



Liebert® SmartRow™ DCX

Installation Manual

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Technical Support Site

If you encounter any installation or operational issues with your product, check the pertinent section of this manual to see if the issue can be resolved by following outlined procedures.

Visit <https://www.vertiv.com/en-us/support/> for additional assistance.

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1 Important Safety Instructions

SAVE THESE INSTRUCTIONS

This manual contains important instructions that must be closely followed during installation of this system to maintain compliance with agency listings. Read all safety and operating instructions for all pieces of equipment before attempting to operate the Vertiv™ Liebert® SmartRow™ DCX. Adhere to all warnings on the system and in this manual. Follow all operating and user instructions.

This product is designed for commercial or industrial use only. This product is not intended for use with life support or other US FDA designated critical devices. Maximum loads must not exceed those specified in this manual.

Install the equipment in a clean environment, free from moisture, flammable liquids, gases, and corrosive substances. The Liebert® SmartRow™ DCX must be deployed in an indoor environment that is maintained year round between 50 °F (10 °C) and 85 °F (30 °C) dry bulb and less than 60 °F dew point (16 °C). It is not suitable to install outdoors or in unconditioned spaces (such as warehouses, garages). This will avoid undesirable condensate formation and ensure there is air available at suitable conditions for ventilating the SmartRow system if the automatic emergency ventilation fans activate. Additionally, systems using a remote condenser must be operated within these parameters:

The control system provides refrigerant head pressure control for outdoor ambient temperatures as low as -30 °F (-35 °C), provided that the total design range (from minimum to maximum) is 125 °F (70 °C) or less. For traditional DX applications, Vertiv™ Liebert® Lee-Temp kits are required only when the design temperature ranges exceed 125°F (70°C).

- Vertiv™ Liebert® MC condensers - above -20°F (-29°C)
- Liebert® MC condensers with Liebert® Lee-Temp kits - above -30°F (-35°C)

This product must be connected to and powered by suitable AC supplies, rated in accordance with the unit's serial tag. It must be properly grounded and protected by appropriately sized circuit breakers.

NOTE: The Liebert® SmartRow™ DCX must be installed on a flat, level surface for proper assembly and operation.

Vertiv recommends using shielded cables for all external communication interfaces.

Ensure that the Liebert® SmartRow™ DCX has proper ventilation. Never block or insert objects into the ventilation holes or other openings. Maintain minimum clearances as specified in this manual (see **Table 5.1** on page 15).



WARNING! Risk of handling heavy unit. Can cause equipment damage, injury or death. Read all instructions before beginning.






WARNING! Risk of top-heavy unit falling over when improperly lifted or moved. Improper handling can cause equipment damage, injury or death.



CAUTION: Risk of contact with sharp edges, splinters and exposed fasteners. Can cause injury. Only properly trained and qualified personnel wearing appropriate, OSHA-approved PPE should attempt to move, lift, remove packaging from or prepare the unit for installation. Read all instructions before attempting to move, lift, remove packaging from or preparing unit for installation.

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2 Glossary of Symbols

	Hazardous voltage present
	Note following instructions
	Consult user manual for additional information
	Indicates weight
	Indicates ground connection
	Indicates alternating current

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3 Introduction

The Vertiv™ Liebert® SmartRow™ DCX is part of the Liebert® SmartRow™ platform from Vertiv. The system includes integrated cooling and power systems. Assembly is a matter of connecting the Expansion Channels (ECs) and cabinets, then making electrical and piping connections.

The basic configuration of the Liebert® SmartRow™ DCX is a dual expansion channel, closed loop system that provides a room neutral solution.

The Liebert® SmartRow™ DCX must be installed in an indoor, climate controlled environment. The unit will not protect electronic equipment if it is installed in an environment subject to extreme temperatures or humidity.

This manual is to be used in conjunction with existing Vertiv product manuals for each component and with site specific documentation and drawings. User and installation manuals ship with the equipment and are also available at www.vertiv.com.

The Liebert® SmartRow™ DCX is a flexible system that allows customization of rack, power, and cooling systems within the limits of the component.

3.1 Operational Overview

The Liebert® SmartRow™ DCX is an enclosed system to house and cool electronic equipment. The Liebert® SmartRow™ DCX racks may house critical IT equipment, optional rack power distribution units and optional rack mounted UPS units.

Cooling air is supplied in the row by Vertiv™ Liebert® CRV thermal management units and conveyed to the racks via front expansion channels. Heated exhaust air from the racks returns to the Liebert® CRV through rear expansion channels. An automatic, emergency ventilation fan system is included to exhaust air in the event of a loss of primary mechanical cooling.

