Carrier

40UV,UH
Floor and Ceiling Mounted Unit Ventilators

Installation, Start-Up and Service Instructions

Part No. 5H1065110000

CONTENTS

SAFETY CONSIDERATIONS

The installation and maintenance instructions in this manual must be followed to provide safe, efficient, and trouble-free operation. In addition, particular care must be exercised regarding the special precautions listed below. Failure to properly address these critical areas could result in property damage or loss, personal injury, or death. These instructions are subject to any more restrictive local or national codes.

HAZARD INTENSITY LEVELS

DANGER: Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.

WARNING: Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.

CAUTION: Indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury.

IMPORTANT: Indicates a situation which, if not avoided, MAY result in a potential safety concern.

PRÉCAUTIONS PARTICULIÈRES

Les instructions d'installation et d'entretien de ce manuel doivent être suivies pour assurer un fonctionnement sûr, efficace et sans problème. De plus, une attention particulière doit être portée aux précautions particulières énumérées ci-dessous. Le fait de ne pas traiter correctement ces zones critiques pourrait entraîner des dommages matériels ou des pertes, des blessures corporelles, voire

la mort. Ces instructions sont soumises à des codes locaux ou nationaux plus restrictifs.

HIÉRARCHIE DES NIVEAUX DE RISQUES

DANGER: Indique un danger imminent qui, s'il n'est pas évité, entraînera INÉVITABLEMENT des blessures graves, voire mortelles.

AVERTISSEMENT: Indique un danger potentiel qui, s'il n'est pas évité, RISQUE d'entraîner des blessures graves, voire mortelles.

ATTENTION: Indique un danger potentiel qui, s'il n'est pas évité, PEUT entraîner des blessures mineures ou modérées.

IMPORTANT: Indique une situation qui, si elle se matérialise, PEUT entraîner des risques pour la sécurité des personnes.

IMPORTANT: The use of this manual is specifically intended for a qualified installation and service agency. A qualified installation and service agency must perform all installation and service of these appliances.

Units with DX evaporator coils contain the refrigerant R-454B. Review the R-454B Material Safety Data Sheet (MSDS) for hazards and first aid measures.

Refrigerant charging should only be carried out by an EPA-certified air conditioning contractor.

For units with DX evaporator coils, Leak Detection System installed. Unit must be powered except for service.

Units with DX evaporator coils are equipped with electrically powered safety measures. To be effective, the unit must be electrically powered at all times after installation, other than when servicing.

Units with evaporator coils shall only be connected to a condenser designed to operate with R-454B.

Units with evaporator coils is a PARTIAL UNIT AIR CONDITIONER and must only be connected to other units that have been confirmed as complying to the PARTIAL UNIT requirements of Standard UL 60335-2-40/CSA C22.2 or UL 1995/CSA C22.2.

IMPORTANT: Ce manuel est spécifiquement destiné au personnel d'une entreprise qualifiée d'installation et d'entretien. Toutes les opérations d'installation et d'entretien doivent être confiées à une entreprise qualifiée.

Les unités munies de serpentins évaporateurs DX (reportez-vous à la nomenclature du modèle) contiennent du fluide frigorigène R-454B. Pour les dangers et les mesures de premiers soins, consultez la fiche signalétique du R-454B.

L'ajout de frigorigène doit être confié à un spécialiste de la climatisation certifié par l'agence de la protection de l'environnement (EPA) du gouvernement américain.

Pour les unités avec des serpentins évaporateurs DX, le système de détection de fuites est installé. L'unité doit être alimentée en électricité sauf pour l'entretien.

Les unités avec des serpentins évaporateurs DX sont équipées de mesures de sécurité alimentées électriquement. Pour être efficaces, l'unité doit être alimentée en électricité en permanence après l'installation, sauf lors de l'entretien.

Les unités avec des serpentins évaporateurs ne doivent être connectées qu'à un condenseur conçu pour fonctionner avec le R-454B.

Les unités avec des serpentins évaporateurs sont des CLIMATISEURS D'UNITÉ PARTIELLE et ne doivent être connectées qu'à d'autres unités confirmées conformes aux exigences des UNITÉS PARTIELLES de la norme UL 60335-2-40/CSA C22.2 ou UL 1995/CSA C22.2.

⚠WARNING

Before performing service or maintenance operations, turn off main power switch to the unit. Electrical shock could cause personal injury.

⚠WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death, and could cause exposure to substances which have been determined by various state agencies to cause cancer, birth defects or other reproductive harm. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.

This unit contains R-454B high pressure refrigerant. Hazards exist that could result in personal injury or death. Installation, maintenance, and service must only be performed by an HVAC technician qualified in R-454B refrigerant and using proper tools and equipment. Due to much higher pressure of R-454B refrigerant, DO NOT USE service equipment or tools designed for refrigerants other than R-454B.

⚠AVERTISSEMENT

Une installation, un réglage, une altération, une réparation ou une maintenance impropre risque de causer des dommages, des blessures ou la mort, et d'engendrer une exposition à des substances dont certains États ont déterminé qu'elles étaient cancérogènes ou pouvaient causer des malformations à la naissance et des problèmes de reproduction. Lisez bien les instructions d'installation, d'utilisation et de maintenance avant d'installer ou de réparer cet appareil.

Les unités munies de serpentins évaporateurs DX (reportez-vous à la nomenclature du modèle) contiennent du fluide frigorigène à haute pression R-454B. Des dangers existent qui, s'ils se matérialisent, pourraient entraîner des blessures ou la mort. L'installation, l'entretien et le service ne doivent être effectués que par un technicien de CVC qualifié quant à l'usage du fluide frigorigène R-454B en utilisant les outils et l'équipement appropriés. En raison de la pression beaucoup plus élevée du fluide frigorigène R-454B, N'utilisez PAS des outils ou de l'équipement de service qui ne sont pas conçus spécifiquement pour le R-454B.

⚠CAUTION

Sharp edges, coil surfaces and rotating fans are a potential injury hazard - avoid contact.

⚠DANGER

Appliances must not be installed where they may be exposed to potentially explosive or flammable atmosphere.

⚠DANGER

Les appareils ne doivent pas être installés à un endroit où ils risquent d'être exposés à une atmosphère potentiellement explosive ou inflammable.

IMPORTANT: Start up and adjustment procedures, installation, and service of these appliances must be performed by a qualified installation and service agency.

Never leave the unit filled with water in a building without heat unless antifreeze has been added.

IMPORTANT: Les procédures de démarrage et de réglage, l'installation et le service de ces appareils doivent être confiés à un centre d'installation et de service qualifié.

Ne laissez jamais l'appareil rempli d'eau dans un immeuble non chauffé sans lui ajouter de l'antigel.

⚠WARNING

1. Units that are connected to an air duct within the same room that has less than the minimum room size, that room shall be without continuously operating open flames or potential ignition sources such as an electric heater or other hot surfaces. A flame producing device may be installed in the same space if the device is provided with an effective flame arrest.
2. Auxiliary devices which may be a potential ignition source with surface temperatures exceeding 1292°F (700°C) shall not be installed in the duct work or plenums.
3. The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance, or an operating electric heater).
4. Disconnect power supply before making wiring connections or working on this equipment. Follow all applicable safety procedures to prevent accidental power up. Failure to do so can result in injury or death from electrical shock or moving parts and may cause equipment damage.
5. All appliances must be wired strictly in accordance with the wiring diagram furnished with the appliance. Any wiring different from the wiring diagram could result in a hazard to persons and property.
6. Any original factory wiring that requires replacement must be replaced with wiring material having a temperature rating of at least 221°F (105°C).
7. Ensure that the supply voltage to the appliance, as indicated on the serial plate, is not 5% greater than rated voltage.
8. When servicing or repairing this equipment, use only factory-approved service replacement parts. Refer to the rating plate on the appliance for complete appliance model number, serial number, and company address. Any substitution of parts or controls not approved by the factory will be at the owner's risk.
9. Do not use a means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
10. Do not pierce or burn any portion of the refrigeration system.
11. Do not use open flames for detection of refrigerant leaks. Use only electronic leak detectors or non-chlorinated leak detection fluids.
12. Be aware that refrigerants may not contain an odor.

⚠ AVERTISSEMENT

1. Les unités connectées à un conduit d'air dans la même pièce qui a une taille inférieure à la taille minimale de la pièce, cette pièce doit être sans flammes ouvertes en fonctionnement continu ou sources potentielles d'inflammation telles qu'un radiateur électrique ou d'autres surfaces chaudes. Un dispositif produisant une flamme peut être installé dans le même espace si le dispositif est équipé d'un arrêt de flamme efficace.
2. Les dispositifs auxiliaires qui peuvent être une source potentielle d'inflammation avec des températures de surface dépassant 1292°F (700°C) ne doivent pas être installés dans les conduits ou les plénums.
3. L'appareil doit être stocké dans une pièce sans sources d'inflammation en fonctionnement continu (par exemple : flammes ouvertes, un appareil à gaz en fonctionnement ou un radiateur électrique en fonctionnement).
4. Débranchez l'alimentation électrique avant d'effectuer des connexions ou de travailler sur l'appareil. Respectez toutes les procédures de sécurité qui s'appliquent pour éviter toute mise en marche accidentelle. Le non-respect de cette directive peut entraîner des blessures ou la mort causées par un choc électrique ou des pièces mobiles, en plus d'endommager l'appareil.
5. Tous les appareils doivent être branchés de manière strictement conforme au diagramme fourni. Tout câblage différent de celui du schéma peut créer des risques de dommages matériels ou de blessures.
6. Tout câblage usine d'origine exigeant un remplacement doit être remplacé par un câble d'indice thermique nominal de 221°F (105°C).
7. Assurez-vous que la tension d'alimentation de l'appareil, comme indiqué sur la plaque de série, n'est pas de 5% supérieure à la tension nominale.
8. Pour l'entretien et les réparations de cet appareil, utilisez uniquement des pièces d'origine certifiées. Pour la liste complete des pièces de rechange, consultez Carrier Manufacturing Company. Le numéro de modèle complet, le numéro de série et l'adresse du fabricant figurent sur la plaque signalétique fixée à l'appareil. Toute substitution de pièce ou decommande non approuvée par le fabricant sera aux risques du propriétaire.
9. N'utilisez pas de moyen pour accélérer le processus de dégivrage ou pour nettoyer, autres que ceux recommandés par le fabricant.
10. Ne percez ni ne brûlez aucune partie du système de réfrigération.
11. N'utilisez pas de flammes ouvertes pour détecter les fuites de réfrigérant. Utilisez uniquement des détecteurs de fuites électroniques ou des fluides de détection de fuites non chlorés.
12. Sachez que les réfrigérants peuvent ne pas contenir d'odeur.

⚠ CAUTION

1. Ensure that the supply voltage to the appliance, as indicated on the serial plate, is not 5% less than the rated voltage.
2. Units not approved for use in potable water systems.
3. Hot water supplied to the hot water heating option must not exceed 200°F (93°C) temperature or 125 psig (862 kPa) pressure.
4. Do not operate the units with steam pressure greater than 10 psig (68.9 kPa) Steam pressure must be 10 psig (68.9 kPa) or lower to avoid excessive discharge air temperatures that could cause burns or personal injury.
5. Do not overcharge the refrigeration system. This can lead to elevated compressor discharge pressure and possibly flooding the compressor with liquid.
6. When servicing the unit, some components may be hot enough to cause pain or injury. Allow time for cooling of hot components before servicing.
7. Do not attempt to reuse any mechanical or electrical component which has been wet. Such component must be replaced.

⚠ ATTENTION

1. Vérifiez que la tension d'alimentation de l'appareil n'est pas inférieure de plus de 5% à la tension nominale inscrite sur la plaque de série.
2. Ces unités ne sont pas approuvées pour l'usage dans des systèmes à eau potable.
3. La température de l'eau chaude alimentée en vertu de l'option de chauffage de l'eau chaude ne doit pas dépasser 200°F (93°C) ou une pression de 125 lb/po² (862 kPa).
4. Ne faites pas fonctionner l'unité lorsque la pression de vapeur est supérieure à 10 lb/po² (68.9 kPa). La pression de vapeur doit être de 10 lb/po² (68.9 kPa) ou moins pour éviter des températures excessives de l'air d'évacuation qui pourraient causer des brûlures ou des blessures.
5. Ne surchargez pas le système de réfrigération. Cela peut entraîner une pression d'évacuation élevée du compresseur et possiblement son inondation.
6. Durant l'entretien de l'unité, certains composants peuvent être assez chauds pour causer de la douleur ou une blessure. Laissez les composants chauds se refroidir avant de procéder à tout entretien.
7. Ne tentez pas de réutiliser un composant mécanique ou électrique qui a été mouillé. Ces composants doivent être remplacés.

IMPORTANT: Start up and adjustment procedures, installation, and service of these appliances must be performed by a qualified installation and service agency.

No water-flow can cause a freeze condition resulting in damage to the coil.

Never leave the unit filled with water in a building without heat unless antifreeze has been added.

All refrigeration checks must be made by a qualified R-454B refrigeration technician.

Do not release refrigerant to the atmosphere. When adding or removing refrigerant, all national, state/province, and local laws must be followed.

To check most of the Possible Remedies in the troubleshooting guide listed in Table 11, refer to the applicable sections of the manual.

Unit performance will be significantly reduced at or above 7215 ft (2200 m) and should not be operated above this altitude.

This appliance is not intended to be operated or serviced by persons (including children) with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

IMPORTANT: Les procédures de démarrage et de réglage, l'installation et le service de ces appareils doivent être confiés à un centre d'installation et de service qualifié.

L'absence d'écoulement d'eau risque de causer une condition de gel et d'endommager le serpentin.

Ne laissez jamais l'appareil rempli d'eau dans un immeuble non chauffé sans lui ajouter de l'antigel.

Toutes les vérifications de réfrigération doivent être effectuées par un technicien de la réfrigération qualifié en matière de fluide frigorigène R-454B.

Ne rejetez pas de fluide frigorigène dans l'atmosphère. Respectez toutes les lois locales, provinciales/étatiques et nationales lors de l'ajout ou du retrait de fluide frigorigène.

Pour essayer la plupart des solutions possibles suggérées dans le guide de dépannage du Tableau 11, reportez-vous aux sections correspondantes du manuel.

La performance de l'unité sera grandement réduite à une altitude de 7 215 pieds (2 200 m) et elle ne doit pas être utilisée au-delà de cette hauteur.

Cet appareil n'est pas conçu pour être utilisé ou entretenu par des personnes (y compris des enfants) dont les capacités physiques, sensorielles ou mentales sont réduites, ou qui n'ont pas l'expérience et les connaissances suffisantes, à moins d'être supervisées ou d'avoir obtenu des directives concernant l'utilisation de l'appareil par une personne responsable de leur sécurité.

Les enfants doivent être supervisés pour s'assurer qu'ils ne jouent pas avec l'appareil.

See Fig. 1 for the important warning regarding Proposition 65.

Fig. 1 — Proposition 65 Warning Label

INTRODUCTION

This document contains general installation instructions for the 40UV, UH unit ventilators. Refer to the unit wiring diagram or to specific manufacturer literature for any other type of factory-mounted controls.

See submittal drawings for unit configurations, dimensions, clearances, and pipe connections. Refer to unit wiring label for all electrical connections; follow NEC (National Electrical Code) and local codes.

IMPORTANT: Units can be requested with special features by requesting an ETO. This manual only covers standard features and does not include any changes made for special feature requests by the customer. Units built with special features are noted with a 5-digit SPO (Special Product Order) Number on the Serial Plate.

PRE-INSTALLATION

Unpack and Inspect Units

Inspect unit upon arrival. In case of damage, report it immediately to transportation company and your local factory sales representative.

Check rating plate on unit to verify that power supply meets available electric power at the point of installation.

Inspect unit received for conformance with description of product ordered (including specifications where applicable).

⚠ DANGER

Appliances must not be installed where they may be exposed to potentially explosive or flammable atmosphere.

⚠DANGER

Les appareils ne doivent pas être installés à un endroit où ils risquent d'être exposés à une atmosphère potentiellement explosive ou inflammable.

⚠WARNING

Units that are connected to an air duct within the same room that has less than the minimum room size, that room shall be without continuously operating open flames or potential ignition sources such as an electric heater or other hot surfaces. A flame producing device may be installed in the same space if the device is provided with an effective flame arrest.

Auxiliary devices which may be a potential ignition source with surface temperatures exceeding 1292°F (700°C) shall not be installed in the duct work or plenums.

The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance, or an operating electric heater).

⚠WARNING

Les unités connectées à un conduit d'air dans la même pièce qui a une taille inférieure à la taille minimale de la pièce, cette pièce doit être sans flammes ouvertes en fonctionnement continu ou sources potentielles d'inflammation telles qu'un radiateur électrique ou d'autres surfaces chaudes. Un dispositif produisant une flamme peut être installé dans le même espace si le dispositif est équipé d'un arrêt de flamme efficace.

Les dispositifs auxiliaires qui peuvent être une source potentielle d'inflammation avec des températures de surface dépassant 1292°F (700°C) ne doivent pas être installés dans les conduits ou les plénums.

L'appareil doit être stocké dans une pièce sans sources d'inflammation en fonctionnement continu (par exemple : flammes ouvertes, un appareil à gaz en fonctionnement ou un radiateur électrique en fonctionnement).

IMPORTANT: The installation and maintenance instructions in this manual must be followed to provide safe, efficient, and trouble-free operation.

In addition, particular care must be exercised regarding the special precautions listed below.

Failure to properly address these critical areas could result in property damage or loss, personal injury, or death. These instructions are subject to any more restrictive local or national codes.

Protect Units from Damage

Each unit will be shipped to the site secured to a wood skid using metal brackets. Whenever possible, all lifting and handling of the unit should be done with the packing and skid in position.

Due to the length of the unit, 72 in. (1829 mm) forklift tines are recommended to avoid damaging the unit. Remove the metal brackets prior to lifting the unit off of the skid. When slinging or using a forklift to lift the unit, the support points should be sufficiently apart to give stability when lifting. Unless otherwise noted the lifting points should be equidistant from the centerline. Extreme care should be taken not to drop the unit. Considerable damage can occur to the unit during positioning, in particular, to the paneling and exterior paint. Use an adequate number of personnel and the correct tools when moving the unit.

A lifting device such as a forklift is needed to install this product. A special key is provided with the unit for use with the tamper-proof cabinet locks on the top and front panels. The use of torque screwdrivers on panel, cover, or component mounting screws is not recommended. Hand-start all screws. If electric drills are used, set at the lowest possible torque.

Prepare Jobsite for Unit Installation

To save time and to reduce the possibility of costly errors, set up a complete sample installation in a typical room at jobsite. Check all critical dimensions such as pipe, wire, and duct connection requirements. See figures in Step 1 on page 12 for mounting locations. Refer to job drawings and product dimension drawings on pages 13-16. Confirm that building construction is adequate to support the unit. See Table 3 for unit weight data. Instruct all trades in their part of the installation.

1. Select the unit location. Ensure the wall or ceiling structure is adequate for the required mounting provisions as outlined in the "INSTALLATION" section. For Ceiling Mounted units, check that ceiling is capable of supporting the weight of the unit.
2. Before installation, ensure that the correct electrical power supplies are available for the unit.
3. Each unit requires an independently fused and isolated power supply.
4. If the installation has multiple units, check that unit model and tagging corresponds with the installation plans. Please contact your Carrier representative immediately if discrepancies are noted.
5. Check to make sure that the units will have adequate installation clearance around them for servicing. For ceiling units, see Fig. 2.
6. Note that units with cooling coils will have a condensate connection at the rear and suitable provisions should be made for draining. If multiple units tee into a common drain manifold, it must be sized to ensure free draining with all the units in operation.
7. For units with outside air, inspect the wall sleeve installation for gaps that would allow leakage of outdoor air into the space. All joints and abutments should be sealed with waterproof sealant.

