

This section is based on the products of **Wine Cellar Innovations**, located at:

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#### **Available Downloads**

Wine Cellar Construction Guide: [www.winecellarinnovations.com/learn/how-to-build-a-wine-cellar](http://www.winecellarinnovations.com/learn/how-to-build-a-wine-cellar)

Continuing Education: [www.winecellarinnovations.com/continued-education](http://www.winecellarinnovations.com/continued-education)

Wine Cellar Wood Options: [www.winecellarinnovations.com/interactive-wood-swatch-viewer](http://www.winecellarinnovations.com/interactive-wood-swatch-viewer)

Wine Cellar Innovations provides full turn-key services for complete custom wine cellar and wine racking project needs. All points of project needs can be handled from wine storage design, layout, manufacturing, refrigeration, interior décor fitting, wine cellar doors, as well as factory trained installation services.

**Wine Cellar Design** You may submit a plan to any of our design consultants and request a complimentary 2-dimensional drawing of your wine cellar. Your design will feature a quoted price for the cellar, a plan view, key page, elevations of each wall, molding plan, and an optional reflected ceiling plan if a raised panel ceiling is requested.

**Custom Wine Cellars** All wine racking is hand crafted at our wood manufacturing facility in Cincinnati, OH to assure the highest quality of workmanship. Aside from the wine racking, we can also outfit a complete custom wine cellar with a fitted wine cellar door, flooring, ceilings, as well as paneling material. There are multiple wood type and stain options available. Simply supply us room dimensions and we can supply you with the design.

**Wine Racking Kits** We offer up to eight distinct wine racking kit lines to meet any customer's budget and taste. These wine racks range from simple building blocks which can grow with the client's collection, to more complete modular systems which are virtually custom in appearance.

**Wine Cellar Refrigeration Units** We can provide a free BTU analysis and suggest an appropriate sized unit with every quote.

**Commercial Applications** We also manufacture a complete line of durable commercial wine display racks for wine stores, grocery stores, vineyards, wine wholesalers and the hospitality industry.

*(Specifier Note: The purpose of this guide specification is to assist the specifier in correctly specifying residential wine rack kits, wine refrigeration units and their installation. Wine Cellar Innovations designs, manufactures and installs custom wine cellars as well as offering kits, refrigeration units and decorative accessories. The specifier needs to edit these guide specifications to fit the needs of each specific project. Contact a Wine Cellar Innovations representative to assist in appropriate product selections.)*

*References have been made within the text of the specification to MasterFormat 2004 section numbers and titles; specifier needs to coordinate these numbers and titles with sections included for the specific project. Throughout the guide specification, there are specifier notes to assist in the editing of the file. Brackets [] have been used to indicate when a selection is required.)*

## **SECTION 11 41 12 WINE STORAGE EQUIPMENT**

Wine Cellar Innovations Residential Wine Rack Kits

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES A.

Wine racks.

B. Accessories.

*(Specifier Note: DELETE "Wine refrigeration units" paragraph below if not project specific.)*

C. Wine refrigeration units.

#### 1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

*(Specifier Note: SELECT option in paragraph below when wine cellar refrigeration units are specified.)*

B. Shop Drawings: Include plans, elevations, details, sections, [ **roughing-in dimensions, utility services requirements,** ] and relationship to adjoining work.

C. Samples: For each finish product specified, two samples, 6 inches in length minimum, representing product color.

*(Specifier Note: DELETE "LEED Submittals" paragraph and subparagraphs below if project is not required to be LEED certified. COORDINATE with "Manufacturer Qualifications" and "Forest Certification" paragraphs in "Quality Assurance" article.)*

D. LEED Submittals

1. Certificates for Credit MR 7: Chain-of-custody certificates certifying that wood wine racking complies with forest certification requirements. Include evidence that manufacturer is certified for chain of custody by an FSC-accredited certification body.

a. Include statement indicating costs for each certified wood product.

*(Specifier Note: DELETE "Environmental compliance certificates" paragraph below if wood products are not required to be made with SFI (Sustainable Forestry Initiative) accredited wood. COORDINATE with "Environmental Compliance" paragraph in "Quality Assurance" article.)*

E. Environmental compliance certificates.

*(Specifier Note: DELETE "Operation" option in paragraph below if wine cellar refrigeration units are not specified.)* F. **[Operation and ]** Maintenance data.