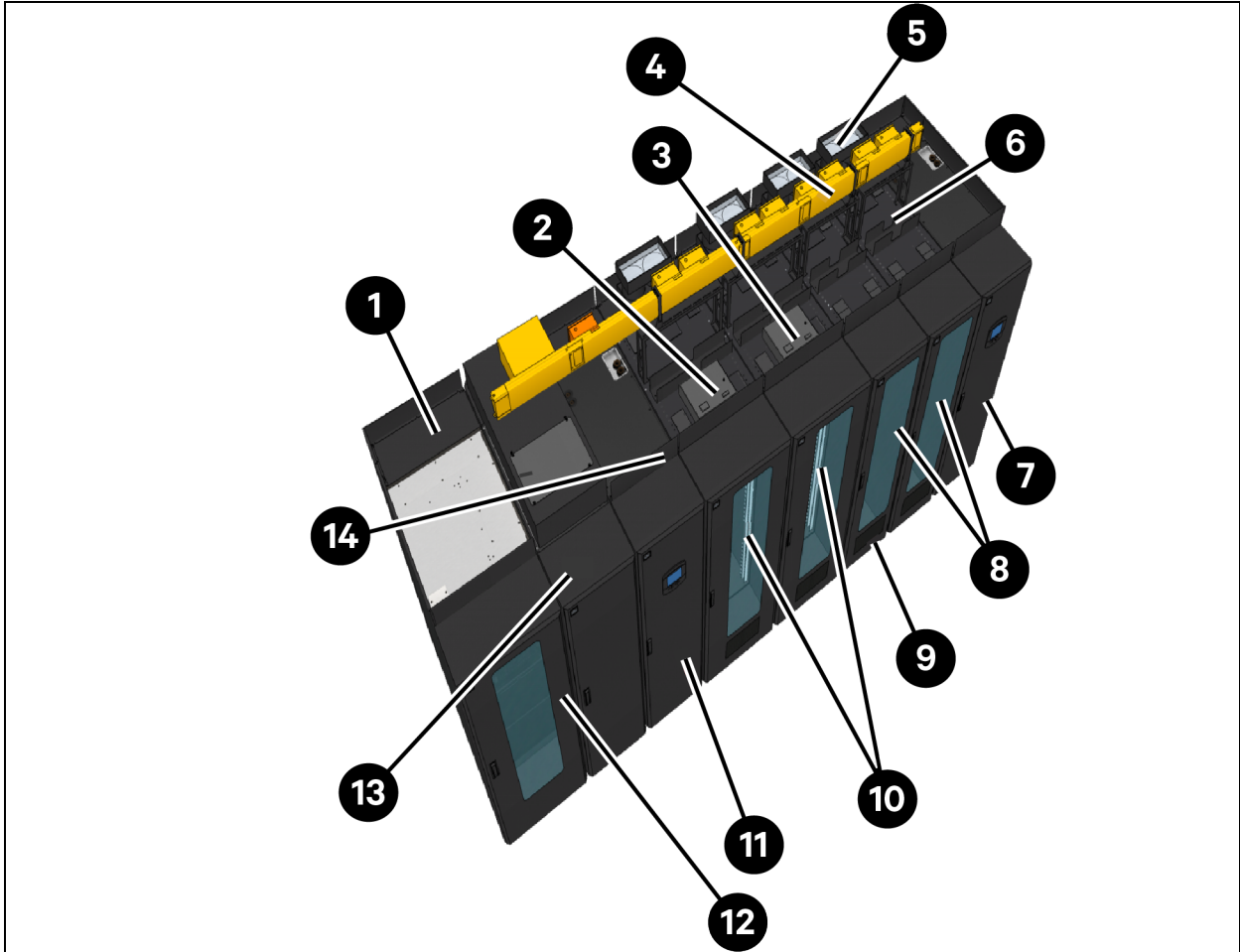
UPS protected conditioned power is provided to each equipment rack using the Vertiv™ Liebert® MBX mounted overhead and by rack PDUs mounted inside each rack.

3.2 Liebert® SmartRow™ DCX Components

Required components differ based on whether the Liebert® SmartRow™ DCX includes power and/or redundancy options.

- Liebert® SmartRow™ DCX ECs — for each DCX rack, Liebert® CRV and UPS.
- Liebert® MBX — power distribution system.
- Vertiv™ Liebert® EXM UPS — modular, scalable, with wrap around BDC and internal or external batteries.
- Liebert® CRV in-row cooling unit specially configured for use in the Liebert® SmartRow™ DCX.
- Vertiv™ DCE Rack — network (800 mm wide) and server (600 mm wide) rack configurations.
- Fire detection and suppression — integrated fire detection and suppression cabinet that is sized per design (optional).

Figure 3.1 Vertiv™ Liebert® SmartRow™ DCX components



Item	Components
1	Rear expansion channels
2	SmartRow fan controller
3	SmartRow network switch
4	Power distribution
5	Emergency ventilation fans
6	Cable trays
7	Redundant cooling
8	Server rack with rack PDUs
9	Emergency ventilation Inlet
10	Networking rack with rack PDUs
11	Primary cooling

Item	Components
12	UPS system
13	Front expansion channels
14	Appearance trim

NOTE: Image is representational only, actual component and location may differ.

3.3 Vertiv™ Liebert® CRV Notes

- Does not include reheat or humidifier.
- Includes a condensate pump, drain field installed.
- Factory installed leak detection.

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4 Application Guidelines

The pre-engineered Vertiv™ Liebert® SmartRow™ DCX micro-data center delivers highly predictable, repeatable performance in a variety of applications. This platform maximizes the flexibility in equipment configuration to meet the requirements of a given application without complicating the overall selection, design or deployment process.

The Liebert® SmartRow™ DCX system architecture eases the dependence on the site, allowing it to be deployed on raised and non raised floors within traditional data centers and in non traditional IT spaces. When tailoring and deploying a Liebert® SmartRow™ DCX for a given application, be sure to follow all of the following guidelines.

When selecting a Liebert® SmartRow™ DCX system, be sure to exceed the minimum heat load requirements for the row, do not exceed the maximum UPS and cooling capacities. Select a UPS and busway that offer capacity expansion that is sufficient to support future growth, if desired. Also, be sure that the initial placement of the cooling units within the row allows for additional racks and cooling units to be added without having to relocate the existing equipment.

