



PART 1 - GENERAL

1.1 Summary

A. Section Includes:

1. Hot Aisle Containment System (HACS)

1.2 Proposal Submittals

A. Submit a complete proposal, including but not limited to the following:

1. Product Information: Cut sheets that indicate features and specifications.
2. Indicate HACS 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, material lists and schedules for approval.
4. Include a schedule of the time required for manufacturing and the time required for onsite final fabrication and installation.
5. Provide a Compliance Review of the Specifications, Drawings and Addenda. Mark on the original Specifications and any subsequent Addenda with a "C" for complying, "D" for complying with deviations, and an "E" for exceptions/do not comply. Provide explanations for Deviations and Exceptions.

1.3 Action Submittals

A. Product Data: For each product and assembly include dimensions and manufacturers' technical data, performance, ratings, and finishes. Include data sheets, material data sheets, and installation instructions.

B. Shop Drawings: Provide HAC dimensioned plans, elevations, sections, and details. Include plan views showing dimensioned layout, center lines, and support to building structure. Indicate types of ceiling support or floor anchorage, and weight on each ceiling support.

C. Documents shall be submitted in PDF for Drawings and Microsoft Word for text format documents. Provide 3D CAD (.dwg) models for each HAC type for BIM Coordination.



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1.4 Closeout Submittals:

- A. Spare and Accessory Part/Price List. Include Infill/Blank-Off Panels.
- B. Maintenance instructions, if any.
- C. Final Shop Drawings if As-Built is substantially different from original drawings.

1.5 Qualifications

- A. Manufacturer: A manufacturer capable of fabricating containment assemblies that meet or exceed performance requirements indicated and who has been manufacturing systems of the type required for the project for a period of more than 5 years.
- B. Installer: An entity that employs installers and supervisors who are trained and approved by the manufacturer.

1.6 Delivery, Storage, and Handling

- A. Deliver materials to the project site in original wrappings and containers, labeled with manufacturer's name, and aisle/room/location number, if any.
- B. 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.
- C. Inspect for dents, scratches, or other damage. Replace damaged products.

1.7 Warranty

- A. HACS shall be warranted against defects in materials and workmanship for a two-year period. The two-year period measured as the first 24 months after initial start-up or 30 months after ship date, whichever occurs first. measurements. Server rack dimensions to be provided by the Owner before fabrication.



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1.8 Preinstallation and Coordination

- A. Preinstallation Conference: Manufacturer or installer attend conference at project site or via video conference.
- B. Field Measurements: Verify actual dimensions of containment assemblies to building structure by field measurements. Server rack dimensions to be provided by the Owner before fabrication.

PART 2 - PRODUCTS

2.1 Manufacturers

- A. Basis of Design: Products specified are the PolarFlex™ HACS and PolarSlide™ Sliding Door as manufactured by Polargy, Inc. HACS and doors specified are to establish a standard of quality for design, function, features, and appearance.
- B. Substitutions: Proposed substitutions must be approved prior to bidding.

2.2 Containment System

- A. This Hot Aisle Containment System shall enclose the hot aisle between two adjacent rows of equipment racks. Each HACS shall form an aisle containment plenum supported from the ceiling and independent of the equipment racks. The HACS shall include aisle end doors to seal either end of the hot aisle. Floor panels shall be placed in the locations of missing cabinets and around columns or other floor obstructions to retain containment integrity.
- B. The HACS shall be packaged in pre-assembled sections with factory installed connecting brackets integrated at proper locations to simplify field assembly.
- C. The HACS shall be designed such that it can be assembled on the floor and subsequently lifted into place as one unit, or in sections, in order to speed installation and improve safety by reducing ladder and lift time.
- D. The HACS shall have the ability to accept the typical roof movement associated with environmental loading on building structures, without impeding the containment integrity. Owner/architect to specify total vertical movement (downward and upward) at the interface between the HACS plenum and the top of the equipment racks as well as for the door support structure.



