APPENDIX F

Noise Assessment

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Villa Del Sol Mixed-Use Residential Project

Noise and Vibration Study

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December 2020

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1 Project Description

1.1 Introduction

This study analyzes the potential noise and vibration impacts of the proposed Villa Del Sol Mixed-Use Residential Project (herein referred to as "proposed project" or "project") in San José, California. Rincon Consultants, Inc. (Rincon) prepared this study for Circlepoint for use in support of environmental documentation being prepared for the project pursuant to the California Environmental Quality Act (CEQA). The purpose of this study is to analyze the project's noise and vibration impacts related to temporary construction activity and long-term operation of the project.

1.2 Project Summary

Project Location

The project site encompasses approximately 1.49 acres (64,904 square feet) on a generally level, rectangular site at 1936 Alum Rock Avenue, on the south side of Alum Rock Road west of its intersection with McCreery Avenue. Tierra Encantada Way lies perpendicular to the west of the project site. The site currently is currently unpaved and used as an outdoor storage area. Adjacent land uses include mixed-use development to the west, an outdoor storage area to the east, single family residences to the south, and commercial development to the north across Alum Rock Avenue. Thompson Creek is approximately 50 feet east of the site. Figure 1 shows the project site's regional location and Figure 2 shows an aerial view of the project site and surrounding area.

Project Description

The project would involve construction of a five-story mixed-use residential development with a total of 194 units on the approximately 1.49-acre site. The project would include 60 studio units, 80 one-bedroom units, 49 two-bedroom units, and 5 three-bedroom units. The project would also provide a lobby, three landscaped courtyards, three recreation areas, a fitness room, and an open space area. In addition to the residential component the project would include approximately 3,000 square feet of commercial space along Alum Rock Avenue. A total of 12 parking spaces would be provided to serve the commercial development. Residential parking spaces would include 97 spaces. Access to the site would be provided from a private drive off of Alum Rock Avenue and a second driveway off of Tierra Encantada Way. Approximately 195 bicycle parking spaces would be included on the site. The project's apartments would be cooled through in-unit packaged terminal air conditioner (PTAC) systems. PTAC specifications are included in Appendix B.[1]

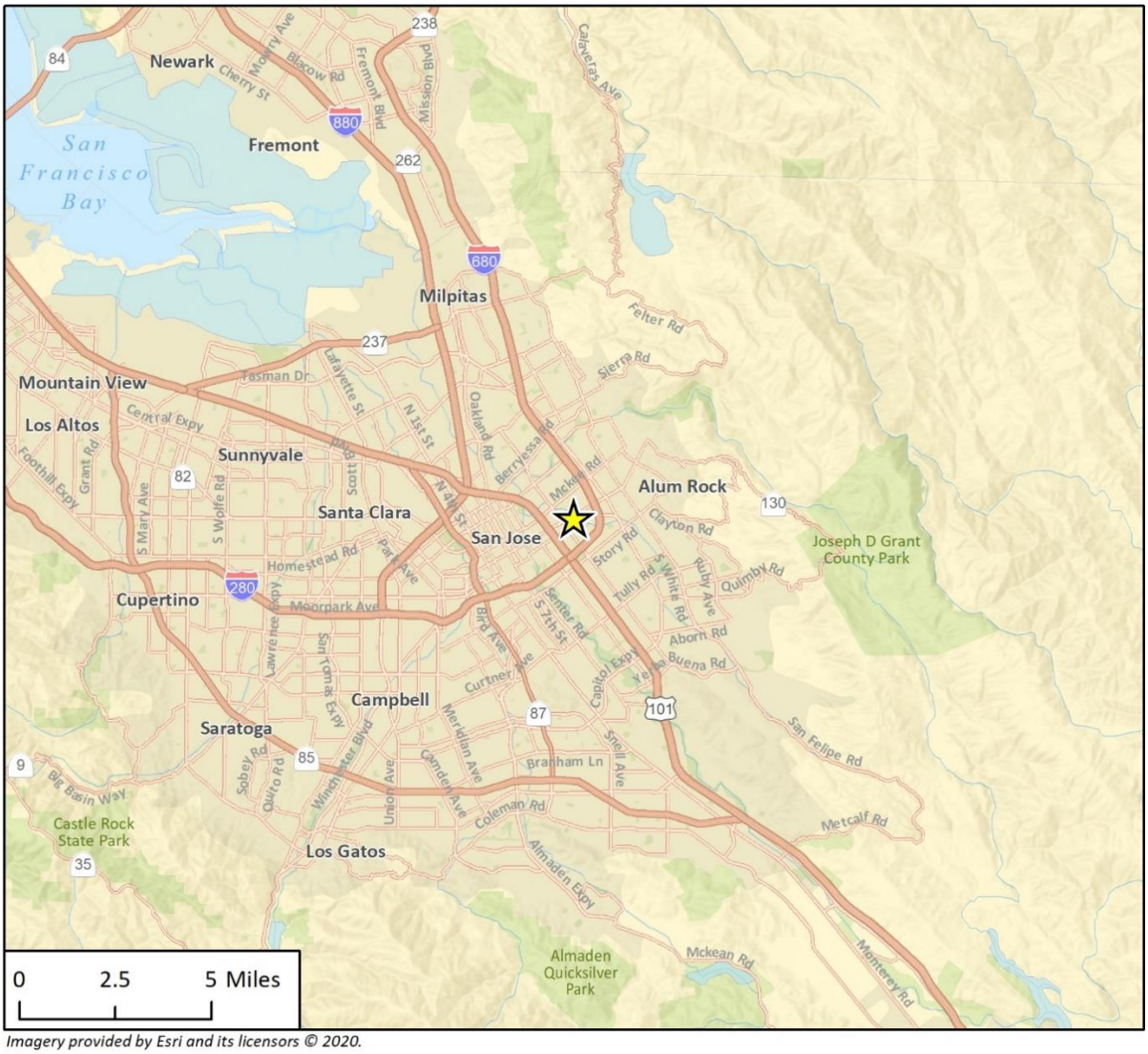
Construction

Project construction is expected to commence in summer 2021 with full buildout completed by January 2023. Site preparation would occur in September 2021 and grading would occur starting in October 2021 and continue for the next two to three months, with building construction beginning

[1] Minor changes have been made to the project plans since noise calculations in October 2020. Notable changes include increase of the lobby square footage by 146 square feet, reduction of two parking spaces, addition of three parking spaces, increased open space by 288 square feet. These minor changes would not notably alter the project operation or construction noise, which are based on the October 2020 site plans.

in December 2021. The project would require approximately 2,318 cubic yards (CY) of export material from the site. Approximately 807 CY would be exported during demolition and 1,511 CY would be exported during grading. The approximately 3,614 CY of cut volume during site

Figure 1 Regional Location



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Project Location

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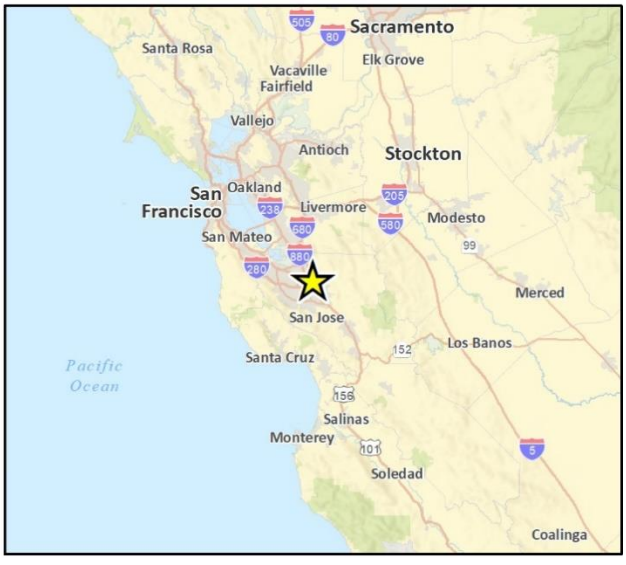

Figure 2 Project Site

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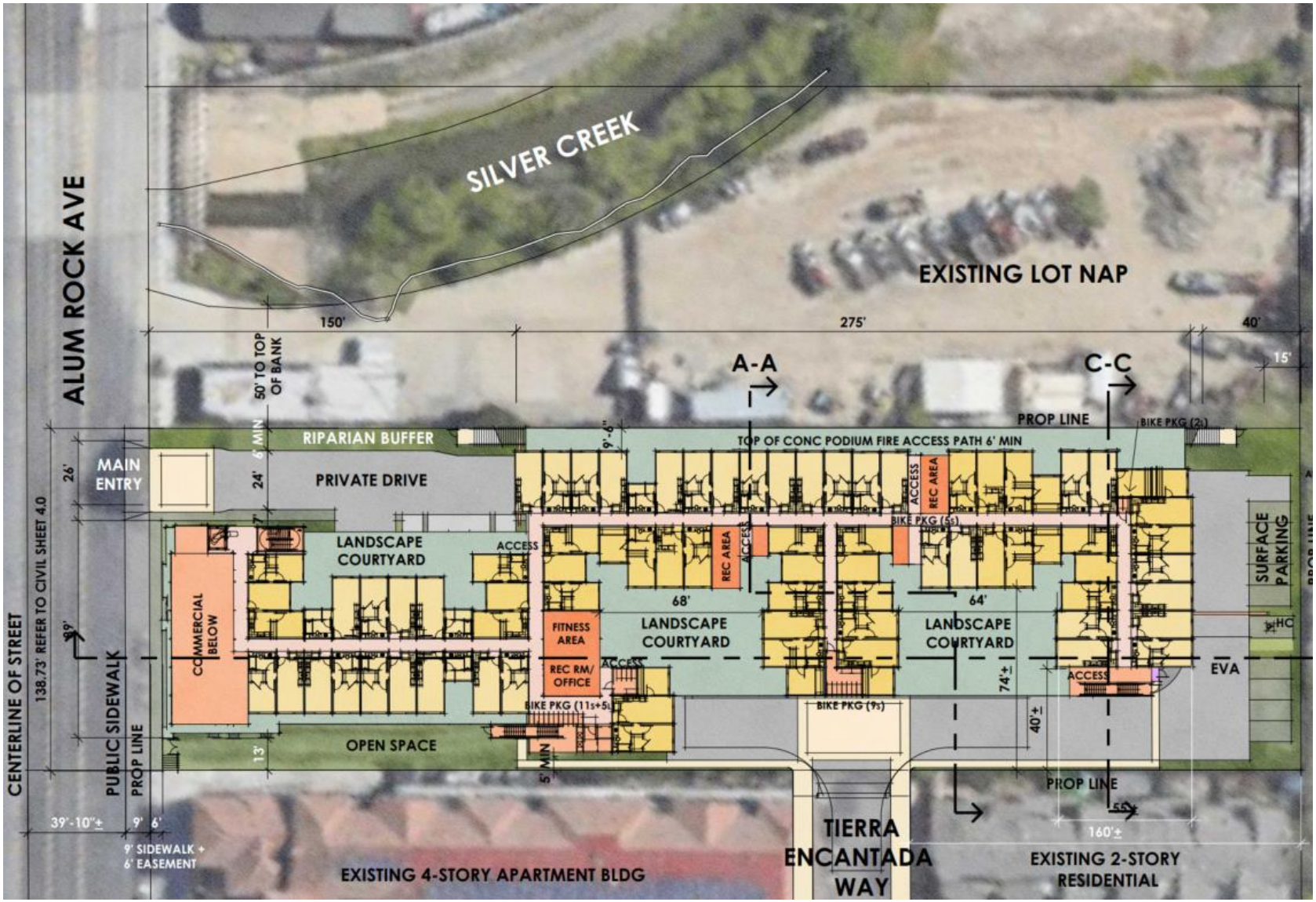
Fig 2 Project Location

preparation would be used as fill on the site. Figure 3 shows the site plan for the upper levels of the project.

Sustainability Features

The project would include green building features such as energy-efficient appliances, construction of southwest facing resident courtyards, and modular construction.

Figure 3 Proposed Upper Level Site Plan



2 Background

2.1 Overview of Sound Measurement

Sound is a vibratory disturbance created by a moving or vibrating source, which is capable of being detected by the hearing organs. Noise is defined as sound that is loud, unpleasant, unexpected, or undesired and may therefore be classified as a more specific group of sounds. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance, and, in the extreme, hearing impairment (Caltrans 2013a).

Noise levels are commonly measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound pressure levels so that they are consistent with the human hearing response, which is most sensitive to frequencies around 4,000 Hertz and less sensitive to frequencies around and below 100 Hertz (Kinsler, et. al. 1999). Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used to measure earthquake magnitudes. A doubling of the energy of a noise source, such as doubling of traffic volume, would increase the noise level by 3 dB; dividing the energy in half would result in a 3-dB decrease (Crocker 2007).

Human perception of noise has no simple correlation with sound energy: the perception of sound is not linear in terms of dBA or in terms of sound energy. Two sources do not “sound twice as loud” as one source. It is widely accepted that the average healthy ear can barely perceive changes of 3 dBA, increase or decrease (i.e., twice the sound energy); that a change of 5 dBA is readily perceptible (8 times the sound energy); and that an increase (or decrease) of 10 dBA sounds twice (half) as loud ([10.5x the sound energy] Crocker 2007).

Sound changes in both level and frequency spectrum as it travels from the source to the receiver. The most obvious change is the decrease in level as the distance from the source increases. The manner by which noise reduces with distance depends on factors such as the type of sources (e.g., point or line, the path the sound will travel, site conditions, and obstructions). Noise levels from a point source typically attenuate, or drop off, at a rate of 6 dBA per doubling of distance (e.g., construction, industrial machinery, ventilation units). Noise from a line source (e.g., roadway, pipeline, railroad) typically attenuates at about 3 dBA per doubling of distance (Caltrans 2013a). The propagation of noise is also affected by the intervening ground, known as ground absorption. A hard site, such as a parking lot or smooth body of water, receives no additional ground attenuation and the changes in noise levels with distance (drop-off rate) result from simply the geometric spreading of the source. An additional ground attenuation value of 1.5 dBA per doubling of distance applies to a soft site (e.g., soft dirt, grass, or scattered bushes and trees) (Caltrans 2013a). Noise levels may also be reduced by intervening structures; the amount of attenuation provided by this “shielding” depends on the size of the object and the frequencies of the noise levels. Natural terrain features such as hills and dense woods, and man-made features such as buildings and walls, can significantly alter noise levels. Generally, any large structure blocking the line of sight will provide at least a 5-dBA reduction in source noise levels at the receiver (Federal Highway Administration [FHWA] 2011). Structures can substantially reduce exposure to noise as well. The FHWA’s guidelines indicate that modern building construction generally provides an exterior-to-interior noise level reduction of 20 to 35 dBA with closed windows.

The impact of noise is not a function of loudness alone. The time of day when noise occurs and the duration of the noise are also important factors of project noise impact. Most noise that lasts for more than a few seconds is variable in its intensity. Consequently, a variety of noise descriptors have been developed. One of the most frequently used noise metrics is the equivalent noise level (L_{eq}); it considers both duration and sound power level. L_{eq} is defined as the single steady A-weighted level equivalent to the same amount of energy as that contained in the actual fluctuating levels over time. Typically, L_{eq} is summed over a one-hour period. L_{max} is the highest root mean squared (RMS) sound pressure level within the sampling period, and L_{min} is the lowest RMS sound pressure level within the measuring period (Crocker 2007).

Noise that occurs at night tends to be more disturbing than that occurring during the day. Community noise is usually measured using Day-Night Average Level (L_{dn}), which is the 24-hour average noise level with a +10 dBA penalty for noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours.

2.2 Vibration

Groundborne vibration of concern in environmental analysis consists of the oscillatory waves that move from a source through the ground to adjacent structures. The number of cycles per second of oscillation makes up the vibration frequency, described in terms of Hz. The frequency of a vibrating object describes how rapidly it oscillates. The normal frequency range of most groundborne vibration that can be felt by the human body starts from a low frequency of less than 1 Hz and goes to a high of about 200 Hz (Crocker 2007).

While people have varying sensitivities to vibrations at different frequencies, in general they are most sensitive to low-frequency vibration. Vibration in buildings, such as from nearby construction activities, may cause windows, items on shelves, and pictures on walls to rattle. Vibration of building components can also take the form of an audible low-frequency rumbling noise, referred to as groundborne noise. Groundborne noise is usually only a problem when the originating vibration spectrum is dominated by frequencies in the upper end of the range (60 to 200 Hz), or when foundations or utilities, such as sewer and water pipes, physically connect the structure and the vibration source (Federal Transit Administration [FTA] 2018). Although groundborne vibration is sometimes noticeable in outdoor environments, it is almost never annoying to people who are outdoors. The primary concern from vibration is that it can be intrusive and annoying to building occupants and vibration-sensitive land uses.

Vibration energy spreads out as it travels through the ground, causing the vibration level to diminish with distance away from the source. High-frequency vibrations diminish much more rapidly than low frequencies, so low frequencies tend to dominate the spectrum at large distances from the source. Discontinuities in the soil strata can also cause diffractions or channeling effects that affect the propagation of vibration over long distances (Caltrans 2013b). When a building is impacted by vibration, a ground-to-foundation coupling loss will usually reduce the overall vibration level. However, under rare circumstances, the ground-to-foundation coupling may actually amplify the vibration level due to structural resonances of the floors and walls.

Vibration amplitudes are usually expressed in peak particle velocity (PPV) or root mean squared (RMS) vibration velocity. The PPV and RMS velocity are normally described in inches per second (in/sec). PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is often used in monitoring of blasting vibration because it is related to the stresses that are experienced by buildings (Caltrans 2013b).

2.3 Sensitive Receivers

Noise exposure goals for various types of land uses reflect the varying noise sensitivities associated with those uses. As defined by the City of San José's Noise Element Background Report, noise sensitive land uses (also referred to as "sensitive receivers") include picnic areas, recreational areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals. (City of San José 2009).

Sensitive receivers nearest to the project site include multi-family residences located adjacent to the western boundary of the project site and single-family residences located adjacent to southern boundary of the project site.

2.4 Project Noise Setting

The dominant sources of noise in the project site vicinity is vehicular traffic on Alum Rock Avenue. Per the City's General Plan Noise Element's Noise Level Contours, the entire project is within at 65-70 CNEL noise level contour from traffic on Alum Rock Avenue and traffic from Interstate-680 (I-680) (City of San José, 2020). These noise level contours do not account for topography or building attenuation.

A previous noise report was prepared for a different project proposed at the project site by Edward L. Pack Associates Inc. in October 2018 to characterize ambient sound levels at and near the project site (Edward L. Pack Associates Inc. 2018). The ambient sound level measurements taken previously would be similar to ambient noise for the proposed project. Three 24-hour sound level measurements were conducted on October 16-17, 2017. Noise Measurement (NM) 1 was taken off Alum Rock Avenue to capture roadway noise levels near the northern border of the project site; NM2 was taken near the western boundary of the project to capture ambient noise levels on the project site; and NM3 was taken at the south property line of the site to capture ambient noise levels on the project site. Table 1 summarizes the noise measurement results.

Table 1 Project Vicinity Sound Level Monitoring Results

Measurement Number	Measurement Location	Approximate Distance to Primary Noise Source	L_{dn}
NM1	Along Alum Rock Ave.	60 feet from centerline of Alum Rock Ave.	70
NM2	Westerly property line at the terminus of Encantada Way	Ambient measurement 325 feet from centerline of Alum Rock Ave.	58
NM3	Southern Property Line	Ambient Measurement 500 feet from centerline of Alum Rock Ave.	57

Source: Edward L Pack Associates Inc. 2018

2.5 Regulatory Setting

Envision San José 2040 General Plan

The San José General Plan includes goals and policies to reduce noise impacts in the City and maintain a health noise environment for residents. The General Plan establishes compatibility standards for land uses in the City, as shown in Table 2.

Table 2 City of San José Noise and Land Use Compatibility Guidelines

Land Use Category	Noise Exposure Levels (DNL in Decibels)		
	Normally Acceptable	Conditionally Acceptable	Unacceptable
Residential, Hotels and Motels, Hospitals and Residential Care	50-60	60-75	75-85
Outdoor Sports and Recreation, Neighborhood Parks and Playgrounds	50-65	65-80	80-85
Schools, Libraries, Museums, Meeting Halls, Churches	50-60	60-75	75-85
Office Buildings, Business Commercial, and Professional Offices	50-70	70-80	80-85
Sports Arena, Outdoor Spectator Sports	50-70	70-80	80-85
Public and Quasi-Public Auditoriums, Concert Halls, Amphitheaters	NA	50-70	70-85

Normally acceptable = Specific land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements

Conditionally acceptable = Specified land use may be permitted only after detailed analysis of the noise reduction requirements and needed noise insulation features included in the design

Unacceptable = New construction or development should generally not be undertaken because mitigation is usually not feasible to comply with noise element policies.

Source: San José 2020

Goals and policies in the General Plan that are applicable to the project include:

Goal EC-1: Noise and Vibration: Minimize the impact of noise on people through noise reduction and suppression techniques, and through appropriate land use policies.

Policy EC-1.1: Locate new development in areas where noise levels are appropriate for the proposed uses. Consider federal, state and City noise standards and guidelines as a part of new development review. Applicable standards and guidelines for land uses in San José include:

Interior Noise Levels: The City's standard for interior noise levels in residences, hotels, motels, residential care facilities, and hospitals is 45 dBA DNL. Include appropriate site and building design, building construction and noise attenuation techniques in new development to meet this standard.

Exterior Noise Levels: The City's acceptable exterior noise level objective is 60 dBA DNL or less for residential and most institutional land uses. The acceptable exterior noise level objective is established for the City, except in the environs of the San José International Airport and the Downtown.

Policy EC-1.2: Minimize the noise impacts of new development on land uses sensitive to increased noise levels by limiting noise generation and by requiring use of noise attenuation measures such as acoustical enclosures and sound barriers, where feasible. The City considers significant noise impacts to occur if a project would:

- Cause the DNL at noise sensitive receptors to increase by five dBA DNL or more where the noise levels would remain "Normally Acceptable"; or
- Cause the DNL at noise sensitive receptors to increase by three dBA DNL or more where noise levels would equal or exceed the "Normally Acceptable" level.

Policy EC-1.7: Require construction operations within San José to use best available noise suppression devices and techniques and limit construction hours near residential uses per the City's Municipal Code. The City considers significant construction noise impacts to occur if a project located within 500 feet of residential uses or 200 feet of commercial or office uses would:

- Involve substantial noise generating activities (such as building demolition, grading, excavation, pile driving, use of impact equipment, or building framing) continuing for more than 12 months.

For such large or complex projects, a construction noise logistics plan that specifies hours of construction, noise and vibration minimization measures, posting or notification of construction schedules, and designation of a noise disturbance coordinator who would respond to neighborhood complaints will be required to be in place prior to the start of construction and implemented during construction to reduce noise impacts on neighboring residents and other uses.

Goal EC-2: Vibration: Minimize vibration impacts on people, residences, and business operations.

Policy EC-2.3: Require new development to minimize vibration impacts to adjacent uses during demolition and construction. For sensitive historic structures, a vibration limit of 0.08 in/sec PPV (peak particle velocity) will be used to minimize the potential for cosmetic damage to a building. A vibration limit of 0.20 inches per second (in/sec) peak particle velocity (PPV) will be used to minimize the potential for cosmetic damage at buildings of normal conventional construction.

City of San José Municipal Code

Title 20 of the Municipal Code lists performance standards for different zonings. Section 20.100.450 restricts construction hours within 500 feet of a residential unit to 7:00 a.m. to 7:00 p.m. Monday through Friday, unless otherwise expressly allowed in a Development Permit or other planning approval. The San Jose Municipal Code (SJMC) does not establish quantitative noise limits for demolition or construction activities.

Section 20.40.600 of the Municipal Code provides performance standards for commercially-zoned properties, and limits operational noise levels resulting from commercially-zoned properties to 55 dBA L_{eq} at any residentially-zoned property line and 60 dBA L_{eq} at any commercially-zoned property line.

City of San José Standard Permit Conditions

Consistent with General Plan Policy EC-1.7 and the Municipal Code, the City will require the applicant to implement the following standard measure to reduce construction-related noise impacts:

- Construct solid plywood fences around ground level construction sites adjacent to operational businesses, residences, or other noise-sensitive land uses.
- Equip all internal combustion engine-driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.
- Prohibit unnecessary idling of internal combustion engines.
- Locate stationary noise-generating equipment such as air compressors or portable power generators as far as possible from sensitive receptors. Construct temporary noise barriers to screen stationary noise-generating equipment when located near adjoining sensitive land uses.
- Utilize "quiet" air compressors and other stationary noise sources where technology exists.
- Control noise from construction workers' radios to a point where they are not audible at existing residences bordering the project site.
- Notify all adjacent businesses, residences, and other noise-sensitive land uses of the construction schedule, in writing, and provide a written schedule of "noisy" construction activities to the adjacent land uses and nearby residences.
- If complaints are received or excessive noise levels cannot be reduced using the measures above, erect a temporary noise control blanket barrier along surrounding building facades that face the construction sites.
- Designate a "disturbance coordinator" who shall be responsible for responding to any complaints about construction noise. The disturbance coordinator shall determine the cause of the noise complaint (e.g., bad muffler, etc.) and shall require that reasonable measures be implemented to correct the problem. Conspicuously post a telephone number for the disturbance coordinator at the construction site and include it in the notice sent to neighbors regarding the construction schedule.
- Limit construction to the hours of 7:00 AM to 7:00 PM Monday through Friday for any onsite or off-site work within 500 feet of any residential unit. Construction outside of these hours may be approved through a development permit based on a site-specific "construction noise mitigation plan" and a finding by the Director of Planning, Building and Code Enforcement that the construction noise mitigation plan is adequate to prevent noise disturbance of affected residential uses.

3 Methodology

3.1 Construction Noise

Construction noise was estimated using the FHWA Roadway Construction Noise Model (RCNM) (FHWA 2006). RCNM predicts construction noise levels for a variety of construction operations based on empirical data and the application of acoustical propagation formulas. Using RCNM, construction noise levels were estimated at noise sensitive receivers near the project site. RCNM provides reference noise levels for standard construction equipment, with an attenuation of 6 dBA per doubling of distance for stationary equipment.

Variation in power imposes additional complexity in characterizing the noise source level from construction equipment. Power variation is accounted for by describing the noise at a reference distance from the equipment operating at full power and adjusting it based on the duty cycle of the activity to determine the L_{eq} of the operation (FHWA 2018). Each phase of construction has a specific equipment mix, depending on the work to be accomplished during that phase. Each phase also has its own noise characteristics; some will have higher continuous noise levels than others, and some have high-impact noise levels.

Construction noise would typically be higher during the heavier periods of initial construction (i.e., site preparation and grading work) and would be lower during the later construction phases (i.e., interior building construction). Typical heavy construction equipment during project grading and site preparation would include graders, dozers and backhoes. It is assumed that diesel engines would power all construction equipment. Construction equipment would not all operate at the same time or location. In addition, construction equipment would not be in constant use during the 8-hour operating day. A grader, dozer, and backhoe were analyzed together for construction noise impacts due to their likelihood of being used in conjunction with one another and therefore a conservative scenario for the greatest noise generation during construction. Using RCNM to estimate noise associated with a grader, dozer and backhoe, noise levels are calculated to be 83 dBA L_{eq} at 50 feet (RCNM calculations are included in Appendix A).

3.2 Groundborne Vibration

The proposed project would not include substantial vibration sources associated with operation. Therefore, construction activities have the greatest potential to generate ground-borne vibration affecting nearby receivers. The greatest vibratory source during construction within the project vicinity would be from a bulldozer. Neither blasting nor pile driving would be required for construction of the proposed project. Construction vibration estimates are based on vibration levels reported by Caltrans and the FTA (Caltrans 2013b, FTA 2018). Table 3 shows typical vibration levels for various pieces of construction equipment used in the assessment of construction vibration (FTA 2018).

Table 3 Vibration Levels Measured during Construction Activities

Equipment	PPV at 25 ft. (in/sec)
Large Bulldozer	0.089
Loaded Trucks	0.076
Jackhammer	0.035
Small Bulldozer	0.003

Source: FTA 2018

3.3 Operational Noise Sources

Noise sources associated with operation of the proposed project would consist of low speed on-site vehicular noise, project-generated off-site traffic, landscape maintenance, general conversations, and mechanical equipment (e.g., heating, ventilation, and air conditioning [HVAC] units and lift station equipment). Low noise levels associated with general conversations, low speed on-site vehicular noise, and landscape maintenance would be similar to existing noise sources in the project's urban setting and are not analyzed further.

