Polargy PolarPlexTM

Cabinet Supported Vertical Panel System

Hot/Cold Aisle Containment System Specification

**PART 1 - GENERAL**

* 1. SUMMARY

1. Cabinet Supported Aisle Containment System with Vertical Panels used for either Hot or Cold Aisle Containment.  
   1. SYSTEM DESCRIPTION
2. Each HACS/CACS is to consist of Vertical 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 Vertical Panels shall be individual aluminum framed panels with twinwall polycarbonate inserts. Panel twinwall inserts shall be Class A fire-rated material.
4. HACS/CACS Vertical Panels shall be individual panels that are tool-lessly and easily removable so that the panels can be removed for maintenance access to the space above the equipment racks and for cleaning of the panels.
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. 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.
3. 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 vertical panels above the equipment racks and doors. The vertical panels shall be supported by a Unistrut/F-bracket track installed along the top of the equipment racks. Sliding doors shall be mounted to the Unistrut/F-Bracket track and to the floor. Rack Gap Panels, sealing materials and blanking panels are included as needed.

2.3 STRUCTURE

1. [System Architecture] Vertical panels shall be tool-lessly removable and held at the bottom in the F-Bracket/Unistrut track that runs along the tops of the equipment racks. For closed top architectures vertical panels shall be supported at the top with a ceiling trim piece and 3M Dual-Lock. For open top architectures, the vertical panels shall be aligned at their tops with U-channel pieces that connect adjacent panels. Sliding Doors shall attach to the Unistrut/F-Bracket track and to the floor with brackets.
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. Vertical Panels shall be prefabricated in order to minimize installation time.
6. Vertical Panels shall be individual panels no wider than 48”. 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. Each panel shall be installed and removed easily without tools to allow for easy cleaning and maintenance access.
7. Rack Gap Panels shall also be held at the bottom in an F-Bracket and secured to the F-bracket/Unistrut along the top of the equipment cabinets with 3M Dual-Lock. Panel sizes and quantities shall be coordinated with the owner.
8. 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.
9. 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.
10. 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 are attached should be level and square and properly secured to the floor.
2. Cabinets to which 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 F-Bracket/Unistrut track (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 be supported in the F-Bracket/Unistrut track on the bottom. If rack independence is not needed then the F-Bracket and doors must be secured directly to the tops of the equipment cabinets.
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