

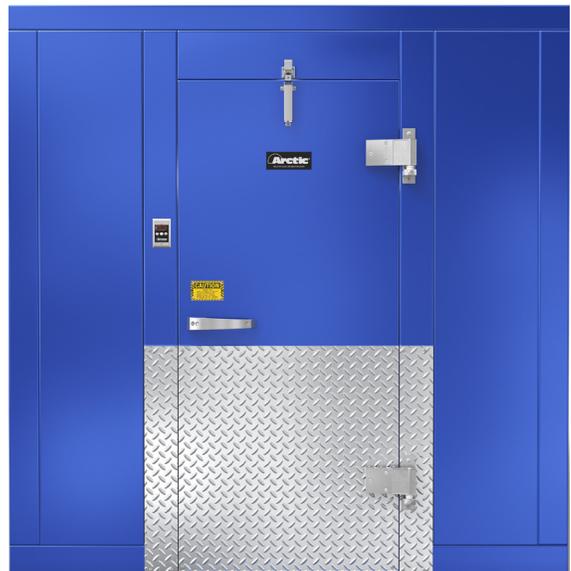
Walk-In Hinged Doors



Overview

Insulation and refrigeration do their magic in the background and require little to no user interaction, but the walk-in door is a different component altogether. Doors are opened, closed, kicked, pushed, pulled, locked, and unlocked multiple times a day for the life of the walk-in, therefore, having a door that has been built to withstand heavy use while offering an energy efficient solution is a crucial step during the engineering of any walk-in.

In this article we will delve into the specifications and main characteristics of a hinged action walk-in door – the most common door in the walk-in industry.



Sizes

Walk-in door sizes are commonly specified not by the size of the door itself (known as door plug), but by the opening. The opening size provides customers with useful information about clearances.

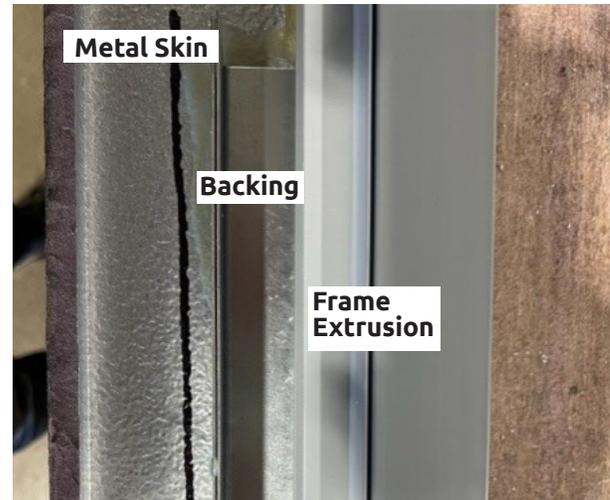
Arctic's most common sizes are:

- 34" x 78" (Standard)
- 36" x 78"
- 42" x 78"
- 48" x 78"
- 60" x 78"

Arctic doors can be custom made in almost any size; this is one of the advantages of FIP (Foamed-In-Place) manufacturing. Arctic can provide hinged doors up to 72 inches in width and up to 20 feet tall.

Anti-sag Design (Foamed-In-Place Backing)

Providing sufficient structural support (backing) on a door plug and the door frame is key to ensure all hardware will be properly anchored. Arctic doors are engineered with a dual layer composite of 14-Gauge galvanized steel backing foamed-in-place in the door frame and door plug, providing the perfect foundation for the door hardware to be anchored.



Standards and Energy Efficiency Compliance

Like the other components of a walk-in, the door panel (plug and frame) must meet minimum standards and specifications set by regulatory agencies to guarantee the performance and safety of the equipment.

Energy Efficiency and Environmental Compliance

Arctic door panels can be 4" or 5-3/8" thick. Insulation is "foamed-in-place" to form a rigid insulation block that is permanently bonded to the interior and exterior metal skins. Insulated doors are constructed to meet Federal Energy Regulations and to be EISA compliant.