On site-noise mechanical sources were modeled with algorithms from the SoundPLAN three-dimensional noise model (SoundPLAN), Version 8.2. Propagation of modeled stationary noise sources was based on ISO Standard 9613-2, "Attenuation of Sound during Propagation Outdoors, Part 2: General Method of Calculation." The assessment methodology assumes that all receptors would be downwind of stationary sources. This is a conservative assumption for total noise impacts since, in reality, only some receivers would be downwind at any one time. The primary stationary noise generator from the project would site would be packaged terminal air conditioner (PTAC) units. Each dwelling unit would contain a PTAC located in exterior walls. In the modeling, units were conservatively placed in likely locations of each unit, i.e., in the walls of the units facing the exhaust to the adjacent property lines. One PTAC was assigned to the studio and one-bedroom units while one or two units were assigned to two-bedroom units and two or three units were assigned to three-bedroom units, depending on the layout of the unit. The PTAC used in this analysis is typical for a larger residential unit, a LG Model LP156HD3A (see Appendix B for specification sheets). The manufacturer's noise data indicates each unit generates an outdoor sound power level of 63 dBA. All PTAC units were modeled as being approximately three feet above the elevation of each floor. The units were conservatively assumed to operate at 100 percent of the hour both day and night and were modeled without screening.

Traffic Noise

Noise levels at the project site would be primarily influenced by traffic noise from Alum Rock Avenue. Future noise levels affecting the compatibility of the project site were estimated using the FHWA's Traffic Noise Model (TNM) traffic noise-reference levels and SoundPLAN. Traffic noise-model inputs to SoundPLAN include the three- dimensional coordinates of the roadways, noise receivers, and topographic features or planned barriers that would affect noise propagation; vehicle volumes and speeds, by type of vehicle; and absorption factors.

The project would generate 864 daily trips (Hexagon 2020). Traffic volumes obtained from Hexagon and used for the noise analysis are shown in Table 4.

Table 4 Existing and Future Traffic Volumes

Roadway	Existing	Existing + Project	Opening Year	Opening Year + Project
Alum Rock Blvd.				
West of McCreery Avenue	16,400	16,800	17,400	17,800
East of McCreery Avenue	16,700	16,900	18,200	18,300

Source: Hexagon Transportation Consultants Inc. 2020

The posted speed limit on Alum Rock Avenue is 30 miles per hour. To determine the vehicle classification mix for modeling, the vehicle classification mix from Highway 101 was used, which is 94.2 percent automobiles, 2.9 percent medium trucks, and 2.8 percent heavy trucks. Additionally, based on traffic flow data for Highway 101, 64.5 percent of the traffic occurs during the daytime, 8 percent during the evening, and 27.5 occurs at night and peak hour traffic is 8.4 percent of the total ADT.

3.4 Significance Thresholds

To determine whether a project would have a significant noise impact, Appendix G to the *State CEQA Guidelines* requires consideration of whether a project would result in:

1. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
2. Generation of excessive groundborne vibration or groundborne noise levels; or
3. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, exposure of people residing or working in the project area to excessive noise levels.

Construction Noise

The City of San José does not currently have an established quantitative noise standard for construction noise. However, Policy EC-1.7 of the City of San José General Plan states that the project would have a significant impact if it would generate substantial noise continuing for more than 12 months within 500 feet of a residence or 200 feet of commercial or office use or does not use best available suppression devices and techniques. As such, this standard is used to evaluate the significance of construction noise impacts.

Operational Noise

Pursuant to City of San José General Plan Policies EC-1.2 and EC-1.3 and SJMC Chapter 20.50.300, the project would have a significant operational impact on ambient noise levels if it would:

- Cause the DNL at noise-sensitive receivers to increase by five L_{dn} or more where the noise levels would remain “Normally Acceptable”;
- Cause the DNL at noise-sensitive receivers to increase by three L_{dn} or more where noise levels would equal or exceed the “Normally Acceptable” level;
- Generate noise levels at noise-sensitive receivers that exceed 55 L_{dn};
- Generate noise levels at residential property lines that exceed 55 dBA L_{eq}; or

Construction Vibration

To minimize the potential for cosmetic damage to buildings, the City of San José has established vibration thresholds of 0.08 in/sec PPV for sensitive historic structures and 0.20 in/sec PPV for buildings of normal conventional construction. Therefore, the City of San José's standards are used to evaluate the significance of the project's construction vibration impacts.

4 Impact Analysis

Threshold 1:	Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? [Construction]

Project construction would occur nearest to the multi-family residences to the west and single-family residences to the south of the project site. Over the course of a typical construction day, construction equipment could be located as close as 20 feet to these adjacent sensitive receivers but would typically be located at an average distance farther away due to the nature of construction and the size of the project site. Therefore, it is assumed that over the course of a typical day the construction equipment would operate at an average distance of 50 feet from the nearby single- and multi-family residences.

At a distance of 50 feet, a grader, dozer and a backhoe would generate a noise level of 83 dBA L_{eq} (RCNM calculations are included in Appendix B). Per SJMC Chapter 20.100.450, the hours of construction would be limited to 7:00 a.m. to 7:00 p.m. Monday through Friday because the project site is within 500 feet of a residential land use.

San José does not currently have an established quantitative noise standard for construction noise. However, according to the General Plan Policy EC-1.7, the project would have a significant impact if it generates substantial noise continuing for more than 12 months within 500 feet of a residence or 200 feet of commercial or office use, or does not use best available suppression devices and techniques. The project would be located approximately 20 feet east of existing residences and construction would occur for over 12 months. Because existing residences are located within 500 feet of the project site and construction would continue for more than 12 months, construction activities would be subject to Standard Permit Conditions, which are outlined in Section 2.5, *Regulatory Setting*. Adherence to the Standard Permit Conditions for construction noise such as installing temporary noise barriers and locating stationary equipment as far as possible from sensitive receptors would reduce the exposure of sensitive receptors to construction noise. In addition, construction noise would be typical of common construction in urban areas and would not include the use of exceptionally high noise-generating equipment such as pile drivers. Impacts would be less than significant.

Threshold 1:	Would the proposed project generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? [Operation]

The proposed residences would be a new source of noise that may be audible at adjacent properties, which are developed with single-family and multi-family residences. These sensitive receivers would periodically be subject to stationary noise from the PTAC and traffic noise from project vehicles added to Alum Rock Avenue and McCreery Avenue.

Mechanical Noise

Noise levels from proposed mechanical equipment were modeled at four receivers in the project vicinity. On-site receiver locations are displayed in Figure 4. Mechanical noise levels at adjacent properties and noise contours are displayed in Figure 5 as receivers 1 through 4. As shown in Figure 5, noise levels would not exceed City noise limits of 55 dBA from stationary sources. Noise levels from project operation would result in less than significant impacts.

Off-site Traffic Noise

The project would generate new vehicle trips that would increase noise levels on nearby roadways. These trips would occur primarily on Alum Rock Avenue. As shown in Table 4, the project is anticipated to increase traffic by up to 3 percent on Alum Rock Avenue. This would result in traffic noise increase of approximately 0.1 dBA. Therefore, the project's traffic noise increase would not exceed the 3 dBA criteria for off-site traffic noise impacts. Impacts would be less than significant.

Land Use Compatibility

Following the methodology and reference noise levels discussed in Section 3.4, noise levels at the project's individual proposed residential units closest to Alum Rock Avenue were modeled in SoundPLAN. A receiver was modeled at the building façade closest to Alum Rock Avenue to represent potential exterior and building façade with the highest noise level. Building façade noise levels were modeled at ground-level and at the potential 2nd through 5th floors of the proposed residential structure and are shown in Table 5. As shown in Table 5 and Figure 6, exterior noise levels from traffic noise at the building façade would reach 70 CNEL. Therefore, noise levels would exceed the City's 60 CNEL normally acceptable exterior noise standard and require additional detailed analysis to incorporate sound attenuation components in the project design, including insulation and upgraded windows and doors.

While the project would be required to demonstrate during plan check that the project meets an interior noise level of 45 CNEL or less in all residences and a noise level of 50 CNEL or less in the occupied retail space, standard construction techniques for wood-frame construction buildings required under the California Building Code typically achieve a minimum 25-dBA reduction from exterior sources at interior locations when the windows are in a closed position (FHWA 2011). Commercial structures can similarly attain a 35 CNEL reduction though standard building practices. Therefore, where building façade noise levels are 70 CNEL, interior noise levels for the project would comply with the state and City's interior noise standard of 45 CNEL for residences as well as the State interior noise level standard for non-residential occupied space.

Figure 4 On-Site Receivers

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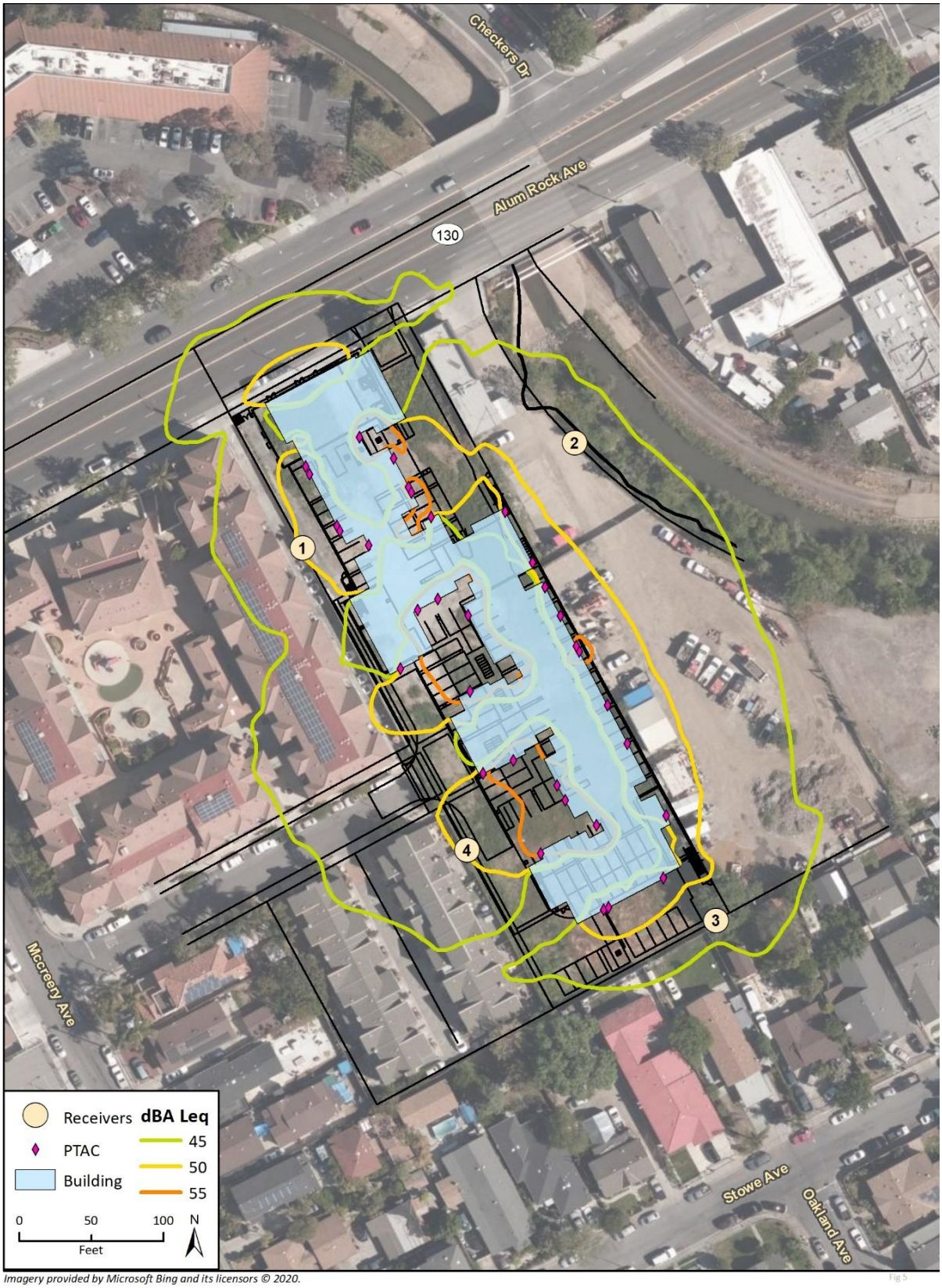
Figure 5 Operation Noise Level Contours



Imagery provided by Microsoft Bing and its licensors © 2020.

Figure 6 Traffic Noise Level Contours for Land Use Compatability

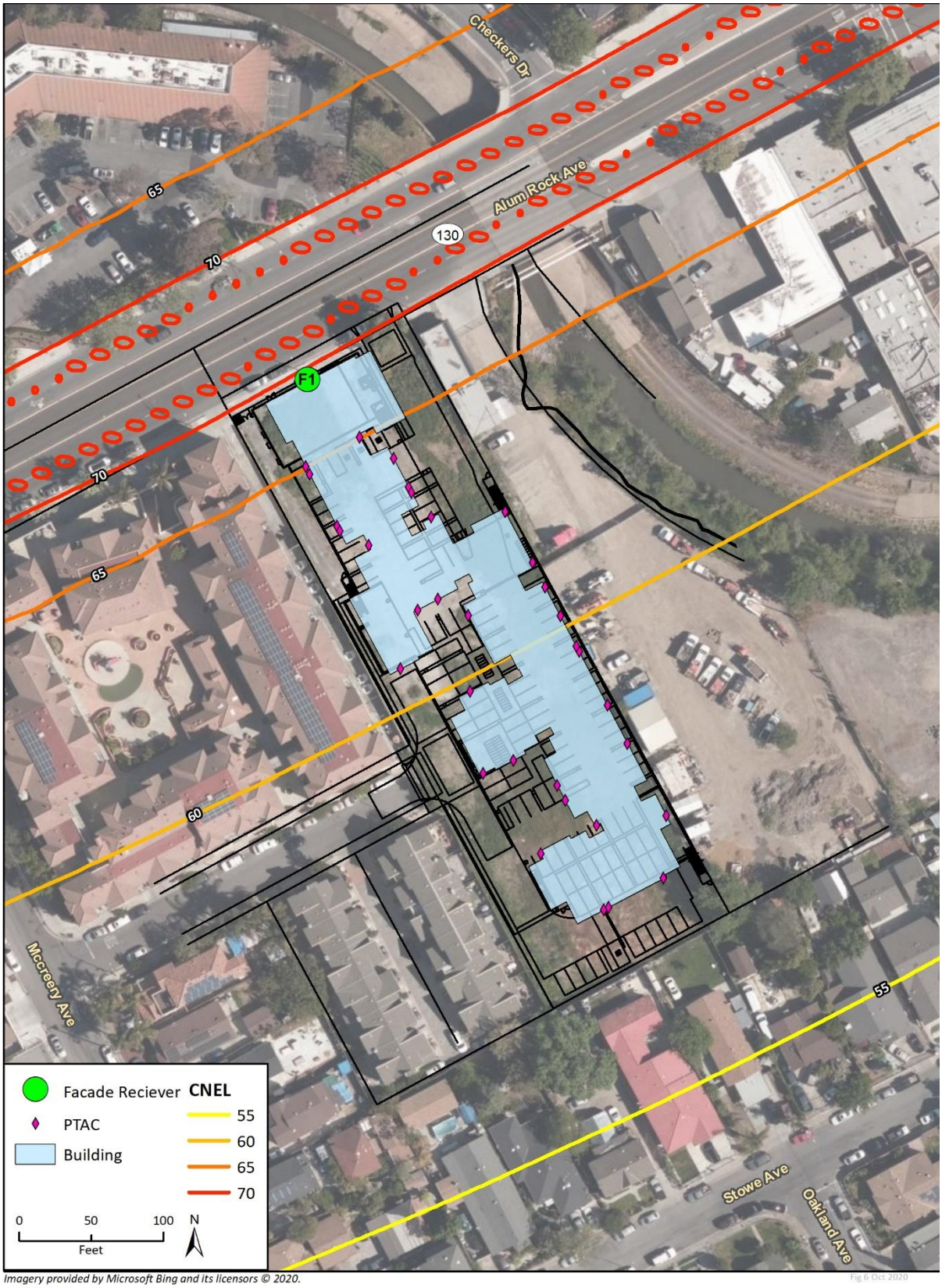


Table 5 Traffic Noise Levels

Receiver	Description	CNEL	Normally Acceptable Threshold[1]	Exceed Exterior Threshold	Exceed Interior Threshold
F1	Ground Floor	70	60	Yes	No
	1st Floor	69	60	Yes	No
	2nd Floor	69	60	Yes	No
	3rd Floor	69	60	Yes	No
	4th Floor	69	60	Yes	No
	5th Floor	69	60	Yes	No

[1] Exceedance of the normally acceptable threshold requires the project to conduct a detailed analysis of the noise reduction requirements and needed noise insulation features included in the design to meet interior noise level requirements.

See Figure 4 for receiver locations.

Threshold 2: Would the project result in generation of excessive ground-borne vibration or ground-borne noise levels?

Construction activities known to generate excessive ground-borne vibration, such as pile driving, are not proposed for the project. The greatest anticipated source of vibration during general project construction activities would be from a dozer, which may be used within 20 feet of the nearest off-site residential structures to the south and west when accounting for setbacks. A dozer would create approximately 0.089 in/sec PPV at a distance of 25 feet (Caltrans 2013b). This would equal a vibration level of 0.11 in/sec PPV at a distance of 20 feet.[2] Therefore, project construction would not exceed the San José Municipal Code vibration limit of 0.20 in/sec PPV for cosmetic damage at buildings of normal conventional construction. A vibration level of 0.11 in/sec PPV during the potential use of a dozer also would not exceed 0.25 in/sec PPV, Caltrans' recommended criterion for distinctly perceptible vibration from transient sources (Caltrans 2013b). Therefore, temporary impacts associated with a dozer (and other potential equipment) would be less than significant.

Operation of the project would not include any substantial vibration sources. Therefore, operational vibration impacts would be less than significant.

Threshold 3: For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

The nearest airport to the project site is the San José International Airport, which is approximately 3 miles to the west. The project site is not located within the noise contours of the airport (Santa Clara County Airport Land Use Commission 2011). Therefore, the project would not expose people to excessive noise associated with an airstrip or airport. There would be no impact.

[2] $PPVEquipment = PPVRef (25/D)^n$ (in/sec), PPVRef = reference PPV at 25 feet, D = distance ,and n = 1.1

5 Conclusion

Because project construction would generate substantial noise continuing for more than 12 months within 500 feet of a residence or 200 feet of commercial or office use, noise generated by project construction would be potentially significant. Compliance with the City's Standard Permit Conditions would reduce impacts to a less-than-significant level.

The project's stationary noise sources (PTAC units) would not exceed City standards at the nearest property lines. Therefore, stationary noise impacts would be less than significant.

Project-generated traffic would increase noise along McCreery Ave by approximately 1.4 dBA and along Alum Rock Avenue by approximately 0.2 dBA. Both of these increases would be below the threshold of 3 dBA; therefore, the off-site traffic noise increase would be less than significant.

The project's noise exposure from traffic at outdoor living areas would exceed the City's 60 dBA CNEL exterior noise standard. However, interior noise levels at the proposed second floors of the residences closest to Alum Rock Avenue would not exceed the City's interior standard of 45 dBA CNEL.

The project would generate groundborne vibration during construction, but vibration would not exceed the applicable thresholds at the closest residential structures adjacent to the south. Therefore, construction-related vibration impacts would be less than significant.

The project site is outside the noise contour for the nearest airport, the San José International Airport. The project would not result in impacts from airport noise.

6 References

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Appendix A

RCNM Results

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 6/4/2020
Case Descriptio Alum Rock Mixed-Use

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Multi-family res	Residential	80	80	80

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		50	0
Dozer	No	40		81.7	50	0
Backhoe	No	40		77.6	50	0

Results

Calculated (dBA)

Equipment	*Lmax	Leq
Grader	85	81
Dozer	81.7	77.7
Backhoe	77.6	73.6
Total	85	83.2

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Single-family re	Residential	80	80	80

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		75	0
Dozer	No	40		81.7	75	0
Backhoe	No	40		77.6	75	0

Results

Calculated (dBA)

Equipment	*Lmax	Leq	Day Lmax
Grader	81.5	77.5	N/A
Dozer	78.1	74.2	N/A

Backhoe		74	70.1	N/A
	Total	81.5	79.7	N/A

*Calculated Lmax is the Loudest value.

Appendix B

Sample PTAC Specification

http://www.lgservice.com

LG

LG Packaged Terminal Air Conditioner/Heat Pump

SERVICE MANUAL

CAUTION

- BEFORE SERVICING THE UNIT, READ THE SAFETY PRECAUTIONS IN THIS MANUAL.
- FOR AUTHORIZED SERVICE ONLY.

CONTENTS

1. PREFACE

This SERVICE MANUAL provides various service information, including the mechanical and electrical parts, etc. This room air conditioner was manufactured and assembled under a strict quality control system. The refrigerant is charged at the factory. Be sure to read the safety precautions prior to servicing the unit.

1.1 SPECIFICATIONS

LP 12 0 C E M 1
12 34 5 6 7 8 9

Digits 1,2 - LG Packaged Terminal Air Conditioner
Digits 3,4 - Unit Cooling Capacity
07 = 7,000 Btu/h
09 = 9,000 Btu/h
12 = 12,000 Btu/h
15 = 15,000 Btu/h

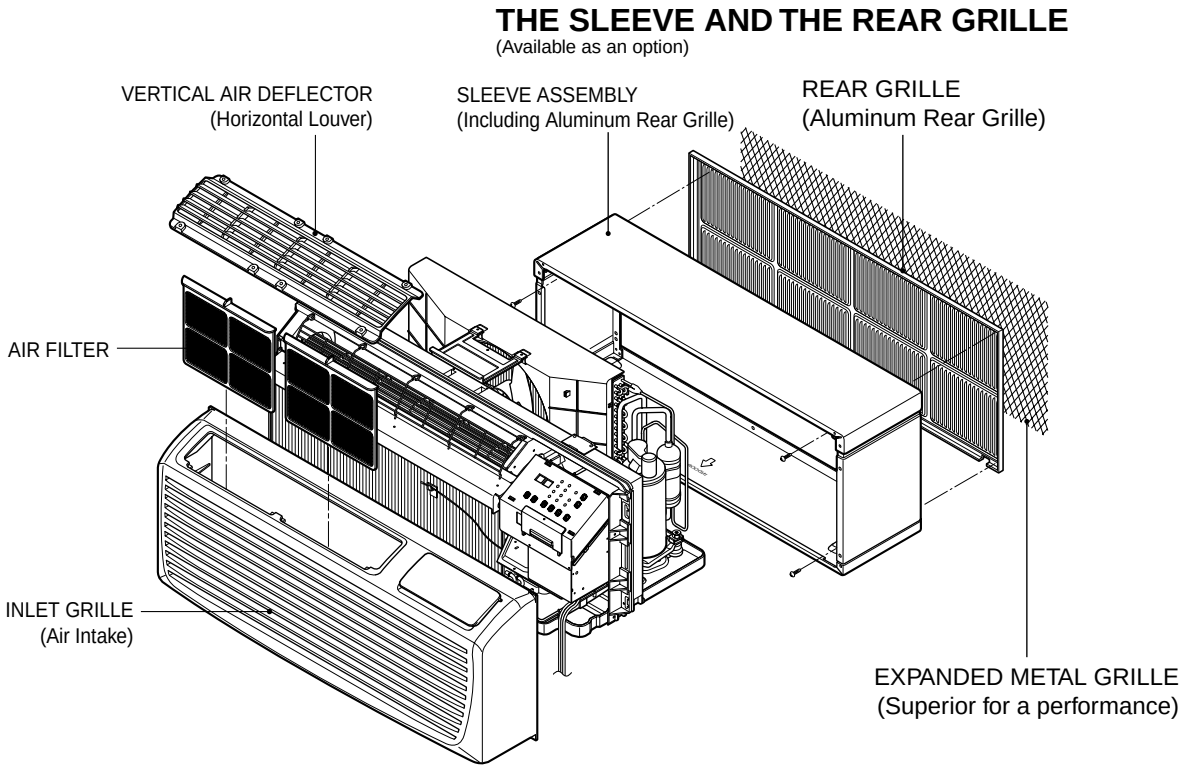
Digit 6 - Product Type
C = Air Conditoner
H = Heat Pump
Digit 7- Electric Heat
E = Electric Heater
Digit 8 - D = Digital
M = Mechanical
Digit 9 - Electric Voltage
1 = 265V, 60Hz
None = 230V, 60Hz

Models			LP070CED1	LP090CED1	LP120CED1	LP150CED1
Cooling Capacity	W		2227	2608	3458	4103
	Btu/h		7600	8900	11800	14000
Heating Capacity	W		-	-	-	-
	Btu/h		-	-	-	-
Electric Heatier Capacity		W	2000	3700	3700	3700
Power Input	Cooling/Heating	W	650	810	1105	1475
Running Current	Cooling/Heating	A	2.6	3.2	4.4	5.8
Starting Current	Cooling/Heating	A	-/-	-/-	-/-	-/-
EER	W/W		3.42	3.2	3.12	2.78
	Btu/h.W		11.7	11.0	10.7	9.5
COP	W/W		-	-	-	-
Power Supply	Ø / V / Hz		1 / 265 / 60	1 / 265 / 60	1 / 265 / 60	1 / 265 / 60
Air Flow Rate	Indoor,Max	m^3G/min(cfm)	8.5(300)	8.5(300)	12.0(420)	12.0(420)
	Outdoor,Max	m^3G/min(cfm)	-	-	-	-
Moisture Removal	l/h		0.9	1.2	1.5	2.0
Sound Level	Indoor,H/M/L	dB(A)+3	45/-/43	45/-/43	49/-/47	49/-/47
	Outdoor,Max	dB(A)+3	60/58	60/58	63/61	63/61
Refrigerant & Charge		g(oz)	R22,645(22.8)	R22, 690(24.3)	R22, 680(24.0)	R22, 650(22.9)
Compressor	Type		Rotaty(Non Tropical)	Rotaty(Non Tropical)	Rotaty(Non Tropical)	Rotaty(Non Tropical)
	Model		2R9S276A6A	2R12S276A6B	2P16S276A1A	2K20S276A6A
	Motor Type		PSC	PSC	PSC	PSC
	Oil Type		ATMOS M60 or SUNISO 4GDID	ATMOS M60 or SUNISO 4GDID	ATMOS M60 or SUNISO 4GDID	ATMOS M60 or SUNISO 4GDID
	Oil Charge	cc	260	290	270	410
	O.L.P Name		Internal	Internal	Internal	Internal
Fan	Type(In/Out)		Cross Flow Fan / Axial Fan	Cross Flow Fan / Axial Fan	Cross Flow Fan / Axial Fan	Cross Flow Fan / Axial Fan
	Motor Type		4 POLES	4 POLES	4 POLES	4 POLES
	Motor OutputW		50	50	50	50
Power Supply Cable		No.*mm^2	3*2.1	3*2.1	3*2.1	3*2.1
Dimension	W*H*D	mm	1066*406*505	1066*406*505	1066*406*505	1066*406*505
		inch	42*16*19-7/8	42*16*19-7/8	42*16*19-7/8	42*16*19-7/8
Net Weight	Indoor	kg(lbs)	39.8(88)	39.3(87)	42.5(94)	46.3(102)
Tool Code(Chassis)			YA	YA	YA	YA
Functions	Temperature Control		Thermistor	Thermistor	Thermistor	Thermistor
	Energy Saver Switch		O	O	O	O
	Prefilter(washable/anti-fungus)		O	O	O	O
	Plasma Filter		-	-	-	-
	Steps, Fan/Cool/Heat		2/2/2	2/2/2	2/2/2	2/2/2
	Airflow Direction Control(up&down)		Manual	Manual	Manual	Manual
	Airflow Direction Control(left&right)		-	-	-	-
	Remocon Type		-	-	-	-
	Setting Temperature Range	Cooling	54˚F~86˚F(12.2˚C~30˚C)	54˚F~86˚F(12.2˚C~30˚C)	54˚F~86˚F(12.2˚C~30˚C)	54˚F~86˚F(12.2˚C~30˚C)
		Heating	54˚F~86˚F(12.2˚C~30˚C)	54˚F~86˚F(12.2˚C~30˚C)	54˚F~86˚F(12.2˚C~30˚C)	54˚F~86˚F(12.2˚C~30˚C)
	Auto Operation (Micom Control)		-	-	-	-
	Panel Touch Type		Micom	Micom	Micom	Micom
	Timer		12h, On/Off	12h, On/Off	12h, On/Off	12h, On/Off
	Air Discharge		Rear	Rear	Rear	Rear
	Air Ventilation		O	O	O	O
	Device Control(Defrost)		-	-	-	-
	Hot Start		-	-	-	-
	Look		L-Look	L-Look	L-Look	L-Look
	Cabinet Type(Chassis Type)		-	-	-	-
	Special Function		Electric Heater	Electric Heater	Electric Heater	Electric Heater

