

# Guide Specifications

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## HyperPod System

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### PART 1 - GENERAL

#### 1.01 SUMMARY

HyperPod uses a floor standing steel frame structure, door frames and doors, panels and air blocks to enclose a hot or cold aisle zone which contains IT equipment warm exhaust air (HACS) or cooling unit supply air (CACS). HyperPod provides mounting locations for a series of cantilever arms, able to support a range of infrastructure components, end of row distribution cabinets, able to support power distribution and control panels.

Hot Aisle Containment (HACS) - The hot aisle zone is the space between two rows of IT equipment racks with the hot air exhaust side of the IT equipment in one row of racks facing the opposite row. In this enclosed space hot exhaust air from all IT racks is collected inside of the HyperPod. The exhaust air is captured by close coupled cooling units, or ducted to a ceiling plenum or overhead duct. The HACS is available in ceiling panel or ducted return configurations

Cold Aisle Containment (CACS) - The cold aisle zone is the space between two rows of IT equipment racks with cold air being supplied between the two rows of racks and the IT equipment exhausts hot air away from the aisle. In this enclosed space, cooling unit supply air is collected inside of the HyperPod. The cool air is supplied to the IT equipment while the IT equipment exhaust air is pushed outside the HyperPod and returned to the cooling unit.

By preventing mixing of cool supply air and hot exhaust air, this self-contained configuration is capable of supporting a complete range of low, medium and high power/heat density loads, and can be deployed in multiple environments without affecting the surrounding area.

#### 1.02 REFERENCES

- A. General: The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only. The edition/revision of the referenced publications shall be the latest date as of the date of the Contract Documents, unless otherwise specified.

### 1.03 SYSTEM DESCRIPTION

- A. Design Requirements: The HyperPod frame shall be telescopic to allow for an aisle length range of 8ft-12ft (2.4m-3.6m) expandable in increments of 50mm. The HyperPod frame shall allow for multi-pod configurations, where additional 8ft-12ft (2.4m-3.6m) sections can be added to form a single pod. Supporting aisle widths range from 3ft, 4ft, 5ft or 6ft (900mm, 1200mm, 1500mm or 1800mm). Hot and cold aisle, ceiling and ducted configurations are supported. Ceiling and duct panels must be constructed in a rectangular fashion and extend horizontally and vertically (angled panels or tapers are not supported). Refer to proper documentation for clearance requirements for various components. Most standard dimension third party racks should be supported. The HyperPod frame shall provide suitable locations for mounting of cantilever arms, which in turn can be used to support infrastructure components. The HyperPod frame shall have integrated, end of row distribution cabinets, to support power distribution or control panels.
- B. System Characteristics:
  - 1. Physical:
    - a. External width dimensions shall be the width of the aisle and two rows of enclosures
    - b. External depth dimensions shall be the length of the HyperPod frame and any clearances for end-of-aisle doors.
    - c. External height dimensions shall be the height of the chosen HyperPod frame, plus any overhead infrastructure components attached to the frame.

### 1.04 SUBMITTALS FOR REVIEW

- A. Product Data: Provide for manufactured products and assemblies. Indicate dimensions, System layout, description and location of components, rough-in connections, and materials characteristics and connection requirements.
- B. Installation, Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, installation instructions, and maintenance and repair data.
- C. Submit installation - startup report provided by manufacturer's factory trained technician.

### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum 5 years documented experience with service facilities within 8 hour reaction time of Project site.

### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the Project site in supplier's or manufacturer's original wrappings and containers, labeled with supplier's or manufacturer's name, material or product brand name, and lot number, if any.
- B. The customer shall store materials in their original, undamaged packages and containers, inside a well ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

## 1.07 WARRANTY

- A. The manufacturer shall provide a one-year warranty against defects in material and workmanship for 12 months after initial start-up or 18 months after ship date, whichever occurs first. (Refer to the Warranty Statement for details.)
- B. Additional Owner Rights: The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

## 1.08 MAINTENANCE

- A. The equipment supplier shall be capable to maintain, service, and repair the equipment for a period of one (1) year. The supplier is responsible to include all parts & labor and maintain the equipment in accordance to the equipment manufacturer's recommended guidelines as set forth in the equipment's user/operations manual.

