

**280A EVOLUTION® EXTREME  
VARIABLE SPEED HEAT PUMP  
WITH PURON® REFRIGERANT  
(2 - 5 Ton)**



## Advance Product Data



Bryant's 280A Evolution® Extreme is a breakthrough product providing up to 13 HSPF heating efficiency and up to 20.5 SEER cooling efficiency. The variable speed capacity control results in strong heating capacity as the outdoor temperature drops resulting in less reliance on auxiliary heat. Lower speed operation, when needed in cooling, for enhanced comfort and dehumidification.

This product has been designed and manufactured to meet Energy Star® criteria for energy efficiency when matched with appropriate coil components. Refer to the combination ratings in the Product Data for system combinations that meet Energy Star® guidelines.

**NOTE: Ratings contained in this document are subject to change at any time. Always refer to the AHRI directory ([www.ahridirectory.org](http://www.ahridirectory.org)) for the most up-to-date ratings information.**

### INDUSTRY LEADING FEATURES / BENEFITS

#### Energy Efficiency

- Up to 20.5 SEER/13.0 HSPF  
(based on tested combinations)
- Microtube Technology™ refrigeration system
- Indoor air quality accessories available

#### Sound

- Sound level as low as 58 dBA in low speed .

#### Comfort

- Variable speed compressor with capacity range from 40-100%
- Air cooled Inverter variable speed drive
  - System requires Evolution Control (SYSTXBBUID01-D or SYSTXBBUIZ01-D software version 23 or newer)

#### Reliability

- Puron® refrigerant - environmentally sound, won't deplete the ozone layer and low lifetime service cost.
- Front-seating service valves
- Evolution® Extreme Intelligence actively monitors critical system parameters
- High pressure switch
- Suction pressure transducer
- Electronic expansion valve (EXV) for heating, TXV for cooling
- Filter drier (field installed)
- External Muffler (field installed)
- Internal crankcase heater standard

#### Flexibility and installation:

- 2 control wires to outdoor unit
- Minimum and maximum airflow adjustments
- Compressor heating RPM control
- Hybrid Heat™ Dual Fuel capable

#### Durability

DuraGuard™ protection package:

- Solid, Durable sheet metal construction
- Steel louver coil guard
- Baked-on, complete outer coverage, powder paint

#### Applications

- Long-line - up to 250 feet (76.2 m) total equivalent length, up to 200 feet (60.96 m) condenser above evaporator, or up to 80 ft. (24.38 m) evaporator above condenser (See Longline Guide for more information.)

## MODEL NUMBER NOMENCLATURE

|                |                     |             |              |                           |                    |                  |   |   |               |               |               |                     |
|----------------|---------------------|-------------|--------------|---------------------------|--------------------|------------------|---|---|---------------|---------------|---------------|---------------------|
| 1              | 2                   | 3           | 4            | 5                         | 6                  | 7                | 8 | 9 | 10            | 11            | 12            | 14                  |
| N              | N                   | N           | A            | A/N                       | N                  | N                | N | N | A/N           | A/N           | N             | A                   |
| 2              | 8                   | 0           | A            | N                         | V                  | 0                | 3 | 6 | 0             | 0             | 0             | A                   |
| Product Family | Tier                | SEER        | Major Series | Voltage                   | Variations         | Cooling Capacity |   |   | Open          | Open          | Open          | Series              |
| 2=HP           | 8= Evolution Series | 0 = 20 SEER | A=Puron      | N= 208-230-1 or 208/230-1 | V = Variable Speed |                  |   |   | 0=Not Defined | 0=Not Defined | 0=Not Defined | A = Original Series |



Use of the AHRI Certified TM Mark indicates a manufacturer's participation in the program. For verification of certification for individual products, go to [www.ahridirectory.org](http://www.ahridirectory.org).



ISO 9001  
QMI-SAI Global



This product has been designed and manufactured to meet Energy Star® criteria for energy efficiency when matched with appropriate coil components. However, proper refrigerant charge and proper air flow are critical to achieve rated capacity and efficiency. Installation of this product should follow all manufacturing refrigerant charging and air flow instructions. Failure to confirm proper charge and air flow may reduce energy efficiency and shorten equipment life.

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## STANDARD FEATURES

| FEATURES                                                          | Unit Size – Voltage, Series |       |       |       |
|-------------------------------------------------------------------|-----------------------------|-------|-------|-------|
|                                                                   | 024-A                       | 036-A | 048-A | 060-A |
| Puron Refrigerant                                                 | X                           | X     | X     | X     |
| Louvered Coil Guard                                               | X                           | X     | X     | X     |
| Field Installed Filter Drier / External Muffler                   | X                           | X     | X     | X     |
| Front Seating Service Valves                                      | X                           | X     | X     | X     |
| Internal Pressure and Temperature Protection                      | X                           | X     | X     | X     |
| Long Line capability                                              | X                           | X     | X     | X     |
| Suction Pressure Transducer                                       | X                           | X     | X     | X     |
| High Pressure Switch                                              | X                           | X     | X     | X     |
| Crankcase Heater                                                  | X                           | X     | X     | X     |
| Low ambient cooling down to 0°F capability with Evolution Control | X                           | X     | X     | X     |
| Utility Interface Connections                                     | X                           | X     | X     | X     |
| Enhanced Diagnostics with Evolution Control                       | X                           | X     | X     | X     |
| Deluxe Sound Blanket                                              | X                           | X     | X     | X     |
| Outdoor Air Temperature Sensor                                    | X                           | X     | X     | X     |

X = Standard

# REFRIGERANT PIPING LENGTH LIMITATIONS

## Maximum Line Lengths:

The maximum allowable total equivalent length for heat pumps varies depending on the vertical separation. See the tables below for allowable lengths depending on whether the outdoor unit is on the same level, above or below the indoor unit.

### Maximum Line Lengths for Heat Pump Applications

|                                | MAXIMUM ACTUAL LENGTH<br>ft (m)                                             | MAXIMUM EQUIVALENT LENGTH†<br>ft (m) | MAXIMUM VERTICAL SEPARATION<br>ft (m) |
|--------------------------------|-----------------------------------------------------------------------------|--------------------------------------|---------------------------------------|
| Units on equal level           | 200 (61)                                                                    | 250 (76.2)                           | N/A                                   |
| Outdoor unit ABOVE indoor unit | 200 (61)                                                                    | 250 (76.2)                           | 200 (61)                              |
| Outdoor unit BELOW indoor unit | See Table 'Maximum Total Equivalent Length: Outdoor Unit BELOW Indoor Unit' |                                      |                                       |

† Total equivalent length accounts for losses due to elbows or fitting. See the Long Line Guideline for details.

### Maximum Total Equivalent Length† - Outdoor Unit BELOW Indoor Unit

| Size                 | Liquid Line Diameter w/ TXV | HP with Puron® Refrigerant – Maximum Total Equivalent Length†<br>Vertical Separation ft (m) Outdoor unit BELOW indoor unit; |                      |                       |                        |                        |                        |                        |
|----------------------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------|----------------------|-----------------------|------------------------|------------------------|------------------------|------------------------|
|                      |                             | 0–20<br>(0 – 6.1)                                                                                                           | 21–30<br>(6.4 – 9.1) | 31–40<br>(9.4 – 12.2) | 41–50<br>(12.5 – 15.2) | 51–60<br>(15.5 – 18.3) | 61–70<br>(18.6 – 21.3) | 71–80<br>(21.6 – 24.4) |
| 024<br>HP with Puron | 3/8                         | 250*                                                                                                                        | 250*                 | 250*                  | 250*                   | 250*                   | 250*                   | 250*                   |
| 036<br>HP with Puron | 3//8                        | 250*                                                                                                                        | 250*                 | 250*                  | 250*                   | 250*                   | 250*                   | 250*                   |
| 048<br>HP with Puron | 3/8                         | 250*                                                                                                                        | 250*                 | 250*                  | 250*                   | 230                    | 160                    | --                     |
| 060<br>HP with Puron | 3/8                         | 250*                                                                                                                        | 225*                 | 190                   | 150                    | 110                    | --                     | --                     |

\* Maximum actual length not to exceed 200 ft (61 m)

† Total equivalent length accounts for losses due to elbows or fitting. See the Long Line Guideline for details.