The insulation used in manufacturing Arctic's panels and door panels does not contain any chlorofluorocarbons (CFCs) and does not contain any substances that are considered declarable according to the EPA Clean Air Act (CAA).

In accordance with ASTM C518-2004, insulation must have a K factor ≤ 0.125 BTU/hr/sq.ft. per °F/inch at 20°F for freezers, and ≤ 0.143 BTU/hr/sq.ft. per °F/inch at 55°F for coolers.

Let's look at this in layman terms:

We can calculate the R value per inch with this formula: $R=1/k$.

Arctic Freezers:

R= 1/0.125 = 8 per inch.

- On a 4" door panel the total R value equals $R = 8 \times 4 = 32 = \mathbf{R-32}$
- On a 5-3/8" door panel the total R value is $R = 8 \times 5.375 = 43 = \mathbf{R-43}$

Arctic Coolers:

R=1/0.138 = 7.2464 per inch.

- On a 4" door panel the total R value equals $R = 7.2464 \times 4 = 28.98 = \mathbf{R-29}$
- On a 5-3/8" door panel the total R value equals $R = 7.2464 \times 5.375 = 38.95 = \mathbf{R-39}$

UL / ASTM / NSF Compliance

Arctic's walk-in door panels comply with the current industry standards for food service applications. Intertek, a Total Quality & Safety Assurance provider to industries worldwide, is contracted by Arctic for testing and certification of the below standards:

- **UL 471** Standard For Safety Standard For Commercial Refrigerators And Freezers
- **NSF/ANSI 7** Commercial Refrigerators And Freezers
- **ASTM E84/UL 723** Building Materials with Surface Burn Characteristics



MODEL NO.	<input type="text"/>
SERIAL NO.	<input type="text"/>

DOOR PANEL ASSEMBLY

VOLTS PHASE HERTZ

CIRCUIT RATED FOR AMPS MAXIMUM



Additionally, Arctic's walk-in door panels and boxes are in compliance with:

- International Building Code (IBC)
- Energy Independence and Security Act (EISA)
- Department of Energy listed in CCMS database
- State of Oregon
- City of Houston
- Miami-Dade County Outdoor NOA (special construction when requested)
- City Of Los Angeles Department Of Building & Safety (LADBS). LARR report listed.

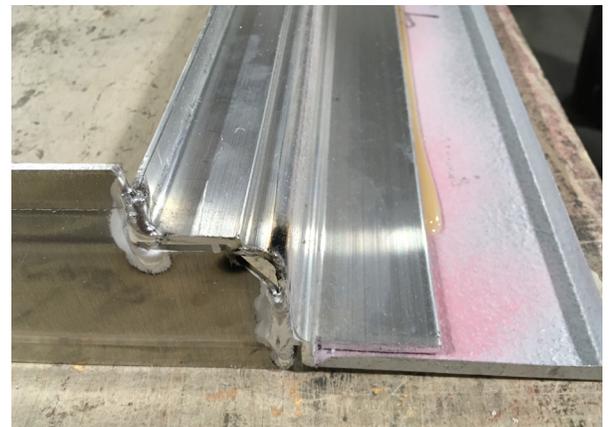
Walk-in door nameplate with Certifications & Compliance by Intertek. Each walk-in has a nameplate on the door assembly indicating certification to UL Standard 471, ASTM E84 (UL Standard 723) and NSF Standard 7.

Structural Integrity

A walk-in door cannot be made just of foam, choosing a sturdy material to frame the door jambs and the door plug guarantees they will retain their shape over time. The framing materials provide structural integrity to the door frame and the door plug.

Arctic's Signature Series cooler door jambs and plugs are engineered with structural fiberglass-reinforced plastic (FRP) pultrusions alongside mitered corners which are foamed-in-place to provide accurate dimensions, superior rigidity and to prevent twisting and door sag.

Freezers require frame heaters because inside temperatures are significantly lower compared to coolers. Arctic's freezer door jambs are engineered with structural aluminum extrusions that are fully welded into an integrated frame structure. This structure is foamed-in-place to provide maximum durability and performance.