Models			LP070HED1	LP090HED1	LP120HED1	LP150HED1
Cooling Capacity	W		2139	2726	3517	4220
	Btu/h		7300	9300	12000	14400
Heating Capacity	W		1817	2345	3165	3869
	Btu/h		6200	8000	10800	13200
Electric Heater Capacity		W	2000	3700	3700	3700
Power Input	Cooling/Heating	W	630/550	830/690	1155/990	1565/1335
Running Current	Cooling/Heating	A	2.5/2.2	3.3/2.7	4.6/3.9	6.2/5.3
Starting Current	Cooling/Heating	A	-/-	-/-	-/-	-/-
EER	W/W		3.39	3.28	3.04	2.69
	Btu/h.W		11.6	11.2	10.4	9.2
COP	W/W		3.3	3.4	3.2	2.9
Power Supply	Ø / V / Hz		1 / 265 / 60	1 / 265 / 60	1 / 265 / 60	1 / 265 / 60
Air Flow Rate	Indoor,Max	m^3G/min(cfm)	8.5(300)	8.5(300)	12.0(420)	12.0(420)
	Outdoor,Max	m^3G/min(cfm)	-	-	-	-
Moisture Removal	l/h		0.9	1.2	1.5	2.0
Sound Level	Indoor,H/M/L	dB(A)+3	45/-/43	45/-/43	49/-/47	49/-/47
	Outdoor,Max	dB(A)+3	60/58	60/58	63/61	63/61
Refrigerant & Charge		g(oz)	R22, 625(22.0)	R22, 730(25.8)	R22, 970(34.2)	R22, 890(31.4)
Compressor	Type		Rotaty(Non Tropical)	Rotaty(Non Tropical)	Rotaty(Non Tropical)	Rotaty(Non Tropical)
	Model		2R10S276A6C(RSM284)	2R13S276A6C	2P17S276(PSM312)	2K21S276A6C
	Motor Type		PSC	PSC	PSC	PSC
	Oil Type		ATMOS M60 or SUNISO 4GDID	ATMOS M60 or SUNISO 4GDID	ATMOS M60 or SUNISO 4GDID	ATMOS M60 or SUNISO 4GDID
	Oil Charge	cc	260	290	350	410
	O.L.P Name		Internal	Internal	Internal	Internal
Fan	Type(In/Out)		Cross Flow Fan / Axial Fan	Cross Flow Fan / Axial Fan	Cross Flow Fan / Axial Fan	Cross Flow Fan / Axial Fan
	Motor Type		4 POLES	4 POLES	4 POLES	4 POLES
	Motor OutputW		50	50	50	50
Power Supply Cable		No.*mm^2	3*2.1	3*2.1	3*2.1	3*2.1
Dimension	W*H*D	mm	1066*406*505	1066*406*505	1066*406*505	1066*406*505
		inch	42*16*19-7/8	42*16*19-7/8	42*16*19-7/8	42*16*19-7/8
Net Weight	Indoor	kg(lbs)	41.2(91)	41.8(92)	45.0(99)	48.3(106)
Tool Code(Chassis)			YA	YA	YA	YA
Functions	Temperature Control		Thermistor	Thermistor	Thermistor	Thermistor
	Energy Saver Switch		O	O	O	O
	Prefilter(washable/anti-fungus)		O	O	O	O
	Plasma Filter		-	-	-	-
	Steps, Fan/Cool/Heat		2/2/2	2/2/2	2/2/2	2/2/2
	Airflow Direction Control(up&down)		Manual	Manual	Manual	Manual
	Airflow Direction Control(left&right)		-	-	-	-
	Remocon Type		-	-	-	-
	Setting Temperature Range	Cooling	54˚F~86˚F(12.2˚C~30˚C)	54˚F~86˚F(12.2˚C~30˚C)	54˚F~86˚F(12.2˚C~30˚C)	54˚F~86˚F(12.2˚C~30˚C)
		Heating	54˚F~86˚F(12.2˚C~30˚C)	54˚F~86˚F(12.2˚C~30˚C)	54˚F~86˚F(12.2˚C~30˚C)	54˚F~86˚F(12.2˚C~30˚C)
	Auto Operation (Micom Control)		-	-	-	-
	Panel Touch Type		Micom	Micom	Micom	Micom
	Timer		12h, On/Off	12h, On/Off	12h, On/Off	12h, On/Off
	Air Discharge		Rear	Rear	Rear	Rear
	Air Ventilation		O	O	O	O
	Device Control(Defrost)		O	O	O	O
	Hot Start		-	-	-	-
	Look		L-Look	L-Look	L-Look	L-Look
	Cabinet Type(Chassis Type)		-	-	-	-
	Special Function		Electric Heater	Electric Heater	Electric Heater	Electric Heater

1.2 FEATURES AND BENEFITS

The PTAC has many features, some of which are different than those found on conventional PTAC units. The servicer must be familiar with these features in order to properly service the unit.



- **IIR** (Infinite Impulse Response)
  The IIR function senses the temperature several times per second and makes micro-adjustments several times per
- **Compressor Restart Delay**
  This feature extends the overall life of compressor by preventing the short-cycling of the air-conditioner. When the compressor restarts, LG PTAC is designed to give a minimum of three minutes to have a time of equalizing the refrigerant pressures for optimizing cycling.
- **Fan-Only Setting - High/Low**
  The fan can run at HIGH or LOW speed without COOLING or HEATING to provide air circulation and ventilation.
- **Indoor Fan Speed Selections - High/Low**
  The fan can run at HIGH or LOW speed for either COOLING or HEATING.
- **Two Fan motors**
  The unit has two fan motors to provide quiet operation and maximum efficiency.

- **Indoor Filters**
  The unit uses two indoor filters which slide in and cut easily. The filters may be cleaned by washing and brushing without removing the front grille.

- **Rotary Compressor**
  The unit uses a rotary compressor for quiet, reliable operation and long life.

- **2 Position Discharge Grille**
  The discharge grille can provide air flows upward at an angle of 40 off vertical or 15 degree off vertical. The angle is changed by removing the front grille and 4 screws that fasten the discharge grille to the front grille and rotating the louvers to an alternate position.

- **Indoor Room Freeze Protection**
  When the unit senses the room temperature falls to less than 40° F the unit activates the fan motor and either the electric resistance heater or the hydronic heater to prevent pipes or fixtures from freezing. This also overrides front desk control of the unit mounted or wall mounted controls.

- **Door Switch/Occupancy Sensor**
  The unit is capable of accommodating a field installed door switch and occupancy sensor to operate the energy management feature. For additional information, refer to the unit operation section.

- **Compressor Overload Protection**
  This feature prevents the damage of the compressor by sensing the indoor tube temperature in heating. If the indoor temperature is over 130˚ F, the outdoor fan will be switched off and back on when the temperature drops below 120˚ F.

- **Outdoor Air Temperature Switchover**
  This will effectively change the unit from heat pump mode to total electric resistance heat.

- **Temperature limits**
  The unit is programmed to provide both heating and cooling temperature limits by dip switches on control panel from 54˚ F to 86˚ F. Temperature limits help to prevent overheating and overcooling and reduce energy costs.

- **Condensate Drain Valve**
  The unit has a condensate drain valve to prevent water from collecting or freezing in the basepan.

- **Quick Heater Recovery**
  The unit is designed to operate the electric heater to warm the room to the temperature set point as soon as heat pump cycle is on in heating. This feature has an advantage of reducing the time to reach the set point and improving the temperature increase for better comfort.

- **Reverse Cycle Defrosting - (PTHDs only)**
  The unit will activate the reverse cycle defrost when the outdoor coil temperature has remained at a cold temperature to form the ice on the coil.This ice will reduce airflow though the coil and will also reduce the efficiency of unit. The LG PTHP will employ an active reverse cycle defrost function to melt the ice off the outdoor coil for insuring room comfort conditions and savings from extended operation.

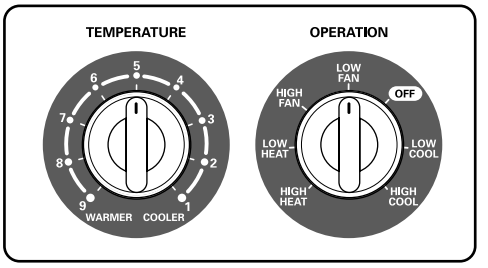
- **High Temperature Heat Pump Operation Protection**
  The compressor will be switched off to prevent damage when the heat pump is operated in high outdoor temperatures.

- **Remote Thermostat Control**
  Each unit is built to be operated from any standard 4 or 5 wire remote-mounted thermostat, if desired. The unit has a built-in low voltage power source which can accommodate a large variety of thermostat choices-manual, auto changeover, or programmable. A remote thermostat can also be added to any installed unit.

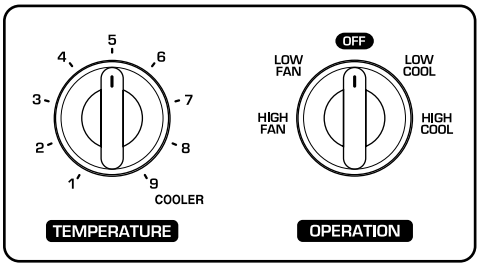
- **Zone Sensor**
  Occupants enjoy ultimate comfort with consistent climate control. Attach an optional, inexpensive remote Zone Sensor to exactly match the functions of the PTAC without disabling any features.

1.3 CONTROL LOCATIONS

• OPERATION



ELECTRIC HEATING MODEL



COOLING ONLY MODEL

TEMPERATURE CONTROL

Set the Thermostat control to the desired temperature mark 5 (the mid-point is a good starting position). If the room temperature is not satisfactory after a reasonable time, adjust the control to a cooler or warmer setting, as appropriate.

• VENTILATION

The ventilation lever is located to the lower left side of the unit.
The ventilation lever must be in the CLOSE position in order to maintain the best cooling conditions.
When fresh air is necessary in the room, set the ventilation lever to the OPEN position.
The damper is opened and outdoor air is drawn into the room. This will reduce the cooling or heating efficiency.

CAUTION

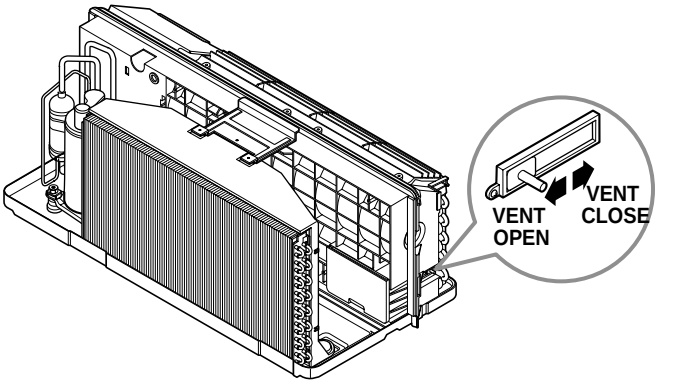
When the air conditioner has performed a cooling or heating operation and is turned off or set to the fan position, wait at least 3 minutes before resetting to the cooling operation.

NOTE

A slight heat odor may come from the unit when first switching to HEAT after the cooling season is over. This odor, caused by fine dust particles on the heater, will disappear quickly. This is harmless.

OPERATION MODE SELECTOR

OFF	Turns air conditioner off.
LOW FAN	Low speed fan operation without cooling.
HIGH FAN	High speed fan operation without cooling.
LOW COOL	Cooling with the low speed fan operation.
HIGH COOL	Cooling with the high speed fan operation.
LOW HEAT	Heating with the low speed fan operation.
HIGH HEAT	Heating with the high speed fan operation.

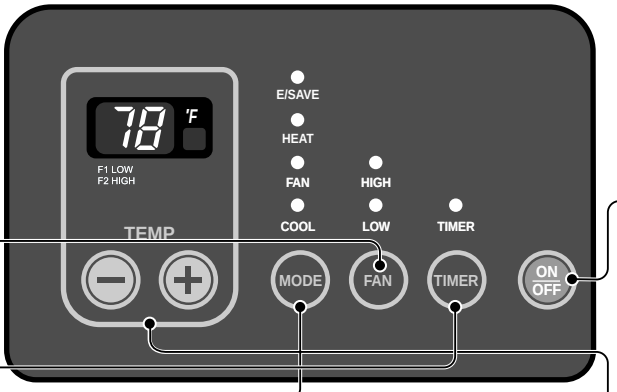


• ELECTRONIC CONTROLS

The controls will look like one of the following.

FAN SPEED

• Every time you push this button, it cycles through the settings as follows:
{High(F2) → Low(F1) → High(F2) → Low(F1)}



POWER

• To turn the air conditioner ON, push this button. To turn the air conditioner OFF, push the button again.
• This button takes priority over any other button.

MODE

- Push this button to cycle through the modes from COOL → FAN → HEAT→ COOL.

- COOL
  • Fan runs continually for normal cooling operation.

- ENERGY SAVER
  • The fan stops when the compressor stops cooling. Approximately every 3 minutes the fan will turn on and the unit will check the room air temperature to determine if cooling is needed.

- FAN
  • Fan operation without heating or cooling.

- HEAT
  • Fan runs continually for normal heating operation.

TEMPERATURE SETTING

• Use this button to automatically control the temperature of the room.
The temperature can be set within a range of 54° F to 86° F by increments of 2° F.
• The setting appears in the display.

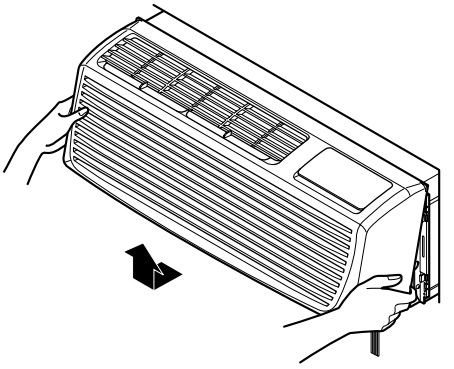
TIMER

- SHUT-OFF TIME
  • You will usually use shut-off time while you sleep.
  • If unit is running, use Timer to set number of hours until shut-off.
  • For your sleeping comfort, once Time is set, the Temperature setting will raise 2° F after 30 minutes, and once again after another 30 minutes.
  • Push Timer to cycle through the settings from 1 Hour → 2 Hours → ... → 12 Hours maximum.

1.4 ADDITIONAL CONTROLS

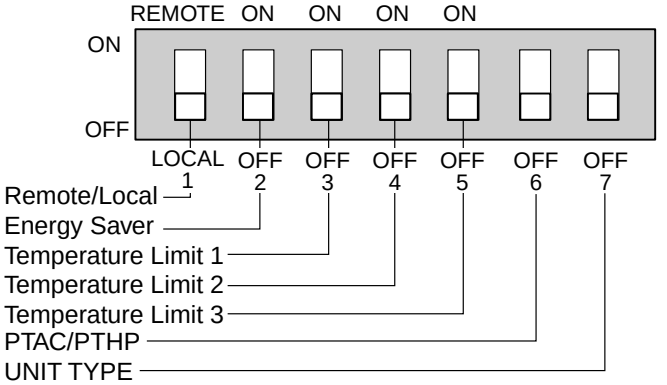
• REMOVING THE FRONT GRILLE

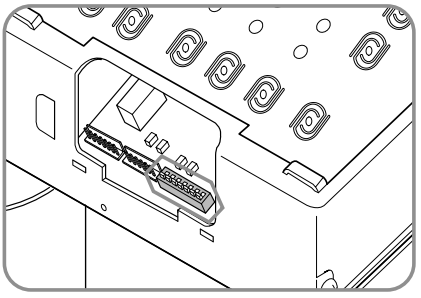
Additional controls are available after removing the front grille and option cover of control box.
To remove the front grille, pull out the bottom of front grille and then lift up.
To replace the front grille, place the tabs over the top of the unit and push the bottom of front grille until the clips snap into place.



• ADDITIONAL CONTROLS

The additional controls are located behind the option cover of control box. The standard settings will be in the OFF position. The authorized servicer has to check switches and ensure the switches are in the desired position.





• TEMPERATURE LIMITING

Temperature Limiting can save money by limiting the lowest temperature for cooling and the highest temperature for heating. The temperature limiting is controlled by switches #1 - #3.
This temperature limiting is not available with the Remote Wall Thermostat.

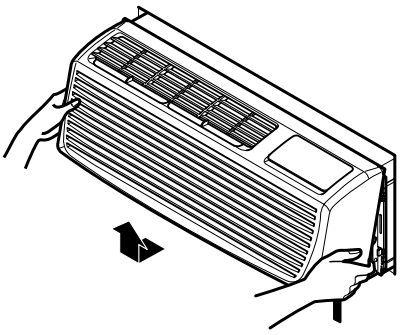
Temperature Limit #1	Temperature Limit #2	Temperature Limit #3	Cooling Operation		Heating Operation	
			Lowest Temp.	Highest Temp.	Lowest Temp.	Highest Temp.
OFF	OFF	OFF	54° F (12.2° C)	86° F (30.0° C)	54° F (12.2° C)	86° F (30.0° C)
ON	OFF	OFF	56° F (13.3° C)	86° F (30.0° C)	54° F (12.2° C)	84° F (28.9° C)
OFF	ON	OFF	58° F (14.4° C)	86° F (30.0° C)	54° F (12.2° C)	82° F (27.8° C)
ON	ON	OFF	60° F (15.5° C)	86° F (30.0° C)	54° F (12.2° C)	80° F (26.7° C)
OFF	OFF	ON	62° F (16.6° C)	86° F (30.0° C)	54° F (12.2° C)	78° F (25.5° C)
ON	OFF	ON	64° F (17.7° C)	86° F (30.0° C)	54° F (12.2° C)	76° F (24.4° C)
OFF	ON	ON	66° F (18.9° C)	86° F (30.0° C)	54° F (12.2° C)	74° F (23.3° C)
ON	ON	ON	68° F (20.0° C)	86° F (30.0° C)	54° F (12.2° C)	72° F (22.2° C)

#6	#7	Unit Type
OFF	OFF	Cooling+Electric Heater+Heat Pump
OFF	ON	Cooling+Electric Heater
ON	OFF	Heat Pump Only
ON	ON	Cooling Only

• REMOVING THE FRONT GRILLE

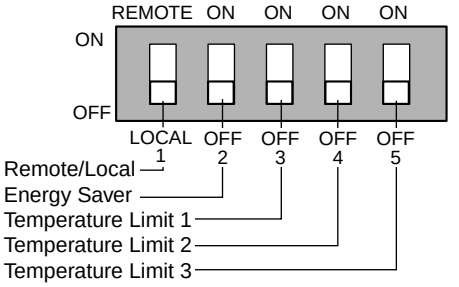
Additional controls are available after removing the front grille and option cover of control box.
To remove the front grille, pull out the bottom of front grille and then lift up.

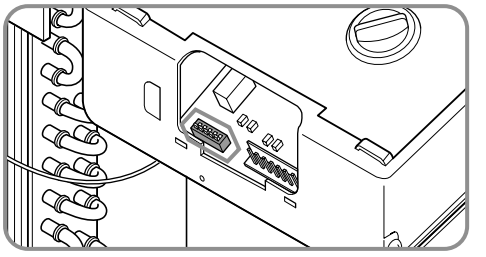
To replace the front grille, place the tabs over the top of the unit and push the bottom of front grille until the clips snap into place.



• ADDITIONAL CONTROLS

The additional controls are located behind the option cover of control box. The standard settings will be in the OFF position. The authorized service man has to check switches and ensure the switches are in the desired position.





• TEMPERATURE LIMITING

Temperature Limiting can save money by limiting the lowest temperature for cooling and the highest temperature for heating. The temperature limiting is controlled by dip switch #1 - #3.
This temperature limiting is not available with the Remote Wall Thermostat.

Temperature Limit #1	Temperature Limit #2	Temperature Limit #3	Cooling Operation		Heating Operation	
			Lowest Temp.	Highest Temp.	Lowest Temp.	Highest Temp.
OFF	OFF	OFF	54°F (12.2°C)	86°F (30.0°C)	54°F (12.2°C)	86°F (30.0°C)
ON	OFF	OFF	56°F (13.3°C)	86°F (30.0°C)	54°F (12.2°C)	84°F (28.9°C)
OFF	ON	OFF	58°F (14.4°C)	86°F (30.0°C)	54°F (12.2°C)	82°F (27.8°C)
ON	ON	OFF	60°F (15.5°C)	86°F (30.0°C)	54°F (12.2°C)	80°F (26.7°C)
OFF	OFF	ON	62°F (16.6°C)	86°F (30.0°C)	54°F (12.2°C)	78°F (25.5°C)
ON	OFF	ON	64°F (17.7°C)	86°F (30.0°C)	54°F (12.2°C)	76°F (24.4°C)
OFF	ON	ON	66°F (18.9°C)	86°F (30.0°C)	54°F (12.2°C)	74°F (23.3°C)
ON	ON	ON	68°F (20.0°C)	86°F (30.0°C)	54°F (12.2°C)	72°F (22.2°C)

• REMOTE/LOCAL CONTROL

When remote/local switch #1 is on, it allow the unit to operate by the Remote Wall Thermostat.
The unit control by knobs are not available.

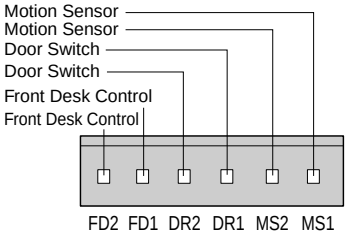
• ENERGY SAVER

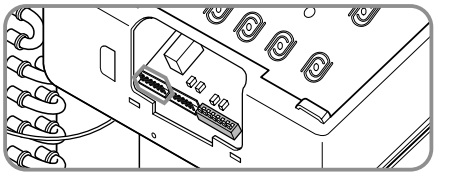
The energy saver switch #2 is on. This switch is set at cycle fan to provide continuous fan operation in cool or heat modes. When the switch is off the continuous fan allows continuous circulation of room air and make the more balanced temperature of the room. When the switch is on, the fan is on or off with the compressor or with the heater.

• FRONT DESK CONTROL

When the pair wire is connected to the connector FD2 and FD1, the unit can be turned ON or OFF with a switch located at the Front Desk Control panel. When the front desk switch is ON, the fan operates according to the setting without working compressor and heater. When the front desk switch is OFF, the unit can operate according to the setting of controls.

Wire # AWG	Maximum Length
#22	600 ft (180 m)
#20	900 ft (270 m)
#18	1500 ft (450 m)
#16	2000 ft (610 m)



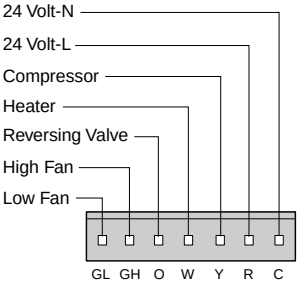


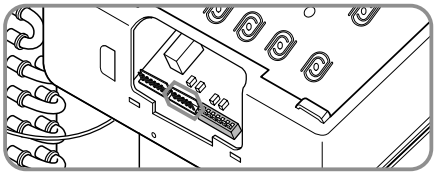
(Molex Housing Spec 396-06V)

• REMOTE WALL THERMOSTAT

When the wires are connected, the unit will be controlled by a remote wall thermostat.

The thermostat connections supply the 24 Volt AC. When you install the digital/electronic thermostat, you must set it to 24 Volt AC. See the installation Instruction in this manual for the Remote Wall Thermostat.

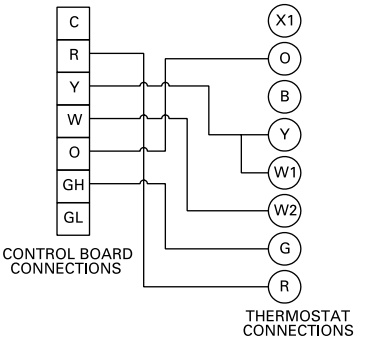




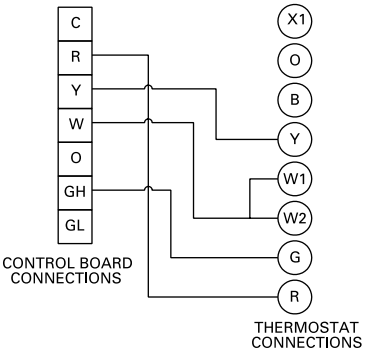
(Molex Housing Spec 396-07V)

Note: The following figures show wiring schematics for heat pump and straight cool units with electric heat, respectively.

Wiring Schematic for Remote Heat Pump



Wiring Schematic for Straight Cool Unit.



• REMOTE/LOCAL CONTROL

When remote/local switch #1 is on, it allow the unit to operate by the control of Remote Wall Thermostat. The unit control by knobs are not available.

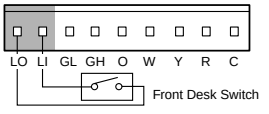
• ENERGY SAVER

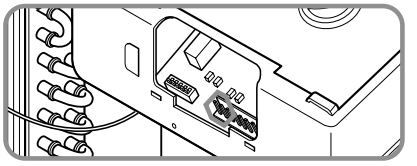
The energy saver switch #2 is on. This switch is set at continuous fan to provide continuous fan operation in cool or heat modes. When the switch is off the continuous fan allows continuous circulation of room air and make the more balanced temperature of the room. When the switch is on the fan is on or off with the compressor or with the heater.

• FRONT DESK CONTROL

When the pair wire is connected to the connector LOand LI, the unit can be turned ON or OFF with a switch located at the Front Desk Control panel. When the front desk switch is ON, the fan operate according to the condition of setting without working compressor and heater. When the front desk switch is OFF, the unit can operate according to the setting of controls.

Wire # AWG	Maximum Length
#22	600ft(180m)
#20	900ft(270m)
#18	1500ft(450m)
#16	2000ft(610m)

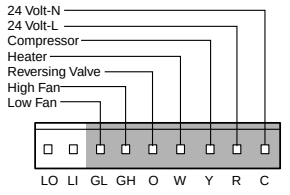


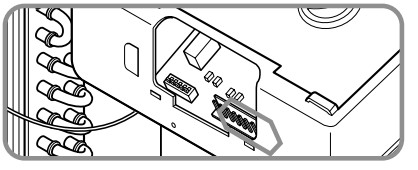


• REMOTE WALL THERMOSTAT

When the wires are connected, the unit will be controlled by a remote wall thermostat.

The thermostat connections supply the 24 Volt AC. When you install the digital / electronic thermostat, you must set it to the 24 Volt AC. See the installation Instruction in this manual for the Remote Wall Thermostat.

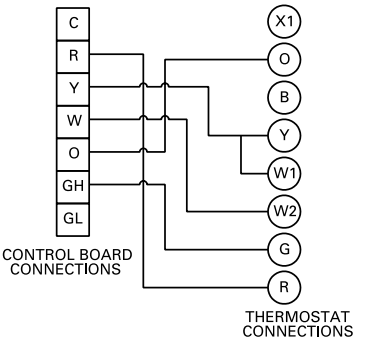




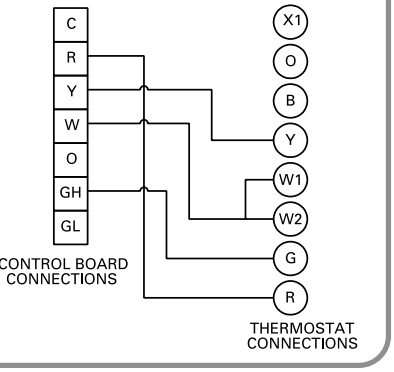
(Molex Housing Spec 396-09V)

Note: The following figures show wiring schematics for heat pump and straight cool units with electric heat, respectively.

Wiring Schematic for Remote Heat Pump



Wiring Schematic for Straight Cool Unit.



2. DISASSEMBLY INSTRUCTIONS

— Before the following disassembly, POWER SWITCH is set to OFF and disconnected the power cord.

2.1 MECHANICAL PARTS

2.1.1 FRONT GRILLE

1. Remove the front grille. (See Figure 1)
2. To remove the front grille, pull out the bottom of the front grille and then lift up.
   Re-install the component by referring to the removal procedure.
3. To replace the front grille, place the tabs over the top of the unit and push the bottom of front grille until the clips snap into place.

