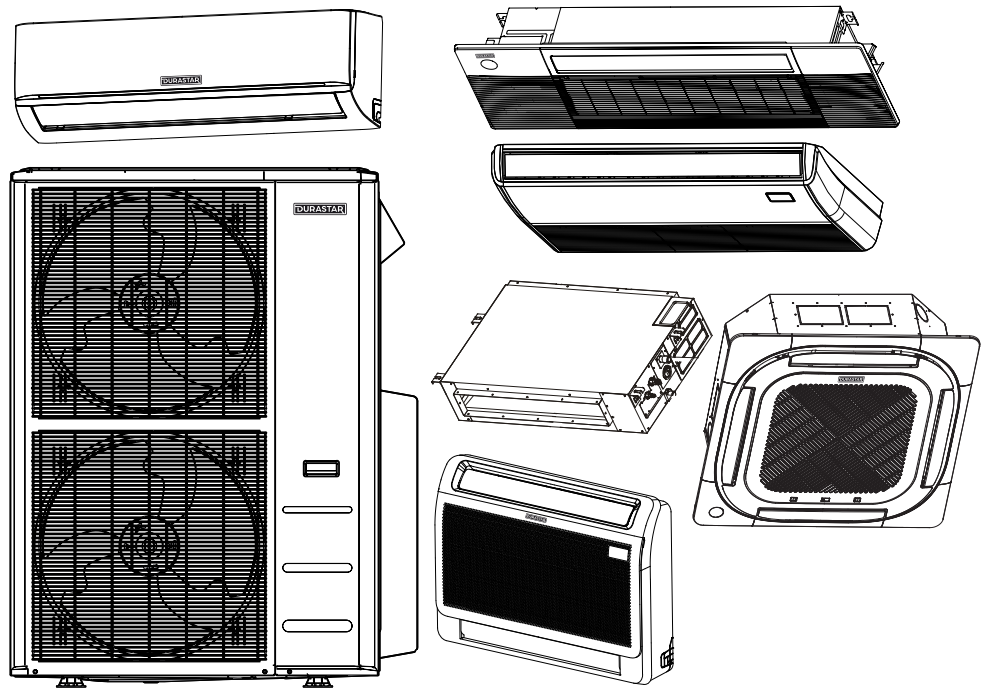
DURASTAR

INSTALLATION MANUAL

MULTI-ZONE HEAT PUMP OUTDOOR UNIT

DRA3U18M2A, DRA3H18M2A, DRA4U28M2A, DRA4H28M2A, DRA5U36M2A, DRA5H36M2A, DRA6U48M2A DRA6H48M2A, DRA6U60M2A, DRA6H55M2A

R-454B 208/230V 1ph 60 HZ



Model Number:

Serial Number:

Purchase Date:

Installing Contractor Company Name:

TIP

Capture relevant information about your Durastar mini-split equipment before it is installed and write it above for future reference.

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INTRODUCTION

To better serve you, please do the following before contacting customer service:

- If you received a damaged product, immediately contact the retailer or dealer that sold you the product.
- Read and follow this manual carefully to install this air conditioner.
- Read the troubleshooting section of this manual as it will help you diagnose and solve common issues.
- Visit us on the web at **WWW.DURASTAR.COM** to download product guides and up-to-date information.
- If you need warranty service, our friendly customer service representatives are available via email at **QUESTIONS@DURASTAR.COM** or by telephone at **1-888-320-0706**.

SYMBOLS USED IN THIS MANUAL

WARNING: The warning symbol indicates personal injury or loss of life is possible. Extra care and precautions should be taken to ensure the user's safety.

CAUTION: The caution symbol indicates property damage or other serious consequences could occur.

NOTE: The pencil indicates any manufacturer notes relating to surrounding content. These may include further clarifications or call-outs.

TIP: A light bulb symbol indicates suggested manufacturer tips for the user to get the most out of the Durastar equipment and to accommodate the best user experience.

Refrigerant Safety Group A2L

WARNING:
RISK OF FIRE DUE TO FLAMMABLE MATERIALS
Follow handling instructions carefully in compliance with national regulations.

Explanation of symbols displayed on the unit

	**CAUTION**	This symbol shows that the operation manual should be read carefully.
	**CAUTION**	This symbol shows that a service personnel should be handling this equipment with reference to the installation manual.
	**CAUTION**	This symbol shows that information is available such as the operating manual or installation manual.

WARNING
Turn off the air conditioner and disconnect the power before installing, cleaning, or repairing the air conditioner. Failure to do so can cause electric shock.

IMPORTANT SAFETY PRECAUTIONS

Improper handling can cause serious damage or injury. Please read the following safety information in its entirety.

Operation, Cleaning, and Maintenance Safety Precautions

- Children and people with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, should only use, clean, or maintain this air conditioner if they are given supervision or instructions concerning use of the air conditioner in a safe way and understand the hazards involved. Children should not play with the air conditioner.
- Maintenance or repair must be performed by qualified professionals. Otherwise, you may experience personal injury or damage to the air conditioner and surrounding property.
- Disconnect the power supply by turning it off at the circuit breaker when cleaning, maintaining, or repairing the air conditioner. Otherwise, you could risk electric shock.
- When turning the unit on or off via the emergency operation switch, press the switch with an insulated object other than metal.
- If the below problems occur, please turn off the air conditioner and disconnect power at the circuit breaker immediately. Then contact your dealer or a qualified professional for service.
  - The power cord is overheating or damaged.
  - There is an abnormal sound during operation.
  - The circuit breaker trips frequently.
  - The air conditioner gives off a burning smell.
  - The indoor unit is leaking.
- Do not block the air outlet or air inlet. This could cause a malfunction.
- Never stick fingers or any other body parts into the air conditioner openings. The internal fan may be rotating at high speeds, and may result in injury.
- Do not spill water on the remote control as this can permanently damage the remote.
- Do not spray water on the indoor unit. This could cause electric shock or a unit malfunction.
- Do not clean the air conditioner with excessive amounts of water.
- Do not clean the air conditioner with combustible cleaning agents; they can cause fire or deformation.
- After removing the filter, do not touch the fins in order to avoid injury.
- Do not use fire or a hair dryer to dry the filter. This could cause a deformation or fire hazard.
- Do not step on the top panel of the unit, or put heavy objects on the top panel. This could cause damage or personal injury.
- Do not use flammable materials such as hair spray, lacquer, or paint near the air conditioner as they may catch fire.
- Do not operate the air conditioner in places near combustible gases. Emitted gases may collect around the air conditioner and cause an explosion.
- Do not operate your air conditioner in a wet room such as a bathroom or laundry room. Too much exposure to water can cause electrical components to short circuit.
- If the air conditioner is used together with burners or other heating devices, thoroughly ventilate the room to avoid oxygen deficiency.

Electrical Safety

- Do not modify the length of the power supply cord or use an extension cord to power the unit.
- If the supply cord is damaged, it must be replaced by the manufacturer, a service agent, or a similarly qualified person in order to avoid a safety hazard.
- Keep power plug clean. Remove any dust or grime that accumulates on or around the plug. Dirty plugs can cause fire or electric shock.
- Do not pull power cord to unplug unit. Hold the plug firmly and pull it from the outlet. Pulling directly on the cord can damage it, which can lead to fire or electric shock.
- Do not share the electrical outlet with other appliances. Improper or insufficient power supply can cause fire or electrical shock.
- The product must be properly grounded at the time of installation, or electrical shock may occur.
- For all electrical work, follow all local and national wiring standards and regulations. Connect cables tightly, and clamp them securely to prevent external forces from damaging the terminal. Improper electrical connections can overheat and cause fire, and may also cause shock. All electrical connections must be made according to the Electrical Connection Diagram located on the panels of the indoor and outdoor units.
- All wiring must be properly arranged to ensure that the control board cover can close properly. If the control board cover is not closed properly, it can lead to corrosion and cause the connection points on the terminal to heat up, catch fire, or cause electrical shock.
- If connecting power to fixed wiring, an all-pole disconnection device which has at least 3mm clearances in all poles, and have a leakage current that may exceed 10mA, the residual current device(RCD) having a rated residual operating current not exceeding 30mA, and disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.
- The air conditioner's circuit board (PCB) is designed with a fuse to provide over-current protection. The specifications of the fuse are printed on the circuit board.

Installation Safety

- Installation must be performed by an authorized dealer or specialist. Improper installation can cause water leakage, electrical shock, or fire. (In North America, installation must be performed in accordance with NEC and CEC requirements by authorized personnel only.)
- Installation must be performed according to the installation instructions. Improper installation can cause water leakage, electrical shock, or fire.
- This air conditioner shall be installed in accordance with national and local wiring regulations.
- Contact an authorized service technician for repair or maintenance of this unit.
- Only use the included accessories, parts, and specified parts for installation. Using non-standard parts can cause water leakage, electrical shock, fire, and can cause the unit to fail.
- Install the unit in a firm location that can support the unit's weight. If the chosen location cannot support the unit's weight, or the installation is not done properly, the unit may fall and cause serious injury and damage.
- Install drainage piping according to the instructions in the installation manual. Improper drainage may cause water damage to your home and property.
- For units that have an auxiliary electric heater, do not install the unit within 3 feet (1 meter) of any combustible materials.
- Do not install the unit in a location that may be exposed to combustible gas leaks. If combustible gas accumulates around the unit, it may cause a fire.

- Do not turn on the power until all work has been completed.
- When moving or relocating the air conditioner, consult experienced service technicians for disconnection and re-installation of the unit.
- Be careful when opening or closing valves below freezing temperatures. Refrigerant may spurt out from the gap between the valve stem and the valve body, resulting in injuries.

WARNING: REFRIGERANT SAFETY (A2L)

- Do not use means to accelerate the defrosting process or to clean the unit, other than those recommended by the manufacturer.
- The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).
- Do not pierce or burn.
- Be aware that flammable refrigerants may not contain an odor.
- Compliance with national refrigerant regulations shall be observed.

A2L REFRIGERANT SAFETY PRECAUTIONS

1. Installation (Where Refrigerant Pipes Are Allowed)

- Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorizes their competence to handle refrigerants safely in accordance with an industry recognized assessment specification.
- Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.
- That the installation of pipe-work shall be kept to a minimum.
- That pipe-work shall be protected from physical damage.
- Where refrigerant pipes shall be compliance with national gas regulations.
- That mechanical connections shall be accessible for maintenance purposes.
- Be more careful that foreign matter(oil, water,etc) does not enter the piping. Also, when storing the piping, securely seal the opening by pinching, taping, etc.
- All working procedure that affects safety means shall only be carried by competent persons.
- Appliance shall be stored in a well ventilated area where the room size corresponds to the room area as specific for operation.
- Joints shall be tested with detection equipment with a capability of 0.18 oz (5 g) per year of refrigerant or better, with the equipment in standstill and under operation or under a pressure of at least these standstill or operation conditions after installation. Detachable joints shall NOT be used in the indoor side of the unit (brazed, welded joint could be used).
- In cases that require mechanical ventilation, ventilation openings shall be kept clear of obstruction.

LEAK DETECTION SYSTEM installed. Unit must be powered except for service. For the unit with refrigerant sensor, when the refrigerant sensor detects refrigerant leakage, the indoor unit will display a error code and emit a buzzing sound, the compressor of outdoor unit will immediately stop, and the indoor fan will start running. The service life of the refrigerant sensor is 15 years. When the refrigerant sensor malfunctions, the indoor unit will display the error code "FHCC". The refrigerant sensor can not be repaired and can only be replaced by the manufacturer. It shall only be replaced with the sensor specified by the manufacturer.

2. Because a FLAMMABLE REFRIGERANT is used, the requirements for installation space of appliance and/or ventilation requirements are determined according to:

- the mass charge amount(M) used in the appliance,
- the installation location,
- the type of ventilation of the location or of the appliance.
- piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and be in compliance with national and local codes and standards, such as ASHRAE 15, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA B52. All field joints shall be accessible for inspection prior to being covered or enclosed.
- that protection devices, piping, and fittings shall be protected as far as possible against adverse environmental effects, for example, the danger of water collecting and freezing in relief pipes or the accumulation of dirt and debris;
- that piping in refrigeration systems shall be so designed and installed to minimize the likelihood of hydraulic shock damaging the system;
- that steel pipes and components shall be protected against corrosion with a rustproof coating before applying any insulation;
- that precautions shall be taken to avoid excessive vibration or pulsation;
- the minimum floor area of the room shall be mentioned in the form of a table or a single figure without reference to a formula;
- After completion of field piping for split systems, the field pipework shall be pressure tested with OXYGEN-FREE NITROGEN (OFN) and then vacuum tested prior to refrigerant charging, according to the following requirements:
  1. Pressure test the refrigerant piping to 500 PSI.
  2. The test pressure after removal of pressure source shall be maintained for at least 1 hour with no decrease of pressure indicated by the test gauge, with test gauge resolution not exceeding 5% of the test pressure.
  3. During the evacuation test, after achieving a vacuum level specified in the manual or less, the refrigeration system shall be isolated from the vacuum pump and the pressure shall not rise above 1500 microns within 10 min. The vacuum pressure level shall be specified in the manual, and shall be the lessor of 500 microns or the value required for compliance with national and local codes and standards, which may vary between residential, commercial,and industrial buildings.
- Field-made refrigerant joints indoors shall be tightness tested according to the following requirements: The test method shall have a sensitivity of 0.18 oz (5 g) per year of refrigerant or better under a pressure of at least 125% of the maximum allowable pressure. No leak shall be detected.

3 . Qualifications Of Workers

Any maintenance, service and repair operations must be performed by qualified personnel. Any working procedure that impacts safety must be performed only by qualified individuals who have completed the necessary training and obtained certification to demonstrate their competence. The training of these procedures is carried out by national training organizations or manufacturers that are accredited to teach the relevant national competency standards that may be set in legislation. All training shall follow the ANNEX HH requirements of UL 60335-2-40 4th Edition.

Examples for such working procedures are:

- breaking into the refrigerating circuit;
- opening of sealed components;
- opening of ventilated enclosures.

4. Ventilated Area

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any work that could produce ignition. Keep ventilation openings clear of obstruction. Ventilation continue during the period that the work is carried out. Proper ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

5. Cabling

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

6. Detection Of Flammable Refrigerants

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

The following leak detection methods are deemed acceptable for refrigerant systems:

- Electronic leak detectors may be used to detect refrigerant leaks but, in the case of FLAMMABLE REFRIGERANTS, the sensitivity may not be adequate, or may need re–calibration to a sensitivity of 0.18 oz (5 g) per year. (Detection equipment shall be calibrated in a refrigerant free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed.
- Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe–work.

Note
Examples of leak detection fluids are bubble method and fluorescent method agents.

If a leak is suspected, all naked flames shall be removed/extinguished.

If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut o valves) in a part of the system remote from the leak. See the following instructions for removal of refrigerant.

7. Evacuation

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

The following procedure shall be adhered to:

- safely remove refrigerant following local and national regulations; evacuate;
- purge the circuit with NITROGEN
- evacuate (requirement);
- continuously flush or purge with NITROGEN when using flame to open circuit; and
- open the circuit

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with OXYGEN-FREE NITROGEN (OFN) to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen **shall not be used** for purging refrigerant systems.

For appliances containing flammable refrigerants, refrigerant purging shall be achieved by breaking the vacuum in the system with OXYGEN-FREE NITROGEN (OFN) and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum (requirement). This process shall be repeated until no refrigerant is within the system (requirement). When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.