Metals and Finishes

Door finish options are virtually limitless and are tailored to the functional and artistic needs of each customer and project.

Arctic offers a wide variety of custom materials, finishes and embossments, including but not limited to the industries' most common ones:

- 26 gauge stucco embossed Galvalume (Acrylume) or G-90 galvanized
- 26 gauge white stucco embossed Galvalume
- 26 gauge smooth Galvalume
- .032" stucco embossed aluminum
- .040" smooth white aluminum
- 22 gauge #4 finish 304 stainless steel



26ga Galvalume
(Acrylume)



.032 Mill
Embossed
Aluminum



22ga
Stainless
Steel



26ga White
Galvanized
Steel

Kickplates

Aluminum Diamond Tread Plate is the most common material for door kickplates. Doors can have kickplates on the outside, on the inside or both. The most common heights are 24" and 36". Kickplates are typically constructed as an overlay on top of the parent door materials. For those ultra high-end projects, kickplates can be constructed flush with the parent door metal.

Electrical

Foamed-in-place insulation technology provides seamless integration between electrical design and panel insulation when manufacturing. All electrical routing can be engineered prior to injecting foam, the result: no cuts, no gaps, no weak points in the panel. Wiring is concealed in the interior of the door frame and foamed-in-place minimizing external conduit runs and providing a more sanitary and aesthetic look.

Standard electrical requirements for doors are 120 volts, 60 cycle, 1-phase on a 15 amp circuit, yet accommodation for other electrical service requirements can be made at the time of sale. Because of the flexibility offered by foamed-in-place construction, Arctic can install concealed electrical wiring with receptacles mounted flush on the inside or outside of the walk-in to meet specific project needs.



Door header electrical conduit routing and J-box placements before foaming in place - custom order.

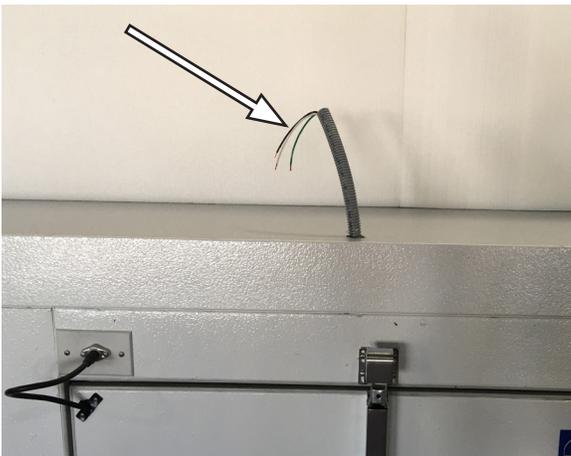


Below are some of Arctic's hinged doors main standard electrical features:

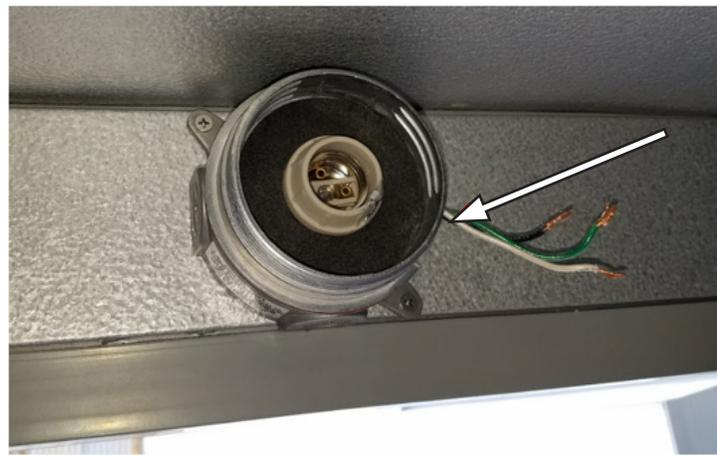
- 120 V, 60 Hz, 1-phase - 15 amp circuit
- Prewired temperature display and light switch mounted on the door frame
- Prewired vapor proof light fixture on the interior centered above the door
- Auxiliary light wiring provision from the main door light switch

Arctic Signature Series door assemblies provide a centered top electrical connection outside of the walk-in. The conduit protrudes above the walk-in to provide a convenient exterior location for the main power connection. This feature eliminates a warm to cold penetration of the walk-in while providing a much more aesthetically pleasing approach to electrifying the walk-in. Outdoor Signature Series and all Blue Line walk-ins have the main power connection inside the walk-in at the over the door light fixture junction box.