4.1 Environmental Conditions

The Liebert® SmartRow™ DCX must be deployed in an indoor environment that is maintained year round between 50 °F (10 °C) and 85 °F (30 °C) dry bulb and less than 60 °F dew point (16 °C). It is not suitable for installation outdoors or in unconditioned spaces (such as loading docks, unconditioned warehouses, garages). A properly conditioned environment avoids undesirable condensate formation and ensures that there is air available at suitable conditions for ventilating the SmartRow system if the automatic emergency ventilation fans activate.

4.2 Cooling System Design

Adhere to the following guidelines when tailoring a Liebert® SmartRow™ DCX cooling system for a particular application. The automatic, emergency backup ventilation fans are nominally rated for 1000 CFM. They are designed to provide time to perform an orderly shutdown of the protected system. The duration of this time is dependent on the size and environmental conditions of the room external to the Liebert® SmartRow™ DCX.

NOTICE

If the Liebert® SmartRow™ DCX is installed in a dedicated room and the airflow inlet and outlet openings are not provided, the effectiveness of the ventilation system will degrade as the room warms. The runtime will extend by ducting the fan exhaust out of the space and providing the room with fresh air relief. Large rooms may be able to run for the full duration of the UPS battery run time before elevating the room temperature, not requiring the heat to be ducted out.

The Vertiv™ Liebert® CRV 600 Series row based cooling units are 600 mm wide and includes 20 kW, 35 kW and 40 kW models.

Table 4.1 Vertiv™ Liebert® SmartRow™ DCX Quick Reference Cooling Unit Capacities

System Type	Vertiv™ Liebert® CRV Model	Nominal Cooling Capacity kW	Minimum Heat Load per cooling unit ¹ kW	Maximum Capacity per cooling unit ² kW
Air Cooled ³	CR020RA	20	4.8	24.8
	CR035RA	35	9	39.7
Water/Glycol ⁴	CR020RW	20	4.7	22.9

Table 4.1 Vertiv™ Liebert® SmartRow™ DCX Quick Reference Cooling Unit Capacities (continued)

System Type	Vertiv™ Liebert® CRV Model	Nominal Cooling Capacity kW	Minimum Heat Load per cooling unit ¹ kW	Maximum Capacity per cooling unit ² kW
	CR035RW	35	8.7	37.0
Chilled Water ⁵	CR04ORC	40	6.0	46.6
<ol style="list-style-type: none"> 1. Minimum heat load based on 20% net sensible cooling capacity at 80 °F (27 °C) return air temperature, 52 °F (11 °C) dew point. 2. Maximum capacity based on 100% net sensible cooling capacity at 100 °F (38 °C) return air temperature, 52 °F (11 °C) dew point. 3. Air cooled capacities based on 105°F (41°C) outdoor Liebert® MC condenser match up. 4. Water glycol capacities based on 10% propylene glycol concentration with matching 105 °F (41 °C) outdoor dry cooler match up and pump package. 5. Chilled water capacities based on 45 °F (8 °C) entering water conditions with 10 °F (6 °C) rise, always use site specific water conditions when determining cooling unit net sensible capacity. 				

Table 4.2 Vertiv™ Liebert® EXM UPS Quick Reference Heat Dissipation and Airflow

UPS Capacity	Heat Dissipation (kWh)		Cooling Air Flow (CFM)
	208V 4W+G UPS input without input transformer	480V 3W+G UPS input w \input transformer	
Liebert® EXM 100 kVA	5.5	8.6	339
Liebert® EXM 80 kVA	4.4	7.2	271
Liebert® EXM 60 kVA	3.3	5.3	203
Liebert® EXM 40 kVA	2.2	3.8	136
Liebert® EXM 20 kVA	1.1	1.8	68

Table 4.3 Minimum and Maximum Number of Racks per Liebert® CRV Cooling Unit

Number of Racks* per Liebert® CRV	Minimum (R _{min})	Maximum (R _{max})
Liebert® CRV 600: 20 kW	2	7
Liebert® CRV 600: 35/40 kW	3	8
<p>*Server (600 mm wide) and networking (800 mm wide) racks are treated equally and are generically referred to as racks. Consult the factory if you need to deviate from these limits.</p>		

4.3 Heat Load Calculation

When determining the number of cooling units required to support the SmartRow, make sure to include the total IT equipment and UPS heat dissipation, along with parasitic room losses. The amount of heat that an IT device rejects may be very different than the power it consumes. This is common with Power over Ethernet (PoE) switches. Always reference the heat dissipation value, not power consumed, on the IT device's specification sheet.

When a UPS system is located within the Vertiv™ Liebert® SmartRow™ DCX and conditioned by the row based air conditioners, all of the power leaving the UPS should be fed to the rack mounted IT equipment. Consult the factory before using the integral UPS system to power equipment outside of the row.

Table 4.4 Capacity calculation template

1	Rack Mounted Heat Load*	_____ kW
2	UPS Heat Load	_____ kW
3	Room Heat Load	_____ kW
4	Total Heat Load, S	_____ kW
5	Maximum Capacity per Cooling Unit	_____ kW (From Table 4.1 on page 9)
6	Minimum Quantity of Liebert® CRV Cooling Units, =	_____ Cooling units (Round up to whole number)
7	Add 1 if desire N+1 cooling redundancy, +	_____ (Enter 0 or 1)
8	Total Quantity of Liebert CRV Cooling Units in SmartRow™ DCX, =	_____ Cooling units
9	Minimum Heat Load per Liebert CRV, x	_____ kW (From Table 4.1 on page 9)
10	Minimum Constant Rack Mount Heat Load, =	_____ kW (UPS heat load does not count toward minimum)
11	Total Quantity of Liebert CRV Cooling Units in SmartRow™ DCX	_____ Cooling units (From Row 8 above)
12	Minimum number of racks per CRV (Rmin), x	_____ Racks (From Table 4.3 on the previous page)
13	Minimum number of SmartRow™ DCX racks, =	_____ Racks
14	Consult Table 4.3 on the previous page for Maximum Rack Limitations	_____