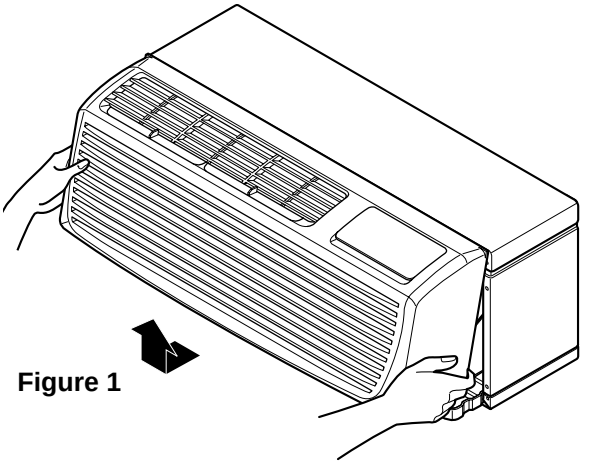
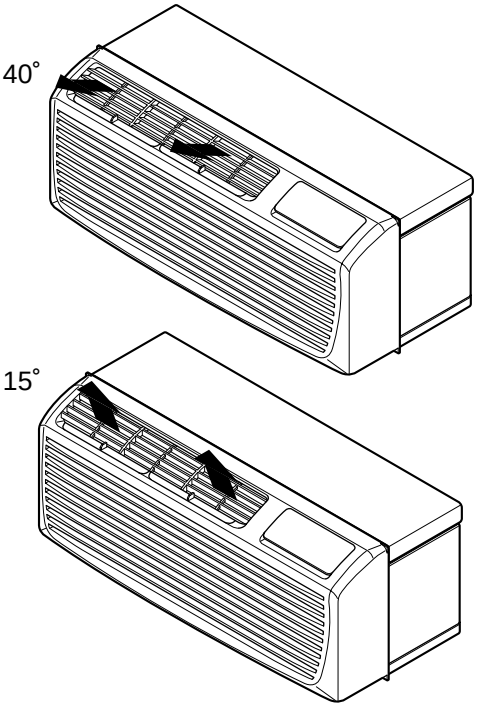


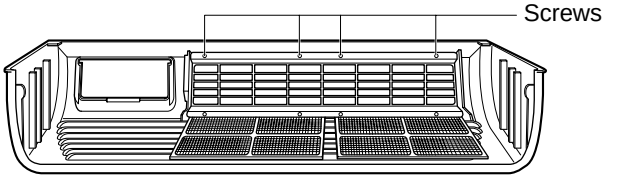
Figure 1

• This Room Air Conditioner (PTAC) discharges air from the top of the unit through reversible, 2-position discharge grille louvers. The unit is shipped from the factory with the discharge grille louvers at an angle of 40˚ off vertical. In the alternate position, the louvers will be at an angle of 15˚ off vertical.



To adjust air direction, remove the front grille. Remove the 4 screws that fasten the discharge grille to the front grille.

Flip the discharge grille 180°, then reattach the discharge grille to the front grille with 4 screws.



2.1.2 CONTROL BOX

1. Remove the front grille. (Refer to section 2.1.1)
2. Remove the two screws which fasten the control box. (See Figure 2)
3. Pull the control box from the Air guide.

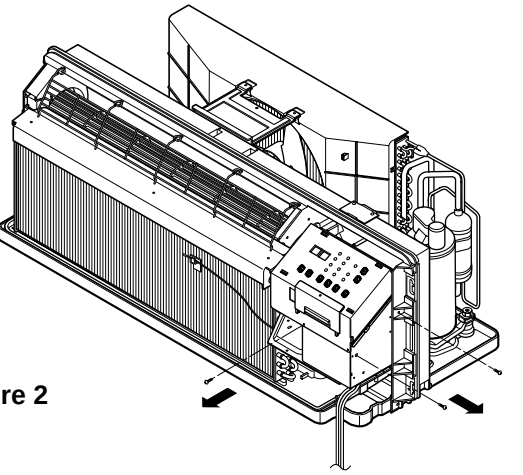


Figure 2

4. Remove the control box cover. (See Figure 3)
5. Disconnect wire housings on the control box.

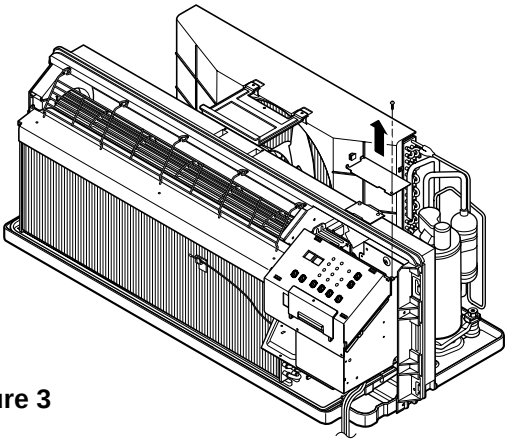


Figure 3

6. Pull the control box assembly out from the unit. (See Figure 4)
7. Re-install the components by referring to the removal procedure.

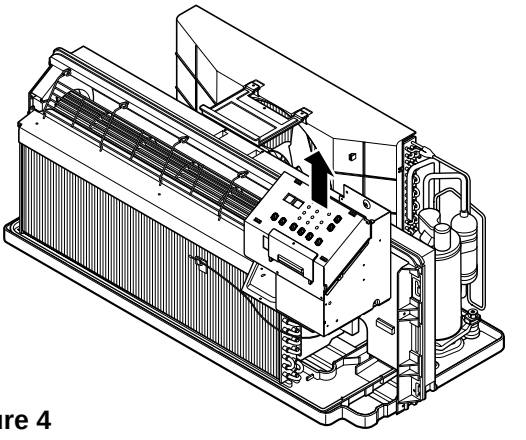


Figure 4

2.2 AIR HANDLING PARTS

2.2.1 HEATER ASSEMBLY AND CROSS FLOW FAN

1. Remove the front grille. (Refer to section 2.1.1)
2. Remove the control box assembly. (Refer to section 2.1.3)
3. Remove the 3 screws which fasten the net steel. (See Fig. 5)
4. Remove the 3 screws which fasten the electric heater assembly.(Electric heater model only) (See Fig.5).

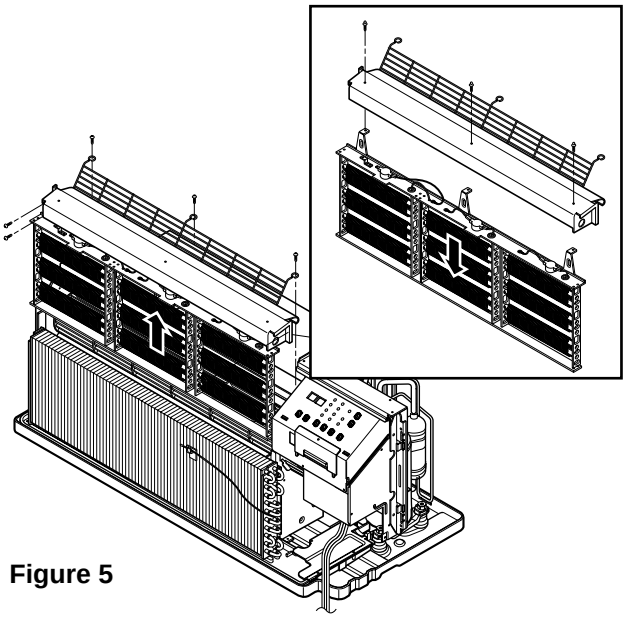


Figure 5

5. Loosen the hexagon screw with the Hex-wrench(See Fig.6)

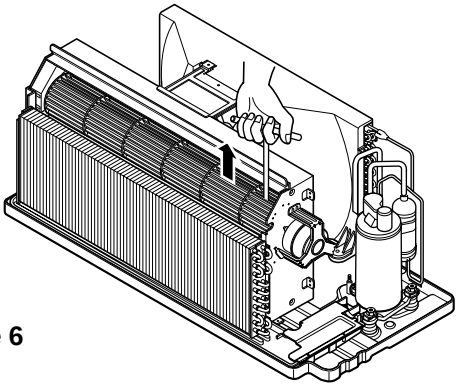


Figure 6

6. Remove the 4 screws which fasten the indoor motor and the earth wire. (See Fig. 6, 7)
7. Re-install the components by referring to the removal procedure, above.

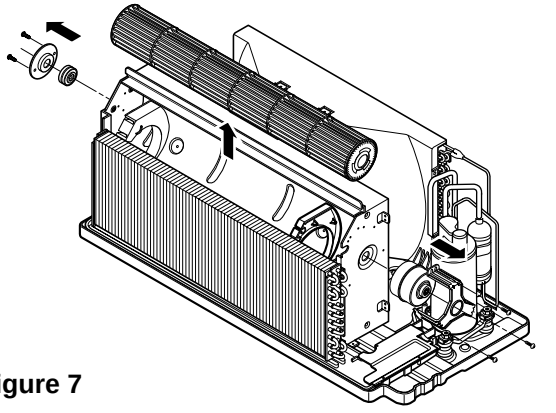


Figure 7

2.2.2 FAN

1. Remove the brace.
2. Remove the 4 screws which fasten the condenser with the shroud and the basepan.
3. Move the condenser sideways carefully.
4. Remove the clamp which secures the fan with plier.
5. Remove the fan. (See Fig. 8)
6. Re-install the components by referring to the removal procedure, above.

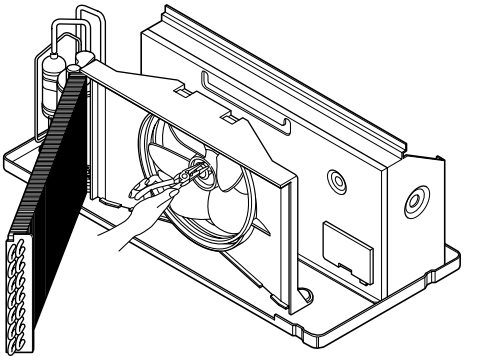


Figure 8

2.2.3 SHROUD

1. Remove the axial fan. (Refer to section 2.2.3)
2. Remove the 4 screws which fasten the condenser with the shroud and the basepan.
3. Remove the shroud.
4. Re-install the component by referring to the removal procedure.

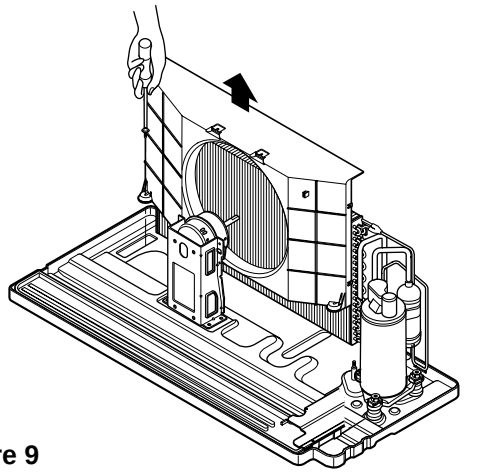


Figure 9

2.3. ELECTRICAL PARTS

2.3.1 OUTDOOR MOTOR

1. Remove the clamp cord and disconnect a wire housing in control box. (Refer to section 2.1.2)
2. Remove the axial fan. (Refer to section 2.2.3)
3. Remove the 2 screws which fasten the motor. (See Figure 10)
4. Remove the motor
5. Re-install the component by referring to the removal procedure, above.

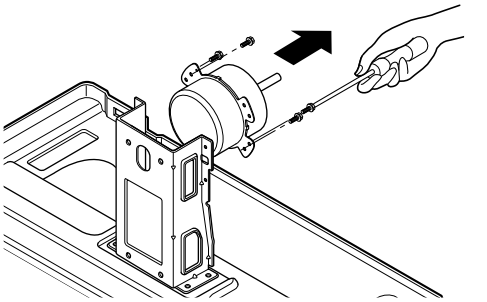


Figure 10

2.3.2 INDOOR MOTOR (Refer to section 2.2.2)

2.3.3 COMPRESSOR

1. Discharge the refrigerant system using a refrigerant recovery system.
   If there is no valve to attach the recovery system, install one (such as a WATCO A-1) before venting the refrigerant. Leave the valve in place after servicing the system.
2. Disconnect the 3 leads from the compressor.
3. After purging the unit completely, unbraze the suction and discharge tubes at the compressor connections.
4. Remove the 3 nuts and the 3 washers which fasten the compressor. (See Figure 11)
5. Remove the compressor.
6. Re-instill the components by referring to the removal procedure, above.

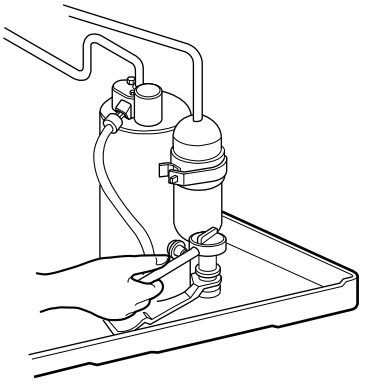


Figure 11

2.3.4 CAPACITOR

1. Remove the control box. (Refer to section 2.1.2)
2. Remove 1 screw and disconnect the leads which connected to the box type capacitor. (See Figure 12)
3. Remove 1 screw and the clamp which fastens the can-type capacitor.
4. Disconnect all the leads of capacitor terminals.
5. Re-install the components by referring to the removal procedure, above.

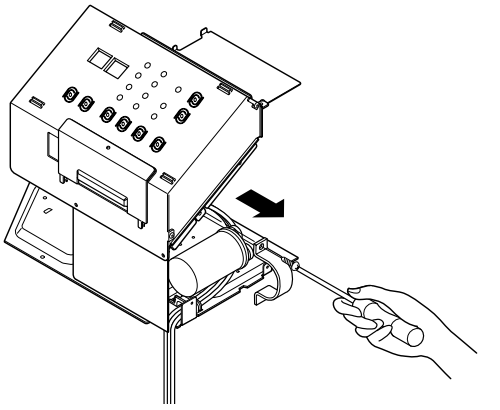


Figure 12

2.3.5 POWER CORD

1. Remove the control box. (Refer to section 2.1.2)
2. Disconnect the grounding screw from the control box.
3. Disconnect 2 receptacles.
4. Remove a screw which fastens the clip cord.
5. Separate the power cord from the control box. (See Figure 13)
6. Re-install the component by referring to the removal procedure, above.
   (Use only one ground-marked hole ⏚ for ground connection.)
7. If the supply cord of this appliance is damaged, it must be replaced by an exact replacement part. (The special cord means the cord which has the same specification marked on the supply cord fitted to the unit.)

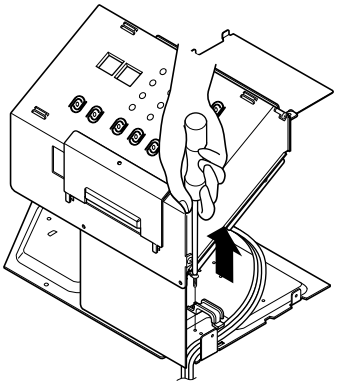
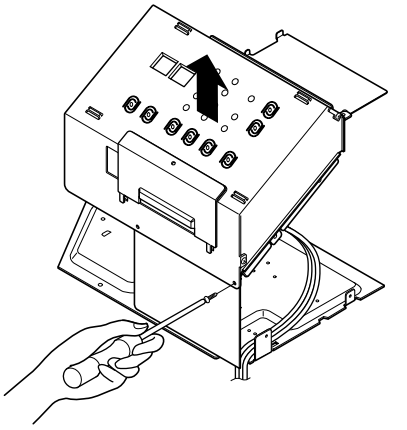


Figure 13

2.3.6 P.C.B.

1. Remove the escutcheon.
2. Remove the two knobs.
3. Remove the 2 screws which fasten P.C.B. cover.
4. Disconnect all the leads which connected to the P.C.B.
5. Remove the two screws which fasten the P.C.B. board.
6. Re-install the components by referring to the removal procedure, above.



WARNING

After servicing control box ,make sure that AC and DC wires are separated and tied up properly.

The wires should also be pressed a little downwards to prevent touching it to the display pcb.

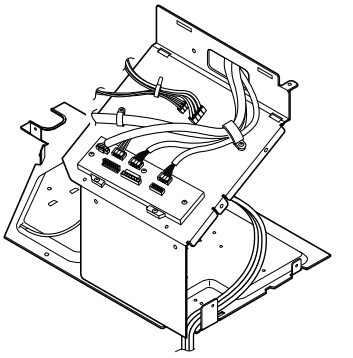


Figure 14

2.4 REFRIGERATION CYCLE

CAUTION

Discharge the refrigerant system using a refrigerant recovery system.
If there is no valve to attach the recovery system, install one (such as a WATCO A-1) before venting the refrigerant. Leave the valve in place after servicing the system.

2.4.1 CONDENSER

1. Remove the brace and the shroud. (Refer to section 2.2.2)
2. Remove the 4 screws which fasten the shroud. (Refer to section 2.2.2)
3. Push forward the shroud and remove the 2 screws which fasten the condenser with the basepan.
4. After discharging the refrigerant completely, unbraze the interconnecting tube at the condenser connections.
5. Remove the condenser.
6. Re-install the components by referring to notes. (See Figure 15)

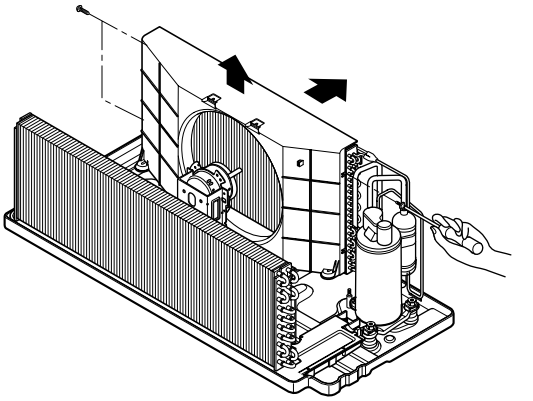


Figure 15

2.4.2 EVAPORATOR

1. Remove the front grille. (Refer to section 2.1.1)
2. Discharge the refrigerant completely.
3. Remove the control box assembly. (Refer to section 2.1.2)
4. Remove the 4 screws which fasten the evaporator at the left side and the right side.
5. Move the evaporator sideward carefully and then unbraze the interconnecting tube at the evaporator connectors.
6. Remove the evaporator.
7. Re-install the components by referring to notes. (See Figure 16)

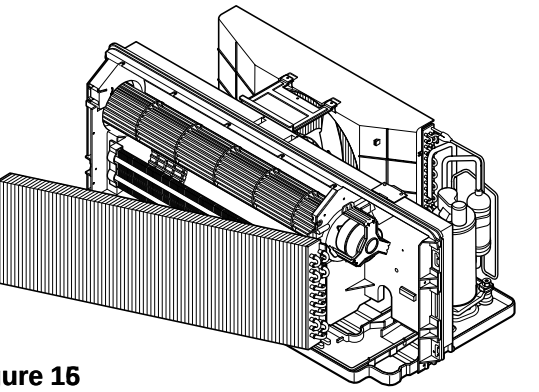


Figure 16

2.4.3 CAPILLARY TUBE

1. After discharging the refrigerant completely, unbraze the interconnecting tube at the capillary tube.
2. Remove the capillary tube.
3. Re-install the components by referring to notes.

NOTES

— Replacement of the refrigeration cycle.

1. When replacing the refrigeration cycle, be sure to discharge the refrigerant system using a refrigerant recovery system.
   If there is no valve to attach the recovery system, install one (such as a WATCO A-1) before venting the refrigerant. Leave the valve in place after servicing the system.
2. After discharging the unit completely, remove the desired component, and unbraze the pinch-off tubes.
3. Solder service valves into the pinch-off tube ports, leaving the valves open.
4. Solder the pinch-off tubes with service valves.
5. Evacuate as follows.
   1) Connect the vacuum pump, as illustrated Figure 17 A.
   2) Start the vacuum pump, slowly open manifold valves A and B with two full turns counterclockwise and leave the valves closed. The vacuum pump is now pulling through valves A and B up to valve C by means of the manifold and entire system.

   CAUTION

   If high vacuum equipment is used, just crack valves A and B for a few minutes, then open slowly with the two full turns counterclockwise. This will keep oil from foaming and being drawn into the vacuum pump.

   3) Operate the vacuum pump for 20 to 30 minutes, until 600 microns of vacuum are obtained. Close valves A and B, and observe the vacuum gauge for a few minutes. A rise in pressure would indicate a possible leak or moisture remaining in the system. With valves A and B closed, stop the vacuum pump.
   4) Remove the hose from the vacuum pump and place it on the charging cylinder. See Figure 16 B. Open valve C.
   Discharge the line at the manifold connection.
   5) The system is now ready for final charging.
6. Recharge as follows :
   1) Refrigeration cycle systems are charged from the high-side. If the total charge cannot be put in the high-side, the balance will be put in the suction line through the access valve which you installed as the system was opened.
   2) Connect the charging cylinder as shown in Figure 17B.
   With valve C open, discharge the hose at the manifold connection.
   3) Open valve A and allow the proper charge to enter the system. Valve B is still closed.
   4) If more charge is required, the high-side will not take it. Close valve A.
   5) With the unit running, open valve B and add the balance of the charge.
      a. Do not add the liquid refrigerant to the low-side.
      b. Watch the low-side gauge; allow pressure to rise to 30 lbs.
      c. Turn off valve B and allow pressure to drop.
      d. Repeat steps B and C until the balance of the charge is in the system.
   6) When satisfied the unit is operating correctly, use the pinch-off tool with the unit still running and clamp on to the pinch-off tube. Using a tube cutter, cut the pinch-off tube about 2 inches from the pinch-off tool. Use sil-fos solder and solder pinch-off tube closed. Turn off the unit, allow it to set for a while, and then test the leakage of the pinch-off connection.

Equipment needed: Vacuum pump, charging cylinder, manifold gauge, brazing equipment. pinch-off tool capable of making a vapor-proof seal, leak detector, tubing cutter, hand tools to remove components, service valve.

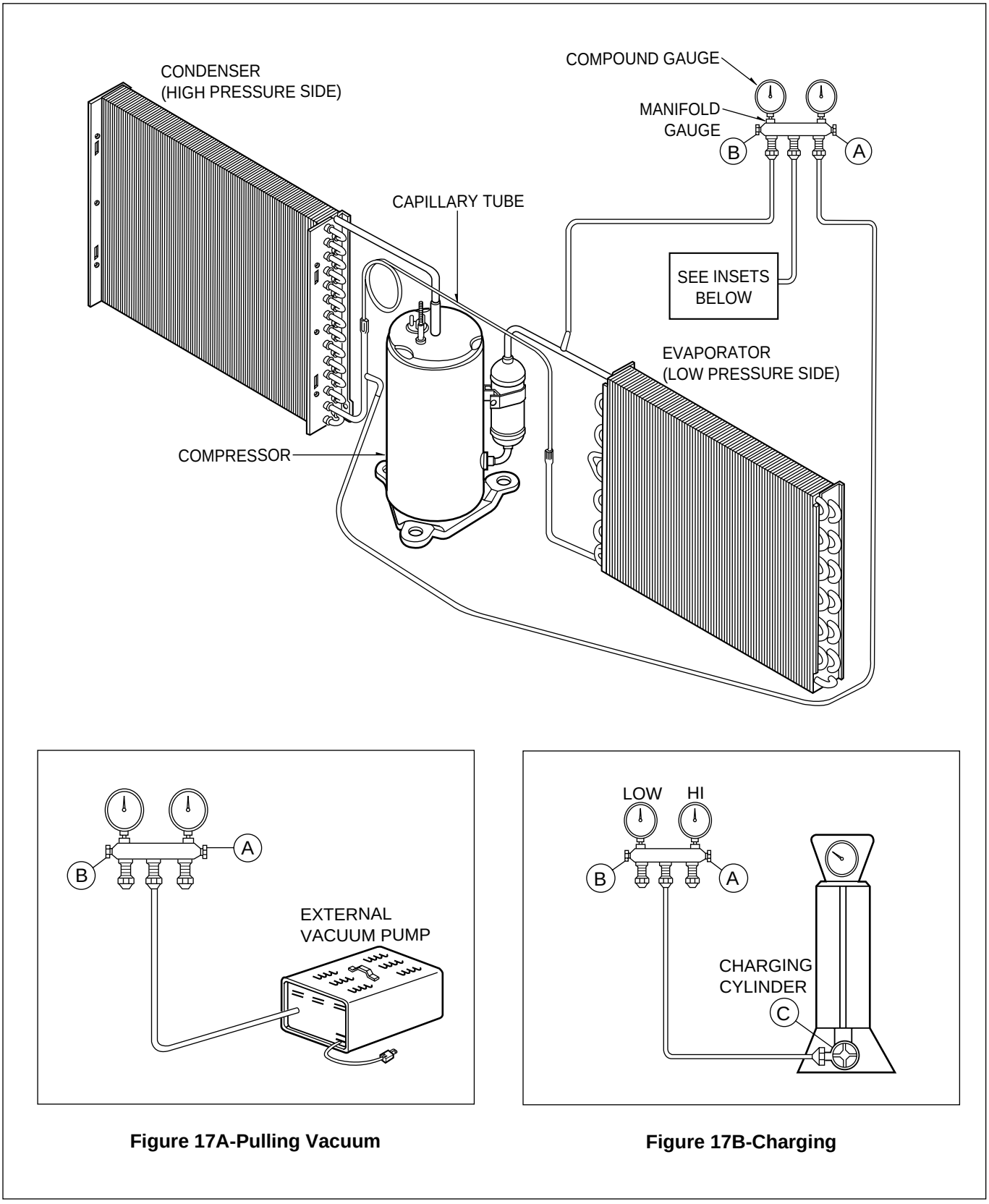


Figure 17A-Pulling Vacuum

Figure 17B-Charging

3. INSTALLATION

3.1 HOW TO INSTALL THE UNIT

CAUTION

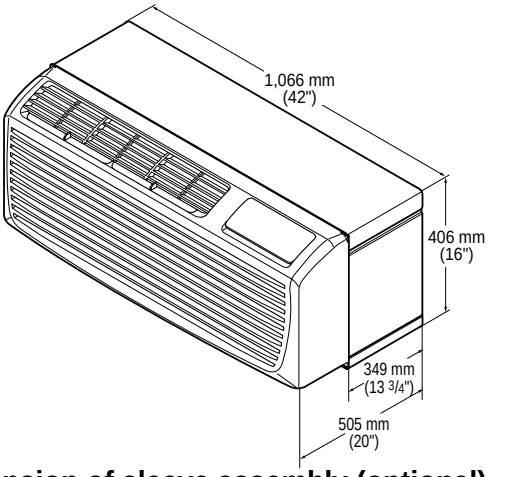
- There are sharp edges that can cause serious cuts.
- When lifting the air conditioner, it is HEAVY. Use 2 people to lift.

For existing sleeve, you should measure the wall sleeve dimensions.
Install the new air conditioner according to these installation instructions to achieve the best performence. All wall sleeves used to mount the new air conditioner must be in good structural condition and have a rear grille that securely attaches to the sleeve or the flange of the sleeve to secure the new air conditioner.

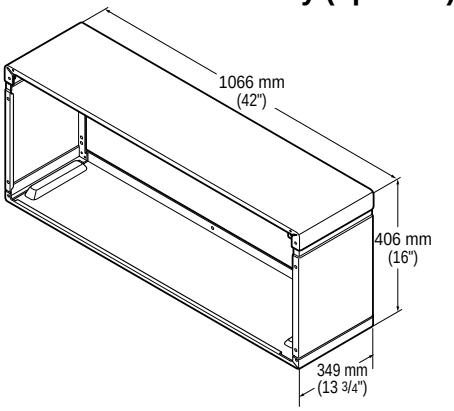
- To avoid vibration and noise, make sure the unit is installed securely and firmly.

When installing the sleeve, make certain there is nothing within 20" of the back that would interfere with heat radiation and exhaust air flow.

Dimension of air conditioner

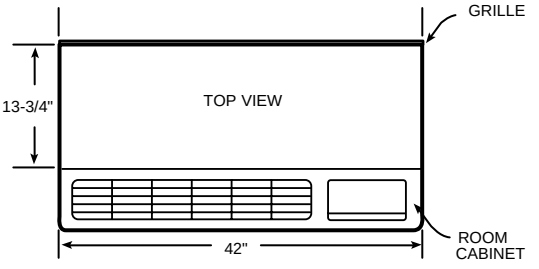


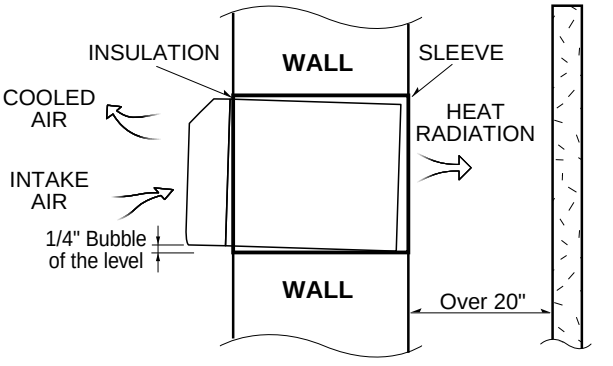
Dimension of sleeve assembly (optional)



Wall opening 16-1/4"x42-1/4"

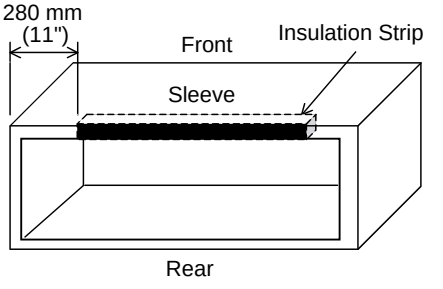
Recommended **Insulation strip must be attached to prevent the re-circulation of exhaust air to inward side from the either side of condenser space. The insulation strip is provided with the box. Refer to the diagram below.**





1) Take out the insulation strip from the upper packing.

