling Mode – Adaptive Dehumidification System for 40RL 07-12

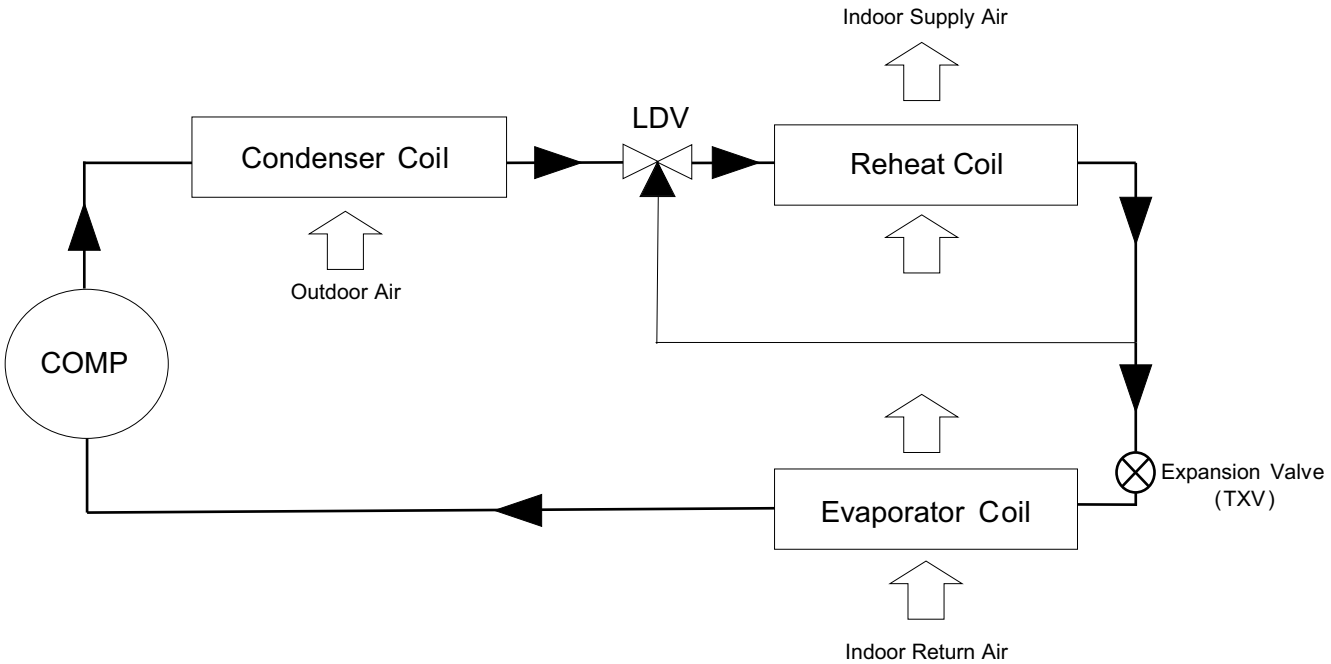


Fig. 53 — Subcooling Mode – Adaptive Dehumidification System for 40RL 07-12

FAN PERFORMANCE

General Fan Performance Notes

See Tables 20-46 for fan performance data.

1. Interpolation is permissible. Do not extrapolate.
2. External static pressure is the static pressure difference between the return duct and the supply duct plus the static pressure caused by any FIOPs or accessories.
3. Tabular data accounts for pressure loss due to clean filters, unit casing and wet coils.
4. Factory options and accessories may effect static pressure losses. Selection software is available, through your salesperson, to help you select the best motor/drive combination for your application.
5. The fan performance tables (see Tables 20-46) offer motor/drive recommendations. In cases when two motor/drive combinations would work, Carrier recommends the lower horsepower option.
6. The EPACT (Energy Policy Act of 1992) regulates energy requirements for specific types of indoor fan motors. Motors regulated by EPACT include any general purpose, T-frame (three-digit, 143 and larger), single-speed, foot mounted, polyphase, squirrel cage induction motors of NEMA (National Electrical Manufacturers Association) design A and B, manufactured for use in the United States. Ranging from 1 to 200 Hp, these continuous-duty motors operate on 230 and 460 volt, 60 Hz power. If a motor does not fit into these specifications, the motor does not have to be replaced by an EPACT compliant energy-efficient motor. Variable-speed motors are exempt from EPACT compliance requirements.

Table 20 — 40RLAA07 Fan Data (rpm — bhp)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1800	788	0.18	942	0.31	1081	0.48	1202	0.67	1308	0.88
1950	828	0.20	973	0.34	1107	0.52	1227	0.71	1333	0.92
2100	870	0.23	1005	0.37	1134	0.55	1252	0.75	1358	0.97
2250	914	0.26	1040	0.41	1163	0.59	1278	0.80	1383	1.02
2400	958	0.30	1077	0.45	1194	0.63	1305	0.84	1409	1.07
2550	1004	0.34	1115	0.50	1226	0.68	1334	0.89	1435	1.13
2700	1050	0.39	1155	0.55	1261	0.74	1364	0.95	1462	1.18
2850	1097	0.44	1197	0.60	1297	0.79	1395	1.01	1491	1.25
3000	1144	0.50	1239	0.66	1334	0.86	1429	1.08	1521	1.32

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1800	1403	1.09	1491	1.32	1571	1.55	1647	1.79	1718	2.04
1950	1429	1.14	1517	1.38	1598	1.62	1674	1.87	1745	2.13
2100	1454	1.20	1542	1.44	1624	1.69	1700	1.95	1772	2.21
2250	1479	1.25	1568	1.50	1650	1.76	1726	2.02	1799	2.30
2400	1504	1.31	1593	1.57	1675	1.83	1752	2.11	1825	2.39
2550	1529	1.37	1618	1.64	1700	1.91	1777	2.19	1850	2.48
2700	1555	1.44	1643	1.70	1725	1.98	1802	2.27	1875	2.57
2850	1582	1.50	1668	1.78	1750	2.06	1827	2.36	1900	2.66
3000	1610	1.58	1695	1.86	1775	2.14	1852	2.45	1925	2.76

Standard Static 788-2000 rpm, 2.55 Max bhp

High Static 788-2200 rpm, 3.2 Max bhp

Table 21 — 40RLAA07 Standard Static Fan Data (rpm — vdc)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
1800	788	3.8	942	4.6	1081	5.3	1202	5.9	1308	6.4
1950	828	4.0	973	4.7	1107	5.4	1227	6.0	1333	6.6
2100	870	4.2	1005	4.9	1134	5.5	1252	6.2	1358	6.7
2250	914	4.4	1040	5.1	1163	5.7	1278	6.3	1383	6.8
2400	958	4.6	1077	5.3	1194	5.9	1305	6.4	1409	7.0
2550	1004	4.9	1115	5.4	1226	6.0	1334	6.6	1435	7.1
2700	1050	5.1	1155	5.7	1261	6.2	1364	6.7	1462	7.2
2850	1097	5.4	1197	5.9	1297	6.4	1395	6.9	1491	7.4
3000	1144	5.6	1239	6.1	1334	6.6	1429	7.1	1521	7.5