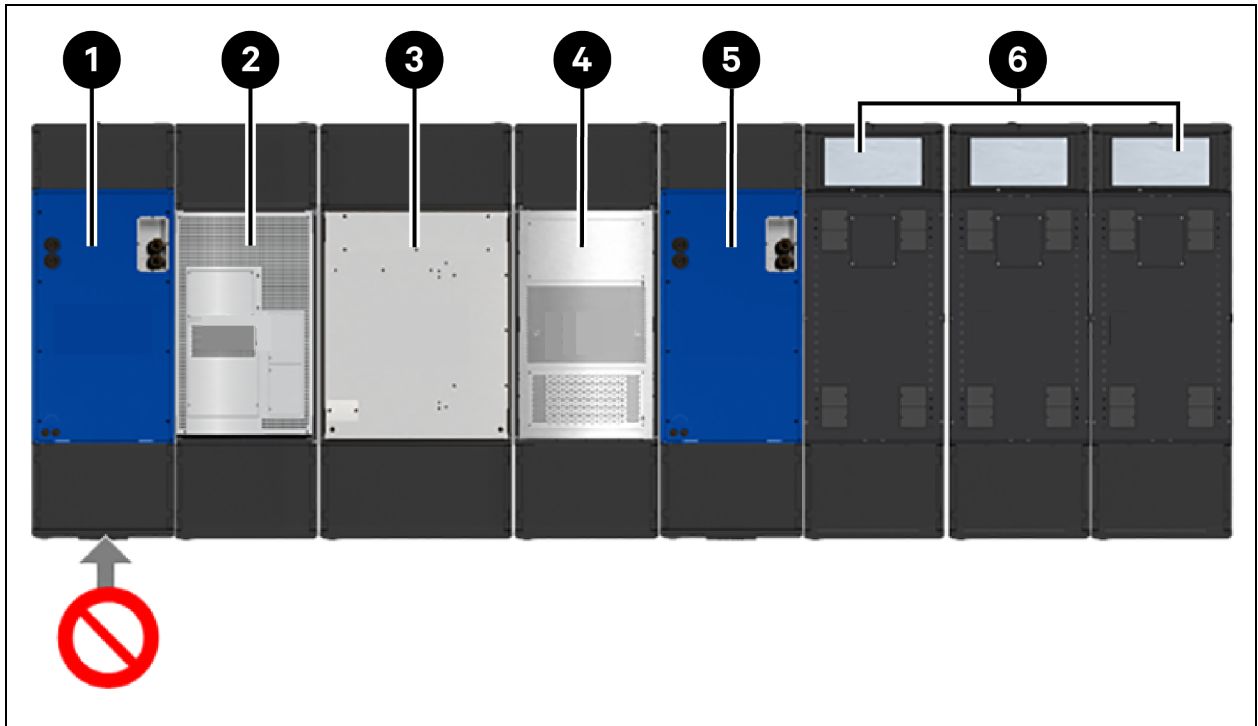
If designing for N+1 cooling redundancy, be sure that all racks are within the region of influence of 2 or more Liebert® CRVs. *Enter heat dissipation, not power consumption. Contact factory if powering IT equipment outside of the Liebert.

4.4 Vertiv™ Liebert® SmartRow™ DCX Equipment Placement within the Row

4.4.1 Cooling Unit and Rack Placement

- Server (600 mm wide) and networking (800 mm wide) racks are treated equally and generically referred to as racks.
- When determining the location for Vertiv™ Liebert® CRVs within the row, they should be evenly spaced within the rack lineup to maintain uniform airflow distribution, assuming that the heat load density is fairly uniform across all of the racks. If there are a couple of racks within the row with a higher concentration of heat, Liebert® CRVs may be placed closer to that equipment.
- Do not place two Liebert® CRV cooling units next to each other.
- UPS placement does not influence the placement of the cooling units due to the relatively low heat and airflow demands of the UPS system.
- If the cooling system is designed for N+1 redundancy, be sure that each rack is within the region of influence of 2 or more Liebert® CRVs with sufficient capacity. This will ensure that if any cooling unit fails, another unit will be able to condition the IT equipment.
- Do not place a Liebert® CRV at the end of a row next to a UPS because this would put the Liebert® CRV too far from the rack mounted IT equipment (see **Figure 4.1** on the next page).