2) Attach the insulation strip onto the rear upper side of the wall sleeve.
3) To improve unit energy efficiency, it is recommended the change of outside grille for an unit protection and an addition of a plastic rear grille. (This is optional.)
4) Insulation strip prevents the exhaust air from re-entering from either side of condenser space which may decrease the cooling efficiency of condenser.



3.2 WALL SLEEVE INSTALLATION

3.2.1 Wall Case Installation Data

General

Generally, units are installed 3" to 5" above the floor (flush to finished floor installation is possible) as near to the center of the room as possible; underneath a window or a glass panel is typical. Normal installation of the wall case allows installation flexibility; from flush with the finished interior wall to a minimum of 1/4" of the wall case extending beyond the finished exterior of the building.

Special consideration must be given to installations where the wall case does not extend a minimum of 1/4" beyond the finished exterior wall.

Regardless of the installation, there are several things to consider when selecting a location for installing the unit. For instance, drapery location could interfere with air discharge, and placement of furniture may have an impact on the performance of the unit. The following information is intended to minimize installation problems and assure you of trouble-free installation.

Refer to page 24 for required wall opening dimensions. Minimum recommended interior and exterior case projection for standard wall thicknesses are shown in the drawings in this manual. The case may be installed flush with the finished indoor wall.

Mounting an outdoor grille or louver section to the building face may cause a space between the outdoor coil and the louver section. Air splitters, aligned with the ends of the outdoor coil, must be installed between the outdoor coil inlet and outlet air streams. Gaps between the outdoor coil and the louver section may allow condenser air recirculation and affect the operation of the unit. See page 40 for requirements for custom louver sections.

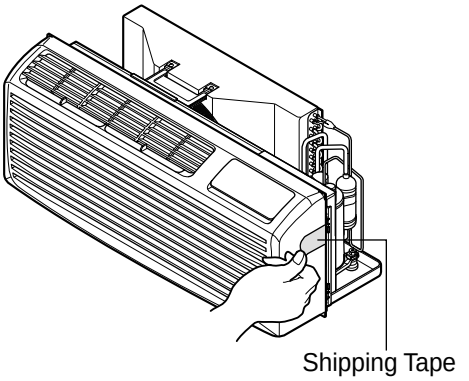
The wall case should be level from side to side and from level to 1/4 bubble tilt to the outdoors. The condensate disposal system in the unit is designed to dissipate the condensate water generated during cooling operation in accordance with ARI standards and actually uses this water for maximum unit efficiency. A level unit will also insure proper performance of the Internal Condensate Removal (ICR) system optional on heat pump units.

For new construction, early planning with the architect is necessary. Unit location, electrical connection locations, and wall openings of the proper dimensions are essential to avoid the necessity of rework, fillers, framing, moving electrical outlets, and other expensive modifications.

For existing construction it is important that carpentry, masonry and electrical work be performed by competent, qualified personnel. **Since installations in existing construction may involve removal of building material from the structure, locating the wall case must be done correctly.**

3.2.2 PREPARATION OF THE FRONT GRILLE

Carefully remove shipping tape from the front grille.



Brick, Frame, Stucco and Shingle Construction

For new construction, the opening for the wall case should be framed and the wall case inserted into the opening during construction. Lintels should be used when the building material is heavy and is not self supporting (such as brick). The wall case will fit an opening of six courses of standard brick or five courses of jumbo brick. Wall framing in this type construction is normally on 16" centers and the wall case will fit a framed opening spanning three 16" O.C. 2" x 4" stud spaces.

For existing construction the indoor and outdoor wall will need to be cut out, allowing for clearances of 1/8" on all sides of the wall case. Work should begin on the inside wall.
Cut the correct dimensions and mark (using drill holes) the outside wall from each corner of the inside cutout. Studding that interferes with the opening must be removed and a suitable frame constructed to secure the wall case and provide adequate support for case and chassis.

Preparation of the Wall Case for All Types of Construction

As shipped, the LG wall sleeve is ready for installation.
Do not remove the stiffener from inside the wall case or the weather closure panel from the outside face of the wall case until the outdoor grille and chassis are ready to be installed.

Installation of Wall Case in Wall Opening

1. Position the wall case into the wall. The room side edge of the wall case should be at least flush with the finished wall for line cord installations and permanent connection installations when no sub-base is used, and should project into the room at least 2-3/8" when a sub-base is used. If the minimum exterior dimensions are not met, refer to page 23.
   The outside edge of the wall case should extend at least 1/4" beyond the outside wall.
   This is necessary for proper caulking, to prevent sealing thedrain holes in the rear flange of the wall case, and to facilitate the installation of an accessory drain, if used.

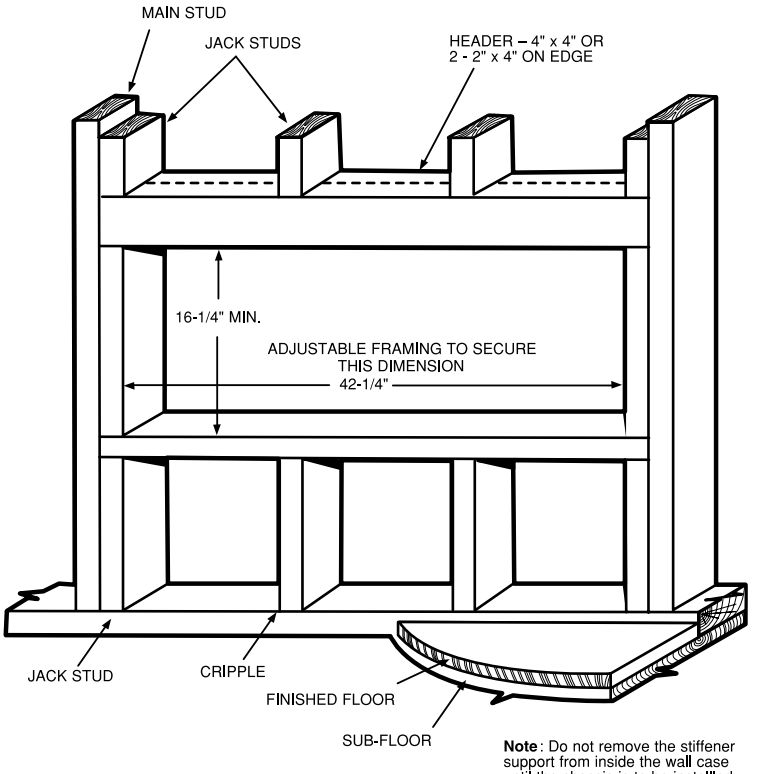
The wall case should be level from side to side and from level to 1/4 bubble tilt to the outdoors. The condensate disposal system in the unit is designed to dissipate the condensate water generated during cooling operation in accordance with ARI standards and actually uses this water for maximum unit efficiency. A level unit will also insure proper performance of the Internal Condensate Removal (ICR) system optional on heat pump units.

2. The wall case should be secured to the wall at both sides. Use a minimum of two screws or other fastening device on each side. See Figure 2 page 19. Mark the wall case on each side 2" from the bottom and 2" from the top at a point where basic wall structure is located. Drill wall case and use fasteners appropriate for wall construction. All holes for fasteners in the side of the wall case must be at least 2" up from the bottom of the wall case. **Never locate screws or put other holes in the bottom of the wall case.**
   If the wall opening is greater than the case dimensions, spacers must be used on the sides between the wall case and the wall support structure to prevent distorting the wall case.
3. Caulk or gasket the entire opening on the outside between the wall case and exterior wall surface (4 sides) to provide total water and air seal.
4. Caulk or gasket room-side opening between wall case and interior wall surface (4 sides). Opening beneath or around the wall case can allow outdoor air to leak into the room resulting in increased operating costs and improper room temperature control.

Care should be taken in location of electrical supply entry in relationship to wall sleeve to assure access to receptacle or junction box once unit is installed.

FRAMING FOR WALL CASE

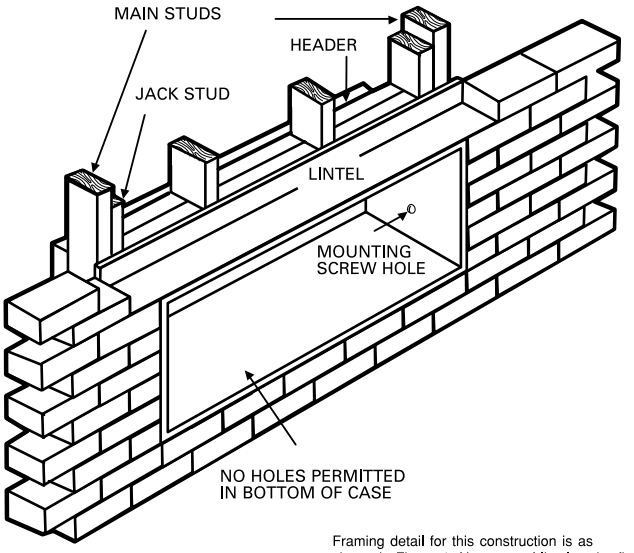
BRICK VENEER AND FRAME CONSTRUCTION



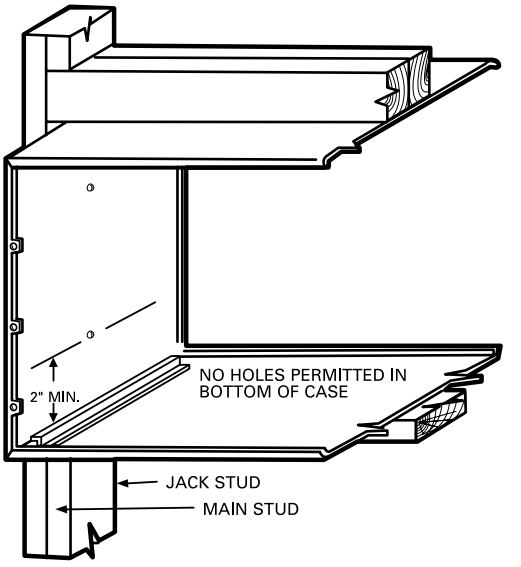
Note: Do not remove the stiffener support from inside the wall case until the chassis is to be installed.

Figure **18**

FASTENING WALL CASE



Framing detail for this construction is as shown in Figure 1. Note use of lintel under first course of brick above theZoneline case. Do not use the case as alintel. Mounting screw holes shown are tobe made by the installer



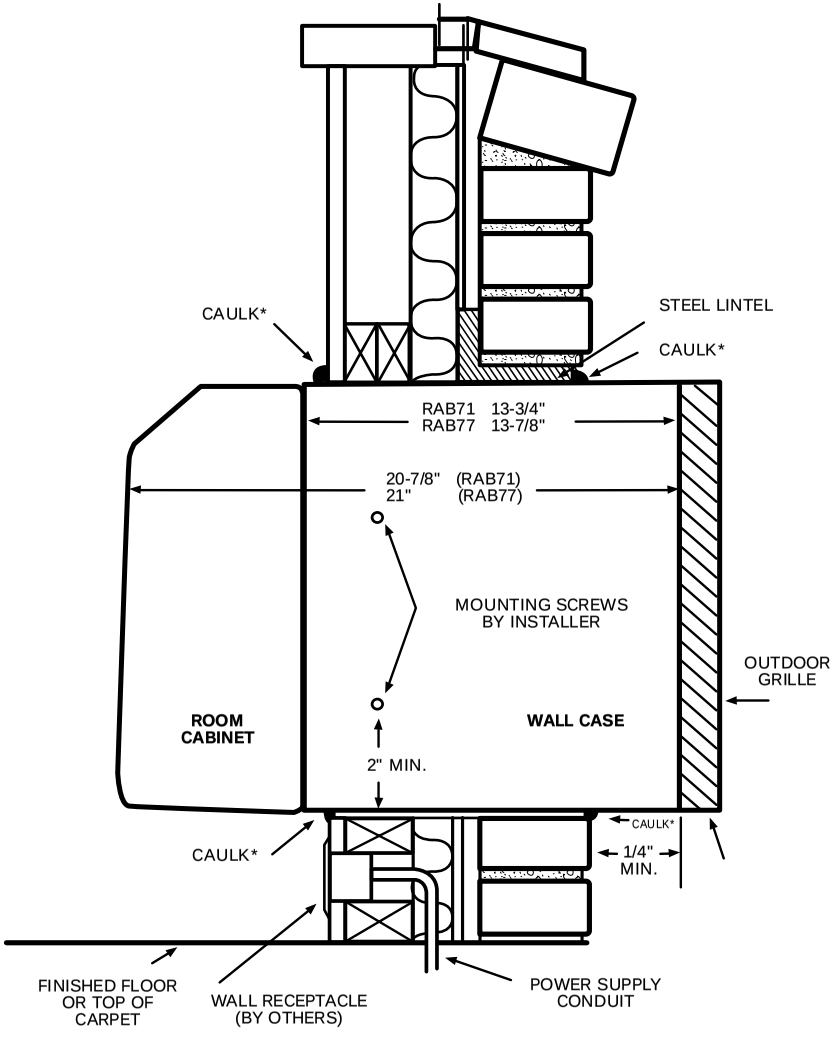
Choice of attachment devices through both ends of case or thetop. Mounting screw holes and attachment devices by installer.

Figure **19**

WALL SECTION – DETAILED SIDE VIEW

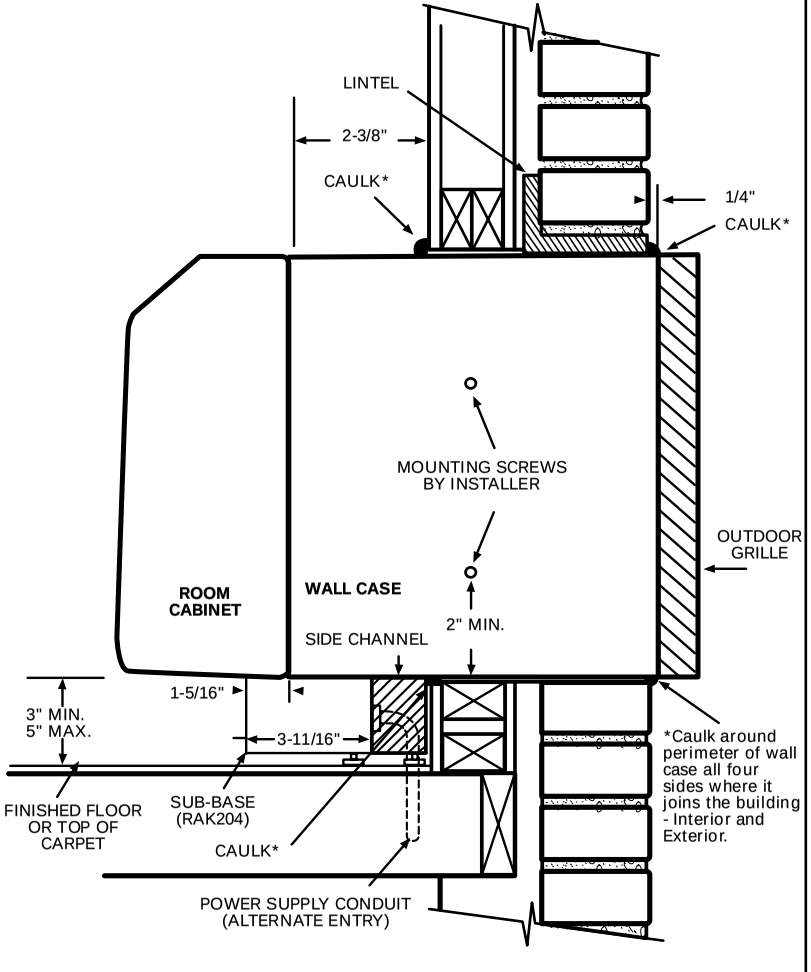
FRAME AND BRICK VENEER INSTALLATION

Cord Set Connected



*Caulk around perimeter of wall case all four sides where it joins the building - Interior and Exterior.

Sub-Base Connected



3.2.3 UNIT INSTALLATION

1. Remove the shipping screw from the ventilation door. (See Figure 20)

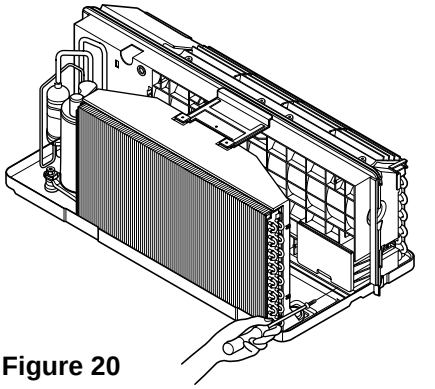


Figure 20

2. Remove the front gille by pulling it out at the bottom to release it, then lift it up along the unit top front. (See Figure 21)

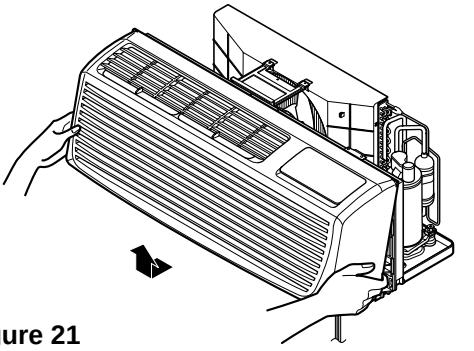


Figure 21

3. Slide the unit into the wall sleeve and secure with 6 screws through the unit flange holes. (See Figure 22)

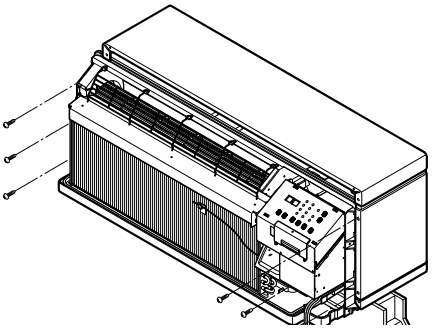


Figure 22

4. Reinstall the front grille by hooking the top over the unit top, then pushing it in at the bottom. (See Figure 23)

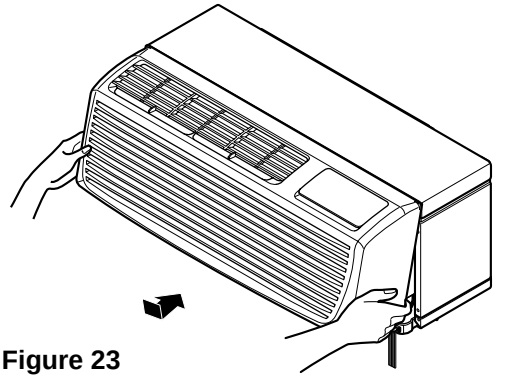


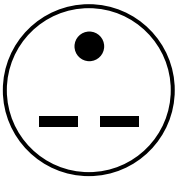
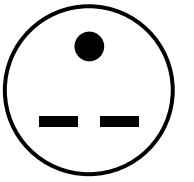
Figure 23

3.3 ELECTRICAL REQUIREMENTS

3.3.1 ELECTRICAL DATA (FOR 265V MODEL)

⚠ CAUTION

1. Do not use an extension cord with this unit.
2. When the unit is in the OFF position, the power supply to the electrical controls is still energized.
3. Disconnect the power to the unit before servicing the unit.
4. Remove the power cord from the wall receptacle.
5. Remove or turn off the protective device (fuses or circuit breaker).

 Standard 265V grounding receptacle rated 20A	Use 20AMP,time delay fuse or 20AMP circuit breaker (2500W Heater → 15 AMP Circuit Breaker)
 Standard 265V grounding receptacle rated 25A	Use 25AMP,time delay fuse or 25AMP circuit breaker (2500W Heater → 15 AMP Circuit Breaker)

Wirings including installation of the receptacle must comply with the NEC and local codes, local regulations.

FUSE- Use a time-delay fuse or circuit breaker. Refer to the nameplate for proper power supply requirements.

"If unit equipped with cords and plugs as long as they are installed with sub-bases, and the cord and plug are enclosed within the sub-base."
"The sub-base must have means for permanent connection."
"The sub-base must have an outlet for the connection of the cord and plug."
"To complete the installation of this PTAC, there must be a sub-base"

3.3.2 ELECTRICAL SAFETY

IMPORTANT GROUNDING INSTRUCTIONS

The air conditioner has a three-prong grounding plug on its power supply cord which must be plugged into properly grounded three-prong wall receptacle for your protection against possible shock hazard.

FUSE – Use a time-delay fuse or circuit breaker. Refer to the nameplate for proper power supply requirements.

265 VOLT UNITS

These units are equipped with a three-prong grounding plug on the power supply cord which must be plugged into a matching properly grounded three-prong wall receptacle for your protection against possible shock hazard. If such an outlet is not present, one must be installed by a qualified electrician in accordance with the National Electrical Code and local codes and ordinances.

NOTE: DO NOT USE AN EXTENSION CORD on 265 Volt units.

4. FIELD INSTALLED ACCESSORIES

Note: The installation and servicing of this equipment must be performed by qualifieed. experienced technicians

NOTICE:

Warnings and Cautions appear at appropriate sections throughout this manual. Read these carefully.

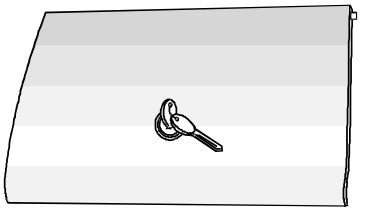
⚠ **WARNING** - Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ **CAUTION** - Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

CAUTION –Indicates a situation that may result in equipment or property-damage-only accidents.

Control Panel Key Lock

Part No: AYCP101



Description

The Key Lock kit prevents tampering of the controls used to set temperatures and heating or cooling functions.

Receiving

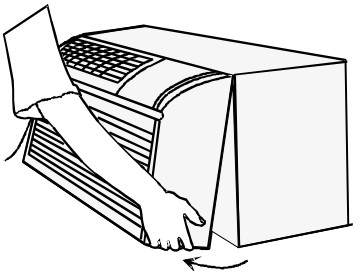
Upon receipt of the product, inspect the shipping carton for signs of visible damage. Report any damage or shortage to the carrier and note it on the delivery receipt. Unit must be stored in its original shipping carton in a dry, secure place prior to its installation and use.

Installation

The installation and servicing of the equipment referred to in this booklet should be performed by qualified, experienced technicians.

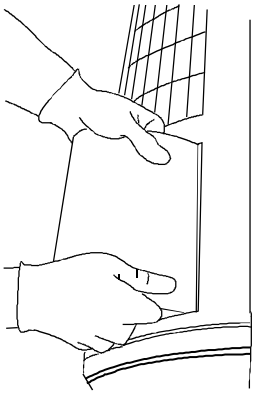
1. Remove front from unit by pulling bottom out and then lifting upward. (Figure 24)

Figure 24 - Remove Front



2. Remove existing door assembly by lifting door halfway and using both hands, bow door just enough for door hinge pins to slide out of mating holes. (Figure 25)

Figure 25 - Door Removal



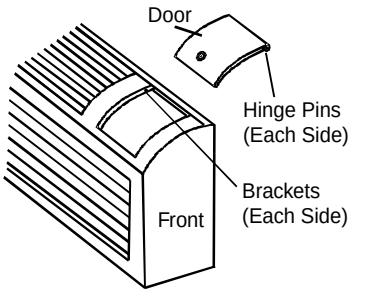
3. Install the new door assembly with the key lock by bowing the door with both hands and aligning the door hinge pins with their bracket in the front. (Figure 26)

Important Note:

Personal Risk Hazard Underwriter's Laboratories Inc. listed. For institutional use only where supervisory monitoring is available.

Any other use may increase the risk of personal injury or property damage.

Figure 26 - New Door Installation



Condensate Disposal Pump Kit Installation

Part No: AYSB3101

Description

The internal condensate pump serves as a means for disposing of condensate generated during heat pump operation by transferring it to the indoor coil. The warm coil surface and the warm room air help in evaporation of the condensate while adding humidity to the room.
As with any equipment of this type, the addition of this kit will decrease the effective heating capacity of the unit. This kit is not intended for use in seacoast or corrosive environments.

NOTE:
Under extreme high humidity conditions, the internal condensate pump may not be able to dispose of all the condensate produced, and condensate would then drip from the outside of the wall sleeve. If this condensation is unacceptable, then a drain system (including factory approved drain kit for the wall sleeve) should be installed.

Receiving

Upon receipt of the product, inspect the shipping carton for signs of visible damage. Report any damage or shortage to the carrier and note it on the delivery receipt. Unit must be stored in its original shipping carton in a dry, secure place prior to its installation and use.

Installation

The installation and servicing of the equipment referred to in this booklet should be performed by qualified, experienced technicians.

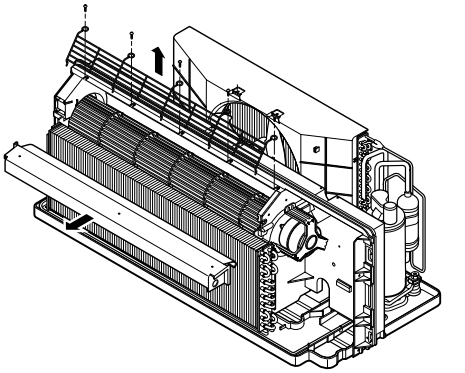
⚠ **WARNING**

Hazardous Voltage!
Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

Important Note:
The unit OFF switch does not disconnect all electrical power to this unit.