Identify and Prepare Units

1. Be sure power requirements match available power source. Refer to the unit nameplate and wiring diagram.
2. Remove front (40UV) or bottom (40UH) access panels from the unit. Retain the 5/32 in. socket head fasteners and panels for re-installation later.
3. Rotate the fan shaft by hand to ensure that fans are unrestricted and can rotate freely. Check for shipping damage and fan obstructions.

Drainage

Units with cooling coils have a condensate drain pan connection and 3/4 in. ID (Inside Dimension) condensate line. The condensate drain pan connection is field changeable and can be mounted on either the left or right side of the unit. To change the connection location, remove the condensate line from the elbow. Remove the elbow from the drain pan and remove the plug from the opposite side of the drain pan. Re-install the elbow and the plug on the opposite sides of the drain pan. Re-connect the condensate line.

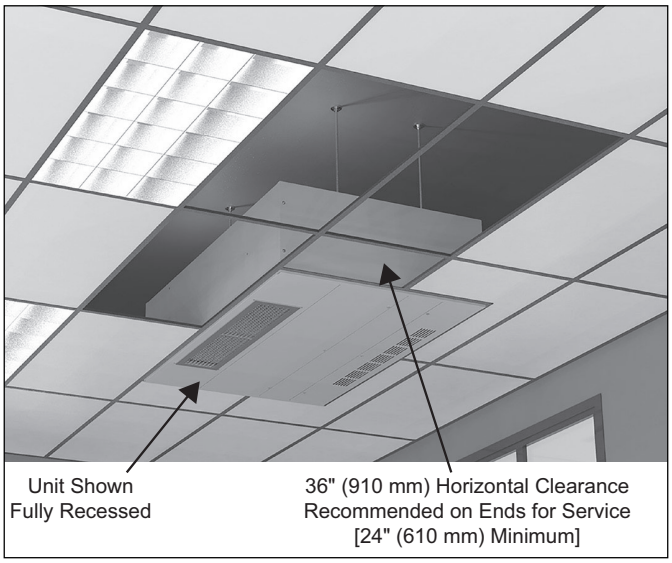


Fig. 2 — Recommended Service Clearance for Ceiling Mounted Units

SPECIAL PRECAUTIONS: A2L REFRIGERANTS

For DX cooling models, due to the slightly flammable nature of R-454B, there are minimum room size requirements by unit size to ensure that if there is a refrigerant leak accumulating in the space, it will not reach a density that can become a risk of ignition. Refer to Tables 1 and 2 for the lookup tables according to room area. Refrigerant charge maximums, minimum room size, and minimum airflow settings should be followed according to UL 60335-2-40 Annex GG.

Table 1 — Refrigerant Charge and Airflow Per Room Area —English Units

FLOOR MOUNTED (Model Digit 2 = F)			CEILING MOUNTED (Model Digit 2 = C)		
A_{min} (ft^2)	m_{max} (lb)	Q_{min} (ft^3/min)	A_{min} (ft^2)	m_{max} (lb)	Q_{min} (ft^3/min)
30	0.619	16.9	30	0.813	22.1
40	0.826	22.5	40	1.084	29.5
50	1.032	28.1	50	1.355	36.9
60	1.239	33.8	60	1.626	44.3
70	1.445	39.4	70	1.897	51.7
80	1.652	45.0	80	2.168	59.1
90	1.858	50.6	90	2.439	66.4
100	2.065	56.3	100	2.710	73.8
110	2.271	61.9	110	2.981	81.2
120	2.478	67.5	120	3.252	88.6
130	2.684	73.1	130	3.523	96.0
140	2.891	78.8	140	3.794	103.3
150	3.097	84.4	150	4.065	110.7
160	3.304	90.0	160	4.336	118.1
170	3.510	95.6	170	4.607	125.5
180	3.717	101.3	180	4.877	132.9
190	3.923	106.9	190	5.148	140.3
200	4.130	112.5	200	5.419	147.6
210	4.336	118.1	210	5.690	155.0
220	4.543	123.8	220	5.961	162.4
230	4.749	129.4	230	6.232	169.8
240	4.956	135.0	240	6.503	177.2
250	5.162	140.6	250	6.774	184.5
260	5.368	146.3	260	7.045	191.9
270	5.575	151.9	270	7.316	199.3
280	5.781	157.5	280	7.587	206.7
290	5.988	163.1	290	7.858	214.1
300	6.194	168.8	300	8.129	221.5

Table 1 — Refrigerant Charge and Airflow Per Room Area —English Units (cont)

FLOOR MOUNTED (Model Digit 2 = F)			CEILING MOUNTED (Model Digit 2 = C)		
A_{min} (ft^2)	m_{max} (lb)	Q_{min} (ft^3/min)	A_{min} (ft^2)	m_{max} (lb)	Q_{min} (ft^3/min)
310	6.401	174.4	310	8.400	228.8
320	6.607	180.0	320	8.671	236.2
330	6.814	185.6	330	8.942	243.6
340	7.020	191.3	340	9.213	251.0
350	7.227	196.9	350	9.484	258.4
360	7.433	202.5	360	9.755	265.7
370	7.640	208.1	370	10.026	273.1
380	7.846	213.8	380	10.297	280.5
390	8.053	219.4	390	10.568	287.9
400	8.259	225.0	400	10.839	295.3
410	8.466	230.6	410	11.110	302.7
420	8.672	236.3	420	11.381	310.0
430	8.879	241.9	430	11.652	317.4
440	9.085	247.5	440	11.923	324.8
450	9.292	253.1	450	12.194	332.2
460	9.498	258.8	460	12.465	339.6
470	9.705	264.4	470	12.736	346.9
480	9.911	270.0	480	13.007	354.3
490	10.118	275.6	490	13.278	361.7
500	10.324	281.3	500	13.549	369.1
510	10.531	286.9	510	13.820	376.5
520	10.737	292.5	520	14.091	383.9
530	10.943	298.1	530	14.362	391.2
540	11.150	303.8	540	14.632	398.6
550	11.356	309.4	550	14.903	406.0
560	11.563	315.0	560	15.174	413.4
570	11.769	320.6	570	15.445	420.8
580	11.976	326.3	580	15.716	428.1
590	12.182	331.9	590	15.987	435.5
600	12.389	337.5	600	16.258	442.9
610	12.595	343.1	610	16.529	450.3
620	12.802	348.8	620	16.800	457.7
630	13.008	354.4	630	17.071	465.1
640	13.215	360.0	640	17.342	472.4
650	13.421	365.6	650	17.613	479.8
660	13.628	371.3	660	17.884	487.2
670	13.834	376.9	670	18.155	494.6
680	14.041	382.5	680	18.426	502.0
690	14.247	388.1	690	18.697	509.4
700	14.454	393.8	700	18.968	516.7
710	14.660	399.4	710	19.239	524.1
720	14.867	405.0	720	19.510	531.5
730	15.073	410.6	730	19.781	538.9
740	15.280	416.3	740	20.052	546.3
750	15.486	421.9	750	20.323	553.6

LEGEND

A (min) — Minimum Room Area
m (max) — Maximum Refrigerant Charge
Q (min) — Minimum Airflow

Table 2 — Refrigerant Charge and Airflow Per Room Area — SI Units

FLOOR MOUNTED (Model Digit 2 = F)			CEILING MOUNTED (Model Digit 2 = C)		
A_{min} (m^2)	m_{max} (kg)	Q_{min} (m^3/hr)	A_{min} (m^2)	m_{max} (kg)	Q_{min} (m^3/hr)
2.787	0.281	28.7	2.787	0.369	37.6
3.716	0.375	38.2	3.716	0.492	50.2
4.645	0.468	47.8	4.645	0.615	62.7
5.574	0.562	57.3	5.574	0.737	75.3
6.503	0.656	66.9	6.503	0.860	87.8
7.432	0.749	76.5	7.432	0.983	100.3
8.361	0.843	86.0	8.361	1.106	112.9
9.290	0.937	95.6	9.290	1.229	125.4
10.219	1.030	105.1	10.219	1.352	138.0
11.148	1.124	114.7	11.148	1.475	150.5
12.077	1.218	124.2	12.077	1.598	163.0
13.006	1.311	133.8	13.006	1.721	175.6
13.935	1.405	143.4	13.935	1.844	188.1
14.864	1.499	152.9	14.864	1.967	200.7
15.794	1.592	162.5	15.794	2.089	213.2
16.723	1.686	172.0	16.723	2.212	225.8
17.652	1.780	181.6	17.652	2.335	238.3
18.581	1.873	191.1	18.581	2.458	250.8
19.510	1.967	200.7	19.510	2.581	263.4
20.439	2.060	210.3	20.439	2.704	275.9
21.368	2.154	219.8	21.368	2.827	288.5
22.297	2.248	229.4	22.297	2.950	301.0
23.226	2.341	238.9	23.226	3.073	313.5
24.155	2.435	248.5	24.155	3.196	326.1
25.084	2.529	258.0	25.084	3.319	338.6
26.013	2.622	267.6	26.013	3.442	351.2
26.942	2.716	277.2	26.942	3.564	363.7
27.871	2.810	286.7	27.871	3.687	376.3
28.800	2.903	296.3	28.800	3.810	388.8
29.729	2.997	305.8	29.729	3.933	401.3
30.658	3.091	315.4	30.658	4.056	413.9
31.587	3.184	324.9	31.587	4.179	426.4
32.516	3.278	334.5	32.516	4.302	439.0
33.445	3.372	344.0	33.445	4.425	451.5
34.374	3.465	353.6	34.374	4.548	464.1
35.303	3.559	363.2	35.303	4.671	476.6
36.232	3.653	372.7	36.232	4.794	489.1
37.161	3.746	382.3	37.161	4.916	501.7
38.090	3.840	391.8	38.090	5.039	514.2
39.019	3.934	401.4	39.019	5.162	526.8
39.948	4.027	410.9	39.948	5.285	539.3
40.877	4.121	420.5	40.877	5.408	551.8
41.806	4.215	430.1	41.806	5.531	564.4
42.735	4.308	439.6	42.735	5.654	576.9
43.664	4.402	449.2	43.664	5.777	589.5
44.593	4.496	458.7	44.593	5.900	602.0
45.522	4.589	468.3	45.522	6.023	614.6
46.452	4.683	477.8	46.452	6.146	627.1
47.381	4.777	487.4	47.381	6.268	639.6
48.310	4.870	497.0	48.310	6.391	652.2
49.239	4.964	506.5	49.239	6.514	664.7
50.168	5.058	516.1	50.168	6.637	677.3
51.097	5.151	525.6	51.097	6.760	689.8
52.026	5.245	535.2	52.026	6.883	702.3
52.955	5.339	544.7	52.955	7.006	714.9
53.884	5.432	554.3	53.884	7.129	727.4
54.813	5.526	563.9	54.813	7.252	740.0
55.742	5.619	573.4	55.742	7.375	752.5
56.671	5.713	583.0	56.671	7.498	765.1

Table 2 — Refrigerant Charge and Airflow Per Room Area — SI Units (cont)

FLOOR MOUNTED (Model Digit 2 = F)			CEILING MOUNTED (Model Digit 2 = C)		
A_{min} (m^2)	m_{max} (kg)	Q_{min} (m^3/hr)	A_{min} (m^2)	m_{max} (kg)	Q_{min} (m^3/hr)
57.600	5.807	592.5	57.600	7.620	777.6
58.529	5.900	602.1	58.529	7.743	790.1
59.458	5.994	611.6	59.458	7.866	802.7
60.387	6.088	621.2	60.387	7.989	815.2
61.316	6.181	630.8	61.316	8.112	827.8
62.245	6.275	640.3	62.245	8.235	840.3
63.174	6.369	649.9	63.174	8.358	852.8
64.103	6.462	659.4	64.103	8.481	865.4
65.032	6.556	669.0	65.032	8.604	877.9
65.961	6.650	678.5	65.961	8.727	890.5
66.890	6.743	688.1	66.890	8.850	903.0
67.819	6.837	697.7	67.819	8.972	915.6
68.748	6.931	707.2	68.748	9.095	928.1
69.677	7.024	716.8	69.677	9.218	940.6

LEGEND

A (min) — Minimum Room Area
m (max) — Maximum Refrigerant Charge
Q (min) — Minimum Airflow

Table 3 — Physical Data

UNIT 40UV, UH		0750	1000	1250	1500
NOMINAL AIRFLOW (cfm)		**0750**	**1000**	**1250**	**1500**
SUPPLY FANS					
Type		Direct Drive Centrifugal			
Fan Quantity		2	3	4	4
Fan Diameter (in.)		8.06	8.06	8.06	8.06
Fan Width (in.)		7.15	7.15	7.15	7.15
Airflow (High/Medium/Low)	**cfm**	750/650/500	1000/750/600	1250/900/750	1500/1100/900
	l/s	354/307/236	472/354/283	590/425/354	708/519/425
SUPPLY FAN MOTOR					
Standard Motor (Digit 16 = 4 or 5)					
Motor Type		ECM - Electronically Commutated Motor			
Motor Size - Qty 1 hp (kW)		1/3 hp (0.25)	1/3 hp (0.25)	1/3 hp (0.25)	1/3 hp (0.25)
Max. External Static Pressure (in. wg)		0.05	0.05	0.05	0.05
High Static Motor (Digit 16 = 2 or 3)					
Motor Type		ECM - Electronically Commutated Motor			
Motor Size - Qty 1 hp (kW)		1/2 hp (0.37 kW)	1/2 hp (0.37 kW)	1/2 hp (0.37 kW)	1/2 hp (0.37)
Max. External Static Pressure (in. wg)		0.25	0.25	0.25	0.25
COIL WATER WEIGHT gal. (L)					
1-Row		0.32 (1.2)	0.38 (1.4)	0.44 (1.7)	0.5 (1.9)
2-Row		0.51 (1.9)	0.63 (2.4)	0.76 (2.9)	0.88 (3.3)
4-Row		0.92 (3.5)	1.17 (4.4)	1.42 (5.4)	1.66 (6.3)
COIL CONNECTIONS (in. OD)					
Water Coils - Standard Units		Unions with 3/4 in. Female Solder Joint			
Water Coils - Units with Piping Package		Chilled Water: 3/4 in. NPT Drop Ear, Hot Water: 1/2 in. NPT Drop Ear			
Evaporator Coil		3/4 in. OD Suction, 1/2 in. OD Liquid			
Steam Coils		1 in. NPT			
Condensate Line		3/4 in. ID Condensate Line			
UNIT OPERATING WEIGHT (Approximate)					
Floor Mounted, 16-5/8 in. Units		410 lb (186 kg)	470 lb (213 kg)	525 lb (238 kg)	580 lb (263 kg)
Floor Mounted, 21-7/8 in. Units		445 lb (202 kg)	510 lb (231 kg)	570 lb (259 kg)	630 lb (286 kg)
Ceiling Mounted Units		510 lb (231 kg)	580 lb (263 kg)	645 lb (293 kg)	710 lb (322 kg)
AIR FILTERS					
Quantity		1	2	2	2
Dimensions	**in.**	10 X 36	10 X 24	10 X 30	10 X 36
	mm	254 X 914	254 X 610	254 X 762	254 X 914

LEGEND

CW — Chilled Water
DX — Direct Expansion
HW — Hot Water
ID — Inside Dimensions
OD — Outside Dimensions

INSTALLATION

⚠ CAUTION

Units must be installed level and plumb. Failure to do so may result in excessive vibration and/or premature failure.

Step 1 — Place Units in Position

FLOOR MOUNTED UNITS

The instructions detailed below are for the installation of a standard unit. Accommodations and adjustments will be required for the usage of additional unit accessories. Should assistance be required for the installation of these additional items, contact the factory. Refer to Fig. 5 and 6 for unit dimensions.

1. Check the walls and floor for straightness and check to ensure that the wall is at a right angle to the floor. Should there be any irregularity, the placement of foam tape on the outside edges of the unit will fill the gaps between the unit and the wall, allowing for the use of a sealant, to create a smooth transition from the unit to the wall.
2. Remove the backing strip from the gasket on the wall sleeve. Place the unit in the correct location, ensuring a tight seal with the wall sleeve and the wall.
3. Place the unit in position and use the leveling legs to ensure that the unit is level in both directions and also plumb. Remove the front kick panel to access the leveling legs (see Fig. 3). Make sure that the foam gasket on the back of the unit forms a tight seal between the unit and the wall.
4. After adjusting for any irregularity in the location site, the cabinet must be secured to the back wall. The back of the cabinet has four holes, two on each side. The type of materials used for the walls will determine the type of fastener to use. Use 3/8 in. (9.5 mm) diameter fasteners with 1-1/2 in. (38.1 mm) diameter washers. Securing the cabinet to the wall helps to reduce movement and noise due to vibration. Drill the appropriate sized holes for the fasteners that are to be utilized, and insert the anchors that are to be used.
5. Make the condensate drain connection and the electrical connections to the unit. For standard units the condensate connection will be located in the left end compartment when left hand cooling is selected, and in the right end compartment when right hand cooling is selected. For units with a cooling piping package, condensate drain connection will always be located in the right end compartment.

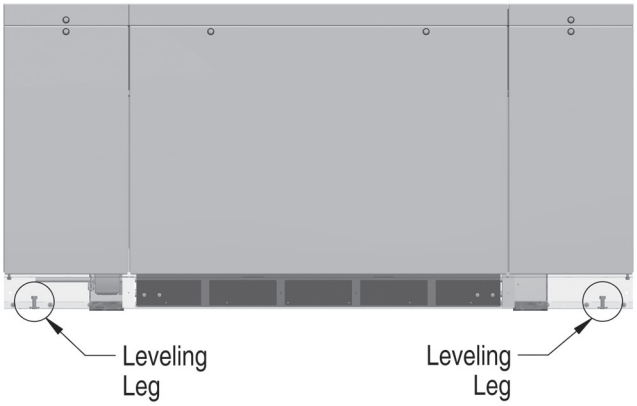


Fig. 3 — Leveling Leg Location

CEILING MOUNTED UNITS

The instructions detailed below are for the installation of a standard unit. Accommodations and adjustments will be required for the usage of additional unit accessories. Should assistance be required for the installation of these additional items, contact the factory at the phone number listed on the back cover of this manual. Refer to Fig. 7 and 8 for unit dimensions.

1. It is recommended that the rear of unit be positioned at least 2 in. (50.8 mm) away from a wall or structure to ensure bottom access panel containing filter and electrical box can fully open.
2. Remove both end panels to allow for access to the mounting holes. If installation does not allow for access through the end of the unit, remove bottom panels prior to placing unit on lifting device.
3. Place protective material on the supports of the lifting device to prevent scratching or denting of the unit. Place unit on the lifting device supporting the unit across its entire length.
4. Raise the unit to the mounting position. Use field supplied rods and fasteners with 1-1/2 in. (31.8 mm) diameter washers to suspend the unit at the mounting holes located at the top of the unit (Fig. 4 and Table 4). The unit must be suspended at each of the (4) 1 in. (25.4 mm) mounting holes. Do not suspend from any other locations.
5. Install unit level and plumb to prevent excessive vibration and premature failure. To ensure proper drainage unit must be level. Do not mount unit on a slope. Tighten all fasteners.
6. Make the condensate drain connection to the unit.