Figure 4.1 Component Locations



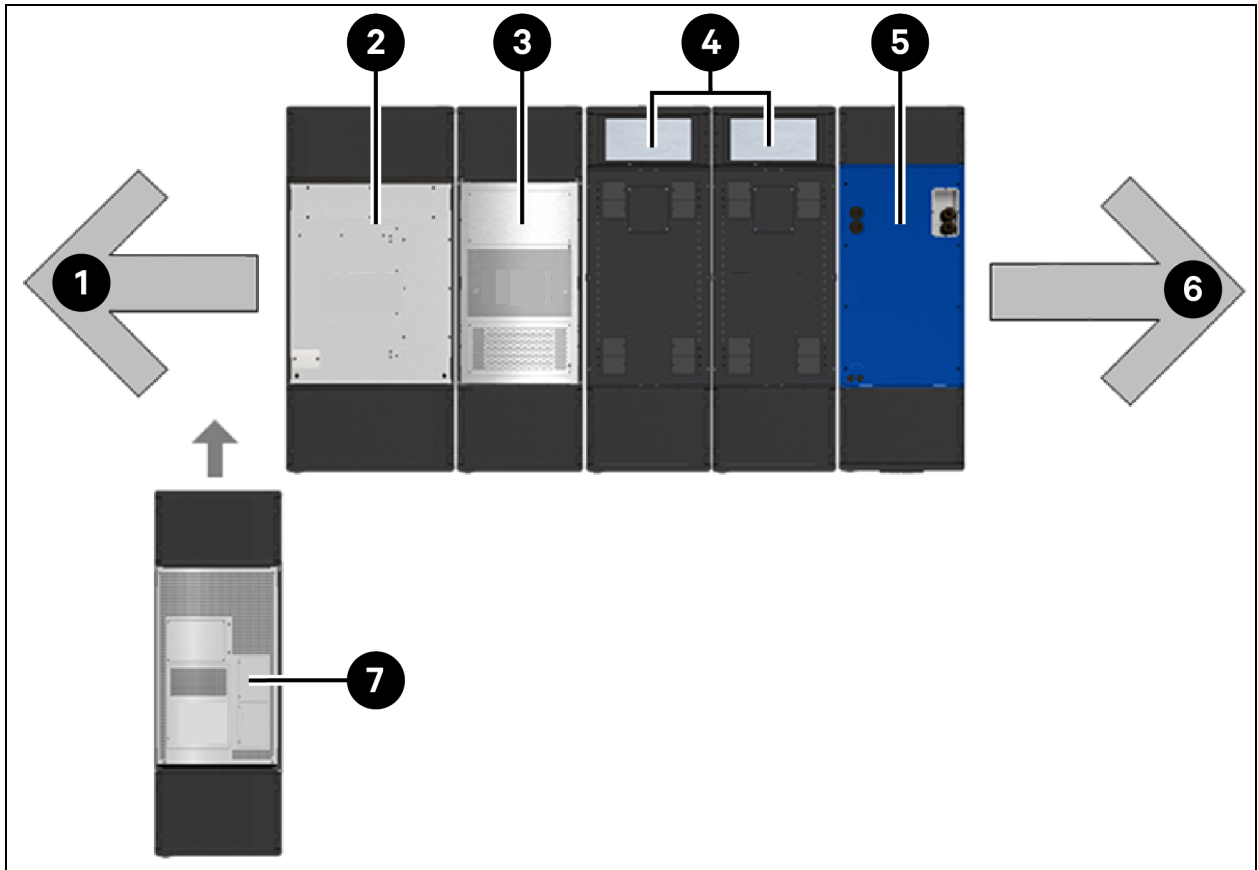
Item	Component
1	CRV
2	Battery
3	UPS
4	BDC
5	CRV
6	Rack

NOTE: Do not locate Liebert®CRV at end of the row next to UPS system.

4.4.2 UPS System

- Two UPS systems can be located next to each other.
- Three-phase, row based UPS systems must be placed at the left end of the row (when viewed from the front, cold side) to ease addition of battery cabinets to the UPS system in the future.
- Battery cabinets can be remotely located, but they will not be conditioned by the row based cooling system.

Figure 4.2 Future Rack Expansion Locations



Item	Component
1	Future Battery Expansion
2	UPS
3	BDC
4	Rack
5	CRV
6	Future Rack Expansion
7	Battery

NOTE: Recommended: UPS system at left end of the row.

4.4.3 Row Length

When calculating the row length of the Vertiv™ Liebert® SmartRow™ DCX, include the following distances between the various pieces of row based equipment to accurately account for the gasketing and baying brackets. See the [Submittal Drawings](#) on page 33 for complete clearance requirements.

Table 4.5 Spacing between System Equipment

Neighboring Equipment	Distance Between mm (in.)
Rack - Rack	10 (0.40)
Rack - Vertiv™ Liebert® CRV	
Rack - UPS, BDC or Battery cabinet	
Liebert CRV - UPS, BDC or Battery Cabinet	
UPS - BDC	28 (1.10)
UPS - Battery Cabinet	
Redundant UPS Systems	

4.5 IT Equipment Deployment and Wiring

- Follow industry best practices when deploying IT equipment within the Vertiv™ Liebert® SmartRow™ DCX.
- To maintain good cold hot air separation, use blanking panels in all unoccupied RU space.
- Neatly manage all fiber and Ethernet cabling to avoid airflow restrictions.
- Never route any type of cable within or through the front or rear expansion channels. Doing so will restrict air flow and prevent the ECs from being removed from the row equipment.
- When loading IT equipment in the racks, try to distribute the load evenly throughout the row. If there is a higher density rack, that rack should be closest to a Vertiv™ Liebert® CRV.

4.6 Settings for the Vertiv™ Liebert® iCOM™ on the Vertiv™ Liebert® CRV Cooling Unit

- All of the Liebert® CRV cooling units are to be configured in Teamwork Mode 3 with the controlling sensors set to use the 2T rack inlet temperature readings.
- The low end of the Liebert® CRV fan speed modulation range is raised at the factory. Do not field adjust.
- Do not run the Liebert® CRV in a staged (staggered) or stand by configuration. All Liebert® CRVs must be operational at the same time. Ensure your IT equipment dissipates the minimum heat load required by the entire cooling system on day one.
- For questions on navigating the Liebert® iCOM™ control system, call 800-543-2778 for Liebert Environmental Technical Support.

