



POLAR KING
INTERNATIONAL, INC.®

Architectural / Engineering Specifications

The following specifications are a guide to Architectural, Engineering, and Food Service Consultant specification writers for projects utilizing outdoor walk-in refrigeration equipment. The specifications are standard and may vary according to project requirements. Changes will be noted on the project approval print. Polar King International, Inc. reserves the right to change specifications without notice for product improvement.

1.0 GENERAL

- 1.1 The equipment provided shall be factory prefabricated and have unitized design. The equipment will allow installation without assembly and relocation without disassembly.
- 1.2 Delivery and set-in-place are provided by company trucks. Additional cranes may be required.
- 1.3 The walk-in shall have completely piped, charged, and tested refrigeration systems if refrigeration is installed by Polar King.
- 1.4 All electrical conduits shall be surface mounted. Lights and connections between refrigeration components will be factory wired and tested.
- 1.5 The customer shall be responsible for pouring of a concrete pad, connection of electrical power supply to each refrigeration system, and for flashing of unit to building wall (if required).
- 1.6 The walk-in is certified and may bear the label of the following Certification Agencies:
 - A. National Sanitation Foundation (NSF 7)
 - B. Miami-Dade NOA No. 21-0914.04
 - C. U.S. Dept. of Energy 2007 EISA compliant
- 1.7 The walk-in as an assembly is not 3rd party listed. It shall however use listed component parts:
 - A. UL-Listed major refrigeration components
 - B. UL-Listed electrical components
 - C. Third-party listed foam insulation
- 1.8 The walk-in shall comply or can meet the requirements of these construction codes:
 - A. International Building Code (IBC)
 - B. National Electric Code (NEC)

2.0 SIZE AND CAPACITY

- 2.1 The walk-in shall be built to the specified interior and exterior dimensions. Maximum size is limited by highway transport height and width restrictions to 16' wide x 65' long x 11'-4" tall, subject to route taken.
- 2.2 The walk-in shall have sufficient refrigeration capacity to maintain operating temperature. Capacity shall be sized using the ASHRAE design ambient temperature for the customer's location, an average of (3) door openings per hour, and no load from warm products entering unless otherwise requested. The refrigeration system shall be specified to operate on the customer's available power supply.



3.0 STRUCTURE

- 3.1 The walk-in structure is a sandwich composite of fiberglass (FRP) interior and exterior skins bonded to an insulating foam core.
- 3.2 The interior and exterior fiberglass shell shall be completely seamless and will form a one-piece structure. This construction shall be water, rust, dent, and scratch resistant. The exterior shall be coated with an industrial enamel finish. The interior shall have an anti-microbial interior finish.
- 3.3 Partition walls shall be constructed in the same manner as the exterior walls with a minimum 4" foam core.
- 3.4 The roof shall have a crown sloping away from the side with a door.
- 3.5 The structure shall accommodate a live load of 70 PSF with a factor of safety. P.E.-stamped structural calculations can be arranged for specific locations or conditions.
- 3.6 As the walk-in is considered equipment, no fire thermal barrier is included by default. Where considered a building it will be of IBC Type V construction.
- 3.7 Automatic sprinklers will not be installed by default but can be coordinated.

4.0 FLOOR

- 4.1 A 4" insulated (R-28) prefabricated floor shall be standard. The floor shall be reinforced with wood sub floor beneath FRP, which is then bonded to the foam core. A skid resistant surface coating will be applied to the floor surface.
- 4.2 A welded steel frame shall be bonded permanently to the floor exterior for lifting and anchoring connections. This frame raises the structure an additional 1.5" above grade and allows air circulation under the walk-in. Air circulation prevents corrosion and condensation and eliminates the need for an insulated or ventilated slab.
- 4.3 Standard floor shall support 700 pounds concentrated on a 3" diameter area.
- 4.4 Keg duty floor shall support 1,600 pounds concentrated on a 3" diameter area.
- 4.5 Cart duty floor shall support 2,500 pounds concentrated on a 3" diameter area.
- 4.6 Pallet duty floor shall support 5,000 pounds concentrated on a 3" diameter area.

5.0 DOORS

- 5.1 Doors shall be constructed in the same manner, material, and thickness as the walls.
- 5.2 The standard door shall be 36" x 79" with an opening of 33½" x 78".
- 5.3 Doors shall be flush mounted with a magnetic gasket around three sides and an adjustable bottom sweep. When the door is closed it shall form a positive airtight seal. Door gasket shall be installed in retainer strips for easy replacement in the field.
- 5.4 All doors opening into a warmer temperature area shall be supplied with doorframe heaters, which shall supply sufficient heat to prevent condensation or frost accumulation.
- 5.5 Doors shall incorporate a positive snap action latch with adjustable strike. The latch shall be equipped with cylinder lock and inside safety release mechanism to prevent entrapment. The hardware shall be chrome finished and mounted with stainless steel tamper-proof screws.
- 5.6 Standard doors shall be equipped with (3) walk-in style door hinges. They shall be cam-lift type with nylon bearings and have door lift-off capability. Hinges shall be chrome finished.