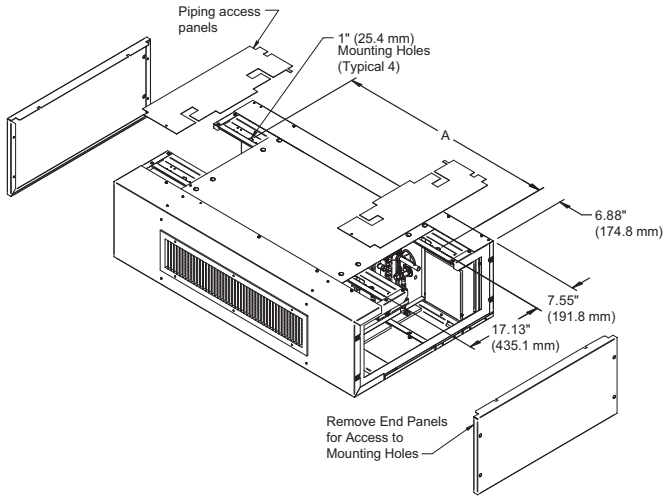
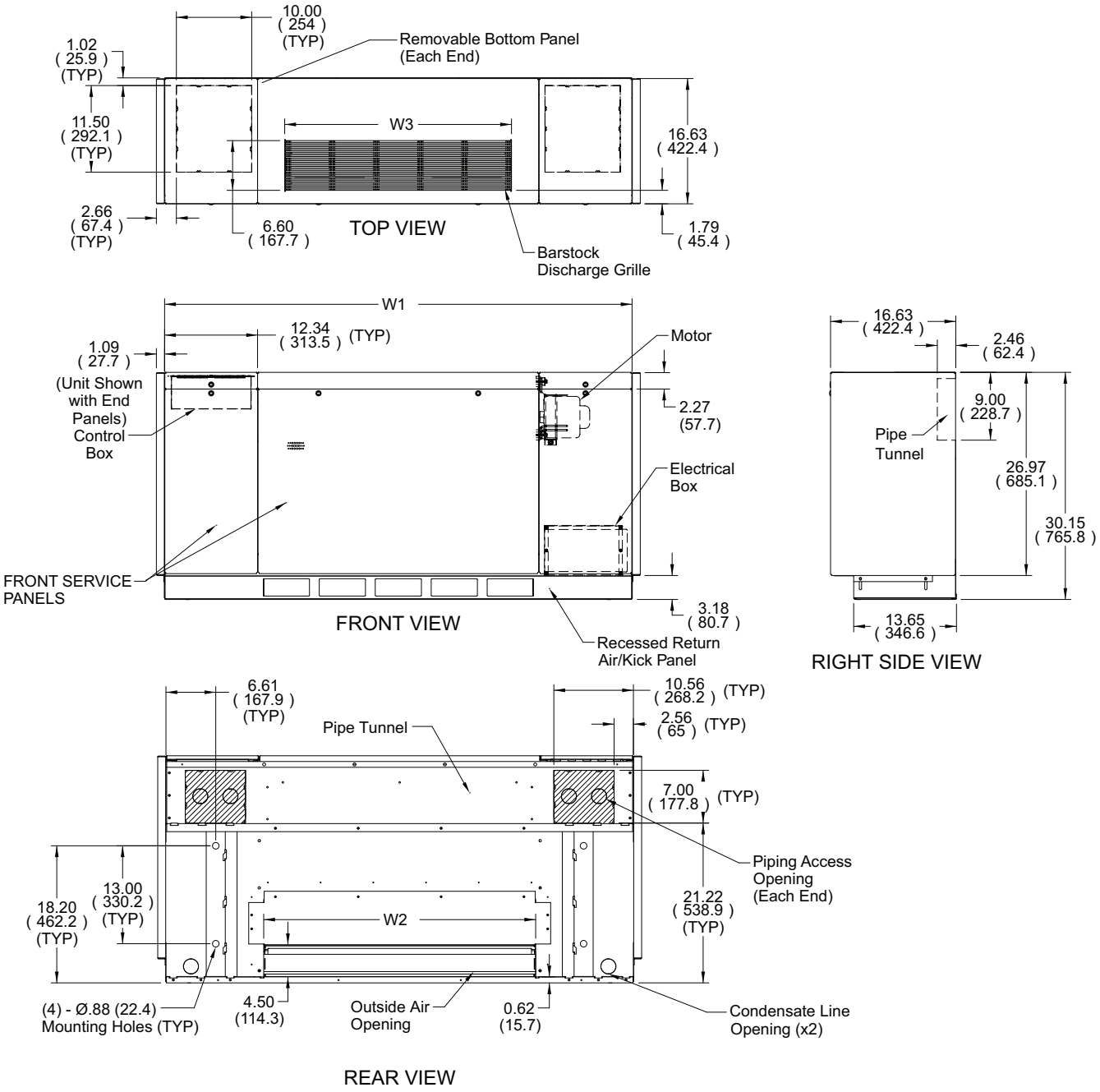


Fig. 4 — Mounting Hole Locations

Table 4 — Mounting Hole Locations Dimension A

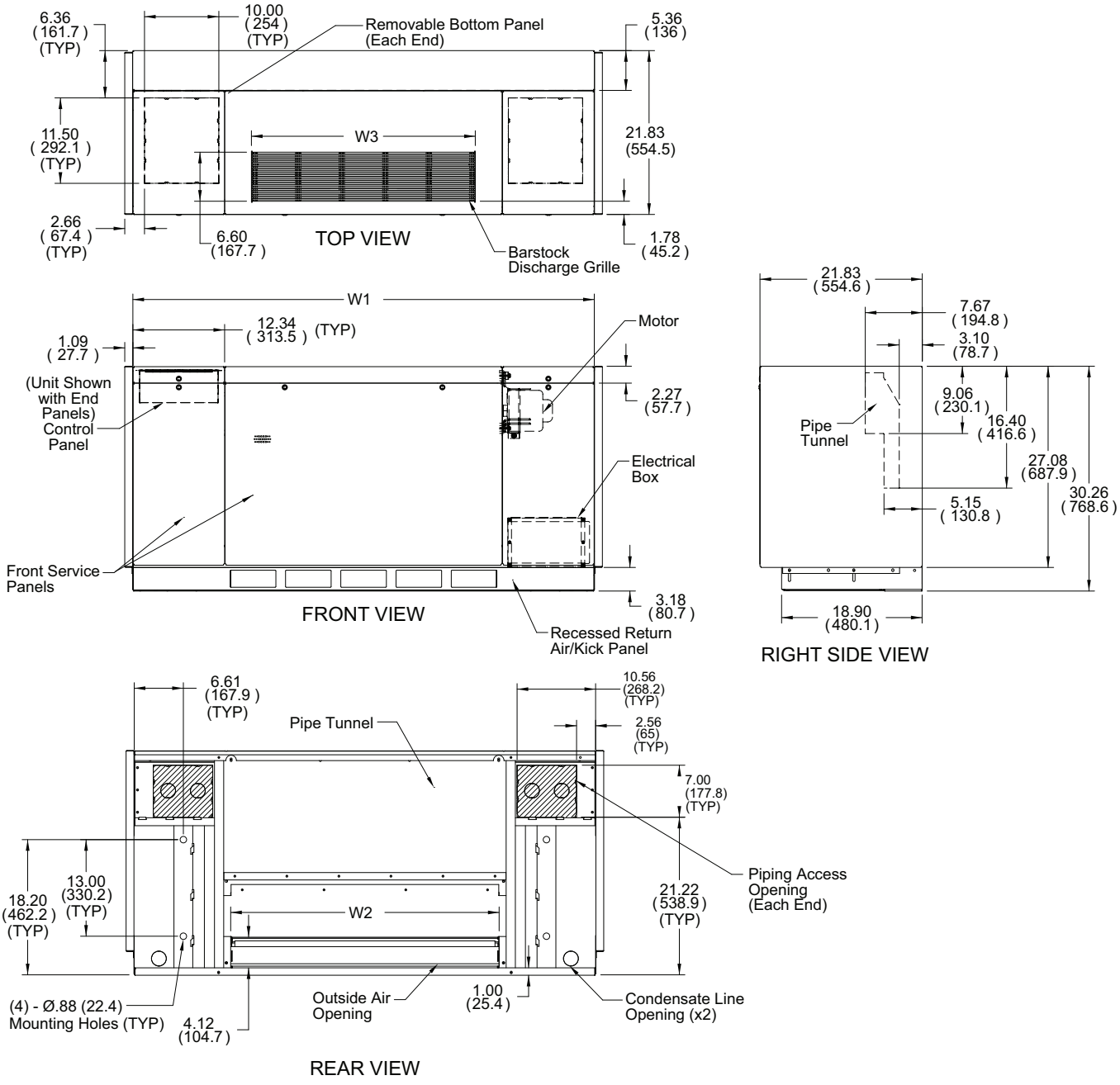
40UHV, UH MODEL SIZE	DIMENISIONS A – in. (mm)
0750	48.25 (1226)
1000	60.25 (1530)
1250	72.25 (1835)
1500	84.25 (2140)



NOTE: Dimensions shown are in inches (mm).

UNIT 40UV	AIRFLOW (cfm)	DIMENSIONS		
		W1	W2	W3
0750	750	62" (1574.8 mm)	36" (914.4 mm)	30" (762.0 mm)
1000	1000	74" (1879.6 mm)	48" (1219.2 mm)	42" (1066.8 mm)
1250	1250	86" (2184.4 mm)	60" (1524.0 mm)	54" (1371.6 mm)
1500	1500	98" (2489.2 mm)	72" (1828.8 mm)	66" (1676.4 mm)

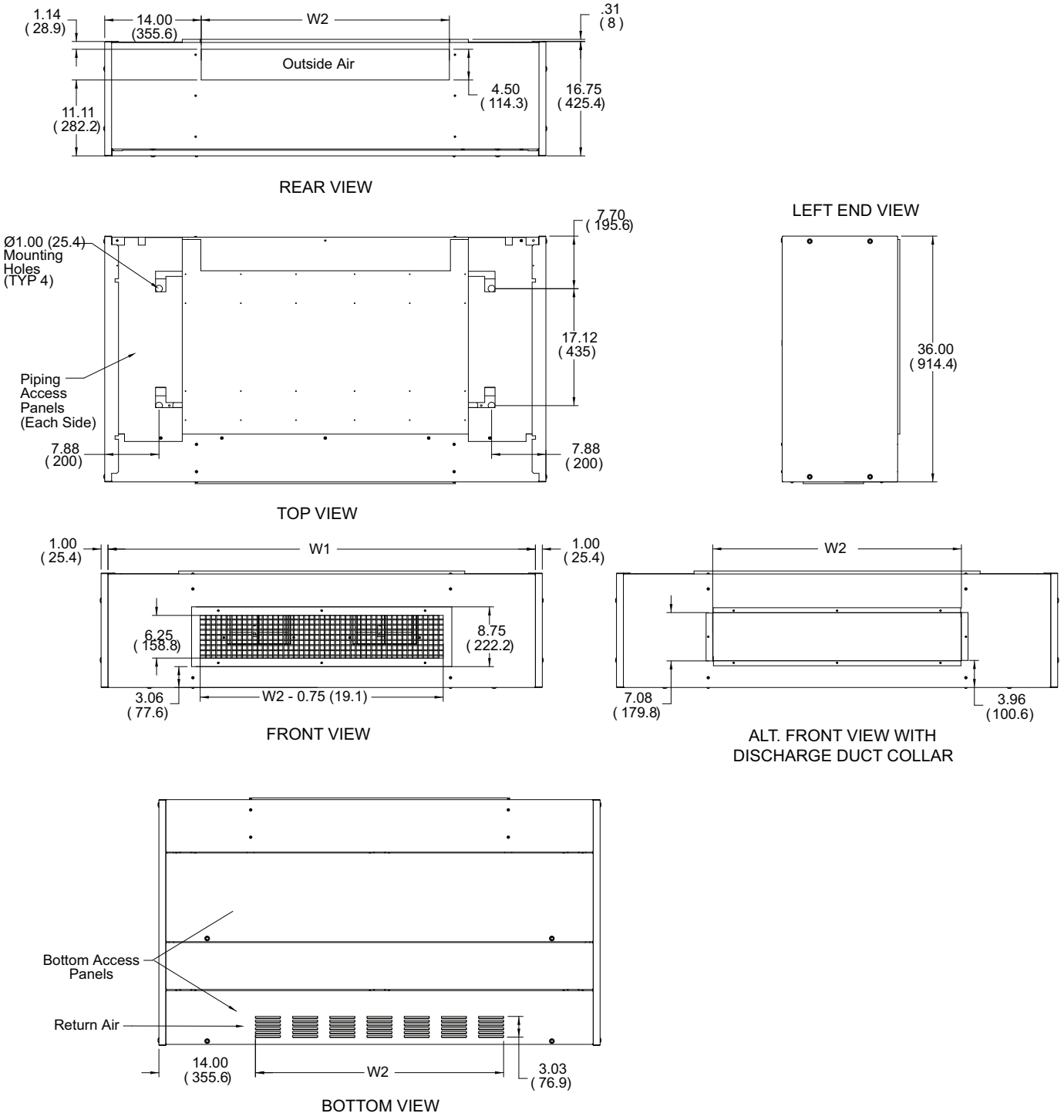
Fig. 5 — 40UV Dimensions — 16-5/8 in. Depth — Floor Mounted Units (Standard)



NOTE: Dimensions shown are inches (mm).

UNIT 40UV	AIRFLOW (cfm)	DIMENSIONS		
		W1	W2	W3
0750	750	62" (1574.8 mm)	36" (914.4 mm)	30" (762.0 mm)
1000	1000	74" (1879.6 mm)	48" (1219.2 mm)	42" (1066.8 mm)
1250	1250	86" (2184.4 mm)	60" (1524.0 mm)	54" (1371.6 mm)
1500	1500	98" (2489.2 mm)	72" (1828.8 mm)	66" (1676.4 mm)

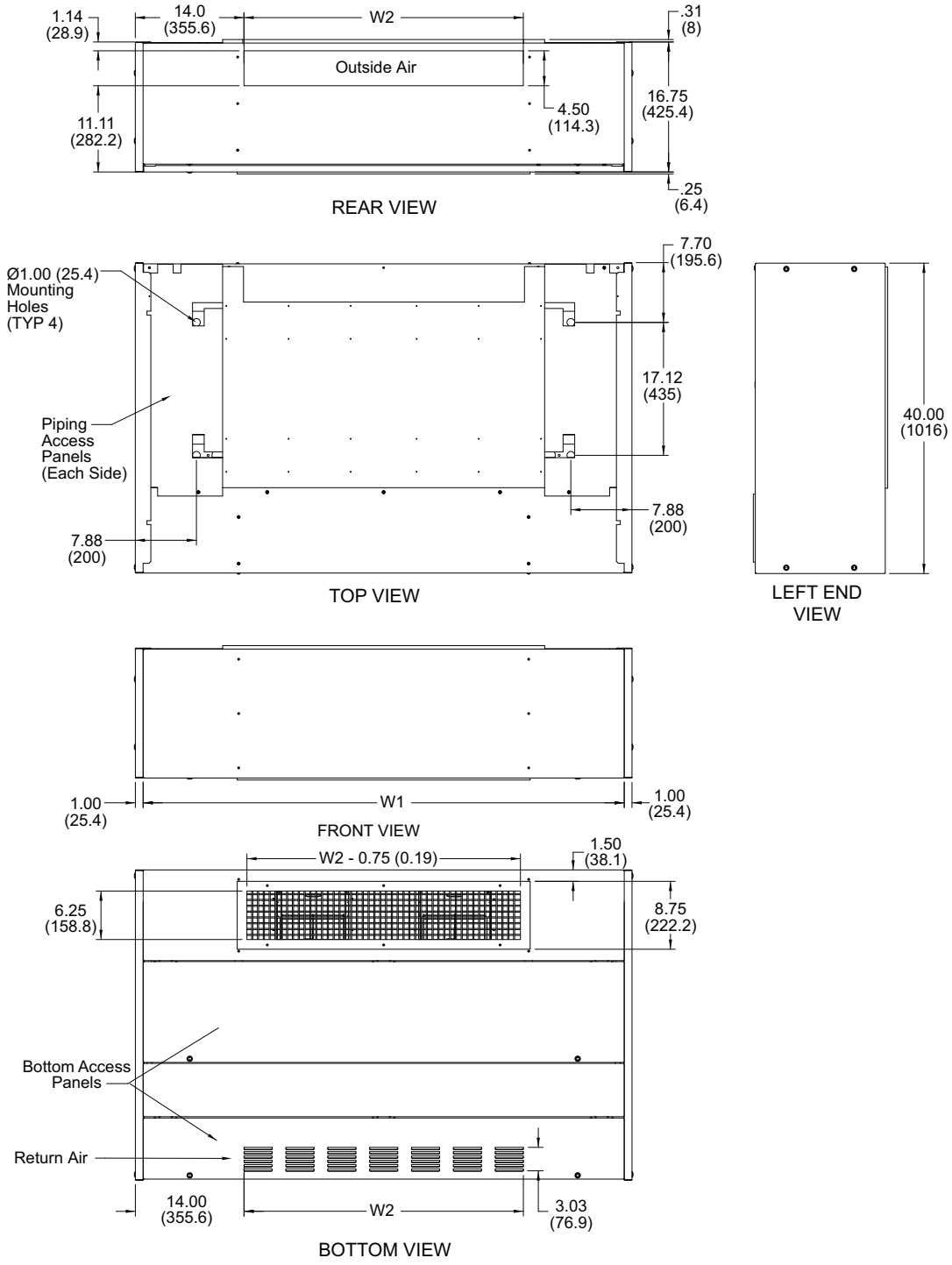
Fig. 6 — 40UV Dimensions — 21-7/8 in. Depth — Floor Mounted Units



NOTE: Dimensions shown are inches (mm).

UNIT 40UH	AIRFLOW (cfm)	DIMENSIONS	
		W1	W2
0750	750	62" (1574.8 mm)	36" (914.4 mm)
1000	1000	74" (1879.6 mm)	48" (1219.2 mm)
1250	1250	86" (2184.4 mm)	60" (1524.0 mm)
1500	1500	98" (2489.2 mm)	72" (1828.8 mm)

Fig. 7 — 40UH Dimensions — Front Discharge — Ceiling Mounted Units



NOTE: Dimensions shown are inches (mm).

UNIT 40UH	AIRFLOW (cfm)	DIMENSIONS	
		W1	W2
0750	750	62" (1574.8 mm)	36" (914.4 mm)
1000	1000	74" (1879.6 mm)	48" (1219.2 mm)
1250	1250	86" (2184.4 mm)	60" (1524.0 mm)
1500	1500	98" (2489.2 mm)	72" (1828.8 mm)

Fig. 8 — 40UH Dimensions —Down Discharge — Ceiling Mounted Units

Step 2 — Make Piping Connections

Piping installation is described in the following sections on pages 17-24 and illustrated in Fig. 9-30.

CHILLED/HOT WATER COILS (NO PIPING PACKAGE)

⚠CAUTION

1. Units not approved for use in potable water systems.
2. Hot water supplied to the hot water heating option must not exceed 200°F temperature or 125 psig pressure.
3. Do not attempt to reuse any mechanical or electrical component which has been wet. Such component must be replaced.

⚠ATTENTION

1. Ces unités ne sont pas approuvées pour l'usage dans des systèmes à eau potable.
2. La température de l'eau chaude alimentée en vertu de l'option de chauffage de l'eau chaude ne doit pas dépasser 200°F (93°C) ou une pression de 125 lb/po² (862 kPa).
3. Ne tentez pas de réutiliser un composant mécanique ou électrique qui a été mouillé. Ces composants doivent être remplacés.