5 Preparation

The application and installation location should be determined and prepared before the Vertiv™ Liebert® SmartRow™ DCX is delivered. Proper planning will permit installation of the required power and coolant connections and ensure proper clearances. The installation location must have:

- An indoor, climate controlled environment with the ambient temperature year round between 50 °F (10 °C) and 85 °F (30 °C) dry bulb and less than 60 °F (16 °C) dew point.
- Sufficient height and clearance from ceilings, walls, fixtures and overhead sprinkler nozzles for the Liebert® SmartRow™ DCX, including its emergency fans and power distribution.

IMPORTANT! The Vertiv™ Liebert® SmartRow™ DCX must be installed on a flat, level surface to maintain proper spacing and provide tight seals. Leaving gaps in the field applied gaskets will reduce cooling efficiency and increase energy use.

- Suitable location for outdoor Vertiv™ Liebert® MC condenser, where the equivalent refrigerant piping length will not exceed values listed in the Liebert® CRV Installation Manual (air cooled systems).
- Adequate heat rejection coolant supply for the Vertiv™ Liebert CRV (chilled water or water/glycol cooled systems).
- Input power sufficient for:
 - Each Liebert® CRV — each requires a separate input power feed.
 - Vertiv™ Liebert® EXM — ships as single input configuration, but may be wired as dual input.

NOTE: For details about any component's requirements, see that unit's user manual.

- Liebert® CRV Installation Manual is SL-11975.
- Liebert® CRV with Vertiv™ Liebert® iCOM™ User Manual is SL-11987.
- Vertiv™ Liebert® iCOM™ User Manual is SL-11987.
- Liebert® EXM 208V User Manual is SL-25650.
- Vertiv™ DCE Rack System User Manual is SL-11992.
- Vertiv™ Liebert® MBX Busway Track System User Manual is SL-70371.

These are delivered with the unit and are available at <http://www.vertiv.com/en-us/support/>.

5.1 Clearance Requirements

See [Submittal Drawings](#) on page 33 for details of Liebert® SmartRow™ DCX dimension.

Table 5.1 Liebert® SmartRow™ DCX system clearances

Clearances	Min., in. (mm)
Liebert® EXM UPS system front and back	36 (915)
Liebert® CRV cooling unit front and back	36 (915)
Closest building sprinkler to any surface	18 (458)
Between emergency fan module and parallel surface	16 (407)

5.2 Inspection

Upon receiving a Vertiv™ Liebert® SmartRow™ DCX, examine the packaging for any signs of mishandling or damage. If any damage is found, notify your local Vertiv representative and the carrier immediately.

5.3 Unloading the Liebert® SmartRow™ DCX

Before unloading the Liebert® SmartRow™ DCX, see the manual for each component, particularly the Vertiv™ Liebert® CRV, Vertiv™ Liebert® EXM and Vertiv™ Liebert® DCE Racks. These manuals are shipped with the Liebert® SmartRow™ DCX and are available at www.vertiv.com.

Read each manual thoroughly. They include handling instructions and safety notices that must be followed when unpacking, installing, operating and maintaining the Liebert® SmartRow™ DCX.

Adhere to all warnings, cautions and installation, operating and safety instructions on the units and in their manuals. Only properly trained and qualified personnel should move, install, operate or service this equipment.

5.4 Required Setup Tools and Equipment

The following tools are needed to set up a Liebert® SmartRow™ DCX:

- Standard and metric socket sets
- Phillips head screwdriver
- Flat blade screwdriver
- Forklift or pallet jacks
- Utility knife
- Carpenter's level, 3 feet long or longer
- Battery powered drill with T30, Phillips and flat blade bits
- Sheet metal hole saw or punch kit (for conduit entries)

6 Installation

6.1 Assembly Sequence Overview

1. Equipment is delivered and de-trashed by Vertiv™ Liebert® SmartRow™ delivery service provider.
2. Stage equipment for installation.
3. Place and level all row based equipment in the lineup according to the user/installation manuals.
4. Install Vertiv™ Liebert® Liebert® MBX system.
5. Install expansion channels.
6. Make all Liebert® SmartRow™ DCX connections as required.

6.1.1 Staging the Liebert® SmartRow™ Equipment

1. Thoroughly inventory the equipment received.
2. Place each piece of row equipment in its designated location.
3. Stage the ECs around the perimeter of the room taking care to position the ECs with the equipment they will be attached to.
4. Each EC contains a box of hardware specific to each EC. Take care to keep the hardware boxes with their respective EC.

6.1.2 Installing the Liebert® SmartRow™ Equipment

1. See the user/installation manual for all row based equipment for specific installation instructions.
2. Referring to the Liebert® SmartRow™ DCX submittal drawings and starting with the UPS (if applicable), install the equipment in the lineup.
3. For proper alignment, install the gasket and spacers included with the UPS equipment.

NOTE: Adjust all equipment leveling feet until the casters are just off the floor. This will ensure proper fit of the skirting, installed later if supplied. This will also assist in leveling if the floor is uneven.

4. Use the provided hardware, included in the Liebert® SmartRow™ DCX spacer kit, to bolt together the 3-phase UPS, BDC and battery cabinet.
5. Use the provided power and control wiring harnesses for the cabinet cabling.
6. Install any top plenums required by the UPS cabinets.
7. Install the Vertiv™ Liebert® CRV and Vertiv™ Liebert® DCE racks in the order shown on the submittal drawings. Use the gasketing and cluster kits for proper alignment.
8. After all cabinets are installed, level the tops from end to end, and then front to back. Make sure the cabinets are completely level in both directions when finished.
9. Install the Vertiv™ Liebert® MBX mounting brackets on top of each Liebert® DCE rack. Consider locations of BDC cabling, busplug rack cabling and Liebert® CRV connections during bracket installation.
10. Assemble and mount the Liebert® MBX according to the SL-70371 Liebert® MBX installation manual.
11. Mount the Vertiv™ Liebert® SmartRow network switch (vNSA) and Liebert® SmartRow™ DCX and fan control box and make control wiring connections.