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
1800	1403	6.9	1491	7.4	1571	7.8	1647	8.2	1718	8.5
1950	1429	7.1	1517	7.5	1598	7.9	1674	8.3	1745	8.7
2100	1454	7.2	1542	7.6	1624	8.1	1700	8.5	1772	8.8
2250	1479	7.3	1568	7.8	1650	8.2	1726	8.6	1799	9.0
2400	1504	7.4	1593	7.9	1675	8.3	1752	8.7	1825	9.1
2550	1529	7.6	1618	8.0	1700	8.5	1777	8.9	1850	9.2
2700	1555	7.7	1643	8.2	1725	8.6	1802	9.0	—	—
2850	1582	7.9	1668	8.3	1750	8.7	1827	9.1	—	—
3000	1610	8.0	1695	8.4	1775	8.8	1852	9.2	—	—

Standard Static 788-2000 rpm, 2.55 Max bhp

Table 22 — 40RLAA07 High Static Fan Data (rpm — vdc)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
1800	788	3.5	942	4.2	1081	4.8	1202	5.4	1308	5.9
1950	828	3.7	973	4.3	1107	5.0	1227	5.5	1333	6.0
2100	870	3.9	1005	4.5	1134	5.1	1252	5.6	1358	6.1
2250	914	4.1	1040	4.6	1163	5.2	1278	5.7	1383	6.2
2400	958	4.3	1077	4.8	1194	5.4	1305	5.9	1409	6.3
2550	1004	4.5	1115	5.0	1226	5.5	1334	6.0	1435	6.5
2700	1050	4.7	1155	5.2	1261	5.7	1364	6.1	1462	6.6
2850	1097	4.9	1197	5.4	1297	5.8	1395	6.3	1491	6.7
3000	1144	5.1	1239	5.6	1334	6.0	1429	6.4	1521	6.9

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
1800	1403	6.3	1491	6.7	1571	7.1	1647	7.4	1718	7.8
1950	1429	6.4	1517	6.8	1598	7.2	1674	7.6	1745	7.9
2100	1454	6.6	1542	7.0	1624	7.3	1700	7.7	1772	8.0
2250	1479	6.7	1568	7.1	1650	7.5	1726	7.8	1799	8.1
2400	1504	6.8	1593	7.2	1675	7.6	1752	7.9	1825	8.3
2550	1529	6.9	1618	7.3	1700	7.7	1777	8.0	1850	8.4
2700	1555	7.0	1643	7.4	1725	7.8	1802	8.2	1875	8.5
2850	1582	7.1	1668	7.5	1750	7.9	1827	8.3	1900	8.6
3000	1610	7.3	1695	7.7	1775	8.0	1852	8.4	1925	8.7

High Static 788-2200 rpm, 3.2 Max bhp

Table 23 — 40RLAA08 Fan Data (rpm — bhp)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2250	884	0.23	1009	0.37	1131	0.54	1247	0.74	1354	0.95
2440	937	0.27	1053	0.42	1168	0.59	1279	0.79	1383	1.01
2625	991	0.32	1099	0.47	1206	0.64	1311	0.84	1412	1.07
2815	1048	0.37	1149	0.53	1249	0.70	1348	0.90	1445	1.13
3000	1103	0.43	1199	0.59	1293	0.77	1386	0.97	1478	1.20
3190	1161	0.50	1252	0.66	1340	0.85	1428	1.05	1516	1.28
3375	1218	0.57	1304	0.74	1388	0.93	1471	1.14	1554	1.37
3565	1277	0.66	1359	0.83	1438	1.02	1517	1.24	1596	1.47
3750	1335	0.75	1413	0.93	1489	1.13	1564	1.34	1639	1.58

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1800	1452	1.18	1542	1.43	1625	1.68	1703	1.94	1776	2.21
1950	1480	1.25	1570	1.50	1653	1.76	1731	2.03	1805	2.31
2100	1507	1.31	1597	1.57	1680	1.83	1759	2.11	1833	2.40
2250	1537	1.38	1625	1.64	1708	1.91	1787	2.20	1861	2.50
2400	1568	1.45	1654	1.72	1736	2.00	1814	2.29	1888	2.60
2550	1602	1.54	1685	1.80	1765	2.09	1842	2.39	1916	2.70
2700	1636	1.62	1717	1.90	1795	2.18	1871	2.49	1944	2.81
2850	1675	1.73	1752	2.00	1828	2.29	1902	2.60	1973	2.92
3000	1714	1.83	1788	2.11	1862	2.41	1933	2.71	2003	3.04

Standard Static 788-2000 rpm, 2.55 Max bhp

High Static 788-2200 rpm, 3.2 Max bhp

Table 24 — 40RLAA08 Standard Static Fan Data (rpm — vdc)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
2250	884	4.3	1009	4.9	1131	5.5	1247	6.1	1354	6.7
2440	937	4.5	1053	5.1	1168	5.7	1279	6.3	1383	6.8
2625	991	4.8	1099	5.4	1206	5.9	1311	6.5	1412	7.0
2815	1048	5.1	1149	5.6	1249	6.1	1348	6.6	1445	7.1
3000	1103	5.4	1199	5.9	1293	6.4	1386	6.8	1478	7.3
3190	1161	5.7	1252	6.2	1340	6.6	1428	7.1	1516	7.5
3375	1218	6.0	1304	6.4	1388	6.9	1471	7.3	1554	7.7
3565	1277	6.3	1359	6.7	1438	7.1	1517	7.5	1596	7.9
3750	1335	6.6	1413	7.0	1489	7.4	1564	7.8	1639	8.1

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
2250	1452	7.2	1542	7.6	1625	8.1	1703	8.5	1776	8.8
2440	1480	7.3	1570	7.8	1653	8.2	1731	8.6	1805	9.0
2625	1507	7.5	1597	7.9	1680	8.4	1759	8.8	1833	9.1
2815	1537	7.6	1625	8.1	1708	8.5	1787	8.9	1861	9.3
3000	1568	7.8	1654	8.2	1736	8.6	1814	9.0	—	—
3190	1602	8.0	1685	8.4	1765	8.8	1842	9.2	—	—
3375	1636	8.1	1717	8.5	1795	8.9	1871	9.3	—	—
3565	1675	8.3	1752	8.7	1828	9.1	—	—	—	—
3750	1714	8.5	1788	8.9	1862	9.3	—	—	—	—

Standard Static 788-2000 rpm, 2.55 Max bhp

Table 25 — 40RLAA08 High Static Fan Data (rpm — vdc)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
2250	884	3.9	1009	4.5	1131	5.1	1247	5.6	1354	6.1
2440	937	4.2	1053	4.7	1168	5.2	1279	5.7	1383	6.2
2625	991	4.4	1099	4.9	1206	5.4	1311	5.9	1412	6.4
2815	1048	4.7	1149	5.1	1249	5.6	1348	6.1	1445	6.5
3000	1103	4.9	1199	5.4	1293	5.8	1386	6.2	1478	6.7
3190	1161	5.2	1252	5.6	1340	6.0	1428	6.4	1516	6.8
3375	1218	5.5	1304	5.9	1388	6.3	1471	6.6	1554	7.0
3565	1277	5.7	1359	6.1	1438	6.5	1517	6.8	1596	7.2
3750	1335	6.0	1413	6.4	1489	6.7	1564	7.1	1639	7.4

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
2250	1452	6.5	1542	7.0	1625	7.3	1703	7.7	1776	8.0
2440	1480	6.7	1570	7.1	1653	7.5	1731	7.8	1805	8.2
2625	1507	6.8	1597	7.2	1680	7.6	1759	8.0	1833	8.3
2815	1537	6.9	1625	7.3	1708	7.7	1787	8.1	1861	8.4
3000	1568	7.1	1654	7.5	1736	7.9	1814	8.2	1888	8.6
3190	1602	7.2	1685	7.6	1765	8.0	1842	8.3	1916	8.7
3375	1636	7.4	1717	7.8	1795	8.1	1871	8.5	1944	8.8
3565	1675	7.6	1752	7.9	1828	8.3	1902	8.6	1973	9.0
3750	1714	7.8	1788	8.1	1862	8.4	1933	8.8	2003	9.1