Units without Piping Package

1. Chilled water and hot water coils are supplied, from the factory, with unions. Field installed piping can be mounted to the supplied unions with 3/4 in. female sweat connections.
2. Install shut-off valves in lines to and from each coil to allow maintenance or replacement of unit without shutting down and draining entire system (see Fig. 9 and 10).
3. Include a circuit setter in the return line for water flow regulation.
4. A drain valve (hose bib) should also be provided for each coil to allow removal of water from the coil if located in an area subject to freezing.
5. It is advisable to use a pipe line strainer before each coil.
6. Provide adequate pipe hangers, supports, or anchors to secure the piping system independently of the coil.
7. See Fig. 11-14 and Tables 5-8 for supply and return connection locations.

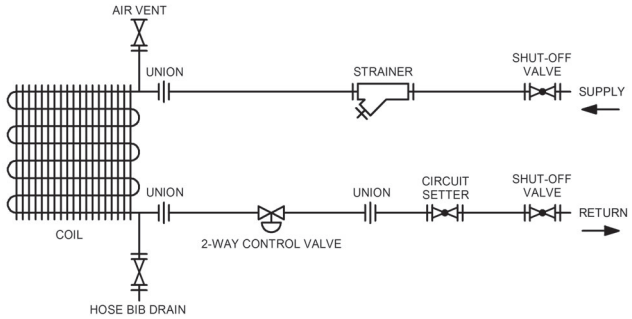


Fig. 9 — Typical 2-way Piping Installation

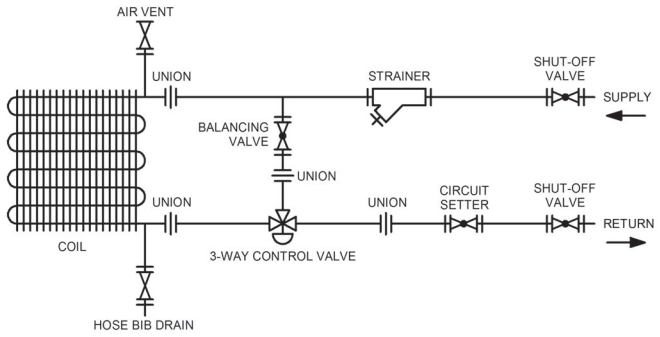
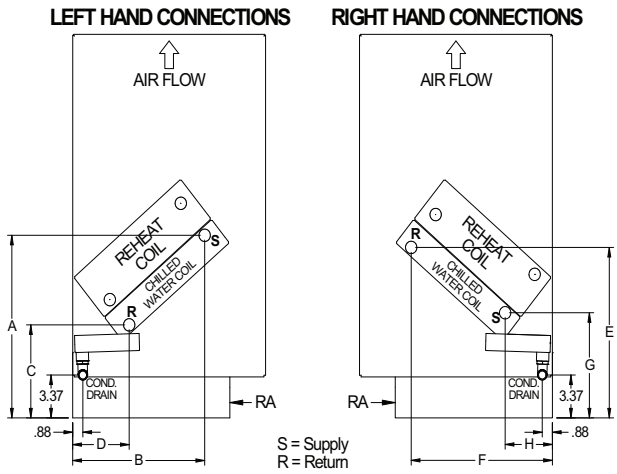


Fig. 10 — Typical 3-way Piping Installation



NOTES:
1. Supply and Return connection locations represent counterflow orientation (recommended). Unit should be piped in accordance with good plumbing practices.
2. All dimensions shown are in inches and are for reference only. For dimensions in mm, multiply inches by 25.4.

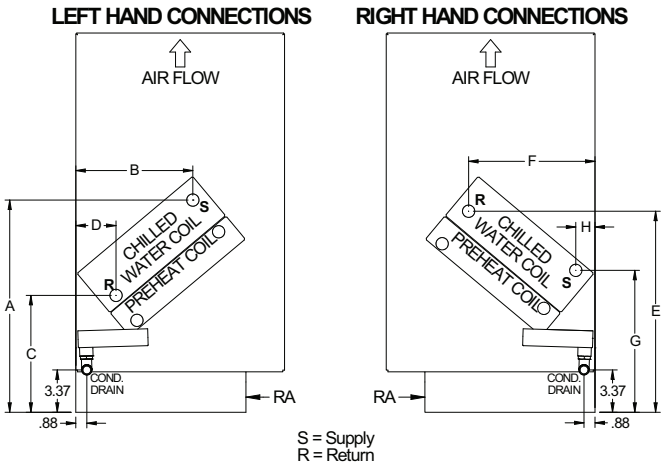
Fig. 11 — Chilled Water Coil with or Without Optional Re-Heat Coil (No Piping Package)

Table 5 — Piping Location Dimensions (Chilled Water Optional Re-Heat Coil)[a]

UNIT DEPTH (in.)	COIL ROWS	DIMENSIONS (in.)[b]							
		A	B	C	D	E	F	G	H
16-5/8	2-row	14.25	11.25	7.25	4.75	13.50	12.25	8.25	4.00
	4-row	15.00	11.00	7.50	4.75	14.00	11.75	9.50	3.00
21-7/8	2-row	14.25	16.50	7.25	10.00	13.50	17.50	8.25	10.00
	4-row	15.00	16.25	7.50	10.00	14.00	17.00	9.50	8.25

NOTE(S):

a. For Hot Water Reheat piping locations see Fig. 14. For Steam Reheat piping locations see Fig. 28.
b. All dimensions are in inches and are for reference only. For dimensions in mm, multiply inches by 25.4.



NOTES:
1. Supply and Return connection locations represent counterflow orientation (recommended). Unit should be piped in accordance with good plumbing practices.
2. All dimensions shown are in inches and are for reference only. For dimensions in mm, multiply inches by 25.4.

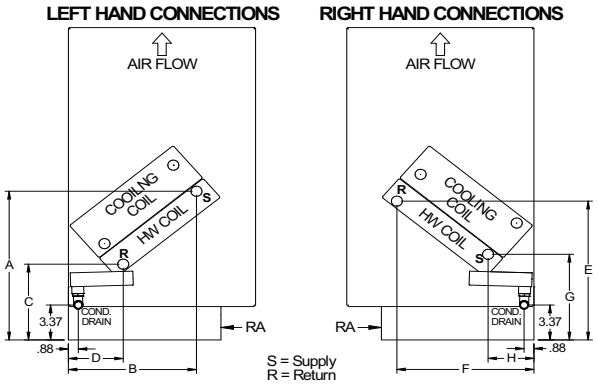
Fig. 12 — Chilled Water Coil with Pre-Heat Coil (No Piping Package)

Table 6 — Piping Location Dimensions (Chilled Water Pre-Heat Coil)[a]

UNIT DEPTH (in.)	COIL ROWS	DIMENSIONS (in.)[b]							
		A	B	C	D	E	F	G	H
16-5/8	2-row	17.50	8.75	10.50	2.25	16.50	9.50	11.50	1.50
	4-row	16.75	9.25	9.25	3.25	16.00	10.00	11.25	1.50
21-7/8	2-row	17.50	14.00	10.50	7.50	16.50	14.75	11.50	6.75
	4-row	16.75	14.50	9.25	8.50	16.00	15.25	11.25	6.75

NOTE(S):

a. For Hot Water Pre-heat piping locations see Fig. 13. For Steam Pre-heat piping locations see Fig. 27.
b. All dimensions are in inches and are for reference only. For dimensions in mm, multiply inches by 25.4.



NOTES:
1. Supply and Return connection locations represent counterflow orientation (recommended). Unit should be piped in accordance with good plumbing practices. Refer to Hot Water Heating Coil Piping Locations table dimensions.
2. All dimensions shown are in inches and are for reference only. For dimensions in mm, multiply inches by 25.4.

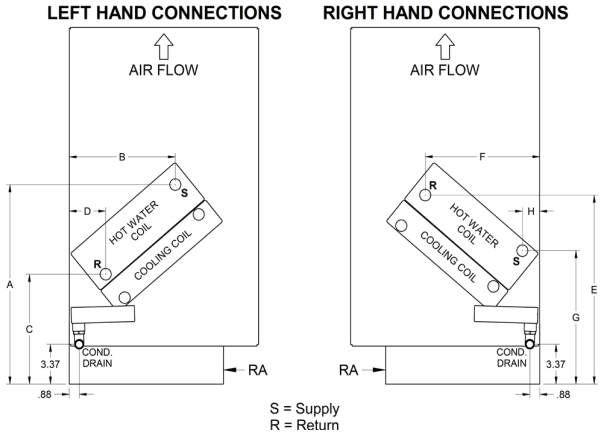
Fig. 13 — Hot Water Only or Chilled Water/DX Cooling Coil with Hot Water Pre-Heat Coil (No Piping Package)

Table 7 — Hot Water Heating Coil Piping Locations[a]

UNIT DEPTH (in.)	COIL ROW	DIMENSIONS (in.)[b]							
		A	B	C	D	E	F	G	H
16-5/8	1-row	14.25	11.50	7.00	5.00	13.50	12.00	8.25	4.00
	2-row	14.25	11.25	7.25	4.75	13.50	12.25	8.25	4.00
21-7/8	1-row	14.25	16.75	7.00	10.25	13.50	17.25	8.25	9.25
	2-row	14.25	16.50	7.25	10.00	13.50	17.50	8.25	9.25

NOTE(S):

a. For Chilled Water piping location see Fig. 12. For DX Cooling piping location see Fig. 20 and 22.
b. All dimensions are in inches and are for reference only. For dimensions in mm, multiply inches by 25.4.



NOTES:
1. Supply and Return connection locations represent counterflow orientation (recommended). Unit should be piped in accordance with good plumbing practices. Refer to Hot Water Re-Heat Coil Piping Locations table dimensions.
2. All dimensions shown are in inches and are for reference only. For dimensions in mm, multiply inches by 25.4.

Fig. 14 — Hot Water Re-Heat Coil with Chilled Water/ DX Cooling Coil (No Piping Package)

Table 8 — Hot Water Re-Heat Coil Piping Locations[a]

UNIT DEPTH (in.)	COIL ROW	DIMENSIONS (in.)[b]							
		A	B	C	D	E	F	G	H
16-5/8	1-row	17.50	8.75	10.25	2.25	16.75	9.50	11.50	1.25
	2-row	17.50	8.75	10.50	2.25	16.50	9.50	11.50	1.50
21-7/8	1-row	17.50	14.00	10.25	7.50	16.75	14.75	11.50	6.50
	2-row	17.50	14.00	10.50	7.50	16.50	14.75	11.50	6.75

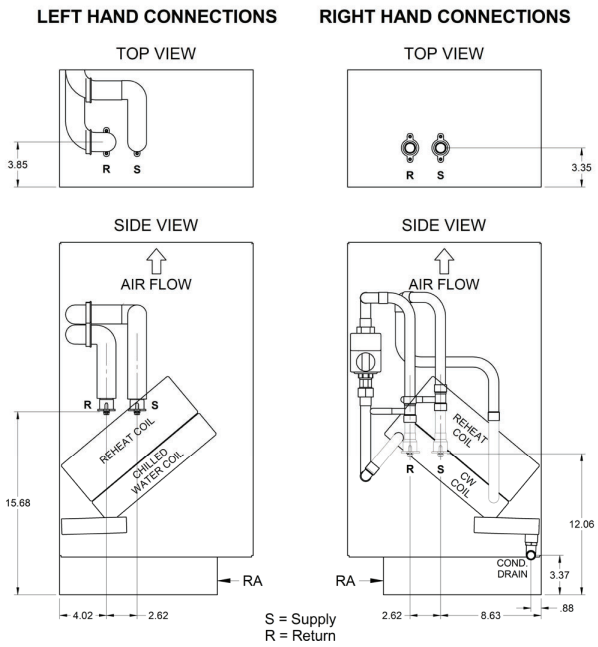
NOTE(S):

a. For Chilled Water piping location see Fig. 11. For DX Cooling piping location see Fig.19 and 21.
b. All dimensions are in inches and are for reference only. For dimensions in mm, multiply inches by 25.4.

CHILLED/HOT WATER COILS (PIPING PACKAGE)

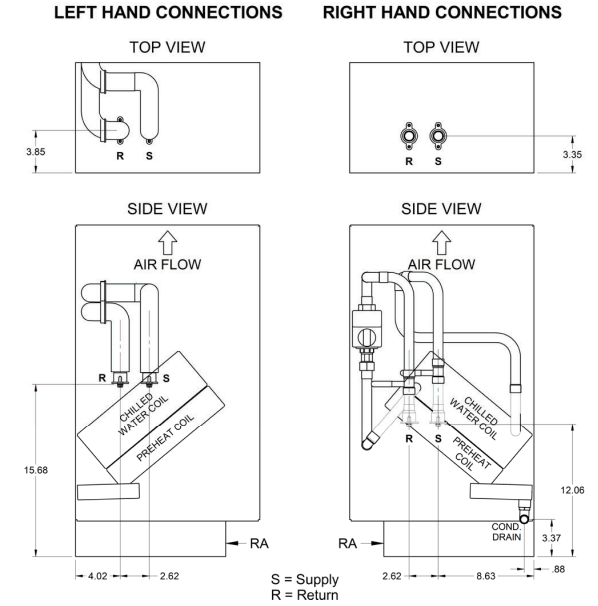
Units with Piping Package

1. Chilled water and hot water piping packages are supplied factory assembled and installed to the coil. All piping packages include the following: control valve, shut-off valves, strainer, circuit setter, PT ports, and balancing valve (when 3-way control valve is selected).
2. Piping package terminations are threaded drop ear connections, and are 3/4 in. for chilled water and 1/2 in. for hot water. Drop ear connections are attached to fixed plates, and along with the coil provide support for the piping package.
3. Piping package termination locations are set such that field piping can be routed through the bottom knock out, back knock out, or out the side of the unit.
4. See Fig. 15 -18 for supply and return connections.



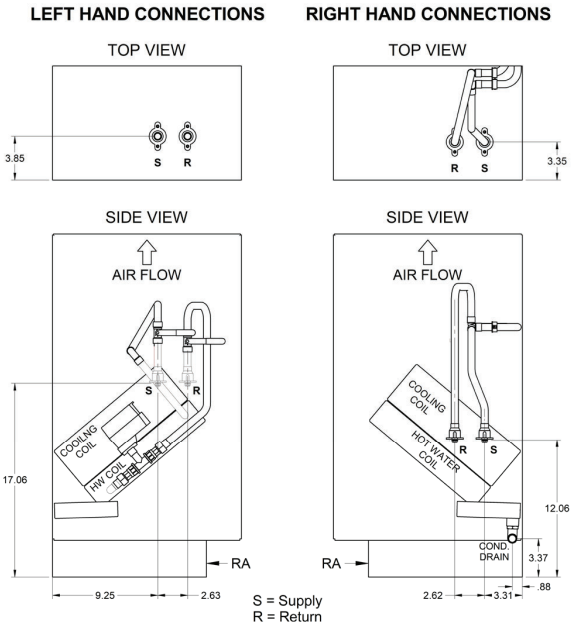
NOTE(S):
1. Condensate drain connection located in right end compartment.
2. All dimensions shown are in inches and are for reference only. For dimensions in mm, multiply inches by 25.4.

Fig. 15 — Chilled Water Coil With or Without Optional Re-Heat Coil (With Piping Package)



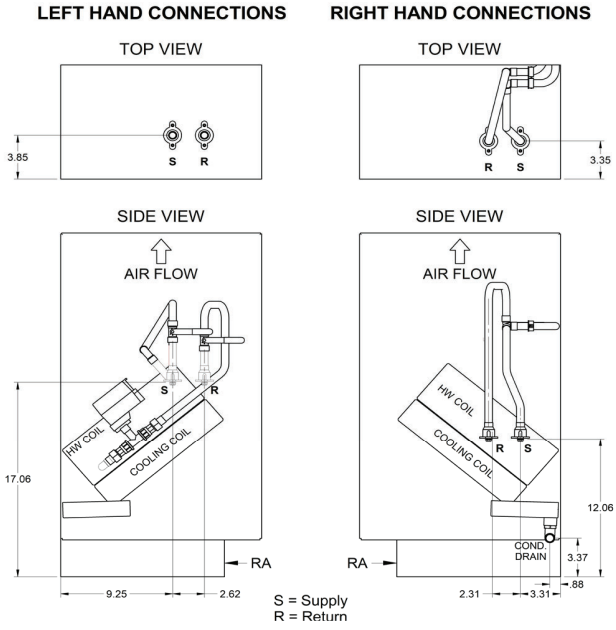
NOTE(S):
1. Condensate drain connection located in right end compartment.
2. All dimensions shown are in inches and are for reference only. For dimensions in mm, multiply inches by 25.4.

Fig. 16 — Chilled Water Coil with Pre-Heat Coil (With Piping Package)



NOTE(S):
1. Condensate drain connection located in right end compartment when unit is equipped with a cooling coil.
2. All dimensions shown are in inches and are for reference only. For dimensions in mm, multiply inches by 25.4.

Fig. 17 — Hot Water Heating Coil Only or Chilled Water/DX Cooling Coil with Hot Water Pre-Heat Coil (With Piping Package)



NOTE(S):
1. Condensate drain connection located in right end compartment when unit is equipped with a cooling coil.
2. All dimensions shown are in inches and are for reference only. For dimension in mm, multiply inches by 25.4.

Fig. 18 — Chilled Water/DX Cooling Coil With Hot Water Re-Heat Coil (With Piping Package)

DIRECT EXPANSION (DX) COILS (NO PIPING PACKAGE)

⚠ CAUTION

1. Units with DX evaporator coils contain the refrigerant R-454B. Review the R-454B Material Safety Data Sheet (MSDS) for hazards and first aid measures.
2. Refrigerant charging should only be carried out by an EPA-certified air conditioning contractor.
3. For units with DX evaporator coils, Leak Detection System installed. Unit must be powered except for service.
4. Units with DX evaporator coils are equipped with electrically powered safety measures. To be effective, the unit must be electrically powered at all times after installation, other than when servicing.
5. Units with evaporator coils shall only be connected to a condenser designed to operate with R-454B.
6. Units with evaporator coils is a PARTIAL UNIT AIR CONDITIONER and must only be connected to other units that have been confirmed as complying to the PARTIAL UNIT requirements of Standard UL 60335-2-40/ CSA C22.2 or UL 1995/CSA C22.2.

⚠ ATTENTION

1. Les unités munies de serpentins évaporateurs DX (reportez-vous à la nomenclature du modèle) contiennent du fluide frigorigène R-454B. Pour les dangers et les mesures de premiers soins, consultez la fiche signalétique du R-454B.
2. L'ajout de frigorigène doit être confié à un spécialiste de la climatisation certifié par l'agence de la protection de l'environnement (EPA) du gouvernement américain.
3. Pour les unités avec des serpentins évaporateurs DX, le système de détection de fuites est installé. L'unité doit être alimentée en électricité sauf pour l'entretien.
4. Les unités avec des serpentins évaporateurs DX sont équipées de mesures de sécurité alimentées électriquement. Pour être efficaces, l'unité doit être alimentée en électricité en permanence après l'installation, sauf lors de l'entretien.
5. Les unités avec des serpentins évaporateurs ne doivent être connectées qu'à un condenseur conçu pour fonctionner avec le R-454B.
6. Les unités avec des serpentins évaporateurs sont des CLIMATISEURS D'UNITÉ PARTIELLE et ne doivent être connectées qu'à d'autres unités confirmées conformes aux exigences des UNITÉS PARTIELLES de la norme UL 60335-2-40/CSA C22.2 ou UL 1995/CSA C22.2.

NOTE: R-454B refrigerant is the only approved refrigerant for this system. The unit should be piped up in accordance with good refrigeration and/or plumbing practices.

