A7CP21V

Cold Climate | Variable Capacity | Omniguard® Coil | R-454B | 60Hz

RESIDENTIAL
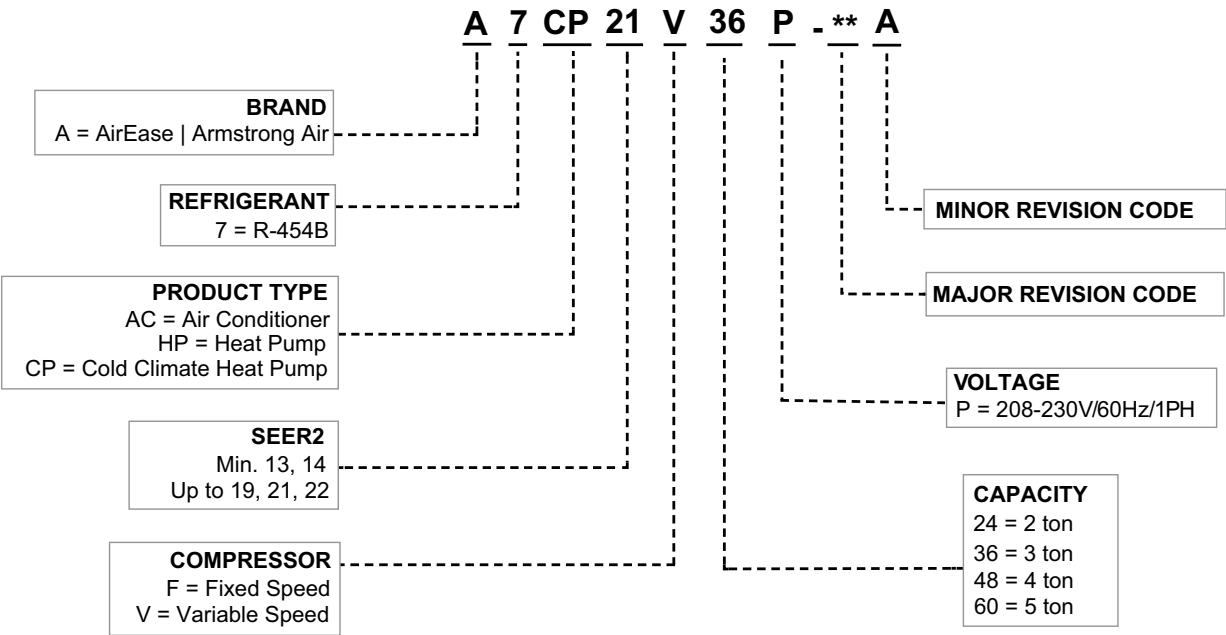## PRODUCT SPECIFICATIONS

2 to 5 Tons
SEER2 up to 21
HSPF2 up to 10

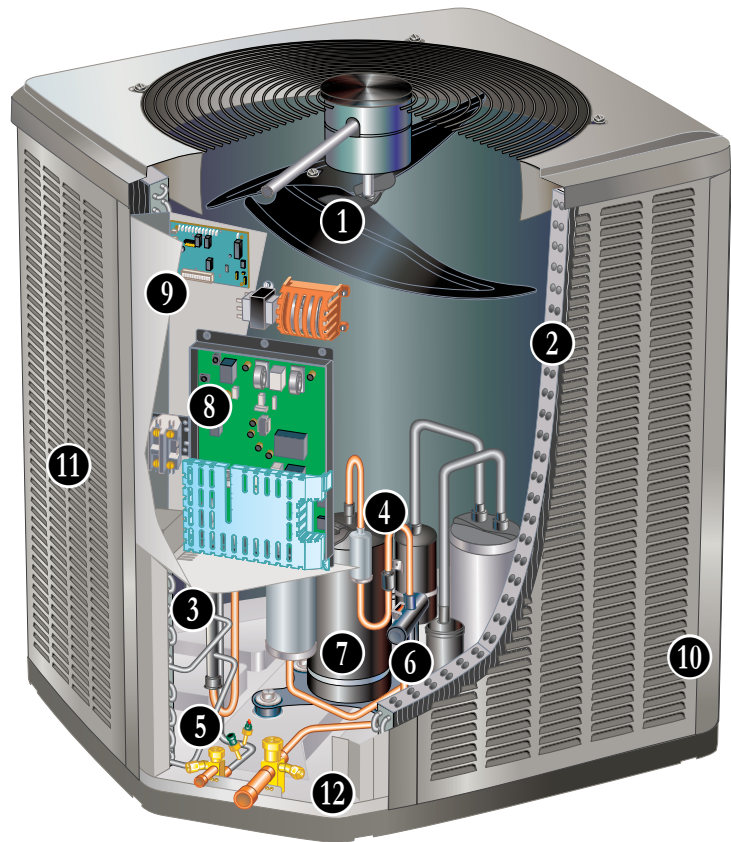Comfort Sync® A3 Smart Wi-Fi
Communicating Thermostat
(Not Furnished)