Door field wiring and auxiliary lighting is the customer's responsibility and must be performed by a qualified electrician following the National Electric Code and all applicable local standards. All field wiring must be properly sealed to prevent air leakage and condensation inside of the conduit and auxiliary light fixtures.



Door electrical hook up on a Signature Series walk-in.



Door electrical hook up on Arctic's outdoor Signature Series and all Blue Line walk-ins.

Hardware Components

A walk-in hinged door is only as good as the hardware installed. Heavy duty hinges, reliable handles, door closers and magnetic NSF approved gaskets, all come together to provide a perfect seal, proper operation, and compliance with current industry standards.

Arctic uses an extensive line of walk-in hardware from the best manufacturers in the industry. Below are some of Arctic's standard door hardware components:

Hinges

Standard doors, 34" wide x 78" tall, are provided with two cam-rise, flush mount hinges. When requested and when engineering calculations require, a third hinge is provided. A cam-rise system is an ingenious design where the door hinges lift the door about 1/2" as it opens. This has a dual purpose: (1) It prevents the sweep from dragging on the floor when opening, extending the life of the sweep gasket, and (2) to bring the door to a higher point before the "dwell point" to allow gravity to bring it back to its closed position. The hinge has a "dwell point" which is typically ~100°. If the door is opened past the dwell point it will remain open, and if it is opened less than the dwell point, the door will gently return to the closed position due to the design of the hinge – very clever!

Additional self-closing assistance to the hinges can be added to any cam-rise hinge in the form of a Spring Kit. Spring Kits are standard on all Arctic's Signature Series walk-ins.



Cam-rise action flush mount hinge.



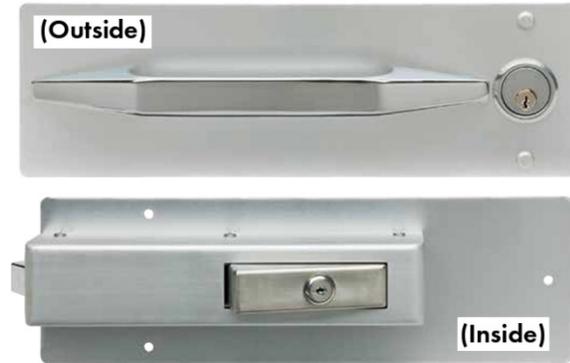
Spring Kit – Add on for hinges.

Handles

Door handles come in many different shapes and sizes. Lever action with lock, no lock handles, locking latch handles, etc., there are options available from different hardware manufacturers. Arctic's standard door handles are provided with a cylinder lock and a key set.



Arctic's standard door handle with lock and key set.



Optional heavy duty high security latching system.

Inside Safety Release

Safety regulations require an inside safety release for all walk-ins. Inside safety releases can be of various types, from a simple twist action latch to a push action glow in the dark button.



Safety release mechanism provided with Arctic's standard door handles.



Glow in the dark push safety release.

High Security Locks

Some applications may require the installation of high-security door locking systems to monitor access to the walk-in. From Bluetooth card reading systems to manual code entry systems, Arctic can offer a variety of state-of-the-art locking solutions for your hinged doors. These tamper-proof systems are manufactured specifically for cold storage applications and can be fitted with optional safety release mechanisms guaranteeing owners a peace of mind for their stored goods while ensuring compliance with safety standards.



Kason SafeGuard® latch with optional Bluetooth card reader.