G. Sample warranties.

1.3 QUALITY ASSURANCE

*(Specifier Note: DELETE "Wine Rack Installer Qualifications" paragraph below if lifetime warranty is not project specific.)*

A. Wine Rack Installer Qualifications: An employer of workers certified and approved by manufacturer.

*(Specifier Note: DELETE "Refrigeration Systems Installer Qualifications" paragraph below if refrigeration units are not specified.)*

B. Refrigeration Systems Installer Qualifications: An employer of workers approved by manufacturer for installation of specified refrigeration system.

*(Specifier Note: DELETE "Manufacturer Qualifications" and "Forest Certification" paragraphs below if not required for LEED-NC or LEED-CI Credit MR 7. FSC-accreditation is an option that needs to be specified from the start of the project. Specifier should be aware that this option will increase cost and lead times significantly.)*

C. Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.

D. Forest Certification: Provide wood components produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship." *(Specifier Note: DELETE "Environmental Compliance" paragraph below if not project specific.)*

- E. Environmental Compliance: Provide wood components produced from SFI (Sustainable Forestry Initiative) accredited wood.

*(Specifier Note: DELETE "UL Certification" and "Regulatory Requirements" paragraphs and subparagraphs below when wine cellar refrigeration units are not specified.)*

*(Specifier Note: UL lists certified products on its Web site in the "Online Certifications Directory" section. Certified products include those that bear the "Listed" and "Classified" versions of the UL EPH Mark. If UL certification is not required for certain equipment or if another testing agency's certification is acceptable, revise first paragraph below.)*

- F. UL Certification: Provide electric equipment and components that are evaluated by UL for fire, electric shock, and casualty hazards according to applicable safety standards, and that are UL certified for compliance and labeled for intended use.
- G. Regulatory Requirements: Install equipment to comply with the following:
  - 1. NFPA 70, "National Electrical Code."

#### 1.4 DELIVERY, STORAGE AND HANDLING

- A. Refer to Section [**01 60 00 Product Requirements**] [**Insert section number and title**].
- B. Deliver materials and components in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Store materials as recommended by manufacturer.

#### 1.5 PROJECT CONDITIONS

- A. Maintain relative humidity and ambient temperature within limits recommended by manufacturer.

#### 1.6 WARRANTY

- A. Manufacturer's Rack Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace wine racking that fails in material, or due to workmanship, under normal use and service within specified warranty period.

*(Specifier Note: SELECT desired warranty below. First option is standard. Second option requires a certified installer to install the product. COORDINATE with "Wine Rack Installer Qualifications" paragraph in "Quality Assurance" article above.)*

1. Warranty Period: [**Five years**][**Lifetime that the owner remains in the residence**].

*(Specifier Note: Extended warranty is available for Winezone units only. DELETE extended warranty paragraph and subparagraph below if not project specific.)*

- B. Manufacturer's Refrigeration Units Extended Warranty: Manufacturer's extended warranty in which manufacturer agrees to repair or replace wine refrigeration units that fail in material or workmanship under normal use and service within specified warranty period.

1. Warranty Period: [**Two**] [**Five**] years.

## PART 2 - PRODUCTS

*(Specifier Note: Product information is proprietary to Wine Cellar Innovations. If additional products are required for competitive procurement, contact Wine Cellar Innovations for assistance.)*

### 2.1 MANUFACTURER

- A. Wine Cellar Innovations; 4575 Eastern Ave., Cincinnati, OH 45226, USA; Phone 800.229.9813, Fax 513.979.5280; Website [www.winecellarinnovations.com](http://www.winecellarinnovations.com).

### 2.2 MATERIALS

*(Specifier Note: COORDINATE materials listed below with descriptive paragraphs in wine racks article. DELETE materials that are not project specific.)*

- A. Premium Redwood: From the outer part of the tree with a natural resistance to decay and insects throughout, resistance to shrinkage, warping and checking, and characterized by a variation in colors that may include a mix of cream, pink, dark red, and an occasional purple swirl mixed in. This wood also has a dramatic grain pattern. Its open-celled structure contains little or no pitch or resins enabling it to absorb and retain finishes extremely well.
- B. Poplar: Carefully selected, premium cuts with a variety of cream and green colors distinctive of Poplar.
- C. Red Oak: Hardwood with legendary toughness.