-- = outside acceptable range

## LONG LINE APPLICATIONS

An application is considered Long Line when the refrigerant level in the system requires the use of accessories to maintain acceptable refrigerant management for systems reliability. Defining a system as long line depends on the liquid line diameter, actual length of the tubing, and vertical separation between the indoor and outdoor units.

For Heat Pump systems, the chart below shows when an application is considered Long Line. Beyond these lengths, long line accessories are required:

### HP WITH PURON® REFRIGERANT LONG LINE DESCRIPTION ft (m) Beyond these lengths, long line accessories are required

| Liquid Line Size | Units On Same Level | Outdoor Below Indoor                 | Outdoor Above Indoor |
|------------------|---------------------|--------------------------------------|----------------------|
| 3/8              | 80 (24.4)           | 20 (6.1) vertical or 80 (24.4) total | 80 (24.4)            |

Note: See Long Line Guideline for details

## COOLING CAPACITY LOSS TABLE

| Nominal Size (Btuh) | Line OD (in.) | 280A Cooling Capacity Loss (%)    |     |     |     |     |     |     |     |      |      |      |
|---------------------|---------------|-----------------------------------|-----|-----|-----|-----|-----|-----|-----|------|------|------|
|                     |               | Total Equivalent Line Length (ft) |     |     |     |     |     |     |     |      |      |      |
|                     |               | 25                                | 50  | 75  | 80  | 100 | 125 | 150 | 175 | 200  | 225  | 250  |
| 24000               | 5/8           | 0.5                               | 1.2 | 1.8 | 1.9 | 2.4 | 3.0 | 3.7 | 4.3 | 4.9  | 5.5  | 6.2  |
|                     | 3/4           | 0.1                               | 0.4 | 0.6 | 0.7 | 0.8 | 1.1 | 1.3 | 1.5 | 1.8  | 2.0  | 2.3  |
|                     | 7/8           | 0.0                               | 0.1 | 0.3 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8  | 1.0  | 1.1  |
| 36000               | 5/8           | 1.1                               | 2.4 | 3.7 | 4.0 | 5.0 | 6.3 | 7.7 | 9.0 | 10.3 | 11.6 | 12.9 |
|                     | 3/4           | 0.3                               | 0.8 | 1.3 | 1.4 | 1.8 | 2.3 | 2.8 | 3.2 | 3.7  | 4.2  | 4.7  |
|                     | 7/8           | 0.0                               | 0.3 | 0.5 | 0.6 | 0.8 | 1.0 | 1.3 | 1.5 | 1.8  | 2.0  | 2.3  |
| 48000               | 3/4           | 0.7                               | 1.6 | 2.4 | 2.6 | 3.2 | 4.1 | 4.9 | 5.7 | 6.5  | 7.4  | 8.2  |
|                     | 7/8           | 0.3                               | 0.7 | 1.1 | 1.2 | 1.6 | 2.0 | 2.4 | 2.8 | 3.2  | 3.6  | 4.1  |
|                     | 1 1/8         | 0.0                               | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8  | 0.9  | 1.0  |
| 60000               | 3/4           | 1.0                               | 2.3 | 3.5 | 3.8 | 4.8 | 6.0 | 7.3 | 8.5 | 9.8  | 11.0 | 12.3 |
|                     | 7/8           | 0.4                               | 1.0 | 1.7 | 1.8 | 2.3 | 2.9 | 3.5 | 4.2 | 4.8  | 5.4  | 6.0  |
|                     | 1 1/8         | 0.0                               | 0.1 | 0.3 | 0.4 | 0.5 | 0.7 | 0.8 | 1.0 | 1.2  | 1.4  | 1.5  |

Rating Line Size in **Bold**

TE Length Greater than 80 ft requires Long Line Accessory Liquid Line Solenoid

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# EQUIPMENT SIZING GUIDELINES

If primary load is cooling, size the same as any other air conditioning system. If primary load is heating, use the chart below for maximum size for heating.

## MAXIMUM RECOMMENDED EQUIPMENT SIZE - HEATING

| COOLING LOAD (tons) | MAXIMUM RECOMMENDED EQUIPMENT SIZE FOR HEATING* |
|---------------------|-------------------------------------------------|
| 2                   | 36                                              |
| 2.5                 | 36                                              |
| 3                   | 48                                              |
| 3.5                 | 60                                              |
| 4                   | 60                                              |
| 5                   | 60                                              |

\* Make sure duct work is capable of delivering required airflow . Make sure combination rating exists for desired combination.

## MIN/MAX AIRFLOW TABLES

The indoor airflow delivered by this system varies significantly based on outdoor temperature, indoor unit combination, and system demand. The airflows on these tables are for duct design considerations. Duct systems capable of these ranges will ensure

the system will deliver full capacity at all outdoor temperatures. Minimum and maximum airflows can be adjusted from these numbers in the Evolution Control Heat Pump Setup screen.

| Cooling – Comfort Mode |              |              | Minimum Cooling (Dehum or Zoning) |
|------------------------|--------------|--------------|-----------------------------------|
| Size                   | Max Capacity | Min Capacity |                                   |
| 24                     | 726          | 651          | 398                               |
| 36                     | 1168         | 651          | 398                               |
| 48                     | 1394         | 1186         | 693                               |
| 60                     | 1650         | 1186         | 693                               |

| Cooling – Efficiency Mode |              |              |
|---------------------------|--------------|--------------|
| Size                      | Max Capacity | Min Capacity |
| 24                        | 949          | 830          |
| 36                        | 1334         | 830          |
| 48                        | 1593         | 1355         |
| 60                        | 1885         | 1355         |

| Heating – Comfort Mode |              |              |
|------------------------|--------------|--------------|
| Size                   | Max Capacity | Min Capacity |
| 24                     | 698          | 440          |
| 36                     | 1140         | 451          |
| 48                     | 1354         | 751          |
| 60                     | 1354         | 751          |

| Heating – Efficiency Mode |              |              |
|---------------------------|--------------|--------------|
| Size                      | Max Capacity | Min Capacity |
| 24                        | 900          | 750          |
| 36                        | 1350         | 750          |
| 48                        | 1600         | 890          |
| 60                        | 1750         | 901          |

## PHYSICAL DATA

| UNIT SIZE SERIES           | 024-A                                      | 036-A        | 048-A        | 060-A        |
|----------------------------|--------------------------------------------|--------------|--------------|--------------|
| Operating Weight lb (kg)   | 324 (147)                                  | 324 (147)    | 334 (152)    | 334 (152)    |
| Shipping Weight lb (kg)    | 367 (167)                                  | 367 (167)    | 375 (170)    | 375 (170)    |
| Compressor Type            | Variable Speed Scroll                      |              |              |              |
| REFRIGERANT                | Puron® (R-410A)                            |              |              |              |
| Control                    | TXV (Puron® Hard Shutoff)                  |              |              |              |
| Charge lb (kg)             | 13.00 (5.90)                               | 13.00 (5.90) | 13.30 (6.03) | 13.30 (6.03) |
| Outdoor Htg Exp. Device    | EXV                                        | EXV          | EXV          | EXV          |
| COND FAN                   | Forward Swept Propeller Type, Direct Drive |              |              |              |
| Air Discharge              | Vertical                                   |              |              |              |
| Air Qty (CFM)              | 2700                                       | 4269         | 4350         | 5000         |
| Motor HP                   | 1/3                                        | 1/3          | 1/3          | 1/3          |
| Motor RPM                  | 500-900                                    | 500-900      | 500-900      | 500-900      |
| COND COIL                  |                                            |              |              |              |
| Face Area (Sq ft)          | 30.25                                      | 30.25        | 30.25        | 30.25        |
| Fins per In.               | 20                                         | 20           | 20           | 20           |
| Rows                       | 2                                          | 2            | 2            | 2            |
| Circuits                   | 8                                          | 8            | 9            | 9            |
| VALVE CONNECT. (In. ID)    |                                            |              |              |              |
| Vapor                      | 7/8                                        | 7/8          | 7/8          | 7/8          |
| Liquid                     | 3/8                                        |              |              |              |
| REFRIGERANT TUBES (In. OD) |                                            |              |              |              |
| Rated Vapor*               | 7/8                                        | 7/8          | 1-1/8        | 1-1/8        |
| Max Liquid Line            | 3/8                                        |              |              |              |

\* Units are rated with 25 ft (7.6 m) of lineset length. See Vapor Line Sizing and Cooling Capacity Loss table when using other sizes and lengths of lineset.