- 5.7 Doors shall be equipped with vinyl strip curtains and automatic door closers by default.
- 5.8 Doors shall have swing direction and location as shown on the approval print.

6.0 INSULATION

- 6.1 All insulation shall be rigid, unfaced, closed cell polyisocyanurate foam. Standard insulation thickness shall be 4" for coolers and 5" for freezers.
- 6.2 The thermal conductivity (K) shall not exceed .165 (BTU's/in/sq. ft./hr. F). The thermal resistance R-factor shall not be less than 25 for coolers or 32 for freezers.
- 6.3 The insulation shall have an ASTM E-84 Class 1 rating with a flame spread less than 25, and smoke developed of less than 450.

7.0 REFRIGERATION SYSTEM(S)

- 7.1 Refrigeration condensing units and evaporators shall have qualified AWEF scores.
- 7.2 Refrigerant shall be R-404a, R-448a, or approved alternative for state requirements.
- 7.3 Cooler condenser/evaporator selections shall target 80% relative humidity. Humidity will not be controllable by default.
- 7.4 Polar King will install the following components: liquid filter/drier, solenoid valve, compressor high/low pressure controls, thermostat, expansion valve, and a condenser weather hood. Condensing units will have crankcase heaters and low ambient pressure control valves. Freezers will have suction accumulators.
- 7.5 The condensing unit shall be installed on the roof unless otherwise noted. It shall have a weather hood with vents and color matching the walk-in paint color choice.
- 7.6 Field electrical connections will be made at a control enclosure located at the condensing unit, which shall house overcurrent protection and defrost controls. Mechanical controls will be set for (4) defrosts per day with temperature termination and time backup. Electronic controllers will defrost on demand.
- 7.7 Evaporator coils shall be furnished with electronically commutated (EC) fan motors. Condensate drain piping shall be installed with 3/4" copper pipe and heat trace for freezers and 3/4" PVC pipe for coolers. Pipe will exit the nearest wall and terminate with a 45° elbow.
- 7.8 Northern latitude locations shall have freeze protection equipment installed in coolers. A separate thermostat will engage heat to prevent product freezing when outdoor temperatures drop below freezing.

8.0 LIGHTING

- 8.1 Walk-in shall have factory installed vapor-proof light fixtures. The standard fixture shall have a 100W-equivalent LED bulb with 1600 lumens. All bulbs used shall exceed 40 lumens/Watt efficiency.
- 8.2 One light shall be used for each 50 sq. ft. of interior floor space. This provides a minimum of 10 foot-candles light intensity 30 inches above the floor.
- 8.3 All lights shall be operated with a pre-wired manual switch as standard.



9.0 STANDARD ACCESSORIES

- 9.1 **Digital thermometer:** mounted on the latch side of each compartment door.
- 9.2 **Lock Hasp:** All doors that are not thru-wall or a room partition will be equipped with padlock hasp to prevent unauthorized entry into the walk-in. The hasp shall have an inside release mechanism to prevent entrapment.
- 9.3 **Door drip cap:** Installed on all exterior doors. Redirects rain away from the door gasket.
- 9.4 **Pressure relief vent:** Relieves vacuum due to warm air shrinking as it cools. Freezers will have a heated vent. Coolers will have an unheated vent only if a freezer door opens into that compartment.