MODEL NUMBER IDENTIFICATION

A 7 CP 21 V 36 P - ** A

BRAND
A = AirEase | Armstrong Air

REFRIGERANT
7 = R-454B

PRODUCT TYPE
AC = Air Conditioner
HP = Heat Pump
CP = Cold Climate Heat Pump

SEER2
Min. 13, 14
Up to 19, 21, 22

COMPRESSOR
F = Fixed Speed
V = Variable Speed

MINOR REVISION CODE

MAJOR REVISION CODE

VOLTAGE
P = 208-230V/60Hz/1PH

CAPACITY
24 = 2 ton
36 = 3 ton
48 = 4 ton
60 = 5 ton

FEATURE HIGHLIGHTS

1. Outdoor Coil Fan
2. Omniguard® Coil
3. Electronic Check/Expansion Valve (EEV)
4. High Capacity Line Drier
5. High Pressure Suction Transducer
6. Four-Way Reversing Valve
7. Variable Capacity Compressor
8. DC Inverter Control
9. Communicating Control
10. Heavy Gauge Steel Cabinet
11. Louvered Steel Coil Protection
12. Refrigerant Line Connections and Access

CONTENTS

APPROVALS AND WARRANTY

APPROVALS

• AHRI Standard 210-240-2023 certified

• AHRI Certified system match-ups and expanded ratings, visit www.alliedratings.com

NOTE - AHRI certified ratings are based on the following control conditions:

A Comfort Sync® A3 Communicating thermostat matched with a "communicating" indoor unit.

Any conventional non-communicating thermostat matched with a conventional "non-communicating" indoor unit.

• ENERGY STAR® Certified

• Sound rated to AHRI Standard 270-2008 test conditions

• Rated According to U.S. Department of Energy (DOE) test procedures

• Unit and components ETL, NEC and CEC bonded for grounding to meet safety standards for servicing

• ETL certified (U.S. and Canada)

• ISO 9001 Registered Manufacturing Quality System

WARRANTY

• 10-year limited warranty on all parts,extended warranty available.

• Warranty provides for a total of 10-years of limited warranty.

• Coverage (Standard 5-year limited parts warranty plus an additional 5-year limited extended parts warranty).

• Warranty must be registered online within 60 days of installation to qualify for 10-year coverage.

• Unregistered equipment defaults to 5-year coverage.

• See full warranty at www.alliedratings.com for terms, conditions, and exclusions.

FEATURES

APPLICATIONS

• 2 through 5 tons

• Sound levels as low as 62 dBA

• Cold climate heating operation down to –15°F

• Single-phase power supply

• Applicable to indoor air handlers or gas furnaces with indoor add-on coils

• Shipped completely factory assembled, piped and wired

NOTE - When heat pumps are used with gas furnaces, a dual-fuel compatible thermostat or zone control system with dual-fuel capabilities must be used (order separately).

NOTE - Installer must set outdoor unit, connect refrigerant lines and make electrical connections to complete job.

REFRIGERATION SYSTEM

R-454B Refrigerant

• Low GWP (Global Warming Potential)

• Zero ODP (Ozone Depletion Potential)

• Low Toxicity/Lower Flammability - A2L

• Unit is factory pre-charged

NOTE - Total system refrigerant charge is dependent on outdoor unit size, indoor unit size and refrigerant line length.

NOTE - Refer to the unit-mounted charging sticker to determine correct amount of charge required.