Kason SecureGuard e-Lock High Security Latch with programmable keypad and quick release push on inside.

Door Closers

Door closers are a requirement for every walk-in manufacturer. They ensure that the door is fully shut during the last portion of travel. This guarantees perfect seal of the gasket against the door frame, saving energy and avoiding potential issues created by doors that fail to close completely.

Door closers are typically spring action or hydraulic and are usually installed at the top of the door. Heavy duty spring action door closers are installed when engineering requirements indicate and are typically seen on very wide and/or very tall doors.



Spring action door closer with adjustable hook.



Heavy duty - high tension spring loaded door closers.

Light Fixtures

Light fixtures in walk-in doors are commonly mounted centered above the door. The light fixture can be mounted on a junction box, or it can be a self-standing light fixture.

Walk-in cooler and freezer light fixtures must be vapor proof and must be designed to work in damp/wet/low temperature conditions.

Fixtures can be either an LED fixture or an Edison style base socket fixture. A safety night light is provided on Arctic's base socket type fixtures to provide emergency light when the switch is off.



Socket type light fixture with LED bulb and safety night light. Standard on Arctic's Blue Line Series.



Arctic's Signature Series standard low profile door light fixture with high impact Lexan lens. Designed to reduce electrical usage by 85%.

Door Gaskets

Hinged walk-in doors use magnetic gaskets to ensure a proper seal against the door frame. Gaskets are made of a flexible PVC extrusion and must be NSF food zone compliant.

Door Gaskets can be Screw-in Style or Push-in Style (Darted/Snap-in). Push-in type is the most common in the refrigeration industry as it allows the user easy maintenance and replacement.

The magnet strength determines the “pull” specification of the gasket and can vary between 2 and 3 lbs/ft. Arctic’s door gaskets are Push-in type (Darted) with 3 lbs/ft of pull.

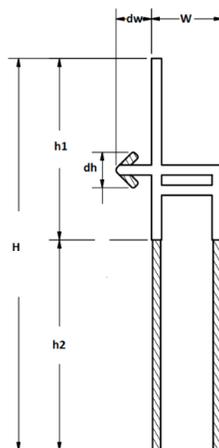
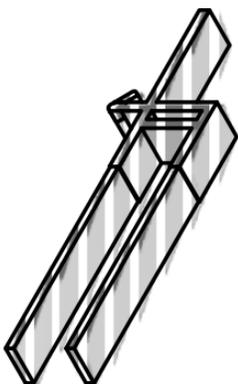


Arctic’s standard NSF push-in door gasket. Magnetic, one piece construction.

Door Sweep

Walk-in door sweeps are made of a combination of rigid and flexible PVC extrusions, and like door gaskets, they must meet NSF requirements.

Sweeps can be of Screw-in Style, Push-in Style (Darted/Snap-in) or both. Arctic uses a Push-in type dual sweep design (2 tails) with screws at the top (rigid section) to ensure optimum performance during use.



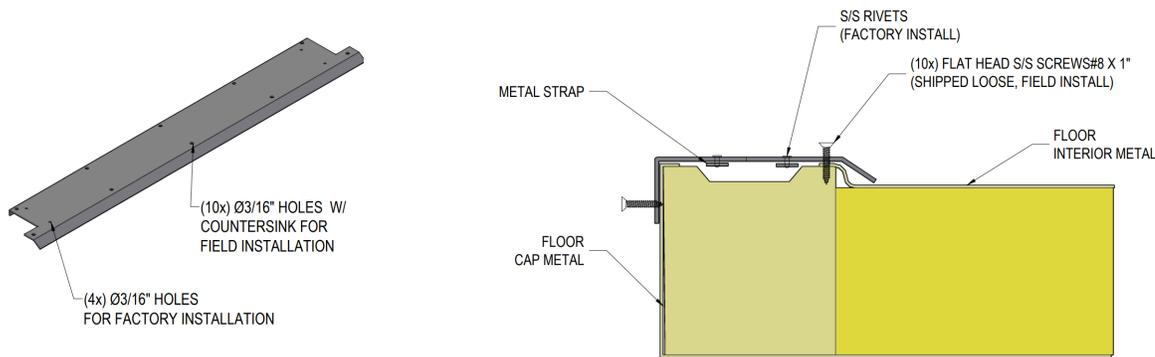
Arctic’s standard door sweep.