**Note:** See unit Installation Instruction for proper installation.

## ACCESSORIES

| KIT NUMBER    | KIT NAME                          | 024-A | 036-A | 048-A | 060-A |
|---------------|-----------------------------------|-------|-------|-------|-------|
| KHAEM0101EMI  | ELECTRO-MAGNETIC INTERFERENCE KIT | X     | X     | X     | X     |
| KHALS0401LLS  | SOLENOID VALVE                    | X     | X     | X     | X     |
| KHASS0606MPK* | SNOW STAND                        | X     | X     | X     | X     |
| KSASF0101AAA  | SUPPORT FEET                      | X     | X     | X     | X     |
| KSATX0301PUR  | TXV                               | X     | X     |       |       |
| KSATX0401PUR  | TXV                               |       |       | X     |       |
| KSATX0501PUR  | TXV                               |       |       |       | X     |
| STANDARD      | CRANKCASE HEATER                  | S     | S     | S     | S     |

x = Accessory S = Standard \* Available from RCD

## ACCESSORY CONTROLS

| CONTROL         | DESCRIPTION                                                                                                             |
|-----------------|-------------------------------------------------------------------------------------------------------------------------|
| SYSTXBBUID01-D* | Evolution Control Deluxe 7-Day Programmable (Wall-mounted system control.)                                              |
| SYSTXBBUIZ01-D* | Evolution Control Deluxe Zoning 7-Day Programmable (Wall-mounted control for a multi-zone system.)                      |
| SYSTXBB4ZC01    | Evolution 4-Zone Damper Control Module (Wall-mounted control for a four-zone system.)                                   |
| SYSTXBBSMS01    | Evolution Smart Sensor (Optional wall control used to monitor temperature and/or fan control in an individual zone.)    |
| SYSTXBBRRS01    | Evolution Remote Room Sensor (Monitors temperature in an individual zone.)                                              |
| SYSTXBBRWF01    | Evolution System Access Module (Hardware for wireless access and control via phone or internet.)                        |
| SYSTXBBNIM01    | Evolution Network Interface Module (Connects Heat Recovery and Energy Recovery Ventilators on non-zoning applications.) |
| SYSTXBBLPU01-C  | Decorative Back Plate for Evolution Control (Decorative wall plate.)                                                    |

\* Requires software version 23 or newer

# ACCESSORY USAGE GUIDELINE

| ACCESSORY                                       | REQUIRED FOR LOW-AMBIENT COOLING APPLICATIONS (Below 55°F/12.8°C) | REQUIRED FOR LONG LINE APPLICATIONS* (Over 80 ft/24.38 m) | REQUIRED FOR SEA COAST APPLICATIONS (Within 2 miles/3.22 km) |
|-------------------------------------------------|-------------------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------|
| Crankcase Heater                                | Standard                                                          | Standard                                                  | Standard                                                     |
| Evaporator Freeze Protection                    | Standard with Evolution Control                                   | No                                                        | No                                                           |
| Liquid-Line Solenoid Valve                      | No                                                                | Yes                                                       | No                                                           |
| Low-Ambient Control                             | Standard with Evolution Control                                   | No                                                        | No                                                           |
| Puron Refrigerant Balance Port Hard-ShutOff TXV | Yes†                                                              | Yes†                                                      | Yes†                                                         |
| Support Feet                                    | Recommended                                                       | No                                                        | Recommended                                                  |
| Winter Start Control                            | Standard with Evolution Control                                   | No                                                        | No                                                           |

\* For tubing set lengths between 80 and 200 ft. (24.38 and 60.96 m) horizontal or 20 ft. (6.10 m) vertical differential (total equivalent length), refer to the Long Line Guideline—Air Conditioners and Heat Pumps using Puron® Refrigerant.

† Required on all indoor units. Standard on all new Greenspeed™ compatible fan coils and furnace coils.

## Accessory Description and Usage (Listed Alphabetically)

### 1. Compressor Start Assist

The inverter drive gently starts the variable speed compressor at all times. No other start device is compatible with this unit.

### 2. Crankcase Heater

Compressor motor winding resistance heater which is internal to compressor to keep the lubricant warm during off cycles. Improves compressor lubrication on restart and minimizes the chance of liquid slugging.

Usage:

Used in low ambient cooling applications.

Used in long line applications.

### 3. Liquid-Line Solenoid Valve (LLS)

An electrically operated shutoff valve which stops and starts refrigerant liquid flow in response to compressor operation. It is to be installed at the outdoor unit to control refrigerant off cycle migration in the heating mode.

Usage Guideline:

An LLS is required in all long line heat pump applications to control refrigerant off cycle migration in the heating mode. See Long Line Guideline.

Suggested for all commercial applications.

### 4. Snow Stand

Coated wire rack which supports unit 18 in. (457.2 mm) above mounting pad to allow for drainage from unit base.

Usage Guideline:

Suggested in the following applications:

Heat pump installations in heavy snowfall areas.

Heat pump installations in snow drift locations.

Heat pump installations in areas of prolonged subfreezing temperatures.

All commercial installations.

### 5. Thermostatic Expansion Valve (TXV) Bi-Flow

A modulating flow-control valve which meters refrigerant liquid flow rate into the evaporator in response to the superheat of the refrigerant gas leaving the evaporator.

Usage Guideline:

Accessory required to meet AHRI rating and system reliability, where indoor not equipped.

Required in all heat pump applications designed with Puron refrigerant.

### 6. Electro-Magnetic Interference Kit

Usage Guideline:

May be required to address radio frequency interference for equipment, such as HAM radios, operating between 6 and 30 MHz.

## ELECTRICAL DATA

| UNIT SIZE – VOLTAGE, SERIES | V/PH | OPER VOLTS* |               | COMPR |     | FAN | MCA  | MIN WIRE SIZE† | MIN WIRE SIZE† | MAX LENGTH ft (m)‡ | MAX LENGTH ft (m)‡ | MAX FUSE*<br>* or<br>CKT<br>BRK<br>AMPS |
|-----------------------------|------|-------------|---------------|-------|-----|-----|------|----------------|----------------|--------------------|--------------------|-----------------------------------------|
|                             |      | MAX         | MIN           | LRA   | RLA | FLA |      | 60°C           | 75°C           | 60°C               | 75°C               |                                         |
|                             |      | 024 – A     | 208 – 230 – 1 | 253   | 197 | 24  |      | 16.5           | 2.9            | 23.5               | 12                 |                                         |
| 036 – A                     | 24   | 16.5        |               |       |     | 2.9 | 23.5 | 12             | 12             | 52 (15.9)          | 50 (16.2)          | 40                                      |
| 048 – A                     | 42   | 27.0        |               |       |     | 2.9 | 36.6 | 8              | 8              | 84 (25.6)          | 80 (24.3)          | 50                                      |
| 060 – A                     | 42   | 27.0        |               |       |     | 2.9 | 36.6 | 8              | 8              | 84 (25.6)          | 80 (24.3)          | 50                                      |

\* Permissible limits of the voltage range at which the unit will operate satisfactorily

† If wire is applied at ambient greater than 30°C, consult table 310–16 of the NEC (NFPA 70). The ampacity of non–metallic–sheathed cable (NM), trade name ROMEX, shall be that of 60°C conditions, per the NEC (NFPA 70) Article 336–26. If other than uncoated (no–plated), 60 or 75°C insulation, copper wire (solid wire for 10 AWG or smaller, stranded wire for larger than 10 AWG) is used, consult applicable tables of the NEC (NFPA 70).

‡ Length shown is as measured 1 way along wire path between unit and service panel for voltage drop not to exceed 2%.

\*\* Time–Delay fuse.

FLA – Full Load Amps

LRA – Locked Rotor Amps

MCA – Minimum Circuit Amps

RLA – Rated Load Amps

NOTE: Control circuit is 24–V on all units and requires external power source. Copper wire must be used from service disconnect to unit.

All motors/compressors contain internal overload protection.