### 2.3 WINE RACKS

*(Specifier Note: SELECT one of five racking kits below. Choose "Designer Series for top quality racks utilizing many custom features but at kit pricing, Simple Wine Rack Solutions for easily assembled modular components, Traditional Redwood for racks with the*

beauty of redwood and a variety of options, Country Pine for racks made from knotty grade wood with a rustic look, or Vintner Series for the most versatile kit that can accommodate any ceiling height.

- A. Basis-of-Design: [**Designer Series Wine Racks**] [**Simple Wine Rack Solutions**] [**Traditional Redwood Wine Racks**] [**Country Pine Wine Racks**] [**Vintner Series Wine Racks**].

*(Specifier Note: SELECT Basis-of-design paragraph above or descriptive paragraph from one of five paragraphs below.)*

- B. Designer Series Wine Racks

1. Description: Full-depth wooden wine racks designed to accommodate wine bottles between 3 and 3 ½ inches in diameter.

*(Specifier Note: SELECT species from one of three sub-paragraphs below. SELECT stain color choice from remaining options.)*

- a. Material and Finish

- 1) Premium Redwood, [**Unstained**] [**Light Stain**] [**Classic Mahogany Stain**] [**Dark Walnut Stain**] [**Midnight Black Stain**].
- 2) Poplar, [**Unstained**] [**Light Stain**] [**Classic Mahogany Stain**] [**Dark Walnut Stain**] [**Midnight Black Stain**]
- 3) Red Oak, [**Unstained**] [**Light Stain**] [**Classic Mahogany Stain**] [**Dark Walnut Stain**] [**Midnight Black Stain**]

- b. Depth: 13 ½ inches.

- c. Individual Cradles: Two rails with beveled ends and rounded edges.

*(Specifier Note: DELETE accessories paragraph below if not project specific.)*

- d. Accessories: [**Decorative Face Trim**] [**Molding**] [**Diamond Bin Archway**].

- C. Simple Racking Solutions

1. Description: Easy to assemble, stackable and interchangeable modules with fully adjustable shelves.

- a. Material and Finish: Premium Redwood, Unstained.

- b. Depth: 9 inches.

*(Specifier Note: DELETE accessories paragraph below if not project specific.)*

- c. Accessories: 4 inch high base / crown molding.

D. Traditional Redwood

1. Description: Easy to assemble, screw together wooden wine racks designed to accommodate wine bottles between 3 and 3-1/4 inches in diameter.
  - a. Material and Finish: Premium Redwood, Unstained.
  - b. Depth: 8-3/4 inches.

*(Specifier Note: DELETE accessories paragraph below if not project specific.)*

- c. Accessories: **[Crown] [Base] [and] [Toekick]**.

E. Country Pine

1. Description: Wooden wine racks, 8-3/4 inches deep, designed to accommodate wine bottles between 3 and 3-1/4 inches in diameter. Structurally designed to accommodate additional wine storage above racking.
  - a. Material and Finish: Knotty Pine, Unstained.
  - b. Depth: 8-3/4 inches.

F. Vintner Series

1. Description: Full-depth wooden wine racks designed to accommodate wine bottles between 3 and 3 1/2 inches in diameter.
  - a. Material and Finish: Premium Redwood, **[Unstained] [Light Stain] [Classic Mahogany Stain] [Dark Walnut Stain] [Midnight Black Stain]**.
  - b. Depth: 13 1/2 inches.

*(Specifier Note: DELETE accessories paragraph below if not project specific.)*

- c. Accessories: **[Crown] [Base] [Center Trim] [and] [Toekick]**.

## 2.4 ACCESSORIES

*(Specifier Note: Refer to manufacturer's website for complete list of available accessories. DELETE accessories paragraphs below that are not project specific.)*

*(Specifier Note: Wine cellar doors are available from three different collections, each offering different style, hardware, and finish options. SELECT one of three door description options below. DELETE "Basis-of-Design" sub-paragraphs if not required. Refer to manufacturer's website at [www.winecellarinnovations.com/wine-cellar-doors](http://www.winecellarinnovations.com/wine-cellar-doors) or contact a Wine Cellar Innovations representative for assistance.)*

- A. Doors: **[Clear all heart, vertical grain redwood with double paned glass units][Exterior grade, high quality steel][Handcrafted and engineered, [carved wood][wrought iron grilles][wood plank]]**.

1. Basis-of-Design: Wine Cellar Innovations; [**Classic**][**Ornate Iron**][**Designer**] Collection, [**Insert product number**].
  - a. Finish: [**As selected by Architect**][**Insert finish**].
  - b. Glass: [**As selected by Architect**] [**Insert description**].
  - c. Hardware: [**As selected by Architect**] [**Insert description**].
  - d. Trim: [**As selected by Architect**] [**Insert description**].