The outlet for the vacuum pump shall not be close to any potential ignition sources, and ventilation shall be available.

8. Recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated.

9. Charging Procedures

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

- Works shall be undertaken with appropriate tools only (In case of uncertainty, please consult the manufacturer of the tools for use with flammable refrigerants).
- Ensure that contamination of different refrigerants does not occur when using charging equipment.
- Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders shall be kept upright.
- Ensure that the refrigeration system is grounded prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the refrigeration system.
- Prior to recharging the system it shall be pressure tested with OXYGEN FREE NITROGEN
- (OFN). The system shall be leak tested on completion of charging but prior to commissioning.
- A follow up leak test shall be carried out prior to leaving the site.

Additional Precautions

- Turn off the air conditioner and disconnect the power if you are not going to use it for a long time.
- Turn off the unit during electrical storms to avoid damaging the unit.
- Make sure that water condensation can drain unhindered from the unit.
- Do not operate the air conditioner with wet hands. This may cause electric shock.
- Do not use this device for any other purpose than its intended use.
- Do not climb onto or place objects on top of the outdoor unit.
- Do not allow the air conditioner to operate for long periods of time with doors or windows open, or if the humidity is very high.

R454B REQUIRED ROOM HEIGHT AND MINIMUM ROOM AREA

Required Room Height

R454B UL guidelines require the **room height be ≥ 7.2ft / 2.2m.**

Minimum Room Area

R454B UL guidelines require dissipation if there is a refrigerant leak and are based on total square footage and total system charge. The total system charge includes any component that holds refrigerant, including line sets, indoor coils, and outdoor units. The minimum room area for operating and storing the unit should be as specified in the following table.

A_{min}: REQUIRED MINIMUM ROOM AREA: ft² (m²)

m_C or m_{REL} Refrigerant Charge lbs (kg)	h_{inst}: Height from the Floor to the Bottom of the Indoor Unit: ft (m)					
	≤ 7.2 (2.2)	**7.5 (2.3)**	**7.9 (2.4)**	**8.5 (2.6)**	**9.2 (2.8)**	**9.8 (3.0)**
≤ 3.91 (1.776)	12 (1.10)					
4.0 (1.8)	60 (5.53)	57 (5.29)	55 (5.07)	51 (4.68)	47 (4.35)	44 (4.06)
4.4 (2.0)	67 (6.15)	64 (5.88)	61 (5.64)	56 (5.20)	52 (4.83)	49 (4.51)
4.9 (2.2)	73 (6.76)	70 (6.47)	67 (6.20)	62 (5.72)	58 (5.31)	54 (4.96)
5.3 (2.4)	80 (7.38)	76 (7.06)	73 (6.76)	68 (6.24)	63 (5.80)	59 (5.41)
5.7 (2.6)	86 (7.99)	83 (7.64)	79 (7.32)	73 (6.76)	68 (6.28)	64 (5.86)
6.2 (2.8)	93 (8.60)	89 (8.23)	85 (7.89)	79 (7.28)	73 (6.76)	68 (6.31)
6.6 (3.0)	100 (9.22)	95 (8.82)	91 (8.45)	84 (7.80)	78 (7.24)	73 (6.76)
7.1 (3.2)	106 (9.83)	102 (9.41)	97 (9.01)	90 (8.32)	84 (7.73)	78 (7.21)
7.5 (3.4)	113 (10.45)	108 (9.99)	104 (9.58)	96 (8.84)	89 (8.21)	83 (7.66)
7.9 (3.6)	120 (11.06)	114 (10.58)	110 (10.14)	101 (9.36)	94 (8.69)	88 (8.11)
8.4 (3.8)	126 (11.68)	121 (11.17)	116 (10.70)	107 (9.88)	99 (9.17)	93 (8.56)
8.8 (4.0)	133 (12.29)	127 (11.76)	122 (11.27)	112 (10.40)	104 (9.66)	97 (9.01)
9.3 (4.2)	139 (12.90)	133 (12.34)	128 (11.83)	118 (10.92)	110 (10.14)	102 (9.46)
9.7 (4.4)	146 (13.52)	140 (12.93)	134 (12.39)	124 (11.44)	115 (10.62)	107 (9.91)
10.1 (4.6)	153 (14.13)	146 (13.52)	140 (12.96)	129 (11.96)	120 (11.11)	112 (10.37)
10.6 (4.8)	159 (14.75)	152 (14.11)	146 (13.52)	135 (12.48)	125 (11.59)	117 (10.82)
11.0 (5.0)	166 (15.36)	159 (14.69)	152 (14.08)	140 (13.00)	130 (12.07)	122 (11.27)
Variable Definitions	A_{min}: the required minimum room area in ft² (m²) m_c: the actual refrigerant charge in the system in lbs (kg) m_{REL}: the refrigerant releasable charge in lbs (kg) h_{inst} : the height of the bottom of the appliance relative to the floor of the room after installation ft (m) **WARNING:** The minimum room area or the minimum room area of conditioned space is based on releasable charge and total system refrigerant charge.					

RELEASABLE CHARGE m_{REL}

The releasable charge (m_{REL}) of system should be calculated based on internal volume of all indoor units and connecting line sets. Each indoor units correspond to a releasable charge as listed in the following table. Add PART 1, PART 2, AND PART 3 below get the total releasable charge of system.

MODEL	PART 1 Indoor Unit Releasable Charge lbs (kg)	PART 2 Standard Releasable Charge	PART 3 Extra Line Set Length Releasable Charge	TOTAL RELEASABLE CHARGE
DRAC0912F2A	1.09 (0.49)	0.45 lbs (0.204 kg) (Leakage at a rate of 6.8 g/s for 30 s)	0 lbs (0 kg) when the line set length for the indoor unit is lees than or equal to 25 ft (7.5 m). or 0.01 lbs per foot (0.02 kg per meter) when the line set exceeds 25 ft (7.5 m) for 6–18K units. or 0.03 lbs per foot (0.05 kg per meter) when the line set exceeds 25 ft (7.5 m) for 24–33K units.	To get the total releasable charge of the system. **Add PART 1, PART 2, AND PART 3** based on your combination of indoor units and the line set length.
DRAC18F2A	1.13 (0.51)			
DRAC24F2A	1.85 (0.84)			
DRADH0912F2A	0.72 (0.33)			
DRADH18F2A	0.99 (0.45)			
DRADH24F2A	1.51 (0.68)			
DRADL0612F2A	0.77 (0.35)			
DRADL18F2A	1.08 (0.49)			
DRAF18F2A	1.00 (0.46)			
DRAF24F2A	1.84 (0.84)			
DRAL0612F2A	1.04 (0.47)			
DRAL18F2A	1.08 (0.49)			
DRAM18F2A	1.51 (0.69)			
DRAM24F2A	2.03 (0.92)			
DRAS09F2A	0.89 (0.40)			
DRAS12F2A	0.89 (0.40)			
DRAS16F2A	0.93 (0.42)			
DRAW06F2A	0.74 (0.34)			
DRAW09F2A	0.84 (0.38)			
DRAW12F2A	0.84 (0.38)			
DRAW18F2A	1.12 (0.51)			
DRAW24F2A	1.12 (0.51)			
DRAW33F2A	1.85 (0.84)			

SAFETY SHUT–OFF VALVES

In accordance with regulations, some multi–zone outdoor units are equipped with safety shut–off valves that limit the releasable refrigerant charge when activated by a leak detection system. The DRA2U18M2A is the only Durastar multi–zone unit NOT equipped with a SAFETY SHUT–OFF VALVE.

The SAFETY SHUT–OFF VALVE will default to fully closed when the unit is de–energized so refrigerant could remain in the system if not properly released before servicing. Release the refrigerant using one of the methods in the SAFETY SHUT–OFF VALVE RELEASE section later in this manual.

SPECIFICATION OVERVIEW

The table below includes basic specifications for this unit. For more detailed specifications please refer to the submittals on DURASTAR.COM. Durastar reserves the right to change specifications without notice.

MODEL	BTUH	LIQUID PIPE in (mm)	SUCTION PIPE in (mm)	NET WEIGHT lbs (kg)	OUTDOOR UNIT DIMENSIONS (in)		
					W	H	D
DRA3H18M2A	18,000	3 x 1/4 (6.35)	3 x 3/8 (9.52)	137 (62)	37-1/4	31-7/8	16-1/8
DRA3U18M2A	18,000	3 x 1/4 (6.35)	3/8 (9.52) x3	100 (46)	35-1/16	26-1/2	13-1/2
DRA4H28M2A	28,000	4 x 1/4 (6.35)	3 x 3/8 (9.52) / 1 x 1/2 (12.7)	169 (77)	37-1/4	31-7/8	16-1/8
DRA4U28M2A	28,000	4 x 1/4 (6.35)	3 x 3/8 (9.52) / 1 x 1/2 (12.7)	139 (63)	37-1/4	31-7/8	16-1/8
DRA5H36M2A	36,000	5 x 1/4 (6.35)	3 x 3/8 (9.52) / 2 x 1/2 (12.7)	212 (96)	38-5/8	38-3/8	16-5/16
DRA5U36M2A	36,000	5 x 1/4 (6.35)	4 x 3/8 (9.52) / 1 x 1/2 (12.7)	169 (77)	37-1/4	31-7/8	16-1/8
DRA6H48M2A	48,000	6 x 1/4 (6.35)	4 x 3/8 (9.52) / 2 x 1/2 (12.7)	247 (112)	37-1/2	52-1/2	16-5/16
DRA6U48M2A	48,000	6 x 1/4 (6.35)	4 x 3/8 (9.52) / 2 x 1/2 (12.7)	222 (100)	37-1/2	52-1/2	16-5/16
DRA6H55M2A	55,000	6 x 1/4 (6.35)	4 x 3/8 (9.52) / 2 x 1/2 (12.7)	247 (112)	37-1/2	52-1/2	16-5/16
DRA6U60M2A	60,000	6 x 1/4 (6.35)	4 x 3/8 (9.52) / 2 x 1/2 (12.7)	238 (108)	37-1/2	52-1/2	16-5/16

OPERATING TEMPERATURES

Your air conditioner is designed to operate in the following indoor and outdoor temperatures. When your air conditioner is used outside of the following temperature ranges, certain safety features may activate and turn off the unit to protect it from damage.

TEMPERATURE RANGES

	COOL mode	HEAT mode	DRY mode
Indoor Air Temperature	60°F – 90°F (16°C – 32°C)	32°F – 86°F (0°C – 30°C)	50°F – 90°F (10°C – 32°C)
Outdoor Air Temperature	–13°F / –22°F* – 122°F (–25°C / –30°C* – 50°C)	–13°F / –22°F* – 75°F (–25°C / –30°C* – 24°C)	32°F – 122°F (0°C – 50°C)

* The minimum operating temperature depends on the outdoor unit. Low ambient Sirius Heat™ models have a minimum operating temperature in heat mode of –22°F (–30°C).

To further optimize the performance of your unit, do the following:

- Keep doors and windows closed.
- Limit energy usage by using TIMER ON and TIMER OFF features.
- Do not block air inlets or outlets.
- Regularly inspect and clean air filters.

NOTE

Your Durastar air conditioner's outdoor unit is equipped with a base pan heater, allowing it to continue to operate at freezing temperatures as low as –22°F (–30°C). When outdoor air temperatures are at or below 32°F (0°C), we strongly recommend keeping the unit plugged in at all times to ensure smooth ongoing performance.

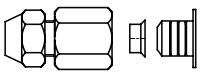
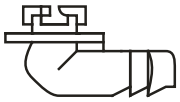
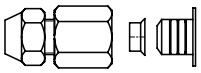
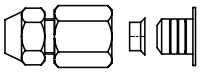
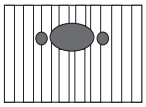
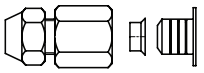
NOTE

Keep the room's relative humidity below 80%. If the air conditioner operates in excess of this, the surface of the air conditioner may attract condensation. To help prevent condensation from forming and dripping, set the vertical airflow louver to its maximum angle (vertically to the floor) and set the fan to HIGH.

ACCESSORIES

INCLUDED INSTALLATION ACCESSORIES

The air conditioning system comes with the following accessories. They may vary by model.

Accessory	Quantity	Image	Accessory	Quantity	Image
Installation Manual	1		Refrigerant Pipe Adapter (3/8"–1/2")	1–2	
Drain Joint	1		Refrigerant Pipe Adapter (1/2"–3/8")	0–2	
Drain Joint Seal (Depending on Drain Joint Type)	0 – 1		Refrigerant Pipe Adapter (1/2"–5/8")	0–2	
Rubber Foot	4		Refrigerant Pipe Adapter (1/4"–3/8")	0–2	

TOOLS NEEDED

The following tools may be required for installation.

- Phillips screwdriver
- Drill with 2 1/2" or 3 1/2" core bit (indoor unit model depending)
- Vacuum pump
- HVAC manifold gauge set
- Refrigerant leak detector
- Copper pipe cutter
- Flaring tool
- Burr reamer
- Crescent or spanner wrench
- Hexagonal wrench set
- Torque wrench
- Wire strippers
- Wire crimper

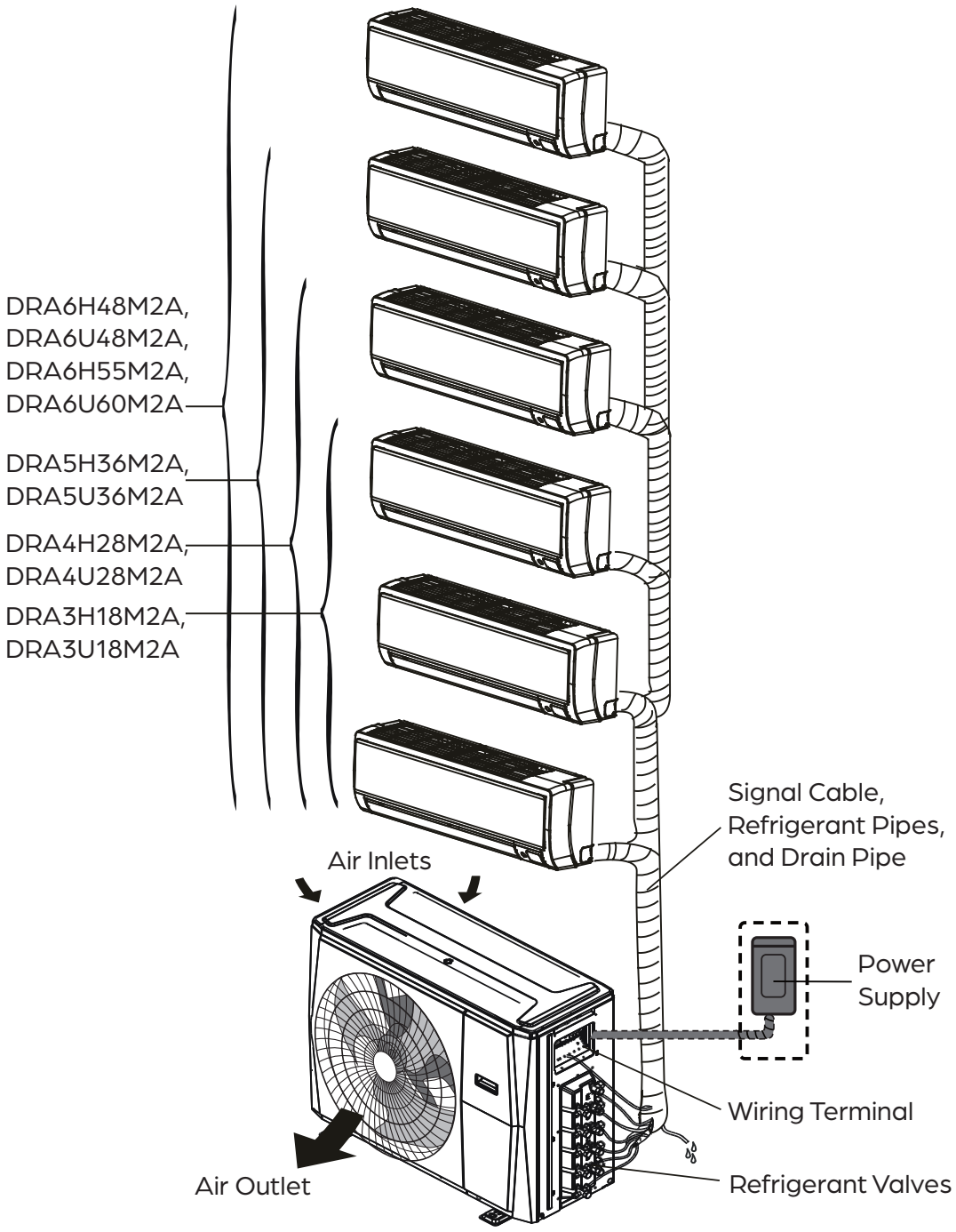
FIELD SUPPLIED INSTALL ACCESSORIES

The following installation accessories may be required and must be purchased separately.