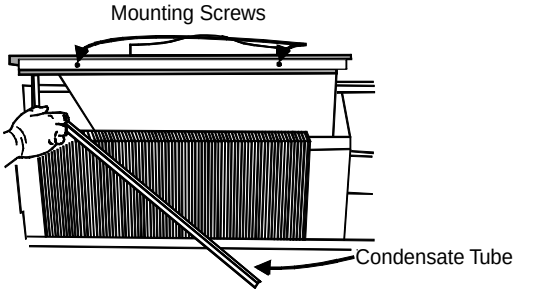
1. Remove front by rotating bottom outward and then lifting up and out from chassis.
2. Unplug and remove the PTAC chassis from the wallsleeve. Move the chassis where the front and back of the chassis can be easily accessed.
3. Remove the top cover assembly, net steel.(Figure 27)

Figure 27



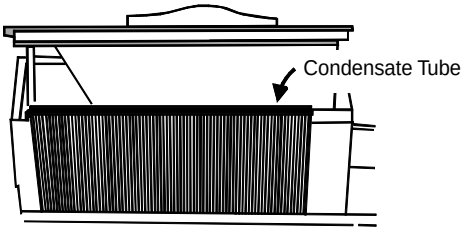
4. Lift the heater/discharge deck assembly approximately 10 inches by unscrewing three screws (two on the left side, one on the right side of the discharge deck) holding the discharge deck to the chassis.
   Lift upward being careful not to pinch heater wires.
   (Figure 28)

Figure 28



5. Place coil cover on top of the evaporator coil with flanges pointing down. Make sure cover is over entire top of coil. (Figure 28)
6. Position the short end of the condensate tube through the back wall of the partition panel using existing hole. The condensate tube should protrude through the partition panel by 1-3/4 inches.
   Rotate the condensate tube so the tube lays flat on the coil cover.
   (Figures 28 & 29)

Figure 29



7. Position the condensate tube through existing hole (located right side of blower deck).
8. Make sure the holes in the condensate tube are facing inward toward the blower wheel.
9. Lower the discharge deck over the condensate tube and screw the discharge deck to the chassis with the existing screws. Replace the discharge screen and screw the screen to the discharge deck with the existing screws.
10. Using the overflow tube holder and the overflow tube, hold the tube with the metal holder and screw the holder to the partition panel with the provided 1/2 inch #8 screw. (Figures 30 & 31)

Figure 30

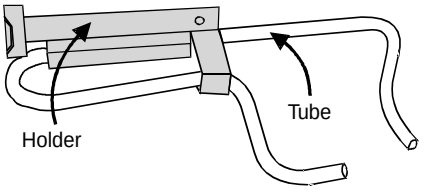
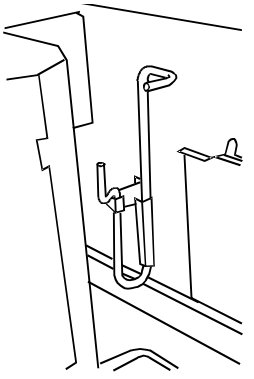
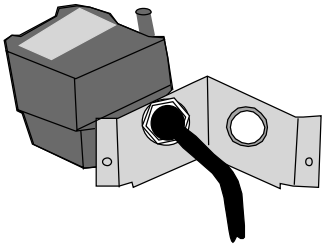


Figure 31



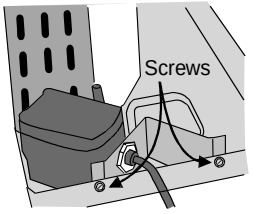
11. Place the pump bracket onto the end of the pump by feeding the pump cord through the hole in the bracket and pushing the bracket onto the threads of the pump. Slide the supplied washer onto the threads of the pump. Screw the pump nut onto the threads of the pump and tighten the nut so that the bracket is secure against the pump. (Figure 32)

Figure 32



12. Position the pump in the back left corner of the basepan and screw the pump bracket to the basepan with the provided two 1/2 inch #8 screws. (Figure 33)

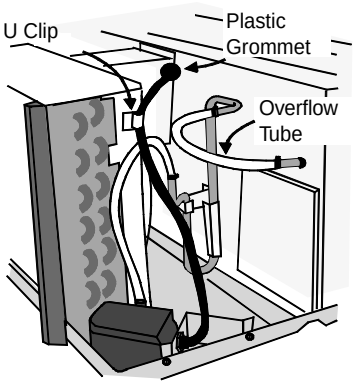
Figure 33



13. Remove the protective adhesive backing from the plastic U clip and mount the U clip to the plastic condenser shroud in approximately the position shown. (Figure 34)
14. Snap the provided round plastic grommet into the top condenser baffle. (Figure 34)

15. Place one of the hose clamps over one end of the 16-inch vinyl hose. Place the same end over the barbed discharge tube of the pump assembly. Place a hose clamp on the other end of the 16 inch hose. Place this same end over the shorter leg of the overflow tube and secure the hose with the hose clamp. (Figure 34)

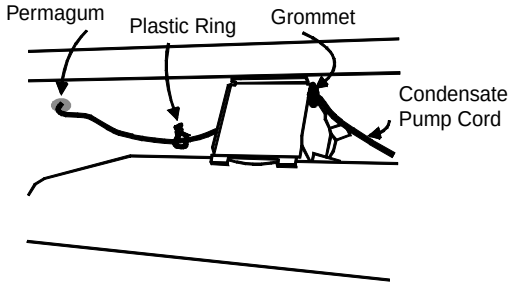
Figure 34



16. Place a hose clamp over one end of the 11-inch long hose. Push this same end over the longer leg of the overflow tube and secure with the hose clamp. Place another hose clamp over the other end of the 11-inch hose. Push this same end over the condensate tube protruding out from the back of the partition panel and secure with the hose clamp. (Figure 34)
17. Route the condensate pump cord through the U clip on the condenser shroud, through the plastic grommet in the sheet metal condenser wing, through the plastic ring in the panel, and then through the hole in the panel where the compressor wires are routed through the panel.

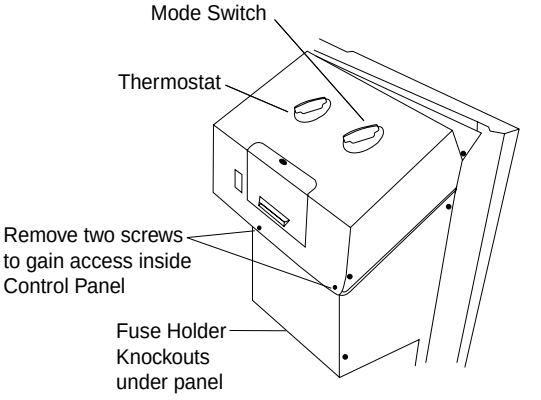
NOTE: The permagum may have to be removed to feed the wires through the panel, make sure wires have no slack and replace the permagum to prevent air leaks. (Figures 34 and 35)

Figure 35



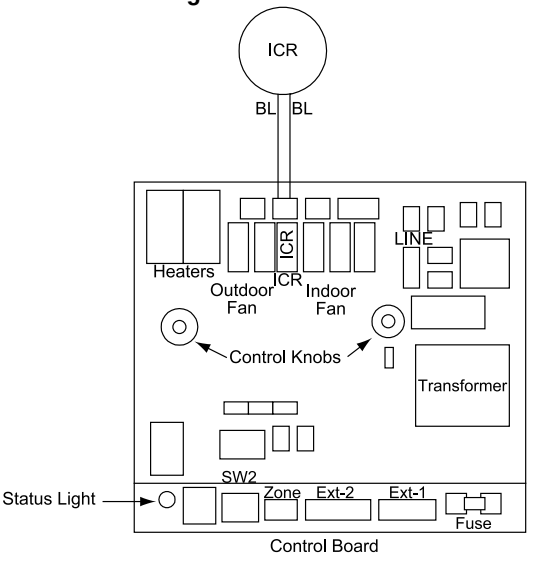
18. To gain access inside the control panel, remove the knobs and escutcheon. Remove the two screws holding the panel in position. Tilt the control panel forward, being careful not to pinch any wires. (Figure 36)
19. Lift the control panel up so the control panel is free of its hinges. Position the control panel so there is easy access for mounting components to the control panel. (Figure 36)

Figure 36



20. Connect the condensate pump to the ICR relay on the terminal board per Figure 37.
21. Install the basepan drain plug into the basepan drain hole by pushing it up into the drain hole from the bottom of the basepan.
    This will defeat the thermostatic controlled drain valve. The basepan drain is located to the left of the outside coil (as viewed from the back of the unit).

Figure 37 - Internal Condensate Removal Pump Wiring



Architecture Grille Aluminum - Single Pack

Part No: AYAGALA01

Stamped Aluminum Grille

Architecture Grille

Description

Outdoor grilles are attached to the wall sleeve and exposed to the exterior wall. The grilles are an industry standard size of 42" x 16".

Receiving

Upon receipt of the product, inspect the shipping carton for signs of visible damage. Report any damage or shortage to the carrier and note it on the delivery receipt. The unit must be stored in its original shipping carton in a dry, secure place prior to its installation and use.

Installation

The installation and servicing of the equipment referred to in this booklet should be performed by qualified, experienced technicians.

⚠ **WARNING**

Hazardous Voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

Important Note:

The unit OFF switch does not disconnect all electrical power to this unit.

Note:

A baffle kit must not be used with a stamped aluminum grille on any PTAC installation.

Stamped Aluminum Grille

1. Prepare the wall sleeve for installation of the grille by removing the cardboard stiffener and rear enclosure panel from the sleeve. These items may be removed from inside of the building.

Note:

The sleeve stiffener must be taken out before the rear sleeve enclosure panel can be removed from the sleeve.

2. Prepare the stamped aluminum grille for installation on the sleeve by inserting the six (6) plastic grommets into the square holes located near the outer edges of all four sides of the grille. With the grille positioned so the flanges of all four sides are in the up position, insert the grommets so the square end protrudes through the grille in the opposite direction from the flanges.
3. Turn the grille so it can be removed through the rear sleeve opening.
4. Install the stamped aluminum grille by aligning the guide pins located in the lower right and left hand corners of the grille with the corresponding holes in the rear of the wall sleeve.
5. Secure the grille by threading each of the screws into the plastic grommets.
6. Remove the wire handle (not shown in the picture) from the center of the grille prior to installing the chassis into the sleeve.

Note:

Be sure to keep a firm grip on wire handle and grille to prevent it from dropping and/or causing possible injury or property damage.

Architectural Grille

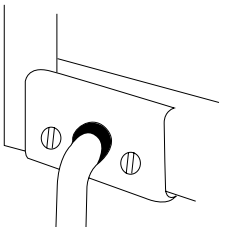
1. Remove the cardboard sleeve stiffener and the rear enclosure of the sleeve as described in Step 1 of the stamped aluminum grille instructions.
2. Turn the grille so it can be removed through the rear sleeve opening.
3. Install the grille by aligning the four screws supplied to their corresonding holes in the architectural grille.

4. Secure the grille to the sleeve by tightening the four screws to their corresponding holes in the grille.
5. Remove the wire handle after the installation is complete.

Note:
The stamped aluminum grille includes 6 screws, washers, nuts, and plastic grommets. The architectural grille includes 4 screws.

Condensate Drain kit

Part No: AYDR101



Description

Condensate water will drain from the chassis into the sleeve during normal heat pump operation. This can also occur during times of high humidity when in cooling operation. Install either the outdoor or indoor drain kit components to control the condensate water where normal drainage from the wall sleeve is not possible or undesirable. See Figure 38 for all components of the drain kit.

⚠ **WARNING**

Hazardous Voltage!
Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/ tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

Important Note:
The unit OFF switch does not disconnect all electrical power to this unit.

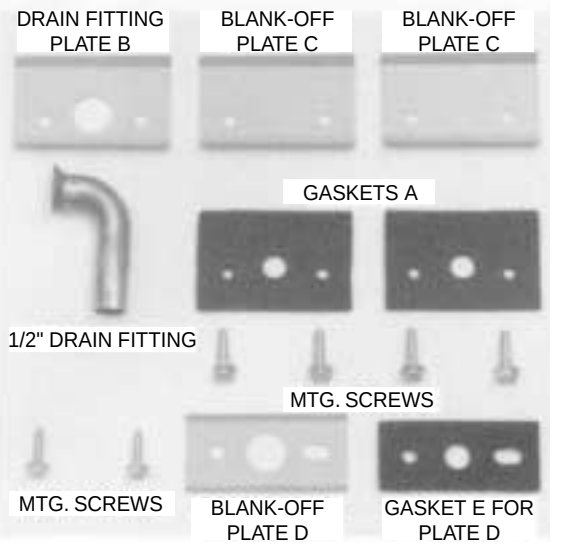
Receiving

Upon receipt of the product, inspect the shipping carton for signs of visible damage. Report any damage or shortage to the carrier and note it on the delivery receipt. The product must be stored in its original shipping carton in a dry, secure place prior to its installation and use.

Installation

The installation and servicing of the equipment referred to in this booklet should be performed by qualified, experienced technicians.

Figure 38 – Components of Drain Kits

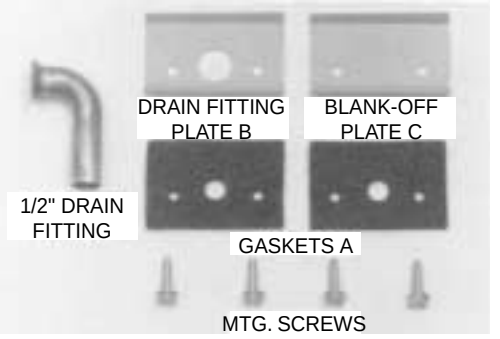


Drain Installation

Note:
The optional drain kit serves only as a link between the unit and field-supplied condensate drain system.
Installing the kit without connecting it to a drainage system will result in inadequate condensate removal, possible leakage and corrosion.

Algaecide: Some algaecide products may cause damage to the unit basepan and therefore should not be used. Contact your sales representative when considering the use of a commercial algaecide. See Figure 38 for components of the drain kit.

Figure 39 – Outdoor Drain Kit Installation



Outdoor Drain Kit Installation

Before installing the wall sleeve louvered condenser grille, it must be determined if the optional outdoor wall sleeve drain kit is to be installed. The drain kit will allow the condensate from the outdoor and indoor coils to be routed to a suitable area. The drain kit can be installed so the condensate can be drained from the right or left hand side of the wall sleeve. See Figure 39. See local codes for proper condensate disposal.

To install the outdoor drain components proceed as follows:

1. Remove the rear enclosure panel and the sleeve stiffener. These items may be removed from the inside of the building.
2. The drain fitting can be installed on the left or right hand side of the sleeve. (Illustration will be for a right hand installation.) Insert the drain fitting in the opening of gasket A and hole of plate B. Secure this assembly to the rear of the sleeve with two sheet metal screws into holes G provided in sleeve. See Figures 40 and 41.
3. Locate the other gasket A on the back of blank off plate C and secure the assembly to the left rear of wall sleeve with sheet metal screws provided. See Figure 42 for finished left hand side installation.

If the unit chassis is to be installed right away, install the condenser grille to wall sleeve with hardware provided. See condenser grille installation instructions.

If the unit chassis will not be installed right away, replace the rear enclosure panel in the wall sleeve. This will help protect the inside of the building from weather damage.

If a subbase is used, be sure the right hand subbase cover is removed before the chassis is installed in the sleeve. Slide the chassis into the wall sleeve until the chassis flanges contact the front edge of sleeve. Secure the chassis to the wall sleeve on each side with screws provided.

Re-install the cabinet front.

See the following pages for installation instructions of indoor drain kit.

Figure 40

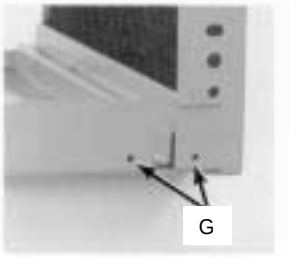


Figure 41

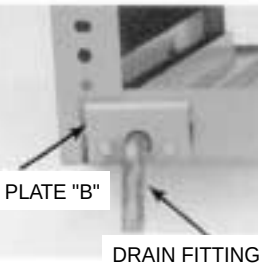


Figure 42

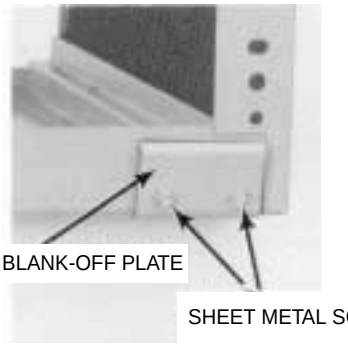
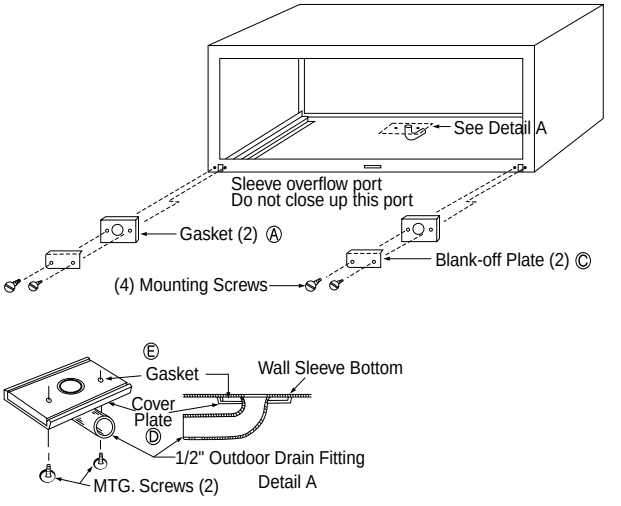


Figure 43



Indoor Drain Kit Installation

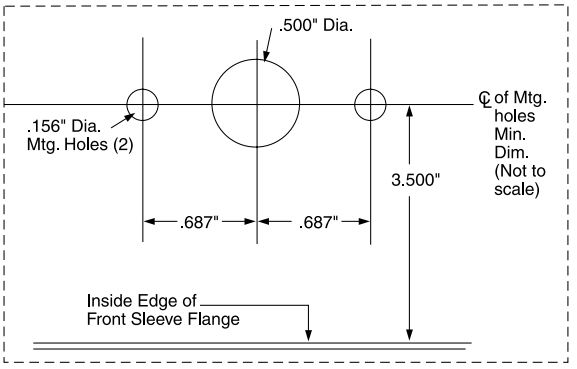
The internal drain is installed on the bottom of the wall sleeve when it is required to drain the condensate into a drain system inside of the building.
The components of the wall sleeve drain kit are shown in Detail A. Use components C (2), D, E, mounting screws (6) and the Outdoor drain fitting.

1. The components D, E, and drain fitting of the kit are mounted on the bottom of the wall sleeve prior to the installation of the sleeve. It may be located in a feasible area on the bottom of the sleeve which is inside of the room except when a subbase is used. When a subbase is installed, the drain may be a minimum of 3 1/2 " from the front flange of the wall sleeve. The minimum clearance should provide adequate clearance for the subbase, see Figures 43 and 44.
2. Cut out the template in the lower right hand corner of these instructions to locate the field drilled holes. (Two to mount the plate and one for the Outdoor drain fitting). See Detail A on how the components have to be installed after the holes are drilled in the bottom of the wall sleeve. If the drain fitting is not connected to an indoor drainage system immediately after the wall sleeve is installed, it must be plugged with a cork to prevent indoor water damage in case it rains.

An indoor tube or hose (furnished by others) must be installed on the drain fitting and interconnected to the drain system inside of the building.

Install the two blank-off plates C and gaskets A on the outdoor portion of the wall sleeve as shown in Figure 43. These components may be installed after the sleeve is secured in the wall opening just prior to the installation of the condenser grille and chassis.

Figure 44



Leveling Legs

Part No: AYLL101

Description

Leveling legs are designed to provide extra front support and leveling of the wall sleeve. Two leg assemblies are required per unit and are provided in each kit. Four screws are also provided with each kit for attachment to the wall sleeve. See Figure 45.

The leveling legs must be installed before the chassis is installed, but after the wall sleeve is in place.
Holes must be drilled in each side of the wall sleeve, below the duct package holes, for attachment to the wall sleeve.

Receiving

- Compare kit identification number with sales order to ensure that the correct kit has been received.
- Inspect the leveling legs for shipping damage. File damage claims with the delivering carrier immediately.

Installation

The installation and servicing of this equipment should be performed by qualified, experienced technicians.

WARNING

Hazardous Voltage!
Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

Important Note:
The unit OFF switch does not disconnect all electrical power to this unit.

Checklist

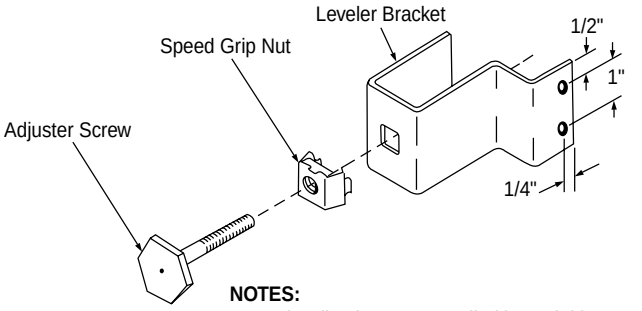
The following is an abbreviated guide to leveling leg installation. Refer to appropriate areas for more detailed information.

Leveling Leg Assembly

To install the leveling leg assembly, complete the following:

1. Drill two 1/8-inch holes in each side of the wall sleeve, as shown in Figure 45, using the leveling leg assembly as a template. Locations near the front of the sleeve provide more support.
2. Adjust the leveling legs to the approximate height needed and install them on either side of the wall sleeve, using the screws provided. Bottom of wall sleeve can be anywhere from three to five inches above the screw base. Caulk around screws to prevent water leaks.
3. Level the sleeve horizontally from side-to-side. Provide a slight slope (one-quarter bubble in the sight glass) toward the outside. Check the level again after the unit has been installed. Adjust the legs as needed.

Figure 45 - Leveling Leg Assembly

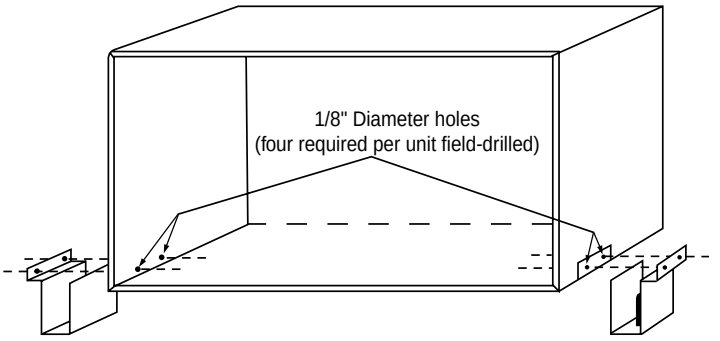


NOTES:
1. Two leveling legs are supplied in each kit.
2. One kit is required per unit.
3. Fout mounting screws are provided in each kit.

Installation on Wall Sleeve

1. Drill four 1/8-inch diameter holes in the wall sleeve, two on each side, using the leveling legs as a template. Caulk around screws to prevent water leaks.
2. Attach the legs to the wall sleeve, using the screws provided.
3. Adjust the leveling legs to level the wall sleeve from side to side and provide a slight pitch to the outside (one-quarter bubble in sight glass).

Figure 46 - Leveling Leg Installation on Wall Sleeve



Hard Wire Kit

Part No: AYAGALA01

Description

Hard Wire Junction Box (Direct Wire Sub-Base) The hard wire junction box kit is used to hard wire the unit when it is not desirable to use the standard unit subbase or the unit power cord.
The junction box provides a protected enclosure for electrical connections as required by some electrical codes.
The hard wire junction box is intended to be mounted on the floor or the adjacent wall.

The junction box is furnished with approximately 2-1/2 feet of 1/2-inch flexible steel conduit and a metal box for securing the conduit to the unit cabinet at the incoming power opening.

An optional 230/208V or 265V power switch assembly is available for use with the hard wire junction box or subbase. The switch provides a POWER ON/OFF function at the unit as required by some electrical codes.
A replacement junction box cover plate is provided with each switch kit.
For additional information, refer to the Power Switch Installation Instructions.

Receiving

Upon receipt of the product, inspect the shipping carton for signs of visible damage. Report any damage or shortage to the carrier and note it on the delivery receipt. Unit must be stored in its original shipping carton in a dry, secure place prior to its installation and use.

Installation

The installation and servicing of this equipment should performed by qualified, experienced technicians.

Junction Box Kit Installation and Wiring Procedure

EIectrical connections at the unit must be made after the unit chassis is installed in the wall sleeve. The installer must determine and supply the mounting components for attaching the junction box to the wall or door.

⚠ **WARNING**

Hazardous Voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

Important Note:

The unit OFF switch does not disconnect all electrical power to this unit.

CAUTION

Use Copper Conductors Only!

Unit terminals are not designed to accept other types of conductors. Failure to use copper conductors may result in equipment damage.

Important Note:

All wiring must comply with applicable local and national codes. Types and location of disconnect switches must comply with all applicable codes.

1. Remove the cover plate from the junction box
2. Mount the junction box to the wall or floor within 28 inches (711 mm) of the lower right corner of the wall sleeve.
3. If a disconnect switch is to be used, make electrical connections to it and mount the switch in the junction box. Refer to the Power Switch Installation Instructions.
4. Remove control panel assembly by removing the two screws holding control panel in place. Rotate the panel forward.
5. Disconnect the power cord leads from all electrical connections including the ground wire.
6. Remove the power cord clamp and the power cord from the unit.
7. For 208/230-volt units, remove and discard the white lead from the wire assembly. For 265-volt units, remove and discard the red lead from the wire assembly.
8. Remove the retaining ring from the threaded portion of the straight conduit clamp. Insert the three wires into the metal box through one of the two openings in the box. Replace the hole cover grommet into the unused hole to prevent objects from entering the box.
9. Replace the retaining ring back on the conduit clamp inside the metal box and tighten the ring securely.
10. Insert the three wires extending from the metal box into the incoming power opening on the unit so that approximately 20 inches (508 mm) of the wires protrude through the opening.
11. Attach the metal box to the chassis with the two screws provided.
12. Insert the wire tie into the 1/4-inch diameter hole located just above the incoming power opening. Tie all wires together securely with the wire tie. See Figure 48.

265 Volt Units

1. Remove and discard the red lead from the wire assembly .
2. Connect the black lead to the center terminal of the fuse holder.
3. Connect the white lead to the common (C) terminal on the capacitor.
4. Connect the ground wire to the partition panel where the ground wire on the power cord was located.
   Use the supplied green ground screw.
5. Connect the white lead of the wire assembly at the junction box to the white lead of the field power source.
6. Connect the black lead of the wire assembly at the junction box to the black lead of the field power source.
7. Connect the ground wire of the field power supply to the bare ground wire of the wire assembly at the junction box.
8. Install the junction box cover plate.
9. Reinstall the control panel assembly.

Figure 48 - Mounting Hard Wire Junction Box Kit

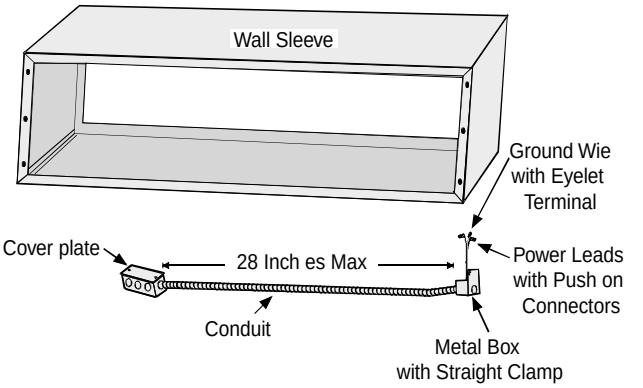


Figure 48 - Metal Box Location

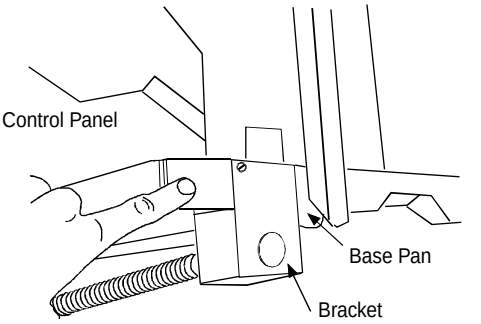
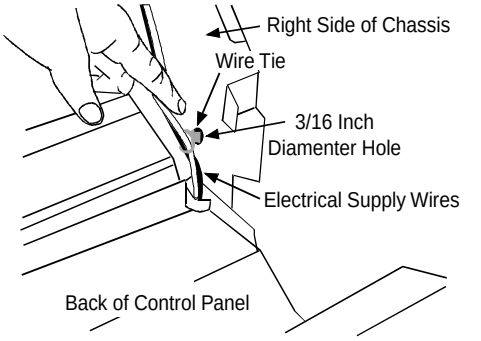
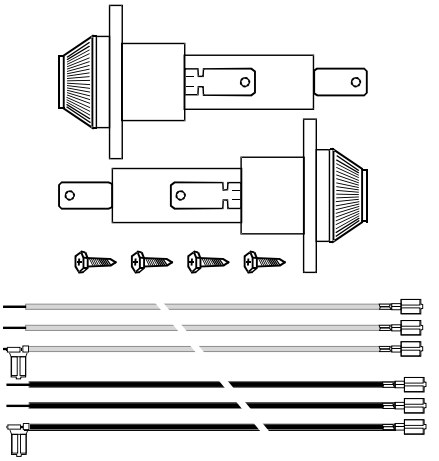


Figure 49 - Electrical Wiring Routing



Fuse Holder Kit

Part No: AYFH1101



Description

This optional fuse holder kit can be installed directly in the chassis or in the optional subbase.
Fuse holder kits are available in 230/ 208 volt ratings. The installer should supply time delay fuses at 15, 20, 25, or 30 amps in accordance with the Maximum Overcurrent Protection as listed on the unit nameplate. Fuses may be purchased from the parts department.

Note:
The installation and servicing of this equipment must be performed by qualified, experienced technicians only.

⚠ **WARNING**

Hazardous Voltage!
Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/ tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

Important Note:
The unit OFF switch does not disconnect all electrical power to this unit.

CAUTION

Use Copper Conductors Only!
Unit terminals are not designed to accept other types of conductors. Failure to use copper conductors may result in equipment damage.

Important Note:
All wiring must comply with applicable local and national codes.
Type and location of fused disconnect switch(es) must comply with all applicable codes. Failure to follow these codes could result in overheating and equipment failure.

Receiving

Upon receipt of the product, inspect the shipping carton for signs of visible damage. Report any damage or shortage to the carrier and note it on the delivery receipt. Unit must be stored in its original shipping carton in a dry, secure place prior to its installation and use.

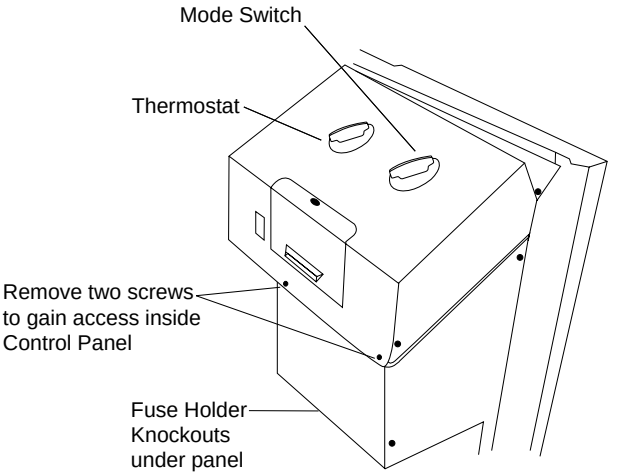
Installation

The installation and servicing of the equipment referred to in this booklet should be performed by qualified, experienced technicians.