❶ Outdoor Coil Fan

• Direct drive fan

• ECM motor

• Vertical air discharge

• Totally enclosed fan motor

• Ball bearings

• Inherently protected

• PVC (polyvinyl chloride) coated steel fan guard

❷ Omniguard® Coil

• Enhanced aluminum alloy tube/enhanced fin coil

• Superior corrosion resistance

• Ripple-edged aluminum fins

• Aluminum tube construction

• Lanced fins for maximum fin surface exposure

• Fin collars grip tubing for maximum contact area

• Flared shoulder tubing connections

• Factory tested under high pressure

• Entire coil is accessible for cleaning

FEATURES

REFRIGERATION SYSTEM (continued)

❸ Electronic Check/Expansion Valve (EEV) - Outdoor Unit
- Designed and sized for heat pump systems
- Precise refrigerant flow is controlled by signals from the Communicating Control
- Measures pressure and temperature for precise superheat control

Discharge Temperature Switch
- Shuts off unit if operating conditions cause the compressor discharge line temperature to rise above setpoint
- Protects compressor from excessive pressure / temperature
- Automatic reset when temperature drops below setpoint

❹ High Capacity Line Drier
- Protects the system from high pressure conditions
- Automatic reset

Low Pressure Transducer
- Shuts off unit if suction pressure falls below setting
- Provides loss of charge and freeze-up protection
- Automatic reset

❺ High Pressure Suction Transduce
- Factory installed in the suction line
- Drier traps moisture or dirt that could contaminate the system.
- 100% molecular-sieve, bead type, drier

❻ Four-Way Reversing Valve
- Rapid changeover of refrigerant flow direction from cooling to heating and vice versa
- Operates on pressure differential between outdoor unit and indoor coil

Optional Accessories

Check/Expansion Valve Kits
- Field installed on indoor units (if required)
- See TXV Usage table
- Chatleff-style fitting

Freezestat
- Senses suction line temperature
- Cycles compressor off when suction line temperature falls below it's setpoint
- Opens at 29°F and closes at 58°F
- Installs on or near the discharge line of the evaporator or on the suction line

INDOOR REFRIGERANT DETECTION SYSTEM (RDS)
- Complies with UL 60335-2-40 approved standard
- Required for all systems using R-454B refrigerant
- Factory or field installed on all indoor units
- Consists of a refrigerant detection sensor and a mitigation control in the indoor unit
- Ensures safe operation for systems equipped with R-454B refrigerant
- Indoor sensor will detect any R-454B refrigerant
- If R-454B refrigerant is detected, the refrigerant detection system will stop compressor operation and operate the blower to reduce concentrations in the conditioned space
- Once safe levels are reached the HVAC system will resume normal operation
- Refer to indoor unit Product Specifications documents for additional details

❼ Variable Capacity Compressor
- High volumetric efficiency
- Uniform suction flow
- Constant discharge flow
- Quiet operation
- Low gas pulses during compression reduces operational sound levels
- Compressor motor is internally protected from excessive current and temperature
- Compressor is installed in the unit on resilient rubber mounts for vibration free operation

FEATURES

Rotary Compressor Operation

- Rotary compressor has a cylindrical chamber
- A roller is mounted to the motor shaft and is offset to rotate in the center of the chamber
- Two spring-loaded vanes sweep the sides of the chamber as the roller rotates
- Roller touches the chamber at a point between the intake and the discharge ports as the roller rotates
- While rotating, the roller draws vapor into the chamber through the intake port
- Vapor is trapped in the space between the chamber wall, the vane, and the point of contact between the roller and the chamber
- As the next vane passes the contact point vapor is compressed
- The space becomes smaller compressing the vapor as the roller rotates
- Vapor is discharged through the discharge port

Compressor Crankcase Heater

- Protects against refrigerant migration that can occur during low ambient operation
- Factory Installed

Compressor Sound Dampening System
- Polyethylene compressor
- 2 inch thick batt fiberglass insulation
- All open edges sealed with one-inch wide hook and loop fastening tape
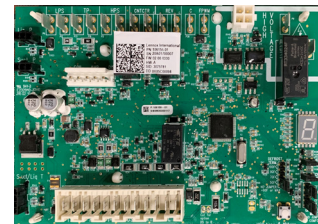
<u>CONTROLS</u>

8 DC Inverter Control

- Converts AC line voltage into filtered variable DC voltage
- Provides continuous compressor operation, while adjusting the capacity according to indoor temperature
- Adjusts compressor output in increments as small as 1%
- The accurate sensing of the cooling or heating load prevents frequent changes in capacity and ensures efficient, economical operation
- Power Factor Correction (PFC) circuit monitors the DC bus for high, low and abnormal voltage conditions to protect the compressor
- Two LEDS (red and green) indicate inverter operating status and aid in troubleshooting
- Noise filter reduces unwanted electromagnetic interference (EMI)
- Integrated on the Allied Communicating Control for 024 and 036 models
- Separate external inverter control for 048 and 060 models

