Polargy PolarPlexTM

Cabinet Supported Roof Drop-Away Panel System

Hot/Cold Aisle Containment System Specification

**PART 1 - GENERAL**

* 1. SUMMARY
1. Cabinet Supported Aisle Containment System with Drop-Away Roof Panels used for either Hot or Cold Aisle Containment.

	1. SYSTEM DESCRIPTION
2. Each HACS/CACS is to consist of Drop-Away Roof Panels and Sliding Doors supported by two rows of server racks. Each HACS/CACS will include Rack Gap Panels to fill empty rack spaces.

1.3 DESIGN REQUIREMENTS

1. Prefabrication of components in order to speed HACS/CACS installation.
2. Provide a sliding door at the end of each HACS/CACS. The sliding door should be a dual door, center opening type with auto-close and hold open features.
3. HACS/CACS Drop-Away Panels shall be individual aluminum framed panels with inserts designed for use below sprinkler heads. Panel inserts shall be UL listed for use below sprinkler heads and shall be Class A fire-rated material.
4. HACS/CACS Drop-Away Roof Panels shall be individual panels that are tool-lessly and easily removable so that there is ready access to the space above the panels and equipment racks.
5. The HACS/CACS shall have the capability to remove 1 or more equipment racks from the continuous row without removal of the HACS/CACS to allow the entire exchange of a fully loaded equipment rack.
6. Where equipment racks are not installed, each HACS/CACS shall include Rack Gap Panels and provisions to mount them. Securing of Rack Gap Panels shall be to the panel support structure and floor.

1.4 PERFORMANCE REQUIREMENTS

1. The HACS/CACS shall have containment integrity to meet or exceed a minimum combined surface area leakage of no more than 3.0% of the total contained zone surface area.
2. The HACS/CACS shall have containment integrity such that no gaps are larger than 0.25” other than the door bottoms that serve as safety pressure relief path when exhaust air and supply air fall out of balance.

1.5 SUBMITTALS

1. Bid Submittals:
	1. Product Data: Provide cut sheets, specification sheets, installation instructions, and material characteristics for manufactured products and assemblies.
	2. Indicate HAC/CAC system layout, plans and elevations, rough dimensions, weights, and system components requiring interface with other systems or structures.
	3. Include the time required for preparing shop drawings, descriptive literature, and material lists.
	4. Include a schedule of the time required for manufacturing and onsite final fabrication and installation time.
	5. Indicate a preferred sequencing and coordination with other trades and installation activities.
2. Action Submittals:
	1. Product Data: For each product and accessory include dimensions and manufacturers' technical data on features, performance, ratings, and finishes.
	2. Shop Drawings for each HACS/CACS: Dimensioned plans, elevations, sections, and details. Include floor plans showing dimensioned layout and support locations, type of support, and weight on each support.
	3. Documents shall also be submitted in PDF for Drawings and Microsoft Word for text format documents.
3. Closeout Submittals:
	1. Spare and Accessory Part/Price List.
	2. Final Shop Drawings if as built substantially different from original drawings.

1.6 QUALIFICATIONS

1. Manufacturer: Company specializing in manufacturing products specified with minimum six years documented experience.
2. Installer: Company specializing in the installation of products and systems specified with minimum six years documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

1. Deliver materials to the project site in original wrappings and containers, labeled with manufacturer’s name, and aisle/room/location number, if any.
2. Store Drop-Away Panels in temperature below 100**°**F.
3. Coordinate with customer for material delivery and staging. The customer shall store/stage materials in their original, undamaged wrappings and containers, inside an area protected from weather, moisture, soiling, extreme temperatures, and humidity.
4. Inspect for dents, scratches, or other damage. Replace damaged products.

1.8 WARRANTY

1. HACS/CACS shall be warranted against defects in materials and workmanship for a one-year period for the first 12 months after initial start-up or 18 months after ship date, whichever occurs first.

**PART 2 – PRODUCTS**

2.1 MANUFACTURERS

1. Basis of Design: Product specified is PolarPlexTM HACS/CACS as manufactured by Polargy, Inc. HACS/CACS specified is to establish a standard of quality for design, function, materials, and appearance.
2. Subject to compliance with this specification, the following Manufacturers may be proposed on the project:
	1. Polargy, Inc.
3. Substitutions: Proposed substitutions must be approved prior to bidding.