See Fig. 19-22 for suction and liquid line connections without piping package. For units with a heating pipe package, see Fig. 23-26 for suction and liquid line connections.

Pipe work including piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and be in compliance with national and local codes and standards, such as ASHRAE 15, ASHRAE 15.2, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA B52. All field joints shall be accessible for inspection prior to being covered or enclosed.

1. The outdoor condensing unit must be connected to the indoor unit coil using field supplied refrigerant grade (ACR) copper tubing that is internally clean and dry.
2. Units should be installed only with the tubing sizes for the approved system combination as specified in Table 1.
3. Condensing unit is typically factory charged for a 15-foot (4.6 m) lineset. For additional lineset lengths please refer to condensing unit manufacturer's charging chart.
4. See the installation and maintenance manual provided with the condensing unit for installation, evacuation and system charge information.
5. The field pipework shall be pressure tested with an inert gas and then vacuum tested prior to refrigerant charging, according to the following requirements:
   a. The minimum test pressure for the low side of the system shall be the low side design pressure and the minimum test pressure for the high side of the system shall be the high side design pressure. If the high side of the system, cannot be isolated from the low side of the system, the entire system shall be pressure tested to the low side design pressure.
   b. Field-made refrigerant joints indoors shall be tightness tested. The test method shall have a sensitivity of 5 grams per year of refrigerant or better under a pressure of at least 0.25 times the maximum allowable pressure. No leak shall be detected.

Refrigerant Detection System:

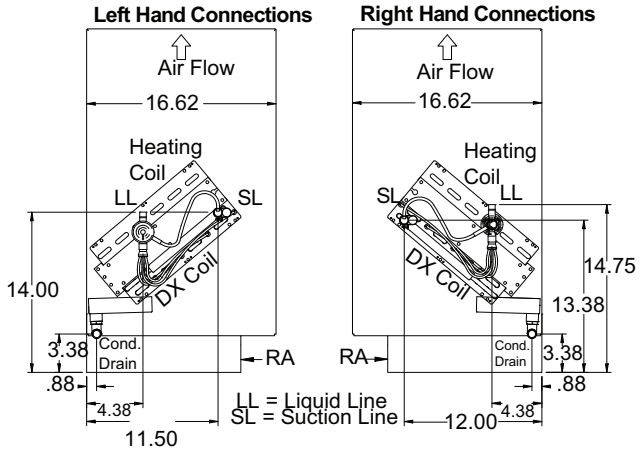
The Refrigerant Detection System (RDS) is an essential safety feature inside unit ventilators that include a refrigerant coil. It helps detect refrigerant leaks and ensures prompt mitigation to prevent hazardous situations. This manual provides detailed instructions for operating and maintaining the RDS.

1. RDS System Components:
   a. (Qty. 2) Refrigerant leak sensors
   b. (Qty. 1) Alarm Relay - This relay will be 4-changeover in DDC-Ready models.
2. Function and Operation of the Refrigerant Detection System:

   The leak sensors are powered and continuously monitoring for the presence of refrigerant whenever the unit is powered. When in a healthy state, these sensors will complete a circuit that will energize the Alarm Relay coil. When the RDS detects leaked refrigerant or one of the sensors fails, the Alarm Relay is de-energized. The unit ventilator controller will check the status of the Alarm Relay between the numbered terminals 810 and 811. In a unit with field-installed controls, electrical interlocks will be used to execute the alarm logic. An spare set of contacts will be available on the Alarm Relay subbase so that an external monitoring system may look at the relay status directly.
3. When a concentration of refrigerant is detected at 12% LFL or greater, the following mitigation actions SHALL be taken when the unit is DDC-Ready:
   a. The sensor that detected the refrigerant will show a red LED that is steady on.
   b. The compressor shall be stopped.
   c. The supply fan shall be started and will run continuously.
4. Mitigation will continue for at least 5 minutes after the concentration has decreased to a safe level.

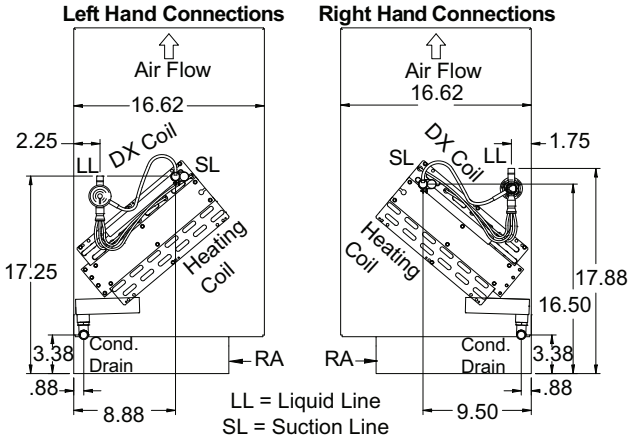
5. Required Servicing Measures: To ensure optimal performance and safety, follow these servicing guidelines:
   a. Regularly inspect the RDS sensors for any signs of damage or contamination.
   b. Test the RDS periodically to verify its functionality.
6. Limited Life Refrigerant Sensors: The RDS uses refrigerant sensors that have a predetermined lifespan. When a sensor's service life has ended, the system will respond as if leaked refrigerant is detected and the sensor will have to be replaced. Different LEDs are used to indicate the service life status:
   a. Near End-of-Life: Blinking green and amber LEDs will show.
   b. End-of-Life: A blinking red LED will show.

   Only replace sensors with those specified by Carrier. Using unauthorized sensors may compromise safety.
7. Verifying Actuation of Mitigation Actions: After installing the unit ventilator or replacing a sensor, verify that the RDS correctly triggers mitigation actions during a simulated leak. Follow these steps:
   a. Simulate a refrigerant leak using a safe method.
   b. Observe the RDS to confirm that the mitigation actions described earlier are taken.
   c. Reset the system after testing.



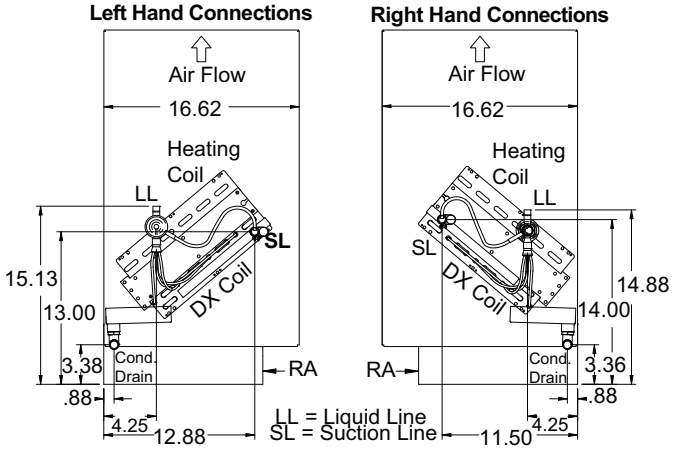
NOTE(S):
1. A 16-5/8 in. depth unit is represented in the dimensional drawing above. For 21-7/8 in. depth units, add 5.25 inches to dimensions that are taken from the rear of the unit.
2. All dimensions are in inches and are for reference only. For dimensions in mm, multiply inches by 25.4.

Fig. 19 — DX Cooling (Size 0750) with or without Optional Reheat Coil (No Piping Package)



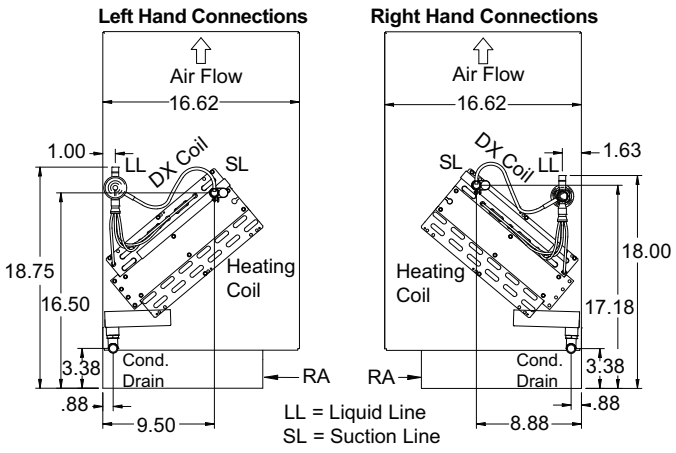
NOTE(S):
1. For Hot Water Reheat piping location see Fig.14. For Steam Reheat piping location see Fig. 28.
2. For Hot Water Pre-Heat piping location see Fig. 13. For Steam Pre-Heat piping location see Fig. 27.
3. All dimensions are in inches and are for reference only. For dimensions in mm, multiply inches by 25.4.
4. A 16-5/8 in. depth unit is represented in the dimensional drawing above. For 21-7/8 in. depth units, add 5.25 inches for dimensions that are taken from the rear of the unit.

Fig. 20 — DX Cooling (Size 0750) with Pre-Heat Coil (No Piping Package)



NOTE(S):
1. For Hot Water Reheat piping location see Fig. 14. For Steam Reheat piping location see Fig. 28.
2. A 16-5/8 in.depth unit is represented in the dimensional drawing above. For 21-7/8 in. depth units, add 5.25 inches to dimensions that are taken from the rear of the unit.
3. All dimensions are in inches and are for reference only. For dimensions in mm, multiply inches by 25.4.

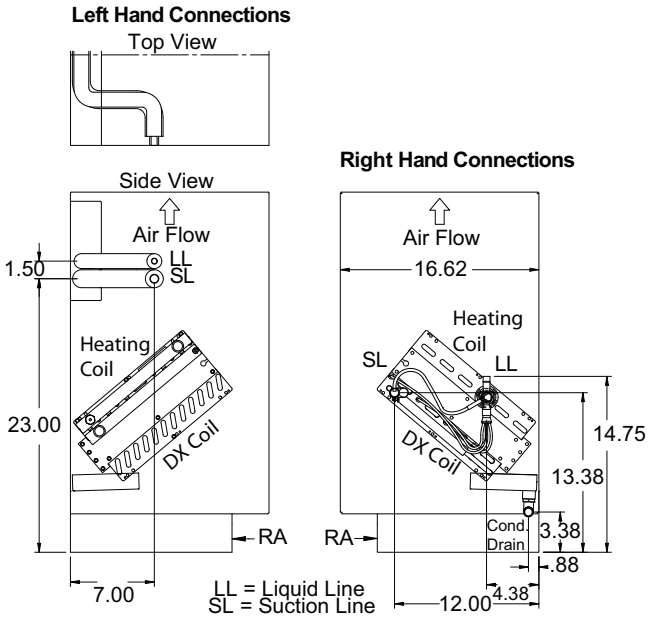
Fig. 21 — DX Cooling (Size 1000-1500) with or without Optional Re-Heat Coil (No Piping Package DX)



NOTE(S):
1. For Hot Water Pre-Heat piping location see Fig. 13. For Steam Pre-Heat piping location see Fig. 27.
2. A 16-5/8 in.depth unit is represented in the dimensional drawing above. For 21-7/8 in.depth units, add 5.25 inches to dimensions that are taken from the rear of the unit.
3. All dimensions are in inches and are for reference only. For dimensions in mm, multiply inches by 25.4.

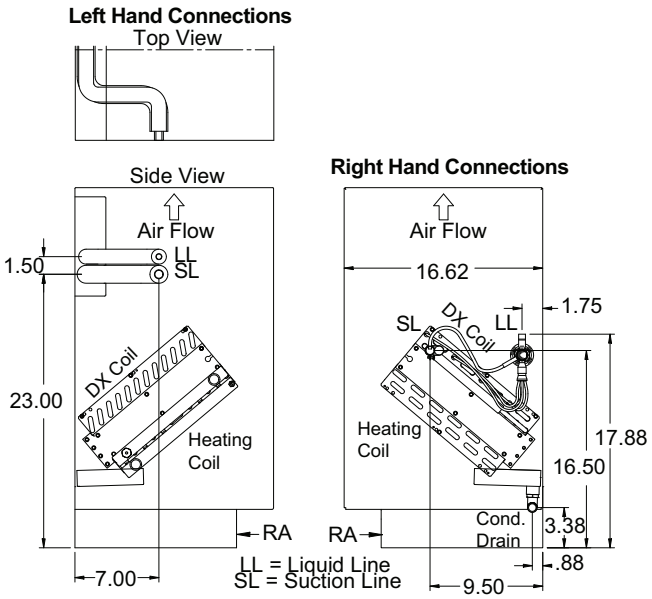
Fig. 22 — DX Cooling (Size 1000-1500) with Pre-Heat Coil (No Piping Package DX)

DIRECT EXPANSION (DX) COILS (PIPING PACKAGE)



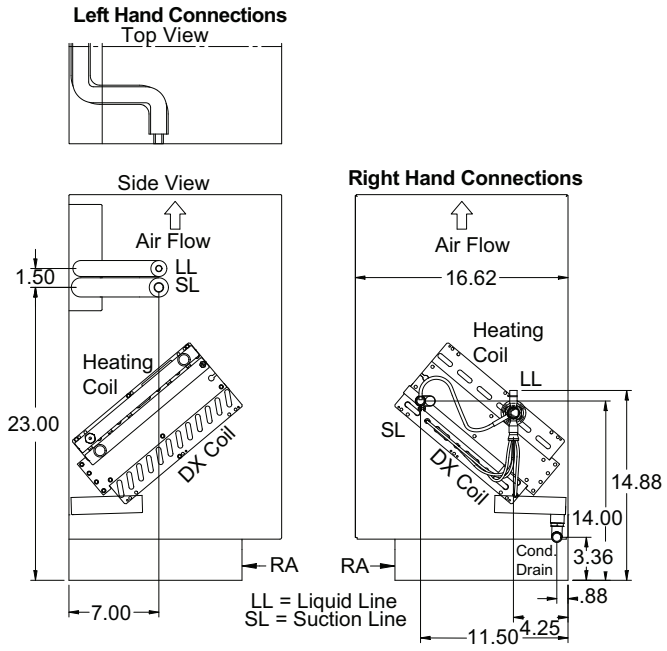
NOTE(S):
1. A 16-5/8 in. depth unit is represented in the dimensional drawing above. For 21-7/8 in. depth units, add 5.25 inches or dimensions that are taken from the rear of the unit.
2. Condensate drain connection located in right end compartment.
3. All dimensions are in inches and are for reference only. For dimensions in mm, multiply inches by 25.4.

Fig. 23 — DX Cooling Coil Only or DX Cooling with Re-Heat Coil (Size 0750 with Piping Package)



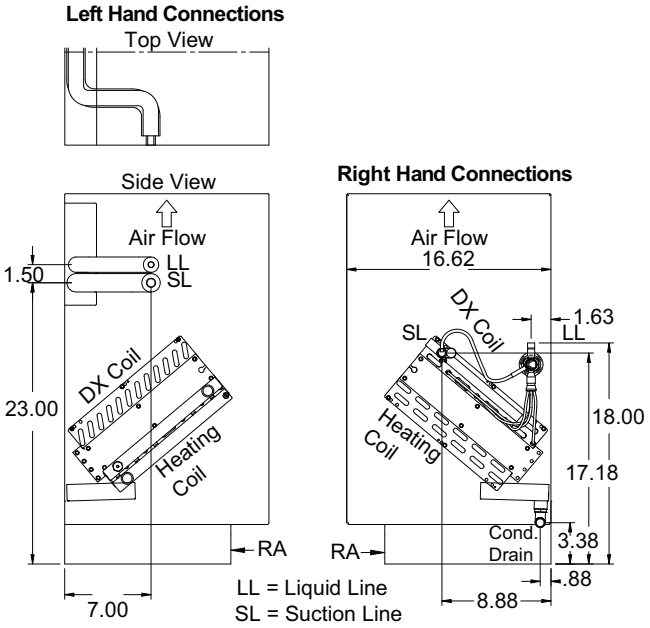
NOTE(S):
1. A 16-5/8 in. depth unit is represented in the dimensional drawing above. For 21-7/8 in. depth units, add 5.25 inches for dimensions that are taken from the rear of the unit.
2. Condensate drain connection located in right end compartment.
3. All dimensions are in inches and are for reference only. For dimensions in mm, multiply inches by 25.4.

Fig. 24 — DX Cooling Coil with Pre-Heat Coil Only (Size 0750 with Piping Package)



NOTE(S):
1. A 16-5/8 in. depth unit is represented in the dimensional drawing above. For 21-7/8 in. depth units, add 5.25 inches for dimensions that are taken from the rear of the unit.
2. Condensate drain connection located in right end compartment.
3. All dimensions are in inches and are for reference only. For dimensions in mm, multiply inches by 25.4.

Fig. 25 — DX Cooling Coil Only or DX Cooling with Re-Heat Coil (Size 1000-1500 with Piping Package)



NOTE(S):
1. A 16-5/8 in. depth unit is represented in the dimensional drawing above. For 21-7/8 in. depth units, add 5.25 inches for dimensions that are taken from the rear of the unit.
2. Condensate drain connection located in right end compartment.
3. All dimensions are in inches and are for reference only. For dimensions in mm, multiply inches by 25.4.

Fig. 26 — DX Cooling Coil with Pre-Heat Coil Only (Size 1000-1500 With Piping Package)

STEAM COILS (NO PIPING PACKAGE)

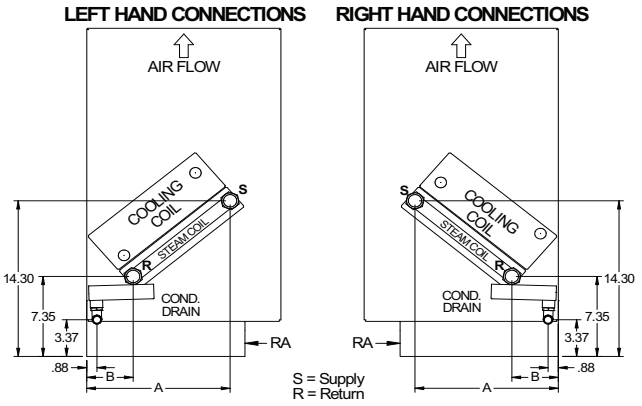
⚠ CAUTION

Do not operate the units within steam pressure greater than 10 psig (68.9 kPa). Steam pressure must be 10 psig (68.9 kPa) or lower to avoid excessive discharge air temperatures that could cause burns or personal injury.

⚠ ATTENTION

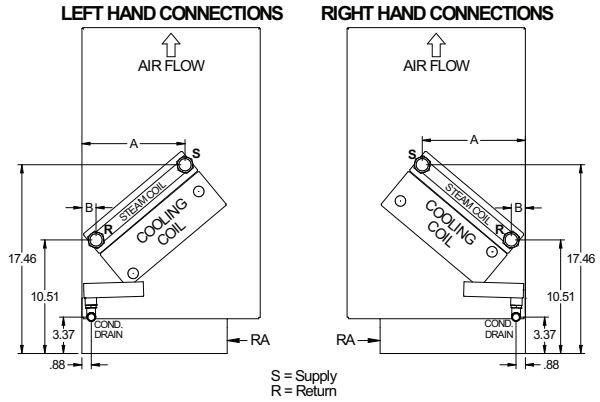
Ne faites pas fonctionner l'unité lorsque la pression de vapeur est supérieure à 10 lb/po² (68.9 kPa). La pression de vapeur doit être de 10 lb/po² (68.9 kPa) ou moins pour éviter des températures excessives de l'air d'évacuation qui pourraient causer des brûlures ou des blessures.

1. Steam coils are supplied from the factory with 1 in. NPT connections.
2. A steam trap should be provided with a trap of sufficient size and capacity to pass a minimum of two times the normal condensate released by the unit at the minimum differential pressure in the system.
3. See Fig. 27-28 and Table 9 for supply and return connections without piping package. For units with a heating pipe package, see Fig. 29-30 for supply and return connections.