- The inverter reactor (mounted separately) adds inductance to the line between the inverter and the compressor to limit current rise and protect the compressor

9 Communicating Control

- Advanced control communicates information about various operating parameters in the heat pump to the Allied Communicating Thermostats to constantly maintain the highest level of comfort, performance and efficiency available
- Connections for connecting a conventional heating/cooling thermostat are also provided on the control
- Auto Configuration - On start-up the control automatically sends a description of the unit to the Allied Communicating Thermostat to automatically configure the features available
- Control also features:
  - **Seven-Segment Display** - Shows information about outdoor unit type and capacity and also displays alerts for common fault conditions (electrical and mechanical)
  - **Low Voltage Protection** - Prevents compressor operation when voltage is not within the specified range
  - High and low pressure switch monitoring with provisions for lockout
  - Five-Strike lockout protection protects compressor
  - Liquid line temperature and sensor monitoring
  - EEPROM storage of all local configurations
  - Non-volatile memory storage of 100 alarm codes with display of last 10 codes for troubleshooting
  - Built-in low-ambient control

NOTE - Two RAST connectors for a conventional heating/cooling thermostat are also provided for connecting to the control. A two-stage or single-stage thermostat can be used.

Low Ambient Cooling Operation

- Unit can operate down to 0°F outdoor air temperature in the cooling mode

NOTE - A freezestat is recommended for extra protection during low ambient cooling operation.

Cold Climate Heating Operation

- Unit can operate down to −15°F in the heating mode

Climate Sync™ Technology

- Optimizes dehumidification settings for specific climates to improve home comfort during cooling or heating operation
- Monitors regional weather conditions and automatically removes excess humidity when necessary

CONTROLS (continued)

Comfort Sync® A3 Ultra-Smart Communicating Thermostat Settings:

Cooling Mode

- Three climate settings are available:
  - Dry - The system supplies higher indoor airflow at all compressor capacities, increasing efficiency by operating at a higher sensible to total ratio
  - Moderate - The system supplies indoor airflow that balances efficiency and comfort
  - Humid - The system supplies lower indoor airflow at all compressor capacities, improving humidity removal by operating at a lower sensible to total ratio

Heating Mode

- Two climate settings are available:
  - Normal - Heats the home with the highest efficiency
  - Comfort - System reduces indoor airflow, increasing supply air temperature
- Climate Sync™(Auto) - Dry, Normal, Basic and Humid modes are automatically set based on the difference between the measured relative humidity and the relative humidity setting
- All modes are selected on the Allied Communicating Thermostat

Outdoor Air Temperature Sensor

- Used with Allied Communicating Thermostats
- Sensor allows thermostat to display outdoor temperature
- Sensor is auto-detected when connected to thermostat

NOTE - The A7CP21V Heat Pump can be used with a Allied Communicating Thermostat matched with a "communicating" indoor unit, or a conventional non-communicating thermostat matched with a "non-communicating" indoor unit.

Thermostat	Model No.	Indoor Unit Type
Communicating	A3	Communicating
Non-Communicating	Conventional thermostat	Non-Communicating

Optional Accessories

- Comfort Sync® A3 Ultra-Smart Communicating Thermostat
- Recognizes and connects to all branded Communicating products to automatically configure and control the heating/cooling system (based on user-specified settings) for the highest level of comfort, performance and efficiency

- Recognizes model and serial number information for branded Communicating products to simplify system setup
- Smart Room Sensors can be added to the system
- Smart home automation compatible with Amazon Alexa®, and Google Assistant
- Sends service alerts and reminders
- Thermostat App features Wi-Fi remote temperature monitoring and adjustment through a home wireless network apps for smartphones or tablets
- Technician App allows installer to manage systems in the home
- Simple easy-to-use touchscreen allows complete system configuration
- Scheduled maintenance alerts, system warnings and troubleshooting are also displayed on thermostat screen
- Easy to read 7 inch high definition color display (measured diagonally)
- Conventional outdoor units (not Communicating) can easily be added and controlled by the A3 Thermostat
- Installer setup screens allow quick and simple system configuration without a manual, Installer can also run tests on complete system or individual components for easy maintenance and troubleshooting
- Serial communications bus (RSBus), with less wiring than a conventional heating/cooling system, allows system communication
- Uses standard 4-wire unshielded thermostat wiring
- High Definition Color Display with Subbase and wallplate furnished for easy installation