High Static 788-2200 rpm, 3.2 Max bhp

Table 26 — 40RLAA12 Fan Data (rpm — bhp)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3000	1080	0.40	1175	0.55	1268	0.72	1361	0.92	1453	1.14
3250	1154	0.48	1243	0.64	1329	0.81	1415	1.01	1501	1.24
3500	1229	0.57	1312	0.74	1393	0.92	1473	1.13	1553	1.35
3750	1305	0.68	1384	0.86	1459	1.04	1534	1.25	1609	1.48
4000	1381	0.80	1456	0.99	1527	1.18	1598	1.40	1668	1.63
4250	1458	0.94	1529	1.13	1597	1.34	1664	1.56	1730	1.79
4500	1535	1.09	1603	1.29	1668	1.50	1731	1.73	1794	1.97
4750	1613	1.26	1678	1.47	1740	1.69	1800	1.92	1860	2.17
5000	1691	1.45	1753	1.67	1813	1.90	1870	2.14	1927	2.39

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3000	1543	1.38	1629	1.64	1712	1.91	1791	2.20	1866	2.50
3250	1586	1.48	1668	1.74	1748	2.02	1825	2.31	1899	2.62
3500	1632	1.59	1711	1.86	1787	2.14	1862	2.44	1935	2.75
3750	1683	1.73	1757	1.99	1830	2.28	1902	2.58	1972	2.89
4000	1738	1.88	1807	2.14	1877	2.43	1945	2.73	2013	3.05
4250	1795	2.04	1861	2.31	1927	2.60	1992	2.90	—	—
4500	1856	2.23	1918	2.50	1980	2.79	2042	3.09	—	—
4750	1919	2.43	1977	2.71	2036	3.00	—	—	—	—
5000	1983	2.66	2039	2.94	—	—	—	—	—	—

Standard Static 788-2000 rpm, 2.55 Max bhp

High Static 788-2200 rpm, 3.2 Max bhp

Table 27 — 40RLAA12 Standard Static Fan Data (rpm — vdc)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
3000	1080	5.3	1175	5.8	1268	6.2	1361	6.7	1453	7.2
3250	1154	5.6	1243	6.1	1329	6.5	1415	7.0	1501	7.4
3500	1229	6.0	1312	6.5	1393	6.9	1473	7.3	1553	7.7
3750	1305	6.4	1384	6.8	1459	7.2	1534	7.6	1609	8.0
4000	1381	6.8	1456	7.2	1527	7.6	1598	7.9	1668	8.3
4250	1458	7.2	1529	7.6	1597	7.9	1664	8.3	1730	8.6
4500	1535	7.6	1603	8.0	1668	8.3	1731	8.6	1794	8.9
4750	1613	8.0	1678	8.3	1740	8.7	1800	9.0	1860	9.3
5000	1691	8.4	1753	8.7	1813	9.0	1870	9.3	1927	9.6

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
3000	1543	7.6	1629	8.1	1712	8.5	1791	8.9	1866	9.3
3250	1586	7.9	1668	8.3	1748	8.7	1825	9.1	—	—
3500	1632	8.1	1711	8.5	1787	8.9	1862	9.3	—	—
3750	1683	8.4	1757	8.8	1830	9.1	—	—	—	—
4000	1738	8.7	1807	9.0	1877	9.4	—	—	—	—
4250	1795	8.9	1861	9.3	—	—	—	—	—	—
4500	1856	9.3	1918	9.6	—	—	—	—	—	—
4750	1919	9.6	—	—	—	—	—	—	—	—
5000	—	—	—	—	—	—	—	—	—	—

Standard Static 788-2000 rpm, 2.55 Max bhp

Table 28 — 40RLAA12 High Static Fan Data (rpm — vdc)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
3000	1080	4.8	1175	5.3	1268	5.7	1361	6.1	1453	6.6
3250	1154	5.2	1243	5.6	1329	6.0	1415	6.4	1501	6.8
3500	1229	5.5	1312	5.9	1393	6.3	1473	6.6	1553	7.0
3750	1305	5.9	1384	6.2	1459	6.6	1534	6.9	1609	7.3
4000	1381	6.2	1456	6.6	1527	6.9	1598	7.2	1668	7.5
4250	1458	6.6	1529	6.9	1597	7.2	1664	7.5	1730	7.8
4500	1535	6.9	1603	7.2	1668	7.5	1731	7.8	1794	8.1
4750	1613	7.3	1678	7.6	1740	7.9	1800	8.2	1860	8.4
5000	1691	7.7	1753	7.9	1813	8.2	1870	8.5	1927	8.7

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
3000	1543	7.0	1629	7.4	1712	7.7	1791	8.1	1866	8.5
3250	1586	7.2	1668	7.5	1748	7.9	1825	8.3	1899	8.6
3500	1632	7.4	1711	7.7	1787	8.1	1862	8.4	1935	8.8
3750	1683	7.6	1757	8.0	1830	8.3	1902	8.6	1972	8.9
4000	1738	7.9	1807	8.2	1877	8.5	1945	8.8	2013	9.1
4250	1795	8.1	1861	8.4	1927	8.7	1992	9.0	—	—
4500	1856	8.4	1918	8.7	1980	9.0	2042	9.3	—	—
4750	1919	8.7	1977	9.0	2036	9.2	—	—	—	—
5000	1983	9.0	2039	9.3	—	—	—	—	—	—

High Static 788-2200 rpm, 3.2 Max bhp

Table 29 — 40RLSA08 Fan Data (rpm — bhp)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2250	850	0.20	975	0.33	1096	0.49	1210	0.67	1315	0.87
2440	900	0.24	1017	0.37	1130	0.53	1239	0.71	1342	0.92
2625	951	0.27	1060	0.41	1167	0.57	1270	0.76	1369	0.97
2815	1004	0.32	1107	0.46	1207	0.62	1305	0.81	1400	1.02
3000	1056	0.37	1154	0.51	1248	0.68	1341	0.87	1432	1.08
3190	1111	0.42	1203	0.57	1292	0.74	1380	0.94	1467	1.15
3375	1165	0.48	1253	0.64	1337	0.81	1421	1.01	1503	1.23
3565	1221	0.55	1304	0.71	1385	0.89	1464	1.09	1543	1.31
3750	1275	0.62	1355	0.79	1432	0.97	1508	1.18	1583	1.40

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2250	1412	1.09	1503	1.32	1587	1.56	1666	1.81	1740	2.08
2440	1437	1.14	1527	1.37	1611	1.62	1690	1.88	1765	2.15
2625	1463	1.19	1551	1.43	1634	1.68	1713	1.95	1788	2.22
2815	1490	1.25	1577	1.49	1659	1.75	1738	2.02	1812	2.30
3000	1519	1.31	1604	1.56	1685	1.82	1762	2.09	1836	2.38
3190	1551	1.38	1633	1.63	1712	1.90	1788	2.18	1861	2.47
3375	1584	1.46	1663	1.71	1740	1.98	1815	2.26	1886	2.55
3565	1621	1.55	1697	1.80	1771	2.07	1843	2.35	1914	2.65
3750	1658	1.64	1731	1.90	1803	2.17	1873	2.45	1942	2.75