- Refrigerant lines
- Indoor and outdoor connection wire
- Outdoor power supply cord
- Drain hose
- Pipe and cable wrapping tape
- Wall hole sleeve and cover
- Putty
- Suspension bolts and necessary hardware to hang indoor unit (if necessary)
- Wiring u-lugs

PARTS IDENTIFICATION

NOTE
The installation must be performed in accordance with the required local and national standards. The installation may be slightly different in different areas.

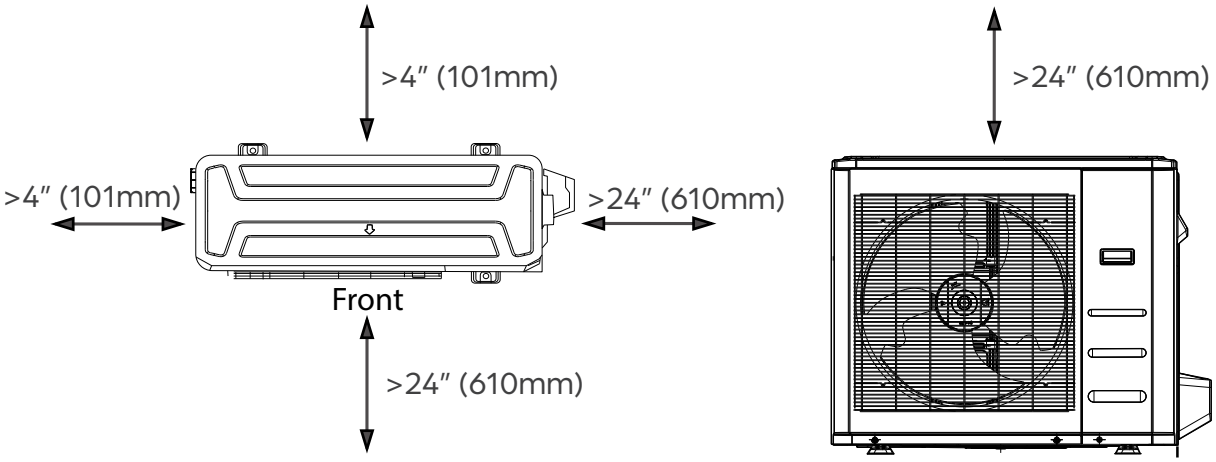


NOTE
Illustrations in this manual are for explanatory purposes. The actual shape of your mini-split equipment may vary slightly. Indoor units may also vary in configuration.

OUTDOOR UNIT INSTALLATION

Installation Instructions

Install the unit following local codes and regulations. These may differ slightly between regions.



STEP 1: SELECT INSTALLATION LOCATION

Before installing the outdoor unit, you must choose an appropriate location. The following are standards that will help you choose an appropriate location for the unit.

Proper installation locations meet the following standards:

- Meets all spatial requirements shown in installation space requirements above.
- Good air circulation and ventilation.
- Firm and solid location —the location can support the unit's weight and will not vibrate.
- Noise from the unit will not disturb others.
- Protected from prolonged periods of direct sunlight or rain.

NOTE

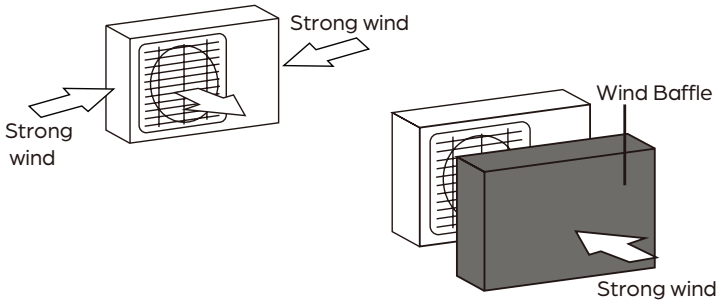
Where snowfall is anticipated, raise the unit above the base pad to allow free drainage to prevent ice buildup and coil damage. Mount the unit high enough to be above the average accumulated area snowfall. The minimum height must be 18 inches.

DO NOT install unit in the following locations:

- Near an obstacle that will block air inlets and outlets.
- Near a public street, crowded areas, or where noise from the unit will disturb others.
- Near animals or plants that will be harmed by hot air discharge.
- Near any source of combustible gas.
- In a location that is exposed to large amounts of dust.
- In a location exposed to an excessive amount of salty air.
- Install the unit at least 10 ft. (3 m) away from TV or radio antennas. Operation of the unit may interfere with antenna reception in areas where the signal is weak. An amplifier may be needed for affected devices.

NOTE
If a line set is not already installed, keep in mind the positioning of the line set before mounting the unit.

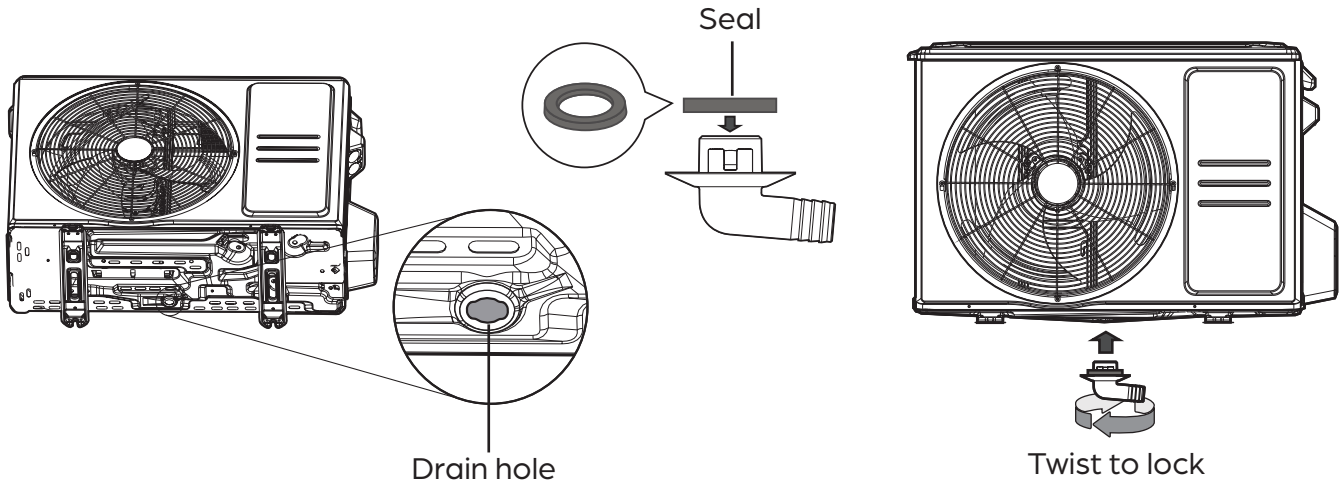
Special considerations for extreme weather
If the unit is exposed to heavy wind, install unit so that air outlet fan is at a 90° angle to the direction of the wind. If needed, build a barrier in front of the unit to protect it from extremely heavy winds. See figures below.



If the unit is frequently exposed to heavy rain or snow
Build a shelter above the unit to protect it from rain or snow. Be careful not to obstruct airflow around the unit.

STEP 2: INSTALL THE DRAIN JOINT

1. Fit the rubber seal on the end of the drain joint that will connect to the outdoor unit.
2. Insert the drain joint into the hole in the base pan of the unit.
3. Rotate the drain joint 90° until it clicks in place facing the front of the unit.
4. Connect a drain hose extension (not included) to the drain joint to redirect water from the unit during heating mode.



CAUTION
In cold climates, make sure that the drain hose is as vertical as possible to ensure swift water drainage. If water drains too slowly, it can freeze in the hose and flood the unit.

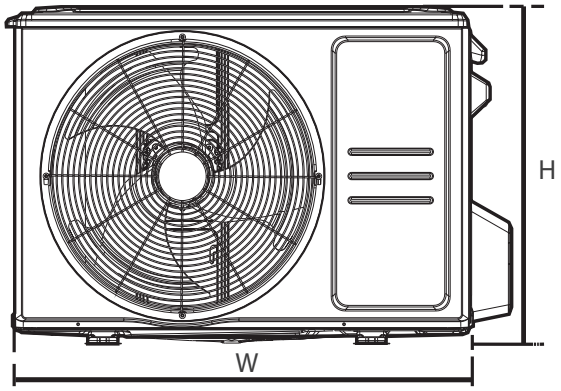
STEP 3: MOUNT THE OUTDOOR UNIT

Anchoring the Unit

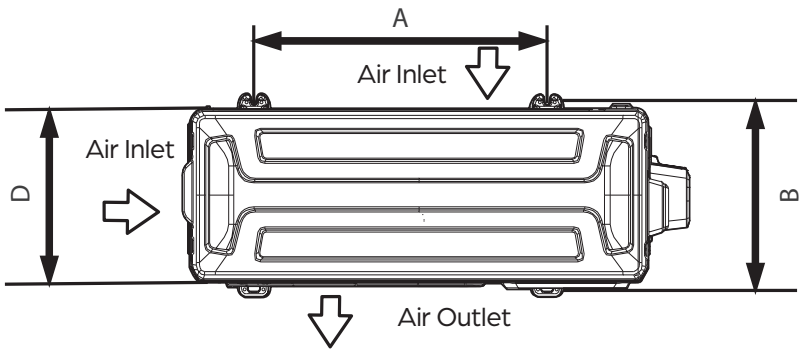
The outdoor unit can be anchored to the ground or to a wall-mounted bracket (sold separately) with bolts (M10). Mount the unit on a cement slab, condenser mounting pad, or other level surface able to support the unit's weight. **Do not place the unit directly on the ground.** If using a wall-mounting bracket, make sure the attached structure can support at least four times the unit's weight.

Unit Mounting Dimensions

The distance between their mounting feet varies by outdoor unit. Prepare the installation base of the unit according to the dimensions below. In most cases, it may be easier to place the outdoor unit in its correct location and mark the exact placement for the anchor holes.



Front View



Top View

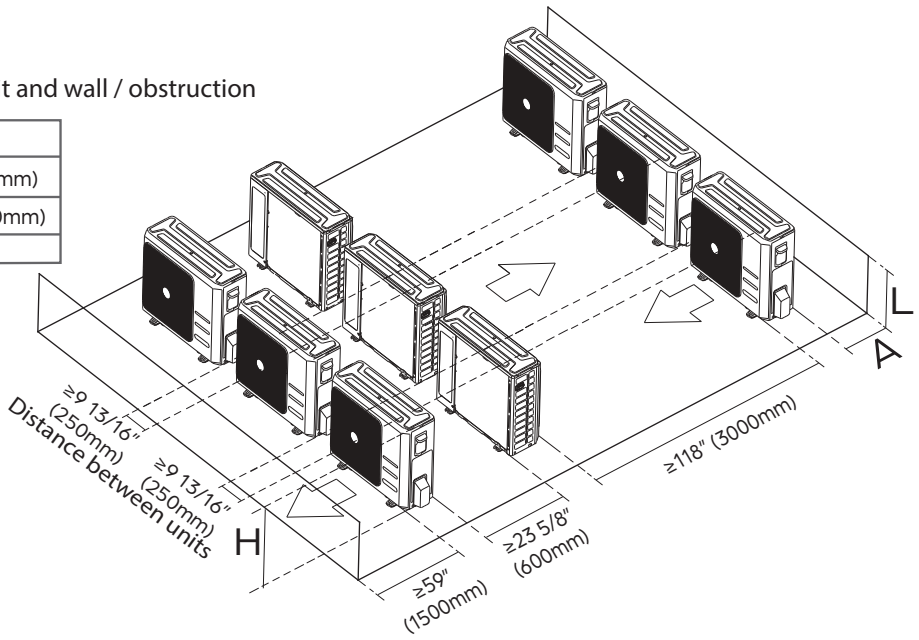
MODEL	OUTDOOR UNIT DIMENSIONS						MOUNTING DIMENSIONS			
	W		H		D		A		B	
	In	mm	In	mm	In	mm	In	mm	In	mm
DRA3H18M2A	37-1/4	946	31-7/8	810	16-1/8	410	26-1/2	673	15-7/8	403
DRA3U18M2A	35-1/16	890	26-1/2	673	13-1/2	342	26-1/8	663	13-11/16	348
DRA4H28M2A	37-1/4	946	31-7/8	810	16-1/8	410	26-1/2	673	15-7/8	403
DRA4U28M2A	37-1/4	946	31-7/8	810	16-1/8	410	26-1/2	673	15-7/8	403
DRA5H36M2A	38-5/8	980	38-3/8	975	16-5/16	415	24-1/4	616	15-5/8	397
DRA5U36M2A	37-1/4	946	31-7/8	810	16-1/8	410	26-1/2	673	15-7/8	403
DRA6H48M2A	37-1/2	952	52-1/2	1333	16-5/16	415	25	634	15-7/8	403
DRA6U48M2A	37-1/2	952	52-1/2	1333	16-5/16	415	25	634	15-7/8	403
DRA6H55M2A	37-1/2	952	52-1/2	1333	16-5/16	415	25	634	15-7/8	403
DRA6U60M2A	37-1/2	952	52-1/2	1333	16-5/16	415	25	634	15-7/8	403

Installing multiple outdoor units

If installing multiple outdoor units, refer to the diagram below for proper clearances.