⑩ Heavy Gauge Steel Cabinet

- Composite unit base and top resists corrosion
- Heavy gauge louvered steel panels surround unit on all four sides
- Pre-painted powder paint finish for all metal surfaces
- Control box is conveniently located with all controls factory wired
- Corner patch plate allows access to compressor components
- Drainage holes are provided in base section for moisture removal

FEATURES

- Composite base raises the unit off of the mounting surface, away from damaging moisture

⑪ Louvered Steel Coil Protection
- Steel louvered panels provides complete coil protection
- Lift-off panels are easily removed to allow easy cleaning and servicing of coils

⑫ Refrigerant Line Connections, Electrical Inlets and Service Valves
- Sweat connection vapor and liquid lines
- Located on corner of unit cabinet
- Vapor valve can be fully shut off, while liquid valve may be front seated to manage refrigerant charge while servicing system
- Refrigerant line connections and field wiring inlets are located in one central area of the cabinet
- See dimension drawing

Braze-Free/Press Fitting Flexibility
- Units can accommodate braze-free or press fittings for installation versatility

Optional Accessories

Snow Guards
- For use in locations where the possibility of heavy snow or freezing rain accumulation may occur
- Custom injection molded snow guard deflects snow and ice away from the outdoor fan and prevents build-up on the fan guard

Stand-Off Guard-Edge Raiser Kit
- High density polyethylene feet raise unit off of mounting surface
- Available in 3 in. (76 mm) and 6 in. (152 mm) heights
- Four feet are furnished per order number

SPECIFICATIONS

Size		024	036	048	060
Nominal Tonnage		2	3	4	5
Sound Data Range	dBA	63-68	62-72	63-75	63-78
Connections (Sweat)	Liquid line (OD) - in.	3/8	3/8	3/8	3/8
	Vapor line (OD) - in.	3/4	7/8	7/8	1-1/8
Compressor Type		Variable Rotary	Variable Rotary	Variable Rotary	Variable Rotary
Refrigerant	[1] R-454B charge furnished	9 lbs. 10 oz.	9 lbs. 14 oz.	12 lbs. 11 oz.	14 lbs. 2 oz.
Indoor Unit Expansion Valve (TXV)		**26Z70**	**26Z70**	**26Z71**	**26Z72**
Outdoor Coil	Net face area - ft.² Outer coil	30.5	30.5	26.1	30.5
	Inner coil	- - -	- - -	25.4	29.6
	Tube diameter - in.	5/16	5/16	5/16	5/16
	Rows	1	1	2	2
	Fins - in.	22	22	22	22
Outdoor Fan	HP	1/3	1/3	1/3	1/3
	Diameter - in.	28	28	28	28
	Blades	2	2	2	2
	Cfm - minimum speed	1216	1216	2532	2594
	maximum speed	5011	5011	5450	5450
	Rpm - minimum speed	206	206	415	425
	maximum speed	855	855	945	945
	Watts - minimum speed	10	10	40	41
	maximum speed	236	236	282	282
Shipping Data - lbs.		263	263	284	318

ELECTRICAL DATA

	Line voltage data (Volts-Phase-Hz)	208/230-1-60	208/230-1-60	208/230-1-60	208/230-1-60
	[2] Maximum overcurrent protection (MOCP) amps	20	30	45	50
	[3] Minimum circuit ampacity (MCA)	15.0	20.1	26.9	32.5
Compressor	Input amps	9.9	14.0	19.5	24.0
Fan Motor	Full load amps	2.6	2.6	2.6	2.6

OPTIONAL CONTROLS - ORDER SEPARATELY

A3 Smart Wi-Fi Thermostat	1.841226	•	•	•	•

OPTIONAL ACCESSORIES - ORDER SEPARATELY

Freezestat	3/8 in.	93G35	•	•	•	•
[4] **Snow Guard**	35-3/8x35-3/8 in. (893x897mm)	27G70	•	•	•	•
Stand-Off Guard-Edge Raiser Kit	3 in. (76 mm)	27X34	•	•	•	•
	6 in. (152 mm)	27X35	•	•	•	•

NOTE - Extremes of operating range are plus 10% and minus 5% of line voltage.

[1] Refrigerant charge sufficient for 15 ft. length of refrigerant lines. For longer line set requirements see the Installation Instructions for information about line set length and additional refrigerant charge required.