Standard Static 788-2000 rpm, 2.55 Max bhp

High Static 788-2200 rpm, 3.2 Max bhp

Table 30 — 40RLSA08 Standard Static Fan Data (rpm — vdc)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
2250	850	4.1	975	4.7	1096	5.4	1210	5.9	1315	6.5
2440	900	4.3	1017	4.9	1130	5.5	1239	6.1	1342	6.6
2625	951	4.6	1060	5.2	1167	5.7	1270	6.2	1369	6.8
2815	1004	4.9	1107	5.4	1207	5.9	1305	6.4	1400	6.9
3000	1056	5.1	1154	5.6	1248	6.1	1341	6.6	1432	7.1
3190	1111	5.4	1203	5.9	1292	6.4	1380	6.8	1467	7.3
3375	1165	5.7	1253	6.2	1337	6.6	1421	7.0	1503	7.4
3565	1221	6.0	1304	6.4	1385	6.8	1464	7.2	1543	7.6
3750	1275	6.3	1355	6.7	1432	7.1	1508	7.5	1583	7.9

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
2250	1412	7.0	1503	7.4	1587	7.9	1666	8.3	1740	8.7
2440	1437	7.1	1527	7.6	1611	8.0	1690	8.4	1765	8.8
2625	1463	7.2	1551	7.7	1634	8.1	1713	8.5	1788	8.9
2815	1490	7.4	1577	7.8	1659	8.2	1738	8.7	1812	9.0
3000	1519	7.5	1604	8.0	1685	8.4	1762	8.8	1836	9.2
3190	1551	7.7	1633	8.1	1712	8.5	1788	8.9	1861	9.3
3375	1584	7.9	1663	8.3	1740	8.7	1815	9.0	—	—
3565	1621	8.1	1697	8.4	1771	8.8	1843	9.2	—	—
3750	1658	8.2	1731	8.6	1803	9.0	1873	9.3	—	—

Standard Static 788-2000 rpm, 2.55 Max bhp

Table 31 — 40RLSA08 High Static Fan Data (rpm — vdc)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
2250	850	3.8	975	4.3	1096	4.9	1210	5.4	1315	5.9
2440	900	4.0	1017	4.5	1130	5.1	1239	5.6	1342	6.0
2625	951	4.2	1060	4.7	1167	5.2	1270	5.7	1369	6.2
2815	1004	4.5	1107	5.0	1207	5.4	1305	5.9	1400	6.3
3000	1056	4.7	1154	5.2	1248	5.6	1341	6.0	1432	6.5
3190	1111	5.0	1203	5.4	1292	5.8	1380	6.2	1467	6.6
3375	1165	5.2	1253	5.6	1337	6.0	1421	6.4	1503	6.8
3565	1221	5.5	1304	5.9	1385	6.2	1464	6.6	1543	7.0
3750	1275	5.7	1355	6.1	1432	6.5	1508	6.8	1583	7.2

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
2250	1412	6.4	1503	6.8	1587	7.2	1666	7.5	1740	7.9
2440	1437	6.5	1527	6.9	1611	7.3	1690	7.6	1765	8.0
2625	1463	6.6	1551	7.0	1634	7.4	1713	7.8	1788	8.1
2815	1490	6.7	1577	7.1	1659	7.5	1738	7.9	1812	8.2
3000	1519	6.9	1604	7.2	1685	7.6	1762	8.0	1836	8.3
3190	1551	7.0	1633	7.4	1712	7.7	1788	8.1	1861	8.4
3375	1584	7.2	1663	7.5	1740	7.9	1815	8.2	1886	8.6
3565	1621	7.3	1697	7.7	1771	8.0	1843	8.4	1914	8.7
3750	1658	7.5	1731	7.8	1803	8.2	1873	8.5	1942	8.8

High Static 788-2200 rpm, 3.2 Max bhp

Table 32 — 40RLSA10 Fan Data (rpm — bhp)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2550	929	0.26	1041	0.39	1151	0.55	1256	0.74	1357	0.94
2765	989	0.30	1093	0.44	1195	0.61	1294	0.80	1390	1.00
2975	1048	0.36	1146	0.50	1241	0.67	1335	0.86	1426	1.07
3190	1110	0.42	1202	0.57	1291	0.74	1379	0.94	1465	1.15
3400	1171	0.49	1257	0.64	1342	0.82	1425	1.02	1507	1.23
3615	1234	0.57	1316	0.73	1396	0.91	1474	1.11	1552	1.33
3825	1296	0.65	1374	0.82	1450	1.01	1525	1.21	1598	1.43
4040	1360	0.75	1435	0.92	1507	1.12	1578	1.32	1648	1.55
4250	1423	0.86	1494	1.03	1563	1.23	1631	1.44	1698	1.67

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2550	1451	1.17	1540	1.40	1624	1.65	1703	1.92	1777	2.19
2765	1482	1.23	1569	1.47	1651	1.73	1730	2.00	1804	2.27
2975	1514	1.30	1599	1.55	1680	1.81	1757	2.08	1831	2.36
3190	1550	1.38	1632	1.63	1711	1.89	1786	2.17	1859	2.46
3400	1587	1.47	1666	1.72	1743	1.99	1817	2.27	1888	2.56
3615	1629	1.57	1704	1.82	1778	2.09	1850	2.37	1920	2.67
3825	1672	1.67	1744	1.93	1815	2.20	1884	2.49	1952	2.79
4040	1718	1.79	1786	2.05	1855	2.33	1922	2.62	1987	2.92
4250	1765	1.92	1831	2.19	1896	2.46	1960	2.75	2024	3.06

Standard Static 788-2000 rpm, 2.55 Max bhp

High Static 788-2200 rpm, 3.2 Max bhp

Table 33 — 40RLSA10 Standard Static Fan Data (rpm — vdc)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
2550	929	4.5	1041	5.1	1151	5.6	1256	6.2	1357	6.7
2765	989	4.8	1093	5.3	1195	5.9	1294	6.4	1390	6.9
2975	1048	5.1	1146	5.6	1241	6.1	1335	6.6	1426	7.0
3190	1110	5.4	1202	5.9	1291	6.4	1379	6.8	1465	7.2
3400	1171	5.7	1257	6.2	1342	6.6	1425	7.0	1507	7.5
3615	1234	6.1	1316	6.5	1396	6.9	1474	7.3	1552	7.7
3825	1296	6.4	1374	6.8	1450	7.2	1525	7.6	1598	7.9
4040	1360	6.7	1435	7.1	1507	7.5	1578	7.8	1648	8.2
4250	1423	7.0	1494	7.4	1563	7.8	1631	8.1	1698	8.4

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
2550	1451	7.2	1540	7.6	1624	8.1	1703	8.5	1777	8.9
2765	1482	7.3	1569	7.8	1651	8.2	1730	8.6	1804	9.0
2975	1514	7.5	1599	7.9	1680	8.4	1757	8.8	1831	9.1
3190	1550	7.7	1632	8.1	1711	8.5	1786	8.9	1859	9.3
3400	1587	7.9	1666	8.3	1743	8.7	1817	9.1	—	—
3615	1629	8.1	1704	8.5	1778	8.9	1850	9.2	—	—
3825	1672	8.3	1744	8.7	1815	9.0	1884	9.4	—	—
4040	1718	8.5	1786	8.9	1855	9.3	—	—	—	—
4250	1765	8.8	1831	9.1	1896	9.5	—	—	—	—