Complies with 2010 requirements of ASHRAE Standards 90.1

## SOUND POWER LEVEL (dBA)

| Unit Size – Voltage, Series | Typical Octave Band Spectrum (without tone adjustment) | Min Speed Cooling | Max Speed Cooling | *Min Speed Heating | *Max Speed Heating |
|-----------------------------|--------------------------------------------------------|-------------------|-------------------|--------------------|--------------------|
| 0024 – A                    | Freq (Hz)                                              | 1800 RPM          | 3200 RPM          | 1800 RPM           | 5700 RPM           |
|                             | 125                                                    | 62.0              | 63.0              | 63.0               | 73.5               |
|                             | 250                                                    | 57.0              | 56.5              | 61.5               | 63.0               |
|                             | 500                                                    | 54.5              | 57.5              | 58.5               | 66.0               |
|                             | 1000                                                   | 52.0              | 58.0              | 54.5               | 63.5               |
|                             | 2000                                                   | 47.5              | 54.0              | 51.5               | 64.5               |
|                             | 4000                                                   | 44.5              | 48.0              | 48.0               | 59.5               |
|                             | 8000                                                   | 52.5              | 54.5              | 54.0               | 61.5               |
|                             | Sound Rating (dBA)                                     | 58                | 63                | 62                 | 71                 |
| 0036 – A                    | Freq (Hz)                                              | 1800 RPM          | 4500 RPM          | 1800 RPM           | 6850**             |
|                             | 125                                                    | 62.0              | 64.5              | 63.0               | 67.0               |
|                             | 250                                                    | 57.0              | 60.5              | 61.5               | 67.5               |
|                             | 500                                                    | 54.5              | 61.0              | 58.5               | 69.0               |
|                             | 1000                                                   | 52.0              | 61.0              | 54.5               | 67.0               |
|                             | 2000                                                   | 47.5              | 56.0              | 51.5               | 67.0               |
|                             | 4000                                                   | 44.5              | 51.0              | 48.0               | 63.0               |
|                             | 8000                                                   | 52.5              | 54.5              | 54.0               | 61.5               |
|                             | Sound Rating (dBA)                                     | 58                | 65                | 62                 | 75                 |
| 0048 – A                    | Freq (Hz)                                              | 1800 RPM          | 3450 RPM          | 1800 RPM           | 6300**             |
|                             | 125                                                    | 62.0              | 70.0              | 66.0               | 73.5               |
|                             | 250                                                    | 60.5              | 67.5              | 63.0               | 69.5               |
|                             | 500                                                    | 56.0              | 67.0              | 63.0               | 73.5               |
|                             | 1000                                                   | 59.0              | 63.0              | 58.0               | 72.0               |
|                             | 2000                                                   | 54.0              | 60.0              | 53.5               | 66.5               |
|                             | 4000                                                   | 52.5              | 56.0              | 50.0               | 65.5               |
|                             | 8000                                                   | 58.5              | 58.5              | 57.0               | 63.0               |
|                             | Sound Rating (dBA)                                     | 65                | 70                | 64                 | 76                 |
| 0060 – A                    | Freq (Hz)                                              | 1800 RPM          | 4250 RPM          | 1800 RPM           | 6300**             |
|                             | 50                                                     | 62.0              | 65.0              | 66.0               | 73.5               |
|                             | 100                                                    | 60.5              | 67.5              | 63.0               | 69.5               |
|                             | 200                                                    | 56.0              | 67.5              | 63.0               | 73.5               |
|                             | 400                                                    | 59.0              | 66.5              | 58.0               | 72.0               |
|                             | 800                                                    | 54.0              | 61.0              | 53.5               | 66.5               |
|                             | 1600                                                   | 52.5              | 60.5              | 50.0               | 65.5               |
|                             | 3150                                                   | 58.5              | 59.0              | 57.0               | 63.0               |
|                             | Sound Rating (dBA)                                     | 65                | 72                | 64                 | 76                 |

NOTE: Tested in compliance with AHRI 270–2008 but not listed with AHRI.

\* 024 & 036 tested at 44°F Outdoor Air Temperature. 048 & 060 tested at 40°F

\*\*Testable RPM limited by outdoor temp. Max unit RPM is 6500 for the 4 ton and 7000 for the 3 and 5 ton.

## CHARGING SUBCOOLING (TXV-TYPE EXPANSION DEVICE)

| UNIT SIZE – VOLTAGE, SERIES | REQUIRED SUBCOOLING °F (°C) – See UI                                        |
|-----------------------------|-----------------------------------------------------------------------------|
| 024 – A                     | Subcooling recommendation displayed on UI in Charging Mode must be followed |
| 036 – A                     |                                                                             |
| 048 – A                     |                                                                             |
| 060 – A                     |                                                                             |

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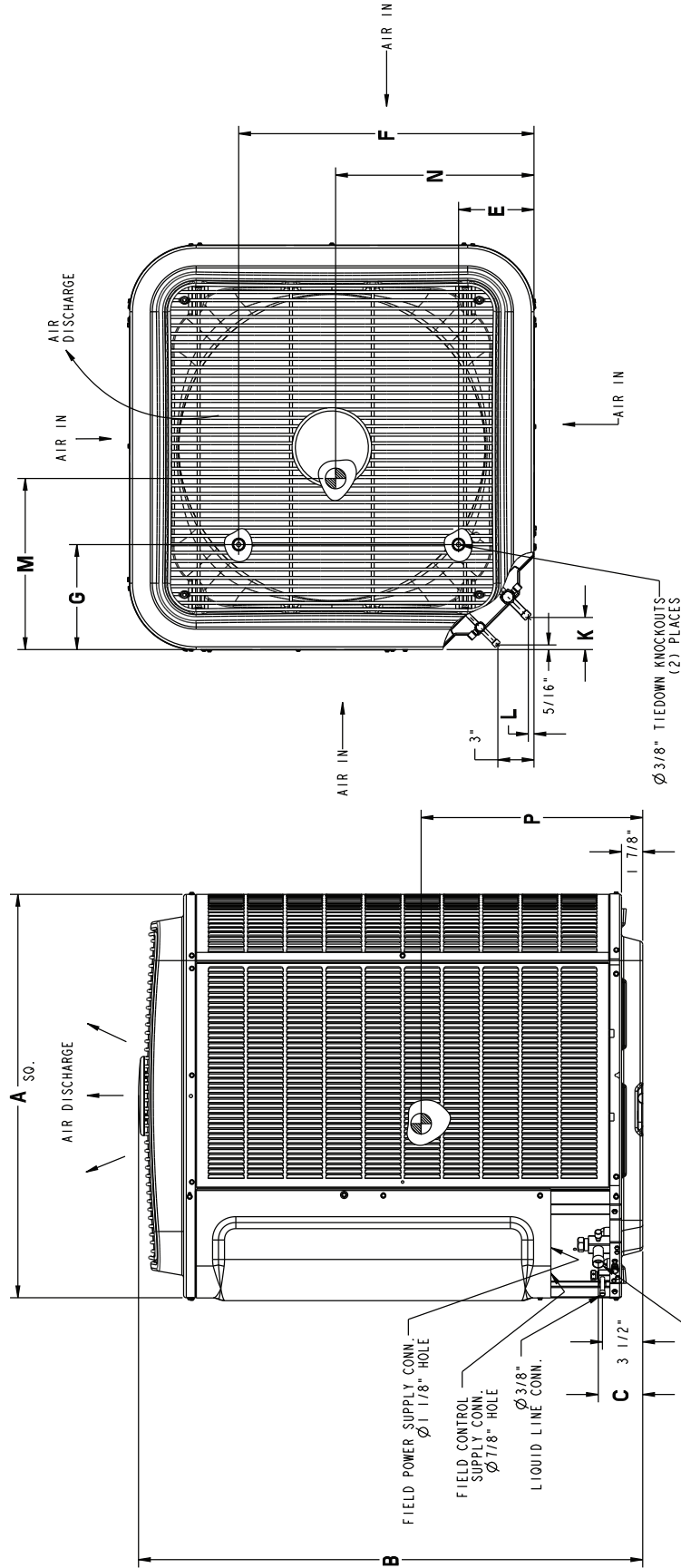
# 280A