Door Thresholds

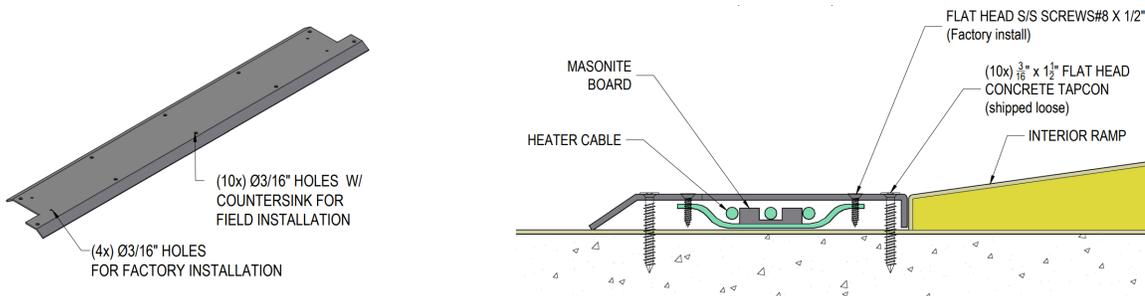
Door thresholds allow smooth transitions between floor surfaces at the door entry. A threshold is not always needed, an example of this are floorless boxes erected over finished concrete or over fully tiled floors as there are no changes in height or type of flooring between the outside and the inside of the box.

Different types of floor transitions call for different types of thresholds: inside ramp, step-in floor, recessed floors, freezer doors are all different applications.

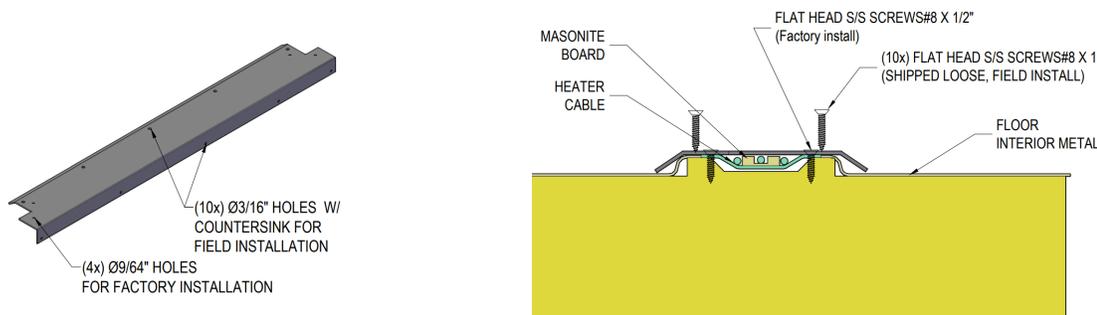
Arctic thresholds are fabricated in-house from 1/8" aluminum unless otherwise specified by the project. Stainless Steel thresholds are also available if required by the project specifications.



Arctic's standard door threshold for a step-in cooler.



Arctic's standard door threshold for a freezer with interior ramp.