## **PART 2 - PRODUCTS**

### 2.01 MANUFACTURERS

- A. Basis of Design: Product specified is HyperPod System as manufactured by Schneider Electric. Items specified are to establish a standard of quality for design, function, materials, and appearance.
- B. Subject to compliance with these and related specification sections, the following Manufacturers may propose on the project: Schneider Electric
- C. Substitutions: Proposed substitutions must be approved prior to bidding. Alternate manufacturers/suppliers will be responsible for any required changes and associated costs if alternate is accepted.
- D. UL Listing: All system components shall be certified as suitable for this data center environment by documentation supporting UL Listings: UL484, CSA C22.2 No.236, UL723S and UL723.

### 2.02 FEATURES

### 2.03 FRAME SYSTEM

- A. Frame shall be constructed of powder coated, 11-gauge steel.
- B. Frame system shall stand either: 2750mm or 3200mm tall, per site requirements.
- C. Frame system shall be telescopically expandable from 8ft to 12ft (2.4m-3.6m) expandable in increments of 50mm Multi-pod configurations shall allow additional 8ft to 12ft (2.4m-3.6m) sections to be added to reach desired pod length.
- D. Frame system shall support both 3ft, 4ft, 5ft or 6ft aisle widths.

- E. Frame system shall provide mounting locations, for mini cantilever arms, along the horizontal aisle length beams. Weight load capacity of 33lbs for each Mini Cantilever.
- F. Frame system shall provide mounting locations, for large cantilever arms, along the vertical frame beams. Weight load capacity of 1500lbs for system of 2.
- G. Frame system shall provide service windows along the length of the aisle, allowing access to the top of equipment in a HyperPod row, from the HyperPod contained aisle.
- H. Frame system shall provide optional brush pass through service windows along the length of the aisle, allowing cable pathway, lighting or other trades to enter and egress the contained aisle.

## 2.04 CEILING PANELS

### SIMPLE ROOF

- A. Ceiling panels shall be 6.0 mm thick V0 Lexan clear-ribbed panels with aluminum framing.
- B. Flame spread rates: Smoke development index "0-65" and flame spread index "0" in accordance with UL723 or ASTM84. Nominal thickness: 6 mm (V0 clear).
- C. Minimum Light Transmission per ASTM D1003 equal to 79% or greater.??
- D. Ceiling panels shall be designed to be supported by the HyperPod frame. Ceiling Panel frames sizes shall be suitable to match up with various aisle lengths, use of ceiling filler panels at either end of the aisle is allowed.

### DROP ROOF

- A. Ceiling panels shall be 6.0 mm thick V0 Lexan clear-ribbed panels with aluminum framing.
- B. Flame spread rates: Smoke development index "0-65" and flame spread index "0" in accordance with UL723 or ASTM84. Nominal thickness: 6 mm (V0 clear).
- C. Minimum Light Transmission per ASTM D1003 equal to 79% or greater.??
- D. Panel to be released at 135°F (57°C).
- E. Panels to have the ability to be released from an auxiliary smoke alarm input.
- F. An audible and visual alarm must activate before the ceiling panels drop.
- G. Solution must be UL723S listed.
- H. Ceiling panels shall be designed to be supported by the HyperPod frame. Ceiling Panel frames sizes shall be suitable to match up with various aisle lengths, use of ceiling filler panels at either end of the aisle is allowed.

## SHRINK ROOF

- A. Ceiling panels shall be .013 thick thermo-formed material.
- B. Panels are to be approved for installation below fire sprinklers.
- C. Panels are to meet FM Class 4651 requirements.
- D. Panels to meet NFPA 13 requirements.
- E. Panels are to be clear
- F. Ceiling panels shall be designed to be supported by the HyperPod frame. Ceiling Panel frames sizes shall be suitable to match up with various aisle lengths, use of ceiling filler panels at either end of the aisle is allowed.

## 2.05 DOOR FRAMES AND DOORS

### DUAL SLIDING DOOR

- A. Metal door frames and doors shall be provided to establish air containment at the end of the HyperPod.
- B. Doors shall be dual sliding doors with window panels for visibility through the doors. Doors shall include key lockable handle, upgradeable to combination lock and other, with manual override within the aisle.
- C. Door frame and door system shall be free of floor obstructions, such as rails and runners, in the doorway entrance.
- D. Doors shall feature a soft close mechanism, fix open at full extension otherwise auto-close to maintain aisle containment integrity.

### SINGLE SWING DOOR

- A. Metal door frames and doors shall be provided to establish air containment at the end of the HyperPod.
- B. Single Swing Door shall have multi-wall polycarbonate inserts. Doors shall include pull handle.
- C. Door frame and door system shall be free of floor obstructions, such as rails and runners, in the doorway entrance.
- D. Doors shall be right hinged using UL approved hinges.