## DIMENSIONS - ENGLISH

| UNIT    | SERIES | ELECTRICAL CHARACTERISTICS | A   | B         | C      | D    | E       | F        | G      | K        | L    | M       | N       | P       | OPERATING WEIGHT (lbs) | SHIPPING WEIGHT (lbs) | SHIPPING DIMENSIONS (L x W x H) |
|---------|--------|----------------------------|-----|-----------|--------|------|---------|----------|--------|----------|------|---------|---------|---------|------------------------|-----------------------|---------------------------------|
| 280A024 | A      | X 0 0 0                    | 35" | 43 11/16" | 3 7/8" | 7/8" | 6 9/16" | 28 7/16" | 9 1/8" | 2 15/16" | 5/8" | 16 1/4" | 16 1/4" | 21 1/4" | 324                    | 367                   | 36 1/8" X 39 1/4" X 50 3/16"    |
| 280A036 | A      | X 0 0 0                    | 35" | 43 11/16" | 3 7/8" | 7/8" | 6 9/16" | 28 7/16" | 9 1/8" | 2 15/16" | 5/8" | 16 1/4" | 16 1/4" | 21 1/4" | 324                    | 367                   | 36 1/8" X 39 1/4" X 50 3/16"    |
| 280A048 | A      | X 0 0 0                    | 35" | 43 11/16" | 3 7/8" | 7/8" | 6 9/16" | 28 7/16" | 9 1/8" | 2 15/16" | 5/8" | 16 1/4" | 16 1/4" | 21 1/4" | 334                    | 375                   | 36 1/8" X 39 1/4" X 50 3/16"    |
| 280A060 | A      | X 0 0 0                    | 35" | 43 11/16" | 3 7/8" | 7/8" | 6 9/16" | 28 7/16" | 9 1/8" | 2 15/16" | 5/8" | 16 1/4" | 16 1/4" | 21 1/4" | 334                    | 375                   | 36 1/8" X 39 1/4" X 50 3/16"    |

X = YES  
O = NO

|             |             |         |
|-------------|-------------|---------|
| 208/230-160 | 230-160     | 460-360 |
| 208/230-360 | 208/230-360 |         |



| UNIT SIZE      | MINIMUM MOUNTING PAD DIMENSIONS |
|----------------|---------------------------------|
| -              | 31 1/2" X 31 1/2"               |
| 24, 36, 48, 60 | 35" X 35"                       |

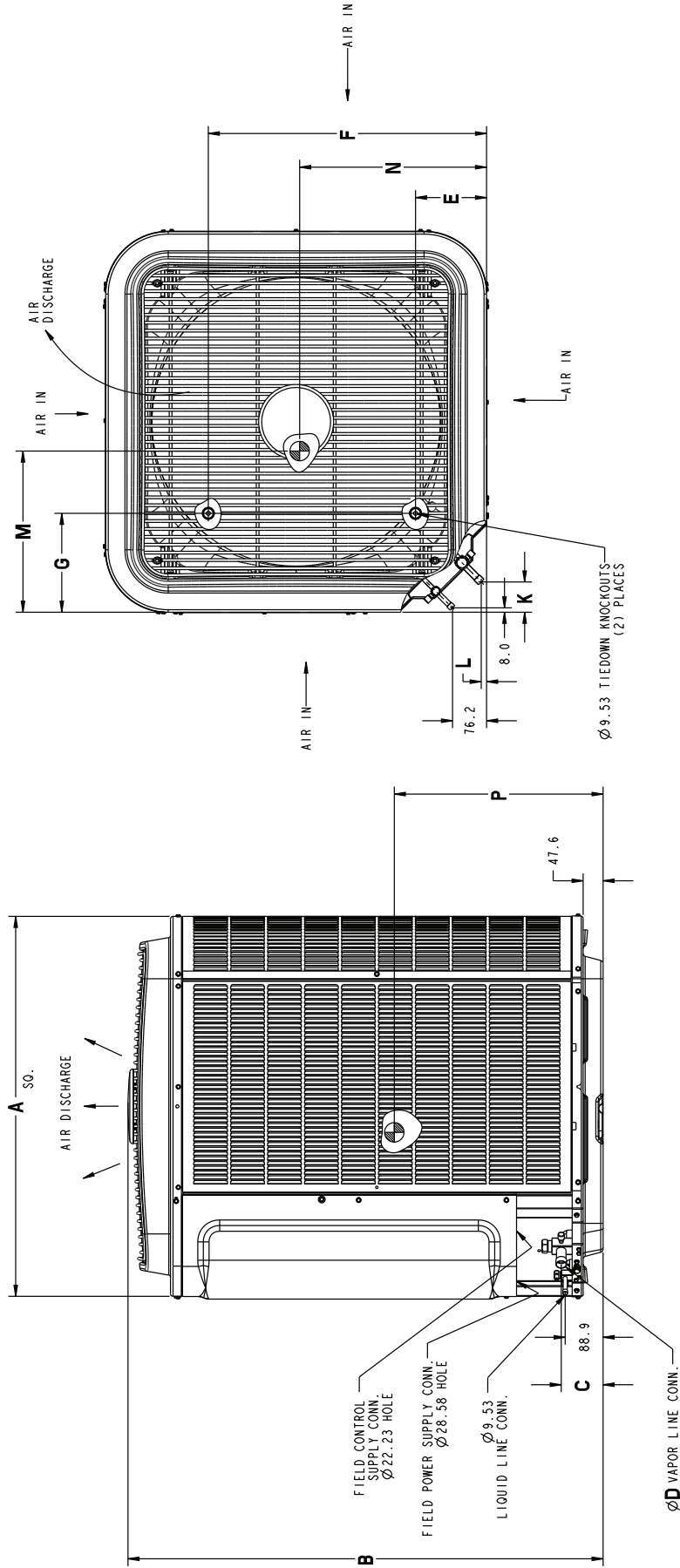


# DIMENSIONS - SI

| UNIT    | SERIES | ELECTRICAL CHARACTERISTICS | A     | B      | C    | D    | E     | F     | G     | K    | L    | M     | N     | P     | OPERATING WEIGHT (Kgs) | SHIPPING WEIGHT (Kgs) | SHIPPING DIMENSIONS (L x W x H) |
|---------|--------|----------------------------|-------|--------|------|------|-------|-------|-------|------|------|-------|-------|-------|------------------------|-----------------------|---------------------------------|
| 280A024 | A      | X 0 0 0                    | 889.0 | 1111.0 | 98.4 | 22.2 | 166.7 | 722.3 | 231.8 | 74.6 | 15.9 | 412.8 | 412.8 | 539.8 | 147                    | 167                   | 917.7 X 997.7 X 1274.9          |
| 280A036 | A      | X 0 0 0                    | 889.0 | 1111.0 | 98.4 | 22.2 | 166.7 | 722.3 | 231.8 | 74.6 | 15.9 | 412.8 | 412.8 | 539.8 | 147                    | 167                   | 917.7 X 997.7 X 1274.9          |
| 280A048 | A      | X 0 0 0                    | 889.0 | 1111.0 | 98.4 | 22.2 | 166.7 | 722.3 | 231.8 | 74.6 | 15.9 | 412.8 | 412.8 | 539.8 | 152                    | 170                   | 917.7 X 997.7 X 1274.9          |
| 280A060 | A      | X 0 0 0                    | 889.0 | 1111.0 | 98.4 | 22.2 | 166.7 | 722.3 | 231.8 | 74.6 | 15.9 | 412.8 | 412.8 | 539.8 | 152                    | 170                   | 917.7 X 997.7 X 1274.9          |

|             |         |             |         |
|-------------|---------|-------------|---------|
| 208/230-160 | 230-160 | 208/230-360 | 460-360 |
|-------------|---------|-------------|---------|