[2] HACR type breaker or fuse.

[3] Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

[4] Adds 12 - 1/2 inches (318 mm) to unit height.

EXPANDED SOUND DATA

Size	Octave Band Sound Power Levels dBA, re 10⁻¹² Watts Center Frequency - HZ							¹ Sound Rating Number (dBA)	² Estimated Sound Pressure Level at Distance From Unit (dBA at distance in ft.)				
	125	250	500	1000	2000	4000	8000		3	5	10	15	50
024 Min.	51	59.5	52.5	52	53.5	49	48	63	56	51	45	42	31
024 Max.	52.5	60.5	64	58.5	59.5	60.5	54	68	61	56	50	47	36
036 Min.	50.5	59.5	52.5	51	53.5	49.5	49	62	55	50	44	41	30
036 Max.	54.5	62.5	64.5	66.5	63.5	65	56	72	65	60	54	51	40
048 Min.	53	56.5	58.5	54.5	53	46	38.5	63	56	51	45	42	31
048 Max.	57.5	66	71	67	65.5	66.5	57	75	68	63	57	54	43
060 Min.	51.5	57.5	59	53.5	53	47	46.5	63	56	51	45	42	31
060 Max.	60	72.5	72	68.5	70.5	66	57	78	71	66	60	57	46

NOTE - The octave sound power data does not include tonal correction.

¹ Tested according to AHRI Standard 270-2008 test conditions. Sound rating Number is the overall A-Weighted Sound Power Level (Lwₐ), dBA (100 Hz to 10,000 Hz).

² Estimated sound pressure level at distance based on AHRI Standard 275-2010 method for equipment located on the ground, roof, or on side of building wall with no adjacent reflective surface within 9.8 feet. Sound pressure levels will increase based on changes to assumptions. For other applications, refer to AHRI Standard 275.

FIELD WIRING
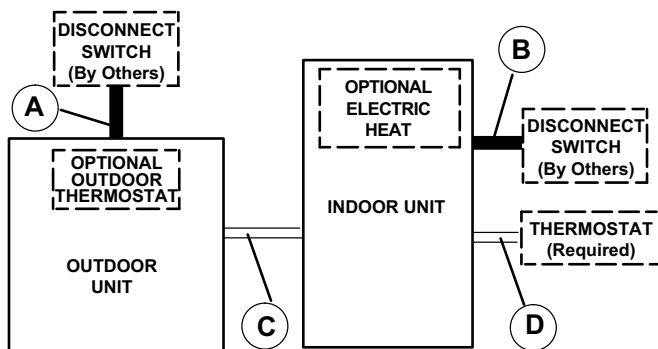
A- Two Wire Power

B- Two or Three Wire Power (size to heater capacity)

C - Comfort Sync® Thermostat:
- Four Wire, 18AWG (RSBus)

C - Conventional Thermostat:
- Eight Wire Low Voltage, 18AWG
- Ten Wire Low Voltage, 18AWG with Optional Outdoor Thermostat

D - Comfort Sync® Thermostat:
- Four Wire, 18 to 22AWG (RSGBus) standard thermostat cable for terminals (R, C, I+, I-).

D - Conventional Thermostat:
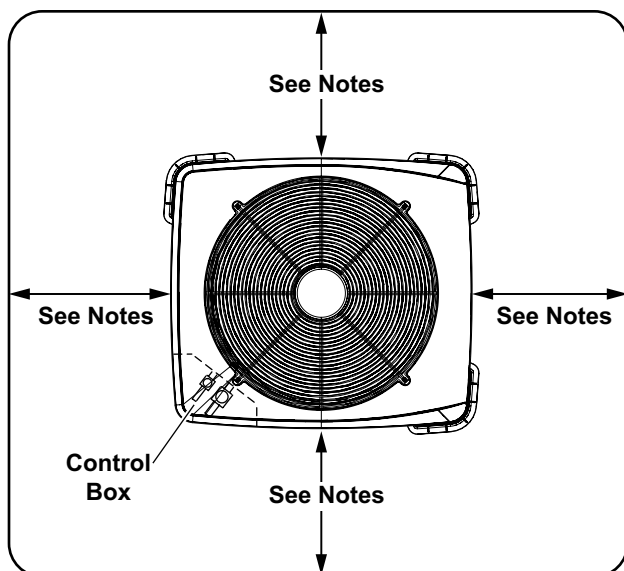- Twelve Wire Low Voltage, 18AWG
- Fourteen Wire Low Voltage, 18AWG with Optional Outdoor Thermostat

NOTE - All wiring must conform to NEC or CEC and local electrical codes.