NOTE(S):
1. For Chilled Water piping location see Fig. 12. For DX Cooling piping location see Fig. 20 and 22.
2. All dimensions are in inches and are for reference only. For dimension in mm, multiply inches by 25.4.

Fig. 27 — Steam Heating Coil Only or Chilled Water/ DX Cooling Coil With Steam Pre-Heat Coil (No Piping Package)



NOTE: All dimensions are in inches and are for reference only. For dimensions in mm, multiply inches by 25.4.

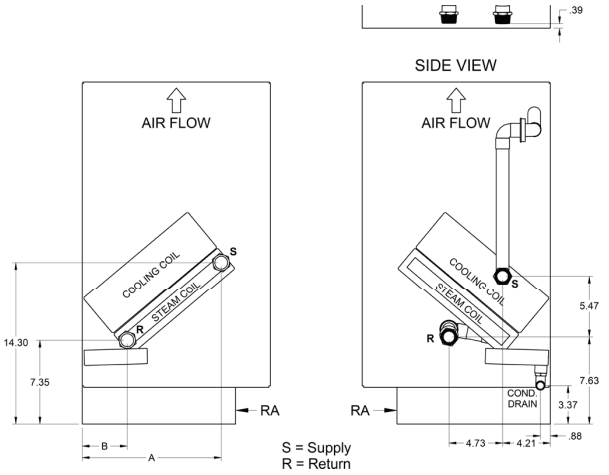
Fig. 28 — Steam Re-Heat Coil With Chilled Water/DX Cooling Coil (No Piping Package)

Table 9 — Steam Re-Heat Coil Piping Locations[a]

UNIT DEPTH (in.)	COIL ROW	DIMENSIONS (in.)[b]	
		A	B
16-5/8	1-Row	9.50	1.25
21-7/8	1-Row	14.75	6.50

NOTE(S):
a. For Chilled Water piping location see Fig. 11. For DX Cooling piping location see Fig. 19 and 21.
b. All dimensions are in inches and are for reference only. For dimensions in mm, multiply inches by 25.4.

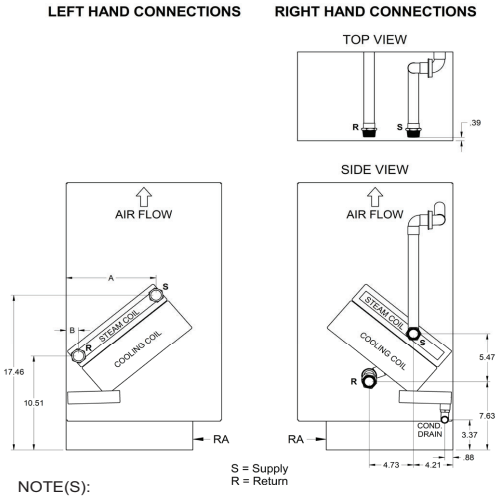
STEAM COILS (PIPING PACKAGE)



NOTE(S):
1. Condensate drain connection located in right compartment when unit is equipped with a cooling coil.
2. For dimensions A and B refer to Steam Re-Heat Coil Piping Locations table.
3. All dimensions are in inches and are for reference only. For dimensions in mm, multiply inches by 25.4.

NOTE(S):
1. Condensate drain connection located in right compartment when unit is equipped with a cooling coil.
2. For dimensions A and B, refer to Steam Re-Heat Coil Piping Locations Table 9.
3. All dimensions are in inches and are for reference only. For dimensions in mm, multiply inches by 25.4.

Fig. 29 — Steam Heating Coil Only or Chilled Water/ DX Cooling Coil With Steam Pre-Heat Coil (with Piping Package)



NOTE(S):
1. Condensate drain connection located in right compartment when unit is equipped with a cooling coil.
2. For dimensions A and B refer to Steam Re-Heat Coil Piping Locations table.
3. All dimensions are in inches and are for reference only. For dimensions in mm, multiply inches by 25.4.

NOTE(S):
1. Condensate drain connection located in right compartment when unit is equipped with a cooling coil.
2. For dimensions A and B, refer to Steam Re-Heat Coil Piping Locations Table 9.
3. All dimensions are in inches and are for reference only. For dimensions in mm, multiply inches by 25.4.

Fig. 30 — Chilled Water/DX Cooling Coil With Steam Re-Heat Coil (with Piping Package)

Piping Insulation

STANDARD UNITS

Chilled water and condensate pipes should be insulated right up to the coil to prevent condensation which can damage objects located below the piping. Chilled water valves must also be insulated to prevent sweating. Hot water pipes should be insulated to reduce heat loss and to prevent overheating of the end compartment.

NOTE: For units with piping package, not available on Ceiling Mounted units. Chilled water piping package will not be insulated except when piping is routed through pipe tunnel. Chilled water piping package shall be positioned over drain pans to catch condensate that forms on piping.

Step 3 — Make Electrical Connections

WIRING

Refer to Table 10 for electrical data.

⚠ WARNING

1. Disconnect power supply before making wiring connections to prevent electrical shock and equipment damage.
2. All appliances must be wired strictly in accordance with the wiring diagram furnished with the appliance. Any wiring different from the wiring diagram could result in a hazard to persons and property.
3. Any original factory wiring that requires replacement must be replaced with wiring material having a temperature rating of at least 105°C.
4. Ensure that the supply voltage to the appliance, as indicated on the serial plate, is not 5% greater than rated voltage.

⚠ AVERTISSEMENT

1. Débranchez l'alimentation électrique avant d'effectuer des connexions ou de travailler sur l'appareil. Respectez toutes les procédures de sécurité qui s'appliquent pour éviter toute mise en marche accidentelle. Le non-respect de cette directive peut entraîner des blessures ou la mort causées par un choc électrique ou des pièces mobiles, en plus d'endommager l'appareil.
2. Tous les appareils doivent être branchés de manière strictement conforme au diagramme fourni. Tout câblage différent de celui du schéma peut créer des risques de dommages matériels ou de blessures.
3. Tout câblage usine d'origine exigeant un remplacement doit être remplacé par un câble d'indice thermique nominal de 221°F (105°C).
4. Assurez-vous que la tension d'alimentation de l'appareil, comme indiqué sur la plaque de série, n'est pas de 5% supérieure à la tension nominale.

⚠ CAUTION

Ensure that the supply voltage to the appliance, as indicated on the serial plate, is not 5% less than the rated voltage.

Do not attempt to reuse any mechanical or electrical component which has been wet. Such component must be replaced.

⚠ ATTENTION

Vérifiez que la tension d'alimentation de l'appareil n'est pas inférieure de plus de 5% à la tension nominale inscrite sur la plaque de série.

Ne tentez pas de réutiliser un composant mécanique ou électrique qui a été mouillé. Ces composants doivent être remplacés.

Installation of wiring must conform with local building codes, or in the absence of local codes, with the National Electric Code ANSI/NFPA 70 – Latest Edition. Unit must be electrically grounded in conformance to this code. In Canada, wiring must comply with CSA C22.1, Part 1, Electrical Code.

A wiring diagram is provided with each unit. Refer to this diagram for all wiring connections.

When installing any wiring into the control box, extra cable must be left outside the panel to allow the panel to open fully. Failure to follow these instructions may cause damage to the wiring and/or the unit.

Control wiring may consist of both 24V analog control wiring and low current digital control signal wiring. To avoid signal interference, the two types should be run in separate conduits. If run in the same conduit, the digital signal wiring should be shielded at one end of the wiring run. Wiring should be twisted, stranded, and shielded communication wire.

The wire gauge must be sized according to the National Electric Code or CSA code based on amp draw and length of run. Use only copper wire.

A knockout with strain relief is provided on the electrical box for power wiring. Each unit is supplied with terminal strip for power connection.

Check the cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

TERMINAL STRIP CONNECTIONS

The terminal strip connections are designed to clamp down on the wires. To properly connect the wires to the terminal strip:

1. Push a small flat-head screwdriver into the square hole on the terminal. Press firmly until the screwdriver hits the back stop and opens the terminal (see Fig. 31).
2. Remove approximately 3/8 in. (9.5 mm) of insulation from the end of the wire and push the stripped wire into the oval hole in the terminal.
3. Remove the screwdriver. Pull on the wire to make sure that it is securely clamped in the terminal.
4. Make sure that the terminal clamp is in contact with bare wire (insulation removed).

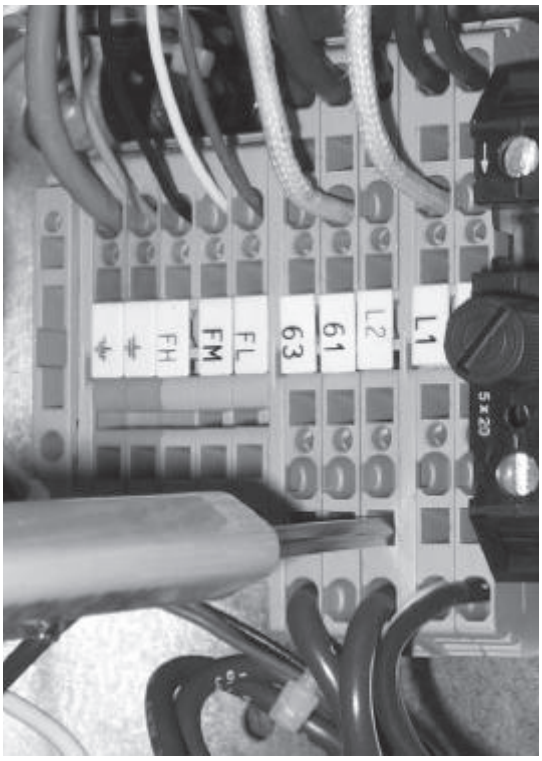


Fig. 31 — Terminal Strip

Table 10 — Electrical Data

UNIT	NOMINAL V/Ph/Hz	CONDENSATE PUMP	FLA	MCA	MOP
Standard – ECM	115/1/60	no	5.7	7.1	15
		yes	7.2	8.6	15
	208/1/60	no	3.8	4.7	15
		yes	4.4	5.3	15
	230/1/60	no	3.3	4.1	15
		yes	3.8	4.6	15
	277/1/60	no	3.5	4.4	15
		yes	4.0	4.9	15
High Static – ECM	115/1/60	no	6.8	8.5	15
		yes	8.3	10.0	15
	208/1/60	no	4.5	5.6	15
		yes	5.1	6.2	15
	230/1/60	no	4.1	5.1	15
		yes	4.6	5.6	15
	277/1/60	no	3.7	4.6	15
		yes	4.2	5.1	15

LEGEND

ECM — Electronically Commutated Motor
FLA — Full Load Amps
MCA — Unit Minimum Circuit Ampacity
MOP — Maximum Overcurrent Protection (Maximum Fuse Size or Circuit Breaker Amps)

PRE-START-UP

NOTE: Refer to start-up sheets.

IMPORTANT: Start-up and adjustment procedures should be performed by a qualified service agency.

No water-flow can cause a freeze condition resulting in damage to the coil.

Never leave the unit filled with water in a building without heat unless antifreeze has been added.

IMPORTANT: Les procédures de démarrage et de réglage, l'installation et le service de ces appareils doivent être confiés à un centre d'installation et de service qualifié.

L'absence d'écoulement d'eau risque de causer une condition de gel et d'endommager le serpentin.

Ne laissez jamais l'appareil rempli d'eau dans un immeuble non chauffé sans lui ajouter de l'antigel.

Pre-start Checks

1. Check that the supply voltage matches the unit supply voltage listed on the Unit Serial Plate. Verify that all wiring is secure and properly protected. Trace circuits to ensure that the unit has been wired according to the wiring diagram.
2. Check that the unit has no visible damage and that all the components are secure.
3. Check that all field electrical and mechanical work has been performed according to all applicable Federal, State, and Local codes.
4. Check the supply voltage to the unit is within ± 5% of the voltage on the unit serial plate.
5. Check that the system has been correctly flushed.
6. Check for any water leaks.
7. The unit and interconnecting piping have been evacuated correctly and the condensing unit service valves are open (DX Cooling units only).
8. Check that the plug is installed for the condensate connection that is not being used.
9. Check that the motor is secure and the shaft and blower set screws are tight. Rotate the blower shaft by hand.
10. Check that the filters have been properly installed.
11. Prior to beginning work on systems containing FLAMMABLE REFRIGERANTS, safety checks are necessary to ensure that the risk of ignition is minimized.
    a. Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.
    b. All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided.
    c. The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. nonsparking, adequately sealed or intrinsically safe.
    d. If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO_2 fire extinguisher adjacent to the charging area.
    e. No person carrying out work in relation to a REFRIGERATING SYSTEM which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. “No Smoking” signs shall be displayed.
    f. 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 of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.
    g. Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer's technical department for assistance.
    h. The following checks shall be applied to installations using FLAMMABLE REFRIGERANTS:
        1) The actual REFRIGERANT CHARGE is in accordance with the room size within which the refrigerant containing parts are installed.
        2) The ventilation machinery and outlets are operating adequately and are not obstructed.
        3) If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant.
        4) Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected.
        5) Refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

Checks to Electrical Devices

Connecting to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.

Initial safety checks shall include:

a. That capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking
b. That no live electrical components and wiring are exposed while charging, recovering or purging the system
c. That there is continuity of earth bonding.

Charging Procedure

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

1. Prior to charging the system, it shall be pressure-tested with the appropriate purging gas.
2. Use only charging equipment used with R-454B refrigerant to ensure that contamination of different refrigerants does not occur.

3. Verify the unit to be charged is labeled for use with R-454B refrigerant.
4. Charging hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
5. Cylinders shall be kept in an appropriate position according to the instructions.
6. Ensure that the refrigeration system is grounded prior to charging the system with refrigerant.
7. Label the system when charging is complete (if not already).
8. Extreme care shall be taken not to overfill the refrigeration system.
9. The system shall be leak-tested on completion of charging but prior to commissioning and again prior to leaving the site. Do not use an open flame for refrigerant leak testing.

START-UP

NOTE: For models with DX Cooling, see the installation and maintenance manual provided with the condensing unit for start-up information.

DX COOLING MODELS ONLY

1. Ensure that the condensing unit start-up procedure (DX Cooling models only) has been carried out, as detailed in the condensing unit installation and maintenance manual.
2. The compressor should be isolated by removing the connection at the Y1 terminal on the indoor unit. Main power can now be applied to the indoor and outdoor units. A system electrical check can now be carried out.
3. Verify the Refrigeration Detection System is functioning properly by disconnecting the refrigerant leak sensors. The unit should initiate the mitigation actions noted in the previous "Refrigeration Detection System" section. Once verified, reconnect the sensors.

ALL MODELS

1. Switch the 3-speed switch to position 1, 2 or 3.
2. Switch the disconnect switch to the "ON" position.
3. Confirm that the blower motor is rotating in the correct direction and blowing air out of the supply air grill.
   a. (Units with Chilled Water, Hot Water and Steam Coils only) Ensure all valves are open to the unit.
   b. (Units with Chilled Water and Hot Water only) Check water flow rates and pressure drops and compare to design.
4. Check that the dampers are not obstructed and move through their full range of motion.

During the unit operation, measure and record all the information that is required to complete the Start-Up Sheets that are supplied with the unit. Copy the information onto the Start-Up Sheets in this manual for your records.

DX COOLING MODELS ONLY:

Shut unit down and disconnect the main power. The compressor signal Y1 (disconnected from the indoor unit in Step 2) can now be re-connected and main power applied to the system.

NOTE: The 24-v power for the indoor unit control circuit is supplied from a unit factory-installed transformer. When the indoor and outdoor units are supplied from separate main supplies, care must be taken to ensure that the outdoor unit is isolated whenever the indoor unit power is removed. Failure to do so may result in freeze ups and other damage to the unit.

Detection of Flammable Refrigerants

1. 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 using a naked flame) shall not be used.
2. The following leak detection methods are deemed acceptable for all refrigerant systems:
   a. 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 re-calibration. (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.
   b. 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 % maximum) is confirmed.
   c. 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.
3. Examples of leak detection fluids are:
   a. bubble method
   b. fluorescent method agents
4. If a leak is suspected, all naked flames shall be removed/extinguished.
5. 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.

OPERATION

The supply fan shall run at all times when unit is in occupied mode. When in unoccupied mode, the supply fan shall run only on a call for heating or cooling. The supply fan speed can be adjusted using the standard equipped manual 3-speed switch.

Freeze Stat (Optional)

On units equipped, an adjustable auto-resetting freeze stat is factory set to trip at 35°F (1.7°C). If the coil temperature reaches the limit and the freeze stat trips, it shall automatically reset when the coil temperature rises 5°F above the setpoint. The freeze stat shall be wired so that upon tripping, power is removed from the supply fan, the outside air damper closes, and either the HW (Hot Water) valve opens or the face and bypass damper goes to full bypass.

Outside Air and Return Air Dampers (Optional)

The outside air and return air dampers control the mixture of return air and outside air drawn through the unit. Both dampers are linked together and are controlled by an actuator requiring a 2-6VDC proportional signal. At 2V, the dampers are positioned for full return air and no outside air. At 6V, the dampers are positioned for full outside air and no return air. The outside air damper shall open to a minimum position to provide ventilation requirements when the room is occupied. When in heating mode, if the space temperature is more than 4°F from the heating setpoint, the outside air damper shall fully close. The outside air damper shall also be fully closed during unoccupied mode. NOTE: Sequence of operations are a factory recommendation.

The dampers can act as economizers for free-cooling. If cooling is required and the outside air temperature is below the economizer outside air lockout temperature (60°F (15.6°C) recommended) and above 35°F (1.7°C) (adjustable), the outside air damper shall modulate open. NOTE: Sequence of operations is a factory recommendation.

CONTROLS

Chilled Water with Valve Control

Units with a chilled water coil and 24v controls by others desiring valve control shall use a non-spring return modulating valve operated by either a proportional (2-10 VDC) or a tri-state (24 VAC) signal.

Chilled Water with Face and Bypass Control

Units equipped with a chilled water coil and face and bypass control shall modulate the face and bypass damper via a spring return actuator, controlled by a proportional signal (2-5.5V). The face and bypass damper regulates the amount of return air and outside air passing through the chilled water coil. On a call for cooling, the damper shall open to the face of the coil proportionally based on how many degrees the room temperature is from the setpoint.

Direct Expansion (DX) Cooling Control

When the room temperature is above the cooling setpoint, the compressor will be energized. The compressor will de-energize when the room temperature falls below the cooling setpoint. If the factory installed low limit stat detects indoor evaporator coil temperatures below its set point, the compressor will be disabled.

Hot Water or Steam with Valve Control

Units with 24V by others or DDC Ready controls that are equipped with hot water or steam coil using valve control are spring-return, normally open modulating valves operated by a proportional signal (2-10 VDC) or a tri-state (24 VAC).

Hot Water with Face and Bypass Control

Units equipped with a Hot Water or Steam Coil and face and bypass control shall modulate the face and bypass damper via a spring return actuator, controlled by a proportional signal (2-5.5V). The face and bypass damper regulates the amount of return air and outside air passing through the heating coil. On a call for heating, the damper shall open proportionally based on how many degrees the room temperature is from the setpoint.

Hot Water and Chilled Water (2-Pipe) with Valve Control

Units with valve control to provide heating and cooling on a single water coil (2-pipe system) and using DDC ready controls shall use a spring-return, normally open modulating valve operated by a proportional signal (2-10 VDC) or a tri-state (24 VAC) signal.