*(Specifier Note: SELECT a description from options below. DELETE "Basis-of-Design" subparagraph if not required. Refer to manufacturer's website at [www.winecellarinnovations.com/cellarart](http://www.winecellarinnovations.com/cellarart) or contact a Wine Cellar Innovations representative for assistance.)*

- B. Wall Art: [**Painting**] [**Mural**][**Tumbled stone art**][**Stained glass**][**Mosaic art**][**Etched mirror**][**Mirror**] [**Hand painted files**][**Wood carving**].

1. Basis-of-Design: Wine Cellar Innovations; [**Insert product name**].

*(Specifier Note: SELECT a description from options below. DELETE "Basis-of-Design" subparagraph if not required. Refer to manufacturer's website at [www.winecellarinnovations.com/tabletops](http://www.winecellarinnovations.com/tabletops) or contact a Wine Cellar Innovations representative for assistance.)*

- C. Table Top: [**Vintage wine barrel**][**Corian**][**Tumbled stone**][**Mosaic**][**Cork**][**Hand painted files**].

1. Basis-of-Design: Wine Cellar Innovations; [**Insert product name**].

*(Specifier Note: SELECT a description from options below. DELETE "Basis-of-Design" subparagraph if not required. Refer to manufacturer's website at [www.winecellarinnovations.com/lighting](http://www.winecellarinnovations.com/lighting) or contact a Wine Cellar Innovations representative for assistance.)*

- D. Lighting: [**Recessed halogen**][**LED**][**Fluorescent Slimlites**][**Rope Lighting**][**As specified in Section 26 51 00 – Interior Lighting**].

1. Basis-of-Design: Wine Cellar Innovations; [**Insert product name**].

- a. Finish: [**As selected by Architect**] [**Insert finish**].

*(Specifier Note: SELECT a description from options below. DELETE "Basis-of-Design" subparagraph if not required. Refer to manufacturer's website at [www.winecellarinnovations.com/decfloor](http://www.winecellarinnovations.com/decfloor) or contact a Wine Cellar Innovations representative for assistance.)*

- E. Flooring: [**Cork**] [**Tile**] [**Vintage Wine Barrel**] [**Mosaic**] [**[[Insert material]** as specified in Section [**Insert section number -Insert section name**]].



1. Basis-of-Design: Wine Cellar Innovations; **[Insert product name]**
  - a. Color: **[As selected by Architect]****[Insert color]**.

*(Specifier Note: SELECT a description from options below. DELETE "Basis-of-Design" subparagraph if not required. Refer to manufacturer's website at [www.winecellarinnovations.com/decceilings](http://www.winecellarinnovations.com/decceilings) or contact a Wine Cellar Innovations representative for assistance.)*

- F. Ceiling: **[Green board]****[Raised Panel]****[Tongue and Groove Paneling]****[Insert material]** as specified in Section **[Insert section number]** – **[Insert section name]**.
  1. Basis-of-Design: Wine Cellar Innovations; **[Insert product name]**.
    - a. Finish: **[As selected by Architect]****[Insert finish]**.

*(Specifier Note: DELETE "Hardware" paragraph below if not required. Refer to manufacturer's website at [www.winecellarinnovations.com/cabhardware](http://www.winecellarinnovations.com/cabhardware) or contact a Wine Cellar Innovations representative for assistance.)* G. Hardware:

1. Basis-of-Design: Wine Cellar Innovations; **[Insert product name]**.
  - a. Finish: **[As selected by Architect]****[Insert finish]**.

H. Molding:

1. Basis-of-Design: Wine Cellar Innovations; **[Insert product name]**.
  - a. Finish: **[As selected by Architect]****[Insert finish]**.

## 2.5 WINE REFRIGERATION SYSTEMS

*(Specifier Note: Wine refrigeration systems must be installed by a qualified HVAC technician. COORDINATE requirements with Part One "Quality Assurance" and Part Three "Installation" articles.)*

- A. Basis-of-Design: Winezone **[Split Air Handler]****[Split Refrigeration]**.

*(Specifier Note: SELECT Basis of Design paragraph above or descriptive paragraph from one of three paragraphs below.)*

- B. Split Air System: Industrial grade, ducted refrigeration system located outside wine cellar, utilizing return and supply vents to maintain a constant temperature.
  1. Evaporator Size: **[4600]** **[5800]** **[8300]** **[9500]** BTUH.
    - a. Unit Orientation: **[Vertical]****[Horizontal]**.