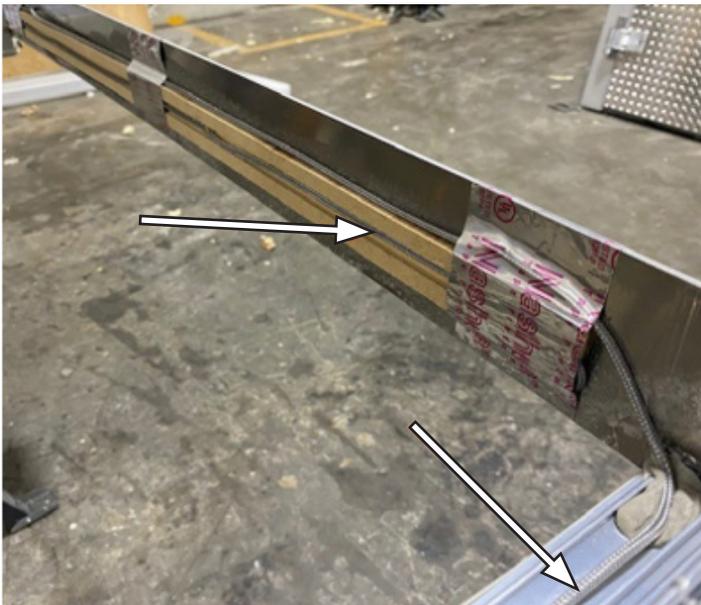
Arctic's standard door threshold for a freezer with a floor transitioning from a cooler with a floor.

Frame Heater

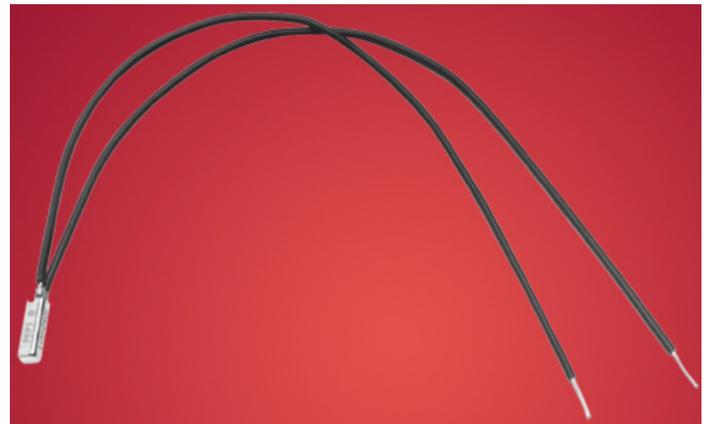
Freezer doors must be supplied with a frame and a threshold heater to prevent ice buildup around the door plug and door entrance due to the temperature difference between the inside of the walk-in and the outside.

Door heaters are installed and pre-wired at the factory, yet they can be replaced in the field if needed. Heater cables must be specified at the right length, resistance (ohm/ft) and wattage as they must comply with energy efficiency regulations.

Small temperature regulators or limiting switches are used on heater circuits to ensure the right temperature and efficient energy consumption.



Heater wire installation on a door frame and sill.



A Pepi-B creep action micro-thermostat to control walk-in door heater cables. Factory preset to maintain 102°F (39°C). Standard on all Arctic's freezer doors.

Pressure Relief Valves

Have you ever wondered why a freezer door sometimes seems impossible to open right after it has been closed? The answer is air pressure. Opening a freezer door allows warm air into the walk-in which is quickly cooled once the door shuts. The quick drop in temperature results in a reduction in pressure, creating a vacuum effect inside making it difficult to open the door.

Pressure relief ports are usually mounted in the door frame and allow airflow through the panel which equalizes pressures inside and outside making it easy to open a door. Pressure relief ports, or pressure relief valves, are available in many types and sizes depending on the size of the walk-in and the application. Pressure Relief Ports for freezer walk-ins have a built-in heater to prevent frost formation in the valve.



A heated pressure relief port. Standard on Arctic's freezer doors.

Take Away

Doors are the most used and one of the most critical components of the walk-in. The engineering that goes into designing a reliable long lasting door that complies with current energy, safety and industry standards is an intensive task; a task that Arctic's engineering team is always up for.

Arctic uses door hardware from the best manufacturers in the industry to provide top-notch quality doors for every job. [Original hardware replacement parts](#) are readily available for online purchasing with fast shipping from the factory to all our customers, dealers, installers, and service companies.

Arctic's engineering team designs doors that meet and exceed industry standards and which can accommodate strict customer specifications. Our knowledgeable sales team is always eager to help you choose the best door and hardware options for your project.