Hot Water and Chilled Water (2-Pipe) with Face and Bypass Control

Units with face and bypass control to provide heating and cooling on a single water coil (2-pipe system) shall modulate the face and bypass damper via a spring return actuator, controlled by a proportional signal (2-5.5V). The face and bypass damper regulates the amount of return air and outside air passing through the water coil. On a call for heating or cooling (depending on the season), the damper shall open proportionally based on how many degrees the room temperature is from the setpoint.

2-Position Control Valves

Optional spring-return, 2-position control valves can be used to control the end of cycle flow on both chilled and hot water coils. On a chilled water coil, a normally closed valve is used. On a hot water coil or 2-pipe changeover system, a normally open valve is used.

NOTE: Controls sequence is a factory recommendation; when units are ordered with field installed controls by others or DDC Ready it is up to the installing contractor to fulfill the controls sequence that is required.

Condensate Pump (Optional)

On units equipped with a condensate pump, the pump shall begin to run once the condensate reaches a set level. The pump comes with an internal safety switch that can be wired either normally open or normally closed. The safety switch shall be wired such that the chilled water valve closes when it trips.

Condensate Pan Float Switch (Optional)

On units equipped with a condensate pan float switch, the normally closed switch shall be wired such that the chilled water valve closes or the outdoor condensing unit is disabled (DX Cooling Models Only) upon tripping.

SERVICE

⚠ WARNING

1. Disconnect power supply before making wiring connections or working on this equipment. Follow all applicable safety procedures to prevent accidental power up. Failure to do so can result in injury or death from electrical shock or moving parts and may cause equipment damage.
2. When servicing or repairing this equipment, use only factory-approved service replacement parts. A complete replacement parts list may be obtained by contacting the factory. Refer to the rating plate on the appliance for complete appliance model number, serial number, and company address. Any substitution of parts or controls not approved by the factory will be at the owner's risk.
3. This unit contains R-454B high pressure refrigerant. Hazards exist that could result in personal injury or death. Installation, maintenance, and service must only be performed by an HVAC technician qualified in R-454B refrigerant and using proper tools and equipment. Due to much higher pressure of R-454B refrigerant, DO NOT USE service equipment or tools designed for refrigerants other than R-454B.
4. Do not use a means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
5. Do not pierce or burn any portion of the refrigeration system.
6. Do not use open flames for detection of refrigerant leaks. Use only electronic leak detectors or non-chlorinated leak detection fluids.
7. Be aware that refrigerants may not contain an odor.

⚠AVERTISSEMENT

1. Débranchez l'alimentation électrique avant d'effectuer des connexions ou de travailler sur l'appareil. Respectez toutes les procédures de sécurité qui s'appliquent pour éviter toute mise en marche accidentelle. Le non-respect de cette directive peut entraîner des blessures ou la mort causées par un choc électrique ou des pièces mobiles, en plus d'endommager l'appareil.
2. Pour l'entretien et les réparations de cet appareil, utilisez uniquement des pièces d'origine certifiées. Pour la liste complete des pièces de rechange, consultez Carrier Manufacturing Company. Le numéro de modèle complet, le numéro de série et l'adresse du fabricant figurent sur la plaque signalétique fixée à l'appareil. Toute substitution de pièce ou decommande non approuvée par le fabricant sera aux risques du propriétaire.
3. Les unités munies de serpentins évaporateurs DX (reportez-vous à la nomenclature du modèle) contiennent du fluide frigorigène à haute pression R-454B. Des dangers existent qui, s'ils se matérialisent, pourraient entraîner des blessures ou la mort. L'installation, l'entretien et le service ne doivent être effectués que par un technicien de CVC qualifié quant à l'usage du fluide frigorigène R-454B en utilisant les outils et l'équipement appropriés. En raison de la pression beaucoup plus élevée du fluide frigorigène R-454B, N'utilisez PAS des outils ou de l'équipement de service qui ne sont pas conçus spécifiquement pour le R-454B.
4. N'utilisez pas de moyen pour accélérer le processus de dégivrage ou pour nettoyer, autres que ceux recommandés par le fabricant.
5. Ne percez ni ne brûlez aucune partie du système de réfrigération.
6. N'utilisez pas de flammes ouvertes pour détecter les fuites de réfrigérant. Utilisez uniquement des détecteurs de fuites électroniques ou des fluides de détection de fuites non chlorés.
7. Sachez que les réfrigérants peuvent ne pas contenir d'odeur.

⚠CAUTION

1. Do not attempt to reuse any mechanical or electrical controllers which have been wet. Replace defective controller.
2. When servicing the unit, some components may be hot enough to cause pain or injury. Allow time for cooling of hot components before servicing.

⚠ATTENTION

1. Ne tentez pas de réutiliser un composant mécanique ou électrique qui a été mouillé. Ces composants doivent être remplacés.
2. Durant l'entretien de l'unité, certains composants peuvent être assez chauds pour causer de la douleur ou une blessure. Laissez les composants chauds se refroidir avant de procéder à tout entretien.

IMPORTANT: Start-up and adjustment procedures must be performed by a qualified service agency.

No water flow can cause a freeze condition resulting in damage to the coil. To check most of the possible remedies in the Troubleshooting Table 11, refer to the applicable sections of the manual.

IMPORTANT: Les procédures de démarrage et de réglage, l'installation et le service de ces appareils doivent être confiés à un centre d'installation et de service qualifié.

L'absence d'ecoulement d'eau risque de causer une condition de gel et d'endommager le serpentin. Pour essayer la plupart des solutions possibles suggérées dans le guide de dépannage du Tableau 11, reportezvous aux sections correspondantes du manuel.

Maintenance

The routine care and maintenance of this unit will increase longevity, provide for the proper operational performance, and reduce the probability of failure.

Once the unit is operational, it will be necessary to perform certain routine maintenance/service checks. The following is a Maintenance Schedule with the recommended checks. If your unit is equipped with special features, there may be additional checks that are required. Consult Carrier for assistance.

The use of torque screwdrivers on panel, cover or component mounting screws is not recommended. Hand-start all screws. If electric drills are used, set at the lowest possible torque.

Access

Access to the unit is gained by opening the front panels and hinged top side covers using the key that is provided on Floor Mounted units or by opening the bottom access panels on Ceiling Mounted units. Refer to Components Layout in Fig. 32-34.

Precautions for Work with Flammable Refrigerants

Prior to beginning work on systems containing FLAMMABLE REFRIGERANTS, safety checks are necessary to ensure that the risk of ignition is minimized.

1. Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.
2. All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided.
3. The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. nonsparking, adequately sealed or intrinsically safe.
4. If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO_2 fire extinguisher adjacent to the charging area.
5. No person carrying out work in relation to a REFRIGERATING SYSTEM which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to

the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.

6. 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 of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.
7. Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer's technical department for assistance.
8. The following checks shall be applied to installations using FLAMMABLE REFRIGERANTS:
   a. The actual REFRIGERANT CHARGE is in accordance with the room size within which the refrigerant containing parts are installed.
   b. The ventilation machinery and outlets are operating adequately and are not obstructed.
   c. If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant.
   d. Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected.
   e. Refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

CHECKS TO ELECTRICAL DEVICES

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.

Initial safety checks shall include:

1. That capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking
2. That no live electrical components and wiring are exposed while charging, recovering or purging the system
3. That there is continuity of earth bonding.

REPAIR WORK

When performing maintenance to units with faulty components, it is important to note that sealed electrical components and intrinsically safe components (such as the compressor, solid state relays, motors) shall be replaced and repairs should not be attempted.

Detection of Flammable Refrigerants

1. 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 using a naked flame) shall not be used.
2. The following leak detection methods are deemed acceptable for all refrigerant systems:
   a. 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 re-calibration. (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.
   b. 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% maximum) is confirmed.
   c. 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.
3. Examples of leak detection fluids are:
   a. bubble method
   b. fluorescent method agents
4. If a leak is suspected, all naked flames shall be removed/extinguished.
5. 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.
6. Removal of refrigerant shall be according to "Refrigerant Removal and Evacuation" Section.

Charging Procedure

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

1. Prior to charging the system, it shall be pressure-tested with the appropriate purging gas.
2. Use only charging equipment used with R-454B refrigerant to ensure that contamination of different refrigerants does not occur.
3. Verify the unit to be charged is labeled for use with R-454B refrigerant.
4. Charging hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
5. Cylinders shall be kept in an appropriate position according to the instructions.
6. Ensure that the refrigeration system is grounded prior to charging the system with refrigerant.
7. Label the system when charging is complete (if not already).
8. Extreme care shall be taken not to overfill the refrigeration system.
9. The system shall be leak-tested on completion of charging but prior to commissioning and again prior to leaving the site. Do not use an open flame for refrigerant leak testing.

Refrigerant Removal and Evacuation

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:
   a. Evacuate.
   b. Purge the circuit with inert gas (optional for A2L).

c. Evacuate (optional for A2L).
d. Continuously flush or purge with inert gas when using flame to open circuit.
e. Open the circuit.

2. The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes.
3. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times.
4. Compressed air or oxygen shall not be used for purging refrigerant systems.
5. For appliances containing flammable refrigerants, 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 (optional). This process shall be repeated until no refrigerant is within the system (optional).
6. When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.
7. The outlet for the vacuum pump shall not be close to any potential ignition sources, and ventilation shall be available.

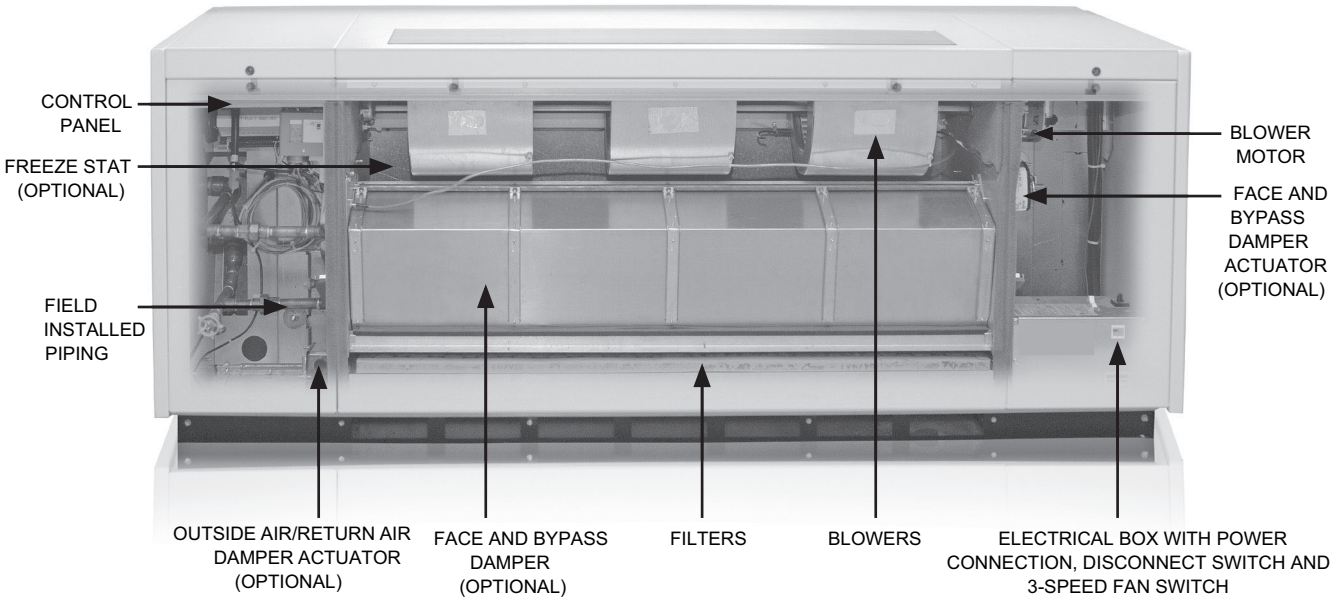


Fig. 32 — Component Layout (Floor Mounted)

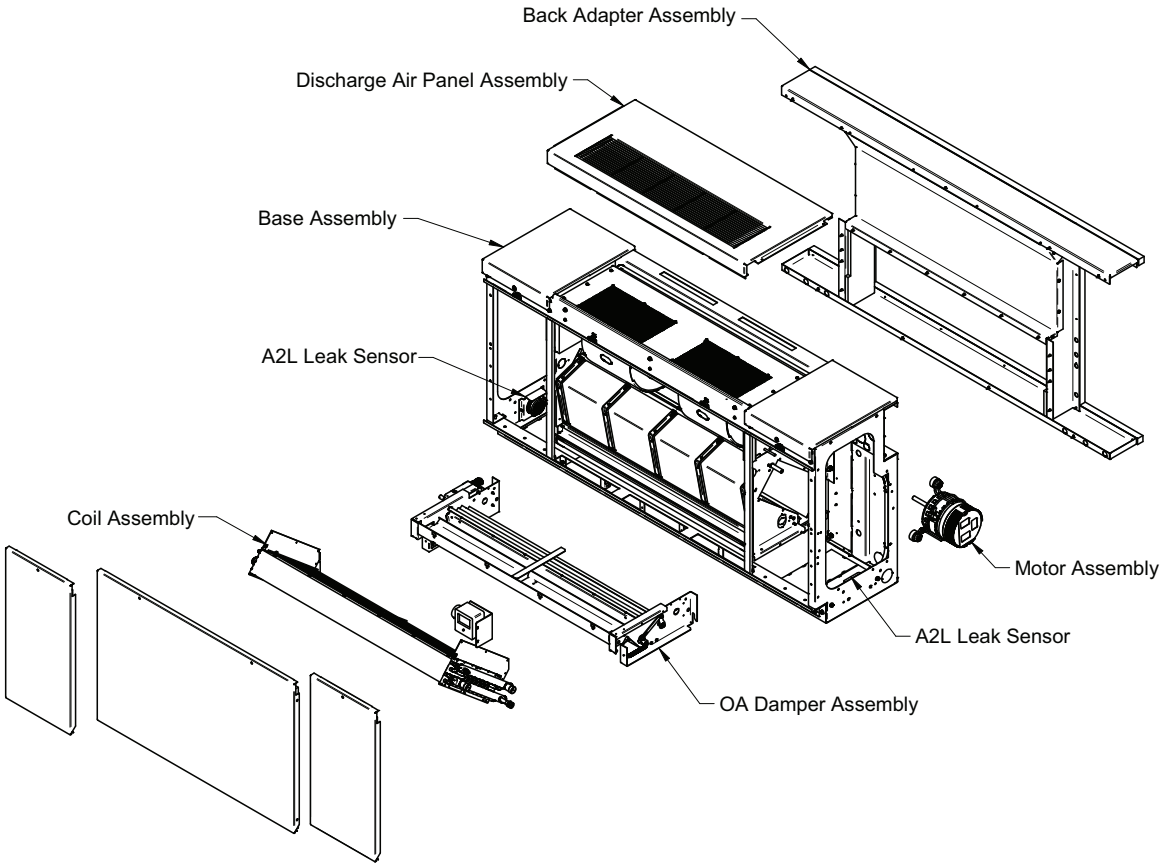


Fig. 33 — Component Layout Exploded View (Floor Mounted)

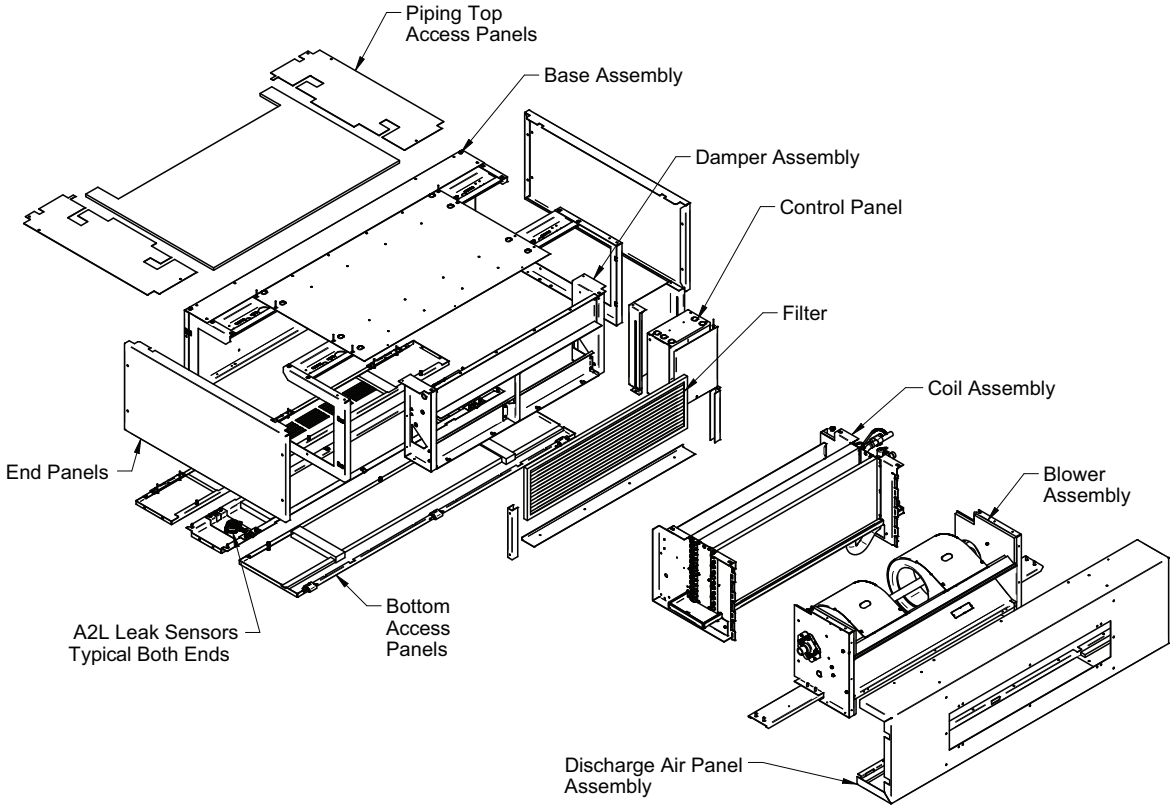


Fig. 34 — Component Layout Ceiling Mounted Units (Exploded View)

Maintenance Schedule

NOTE: Refer to Table 11 for troubleshooting.

1. Monthly:
   a. With the Disconnect in the "OFF" position: check the filter(s) and replace if necessary. Slide the filter(s) out of the track and replace with new filter(s). Refer to Fig. 35-36. The filters are positioned under the coil assembly. Never run the unit without filters.
2. Six Months (Before heating and cooling season):
   a. Check for correct fan operation, no excessive noise vibrations.
3. With the disconnect switch in the "OFF" position:
   a. Inspect all electrical circuits including optional components and sensors for loose connections and signs of overheating, arcing, chafing or other physical damage. The electrical control section should also be wiped clean of all dirt that may affect the unit operation.
   b. Check the filter(s) and replace if necessary. Slide the filter(s) out of the track and replace with new filter(s) (see Fig. 35-36). The filters are positioned under the coil assembly. Never run the unit without filters.
   c. Check the control wiring and sensors. Check the operation and sequencing of controls and ensure that all relevant set points are recorded.
   d. Check all warning labels to ensure they can be read and that they have not been removed.
   e. Inspect condensate hose for any possible clogs.
   f. Check for general obstructions to inlet and discharge openings.
   g. Fill the fan shaft bearing cup with oil. The fan shaft bearing is located in the housing at the opposite end of the fan shaft from the motor (see Fig. 37-38). Additional bearing cup in middle of unit on 1250 and 1500 cfm units is accessible through the front panel.
4. For units with DX evaporator coils:
   a. Inspect the RDS sensors for any signs of damage or contamination.
   b. Verify the RDS is functioning properly by disconnecting the refrigerant leak sensors. The unit should initiate the mitigation actions noted in the "Refrigeration Detection System" section. Once verified, reconnect the sensors.
   c. The RDS uses refrigerant sensors with a predetermined lifespan (approximately 10 years). The RDS will indicate when a sensor has reached its end-of-life via a blinking red LED light on the sensor. The sensors must only be replaced with those specified by Carrier. Using unauthorized sensors may compromise safety and accuracy.