2. Condensing Units: [**Indoor**] [**Outdoor**] unit with pre-wired control panel.
3. Climate Controls: Modular electronic control series that includes on/off temperature, humidity and staging applications.
  - a. Basis of Design: Johnson Controls, Inc.
    - 1) Housing: NEMA 1 high impact.
    - 2) Mounting: [**Surface**] [**DIN rail**].
    - 3) Remote Sensing: Up to 250 feet.
    - 4) SPDT relay with LED relay indication and an adjustable set point, differential, and offset.
    - 5) Connections: 5 pin.
    - 6) Display: Digital. 7) Accuracy:
      - a) Temperature sensor: +/- 2 deg F.
      - b) Temperature module: +/- 3 deg F.
      - c) Humidity sensor: +/- 4 percent relative humidity.
      - d) Humidity module: +/- 3 percent relative humidity.
    - 8) Input Voltage: 110 or 220 volts.

*(Specifier Note: DELETE system options below that are not project specific.)*

4. System Options

- a. Humidifier with Controls: .75 gallon per hour capacity.
- b. Dehumidifier with Controls: Heavy gauge galvanized iron construction sized to refrigeration unit.
- c. Alarm Module with Controls: 24-volt remote annunciator with 85-90 dB piezoelectric horn and LED indicator lights.

*(Specifier Note: DELETE accessories below that are not project specific.)*

5. Accessories

- a. Pre-assembled Outdoor Upgrade Kit: UL listed enclosure composed of galvanized steel base and 20 gauge galvanized steel cabinet with 45 degree front louvers for all season protection.
- b. Condenser sound blankets

*(Specifier Note: Maintain coated evaporator coil below for exposure to corrosive environments such as saltwater.)*

- c. Coated Evaporator Coil

*(Specifier Note: Metal registers are standard. DELETE paragraph below if metal registers are desired.)*

- d. Wood Supply and Return Registers: [**Flush with Frame**] [**Self Rim**][**Flush Mount**] [**Flush Rim**].

- e. Specialty Grilles: **[Wall Mount Diffuser]** **[3 Way 4 Way Diffuser]** **[Radiant]** **[Baseboard]** **[Toekick]**.
- C. Split Refrigeration System: Industrial grade, ductless, surface mounted evaporator.
- 1. Evaporator: **[Wall mounted]**, **[2,800]** **[3,800]** **[5,700]** **[7,200]** **[8800]** **[Ceiling mounted]**, **[1,500]** **[2,800]** **[3,800]** **[5,700]** **[7,200]** **[8800]** BTUH.
  - 2. Condensing Units: **[Indoor]** **[Outdoor]** unit with pre-wired control panel.
  - 3. Climate Controls:
    - a. Basis of Design: Honeywell FocusPRO 5000.

**(Specifier Note: DELETE accessories below that are not project specific.)**

- 4. Accessories
  - a. Condenser sound blankets

**(Specifier Note: Maintain coated evaporator coil below for exposure to corrosive environments such as saltwater.)**

- b. Coated Evaporator Coil

## 2.6 CONVENTIONAL WINE REFRIGERATION UNITS

**(Specifier Note: SELECT waterfall from tabletop fountains in accessories paragraph below.)**

- A. Waterfall System: Industrial grade, air handler housed in a designer cabinet with tabletop waterfall fixture.
  - 1. Basis of Design: Winezone Waterfall Cabinets.
    - a. Cabinet Material: Clear all-heart redwood.
    - b. Countertop Material: Corian.
- B. Whispercool: Self contained, vibration free, thru wall, wall mounted unit.

**(Specifier Note: SELECT thermostat from one of two paragraphs below.)** 1.

Standard Thermostat: Liquid temperature measuring system.

- 2. Upgrade Thermostat: Liquid temperature measuring system with self-calibrating probe, built-in defrost cycling, heavy duty circuitry and digital temperature readout.

**(Specifier Note: Refer to Wine Cellar Innovations website at [www.winecellarinnovations.com](http://www.winecellarinnovations.com) for unit sizing guide.)**

- 3. Unit Size: **[1,600]** **[3,000]** **[4,200]** **[6,000]** **[8,000]** BTU.