NOTE - Refer to the A3 Installation Instructions for optional wiring connections for communicating thermostats.
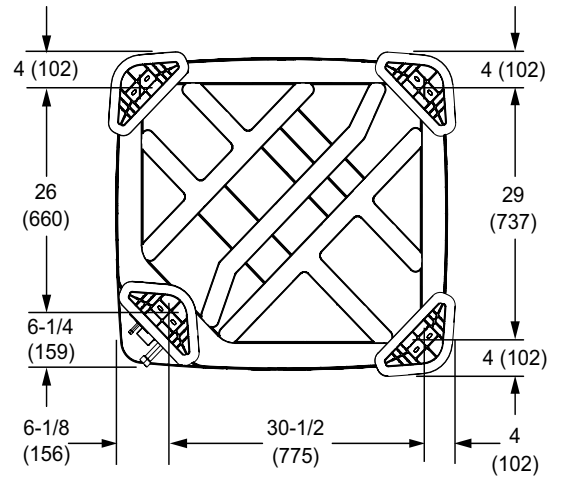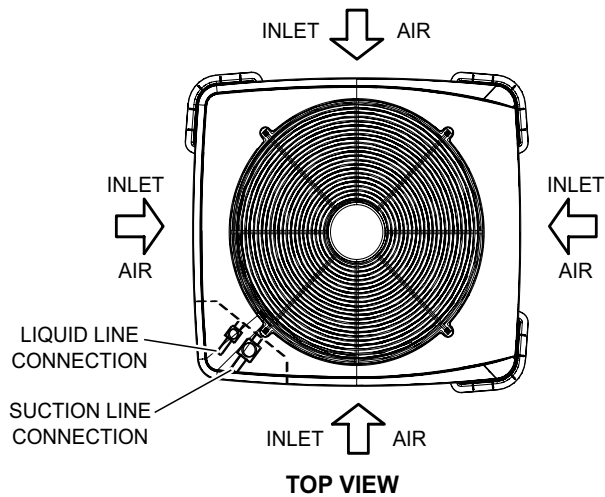
NOTE - Field wiring is not furnished.
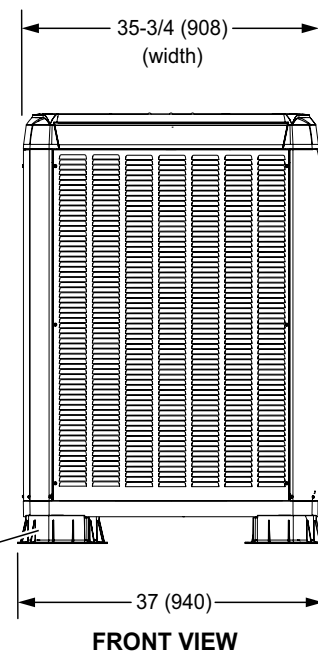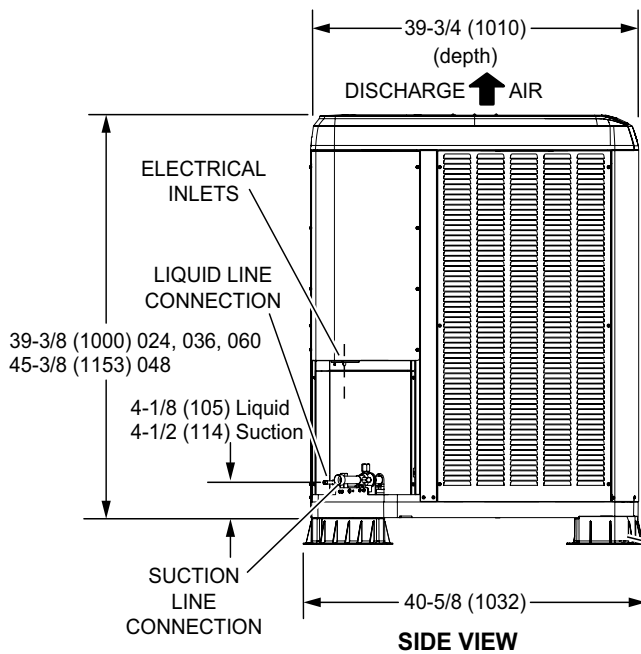
INSTALLATION CLEARANCES