Standard Static 788-2000 rpm, 2.55 Max bhp

Table 34 — 40RLSA10 High Static Fan Data (rpm — vdc)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
2550	929	4.1	1041	4.7	1151	5.2	1256	5.6	1357	6.1
2765	989	4.4	1093	4.9	1195	5.4	1294	5.8	1390	6.3
2975	1048	4.7	1146	5.1	1241	5.6	1335	6.0	1426	6.4
3190	1110	5.0	1202	5.4	1291	5.8	1379	6.2	1465	6.6
3400	1171	5.3	1257	5.6	1342	6.0	1425	6.4	1507	6.8
3615	1234	5.5	1316	5.9	1396	6.3	1474	6.6	1552	7.0
3825	1296	5.8	1374	6.2	1450	6.5	1525	6.9	1598	7.2
4040	1360	6.1	1435	6.5	1507	6.8	1578	7.1	1648	7.5
4250	1423	6.4	1494	6.7	1563	7.1	1631	7.4	1698	7.7

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
2550	1451	6.5	1540	7.0	1624	7.3	1703	7.7	1777	8.0
2765	1482	6.7	1569	7.1	1651	7.5	1730	7.8	1804	8.2
2975	1514	6.8	1599	7.2	1680	7.6	1757	8.0	1831	8.3
3190	1550	7.0	1632	7.4	1711	7.7	1786	8.1	1859	8.4
3400	1587	7.2	1666	7.5	1743	7.9	1817	8.2	1888	8.6
3615	1629	7.4	1704	7.7	1778	8.1	1850	8.4	1920	8.7
3825	1672	7.6	1744	7.9	1815	8.2	1884	8.5	1952	8.9
4040	1718	7.8	1786	8.1	1855	8.4	1922	8.7	1987	9.0
4250	1765	8.0	1831	8.3	1896	8.6	1960	8.9	2024	9.2

High Static 788-2200 rpm, 3.2 Max bhp

Table 35 — 40RLSA12 Fan Data (rpm — bhp)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3000	1049	0.36	1146	0.50	1240	0.67	1333	0.85	1424	1.06
3250	1120	0.43	1211	0.58	1299	0.75	1385	0.94	1470	1.15
3500	1193	0.51	1278	0.67	1360	0.85	1440	1.04	1520	1.25
3750	1266	0.61	1346	0.77	1423	0.95	1499	1.15	1574	1.37
4000	1340	0.71	1415	0.88	1488	1.07	1560	1.28	1630	1.50
4250	1414	0.84	1486	1.01	1555	1.21	1623	1.42	1689	1.64
4500	1489	0.97	1557	1.15	1623	1.36	1687	1.57	1751	1.81
4750	1564	1.12	1629	1.31	1692	1.52	1753	1.74	1814	1.98
5000	1639	1.28	1702	1.49	1762	1.70	1820	1.93	1878	2.17

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3000	1512	1.29	1596	1.54	1677	1.79	1754	2.06	1828	2.35
3250	1553	1.38	1634	1.63	1712	1.89	1788	2.17	1861	2.46
3500	1599	1.49	1676	1.74	1751	2.00	1824	2.28	1895	2.58
3750	1648	1.61	1721	1.86	1793	2.13	1863	2.41	1932	2.71
4000	1700	1.74	1770	2.00	1838	2.27	1906	2.55	1972	2.85
4250	1756	1.89	1822	2.15	1887	2.42	1951	2.71	2015	3.01
4500	1814	2.05	1876	2.31	1938	2.59	2000	2.89	2060	3.19
4750	1874	2.23	1933	2.50	1992	2.78	2051	3.08	—	—
5000	1935	2.43	1992	2.70	2048	2.98	—	—	—	—

Standard Static 788-2000 rpm, 2.55 Max bhp

High Static 788-2200 rpm, 3.2 Max bhp

Table 36 — 40RLSA12 Standard Static Fan Data (rpm — vdc)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
3000	1049	5.1	1146	5.6	1240	6.1	1333	6.6	1424	7.0
3250	1120	5.5	1211	5.9	1299	6.4	1385	6.8	1470	7.3
3500	1193	5.8	1278	6.3	1360	6.7	1440	7.1	1520	7.5
3750	1266	6.2	1346	6.6	1423	7.0	1499	7.4	1574	7.8
4000	1340	6.6	1415	7.0	1488	7.4	1560	7.7	1630	8.1
4250	1414	7.0	1486	7.4	1555	7.7	1623	8.1	1689	8.4
4500	1489	7.4	1557	7.7	1623	8.1	1687	8.4	1751	8.7
4750	1564	7.8	1629	8.1	1692	8.4	1753	8.7	1814	9.0
5000	1639	8.1	1702	8.5	1762	8.8	1820	9.1	1878	9.4

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
3000	1512	7.5	1596	7.9	1677	8.3	1754	8.7	1828	9.1
3250	1553	7.7	1634	8.1	1712	8.5	1788	8.9	1861	9.3
3500	1599	7.9	1676	8.3	1751	8.7	1824	9.1	—	—
3750	1648	8.2	1721	8.6	1793	8.9	1863	9.3	—	—
4000	1700	8.5	1770	8.8	1838	9.2	—	—	—	—
4250	1756	8.7	1822	9.1	1887	9.4	—	—	—	—
4500	1814	9.0	1876	9.4	—	—	—	—	—	—
4750	1874	9.4	1933	9.7	—	—	—	—	—	—
5000	1935	9.7	—	—	—	—	—	—	—	—

Standard Static 788-2000 rpm, 2.55 Max bhp

Table 37 — 40RLSA12 High Static Fan Data (rpm — vdc)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
3000	1049	4.7	1146	5.1	1240	5.6	1333	6.0	1424	6.4
3250	1120	5.0	1211	5.4	1299	5.8	1385	6.2	1470	6.6
3500	1193	5.4	1278	5.7	1360	6.1	1440	6.5	1520	6.9
3750	1266	5.7	1346	6.1	1423	6.4	1499	6.8	1574	7.1
4000	1340	6.0	1415	6.4	1488	6.7	1560	7.0	1630	7.4
4250	1414	6.4	1486	6.7	1555	7.0	1623	7.3	1689	7.6
4500	1489	6.7	1557	7.0	1623	7.3	1687	7.6	1751	7.9
4750	1564	7.1	1629	7.4	1692	7.7	1753	7.9	1814	8.2
5000	1639	7.4	1702	7.7	1762	8.0	1820	8.2	1878	8.5

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
3000	1512	6.8	1596	7.2	1677	7.6	1754	7.9	1828	8.3
3250	1553	7.0	1634	7.4	1712	7.7	1788	8.1	1861	8.4
3500	1599	7.2	1676	7.6	1751	7.9	1824	8.3	1895	8.6
3750	1648	7.5	1721	7.8	1793	8.1	1863	8.4	1932	8.8
4000	1700	7.7	1770	8.0	1838	8.3	1906	8.6	1972	8.9
4250	1756	8.0	1822	8.3	1887	8.6	1951	8.9	2015	9.1
4500	1814	8.2	1876	8.5	1938	8.8	2000	9.1	2060	9.4
4750	1874	8.5	1933	8.8	1992	9.0	2051	9.3	—	—
5000	1935	8.8	1992	9.0	2048	9.3	—	—	—	—