- C. Breezair: Self contained, vibration free, thru wall, platform mounted unit.
  - 1. Unit Size: [1,600] [2,200] [3,000] [4,000] [6,000] [8,000] BTU.
  - 2. Cord Location: [Front (*standard*)] [Back (*upgrade*)].

*(Specifier Note: DELETE accessories below that are not project specific.)*

- D. Accessories
  - 1. Tabletop Fountains: [Slate Bridge] [Classic Misting Bowl] [Contemporary Misting Bowl] [Grapevine Copper Fountain with [Brass] [Burgundy] [Misting Basin]].
  - 2. Wall Fountains: [Angel] [Square Cascading] [Bacchus] [Grapevine Copper Fountain with [Brass] [Burgundy] Grape Clusters].
  - 3. Floor Fountains: [Vinery] [Natural Brushed Steel] [Natural Slate].
  - 4. Fountain Accessories: [Mister/Fogger] [Humidistat].

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Install wine storage equipment in accordance with manufacturer's installation guidelines and recommendations.

### 3.2 EXAMINATION

- A. Verify substrates have been properly prepared.
  - 1. Finish flooring and walls prior to installation according to manufacturer's written recommendations.
  - 2. Notify Architect of unsatisfactory conditions before proceeding.

### 3.3 PREPARATION

- A. Prepare supporting walls and ceiling according to wine storage equipment manufacturer's written recommendations.
  - 1. Frame cellar walls and ceiling with standard 2 by 4 or 2 by 6 nominal stud construction methods and in accordance with local building codes.
  - 2. Apply single layer of 6 mil vapor barrier to warm side of cellar walls and ceiling.
  - 3. Insulate walls using a minimum of R13 and ceilings using a minimum R19 batt insulation.

4. Finish interior of cellar walls, ceiling and floor as specified and per manufacturer's written recommendations.
5. Install door, wine racks and accessories per manufacturer's written recommendations.

*(Specifier Note: DELETE "Wine Refrigeration Systems Installation" article below if not project specific.)*

### 3.4 WINE REFRIGERATION SYSTEMS INSTALLATION

- A. General: Locate equipment in compliance with manufacturer recommendations. Verify conditions are within recommended tolerances and meet local codes.
- B. Install evaporator and condenser.
  1. Install line set.
    - a. Verify maximum line length is 80 equivalent feet.
    - b. Securely fasten line to building structure.
    - c. Insulate suction line along entire length.
    - d. Slope horizontal runs ½ inch per 10 feet towards condenser.
  2. Install crankcase pressure regulator in suction line 4 to 6 feet away from compressor.

*(Specifier Note: DELETE access tee paragraph below for units over 10,000 BTUH.)*

3. Install access tee on receiver flare fitting and place fan cycle control capillary tube on access tee. Install filter dryer and sight glass.
4. Perform leak tests. Repair all leaks prior to start up.
5. Charge condenser.
6. Install electrical wiring.
7. Isolate vacuum pump from system. Break vacuum to positive pressure. Add refrigerant vapor.
8. Apply power to units for 24 hours prior to start up.
9. Start unit.
10. Complete charging process with the compressor running and add balance of charge into suction line of system.
11. Adjust suction pressure at compressor to 30 to 35 PSI.
12. Set condenser fan cycle control to pressures acceptable for R-22 per geographic location.
13. Add refrigerant until bubbles in sight glass disappear. Run system for 10 minutes and refrigerant if bubbles reappear.
14. Allow wine room temperature to fall to 55 deg. F. Check super heat at the evaporator. Adjust expansion valve as so that Superheat is 8 to 12 deg. F.
15. Perform final check of refrigeration unit.

*(Specifier Note: DELETE ductwork paragraph and subparagraph below when split air system is not specified.)*

C. Install ductwork.

1. Verify three feet of straight ductwork precedes coil inlet.

*(Specifier Note: DELETE controls paragraph and subparagraphs below when split air system is not specified.)* D. Install controls.

1. Mount controls near air handler unit.
2. Link controls to control panel in condenser.
3. Check for proper connections before applying power.
4. Set controls according to manufacturer's instructions. E. Install

field wiring.

1. Verify proper voltage, maximum fuse and wire size.
2. Install all equipment according to National Electric Code, and all local codes and ordinances.

### 3.5 CLEANING AND PROTECTING

- A. After completing installation of equipment, repair damaged finishes.
- B. Clean and adjust equipment as required to produce ready-for-use condition.
- C. Protect equipment from damage during remainder of the construction period.

END OF SECTION