H = Outdoor unit height
L = Wall / Obstruction height
A = Required distance between unit and wall / obstruction

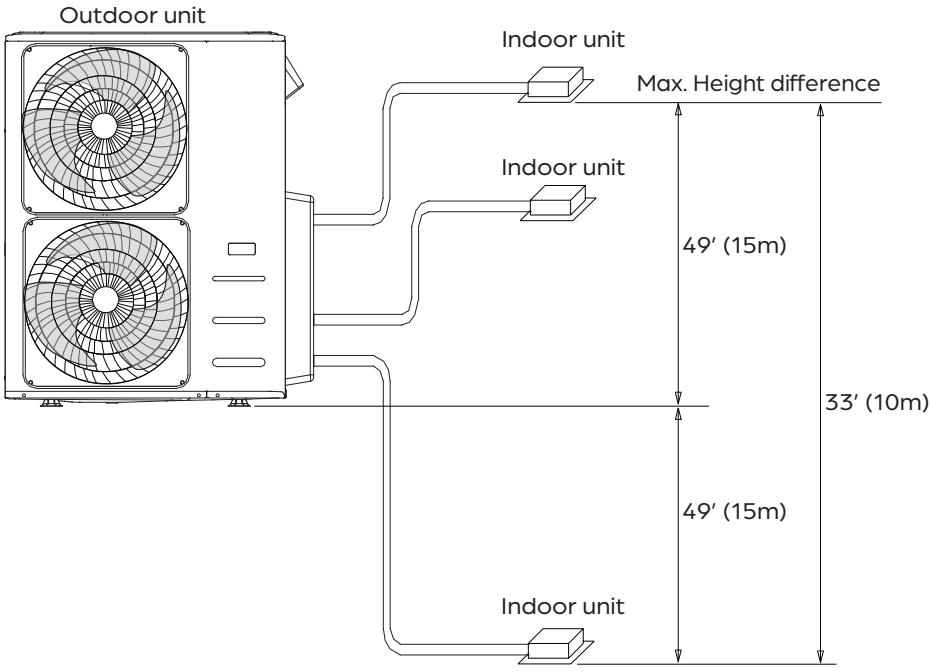
	L	A
L ≤ H	L ≤ 1/2H	≥9 13/16″ (250mm)
	1/2H < L ≤ H	≥11 13/16″ (300mm)
L > H	Can not be installed	



Pipe length and unit height difference maximums

When installing multiple indoor units with a single outdoor unit, ensure that the length of the refrigerant pipe and the drop height between the outdoor and indoor units, and between indoor units, meets the requirements below.

	3–ZONE	4–ZONE, 5–ZONE, AND 6–ZONE
Max. length for all rooms	197' (60m)	262' (80m)
Max. length for one indoor unit	98' (30m)	115' (35m)
Max. height diff. between outdoor and indoor unit	49' (15m)	49' (15m)
Max. height diff. between indoor units	33' (10m)	33' (10m)



STEP 4: CONNECT THE SIGNAL & POWER CABLES

The outside unit's terminal block is protected by an electrical wiring cover on the side of the unit. A comprehensive wiring diagram is printed on the inside of the wiring cover.

WARNING
Before performing any electrical or wiring work, turn off the main power to the system. All wiring work must be performed strictly in accordance with the wiring diagram located inside the terminal cover of the outdoor unit.

USE THE RIGHT CABLE

- Indoor Power/ Signal Cable: 14/4 stranded, unshielded
- Outdoor Power Cable: Determined by amperage of system and the local codes in your area.

Choose the Correct Size of Cable

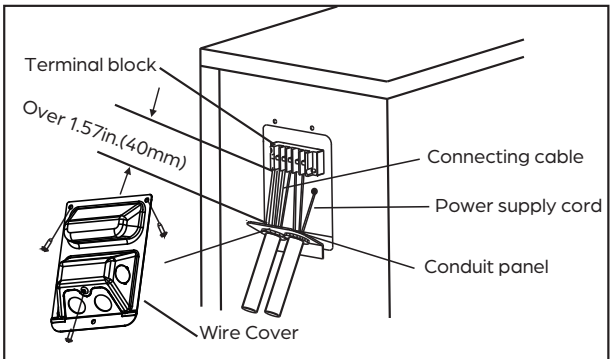
The size of the power supply cable, signal cable, fuse, and switch needed is determined by the maximum current of the unit. The maximum current is indicated on the nameplate located on the side panel of the unit. Refer to this nameplate to choose the right cable (stranded wire preferred), fuse, or switch.

Prepare the cable and wires for connection:

- Using wire strippers, strip the rubber jacket from both ends of cable to reveal about 1.5" (38–40mm) of the wires inside.
- Strip the insulation from the ends of the wires.
- Using a wire crimper, crimp u–lugs on the ends of the wires.

WARNING
Pay attention to the live wire. While crimping wires, make sure you clearly distinguish the Live ("L") Wire from other wires.

1. Remove the electrical wiring cover.
2. Remove the caps on the conduit panel.
3. Temporarily mount the conduit tubes (sold separately) onto the conduit panel.
4. Properly connect both the power supply and low voltage lines to the corresponding terminals on the terminal block.
5. Ground the unit in accordance with local codes.
6. Be sure to cut the wire several inches longer than the required length for future maintenance.
7. Permanently secure the conduit tubes to the conduit panel.
8. Replace the wire cover on the side of the unit, and screw it in place.



Select the appropriate holes to feed the wires through according to their diameter.

REFRIGERANT PIPING CONNECTIONS

WARNING
When connecting refrigerant piping, do not let substances or moisture other than specified refrigerant enter the unit or pipes. The presence of foreign materials will lower the unit's capacity and can cause abnormally high pressure in the refrigeration system. This can result in explosion and personal injury.

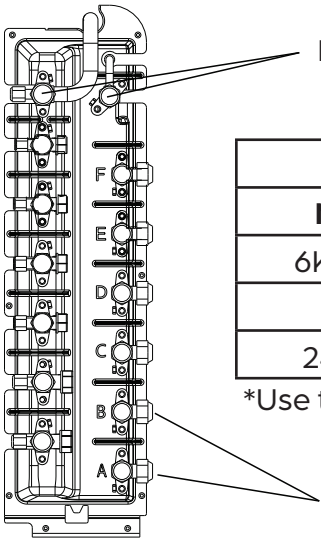
REFRIGERANT PIPE LENGTH
The length of refrigerant piping will affect the performance and efficiency of the unit. Nominal efficiency is tested with a pipe length of 25 feet (7.6 meters). A minimum pipe run of 10 feet (3 meters) is required to minimize vibration and excessive noise.

Refer to the table on page 18 for specifications on the maximum length and drop height of refrigerant piping.

Note on refrigerant valve selection for indoor units

For 4–zone and 5–zone systems:
If installing a 24K BTU or 33k BTU indoor unit, only connect the unit with the valve ports labeled "A" on the outdoor unit.

For 6–zone systems:
If installing one 24K BTU or 33k BTU indoor unit, only connect the unit with the valve ports labeled "A" on the outdoor unit. If installing two 24K BTU or 33k BTU indoor units, only connect the units with the valve ports labeled "A" and "B" on the outdoor unit.



Master Valves

Ports "A" and "B"

INDOOR UNIT PIPE SPECIFICATION in(mm)		
MODEL	**LIQUID PIPE**	**SUCTION PIPE**
6K/9K/12K	1/4 (6.35)	3/8 (9.52)
18K	1/4 (6.35)	1/2 (12.70)
24K/33K*	3/8 (9.52)	5/8 (16.00)

*Use the provided 3/4" –> 5/8" adapter on the 33K indoor

Note on master valves

Initial startup
Once installation is complete, open all zone valves connected to an indoor unit. Connect the high side hose of the manifold gauge to the gas side master valve to gain access to all connected zones. Perform leak check procedures. Afterwards, remove the high side hose and attach the low side hose from the manifold to evacuate all connected zones. Once a vacuum is maintained, open both master valves to release the refrigerant charge into the entire system.

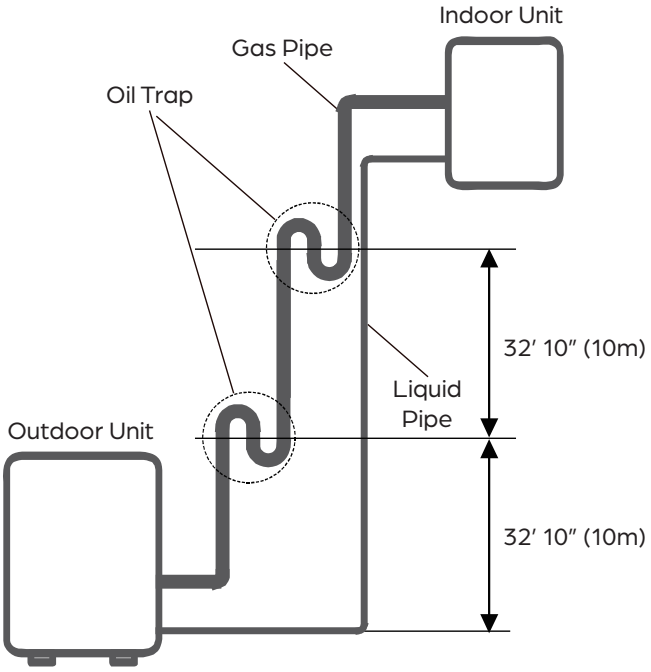
CAUTION
After startup, the master valves and all zone valves connected to an IDU must remain open for proper operation.

Post start-up and servicing
Once the system is operational, the master valves can be used to access the entire system for servicing and troubleshooting. If a repair requires the entire refrigerant charge to be removed, the master valves will allow the recovery of all system refrigerant. Simply connect the low side hose of the manifold gauge directly to the gas side master valve to recover refrigerant. Once repair is complete, use the high side hose of the manifold to leak check. Then, connect the low side hose again to pull a vacuum and charge the system.

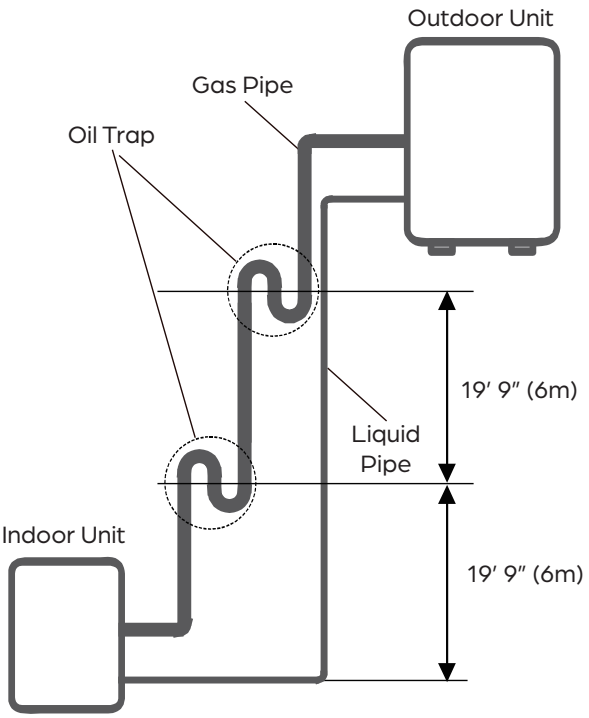
CAUTION
After servicing, the master valves and all zone valves connected to an IDU must remain open for proper operation.

OIL TRAPS
Oil traps are necessary for the continued performance of the system if the indoor and outdoor units are installed at significantly different heights.

Refer to the diagram below for proper installation of any required oil traps.



Required distance between oil traps when the indoor unit is installed higher than the outdoor unit.



Required distance between oil traps when the outdoor unit is installed higher than the indoor unit.

If the indoor unit is installed higher than the outdoor unit:
Oil may flow back into the outdoor unit's compressor and cause liquid compression. This will lead to deterioration of performance and shorten the life of the compressor. Oil traps in the rising gas piping can prevent this and should be installed every 32'10" (10m) of vertical rise.

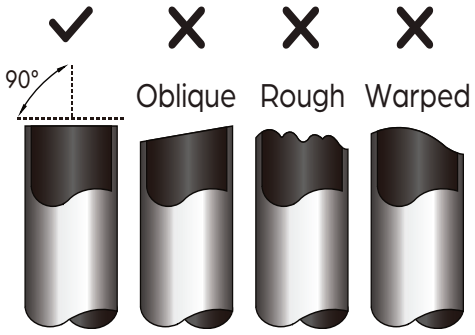
If the outdoor unit is installed higher than the indoor unit:
Proper oil return to the compressor must be maintained with the suction gas velocity. If velocities drop below 1500fpm, oil return will be decreased and lead to deterioration of performance and shorten the life of the compressor. Oil traps in the rising gas piping can prevent this and should be installed every 19'9" (6m) of vertical rise.

REFRIGERANT PIPE CONNECTION INSTRUCTIONS

STEP 1: CUT PIPES

When preparing refrigerant pipes, take extra care to cut and flare them properly. This will ensure efficient operation and minimize leaks and the need for future maintenance.

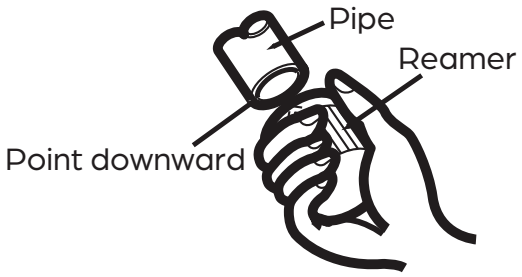
1. Measure the distance between the indoor and outdoor units.
2. Using a pipe cutter, cut the pipe length a little longer than the measured distance.
3. Make sure that the pipe is cut at a perfect 90° angle.
4. Do not damage, deform, or dent the pipe while cutting.



STEP 2: REMOVE BURRS

Burrs can affect the airtight seal of the refrigerant piping connection and must be completely removed.

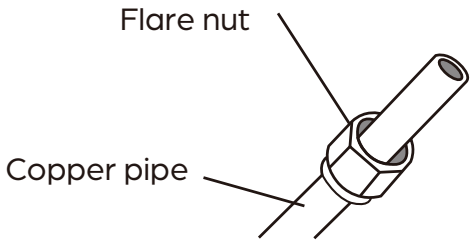
1. Hold the pipe at a downward angle to prevent burrs from falling into the pipe.
2. Using a reamer or deburring tool, remove all burrs from the cut section of the pipe.



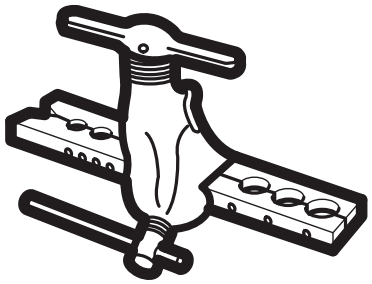
STEP 3: FLARE PIPE ENDS

Proper flaring is essential to achieve an airtight seal.

1. After removing burrs from cut pipe, seal the ends with PVC tape to prevent foreign materials from entering the pipe.
2. Sheath pipe with insulating material.
3. Place flare nuts on both ends of the pipe. Make sure they are facing in the right direction as you cannot change their orientation after flaring.

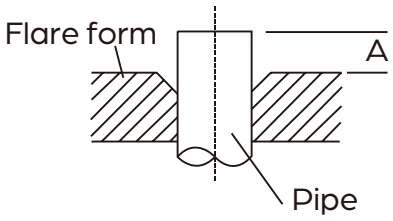


4. Remove PVC tape from ends of pipe when ready to perform flaring.
5. Clamp flare form on the end of pipe. The end of the pipe must extend beyond the edge of the flare form in accordance with the pipe extension table.