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- E. In addition to the self-weight of the HACS, the HACS shall be capable of resisting the required earthquake forces for the location, in accordance with the provisions of American Society of Civil Engineers Standard ASCE/SEI 7-10.
- F. Structural loads for cable and power pathways/trays, communication cables and power cables/busways, and light fixture are not to be supported from the HACS.
- G. The HACS shall have the capability to remove one or more equipment racks from the continuous row without removal of the HACS to allow the entire exchange of a fully loaded equipment rack.
- H. HACS panel frames and doors shall be a clear anodized aluminum extrusion. The panel inserts shall be clear, twin-wall polycarbonate. The door inserts shall be clear, solid polycarbonate.
- I. Fire Rating Classifications: Class A per ASTM E84, with Flame Spread Index 0-25 and Smoke Development Index 0-450.

2.3 System Components

A. HAC Plenum

1. The HACS plenum structure will be a lay-in panel design such that panels can be installed and/or replaced without the removal or disassembly of the HAC framing.
2. The HACS plenum structural shall consist of pre-fabricated sections of aluminum framing rails and brackets that minimize the field assembly.
3. Panels within the aluminum rails shall be 8mm clear, twin-wall polycarbonate.
4. Aluminum framing rails shall have 3/8" threaded bolt-slots on opposing sides. The dual threaded slots shall allow for installing connecting brackets either internally or externally on the HACS plenum. The threaded slots shall be able to support internal cross bars or external support arms for holding cable trays and ladders.
5. Aluminum framing rails shall have 5/8" panel surfaces into which lay-in panels shall fit. Panels shall be attached with panel clips that connect into the 3/8" bolt-slot.
6. Install a brush grommet interface between the HAC framing and top of cabinets with a 3" continuous brush that overlaps the cabinet tops by approximately 3/8" of an inch.
7. For locations where ladder racks, trays, or troughs enter or exit the HACS access holes shall be cut in the twin-wall panels and trimmed with brush grommets.
8. Where equipment cabinets are not installed or aisle lengths are uneven, include Floor Panels to fill gaps with an option to tool-lessly mount and remove them. The Floor Panels shall accommodate the vertical movement noted above. Panel sizes and quantities shall be coordinated with the owner.



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B. Sliding Doors

1. Provide sliding doors at the end of each HACS. The sliding door should typically be a dual door, center opening type. For singled sided aisles doors should be single slide type.
2. The door inserts shall be solid, clear polycarbonate (not acrylic).
3. Doors shall be delivered fully assembled.
4. Doors shall have automatic closing.
5. Doors shall have a soft-close.
6. Doors shall have a magnetic close seal.
7. Sliding door shall have no threshold.
8. Sliding doors shall have a mechanism for holding the door in an open position.

2.4 Performance Requirements

- A. The HACS shall have a leakage of less than 2% pressure loss at a pressure differential of 0.05" of water.
- B. The HACS shall have containment integrity such that no panel gaps are larger than 0.25" and the door bottom gaps shall be less than 0.75".

PART 3 - EXECUTION

3.1 Preparation

- A. Ceiling structure for supporting the HACS will be by others and shall be structurally engineered to support the HACS.
- B. Coordinate sequence of installation with owner and other trades.
- C. Assure ceiling height is within allowable tolerances prior to start of installation.

3.2 Installation

- A. Install HACS in accordance with manufacturer's shop drawings and written instructions.
- B. Doors must be secured to the plenum framing system and to the floor.
- C. Level and align doorframe prior to permanently fastening.
- D. Installers shall provide appropriate installation hardware for ceiling and floor connections as defined by local code or the authority having jurisdiction (AHJ).



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3.3 Adjusting and Cleaning

- A. Adjust doors for smooth operation, and, when closed, the door shall be centered on the aisle ends.
- B. Clean entire HACS assembly with mild soap and water solution.