X = YES  
O = NO

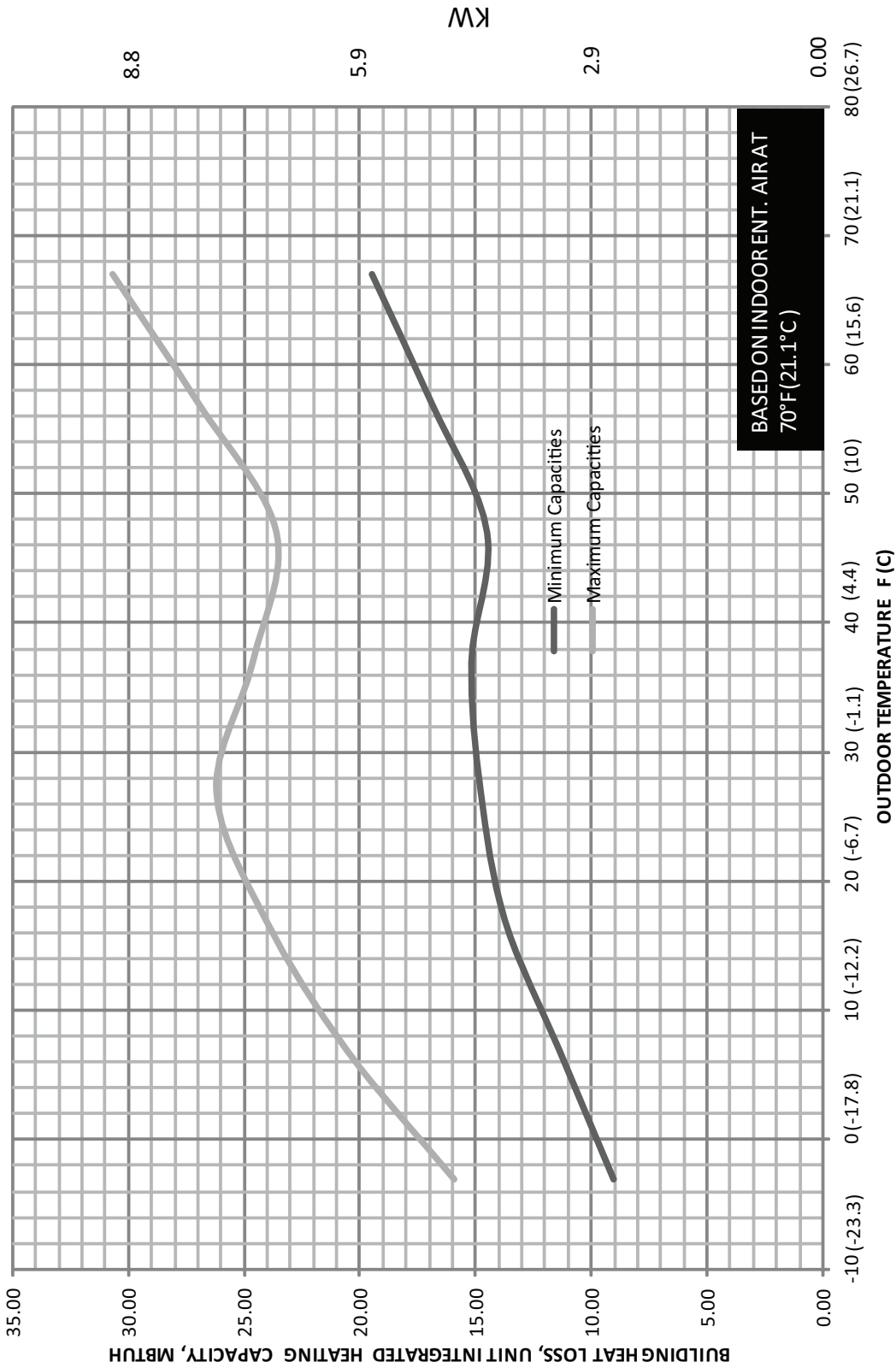


| UNIT SIZE    | MINIMUM MOUNTING PAD DIMENSIONS |
|--------------|---------------------------------|
| -            | 800.1 X 800.1                   |
| 24.36, 48.60 | 889.0 X 889.0                   |

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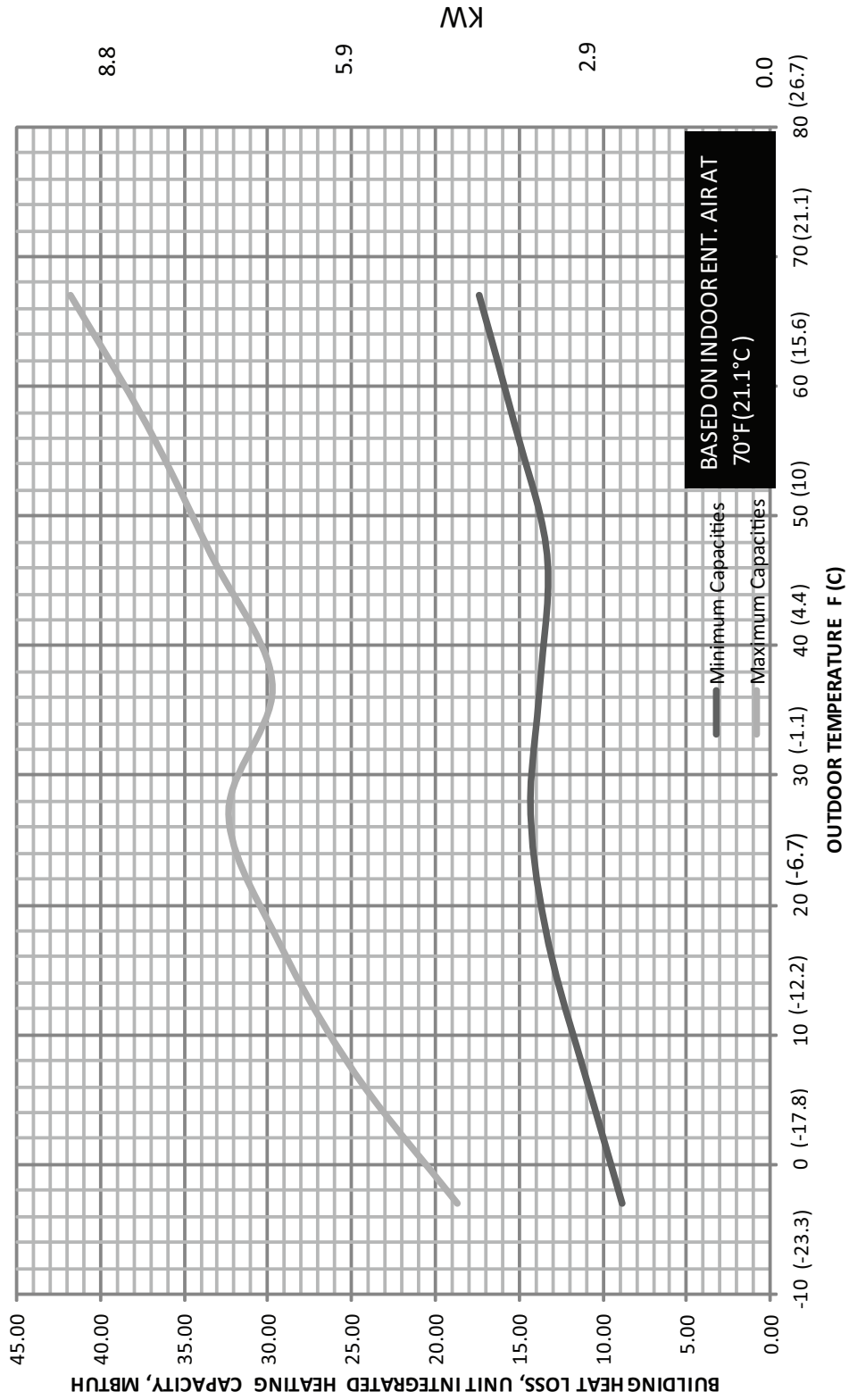
280A BALANCE POINT WORKSHEET

280ANA024 BALANCE POINT WORK SHEET  
(MINIMUM & MAXIMUM HEATING CAPACITIES)