Fuse Holder Kit Installation (Without Subbase)

1. Remove front by rotating bottom outward and then lifting up and out from chassis.

Figure 50 - Control Panel



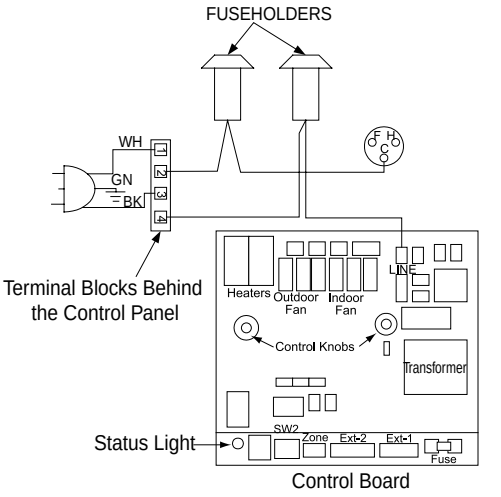
2. To gain access inside the control panel, after removing the knobs and escutcheon, remove the screws holding panel in position.
   Tilt control panel forward, being careful not to pinch any wires. (Figure 50)
3. As viewed from the front, remove both knockouts on the control panel.
4. Insert two fuse holders from the front. The fuse holders should be oriented so the quick-connect tabs are toward the center of the unit. Attach fuse holders using the screws and nuts provided. (Figure 50)
5. Remove both power cord leads, one lead from the capacitor and one from the electronic board.
6. Install one power cord lead on the center terminal of one fuse holder. (Figure 51)
7. Install the remaining power cord lead on the center terminal of the second fuse holder. (Figure 51)
8. Connect BK-10 wire from the side terminal of one fuse holder to the Line terminal on the electronic board. (Figure 50)
9. Connect RD-10 wire from the side terminal of the other fuse holder to the common (C) terminal on the capacitor. (Figure 51)
10. Tilt control panel back to original location, being careful not to pinch any wires. Align the control panel with the cover and screw panels into place with original screws. Replace escutcheon and control knobs.

Fuse Holder Kit Installation (With Subbase)

See previous section for installation in the control panel.

1. Remove both knockouts at the fuse holder location. (Figure 52)
2. Install the fuse holders using screws provided. The side connector tab on the fuse holders should be towards the left.
3. Connect a stripped BK-9 wire to the center of the quick-connect tab of the fuse holders. Wire nut the other end of this wire to the black field connection wire (TB1). (Figure 53)
4. Connect the other stripped BK-9 wire to the quick-connect tab on the side of the same fuse holder.
   Wire nut the other end to black subbase wire leading to receptacle. (Figure 53)

Figure 51 - Fuse Holder Diagram Control Panel Installation



5. Connect the stripped RD-9 wire to the center quick-connect tab of the second fuse holder. Wire nut the other end to the red field connection wire (TB3). (Figure 53)
6. Connect the other stripped RD-9 wire to the quick-connect tab on the side of the second fuse holder.
   Wire nut other end to red subbase wire which leads to receptacle. (Figure 53)
7. Insert time delay fuses into the fuse holders. Size all fuses by the Maximum Overcurrent Protection shown on the nameplate. Also refer to the serial plate on the unit.

Figure 52 - Subbase (Left Side)

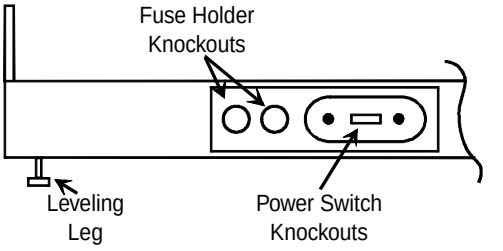
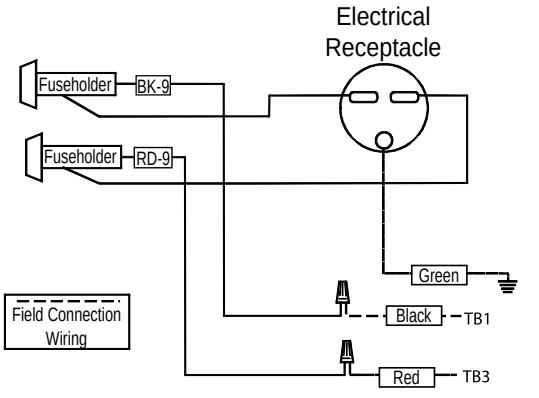


Figure 53 - Fuse Holder Diagram Subbase Installation



Remote Escutcheon Kit

Part No: AYRE110

Description

This kit provides an attractive replacement escutcheon (see Figure 54). The kit allows the removal of control knobs and graphics, which are not required when a wall thermostat is used to control the unit.

Receiving

Upon receipt of the product, inspect the shipping carton for signs of visible damage. Report any damage or shortage to the carrier and note it on the delivery receipt. The unit must be stored in its original shipping carton in a dry, secure place prior to its installation and use.

Installation

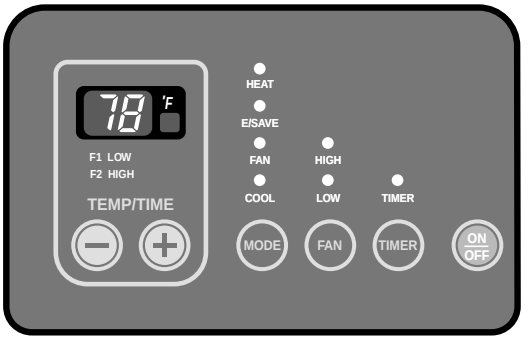
The installation and servicing of the equipment referred to in this booklet should be performed by qualified, experienced technicians.

⚠ WARNING

Hazardous Voltage!
Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/ tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

Important Note:
The unit OFF switch does not disconnect all electrical power to this unit.

Figure 51—Standard Escutcheon



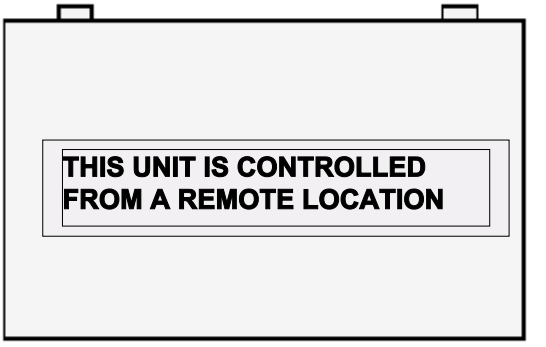
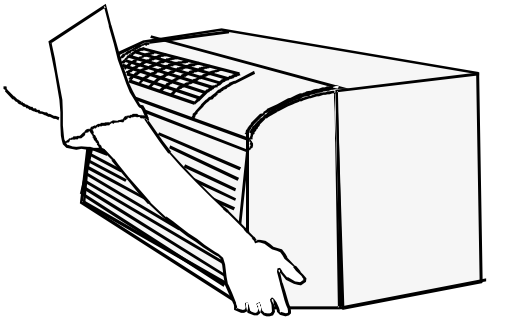
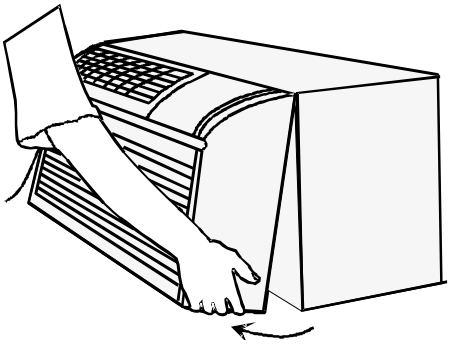


Figure 55



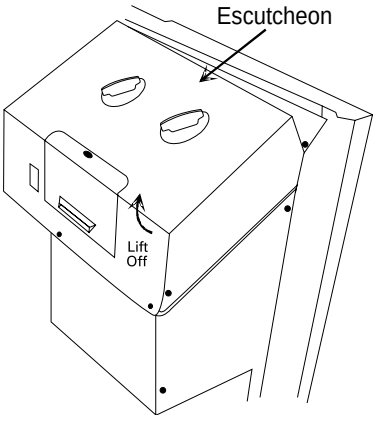
1. Grasp the cabinet front as shown in Figure 55.
2. Pull the bottom of the cabinet front away from the chassis until the retaining clips disengage as in Figure 56.
3. Lift the cabinet front off the chassis.
4. Lifting the front edge of the escutcheon, slide the tabs at the top of the escutcheon out of the retaining holes and remove the escutcheon. See Figure 57.

Figure 56



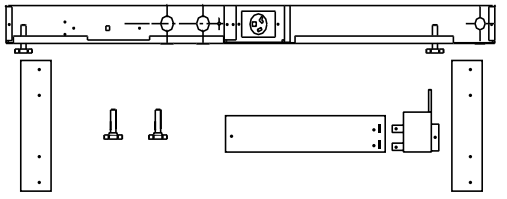
5. Replace the escutcheon with the one from this kit by inserting the tabs at the top of the escutcheon into the retaining holes and laying the escutcheon flat on the control panel.
6. Replace the front by reversing steps 1 through 4.
7. Store the control knobs and escutcheon just removed from the unit for possible reinstallation if the wall thermostat is no longer desired.

Figure 57



Subbase

Part No: AYSB3101 (265V 20A)
AYSB4101 (265V 30A)



Description

The subbase may be installed on the wall sleeve before or after installing the wall sleeve. The subbase is prewired. Electrical connections can be made on the left side after the access cover is removed. A grounding screw is provided.

Receiving

Upon receipt of the product, inspect the shipping carton for signs of visible damage. Report any damage or shortage to the carrier and note it on the delivery receipt. The unit must be stored in its original shipping carton in a dry, secure place prior to its installation and use.

Installation

The installation and servicing of the equipment referred to in this booklet should be performed by qualified, experienced technicians.

⚠ **WARNING**

Hazardous Voltage!
Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/ tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

Important Note:
The unit OFF switch does not disconnect all electrical power to this unit.

CAUTION

Use Copper Conductors Only!
Unit terminals are not designed to accept other types of conductors. Failure to use copper conductors may result in equipment damage.

Note:
When using a subbase, the wall sleeve must be installed a minimum of 3-1/4 inches (83 mm) above a finished floor and a minimum of 2-3/4 inches (70 mm) from a finished wall.

1. Remove parts B and C (Figure 58, next page) from the subbase and join together using two metal screws provided. This assembly now becomes the right front cover (Part F) of the subbase. (Figure 58, next page)
2. Position subbase under the front of the wall sleeve.
3. Align the back edge of the flange on cover A (Figure 54, next page) to front of the wall sleeve flange. (Figure 60, next page)
4. Drill four 1/8 inch holes in wall sleeve to line up with holes in subbase. (Figure 58, Location D, next page) Mount subbase to wall sleeve with four sheet metal screws provided with kit. (Figure 58, Location D, next page)
5. Remove the left front cover from the subbase. (Figure 58, Part A, next page)
6. Position skirting on each side of wall sleeve to prevent the entry of foreign materials. Trim skirting to desired length. Attach skirting with four sheet metal screws provided with kit. (Figure 58, Location E, next page)
7. Wire subbase for appropriate voltage (Figure 61, next page).

Note:

The proper subbase must be ordered to obtain the correct electrical receptacle. (Figure 62)

8. After wiring is complete, mount covers A and F to the subbase with provided screws. (Figure 59)
9. When installing optional accessories to the subbase, refer to each installation instruction for that accessory.

Figure 58

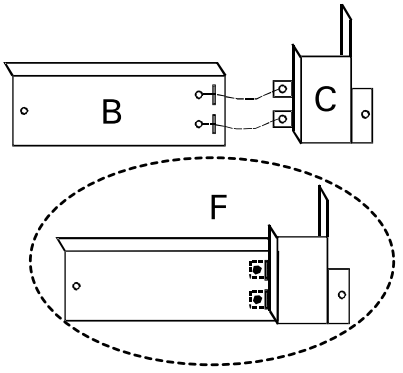


Figure 59 - Part/Location Identification

	Part/Location Identification
A	Left Front Cover
B	Right Front Cover
C	Front Cord Panel
D	Wall Sleeve Hole Location
E	Skirting Hole Location
F	Right Cover Assembly

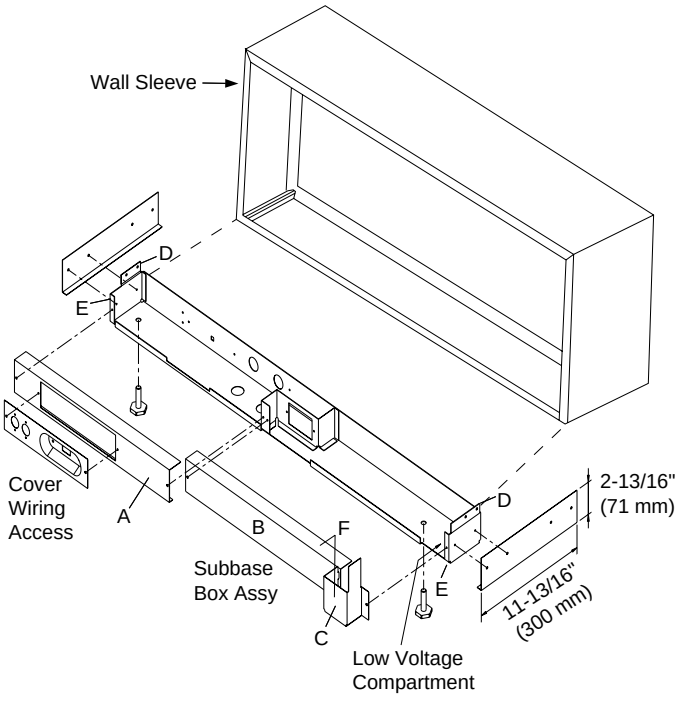


Figure 60 - Dimensions

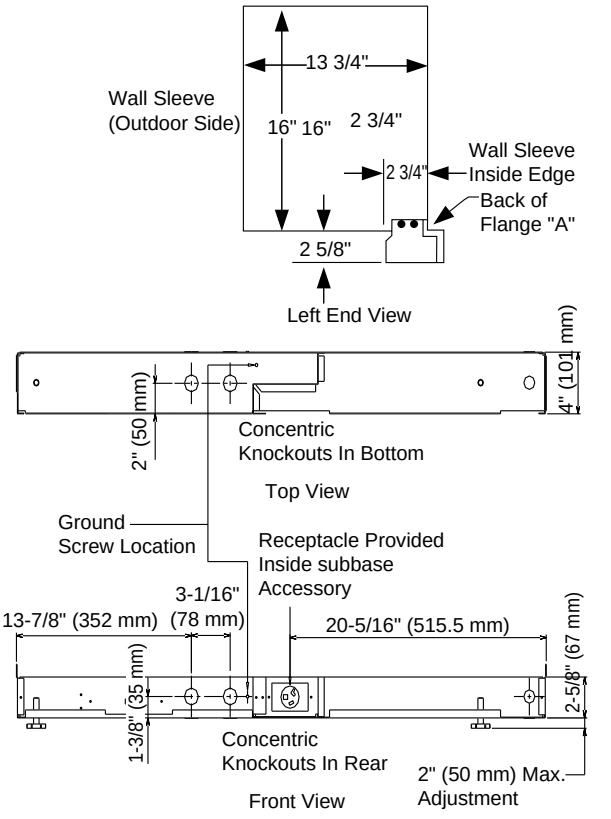


Figure 61 - Wiring Diagram

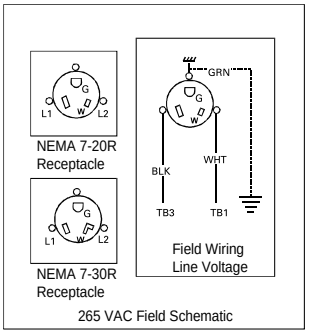


Figure 61 - NEMA Plug Configurations

Voltage	Unit Plug	Subbase Receptacle
265	NEMA7-20AMP	NEMA7-20AMP
265	NEMA7-20AMP	NEMA7-20AMP
265	NEMA7-30AMP	NEMA7-30AMP

5. PERFORMANCE DATA

Air conditioner and Heat Pump Performance Data

	LP070CED1	LP090CED1	LP120CED1	LP150CED1	LP070HED1	LP150HED1	LP090HED1	LP120HED1
Voltage (V)	1 / 265 / 60	1 / 265 / 60	1 / 265 / 60	1 / 265 / 60	1 / 265 / 60	1 / 265 / 60	1 / 265 / 60	1 / 265 / 60
Cooling Data								
Cooling Capacity (Btu/h)	7600	8900	11800	14000	7300	14400	9300	12000
Cooling Amps (A)	2.6	3.21	4.4	5.8	2.5/2.2	6.2/5.3	3.3	3.9
Cooling Power (W)	650	810	1105	1475	630/550	1565/1335	830	1155
EER (Btu/h.Watt)	11.7	11	10.7	9.5	11.6	9.2	11.2	10.4
Moisture Removal (Pts/h)	2	2.6	3.3	4.4	2	4.4	2.6	3.3
Heat Pump Heating Data								
Heating Capacity (Btu/h)	-	-	-	-	6200	13200	8000	10800
Heating Amps (A)	2.6	3.21	4.4	5.8	2.5/2.2	6.2/5.3	2.7	3.9
Heating Power (W)	650	810	1105	1475	630/550	1565/1335	690	990
COP (W/W)	-	-	-	-	3.3	2.9	3.4	3.2
Airflow								
Indoor CFM (Wet)@0.3ESP(Hi)	300	300	420	420	300	420	300	420
Indoor CFM (Wet)@0.3ESP(Lo)	255	255	355	355	255	355	255	355
Indoor CFM (Dry)@0.3ESP(Hi)	320	320	450	450	320	450	320	450
Indoor CFM (Dry)@0.3ESP(Lo)	275	275	385	385	275	385	275	385

Electric Heat Data

	LP070CED1	LP070HED1	LP090CED1	LP090HED1	LP120CED1	LP120HED1	LP150CED1	LP150HED1
Heater Size(kw)	2.0	2.0	3.7	3.7	3.7	3.7	3.7	3.7
Btu/Hr	6800	6800	11900	11900	11900	11900	11900	11900
Heating Watt	2040	2040	3740	3740	3740	3740	3740	3740
Heating Amps	7.6	7.6	14.0	14.0	14.0	14.0	14.0	14.0

Cooling Wattage-Air conditioners and Heat Pumps

Model		LP070CED1		LP090CED1		LP120CED1		LP150CED1		LP070HED1		LP090HED1		LP120HED1		LP150HED1	
Temperature																	
Outdoor Air	Return Air	Total Wattage Input		Total Wattage Input		Total Wattage Input		Total Wattage Input		Total Wattage Input		Total Wattage Input		Total Wattage Input		Total Wattage Input	
Dry Bulb	Wet Bulb	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Rating wattage		620	680	780	840	1065	1145	1435	1515	600	660	800	860	1115	1195	1525	1605
100	80	630	690	790	850	1075	1155	1445	1525	610	670	810	870	1125	1205	1535	1615
	70	630	690	790	850	1075	1155	1445	1525	610	665	810	870	1125	1205	1535	1615
	60	625	685	785	845	1070	1150	1440	1520	605	660	805	865	1120	1200	1530	1610
90	80	615	675	775	835	1060	1140	1430	1510	595	655	795	855	1110	1190	1520	1600
	70	615	675	775	835	1060	1140	1430	1510	595	655	795	855	1110	1190	1520	1600
	60	610	670	770	830	1055	1135	1425	1505	590	650	790	850	1105	1185	1515	1595
80	80	605	665	765	825	1050	1130	1420	1500	585	645	785	845	1100	1180	1510	1590
	70	605	665	765	825	1050	1130	1420	1500	585	645	785	845	1100	1180	1510	1590
	60	600	660	760	820	1045	1125	1415	1495	580	640	780	840	1095	1175	1505	1585

Cooling Change of Temperature-Air conditioners and Heat Pumps

Model																	
Room Air	Room Air	LP070CED1		LP090CED1		LP120CED1		LP150CED1		LP070HED1		LP090HED1		LP120HED1		LP150HED1	
Dry	Wet	Temperature Across		Temperature Across		Temperature Across		Temperature Across		Temperature Across		Temperature Across		Temperature Across		Temperature Across	
Bulb	Bulb	Indoor Coil (△T)		Indoor Coil (△T)		Indoor Coil (△T)		Indoor Coil (△T)		Indoor Coil (△T)		Indoor Coil (△T)		Indoor Coil (△T)		Indoor Coil (△T)	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Rating Btu/h		7450	7750	8750	9050	11650	11950	13850	14150	7150	7450	9150	9450	11850	12150	14250	14550
Rating CFM		185	225	230	260	300	330	315	355	185	225	230	260	300	330	315	355
90	85	1	3	2	6	1	5	1	4	1	3	2	6	1	5	1	4
	80	8	13	11	14	9	13	8	12	8	13	11	14	9	13	8	12
	75	19	22	19	22	18	22	16	20	19	22	19	22	18	22	16	20
	70	30	33	28	30	26	30	25	27	30	33	28	30	26	30	25	27
80	75	9	14	11	14	9	13	8	12	9	14	11	14	9	13	8	12
	70	18	21	18	20	15	20	15	18	18	21	18	20	15	20	15	18
	65	26	29	24	27	23	26	21	24	26	29	24	27	23	26	21	24
	60	35	36	32	33	29	33	29	30	35	36	32	33	29	33	29	30
70	65	12	15	12	14	9	13	9	13	12	15	12	14	9	13	9	13
	60	17	20	16	18	13	17	13	17	17	20	16	18	13	17	13	17
	55	22	24	20	22	18	21	17	21	22	24	20	22	18	21	17	21

Heating Change of Temperature - Heat Pumps

Model									
Room Air	Room Air	LP070HED1		LP090HED1		LP120HED1		LP150HED1	
Dry	Wet	Temperature Across		Temperature Across		Temperature Across		Temperature Across	
Bulb	Bulb	Indoor Coil (△T)		Indoor Coil (△T)		Indoor Coil (△T)		Indoor Coil (△T)	
		Min	Max	Min	Max	Min	Max	Min	Max
Rating Btu/h		6100	6300	7900	8100	10700	10900	13100	13300
Rating CFM		220	250	260	290	330	360	350	390
50	85	22	24	24	27	27	30	28	30
	75	24	25	26	29	29	32	30	31
	65	26	27	28	30	31	34	32	33
45	85	19	22	22	24	24	29	27	30
	75	21	24	24	26	26	30	29	31
	65	23	25	25	28	28	32	31	33
40	85	17	20	20	22	23	27	27	30
	75	19	22	22	24	24	29	29	31
	65	21	24	24	25	26	30	31	33

Cooling Ampere Chart - Air conditioners and Heat Pumps

Cond Inlet Air Temperature	Model		Model		Model		Model		Model		Model		Model		Model	
	LP070CED1		LP090CED1		LP120CED1		LP150CED1		LP070HED1		LP090HED1		LP120HED1		LP150HED1	
	Amperage		Amperage		Amperage		Amperage		Amperage		Amperage		Amperage		Amperage	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Rating ampere	2.4	2.4	3.2	3.2	4.2	4.2	5.7	5.7	2.4	2.4	3.2	3.2	4.2	4.2	5.7	5.7
100	2.4	2.6	2.9	3.1	3.9	4.3	5.6	6.2	2.5	2.7	3	3.2	4.1	4.5	5.5	6.1
95	2.3	2.5	2.7	3	3.7	4.1	5.3	5.9	2.4	2.6	2.8	3.1	3.9	4.3	5.2	5.8
90	2.2	2.4	2.6	2.9	3.6	3.9	5.1	5.6	2.2	2.5	2.7	3	3.7	4.1	5	5.5
85	2.1	2.3	2.5	2.7	3.4	3.8	4.8	5.3	2.1	2.3	2.6	2.9	3.5	3.9	4.7	5.2
80	2	2.2	2.3	2.6	3.2	3.6	4.6	5.1	2.1	2.2	2.5	2.7	3.3	3.7	4.5	4.9

Heating Wattage - Heat Pumps

Temperature

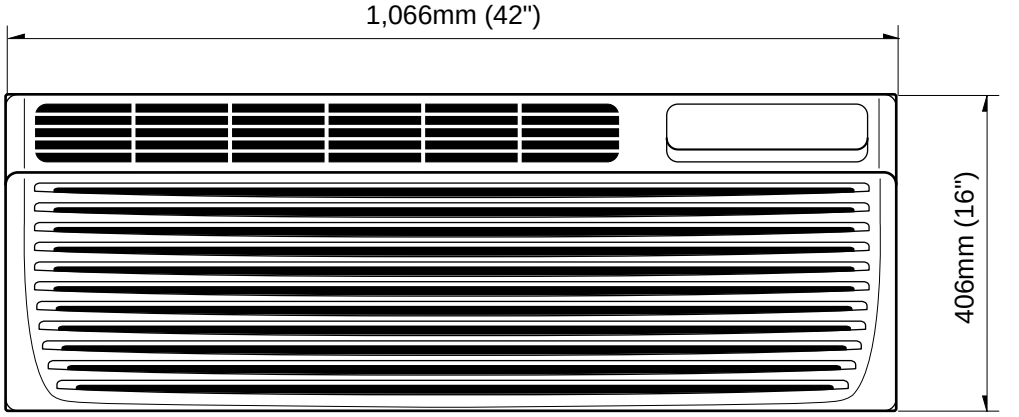
Outside Air Dry Bulb	Room Air Dry Bulb	LP070HED1 Total Wattage Input		LP090HED1 Total Wattage Input		LP120HED1 Total Wattage Input		LP150HED1 Total Wattage Input	
		Min	Max	Min	Max	Min	Max	Min	Max
Rating wattage		540	560	680	700	975	1005	1320	1350
50	585	600	640	755	800	1065	1155	1405	1550
	80	585	620	735	785	1045	1135	1385	1525
	75	570	610	720	770	1025	1115	1355	1500
	70	545	595	705	750	1005	1090	1335	1475
	65	530	580	685	730	980	1065	1310	1450
45	85	585	620	720	770	1035	1120	1360	1490
	80	570	610	705	750	1010	1100	1335	1470
	75	550	590	695	730	990	1090	1310	1445
	70	535	575	675	710	965	1060	1280	1420
	65	520	560	655	690	945	1040	1265	1395
40	85	565	600	690	735	985	1080	1305	1435
	80	550	590	670	720	975	1060	1280	1415
	75	535	575	650	700	955	1040	1255	1385
	70	520	555	640	685	930	1020	1230	1365
	65	500	540	620	660	910	995	1210	1335
35	85	565	585	660	705	970	1050	1250	1385
	80	550	570	640	690	945	1025	1230	1355
	75	540	555	620	675	925	1005	1200	1325
	70	520	540	610	660	900	980	1180	1295
	65	505	520	590	640	885	960	1150	1260

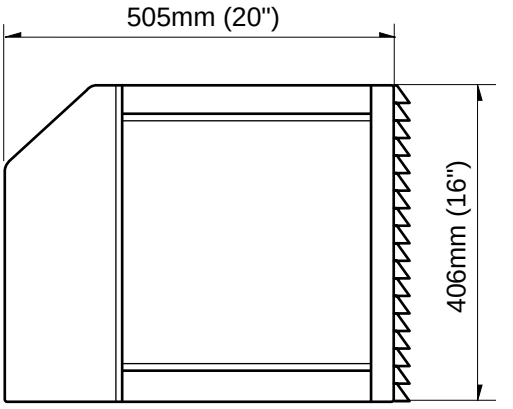
Heat Pump Reverse Cycle Heating Capacity

Model		LP070HED1	LP090HED1	LP120HED1	LP150HED1
Voltage		265	265	265	265
Amps		2.2	2.7	3.9	5.3
Watts		550	690	990	1335
Btu/h		6200	8000	10800	13200
COP		3.3	3.4	3.2	2.9
CFM(Dry)		300	300	420	420
Heating Btu/h					
Outdoor Ambient	62	7200	9700	13100	15700
	57	6900	9200	12400	14900
	52	6500	8600	11600	14100
Rating Point	47	6200	8000	10800	13200
	42	5900	7500	10100	12400
	37	5600	7000	9300	11600
	32	5300	6500	8500	10800
	27	5000	6000	7800	10000
	24	4800	5700	7400	9500
Watts					
Outdoor Ambient	62	580	745	1085	1425
	57	575	735	1055	1405
	52	555	715	1025	1370
Rating Point	47	550	690	990	1335
	42	540	670	955	1300
	37	525	650	925	1265
	32	515	635	875	1220
	27	510	605	835	1180
	24	505	590	810	1170

6. TROUBLESHOOTING GUIDE

6.1 OUTSIDE DIMENSIONS





6.2 PIPING SYSTEM

Following is a brief description of the important components and their functions in the refrigeration system. Refer to Figure 63 to follow the refrigeration cycle and the flow of the refrigerant in the cooling cycle.