10.0 OPTIONAL ACCESSORIES

- 10.1 **Temperature Alarm:** Shall activate when compartment temperature rises above the set point. Signal shall consist of warning light and buzzer located above door latch. Power shall be hard-wired with battery backup in case of power failure.
- 10.2 **Temperature and/or Humidity Recorder:** Recorder shall be graph type with enclosure suitable for outside installation. Recorder shall be complete with graphs and ink.
- 10.3 **Burglar Alarm System:** Shall be Class II rated circuit magnetic type. System shall have contactor mounted in refrigeration system panel for electrical supply from the building's alarm system.
- 10.4 **Exterior Door Ramp:** Sized to match the width of the door. Height adjustable rear feet. Steel versions for cart or pallet jack use and aluminum versions for personnel.
- 10.5 **Spring Loaded Hinges:** A set of three per door shall be installed to provide positive closing of door.
- 10.6 **Vinyl Swing Door:** Clear PVC vinyl panels made from 120-gauge material which meets USDA/FDA and NSF local standards for sanitary codes. Serves the same purpose as strip curtains to reduce cold air loss and/or warm air entry when the door is open but swing out of the away instead of dragging.
- 10.7 **Aluminum Diamond Tread Door Kick Plates:** 18" high x width of door. 1/8" thick. Plates applied to both sides of door.
- 10.8 **Full Bar Security Lock:** Shall be constructed of 1/4" case hardened steel and factory installed on doors which provide outdoor access to unit.
- 10.9 **Through Wall Door Threshold:** Shall be factory provided for installation by others. Shall be 1/2" high x 5" deep x width of door. Threshold shall be aluminum with PVC vinyl frost barrier. Corrosion-resistant plated wood screws for anchoring shall be included.
- 10.10 **Steel Service Door:** Door to provide exterior access to a non-refrigerated compartment. Door shall be constructed of 18 ga. primed steel and equipped with security peephole, panic bar type inside release, ball bearing hinges, key locking latch and felt door sweep. Doorjamb shall be 16 ga. primed steel with foam weather strip and a parallel arm type hydraulic door closer.
- 10.11 **Framed Wall Opening:** Shall be wood stud by default and finished in same manner as the doorjamb.
- 10.12 **Merchandising Doors:** Shall be of the size and number shown on the approval print. Five-tier shelving can be included.
- 10.13 **Wire or Solid Shelving:** Adjustable and sectional types of size, number, and tiers shown on the plans and drawings. Shelving shall be NSF approved and labeled. Shelving system shall be free standing with all necessary posts, shelves, stops, post closures and floor plates for a complete system.



- 10.14 **Explosion-Proof Electrical:** Wiring and electrical components shall be factory installed in conformance with the National Electric Code Section 500. Customer shall classify the hazard level required for both the interior and exterior.
- 10.15 **Three-Way Light Switches:** Shall be flush mounted, vapor proof, and shall allow the lighting system to be turned "ON" or "OFF" at either switch location.
- 10.16 **Saltwater Protection Package:** Shall consist of powder coated door hardware, copper fins on evaporator coil, Heresite coated condenser coil, salt water electrical enclosure, and galvanized steel structural frame.
- 10.17 **Remote Condensing Unit:** Polar King will supply but not install or test the condensing unit. Shall not be supplied with suction piping and insulation, liquid piping, interconnecting wiring and conduit between condensing unit control panel and evaporator electrical panel. A wiring diagram showing the required interconnecting wiring shall be furnished. Refrigerant lines from evaporator shall be capped and the evaporator charged with dry nitrogen. Refrigerant lines from the condensing unit shall be charged with dry nitrogen. Refrigeration pipe sizing, refrigerant charging, and system start-up procedures shall be done according to ASHRAE recommended procedures and in conformance to local codes.
- 10.18 **Shelf Mounted Refrigeration:** Condensing unit(s) to be installed on shelf instead of roof.
- 10.19 **Refrigeration System Switch:** Switch mounted on the evaporator coil shall be wired to shut off evaporator fans and cause the system to pump down when switch is turned to the "OFF" position.
- 10.20 **Floor Drain:** A floor drain shall be factory installed with drainpipe exiting the side of a cooler wall. Floor drain shall consist of 24" x 24" x 3/4" recessed floor pan catch basin, 1" diameter drain screen, 1" PVC pipe drain with internal trap and a 1" diameter x 2" long male extension beyond sidewall of unit for easy on-site connection.
- 10.21 **Pallet Bumper Guard:** 3/4" plywood x 12" tall inlaid at base of walls to prevent pallet bump damage.
- 10.22 **Exterior Flood Light:** Fixture shall have one 150-watt equivalent flood lamp and photoelectric switch.
- 10.23 **Exterior Finishes:** Factory installed options for stucco, vinyl siding, wood fencing and faux-brick.
- 10.24 **Nailer Trim:** Shall be provided according to plans and drawings for attachment of siding, stucco, or other decorative material after the unit is set in place.
- 10.25 **Roof Flashing Kit:** Supplied but not factory installed. Elastoform flashing kit shall consist of 12" wide rubber material; 45° cant strip (filler strip); splice adhesive (Firestone SA-1065 or equivalent) and predrilled termination bar. Additional items to be supplied by contractor include fasteners (screws) for termination bar and silicone sealant.
- 10.26 **Sidewall Flashing Kit:** Supplied but not factory installed. Shall consist of PVC flashing (1" x 5" L-shape PVC material painted to match the exterior color of the walk-in. Additional items to be supplied by the contractor include fasteners (screws or rivets), construction adhesive and silicone sealant.
- 10.27 **One Way Sloped Roof:** Roof shall slope away from the door.