6.1.3 Connecting the Equipment

See the user/install manuals for each piece of equipment as required.

1. Make all connections to the UPS BDC cabinets (input power and Vertiv™ Liebert® MBX).
 - The UPS requires an upstream over protection device (a circuit breaker or manual isolation switch).
 - Install the protection device per local codes and agency requirements.
2. Make all power, coolant and drain connections to the Vertiv™ Liebert® CRV equipment.
3. Connect the Vertiv™ Liebert® MC Condenser (if applicable) control wire to the Liebert® CRVs and route the wire to the condenser based on the site specific application.
4. Using the provided adapter cables, connect power to the Vertiv™ Liebert® SmartRow™ vNSA and Liebert® SmartRow™ fan controller from the Liebert® MBX busplug.

NOTICE

Risk of improper power input. Improper power input can cause equipment damage or degrade performance.

6.1.4 Installing Expansion Channels

See [Submittal Drawings](#) on page 33 for detailed expansion channel installation instructions.

Finalizing Installation

1. Install busplugs into the overhead Liebert® MBX and align them with the Vertiv™ Liebert® DCE racks that they power.
2. Connect the rack PDU plugs into the busplugs.
3. The 2T temperature sensors are pre-wired to each rack. Connect the sensors to the Liebert® CRVs in the row and correctly set the 2T sensor DIP switches per the supplied instructions.
4. Cable the Liebert® CRV iCOM and monitoring card to the Liebert® SmartRow™ network switch.
5. Cable the UPS monitoring card to the Liebert® SmartRow network switch.

NOTICE

Do not run any cables in the expansion channels. Doing so will reduce the airflow and eliminate the ability to remove the expansion channels. The expansion channels should not be removed unless absolutely necessary.

6.2 Optional Vertiv™ Liebert® SmartRow™ DCX Control Panel and Fire Suppression System Overview

The Liebert® SmartRow™ DCX must be installed in compliance with all applicable national, state and local fire codes. An emergency power off (EPO) switch is provided as one means of meeting regulations. Additional field supplied connections to the system may be required, depending on the applicable regulations, the equipment configuration and the users operational preference.

The optional Liebert® SmartRow™ DCX Control Panel and Fire Suppression System has been fully tested and certified at the factory.

The Liebert® SmartRow™ DCX Control Panel and Fire Suppression System is shipped with wiring that, if required by local fire code, must be field connected to the shutdown circuits of the Liebert® CRV and any connected UPS systems.

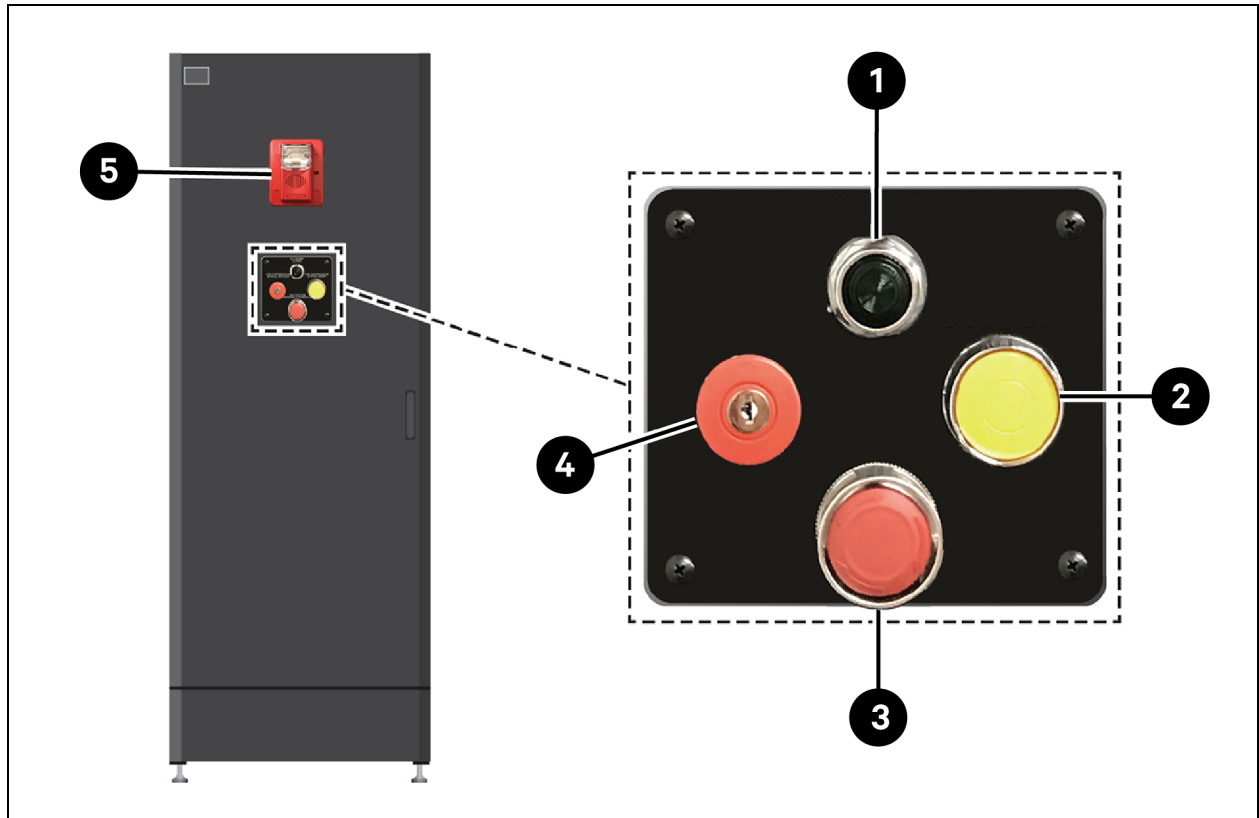
Under NFPA regulations, systems protected by a clean fire suppression agent can be left with the UPS and HVAC systems operational at the discretion of the owner and local fire officials.