PIPE EXTENSION BEYOND FLARE FORM

Outer Diameter of Pipe Inches (mm)	"A" Minimum Extension Inches (mm)	"A" Maximum Extension Inches (mm)
Ø 1/4" (6.4mm)	0.0275" (0.7mm)	0.05" (1.3mm)
Ø 3/8" (9.5mm)	0.04" (1.0mm)	0.063" (1.6mm)
Ø 1/2" (12.7mm)	0.04" (1.0mm)	0.07" (1.8mm)
Ø 5/8" (15.9mm)	0.078" (2.0mm)	0.086" (2.2mm)
Ø 3/4" (19.1mm)	0.078" (2.0mm)	0.094" (2.4mm)



TIP: THICKNESS COMPARISON

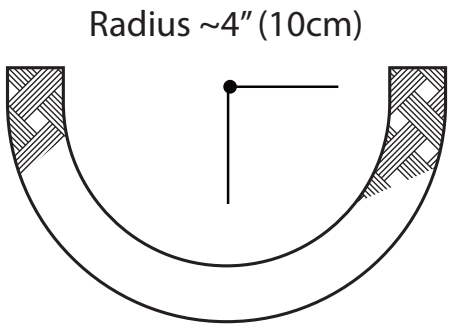
- 0.0275" = A Thumbnail
- 0.04" = A Dime
- 0.078" = A Nickle

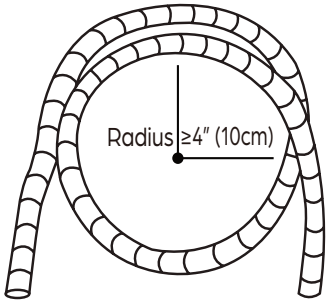
6. Place flaring tool onto the form.
7. Turn the handle of the flaring tool clockwise until the pipe is fully flared.
8. Remove the flaring tool and flare form, then inspect the pipe for cracks and even flaring.

STEP 4: CONNECT PIPES

When connecting refrigerant pipes, be careful not to use excessive torque or to deform the piping in any way. You should first connect the low-pressure pipe, then the high-pressure pipe.

When bending connective refrigerant piping, the minimum bending radius is 4 inches (10cm). Do not leave coils in the refrigerant line sets. Remove excess line length to ensure proper system operation.

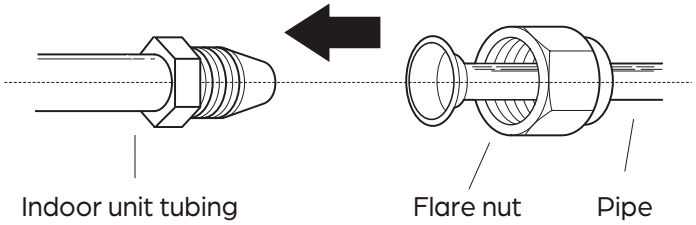




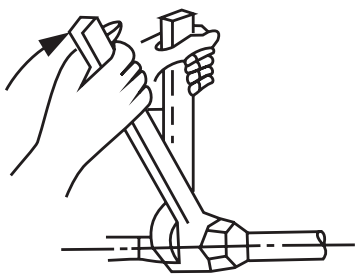
CAUTION
Do not leave coils in the refrigerant line sets. All excess line length must be removed to ensure proper system operation.

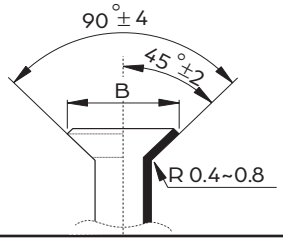
CONNECTING PIPING TO INDOOR UNIT

1. Align the center of the two pipes that you will connect.



2. Tighten the flare nut as tightly as possible by hand.
3. Using a spanner, grip the nut on the unit tubing.
4. While firmly gripping the nut on the unit tubing, use a torque wrench to tighten the flare nut according to the torque values in the table on the next page. Loosen the flaring nut slightly, then tighten again.

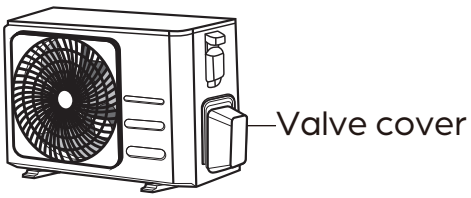


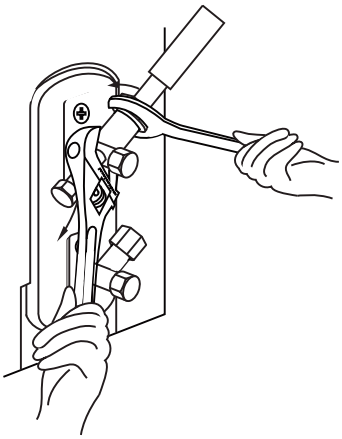
Outer Diameter of Pipe Inches (mm)	Tightening Torque lb–ft (Nm)	Flare Dimension "B" Inches (mm)	Flare Shape
Ø 1/4" (6.4mm)	13.3~14.8 (18~20)	0.33~0.34 (8.4~8.7)	
Ø 3/8" (9.5mm)	23.6~28.8 (32~39)	0.52~0.53 (13.2~13.5)	
Ø 1/2" (12.7mm)	36.1~43.5 (49~59)	0.64~0.65 (16.2~16.5)	
Ø 5/8" (15.9mm)	42~52.4 (57~71)	0.76~0.78 (19.2~19.7)	
Ø 3/4" (19.1mm)	49.4~74.5 (67~101)	0.91~0.93 (23.2~23.7)	

WARNING
Do not use excessive torque. Excessive force can break the nut or damage the refrigerant piping. You must not exceed the torque requirements shown in the table above.

CONNECTING PIPING TO OUTDOOR UNIT

1. Remove the valve cover on the side of the outdoor unit.
2. Remove the protective caps from the ends of the valves.
3. Align flared pipe end with each valve and tighten the flare nut as tightly as possible by hand.
4. Using a spanner, grip the body of the valve. Do not grip the nut that seals the service valve.
5. While firmly gripping the body of the valve, use a torque wrench to tighten the flare nut according to the correct torque values in the table above.
6. Loosen the flare nut slightly, then tighten again.
7. Repeat steps 3–6 for the remaining pipe.





SYSTEM EVACUATION

WARNING
In accordance with regulations, it is REQUIRED to purge the system with OFN (OXYGEN-FREE NITROGEN), pressure test the circuit to 600 PSI, and evacuate the system before charging.

PREPARATIONS AND PRECAUTIONS

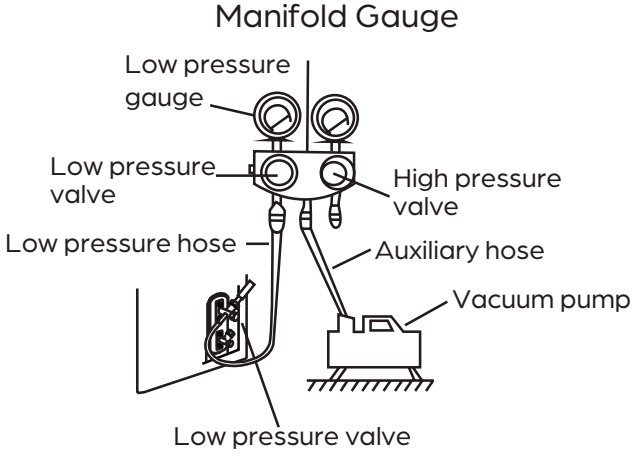
Air and foreign matter in the refrigerant system can cause abnormal rises in pressure, which can damage the air conditioner, reduce energy efficiency, and cause injury. Use a vacuum pump and manifold gauge to evacuate the refrigerant system, removing any non-condensible gas and moisture from the system. Evacuation should be performed upon initial installation and if unit is relocated.

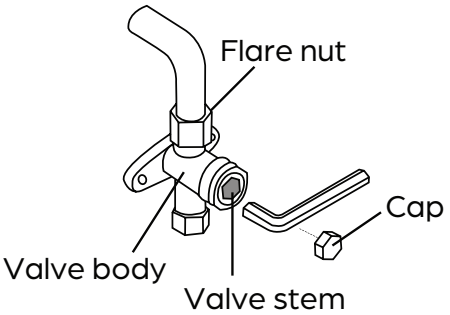
BEFORE PERFORMING EVACUATION

1. Check to make sure the refrigerant pipes connecting the indoor and outdoor units are connected properly and leak free.
2. Check to make sure all wiring is connected properly.

EVACUATION INSTRUCTIONS

1. Connect the high pressure side hose of the manifold gauge to the service port on the outdoor unit's service valve.
2. Connect the hose from the auxiliary port of the manifold gauge to the nitrogen tank.
3. Open the high pressure side of the manifold gauge. Keep the low pressure side closed.
4. Open the nitrogen tank valve and pressurize the system to 600PSIG.
5. Close nitrogen tank valve and high pressure side of the manifold gauge.
6. Wait 15 minutes, then check that there has been no change in pressure.
7. If pressure loss is greater than 5PSIG, a leak may be present. Using the Soap and Bubble Method, locate and fix all leaks. Start back at step 1 once all leaks have been fixed.
8. If there is no change in pressure, remove the auxiliary port of the manifold gauge from the nitrogen tank.
9. Release the pressure in the system by opening up the high side of the manifold gauge.
10. Once pressure has been released, remove the high pressure side hose of the manifold gauge from the service port and replace it with the low pressure side hose.
11. Connect the hose of the auxiliary port of the manifold gauge to the vacuum pump and a MICRON GAUGE.
12. Turn on the vacuum pump to evacuate the system.
13. Run the vacuum until the micron gauge reads 250 microns.
14. Once the micron gauge reads 250 microns, close the low pressure side of the manifold gauge and turn off the vacuum pump. System must hold below 500 microns for 15 minutes with the vacuum pump off.
15. If there is a change in pressure, a leak may be present. Using a leak detector with appropriate sensitivity or the Soap and Bubble Method, locate and fix all leaks. Start back at step 1 once all leaks have been fixed.
16. If there is no change in pressure, remove the manifold gauge auxiliary hose from the vacuum pump.
17. Remove the caps from the unit's valve bodies, and open the system's valves gently with a hex wrench by turning it counterclockwise until they reach their stopping point. Do not try to force the valves to open further.





NOTE ON ADDING ADDITIONAL REFRIGERANT

Each outdoor unit is factory charged with enough refrigerant to support up to 25' (7.5m) per zone. This is based on a one way liquid line measurement from the outdoor unit to the indoor unit. For example, (N x 25' = T) where "T" is the total length of line set that can be supported by the units factory charge and "N" is the number of zones available for use (eg. The DRA3 outdoor system has zone A, B, and C available or 3 zones [3 x 25' = 75'] So the total length of line set that the DRA3 can support in one direction is 75' distributed between the 3 (or less) zones available.) Systems with line sets that exceed this length will require additional refrigerant (see the following chart). The refrigerant should be charged from the service port on the outdoor unit's low pressure valve. Additional refrigerant information can be found in the **SUBMITTAL DOCUMENTS** at **SERVICE.DURASTAR.COM**. Additional refrigerant can be calculated using the following formula:

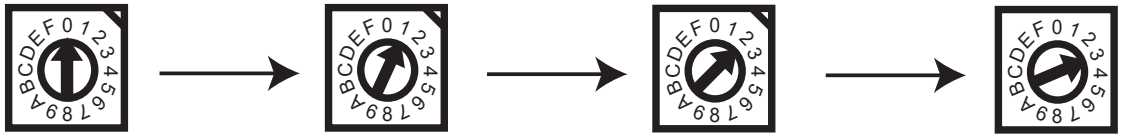
R454B Liquid Side ∅ 1/4" (6.35mm)	R454B Liquid Side ∅ 3/8" (9.52mm)
(Actual pipe length – Standard pipe length) x 0.16oz/ft or (Actual pipe length – Standard pipe length) x 15g/m	**(Actual pipe length – Standard pipe length) x 0.32oz/ft or (Actual pipe length – Standard pipe length) x 30g/m**

WARNING
DO NOT mix refrigerant types.

INDOOR UNIT BTU SETTING

The multi-zone compatible indoor units in the chart below have the ability to operate in multiple BTU settings. These units come in the default setting "0" for automatic BTU identification in single zone applications. However, in multi-zone applications, **the BTU setting must be determined by the position of rotary switch ENC1** on the indoor unit board. Make sure to adjust this switch to the desired BTU capacity. If the indoor unit model number is not listed below, this step is not necessary. Refer to the multi-zone compatibility chart on Durastar.com for allowed combinations.

CAUTION
UNIT MUST BE POWERED OFF BEFORE ADJUSTING ROTARY SWITCH



Default setting "0" | Change to "1" for 6,000 BTU/H | Change to "2" for 9,000 BTU/H | Change to "3" for 12,000 BUT/H

Indoor Unit Model	Description	ENC1 Rotary Switch Settings (If Available)		
		6,000 BTU	9,000 BTU	12,000 BTU
DRAL0612F2A	One-way Cassette	1	2	3
DRADL0612F2A	Low-static Slim-ducted	1	2	3
DRADH0912F2A	High-static Slim-ducted	N/A	2	3
DRAC0912F2A	4-Way Ceiling Cassette	N/A	2	3

AUTOMATIC WIRING & PIPING CHECK

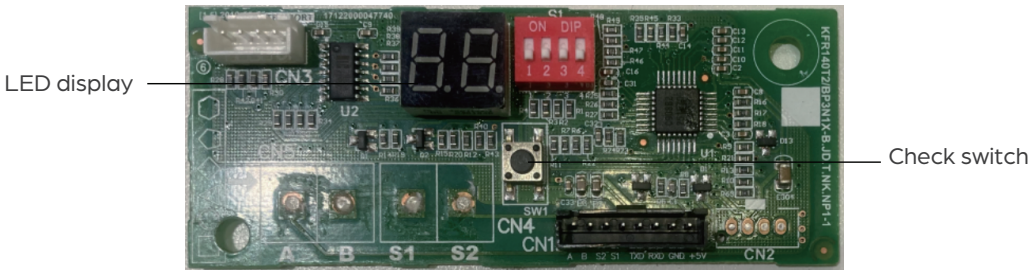
This unit features an automatic piping and wiring correction program to temporarily fix wires or line sets that have been accidentally crossed. Follow the instructions below.

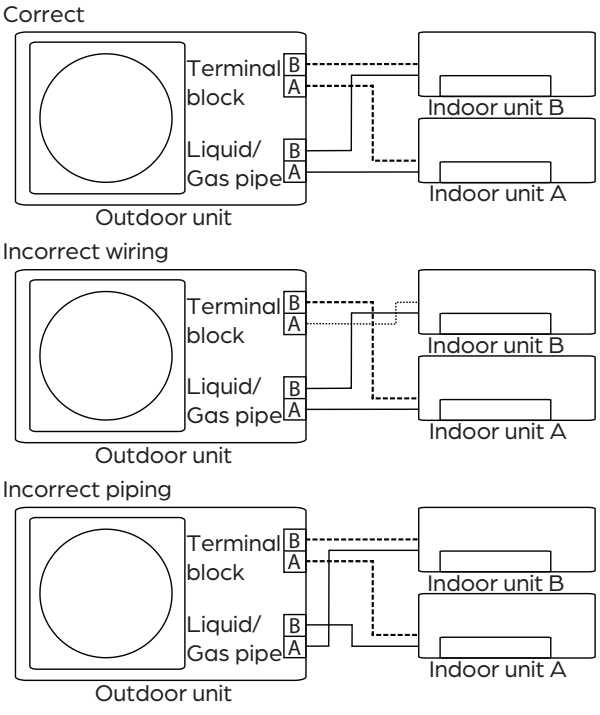
NOTE
This program does not fix when a 24K BTU or 33k BTU indoor unit is connected to a valve ports other than one labeled "A" or "B" on the outdoor unit as mentioned earlier in the REFRIGERANT PIPING CONNECTIONS section.