NOTES:
- Service Clearance − 30 in. (762 mm) on one of the sides adjacent to the Control Box.
- One of other three sides must be 36 in. (914 mm).
- One of the two remaining sides may be 12 in. (305 mm).
- The remaining side may be 6 in. (152 mm).
- 48 in. (1219 mm) clearance required on top of unit
- 24 in. (610 mm) required between two units

DIMENSIONS - UNIT

INLET ⬇ AIR

INLET ➡ AIR

INLET ⬅ AIR

INLET ⬆ AIR

LIQUID LINE CONNECTION

SUCTION LINE CONNECTION

TOP VIEW

4 (102)

4 (102)

26 (660)

29 (737)

6-1/4 (159)

4 (102)

6-1/8 (156)

30-1/2 (775)

4 (102)

BOTTOM VIEW BASE SECTION
(With Optional Standoff Kit)

39-3/4 (1010)
(depth)

DISCHARGE ⬆ AIR

ELECTRICAL INLETS

LIQUID LINE CONNECTION

39-3/8 (1000) 024, 036, 060
45-3/8 (1153) 048

4-1/8 (105) Liquid
4-1/2 (114) Suction

SUCTION LINE CONNECTION

40-5/8 (1032)

SIDE VIEW

35-3/4 (908)
(width)

¹ OPTIONAL STAND-OFF GUARD-EDGE RAISER KIT (4) (Field Installed)

37 (940)

FRONT VIEW

¹ Adds 3 in. (76 mm) or 6 in. (152 mm) to unit height

TXV USAGE

All coils and air handlers are shipped with a factory installed TXV. In most cases, no substitution is needed. If a different size TXV is required, it will be listed in the "TXV SUBSTITUTION" table by size. The correct TXV must be ordered separately and field installed.

Size	Order Number
024	**26Z70**
036	**26Z70**
048	**26Z71**
060	**26Z72**

AHRI STANDARD 210-240-2023

Cooling or heating capacities are net values, including the effects of blower motor heat, and do not include supplementary heat. Power input is the total power input to the compressor(s) and fan(s), plus any controls and other items required as part of the system for normal operation.

Units which do not have an indoor air-circulating blower furnished as part of the model, i.e., split system with indoor coil only, is established by subtracting from the total cooling capacity 1250 Btu/h per 1,000 cfm, and by adding the same amount to the heating capacity.

Total power input for both heating and cooling is increased by 365 W per 1,000 cfm of indoor air circulated.

TXV SUBSTITUTION - R-454B

A general guide for replacing the factory installed R-454B TXV if the indoor unit (coil/air handler) is larger or smaller than the outdoor unit.

Outdoor Unit		Indoor Unit		Indoor TXV Furnished	Indoor TXV Replacement
Size	Tons	Size	Tons		
024	2	42	3.5	**26Z71**	**26Z70**
024	2	48	4	**26Z71**	**26Z70**
024	2	49	4	**26Z71**	**26Z70**
024	2	50/60	4/5	**26Z71**	**26Z70**
024	2	51/61	4/5	**26Z71**	**26Z70**
024	2	60	5	**26Z72**	**26Z70**
036	3	42	3.5	**26Z71**	**26Z70**
036	3	48	4	**26Z71**	**26Z70**
036	3	49	4	**26Z71**	**26Z70**
036	3	50/60	4/5	**26Z71**	**26Z70**
036	3	51/61	4/5	**26Z71**	**26Z70**
036	3	60	5	**26Z72**	**26Z70**
048	4	30/36	2.5/3	**26Z70**	**26Z71**
048	4	36	3	**26Z70**	**26Z71**
048	4	60	5	**26Z72**	**26Z71**
060	5	50/60	4/5	**26Z71**	**26Z72**
060	5	51/61	4/5	**26Z71**	**26Z72**

TXV Ranges:

26Z70 - 1.5 to 3 ton systems - Use on 3 ton (036) and lower systems.

26Z71 - 3.5-4 ton systems - Use on 4 ton (048) and down to 3.5 ton (042) systems.

26Z72 - 5 ton systems - Use on 5 ton (060) systems only.

AHRI CERTIFIED™
www.ahridirectory.org
Unitary Small HP
AHRI Standard 210/240
Certification applies only when the complete system is listed with AHRI.

HRAI
✓MEMBER COMPANY

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Contact us at 1-800-448-5872