High Static 788-2200 rpm, 3.2 Max bhp

Table 38 — 40RLQA07 Fan Data (rpm - bhp)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1800	788	0.18	942	0.31	1081	0.48	1202	0.67	1308	0.88
1950	828	0.20	973	0.34	1107	0.52	1227	0.71	1333	0.92
2100	870	0.23	1005	0.37	1134	0.55	1252	0.75	1358	0.97
2250	914	0.26	1040	0.41	1163	0.59	1278	0.80	1383	1.02
2400	958	0.30	1077	0.45	1194	0.63	1305	0.84	1409	1.07
2550	1004	0.34	1115	0.50	1226	0.68	1334	0.89	1435	1.13
2700	1050	0.39	1155	0.55	1261	0.74	1364	0.95	1462	1.18
2850	1097	0.44	1197	0.60	1297	0.79	1395	1.01	1491	1.25
3000	1144	0.50	1239	0.66	1334	0.86	1429	1.08	1521	1.32

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
1800	1403	1.09	1491	1.32	1571	1.55	1647	1.79	1718	2.04
1950	1429	1.14	1517	1.38	1598	1.62	1674	1.87	1745	2.13
2100	1454	1.20	1542	1.44	1624	1.69	1700	1.95	1772	2.21
2250	1479	1.25	1568	1.50	1650	1.76	1726	2.02	1799	2.30
2400	1504	1.31	1593	1.57	1675	1.83	1752	2.11	1825	2.39
2550	1529	1.37	1618	1.64	1700	1.91	1777	2.19	1850	2.48
2700	1555	1.44	1643	1.70	1725	1.98	1802	2.27	1875	2.57
2850	1582	1.50	1668	1.78	1750	2.06	1827	2.36	1900	2.66
3000	1610	1.58	1695	1.86	1775	2.14	1852	2.45	1925	2.76

Standard Static 1080-2000 rpm, 2.55 Max bhp

High Static 1080-2200 rpm, 3.2 Max bhp

Table 39 — 40RLQA07 Standard Static Fan Data (rpm - vdc)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
1800	788	3.8	942	4.6	1081	5.3	1202	5.9	1308	6.4
1950	828	4.0	973	4.7	1107	5.4	1227	6.0	1333	6.6
2100	870	4.2	1005	4.9	1134	5.5	1252	6.2	1358	6.7
2250	914	4.4	1040	5.1	1163	5.7	1278	6.3	1383	6.8
2400	958	4.6	1077	5.3	1194	5.9	1305	6.4	1409	7.0
2550	1004	4.9	1115	5.4	1226	6.0	1334	6.6	1435	7.1
2700	1050	5.1	1155	5.7	1261	6.2	1364	6.7	1462	7.2
2850	1097	5.4	1197	5.9	1297	6.4	1395	6.9	1491	7.4
3000	1144	5.6	1239	6.1	1334	6.6	1429	7.1	1521	7.5

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
1800	1403	6.9	1491	7.4	1571	7.8	1647	8.2	1718	8.5
1950	1429	7.1	1517	7.5	1598	7.9	1674	8.3	1745	8.7
2100	1454	7.2	1542	7.6	1624	8.1	1700	8.5	1772	8.8
2250	1479	7.3	1568	7.8	1650	8.2	1726	8.6	1799	9.0
2400	1504	7.4	1593	7.9	1675	8.3	1752	8.7	1825	9.1
2550	1529	7.6	1618	8.0	1700	8.5	1777	8.9	1850	9.2
2700	1555	7.7	1643	8.2	1725	8.6	1802	9.0	—	—
2850	1582	7.9	1668	8.3	1750	8.7	1827	9.1	—	—
3000	1610	8.0	1695	8.4	1775	8.8	1852	9.2	—	—

Standard Static 1080-2000 rpm, 2.55 Max bhp

Table 40 — 40RLQA07 High Static Fan Data (rpm - vdc)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
1800	788	3.5	942	4.2	1081	4.8	1202	5.4	1308	5.9
1950	828	3.7	973	4.3	1107	5.0	1227	5.5	1333	6.0
2100	870	3.9	1005	4.5	1134	5.1	1252	5.6	1358	6.1
2250	914	4.1	1040	4.6	1163	5.2	1278	5.7	1383	6.2
2400	958	4.3	1077	4.8	1194	5.4	1305	5.9	1409	6.3
2550	1004	4.5	1115	5.0	1226	5.5	1334	6.0	1435	6.5
2700	1050	4.7	1155	5.2	1261	5.7	1364	6.1	1462	6.6
2850	1097	4.9	1197	5.4	1297	5.8	1395	6.3	1491	6.7
3000	1144	5.1	1239	5.6	1334	6.0	1429	6.4	1521	6.9

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
1800	1403	6.3	1491	6.7	1571	7.1	1647	7.4	1718	7.8
1950	1429	6.4	1517	6.8	1598	7.2	1674	7.6	1745	7.9
2100	1454	6.6	1542	7.0	1624	7.3	1700	7.7	1772	8.0
2250	1479	6.7	1568	7.1	1650	7.5	1726	7.8	1799	8.1
2400	1504	6.8	1593	7.2	1675	7.6	1752	7.9	1825	8.3
2550	1529	6.9	1618	7.3	1700	7.7	1777	8.0	1850	8.4
2700	1555	7.0	1643	7.4	1725	7.8	1802	8.2	1875	8.5
2850	1582	7.1	1668	7.5	1750	7.9	1827	8.3	1900	8.6
3000	1610	7.3	1695	7.7	1775	8.0	1852	8.4	1925	8.7

High Static 1080-2200 rpm, 3.2 Max bhp

Table 41 — 40RLQA08 Fan Data (rpm - bhp)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2250	884	0.23	1009	0.37	1131	0.54	1247	0.74	1354	0.95
2440	937	0.27	1053	0.42	1168	0.59	1279	0.79	1383	1.01
2625	991	0.32	1099	0.47	1206	0.64	1311	0.84	1412	1.07
2815	1048	0.37	1149	0.53	1249	0.70	1348	0.90	1445	1.13
3000	1103	0.43	1199	0.59	1293	0.77	1386	0.97	1478	1.20
3190	1161	0.50	1252	0.66	1340	0.85	1428	1.05	1516	1.28
3375	1218	0.57	1304	0.74	1388	0.93	1471	1.14	1554	1.37
3565	1277	0.66	1359	0.83	1438	1.02	1517	1.24	1596	1.47
3750	1335	0.75	1413	0.93	1489	1.13	1564	1.34	1639	1.58

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
2250	1452	1.18	1542	1.43	1625	1.68	1703	1.94	1776	2.21
2440	1480	1.25	1570	1.50	1653	1.76	1731	2.03	1805	2.31
2625	1507	1.31	1597	1.57	1680	1.83	1759	2.11	1833	2.40
2815	1537	1.38	1625	1.64	1708	1.91	1787	2.20	1861	2.50
3000	1568	1.45	1654	1.72	1736	2.00	1814	2.29	1888	2.60
3190	1602	1.54	1685	1.80	1765	2.09	1842	2.39	1916	2.70
3375	1636	1.62	1717	1.90	1795	2.18	1871	2.49	1944	2.81
3565	1675	1.73	1752	2.00	1828	2.29	1902	2.60	1973	2.92
3750	1714	1.83	1788	2.11	1862	2.41	1933	2.71	2003	3.04