HOW TO ACTIVATE THIS FUNCTION

1. Check that outside temperature is above 41°F (5°C). This function does not work when the outside temperature is below 41°F (5°C).
2. Check that the stop valves of the liquid pipe and gas pipe are open.
3. Turn on the breaker and wait at least 2 minutes.
4. Press and hold the check switch (SW1 pictured below) on the outdoor PCB board for 5 seconds until LED displays "CE". This indicates the function is working.
5. After approximately 5–10 minutes, the "CE" will disappear meaning the wiring/piping error is corrected and all the wiring/piping is properly connected.

NOTE
This is not intended to be a permanent fix of the issue. If the unit has a prolonged power outage or the outdoor unit board is replaced, the unit may revert to default settings.





FINAL CHECKS

BEFORE THE TEST RUN

Only perform the test run after you have completed the following steps:

- Electrical Safety Checks – Confirm that the unit's electrical system is connected and operating correctly.
- Gas Leak Check – Check all flare nut connections and confirm the system is not leaking.
- Confirm that the low and high pressure valves are fully open.
- Check grounding work by measuring the grounding resistance by visual detection and with a multimeter. The grounding resistance must be less than 0.1 Ω.

ELECTRICAL SAFETY CHECKS

After installation, confirm that all electrical wiring is installed in accordance with local and national regulations, and according to this installation manual.

DURING TEST RUN

Using your multimeter, verify the voltage of the main power entering the system. If the main power voltage is greater than ±10% of the name plate voltage, turn off the unit and immediately call a licensed electrician to find and resolve the cause.

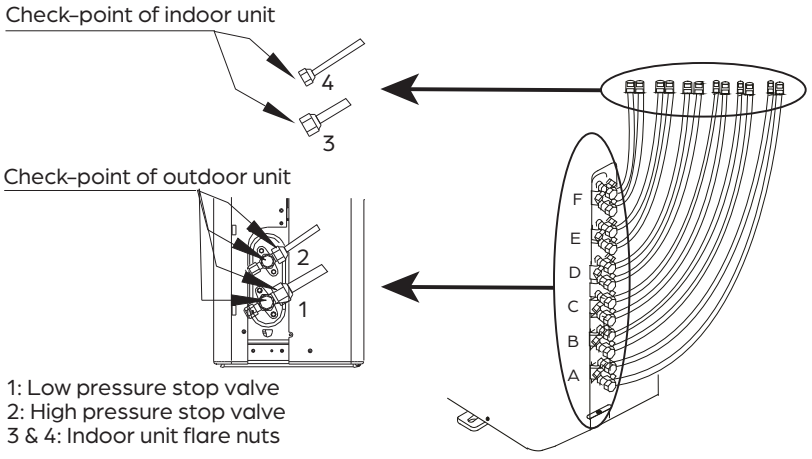
WARNING
RISK OF ELECTRICAL SHOCK – All wiring must comply with local and national electrical codes, and must be installed by a licensed electrician.

GAS LEAK CHECK

There are two methods to check for gas leaks:

1. Soap and Water Method – Using a soft brush, apply a soapy water or liquid detergent to all pipe connection points on the indoor and outdoor unit. The presence of bubbles indicates a leak.
2. Leak Detector Method – If using a leak detector, refer to the device's operation manual for proper usage instructions.

GAS LEAK CHECK POINTS



1: Low pressure stop valve
2: High pressure stop valve
3 & 4: Indoor unit flare nuts

TIP
Use the Durastar Job Site Information Sheet at the end of this manual as a commissioning report to record your start up readings.

SAFETY SHUT–OFF VALVE RELEASE

WARNING
Please read and follow the following if service is needed during or after the installation process.

In accordance with regulations, some multi–zone outdoor units are equipped with safety shut–off valves that limit the releasable refrigerant charge when activated by a leak detection system. The DRA2U18M2A is the only Durastar multi–zone unit NOT equipped with a SAFETY SHUT–OFF VALVE.

The SAFETY SHUT–OFF VALVE will default to fully closed when the unit is de–energized, so refrigerant could remain in the system if not properly released before servicing. Release the refrigerant using one of the methods below:

Method 1: If the system is throwing a refrigerant leak detection error, it will have closed this valve. Press the black check button (SW1 on the auxiliary board) for 10 seconds to clear the error. While the outdoor unit is connected to power and the indoor unit is powered off, evacuate the refrigerant into an approved reclaim tank.

Method 2: Remove the coil of the safety shut–off valve before disconnecting power to the outdoor unit to allow the valve to remain open.

Method 3: If the unit is unable to be energized, remove the coil on the valve and manually open the safety shut–off valve using a magnetic solenoid service ring.

TEST RUN

TEST RUN INSTRUCTIONS

You should perform the test run for at least 30 minutes.

1. Connect power to the unit.
2. Press the ON/OFF button on the remote controller or wired thermostat to turn the unit on.
3. Press the MODE button to scroll through the following functions, one at a time:
   - COOL – Select lowest possible temperature.
   - HEAT – Select highest possible temperature.
4. Let each function run for 5 minutes and perform the following checks:

LIST OF CHECKS TO PERFORM	[X]
Unit is Properly Grounded	[ ]
All Electrical Terminals are Properly Covered	[ ]
Indoor and Outdoor Units are Solidly Installed	[ ]
All Pipe Connection Points Do Not Leak	[ ]
Water Drains Properly from Drain Hose	[ ]
All Piping is Properly Insulated	[ ]
Unit Performs COOL Function Properly	[ ]
Unit Performs HEAT Function Properly	[ ]
Indoor Unit Louvers Move Properly	[ ]
Indoor Unit Responds to Remote Controller or Thermostat	[ ]

5. Double check all pipe connections. During operation, the pressure of the refrigerant system will increase. This may reveal leaks that were not present during the initial leak check. Take time during the test run to recheck all pipe connection points. Refer to *Gas Leak Check* section for instructions.
6. If the ambient temperature is below 60^{0}F (16°C) you can not use the remote controller to turn on the COOL function. In this instance, you can use the MANUAL CONTROL button on the indoor unit to test the COOL function. Refer to the indoor unit manual for the button location.

TROUBLESHOOTING

SAFETY PRECAUTIONS

If ANY of the following conditions occurs, turn off your unit immediately!

• The power cord is damaged or abnormally warm

• You smell a burning odor

• The unit emits loud or abnormal sounds

• A power fuse blows or the circuit breaker frequently trips

• Water or other objects fall into or out of the unit

DO NOT ATTEMPT TO FIX THESE YOURSELF! CONTACT AN AUTHORIZED SERVICE PROVIDER IMMEDIATELY!

COMMON ISSUES

The following problems are not a malfunction and in most situations will not require repairs.

ISSUE	POSSIBLE CAUSES
Unit does not turn on when pressing ON/OFF button	The Unit has a 3-minute protection feature that prevents the unit from overloading. The unit cannot be restarted within three minutes of being turned off.
The unit changes from COOL/HEAT mode to FAN mode	The unit may change its setting to prevent frost from forming on the unit. Once the temperature increases, the unit will start operating in the previously selected mode again.
	The set temperature has been reached, at which point the unit turns off the compressor. The unit will continue operating when the temperature fluctuates again.
The indoor unit emits white mist	In humid regions, a large temperature difference between the room's air and the conditioned air can cause white mist.
Both the indoor and outdoor units emit white mist	When the unit restarts in HEAT mode after defrosting, white mist may be emitted due to moisture generated during the defrosting process.
The indoor unit makes noises	A rushing air sound may occur when the louver resets its position.
	A squeaking sound may occur after running the unit in HEAT mode due to expansion and contraction of the unit's plastic parts.

ISSUE	POSSIBLE CAUSES
Both the indoor unit and outdoor unit make noises	Low hissing sound during operation: This is normal and is caused by refrigerant gas flowing through both indoor and outdoor units.
	Low hissing sound when the system starts, has just stopped running, or is defrosting: This noise is normal and is caused by the refrigerant gas stopping or changing direction.
	Squeaking sound: Normal expansion and contraction of plastic and metal parts caused by temperature changes during operation can cause squeaking noises.
The outdoor unit makes noises	The unit will make different sounds based on its current operating mode.
Dust is emitted from either the indoor or outdoor unit	The unit may accumulate dust during extended periods of non-use, which will be emitted when the unit is turned on. This can be mitigated by covering the unit during long periods of inactivity.
The unit emits a bad odor	The unit may absorb odors from the environment (such as furniture, cooking, cigarettes, etc.) which will be emitted during operations.
	The unit's filters have become moldy and should be cleaned.
The fan of the outdoor unit does not operate	During operation, the fan speed is controlled to optimize product operation.
Operation is erratic, unpredictable, or unit is unresponsive	Interference from cell phone towers and remote boosters may cause the unit to malfunction. In this case, try the following: • Disconnect the power, then reconnect. • Press ON/OFF button on remote control to restart operation.

NOTE
If problem persists, contact a local dealer or your nearest customer service center. Provide them with a detailed description of the unit malfunction as well as your model number.

TROUBLESHOOTING

The following problems may require repairs. Contact a certified service provider.

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PROBLEM	POSSIBLE CAUSES	SOLUTION
Poor Cooling Performance	Temperature setting may be higher than ambient room temperature	Lower the temperature setting
	The heat exchanger on the indoor or outdoor unit is dirty	Clean the affected heat exchanger
	The air filter is dirty	Remove the filter and clean it according to instructions
	The air inlet or outlet of either unit is blocked	Turn the unit off, remove the obstruction and turn it back on

PROBLEM	POSSIBLE CAUSES	SOLUTION
Poor Cooling Performance Cont.	Doors and windows are open	Make sure that all doors and windows are closed while operating the unit
	Excessive heat is generated by sunlight	Close windows and curtains during periods of high heat or bright sunshine
	Low refrigerant due to leak or long-term use	Check for leaks, re-seal if necessary and top off refrigerant
	Excessive heat is generated by sunlight	Block sunlight in installation area
	Too many sources of heat in the room (people, computers, electronics, etc.)	Reduce amount of heat sources
Poor Heating Performance	The outdoor temperature is extremely low	This model is designed to work down to –13°F, however, heating performance is impacted at temperatures below freezing
	Cold air is entering through doors and windows	Make sure that all doors and windows are closed during use
	Low refrigerant due to leak or long-term use	Check for leaks, re-seal if necessary, and top off refrigerant
The unit starts and stops frequently	There's too much or too little refrigerant in the system	Check for leaks and recharge the system with refrigerant
	Incompressible gas or moisture has entered the system	Evacuate and recharge the system with refrigerant
	The compressor is broken	Replace the compressor
	The voltage is too high or too low	Install a manostat to regulate the voltage
The unit is not working	Power failure	Wait for the power to be restored
	The power is turned off	Turn on the power
	The fuse is burned out	Replace the fuse
	Remote control batteries are dead	Replace batteries
	The Unit's 3-minute protection has been activated	Wait three minutes after restarting the unit
	Timer is activated	Turn timer off
Indicator lamps continue flashing or error code appears	The unit may stop operation or continue to run safely. If the indicator lamps continue to flash or error codes appear, wait for about 10 minutes. The problem may resolve itself. If not, disconnect the power, then connect it again. Turn the unit on. If the problem persists, disconnect the power and contact your nearest customer service center.	

NOTE
If your problem persists after performing the checks and diagnostics above, turn off your unit immediately and contact an authorized service center.

WIRING DIAGRAMS

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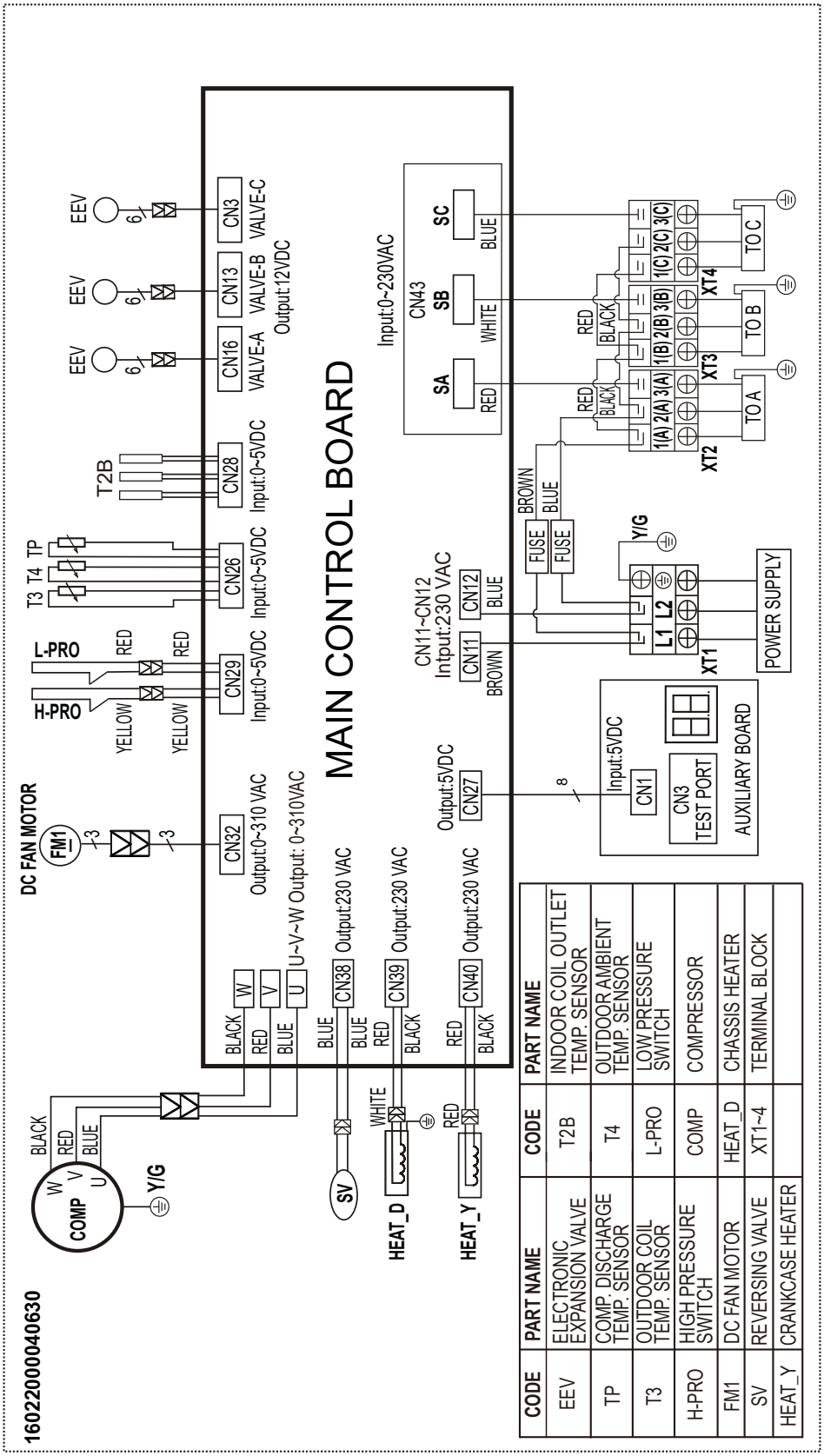

CODE	PART NAME	CODE	PART NAME
EEV	ELECTRONIC EXPANSION VALVE	T2B	INDOOR COIL OUTLET TEMP. SENSOR
TP	COMP. DISCHARGE TEMP. SENSOR	T4	OUTDOOR AMBIENT TEMP. SENSOR
T3	OUTDOOR COIL TEMP. SENSOR	L-PRO	LOW PRESSURE SWITCH
H-PRO	HIGH PRESSURE SWITCH	COMP	COMPRESSOR
FM1	DC FAN MOTOR	HEAT_D	CHASSIS HEATER
SV	REVERSING VALVE	XT1~4	TERMINAL BLOCK
HEAT_Y	CRANKCASE HEATER		