Refrigerant Recovery

When removing refrigerants from a system, either for servicing or decommissioning, all refrigerants are to be removed safely following local and national regulations. The following are additional items that must be followed:

1. When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed.
2. Ensure that the correct number of cylinders for holding the total system charge is available.
3. All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant (i.e. special cylinders for the recovery of the refrigerant). Do not mix different types of refrigerants.
4. Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order.
5. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.
6. 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.
7. A set of calibrated weighing scales shall be available and in good working order.
8. Hoses shall be complete with leak-free disconnect couplings and in good condition.
9. The recovered refrigerant shall be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.
10. 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.

Decommissioning

Decommissioning occurs when equipment will no longer be used and is to be physically removed. Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail by reviewing this Installation and Service Manual in its entirety. Refrigerants must be recovered safely. Prior to decommissioning, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. Ensure that electrical power is available separate from the unit to power tools and refrigerant evacuation equipment.

The following are the general steps in decommissioning the equipment:

1. Become familiar with the equipment and its operation.
2. Isolate the equipment electrically.
3. Before the decommissioning 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. Recover the refrigeration system refrigerant using the recovery pump, operating in accordance with manufacturer instructions.
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 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 % 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 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.
12. Equipment shall be labeled stating that it has been decommissioned and emptied of refrigerant. The label shall be dated and signed. Ensure that there are labels on the unit stating the unit contains a flammable refrigerant.

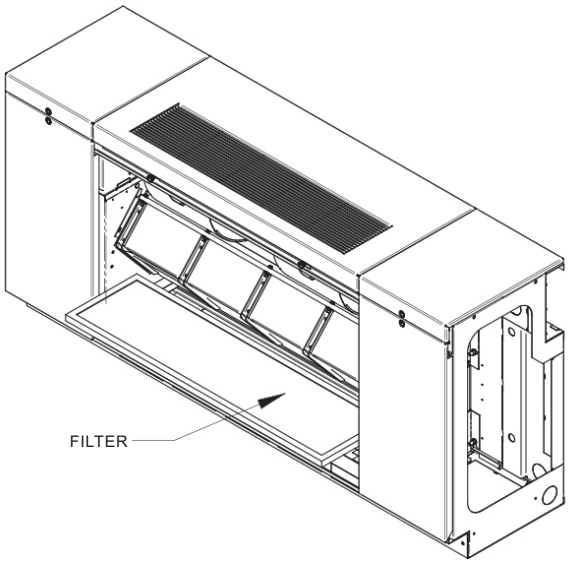


Fig. 35 — Filter Location (Floor Mounted Units)

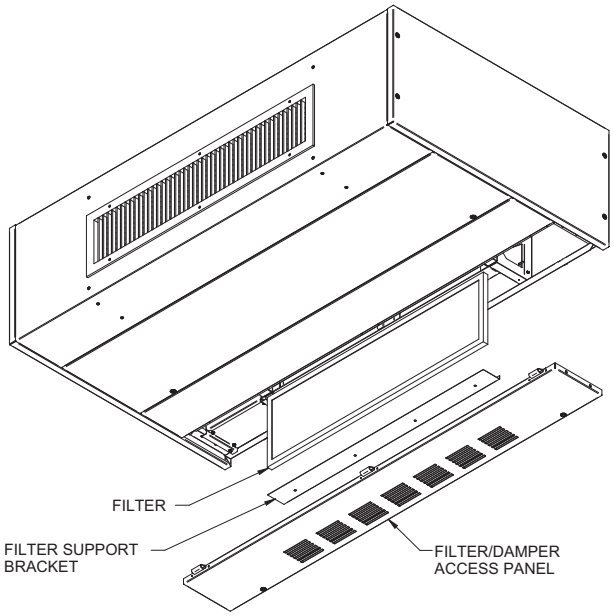


Fig. 36 — Filter Location (Ceiling Mounted Units)

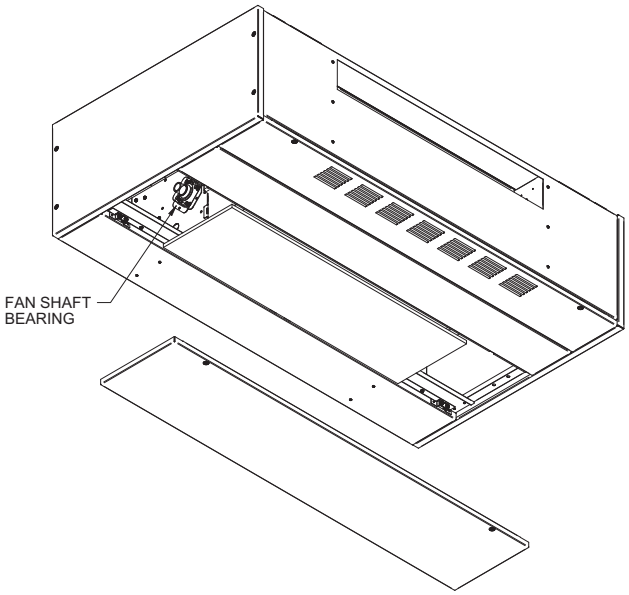


Fig. 37 — End Shaft Bearing Cup Location

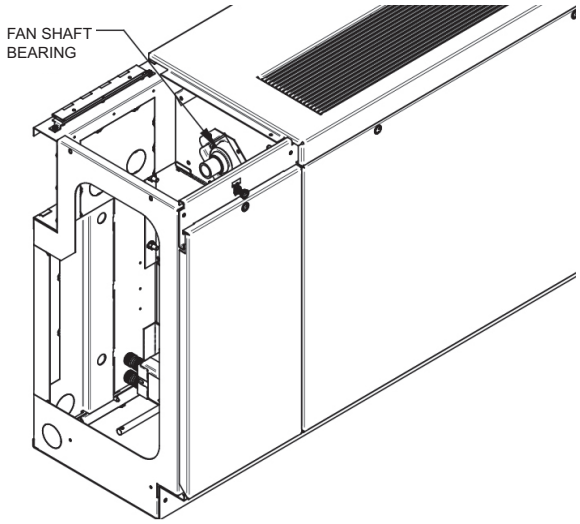


Fig. 38 — End Shaft Bearing Cup Location

Table 11 — Troubleshooting

TROUBLE	POSSIBLE CAUSE	POSSIBLE REMEDY
Unit Not Operating - Power On	Unit mounted disconnect in the “OFF” position.	Turn the disconnect switch to the “ON” position.
	Unit mounted 3-speed selector switch in the “0” position (if equipped with a 4-position switch).	Turn the 3-speed selector switch to the “1, 2, or 3” position.
	Unit switched OFF in the microprocessor.	Consult microprocessor documentation.
	Delay on start set incorrectly.	Consult microprocessor documentation.
	Unit not in occupied mode.	Consult microprocessor documentation, and consult microprocessor occupied setpoints.
	Fire/smoke alarm tripped.	De-energize and re-energize unit.
	Tripped circuit breakers.	Reset the tripped circuit breaker(s).
	Loose mains or control wiring.	With power OFF from distribution panel inspect the field wiring connections in the electrical panel.
	Occupancy sensor malfunction.	Inspect connections beginning with sensor input from the microprocessor.
	Hot water freeze protection (optional) stat tripped.	Manually reset at stat.
Unit Operating - No Mechanical Heating / Cooling	Heating/cooling not required.	Verify applicable set point with return air temperature.
	No output from microprocessor.	Consult microprocessor documentation.
	DX Split Units Only: HP/LP pressure safety switch(es) tripped (open).	Inspect high and low system pressures and wiring. Check for dirty filters in Heat Pump mode.
	DX Split Units Only: Internal overload switch on compressor tripped (open).	Wait for compressor motor windings to cool down (This switch is automatic reset).
	Loose control wiring connections.	Inspect connections beginning with compressor output from the microprocessor.
	Tripped circuit breakers.	Reset the tripped circuit breaker(s).
	Low temperature unit lockout.	Consult microprocessor setpoints.
	DX Split Units Only: Compressor faulty.	Replace compressor.
	Condensate pan/pump float switch tripped.	Check condensate pan/pump and piping for blockage.
No Indoor Fan	Motor tripped on internal overload.	Let motor cool down and reset - possible bad motor or blocked filter.
	Fan not required.	Consult microprocessor documentation, or set thermostat to “ON”. Check if unit is in unoccupied and standby mode.
	No power to the fan.	Check to make sure plugs are locked in place and all pins are secure. Check for 24V control signal.
	Current sensor fault.	Make sure sensor is functioning correctly.
Hot Water / Chilled Water Valve Not Operational (Option)	Heating not required.	Consult microprocessor documentation.
	Loose wiring connections.	Inspect connections beginning with valve output from the microprocessor. Check to ensure 24V supply power is present at actuator.
	Faulty heating actuator.	Replace actuator if faulty.
	Isolation valves are open.	Check for additional external isolation valves.
	Check for DC control signal.	Check for 2-10VDC signal from microprocessor.
DX Split Units Only: Low Suction Pressure (LP Switch Tripped)	Low refrigeration charge.	Measure unit operating pressures. Add charge and check for leaks.
	Clogged filter(s).	Replace filter(s) as necessary.
	Clogged liquid line filter drier.	Replace drier with a direct replacement. Follow proper procedure.
	Improper expansion valve setting or valve malfunctioning.	Check operation and superheat settings.
	Low/restricted supply airflow.	Check diffusers, filters and supply motor to ensure appropriate airflow.
DX Split Units Only: Low Discharge Pressure	Low refrigeration charge.	Measure unit operating pressures. Add charge and check for leaks.
	Faulty compressor.	Replace compressor.
	Faulty reversing valve.	Evacuate system and replace reversing valve.
	Outdoor air sensor out of calibration.	Check outdoor air sensor for accuracy.
DX Split Units Only: High Suction Pressure	Excessive load.	Check occupancy of space.
	Expansion valve malfunctioning (overfeeding).	Check remote bulb is secure and vapor sealed, and regulate superheat.
	Faulty compressor.	Replace compressor.
DX Split Units Only: High Discharge Pressure	Improper installation of wall sleeve and louver.	Ensure splitter plate is in contact with the back of the louver blade and the unit to ensure no re-circulation of exhaust air takes place.
	Dirty condenser coils.	Clean condenser coil.
	System overcharged.	Remove excess refrigerant.
	Noncondensables in system.	Evacuate refrigerant circuit and recharge.
	Condenser fan speed is too slow (cooling mode).	Not applicable, refer to manufacturer’s Technical Manual.

Table 11 — Troubleshooting (cont)

TROUBLE	POSSIBLE CAUSE	POSSIBLE REMEDY
Condensate Leaking	Condensate drain not piped up.	Pipe condensate drain.
	Condensate pan/line plugged.	Clean drain pan and piping.
	Condensate pump (optional) faulty.	Check operation of condensate pump. Replace pump if necessary.
Microprocessor Not Working-Faulty Operation	Loose sensor wire connectors.	Inspect sensor connections at the microprocessor.
	Strategy file corrupted.	Consult microprocessor documentation.
	Loose control wiring.	Check 24V power supply wiring.
Hot Water / Chilled Water Valve Not Operational (Option)	Heating not required.	Consult microprocessor documentation.
	Loose wiring connections.	Inspect connections beginning with valve output from the microprocessor. Check to ensure 24V supply power is present at actuator.
	Faulty heating actuator.	Replace actuator if faulty.
	Isolation valves are open.	Check for additional external isolation valves.
	Check for DC control signal.	Check for 2-10VDC signal from microprocessor.

REPLACEMENT PARTS

When servicing, repairing or replacing parts on these units, locate the model serial plate on the unit and always give the complete Model Number and Serial Number from the unit see example in Fig. 39.

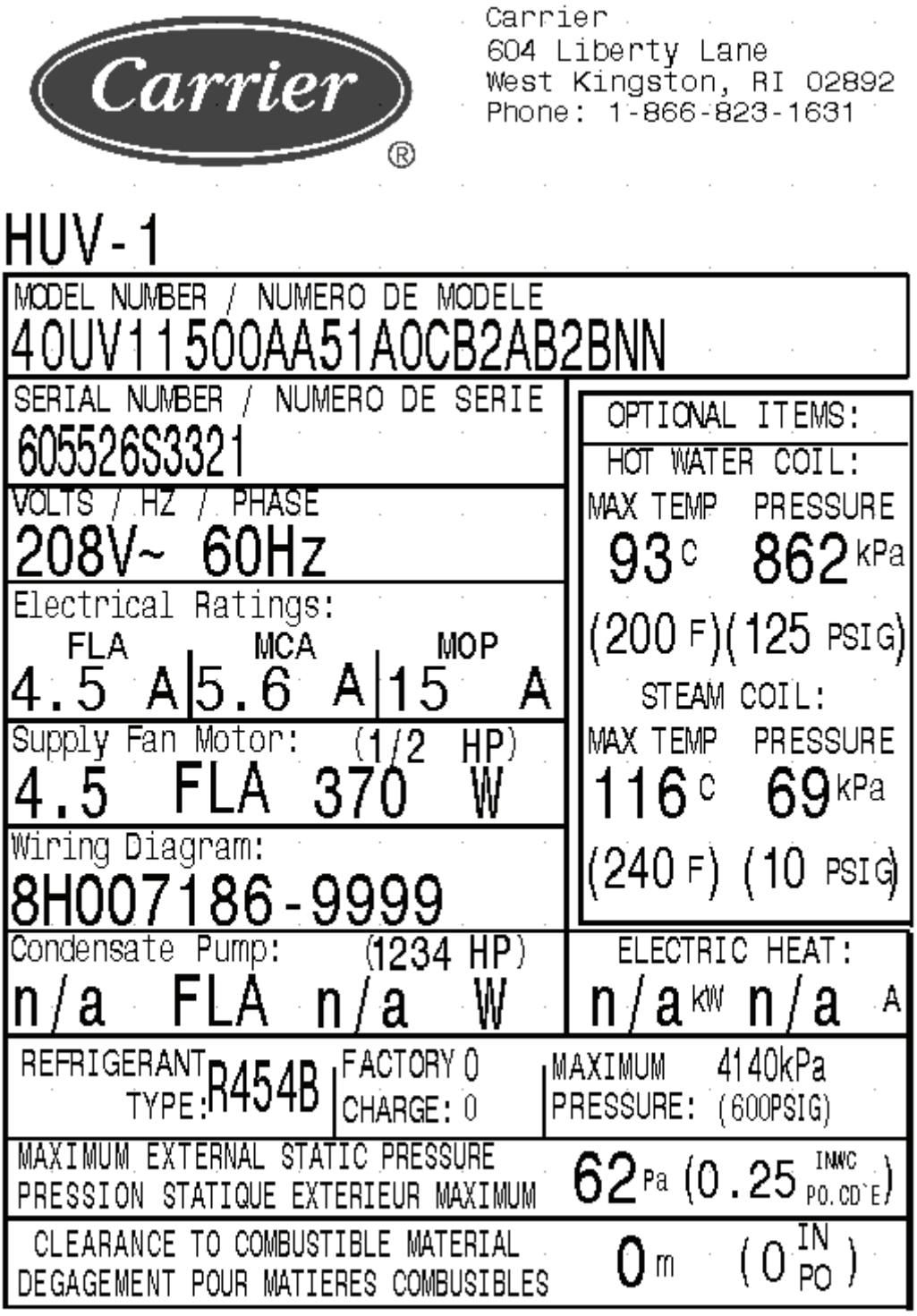


Fig. 39 — Serial Plate Example

UNIT VENTILATOR START-UP SHEET

Date		Job Reference		TAG ID	
Serial #		Unit Type		Room ID	
SPO #		Drawing #			
Installer		Sales Rep			

Installation Checks

Unit mounted level		Condensate drain installed correctly	
Unit floor mounted		Gravity flow or Pump assisted	
Unit ceiling mounted		All electrical connection tight	
Wall sleeve correct		All Mechanical connections tight	
Any visual damage		Supply, Return and Outside air vents unobstructed	

Dry Nitrogen Pressure Test (DX Units Only)	Initial Test Pressure		Psig
	Final Test Pressure		Psig
	Test Duration		Psig

Supply Fan Motor

Motor Size	HP		FLA		Make	
Amps	High		Medium		Low	
RPM	High		Medium		Low	

Main Voltage L1+N

XFMR Voltage Primary Secondary

Controller information

Make		Model		Program Version	
BACnet Card		MS/TP Address		Device Instance	
Loncard		Neuron ID			
Occupied Set point					
Unoccupied Set point					

Air Temperatures	***Cooling***		***Heating***	
Return Air Temp		ºF		ºF
Supply Air Temp		ºF		ºF
Out door Air Temp		ºF		ºF

Component Tests (If Applicable)

Airflow Switch tested		
Aqua Stat tested		
Chilled Water valve tested		
Condensate pump tested		
Remote shutdown link tested		
Face & Bypass damper tested		
Drain pan high limit switch tested		
Fresh air & and return air damper tested		
Electromechanically tested		
Filter change switch tested		
Smoke detector tested		
Freeze stat set at 35ºF and tested		
Freeze stat auto or manual reset		
Hot Water/Steam valve tested		
Fire stat / link tested		
OA / Return air Damper tested		

UNIT VENTILATOR START-UP SHEET (OUTDOOR UNIT)

Outdoor Unit Check List (DX Units Only)

Brand		Model		Serial Number	
Supply Voltage		Primary		Secondary	
Suction Pressure		Psig			
Liquid Pressure		Psig			
Superheat @ Compressor		°F			
Outdoor Air Temperature		°F			
Indoor Air Temperature		°F			

Technicians Notes:

Customer Feedback: Please relay any comments regarding quality and service

Service Technician	
Service Company	
Service Company Telephone	

UNIT START-UP CHECKLIST

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.

Model No.: _____ Serial No.: _____

Software Version _____ Technician: _____

Date: _____

INITIAL CHECKLIST:

☐ Does electrical service correspond to unit nameplate?

☐ Are all electrical connections tight?

☐ Does all field wiring conform to unit wiring diagram?

☐ Is unit installed per IOM (level, cabinet paint condition acceptable, etc.)?

☐ Is the condensate disposal system operating correctly?

☐ Proper slope of field reversible drain pan?

☐ Are end bearing bolts on fan shaft tight?

☐ Are dampers operating properly?

☐ Is the filter clean?

☐ Is expansion valve bulb properly installed and insulated?

PIPING CHECKLIST:

☐ Is expansion valve bulb properly installed and insulated?

☐ Is unit piping correct and insulated to prevent condensation?

☐ Are the control valve packages piped correctly?

☐ Are valve packages properly insulated?

☐ Are there any leaks detected?

CONTROLS CHECKLIST:

☐ Does the unit have carrier controls? If so, continue.

☐ Check that the unit operates per sequence of operation as stated in the controller IOM.

☐ Record the thermostat readings in table below.

PLEASE FILL OUT THE FOLLOWING:	READING
Controller Points	
Space Temperature	
Discharge Air Temperature	
Outdoor Air Temperature	
Outdoor Air Damper Position	
Set Points	
Space Setpoint	
Unoccupied Offset	
Minimum Position	
Deadband	
Position (Open / Closed / %)	
Outdoor Air Damper	
Face/Bypass Damper	

CUT ALONG DOTTED LINE

CUT ALONG DOTTED LINE

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

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