2.2 GENERAL

1. This hot aisle/cold aisle containment system shall enclose two adjacent rows of equipment racks. The system includes aisle end sliding doors at the ends of each aisle and above aisle drop-away panels. The drop-away panels shall be supported by a Unistrut/retaining angle track installed along the top of the equipment racks. Sliding doors shall be mounted to the Unistrut/retaining angle track and to the floor. Rack Gap Panels, sealing materials and blanking panels are included as needed.

2.3 STRUCTURE

1. [System Architecture] Roof panels shall be supported via a Unistrut/L-extrusion retaining angle that is attached to and runs along the tops of the cabinets. The Unistrut/L-extrusion structure allows for removing and replacing equipment racks and allows for equipment racks of various heights. Sliding Doors shall attach to the Unistrut/L-extrusion angle and to the floor with brackets. Gaps above short equipment racks and below the Unistrut/retaining angle track shall be filled with fire safe air barriers or air dam foam.
2. Sliding Doors shall have automatic closing with no threshold and include a mechanism for holding the door in an open position; the mechanism shall be removable without tools in order to accommodate sites where operators prefer to make this feature temporary.
3. Sliding Doors shall be adjustable in height to easily accommodate various height equipment racks and shall have an adjustment range to accommodate rack heights between 42U and 50U.
4. Sliding Doors shall have clear, twin-wall polycarbonate windows comprising over 75% of each door opening. Twinwall material shall be Class A fire-rated material. Twin-wall panel shall be field replaceable in order to easily swap out damaged inserts with a replacement time of less than 20 minutes to minimize disruption to containment.
5. Drop Away Roof Panels shall be designed for use below sprinkler heads and the panel insert material shall be a heat sensitive uPVC material that loses its rigidity at a temperature of 135°F so that it falls from its frame at that temperature. Panel inserts shall be UL listed for use below sprinkler heads. Panel inserts shall rest loosely in a captured frame and shall not be pinched by panel frame so that they can drop freely.
6. Drop Away Roof Panels shall be prefabricated in order to minimize installation time.
7. Drop-Away Roof Panels shall be individual panels with a lightweight aluminum frame with a 1” tall profile. Each panel shall be installed and removed easily without tools to allow for easy cleaning and maintenance access.
8. Rack Gap Panels shall have provisions for tool-lessly fastening to the floor and Unistrut/L-Extrusion track above the equipment cabinets. Panel sizes and quantities shall be coordinated with the owner.
9. Rack Gap Panels shall be aluminum-framed panels with 8mm thick twin-wall polycarbonate inserts. Panel frame members shall be lightweight anodized aluminum with a 1” tall profile.
10. Empty equipment racks shall be blanked off with 42U full length blanking panels. 42U-blanking panels shall install without tools using push rivets. 42U-blanking panels shall be printed with server images to give the appearance of a fully populated cabinet.
11. Miscellaneous gaps of shall be sealed with fire safe air dam foam or air dam barriers. Air dam foam shall be provided in 24”x24”x2” sheets that are pre-scored at 1” increments so that various sizes and shapes can be easily made. Air dam barriers shall be provided in various sizes and shall include magnetic or Velcro options for attaching the barriers to equipment racks.

**PART 3 – EXECUTION**

3.1 PREPARATION

1. Cabinets to which doors and panels are attached should be level and square and properly secured to the floor.

3.2 INSTALLATION

1. Install HACS/CACS in accordance with manufacturer's shop drawings and written instructions.
2. Doors must be secured to the Unistrut/L-extrusion structure (or to the equipment racks if rack independence is not needed) and to the floor.
3. Level and align doorframe prior to permanently fastening.
4. Panels shall rest in and be captured by the Unistrut/L-extrusion structure along the tops of the equipment racks. If rack independence is not needed then the panels must be secured directly to the tops of the equipment cabinets with reclosable fastener.
5. Fill and seal miscellaneous gaps with air dam foam or air dam barriers.
6. Installers shall provide appropriate installation hardware as defined by local code or the authority having jurisdiction (AHJ).

3.3 ADJUSTING AND CLEANING

1. Adjust doors for smooth operation, and, when closed, the door shall be centered on the aisle ends.
2. Clean entire HACS/CACS assembly with mild soap and water solution.

END OF SECTION