Standard Static 1080-2000 rpm, 2.55 Max bhp

High Static 1080-2200 rpm, 3.2 Max bhp

Table 42 — 40RLQA08 Standard Static Fan Data (rpm - vdc)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
2250	884	4.3	1009	4.9	1131	5.5	1247	6.1	1354	6.7
2440	937	4.5	1053	5.1	1168	5.7	1279	6.3	1383	6.8
2625	991	4.8	1099	5.4	1206	5.9	1311	6.5	1412	7.0
2815	1048	5.1	1149	5.6	1249	6.1	1348	6.6	1445	7.1
3000	1103	5.4	1199	5.9	1293	6.4	1386	6.8	1478	7.3
3190	1161	5.7	1252	6.2	1340	6.6	1428	7.1	1516	7.5
3375	1218	6.0	1304	6.4	1388	6.9	1471	7.3	1554	7.7
3565	1277	6.3	1359	6.7	1438	7.1	1517	7.5	1596	7.9
3750	1335	6.6	1413	7.0	1489	7.4	1564	7.8	1639	8.1

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
2250	1452	7.2	1542	7.6	1625	8.1	1703	8.5	1776	8.8
2440	1480	7.3	1570	7.8	1653	8.2	1731	8.6	1805	9.0
2625	1507	7.5	1597	7.9	1680	8.4	1759	8.8	1833	9.1
2815	1537	7.6	1625	8.1	1708	8.5	1787	8.9	1861	9.3
3000	1568	7.8	1654	8.2	1736	8.6	1814	9.0	—	—
3190	1602	8.0	1685	8.4	1765	8.8	1842	9.2	—	—
3375	1636	8.1	1717	8.5	1795	8.9	1871	9.3	—	—
3565	1675	8.3	1752	8.7	1828	9.1	—	—	—	—
3750	1714	8.5	1788	8.9	1862	9.3	—	—	—	—

Standard Static 1080-2000 rpm, 2.55 Max bhp

Table 43 — 40RLQA08 High Static Fan Data (rpm - vdc)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
2250	884	3.9	1009	4.5	1131	5.1	1247	5.6	1354	6.1
2440	937	4.2	1053	4.7	1168	5.2	1279	5.7	1383	6.2
2625	991	4.4	1099	4.9	1206	5.4	1311	5.9	1412	6.4
2815	1048	4.7	1149	5.1	1249	5.6	1348	6.1	1445	6.5
3000	1103	4.9	1199	5.4	1293	5.8	1386	6.2	1478	6.7
3190	1161	5.2	1252	5.6	1340	6.0	1428	6.4	1516	6.8
3375	1218	5.5	1304	5.9	1388	6.3	1471	6.6	1554	7.0
3565	1277	5.7	1359	6.1	1438	6.5	1517	6.8	1596	7.2
3750	1335	6.0	1413	6.4	1489	6.7	1564	7.1	1639	7.4

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
2250	1452	6.5	1542	7.0	1625	7.3	1703	7.7	1776	8.0
2440	1480	6.7	1570	7.1	1653	7.5	1731	7.8	1805	8.2
2625	1507	6.8	1597	7.2	1680	7.6	1759	8.0	1833	8.3
2815	1537	6.9	1625	7.3	1708	7.7	1787	8.1	1861	8.4
3000	1568	7.1	1654	7.5	1736	7.9	1814	8.2	1888	8.6
3190	1602	7.2	1685	7.6	1765	8.0	1842	8.3	1916	8.7
3375	1636	7.4	1717	7.8	1795	8.1	1871	8.5	1944	8.8
3565	1675	7.6	1752	7.9	1828	8.3	1902	8.6	1973	9.0
3750	1714	7.8	1788	8.1	1862	8.4	1933	8.8	2003	9.1

High Static 1080-2200 rpm, 3.2 Max bhp

Table 44 — 40RLQA12 Fan Data (rpm - bhp)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3000	1080	0.40	1175	0.55	1268	0.72	1361	0.92	1453	1.14
3250	1154	0.48	1243	0.64	1329	0.81	1415	1.01	1501	1.24
3500	1229	0.57	1312	0.74	1393	0.92	1473	1.13	1553	1.35
3750	1305	0.68	1384	0.86	1459	1.04	1534	1.25	1609	1.48
4000	1381	0.80	1456	0.99	1527	1.18	1598	1.40	1668	1.63
4250	1458	0.94	1529	1.13	1597	1.34	1664	1.56	1730	1.79
4500	1535	1.09	1603	1.29	1668	1.50	1731	1.73	1794	1.97
4750	1613	1.26	1678	1.47	1740	1.69	1800	1.92	1860	2.17
5000	1691	1.45	1753	1.67	1813	1.90	1870	2.14	1927	2.39

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp	rpm	bhp
3000	1543	1.38	1629	1.64	1712	1.91	1791	2.20	1866	2.50
3250	1586	1.48	1668	1.74	1748	2.02	1825	2.31	1899	2.62
3500	1632	1.59	1711	1.86	1787	2.14	1862	2.44	1935	2.75
3750	1683	1.73	1757	1.99	1830	2.28	1902	2.58	1972	2.89
4000	1738	1.88	1807	2.14	1877	2.43	1945	2.73	2013	3.05
4250	1795	2.04	1861	2.31	1927	2.60	1992	2.90	—	—
4500	1856	2.23	1918	2.50	1980	2.79	2042	3.09	—	—
4750	1919	2.43	1977	2.71	2036	3.00	—	—	—	—
5000	1983	2.66	2039	2.94	—	—	—	—	—	—

Standard Static 1080-2000 rpm, 2.55 Max bhp

High Static 1080-2200 rpm, 3.2 Max bhp

Table 45 — 40RLQA12 Standard Static Fan Data (rpm - vdc)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
3000	1080	5.3	1175	5.8	1268	6.2	1361	6.7	1453	7.2
3250	1154	5.6	1243	6.1	1329	6.5	1415	7.0	1501	7.4
3500	1229	6.0	1312	6.5	1393	6.9	1473	7.3	1553	7.7
3750	1305	6.4	1384	6.8	1459	7.2	1534	7.6	1609	8.0
4000	1381	6.8	1456	7.2	1527	7.6	1598	7.9	1668	8.3
4250	1458	7.2	1529	7.6	1597	7.9	1664	8.3	1730	8.6
4500	1535	7.6	1603	8.0	1668	8.3	1731	8.6	1794	8.9
4750	1613	8.0	1678	8.3	1740	8.7	1800	9.0	1860	9.3
5000	1691	8.4	1753	8.7	1813	9.0	1870	9.3	1927	9.6

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
3000	1543	7.6	1629	8.1	1712	8.5	1791	8.9	1866	9.3
3250	1586	7.9	1668	8.3	1748	8.7	1825	9.1	—	—
3500	1632	8.1	1711	8.5	1787	8.9	1862	9.3	—	—
3750	1683	8.4	1757	8.8	1830	9.1	—	—	—	—
4000	1738	8.7	1807	9.0	1877	9.4	—	—	—	—
4250	1795	8.9	1861	9.3	—	—	—	—	—	—
4500	1856	9.3	1918	9.6	—	—	—	—	—	—
4750	1919	9.6	—	—	—	—	—	—	—	—
5000	—	—	—	—	—	—	—	—	—	—

Standard Static 1080-2000 rpm, 2.55 Max bhp

Table 46 — 40RLQA12 High Static Fan Data (rpm - vdc)