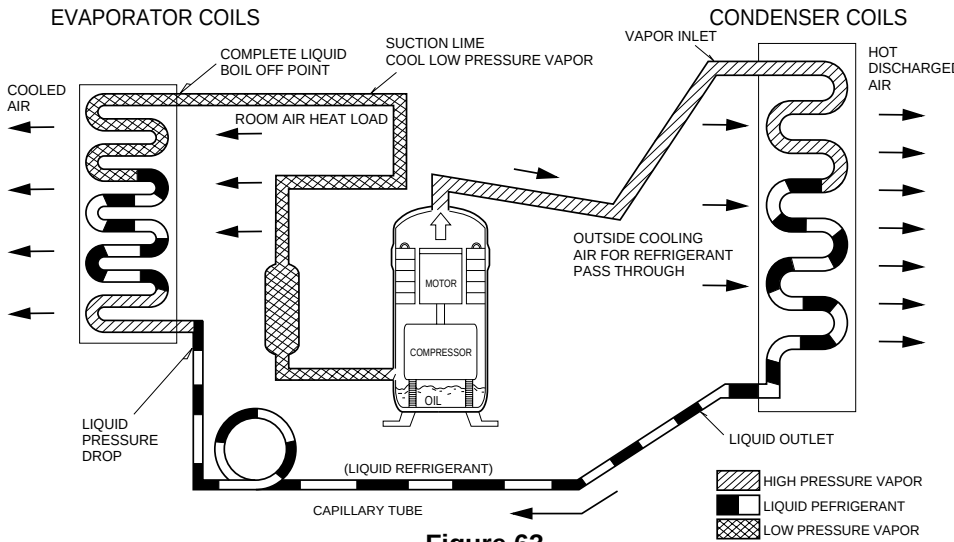
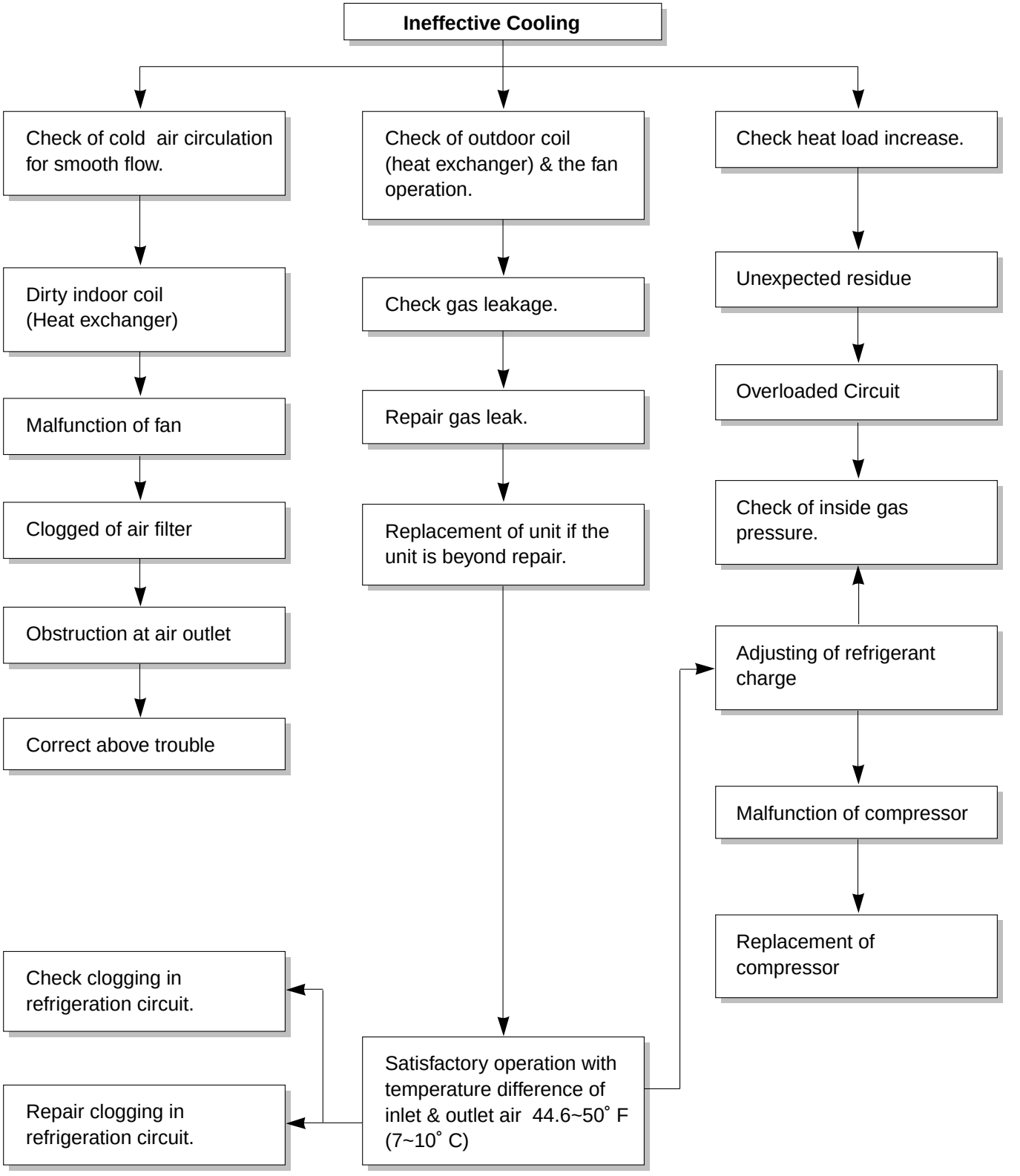


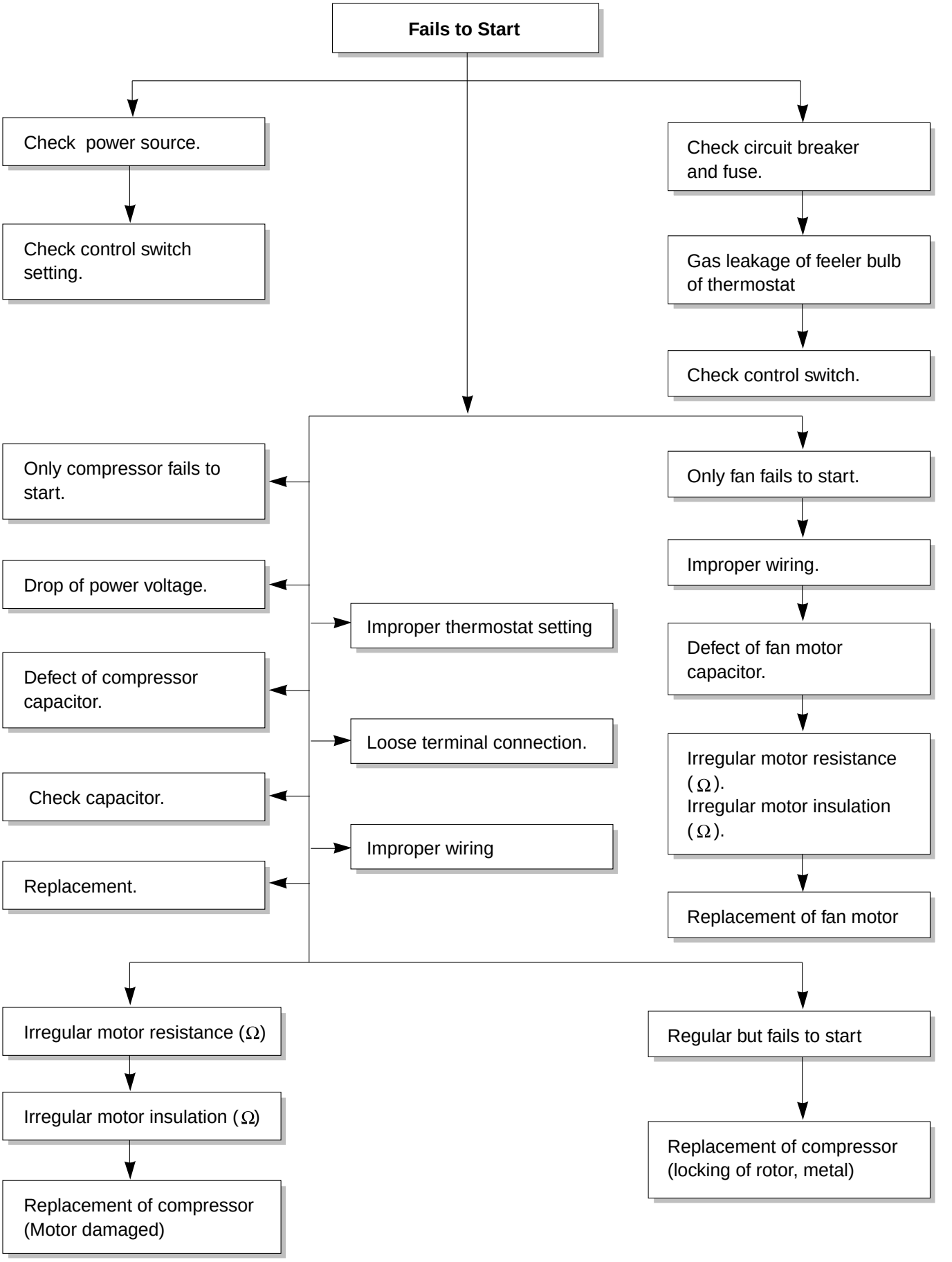
Figure 63

6.3 TROUBLESHOOTING GUIDE

In general, possible trouble is classified in two causes.
The one is Starting Failure which is caused from an electrical defect, and the other is Ineffective Air Conditioning caused by a defect in the refrigeration circuit and improper application.

Unit is running but cooling is ineffective




Fails to Start
Check power source.
Check control switch setting.
Check circuit breaker and fuse.
Gas leakage of feeler bulb of thermostat
Check control switch.
Only compressor fails to start.
Drop of power voltage.
Defect of compressor capacitor.
Check capacitor.
Replacement.
Improper thermostat setting
Loose terminal connection.
Improper wiring
Only fan fails to start.
Improper wiring.
Defect of fan motor capacitor.
Irregular motor resistance (Ω).
Irregular motor insulation (Ω).
Replacement of fan motor
Irregular motor resistance (Ω)
Irregular motor insulation (Ω)
Replacement of compressor (Motor damaged)
Regular but fails to start
Replacement of compressor (locking of rotor, metal)

COMPLAINT	CAUSE	REMEDY
Fan motor will not run.	No power	Check voltage at outlet. Correct if none.
	Power supply cord	Check voltage to rotary switch. If none, check power supply cord. Replace cord if circuit is open.
	Rotary switch	Check switch continuity. Refer to wiring diagram for terminal identification. Replace switch if defective.
	Wire disconnected or connection loose	Connect wire. Refer to wiring diagram for terminal identification. Repair or replace loose terminal.
	Capacitor (Discharge capacitor before testing.)	Test capacitor. Replace if not within ±10% of manufacturer's rating. Replace if shorted, open, or damaged.
	Will not rotate	Fan blade hitting shroud or cross flow fan hitting scroll. Realign assembly. Units using slinger ring condenser fans must have 1/4 to 5/16 inch clearance to the base. If it is hitting the base, shim up the bottom of the fan motor with mounting screw(s). Check fan motor bearings; if motor shaft will not rotate, replace the motor.
Fan motor runs intermittently	Revolves on overload.	Check voltage. See limits on this page. If not within limits, call an electrician. Test capacitor. Check bearings. Does the fan blade rotate freely? If not, replace fan motor. Pay attention to any change from high speed to low speed. If the speed does not change, replace the motor.
Fan motor noise.	Grommets	Check grommets; if worn or missing, replace them.
	Fan	If cracked, out of balance, or partially missing, replace it.
	Turbo fan	If cracked, out of balance, or partially missing, replace it.
	Loose set screw	Tighten it.
	Worn bearings	If knocking sounds continue when running or loose, replace the motor. If the motor hums or noise appears to be internal while running, replace motor.

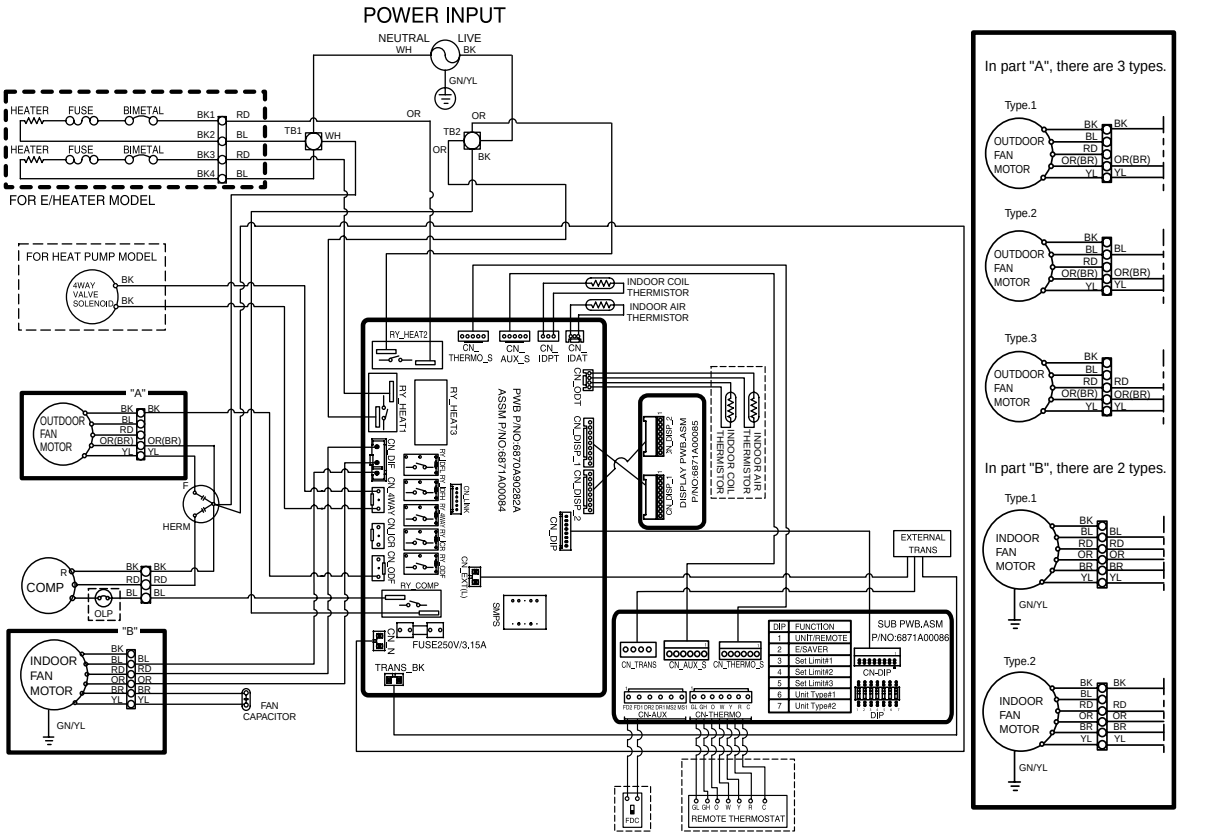
COMPLAINT	CAUSE	REMEDY
Compressor will not run, but fan motor runs.	Voltage	Check voltage. See the limits on the preceding. page. If not within limits, call an electrician.
	Wiring	Check the wire connections, if loose, repair or replace the terminal. If wires are off, refer to wiring diagram for identification, and replace. Check wire locations. If not per wiring diagram, correct.
	Rotary	Check for continuity, refer to the wiring diagram for terminal identification. Replace the switch if circuit is open.
	Thermostat	Check the position of knob If not at the coldest setting, advance the knob to this setting and restart unit. Check continuity of the thermostat. Replace thermostat if circuit is open.
	Capacitor (Discharge capacitor before servicing.)	Check the capacitor. Replace if not within ±10% of manufacturers rating. Replace if shorted, open, or damaged.
	Compressor	Check the compressor for open circuit or ground. If open or grounded, replace the compressor.
	Overload	Check the compressor overload, if externally mounted. Replace if open. (If the compressor temperature is high, remove the overload, cool it, and retest.)

ROOM AIR CONDITIONER VOLTAGE LIMITS

NAME PLATE RATING	MINIMUM	MAXIMUM
265V	239V	292V

COMPLAINT	CAUSE	REMEDY
Compressor cycles on overload.	Voltage	Check the voltage. See the limits on the preceding page. If not within limits, call an electrician.
	Overload	Check overload, if externally mounted. Replace if open. (If the compressor temperature is high, remove the overload, cool, and retest.)
	Fan motor	If not running, determine the cause. Replace if required.
	Condenser air flow restriction	Remove the cabinet. inspect the interior surface of the condenser; if restricted, clean carefully with a vacuum cleaner (do not damage fins) or brush. Clean the interior base before reassembling.
	Condenser fins (damaged)	If condenser fins are closed over a large area on the coil surface, head pressures will increase, causing the compressor to cycle. Straighten the fins or replace the coil.
	Capacitor	Test capacitor.
	Wiring	Check the terminals. If loose, repair or replace.
	Refrigerating system	Check the system for restriction.
Insufficient cooling or heating	Air filter	If restricted, clean of replace.
	Exhaust damper door	Close if open.
	Unit undersized	Determine if the unit is properly sized for the area to be cooled.
Excessive noise.	Cross flow fan	Check the set screw or clamp. If loose or missing, correct. If the blower or fan is hitting air guide, rearrange the air handling parts.
	Copper tubing	Carefully rearrange tubing not to contact, compressor, shroud, and barrier.

7. SCHEMATIC DIAGRAM



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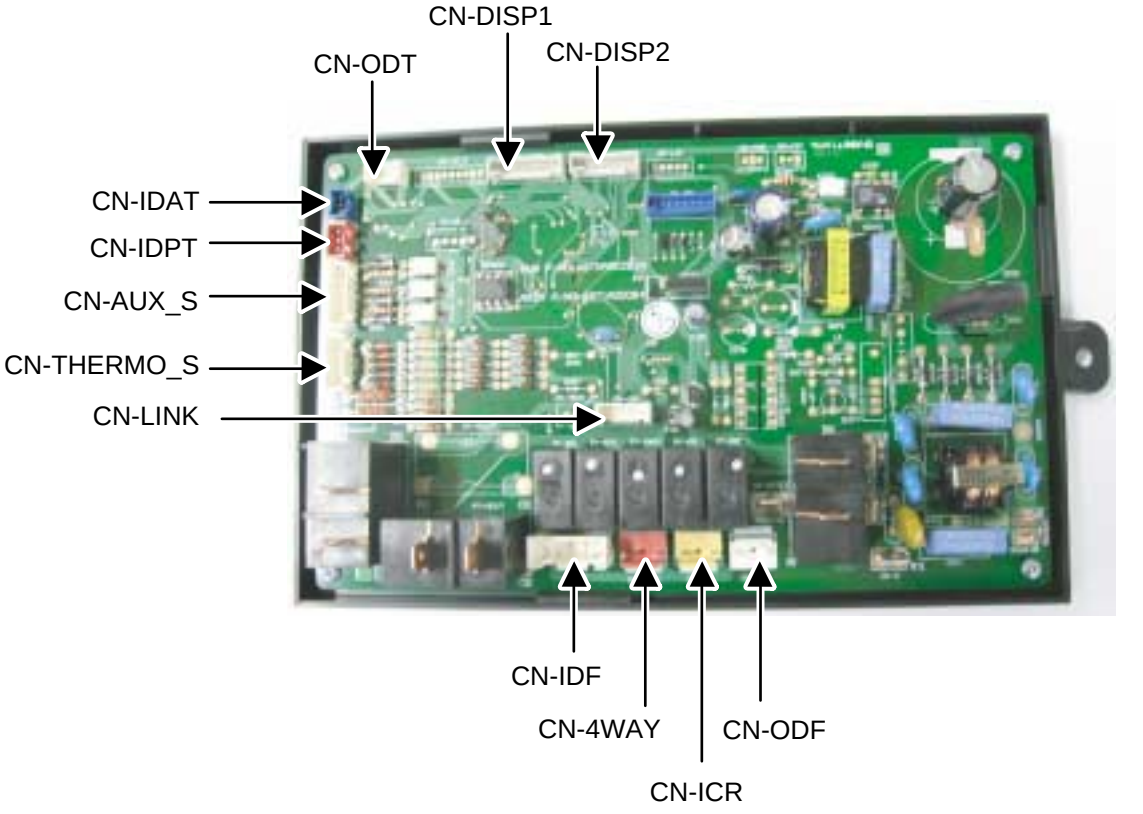
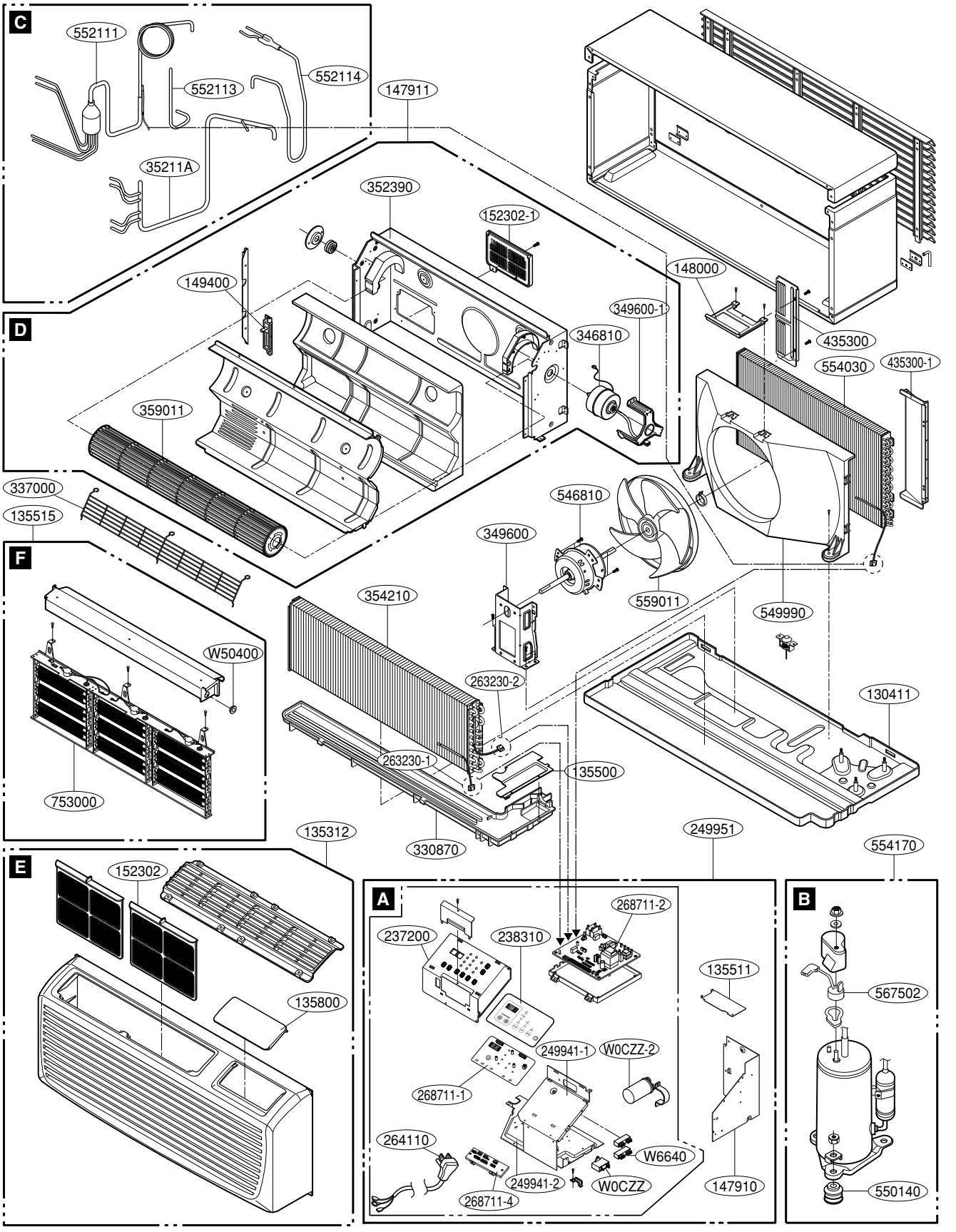
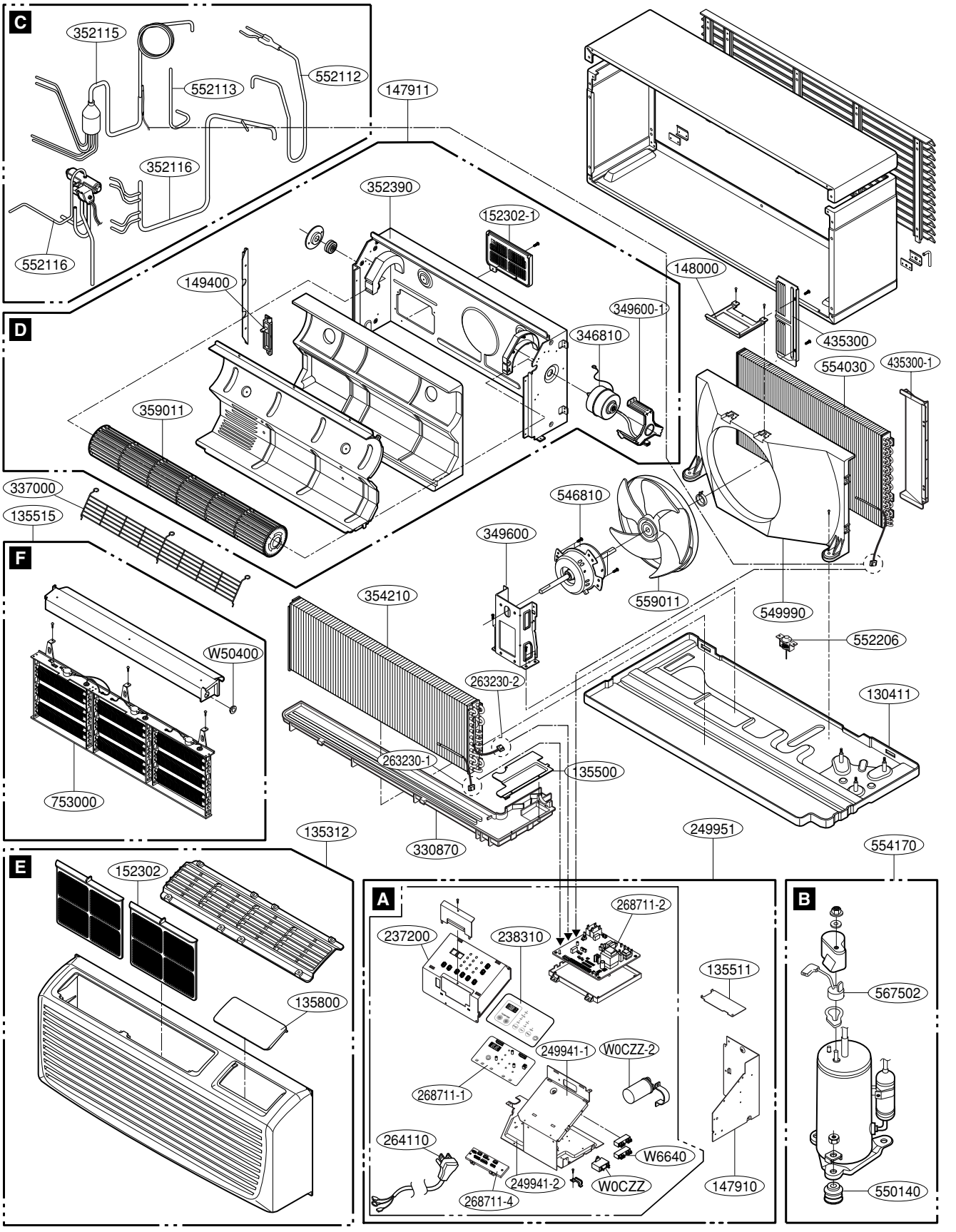


8.1 EXPLODED VIEW(ELECTRICAL COOLING)



8.2 EXPLODED VIEW(ELECTRICAL HEATING)



LG Electronics Inc.

P/No.: 3828A20308K

February, 2007
Printed in Korea