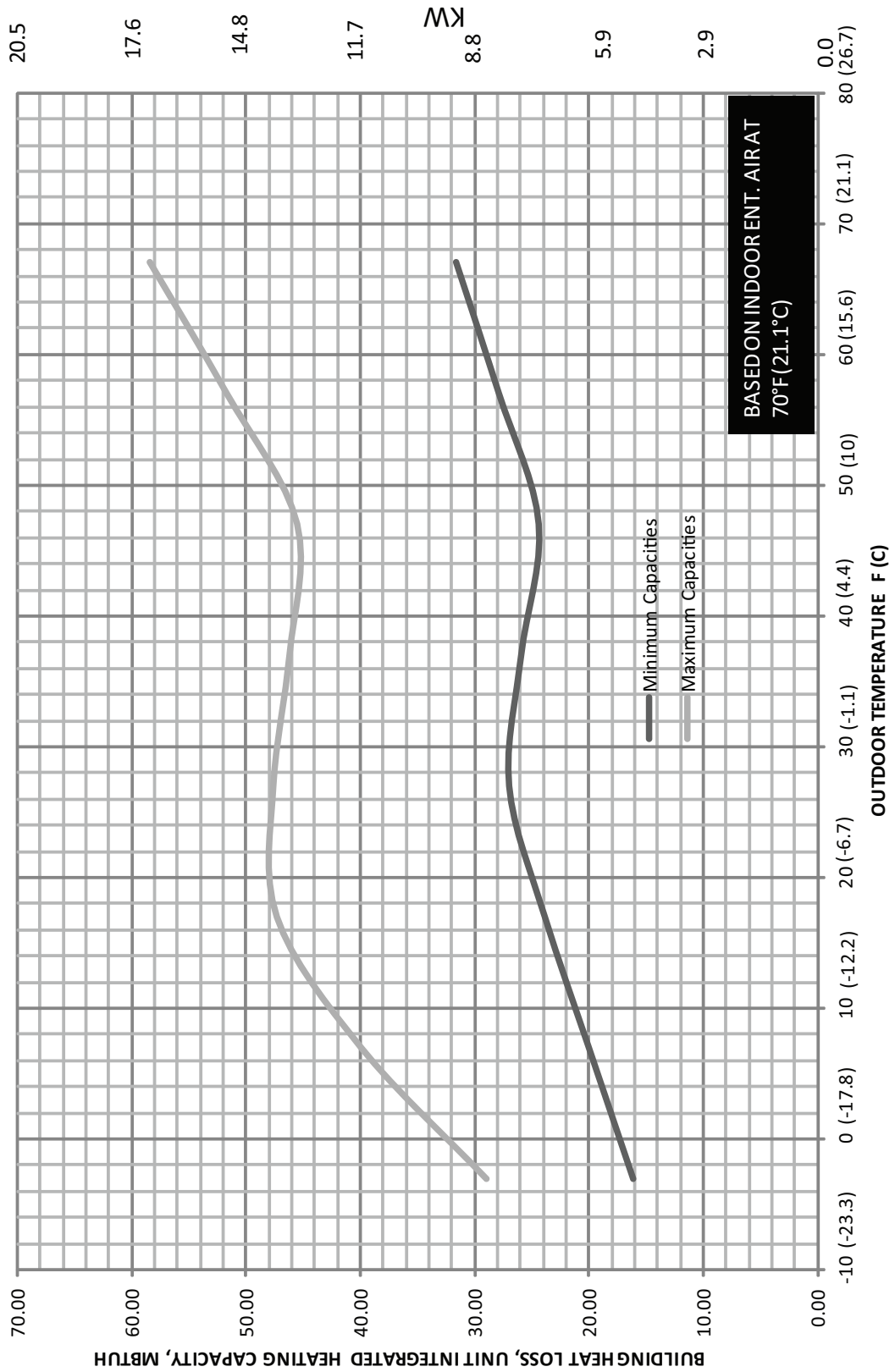
280A BALANCE POINT WORKSHEET CONT.

280ANA036 BALANCE POINT WORKSHEET  
(MINIMUM & MAXIMUM HEATING CAPACITIES)



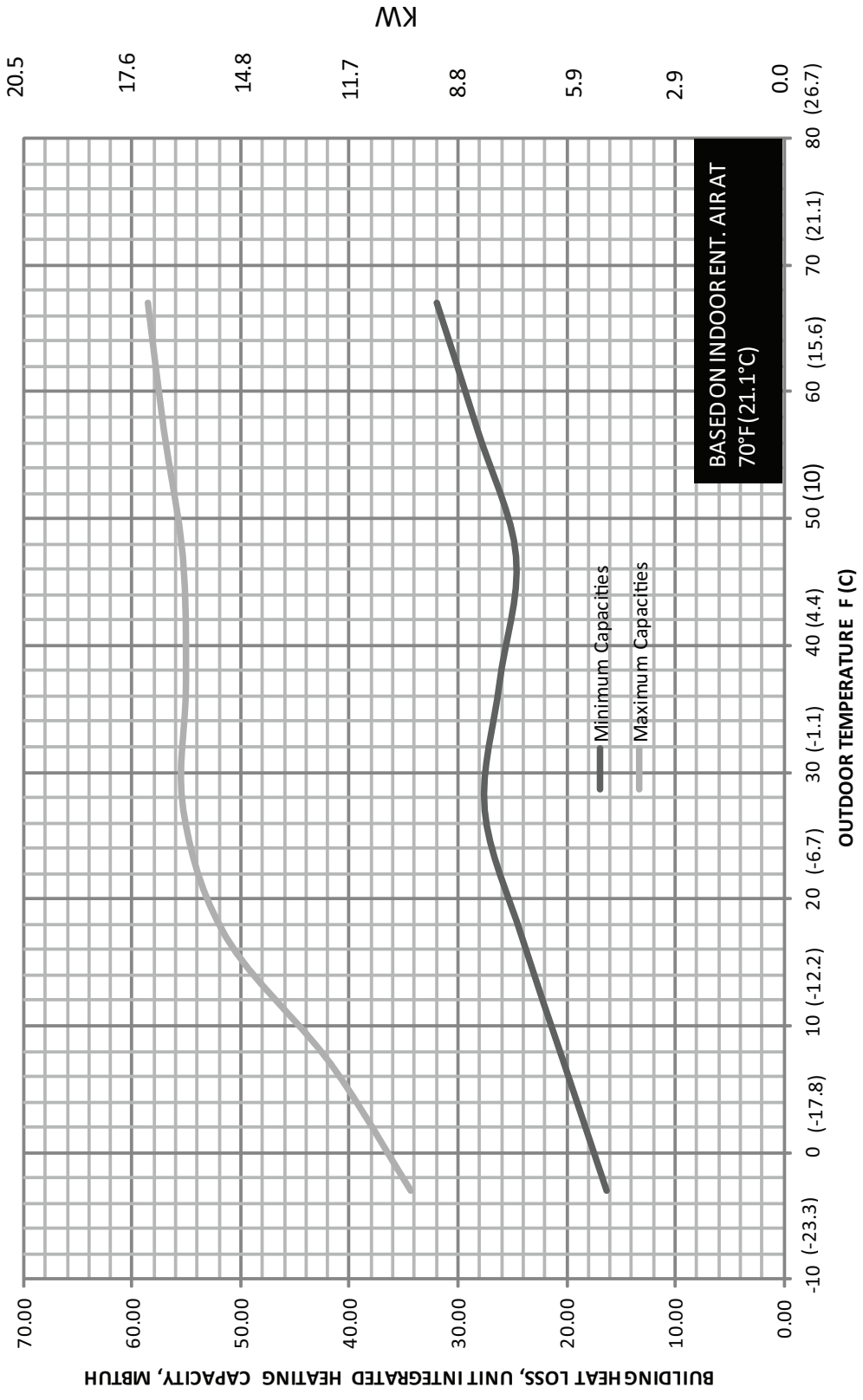
280A BALANCE POINT WORKSHEET CONT.