## 2.06 CANTILEVER ACCESSORY ARMS

- A. Mini cantilever arms shall be mountable along the HyperPod aisle length beams
- B. Each 8ft – 12ft pod shall allow mounting of up to 6 mini cantilever arms
- C. Mini cantilever arms shall be able to support 33lbs for 1 mini cantilever
- D. Large cantilever arms shall be mountable to the upper section of the vertical posts
- E. Each vertical post shall allow mounting of 1 large cantilever arm at least.
- F. Large cantilever arms shall be able to support 1500lbs for system of 2
- G. If specified, an aluminum frame shall be mounted to the large cantilever arm system, offering additional mounting locations for infrastructure components.

## 2.07 DISTRIBUTION CABINETS

- A. Distribution cabinets shall be integrated at the end of each row within the HyperPod system
- B. Distribution cabinets shall be usable for populating with power distribution or control panels (supplied and installed by others)

## 2.08 POWER RACEWAY

- A. An optional, modular power raceway system may be supported by the mini cantilever arm system
- B. The power raceway shall be telescopic to match the length of each 8ft – 12ft HyperPod section
- C. The power raceway will feature waterfall tray, to connect directly to the top of the distribution cabinets.
- D. For multi-pod configurations, a connection module shall allow connection of one power raceway to another in one span.
- E. Cover plates shall be installed to the front and rear faces of the power raceway, providing mounting locations for junction boxes, and other infrastructure components (supplied and installed by others)

## 2.09 OPTIONAL FEATURES

- A. Fire Safe Ceiling
  - 1. UL Listing: The Ceiling System complies to UL484, EN 55022:2006, EN 55024:1998, EN 61000-3-2:2006, EN 61000-3-3:1995, EN 60950-1:2006, CFR 47 FCC Part 15:2011, ANSI C63.4-2003, ICES-003:2004, AS/NZS CISPR 22:2009.
  - 2. The Fire Safe Ceiling system shall contain one of the specified ceiling panels described in section 2.0.4.
  - 3. Thermal links are not an acceptable substitution.
  - 4. Ceiling panel shall be resettable
  - 5. The Ceiling System shall be UL723S certified for use below fire suppression systems at the room ceiling level.

- a. The ceiling system shall use thermal detection for panel release to be UL723S certified
- b. The system shall activate at 135 degF or 57 degC
- c. Multiple temperature switches per aisle must be provided for thermal event detection.
6. The ceiling system shall have the option of panel release based on smoke detection to enable fire suppression system in the room
  - a. Smoke detection shall be supplied by customer
  - b. Smoke detector must send an on/off digital signal to control box (not an analog signal).
  - c. A normally closed dry contact smoke detector must be used
  - d. Smoke detector may utilize 24VDC output from existing power source
7. The Fire Safe System must have an audible and visible alarm to alert personnel of pending panel release. The system must hold the panels in place for 10 sec after alarm sounds and prior to releasing panels to allow personnel to exit the space in the event of a thermal or smoke event.
8. The ceiling system shall utilize electromagnets for panel release mechanism. The electro magnets shall be powered by supplies located in adjacent IT racks or aisle crossover tray.
  - a. The power supplies shall utilize dual inputs
  - b. The electromagnets shall be connected in series (one by one)
  - c. Voltage options are 100-120VAC or 200-240VAC single phase 50/60 Hz
  - d. The power supply can support up to 30 electromagnetic locks
  - e. If smoke detector will draw power from this power supply, the quantity will be decreased based on the power consumption of smoke detector
9. The ceiling system shall include a mechanical locking device to allow system to be serviced without panel release

## B. Lighting

1. UL Listing: Lighting system complies to UL484, CSA C22.2 No.236, EN 55022:2006, EN 55024:1998, EN 61000-3-2:2006, EN 61000-3-3:1995, EN 60950-1:2006, CFR 47 FCC Part 15:2011, ANSI C63.4-2003, ICES-003:2004, AS/NZS CISPR 22:2009.
2. Available for both ducted and ceiling panel, single or dual rack row installations.
  - a. Shall provide additional mounting rail:
    1. Lights shall fasten to rail
    2. Wire covers used for spaces between lights
    3. The bulk of the wiring shall be hidden inside the rail behind each light and cover
  - b. Lights shall be mounted to upper corners inside contained aisle along aisle length
  - c. Lighting density options include: 300 mm or 600 mm spacing between each light
  - d. Lights are to be installed on both sides of aisle (or one side if otherwise specified)
  - e. Shall include all necessary cabling, connectors, and fasteners (no tools provided)
  - f. Across aisle cable shall be provided to minimize number of control units per contained pod
3. Specs
  - a. CCT = 5000K
  - b. CRI = 85
  - c. Typ Watts = 5, max Watts = 6
  - d. Lens = frosted