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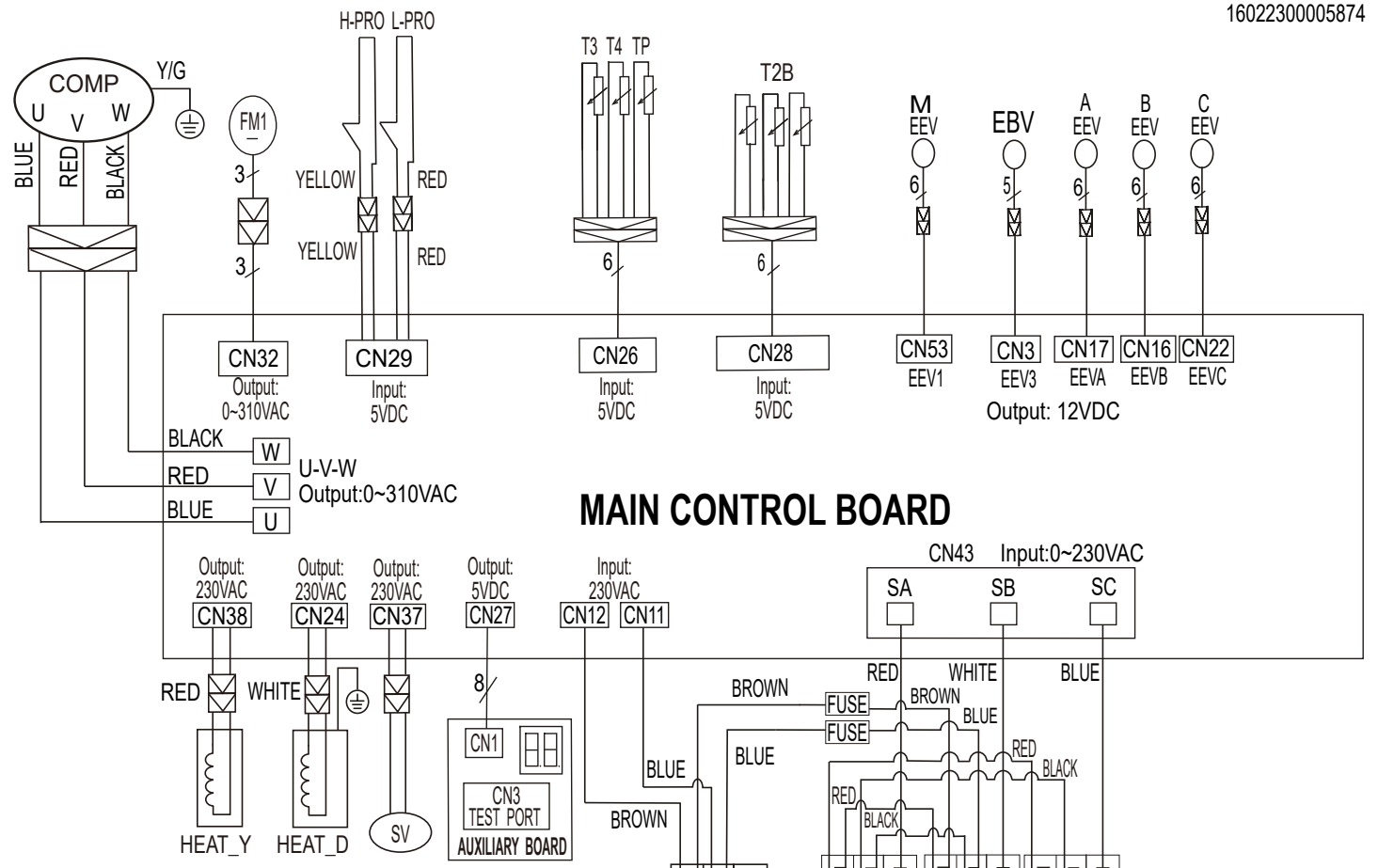
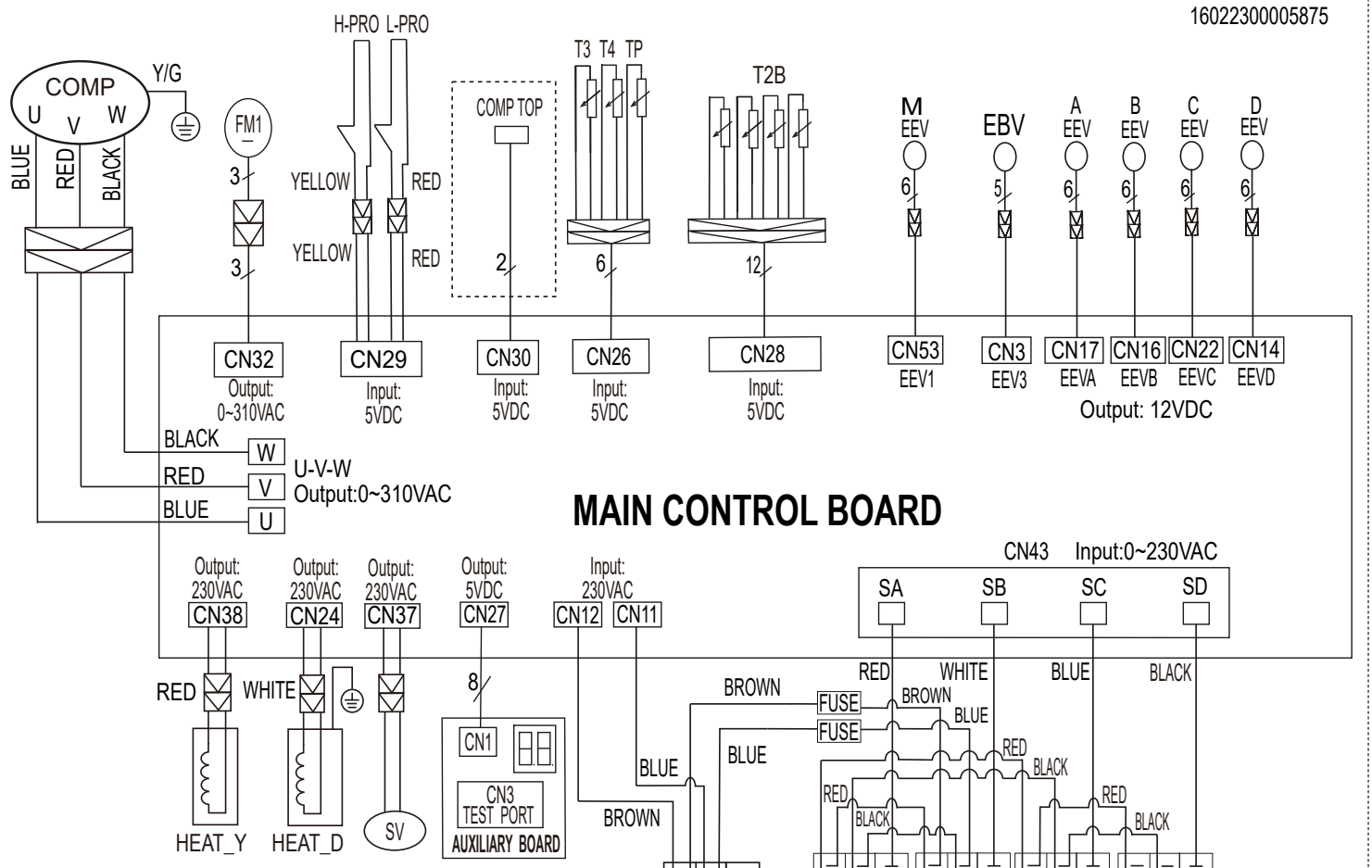
DRA3H18M2A



CODE	PART NAME	CODE	PART NAME
EEV	ELECTRONIC EXPANSION VALVE	FM1	DC FAN MOTOR
TP	COMP. DISCHARGE TEMP. SENSOR	COMP	COMPRESSOR
T3	OUTDOOR COIL TEMP. SENSOR	HEAT_Y	CRANKCASE HEATER
T4	OUTDOOR AMBIENT TEMP. SENSOR	HEAT_D	CHASSIS HEATER
T2B	INDOOR COIL OUTLET TEMP. SENSOR	SV	REVERSING VALVE
COMP TOP	COMP. TOP OLP TEMP. SENSOR	EBV	ELECTRONIC BALL VALVE
H-PRO	HIGH PRESSURE SWITCH	XT1~4	TERMINAL BLOCK
L-PRO	LOW PRESSURE SWITCH		

DRA4U28M2A, DRA4H28M2A



CODE	PART NAME	CODE	PART NAME
EEV	ELECTRONIC EXPANSION VALVE	FM1	DC FAN MOTOR
TP	COMP. DISCHARGE TEMP. SENSOR	COMP	COMPRESSOR
T3	OUTDOOR COIL TEMP. SENSOR	HEAT_Y	CRANKCASE HEATER
T4	OUTDOOR AMBIENT TEMP. SENSOR	HEAT_D	CHASSIS HEATER
T2B	INDOOR COIL OUTLET TEMP. SENSOR	SV	REVERSING VALVE
COMP TOP	COMP. TOP OLP TEMP. SENSOR	EBV	ELECTRONIC BALL VALVE
H-PRO	HIGH PRESSURE SWITCH	XT1~5	TERMINAL BLOCK
L-PRO	LOW PRESSURE SWITCH		

Notes:

COMP. TOP OLP TEMP. SENSOR is only for hyper heat models.

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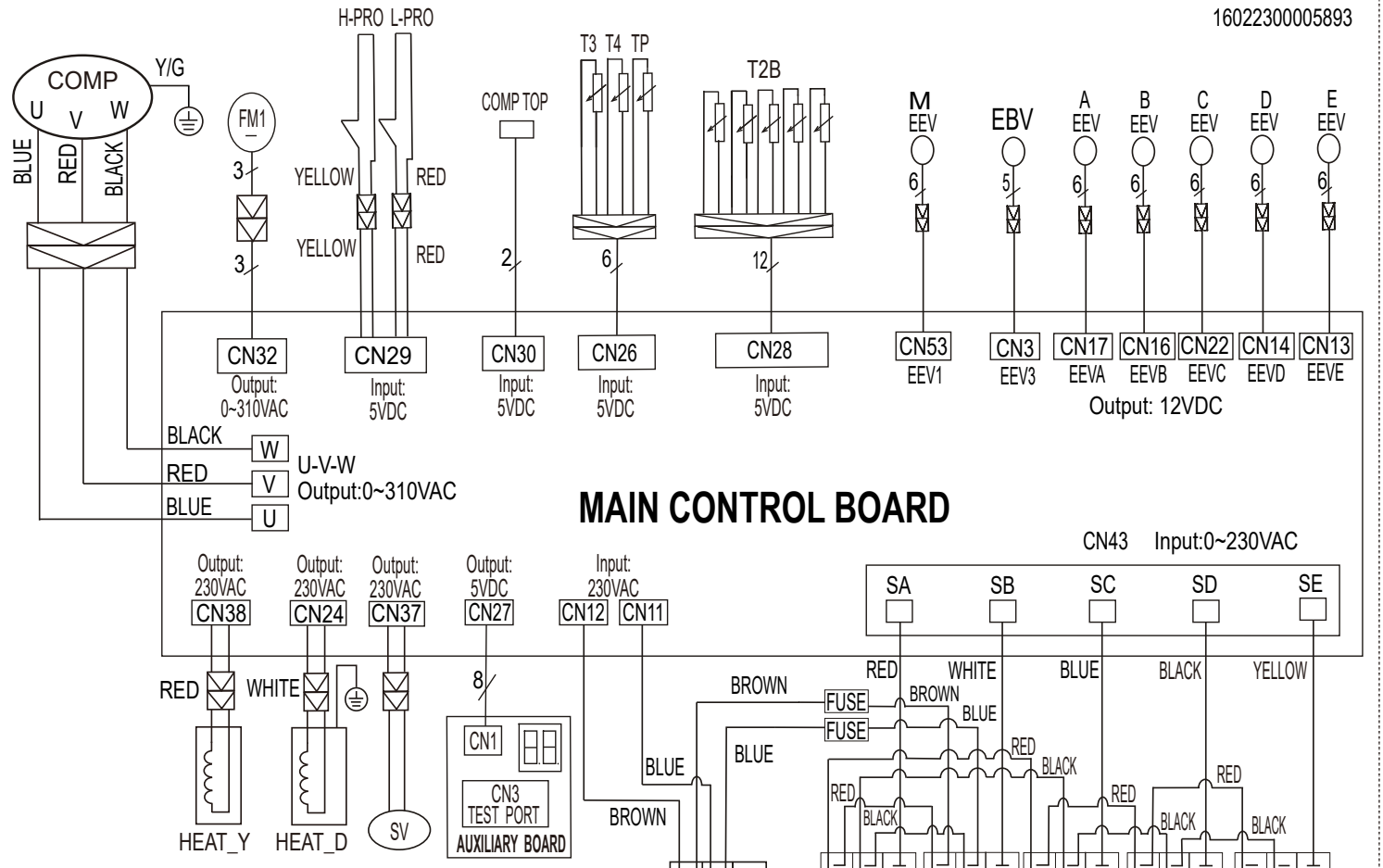
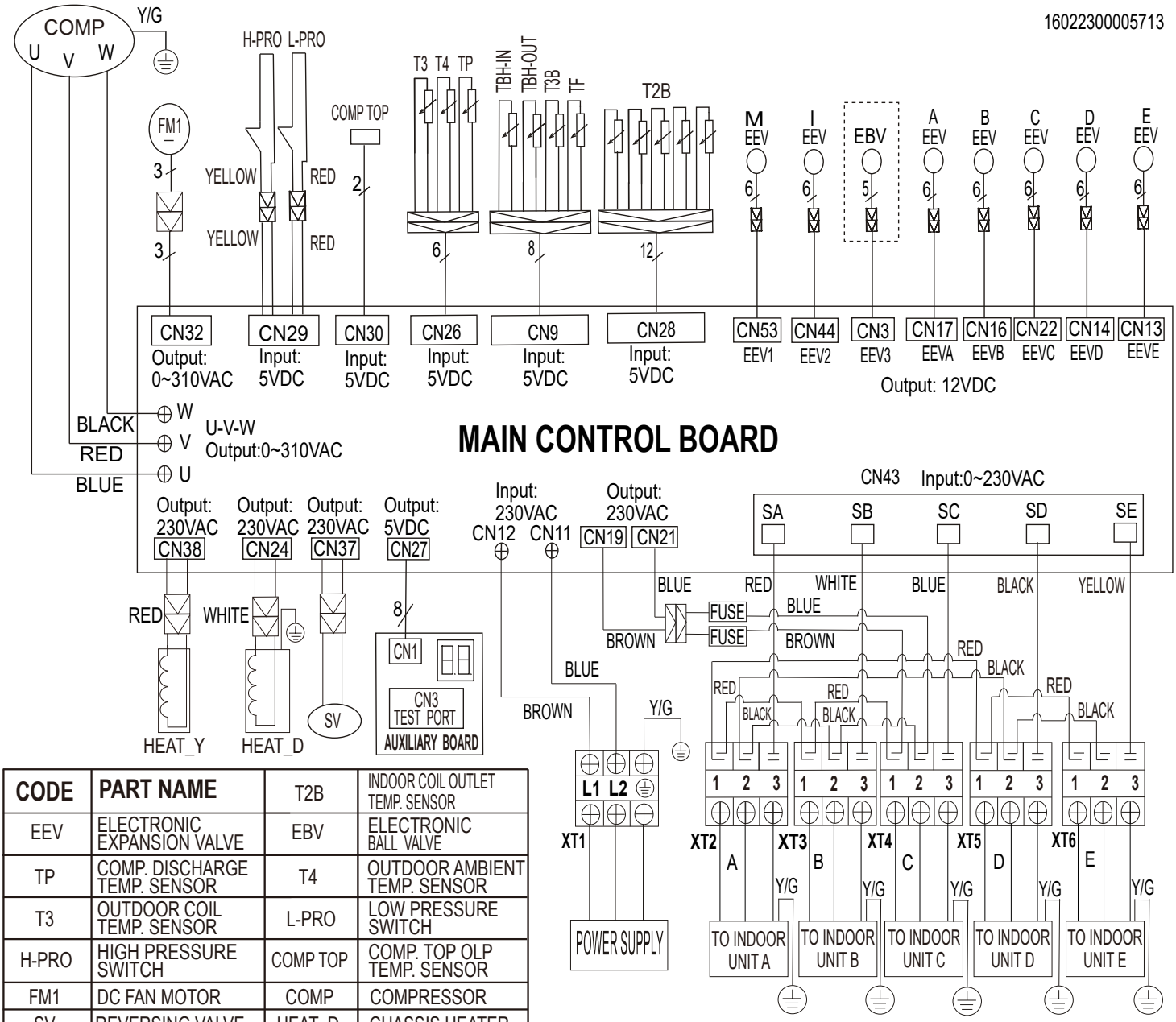