280ANA048 BALANCE POINT WORK SHEET  
MINIMUM AND MAXIMUM HEATING CAPACITIES

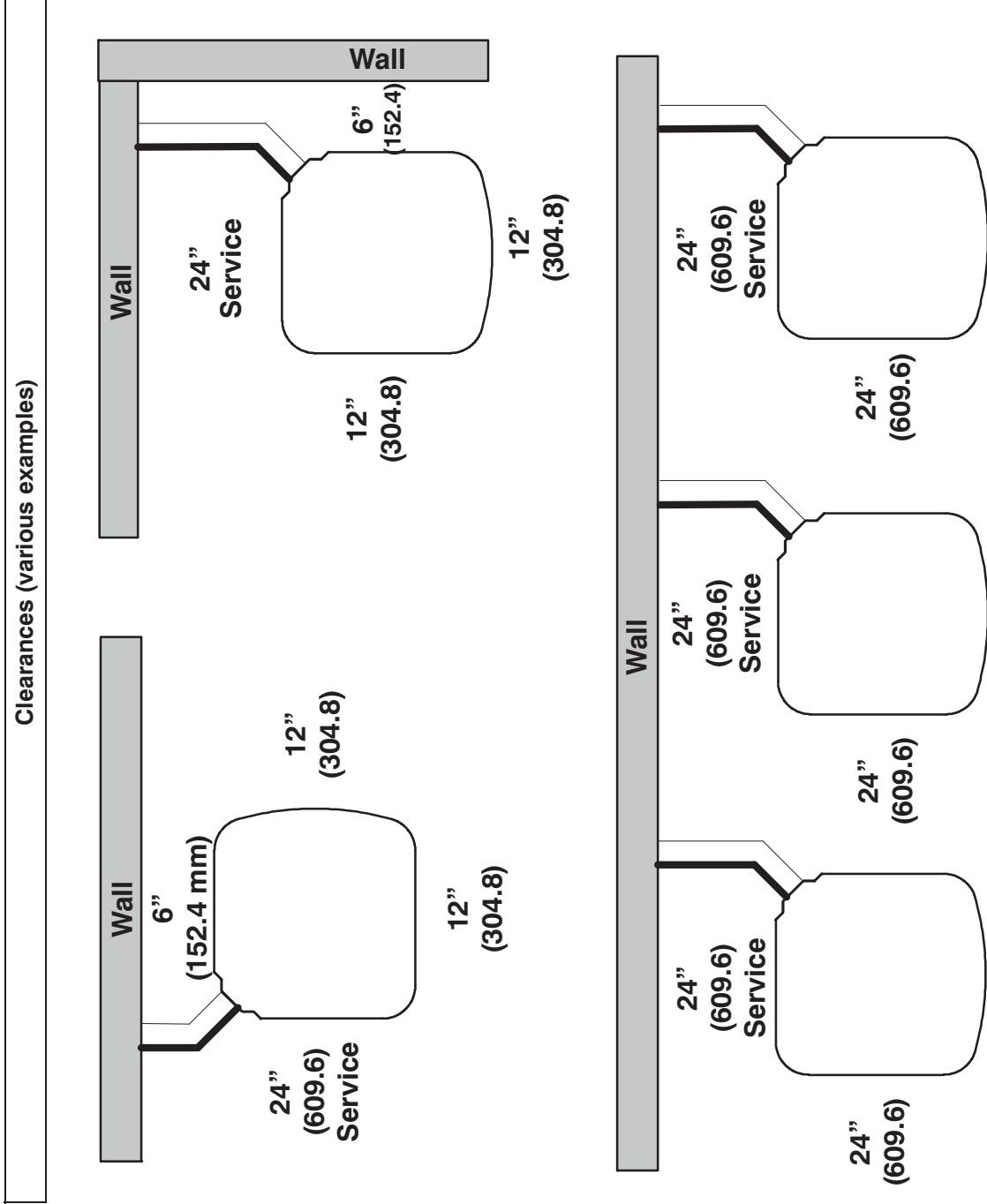


280A BALANCE POINT WORKSHEET CONT.

280ANA060 BALANCE POINT WORK SHEET  
 MINIMUM AND MAXIMUM HEATING CAPACITIES



**CLEARANCES**



**Note: Numbers in ( ) = mm**

**IMPORTANT:** When installing multiple units in an alcove, roof well, or partially enclosed area, ensure there is adequate ventilation to prevent re-circulation of discharge air.

# GUIDE SPECIFICATIONS

## GENERAL

### System Description

Outdoor-mounted, air-cooled, split-system heat pump unit suitable for ground or rooftop installation. Unit consists of a hermetic compressor, an air-cooled coil, forward-swept blade propeller-type condenser fan, and a control box. Unit will discharge supply air upward as shown on contract drawings. Unit will be used in a refrigeration circuit to match up to a packaged fan coil or coil unit.

### Quality Assurance

- Unit will be rated in accordance with the latest edition of AHRI Standard 240.
- Unit will be certified for capacity and efficiency, and listed in the latest AHRI directory.
- Unit construction will comply with latest edition of ASHRAE and with NEC.
- Unit will be constructed in accordance with UL standards and will carry the UL label of approval. Unit will have C-UL approval.
- Unit cabinet will be capable of withstanding Federal Test Method Standard No. 141 (Method 6061) 500-hr salt spray test.
- Air-cooled condenser coils are pressure tested and the outdoor units are leak tested.
- Unit constructed in ISO9001 approved facility.

### Delivery, Storage, and Handling

- Unit will be shipped as single package only and is stored and handled per unit manufacturer's recommendations.

### Warranty (for inclusion by specifying engineer)

- U.S. and Canada only.

## PRODUCTS

### Equipment

- Factory-assembled, single-piece, air-cooled heat pump unit. Contained within the unit enclosure is all factory wiring, piping, controls, compressor, refrigerant charge Puron® (R-410A) refrigerant, and special features required prior to field start-up.

### Unit Cabinet

- Unit cabinet will be constructed of galvanized steel, bonderized, and coated with a powder coat paint.

### Fans

- Condenser fan will be direct-drive propeller type, forward swept blade, discharging air upward.

## AIR-COOLED, SPLIT-SYSTEM HEAT PUMP

280ANA

2 TO 5 NOMINAL TONS

- Condenser fan motors will be totally enclosed, 1-phase type with class B insulation and permanently lubricated.
- Shafts will be corrosion resistant.
- Fan blades will be statically and dynamically balanced.
- Condenser fan openings will be equipped with coated steel wire safety guards.

### Compressor

- Compressor will be hermetically sealed.
- Compressor will be mounted on rubber vibration isolators.
- Compressor will be covered with a sound absorbing blanket.

### Condenser Coil

- Condenser coil will be air cooled.
- Coil will be constructed of aluminum fins mechanically bonded to copper tubes which are then cleaned, dehydrated, and sealed.

### Refrigeration Components

- Refrigeration circuit components will include liquid-line front-seating shutoff valve with sweat connections, vapor-line front-seating shutoff valve with sweat connections, system charge of Puron® (R-410A) refrigerant, POE compressor oil, accumulator, charge compensator, electronic expansion valve, and reversing valve.
- Unit will be equipped with high-pressure switch, suction pressure transducer, and filter drier for Puron® refrigerant and an electronic expansion valve (EXV) for metering in heating mode.

### Operating Characteristics

- The capacity of the unit will meet or exceed \_\_\_\_\_ Btuh at a suction temperature of \_\_\_\_\_ °F (°C). The power consumption at full load will not exceed \_\_\_\_\_ kW.
- Combination of the unit and the evaporator or fan coil unit will have a total net cooling capacity of \_\_\_\_\_ Btuh or greater at conditions of \_\_\_\_\_ CFM entering air temperature at the evaporator at \_\_\_\_\_ °F (°C) wet bulb and \_\_\_\_\_ °F (°C) dry bulb, and air entering the unit at \_\_\_\_\_ °F (°C).
- The system will have a SEER of \_\_\_\_\_ Btuh/watt or greater at DOE conditions.

### Electrical Requirements

- Nominal unit electrical characteristics will be \_\_\_\_\_ v, single phase, 60 hz. The unit will be capable of satisfactory operation within voltage limits of \_\_\_\_\_ v to \_\_\_\_\_ v.
- Unit electrical power will be single point connection.
- Control circuit will be 24v.

### Special Features

- Refer to section of this literature identifying accessories and descriptions for specific features and available enhancements.
- Evolution control with appropriate software version is required for full featured operation.

## SYSTEM DESIGN SUMMARY

1. Intended for outdoor installation with free air inlet and outlet. Outdoor fan external static pressure available is less than 0.01-in. wc.
2. This product is qualified for low ambient cooling operation (below 55°F / 12.8°C) with an Evolution User Interface **ONLY**.
3. The maximum outdoor operating ambient in cooling mode is 125°F (51.67°C).
4. Minimum outdoor operating air temperature for heating mode is -15°F (-26.1°C).
5. Maximum outdoor operating air temperature for heating mode is 66°F (18.9°C).
6. For reliable operation, unit should be level in all horizontal planes.
7. For interconnecting refrigerant tube lengths greater than 80 ft (23.4 m) and/or elevation differences between indoor and outdoor units greater than 20 ft (6.1 m), consult Residential Piping and Longline Guideline and Service Manual available from equipment distributor.
8. If any refrigerant tubing is buried, provide a 6 in. (152.4 mm) vertical rise to the valve connections at the unit. Refrigerant tubing lengths up to 36 in. (914.4 mm) may be buried without further consideration. Do not bury refrigerant lines longer than 36 in. (914.4 mm).
9. Use only copper wire for electric connection at unit. Aluminum and clad aluminum are not acceptable for the type of connector provided.
10. Do not apply capillary tube indoor coils to these units.
11. Factory-supplied filter drier must be installed.

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