- e. Lumens per foot = 187, Lumens/meter = 613
  - f. Length = 11-1/2", width = 1", height = 1/2"
4. Control Unit
    - a. Shall be mounted in rack or HyperPod mounting locations
    - b. Voltage options are 100-240VAC single phase 50/60 Hz
    - c. Shall power up to 12 lights per control unit
    - d. Shall be provided with 2 power cords: (1) C13/C14, (1) C13/NEMA 5-15P
    - e. Group control capability for use of more than one control unit per contained pod. Up to five total control units can be grouped together
    - f. Control unit comes with integrated rotary switch for adjusting light ON interval. Time settings shall consist of various presets from 1 to 75 minutes of light ON operation
    - g. Two group LED outputs on control unit (lights wired in series)
    - h. Integrated LED indicates power status of control unit
    - i. Controller is to be installed to mounting rails in lowest position of rack (preferably the 0U position) (hardware provided)
  5. Motion Sensor
    - a. Shall provide two motion sensors per control unit
    - b. Capable up to four motion sensors per control unit
    - c. Motion sensors shall mount to door or curtain header (mounting brackets provided)
    - d. If any of the four motion sensors (per control unit) detect movement, LED bank will illuminate.
    - e. Utilizes a single RJ45 connection per motion sensor (shall be routed out of visibility)
  6. Manual Light Switch
    - a. Shall provide two manual light switches
    - b. Shall mount inside or outside of aisle
    - c. Shall mount via three methods (hardware provided): 1) Fastener 2) Magnet, or 3) hook and loop
    - d. Manual switch turns OFF the light bank
    - e. Motion sensors become inactive when a manual switch is pushed. After 10 seconds, motion sensors are automatically restored

#### C. Air Return System

1. Centralized hot air return system for room and external air handling systems
2. Shall consist of duct mounting rails and duct panels
  - a. Mount to top of frame and extend up to ceiling plenum
  - b. Allows for flexibility with overhead cabling and cable troughs

#### D. Blanking Panels, Height Adapters

1. Blanking Panels shall be placed where gaps between racks exist to seal contained aisle. The panel shall mount to the HyperPod horizontal aisle length beam, with optional mounting points to the floor or stop rail.
2. Height Adapters shall mount to the HyperPod horizontal aisle length beams to align the enclosure height. The height adapter shall be modular in nature to allow for up to 6U in variance between racks and enclosures. Height adapters shall include brush strip to interface with rack.



## **PART 3 - EXECUTION**

### **3.01 MANUFACTURER FIELD SERVICE:**

- A. Prepare, receive, inventory and install containment system components.
- B. Prepare and submit report of system installation indicating all system parameters.
- C. Provide the services of the manufacturer's technical representative to attend and participate in the on-site integration and to commission equipment. All vendors and contractors affecting the equipment specified herein shall be present at the same time.

## **PART 4 - PLANNING AND RECEIVING**

### **A. ROOM PREPARATION**

- 1. During the design of the room, consideration should be given to the following factors: ease of entry for the system, floor-loading factors, and accessibility of piping and wiring. The room must be sealed with a vapor barrier to minimize moisture infiltration. The room should be thoroughly insulated to minimize thermal loads and make-up air (if required) should be preconditioned to reduce additional temperature, filtration, and moisture loads.

### **B. RECEIVING THE COMPONENTS**

- 1. Your HyperPod System has been completely tested and inspected prior to shipment. To ensure that you have received the components in excellent condition, perform a careful inspection of the crating and the parts immediately upon receipt. Verify that all parts ordered were received as specified and that the components are the correct size necessary to fulfill your environmental control needs. Report any damage discovered to the freight carrier. If necessary, contact the Schneider Electric field service department for help in repairing or replacing damaged parts. While Schneider Electric is not responsible for damage incurred in transit, we want to make sure that you have no undue delays in your system start-up. Please refer to the unpacking sheet for more information.