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	0.2		0.4		0.6		0.8		1.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
3000	1080	4.8	1175	5.3	1268	5.7	1361	6.1	1453	6.6
3250	1154	5.2	1243	5.6	1329	6.0	1415	6.4	1501	6.8
3500	1229	5.5	1312	5.9	1393	6.3	1473	6.6	1553	7.0
3750	1305	5.9	1384	6.2	1459	6.6	1534	6.9	1609	7.3
4000	1381	6.2	1456	6.6	1527	6.9	1598	7.2	1668	7.5
4250	1458	6.6	1529	6.9	1597	7.2	1664	7.5	1730	7.8
4500	1535	6.9	1603	7.2	1668	7.5	1731	7.8	1794	8.1
4750	1613	7.3	1678	7.6	1740	7.9	1800	8.2	1860	8.4
5000	1691	7.7	1753	7.9	1813	8.2	1870	8.5	1927	8.7

CFM	AVAILABLE EXTERNAL STATIC PRESSURE (in. wg)									
	1.2		1.4		1.6		1.8		2.0	
	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc	rpm	vdc
3000	1543	7.0	1629	7.4	1712	7.7	1791	8.1	1866	8.5
3250	1586	7.2	1668	7.5	1748	7.9	1825	8.3	1899	8.6
3500	1632	7.4	1711	7.7	1787	8.1	1862	8.4	1935	8.8
3750	1683	7.6	1757	8.0	1830	8.3	1902	8.6	1972	8.9
4000	1738	7.9	1807	8.2	1877	8.5	1945	8.8	2013	9.1
4250	1795	8.1	1861	8.4	1927	8.7	1992	9.0	—	—
4500	1856	8.4	1918	8.7	1980	9.0	2042	9.3	—	—
4750	1919	8.7	1977	9.0	2036	9.2	—	—	—	—
5000	1983	9.0	2039	9.3	—	—	—	—	—	—

High Static 1080-2200 rpm, 3.2 Max bhp

DECOMMISSIONING

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced.

1. Become familiar with the equipment and its operation.
2. Isolate the system electrically.
3. Before attempting the procedure, ensure that:
   a. Mechanical handling equipment is available, if required for handling refrigerant cylinders.
   b. All personal protective equipment is available and being used correctly.
   c. The recovery process is supervised at all times by a competent person.
   d. Recovery equipment and cylinders conform to the appropriate standards.
4. Pump down refrigerant system, if possible.
5. If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
6. Make sure that the cylinder is situated on the scales before recovery takes place.
7. Start the recovery machine and operate in accordance with instructions.
8. Do not overfill cylinders (no more than 80% of volume liquid charge).
9. Do not exceed the maximum working pressure of the cylinder, even temporarily.
10. When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from the site promptly and all isolation valves on the equipment are closed off.
11. Recovered refrigerant shall not be charged into another refrigerating system unless it has been cleaned and checked.

Equipment shall be labeled that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing flammable refrigerants, ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

START-UP CHECKLIST
(SPLIT SYSTEMS WITH 40RL UNITS)

NOTE: To avoid injury to personnel and damage to equipment or property when completing the procedures listed in this start-up checklist, use good judgment, follow safe practices, and adhere to the safety considerations/information as outlined in preceding sections of this Installation, Start-Up, and Service document.

I. PRELIMINARY INFORMATION

OUTDOOR:
MODEL NO. _____
SERIAL NO. _____
INDOOR:
MODEL NO. _____
SERIAL NO. _____
ADDITIONAL ACCESSORIES _____

_____

II. PRE-START-UP

OUTDOOR UNIT

Is there any shipping damage?
If so, where:_____

_____

Will this damage prevent unit start-up?	(Y/N) _____
Check power supply. Does it agree with unit?	(Y/N) _____
Has the ground wire been connected?	(Y/N) _____
Has ground integrity been verified with a continuity test?	(Y/N) _____
Has the circuit protection been sized and installed properly?	(Y/N) _____
Are the power wires to the unit sized and installed properly?	(Y/N) _____
Have compressor holddown bolts been loosened?	(Y/N) _____
CONTROLS	
Are thermostat(s) & indoor fan control wiring connections made & checked?	(Y/N) _____
Are all wiring terminals (including main power supply) tight?	(Y/N) _____
Have outdoor unit crankcase heaters been energized for 24 hours?	(Y/N) _____
INDOOR UNIT	
Has water been placed in drain pan to confirm proper drainage?	(Y/N) _____
Are proper air filters in place?	(Y/N) _____
PIPING	
40RLA, 40RLQ	
Has foam shipping block been removed from the TXV (Thermostatic Expansion Valve)?	(Y/N) _____
Are Liquid Line Solenoid Valves located at the indoor unit or outdoor unit coils as required?	(Y/N) _____
Have leak checks been made at compressors, condensers, indoor coils, TXVs (Thermostatic Expansion Valves) solenoid valves, filter driers, and fusible plugs with a leak detector? Locate, repair, and report any leaks.	(Y/N) _____
Have all compressor service valves been fully opened (backseated)	(Y/N) _____
Are the compressor oil sight glasses showing correct levels?	(Y/N) _____
40RLS	
Has air been bled from system?	(Y/N) _____
Have leak checks been made at compressors, chillers, valves, & indoor coils?	(Y/N) _____
Locate, repair, and report any leaks.	(Y/N) _____

CHECK VOLTAGE IMBALANCE

LINE-TO-LINEV OLTS: AB_____ V AC_____ V BC_____ V

(AB + AC + BC) / 3 = Average Voltage = _____V

Maximum deviation from average voltage = _____V

Voltage imbalance = 100 x (Max Deviation) / (Average Voltage) = _____

IF OVER 2% VOLTAGE IMBALANCE, DO NOT ATTEMPT TO START SYSTEM!

CALL LOCAL POWER COMPANY FOR ASSISTANCE.

III. START-UP

Check indoor fan motor speed and record.

After at least 10 minutes running time, record the following measurements:

	COMP A1	COMP B1
Oil pressure	_____	_____
Suction pressure	_____	_____
Suction line temp	_____	_____
Discharge pressure	_____	_____
Discharge line temp	_____	_____
Entering outdoor unit air temp	_____	_____
Leaving outdoor unit air temp	_____	_____
Indoor unit entering air DB temp	_____	_____
Indoor unit entering air WB temp	_____	_____
Indoor unit leaving air DB temp	_____	_____
Indoor unit leaving air WB temp		_____ _____

Outdoor unit entering water temp (40RLS only) _____ _____

Outdoor unit leaving water temp (40RLS only) _____ _____

Indoor unit entering water temp (40RLS only) _____ _____

Indoor unit leaving water temp (40RLS only) _____ _____

Compressor amps (L1/L2/L3)____/____/_____/____/____

Check the compressor oil level sight glasses: are the sight glasses showing oil level at 1/8 to 1/3 full? (Y/N) _____

III. ADAPTIVE DEHUMIDIFICATION SYSTEM START-UP

1. Switch unit to dehumid (reheat) by opening Y1 (Y/N) _____

OBSERVE

   a. Suction pressure increases to normal cooling level (Y/N) _____
   b. Discharge pressure decreases (35 to 50 psi) (Limited by low ambient control) (Y/N) _____
   c. Liquid temperature returns to normal cooling level (Y/N) _____
   d. LDV solenoid energized (valve closes) (Y/N) _____

2. With unit in dehumid mode close W1 compressor and outdoor fan stop; LDV solenoids de-energized (Y/N) _____
3. Open W1 restore unit to dehumid mode (Y/N) _____
4. Open humidistat input compressor and outdoor fan stop; LDV solenoids de-energized (Y/N) _____
5. Restore set-points for thermostat and humidistat (Y/N) _____

NOTES:

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CUT ALONG DOTTED LINE

CUT ALONG DOTTED LINE