CODE	PART NAME	CODE	PART NAME
EEV	ELECTRONIC EXPANSION VALVE	FM1	DC FAN MOTOR
TP	COMP. DISCHARGE TEMP. SENSOR	COMP	COMPRESSOR
T3	OUTDOOR COIL TEMP. SENSOR	HEAT_Y	CRANKCASE HEATER
T4	OUTDOOR AMBIENT TEMP. SENSOR	HEAT_D	CHASSIS HEATER
T2B	INDOOR COIL OUTLET TEMP. SENSOR	SV	REVERSING VALVE
COMP TOP	COMP. TOP OLP TEMP. SENSOR	EBV	ELECTRONIC BALL VALVE
H-PRO	HIGH PRESSURE SWITCH	XT1~6	TERMINAL BLOCK
L-PRO	LOW PRESSURE SWITCH		

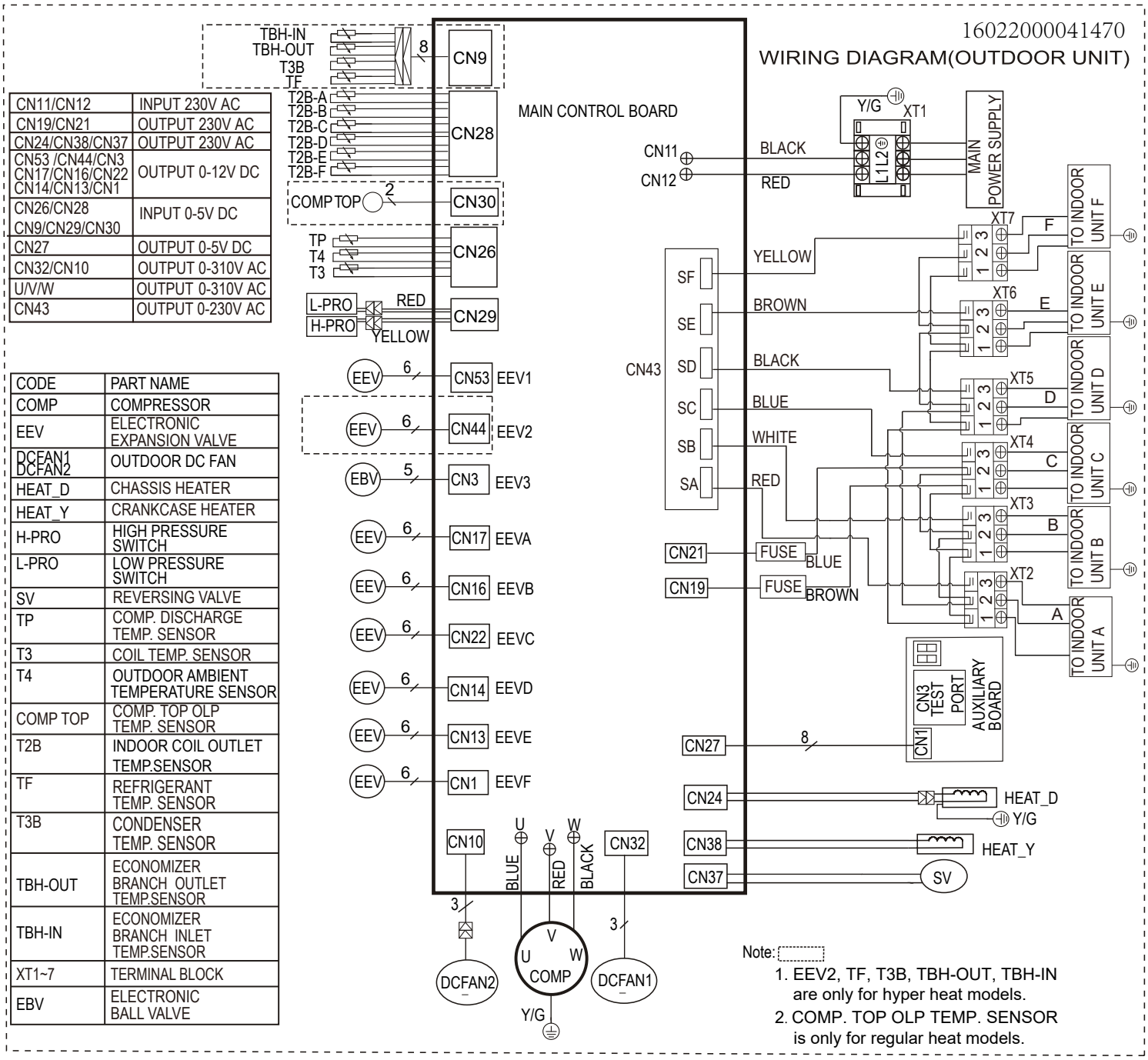
DRA5H36M2A



CODE	PART NAME	T2B	INDOOR COIL OUTLET TEMP. SENSOR
EEV	ELECTRONIC EXPANSION VALVE	EBV	ELECTRONIC BALL VALVE
TP	COMP. DISCHARGE TEMP. SENSOR	T4	OUTDOOR AMBIENT TEMP. SENSOR
T3	OUTDOOR COIL TEMP. SENSOR	L-PRO	LOW PRESSURE SWITCH
H-PRO	HIGH PRESSURE SWITCH	COMP TOP	COMP. TOP OLP TEMP. SENSOR
FM1	DC FAN MOTOR	COMP	COMPRESSOR
SV	REVERSING VALVE	HEAT_D	CHASSIS HEATER
HEAT_Y	CRANKCASE HEATER	XT1~6	TERMINAL BLOCK
TBH-IN	ECONOMIZER BRANCH INLET TEMP.SENSOR	TBH-OUT	ECONOMIZER BRANCH OUTLET TEMP.SENSOR
TF	REFRIGERANT TEMP. SENSOR	T3B	CONDENSER TEMP. SENSOR

Notes:
EBV is only for the units with shut-off valve.

DRA6H48M2A, DRA6U48M2A, DRA6H55M2A, DRA6U60M2A



CN11/CN12	INPUT 230V AC
CN19/CN21	OUTPUT 230V AC
CN24/CN38/CN37	OUTPUT 230V AC
CN53 /CN44/CN3 CN17/CN16/CN22 CN14/CN13/CN1	OUTPUT 0-12V DC
CN26/CN28 CN9/CN29/CN30	INPUT 0-5V DC
CN27	OUTPUT 0-5V DC
CN32/CN10	OUTPUT 0-310V AC
U/V/W	OUTPUT 0-310V AC
CN43	OUTPUT 0-230V AC

CODE	PART NAME
COMP	COMPRESSOR
EEV	ELECTRONIC EXPANSION VALVE
DCFAN1 DCFAN2	OUTDOOR DC FAN
HEAT_D	CHASSIS HEATER
HEAT_Y	CRANKCASE HEATER
H-PRO	HIGH PRESSURE SWITCH
L-PRO	LOW PRESSURE SWITCH
SV	REVERSING VALVE
TP	COMP. DISCHARGE TEMP. SENSOR
T3	COIL TEMP. SENSOR
T4	OUTDOOR AMBIENT TEMPERATURE SENSOR
COMP TOP	COMP. TOP OLP TEMP. SENSOR
T2B	INDOOR COIL OUTLET TEMP.SENSOR
TF	REFRIGERANT TEMP. SENSOR
T3B	CONDENSER TEMP. SENSOR
TBH-OUT	ECONOMIZER BRANCH OUTLET TEMP.SENSOR
TBH-IN	ECONOMIZER BRANCH INLET TEMP.SENSOR
XT1~7	TERMINAL BLOCK
EBV	ELECTRONIC BALL VALVE

ERROR AND OPERATING CODES

Error Code	Operation or Malfunction Description	Error Code	Operation or Malfunction Description
dF	Defrost	FHCC	Refrigerant sensor error
FC	Forced Cooling	LC 06	High temperature protection of Inverter module (IPM)
EC07	ODU fan speed out of control	PC00	ODU IPM module protection
EC50	ODU temp. sensor error	PC02	Compressor top (or IPM) temp. proteciton
EC51	ODU EEPROM parameter error	PC06	Discharge temperature protection of compressor
EC52	ODU coil temp. sensor (T3) error	PC08	ODU overcurrent protection
EC53	ODU ambient temp. sensor (T4) error	PC0A	High temperature protection of condenser
EC54	COMP. discharge temp. sensor (TP) error	PC0F	PFC module protection
EC55	ODU IPM module temperature sensor malfunction	PC0L	Low ambient temperature protection
EC56	IDU coil outlet temp. sensor (T2B) error	PC10	ODU low AC voltage protection
EC57	Refrigerant pipe temperature sensor error	PC11	ODU main control board DC bus high voltage protection
EC5A	Failure of enthalpy inlet temperature sensor	PC12	ODU main control board DC bus low voltage protection / 341 MCE error"
EC5b	Failure of enthalpy outlet temperature sensor	PC13	The AC power is cut off or the AC voltage detection circuit fails
EC5C	Pressure sensor failure	PC30	System high pressure protection
EC5E	ODU condenser temp. sensor (T3B) error	PC31	System low pressure protection
EC71	Over current failure of ODU DC fan motor	PC40	Communication error between ODU main chip and compressor driven chip
EC72	Lack phase failure of ODU DC fan motor	PC42	Compressor start failure of ODU
EHC1	Refrigerant sensor detects leakage	PC43	ODU compressor lack phase protection
EL01	IDU & ODU communication error	PC44	ODU zero speed protection
LC06	High temperature protection of Inverter module (IPM)	PC45	ODU IR chip drive failure
EHC3	Refrigerant sensor is out of range	PC46	Compressor speed has been out of control
EL 01	IDU & ODU communication error	PC49	Compressor overcurrent failure
EL0C	System lacks refrigerant	PCA1	Condensation protection of refrigerant pipe

JOB SITE INFORMATION SHEET

Site Information

Job Name: _____ Installation Date: _____

Address: _____ City: _____ State: _____ Zip: _____

Phone: _____ Email: _____

Contractor Information

Contractor Name: _____ Technician Name: _____

Address: _____ City: _____ State: _____ Zip: _____

Phone: _____ Email: _____

Outdoor Unit Information

Model #: _____ Serial #: _____

Unit Location: _____

_____

Outdoor Electrical Readings

Line Power Wire Color: L1 _____ L2 _____ G _____

Line Voltage (Power Off): L1 to L2 _____ L1 to G _____ L2 to G _____

Line Voltage (Power On): L1 to L2 _____ L1 to G _____ L2 to G _____

Outdoor Thermal Readings

Discharge: _____°F Ambient: _____°F

Indoor System Information

A

Unit Information

Model #: _____ Serial #: _____

Type: _____ Location: _____

Refrigerant Line Size (Circle Liquid and Gas Line): 1/4" 3/8" 1/2" 5/8" Line Set Length: _____

Electrical Readings

Power/Control Wire Color: 1 _____ 2 _____ 3 _____

Voltage Readings: 1–2 _____ AC 2–3 _____DC

Thermal Readings

Return Air: _____°F Supply Air: _____°F Room Air: _____°F

Gas Line Saturation: _____°F Liquid Line Saturation: _____°F

B

Unit Information

Model #: _____ Serial #: _____

Type: _____ Location: _____

Refrigerant Line Size (Circle Liquid and Gas Line): 1/4" 3/8" 1/2" 5/8" Line Set Length: _____

Electrical Readings

Power/Control Wire Color: 1 _____ 2 _____ 3 _____

Voltage Readings: 1–2 _____ AC 2–3 _____DC

Thermal Readings

Return Air: _____°F Supply Air: _____°F Room Air: _____°F

Gas Line Saturation: _____°F Liquid Line Saturation: _____°F

C
DRA3

Unit Information

Model #: _____ Serial #: _____

Type: _____ Location: _____

Refrigerant Line Size 1/4" 3/8" 1/2" 5/8" Line Set Length: _____
(Circle Liquid and Gas Line):

Electrical Readings

Power/Control Wire Color: 1 _____ 2 _____ 3 _____

Voltage Readings: 1–2 _____ AC 2–3 _____DC

Thermal Readings

Return Air: _____°F Supply Air: _____°F Room Air: _____°F

Gas Line Saturation: _____°F Liquid Line Saturation: _____°F

D
DRA4

Unit Information

Model #: _____ Serial #: _____

Type: _____ Location: _____

Refrigerant Line Size 1/4" 3/8" 1/2" 5/8" Line Set Length: _____
(Circle Liquid and Gas Line):

Electrical Readings

Power/Control Wire Color: 1 _____ 2 _____ 3 _____

Voltage Readings: 1–2 _____ AC 2–3 _____DC

Thermal Readings

Return Air: _____°F Supply Air: _____°F Room Air: _____°F

Gas Line Saturation: _____°F Liquid Line Saturation: _____°F

E
DRA5

Unit Information

Model #: _____ Serial #: _____

Type: _____ Location: _____

Refrigerant Line Size 1/4" 3/8" 1/2" 5/8" Line Set Length: _____
(Circle Liquid and Gas Line):

Electrical Readings

Power/Control Wire Color: 1 _____ 2 _____ 3 _____

Voltage Readings: 1–2 _____ AC 2–3 _____DC

Thermal Readings

Return Air: _____°F Supply Air: _____°F Room Air: _____°F

Gas Line Saturation: _____°F Liquid Line Saturation: _____°F

F
DRA6

Unit Information

Model #: _____ Serial #: _____

Type: _____ Location: _____

Refrigerant Line Size 1/4" 3/8" 1/2" 5/8" Line Set Length: _____
(Circle Liquid and Gas Line):

Electrical Readings

Power/Control Wire Color: 1 _____ 2 _____ 3 _____

Voltage Readings: 1–2 _____ AC 2–3 _____DC

Thermal Readings

Return Air: _____°F Supply Air: _____°F Room Air: _____°F

Gas Line Saturation: _____°F Liquid Line Saturation: _____°F