The Vertiv™ Liebert® SmartRow™ DCX Control Panel and Fire Suppression System should be field connected as a separate zone to the building fire detection and alarm system.

If the Liebert® SmartRow™ DCX is installed in a dedicated room, an additional strobe and horn may be installed at the entrance to the room. Contact your local authorized service representative if required.

6.3 Liebert® SmartRow™ DCX Control Panel and Fire Suppression System Component Locations

Figure 6.1 Liebert® SmartRow™ DCX Control Panel and Fire Suppression System Exterior Features



Item	Component	Description
1	ALL DOORS CLOSED indicator	Illuminates when all rack doors are closed.
2	FIRE SUPPRESSION SYSTEM ABORT button	Prevents the fire suppression system from dumping due to a false alarm.
3	DCX SYSTEM EMERGENCY POWER OFF latching button	To engage the Emergency Power Off (EPO), press the button until it latches and the system shuts down. To disengage the EPO, pull out the EPO button. When engaged, all cooling units, UPSs (if wired into the EPO circuit), fire-suppression and emergency ventilation fans power down. There are multiple ways to configure the EPO circuit per the electrical schematic to comply with local codes, so your operation may vary. All equipment can be wired to shut down.

Item	Component	Description
		If equipped, the shunt trip breaker in the load panel can be wired to open as well.
4	FIRE SUPPRESSION MANUAL RELEASE button	Turn the key to activate the manual fire suppression release. If you see smoke and/or fire in the Liebert® SmartRow™ DCX system, but the smoke detector is malfunctioning, you can manually discharge the fire suppression material into the Liebert® SmartRow™ DCX system.
5	Horn and strobe	Alarm sounds and strobe illuminates when the fire suppression system is activated.

Figure 6.2 Vertiv™ Liebert® SmartRow™ DCX Control Panel and Fire Suppression System Internal Features



Item	Description
EMERGENCY POWER OFF OVERRIDE TIMER	Turning this timer temporarily bypasses the EPO circuit. This allows for a manual restart of the UPS after an EPO event. You can turn the timer up to a maximum of two hours, if necessary, to perform maintenance. To continue the bypass operation, turn the timer again to add time when it gets low.
EMERGENCY SUPPRESSION BYPASS TIMER	Turning this timer temporarily suspends fire detection so that maintenance can be performed on the system. This timer provides a normally closed circuit bypassing the internal, normally closed relays in the fire suppression panel. Once the timer expires, the circuit returns to the Off position. You can turn the timer up to a maximum of 2 hours, if necessary, to perform maintenance. To continue the bypass operation, turn the timer again to add time when it gets low.

IMPORTANT! Risk of accidental fire suppression system activation. Can cause equipment and property damage. Do not attempt to bypass the fire suppression system on the Liebert® SmartRow™ DCX. Attempting to bypass the fire suppression system can cause the system to discharge.

6.3.1 Control Panel and Fire Suppression System Component Operation

Table 6.1 below shows each component, describes what each one does, and how to use it.

Table 6.1 Component Operation for the Vertiv™ Liebert® SmartRow™ DCX Control Panel and Fire Suppression System

Action	Operation
<ul style="list-style-type: none"> Emergency power off. Press the EPO button on the front door of the Control Panel and Fire Suppression System. Press the Remote EPO (REPO) button(s) if they are connected to the system. <p>NOTE: Systems manufactured and shipped after August 26, 2016, have the latching EPO button.</p>	<ul style="list-style-type: none"> The EPO button is a latching button. To engage the EPO: Press the button until it latches and the system shuts down. To disengage the EPO: Pull out the EPO button. When engaged, all cooling units, UPSs (if wired into EPO circuit), Fire suppression and emergency ventilation fans (if running) power down. There are multiple ways to configure the EPO circuit per the electrical schematic to comply with local codes, so your operation may vary. However, all equipment can be wired to shut down. If equipped, the shunt trip breaker in the load panel can be wired to open as well.
<ul style="list-style-type: none"> Emergency Ventilation Fan Activation / Testing. Power off all connected CRV units. 	<ul style="list-style-type: none"> Signal is sent to the fan control box that CRV cooling has been lost. Emergency ventilation fans activated until CRV is brought back online. <p>NOTE: CRV is connected to the fan control box via 18 gauge, 2 conductor, PVC jacketed cable from CRV terminal block positions 153 & 154.</p>
<ul style="list-style-type: none"> Turning the fire suppression control bypass timer. Turn the timer past the 1 hour position. 	<ul style="list-style-type: none"> Suspend the fire detection so that maintenance can be performed on the system. The timer provides a normally closed circuit bypassing the internal, normally closed relays in the fire suppression panel. Once the timer expires, the circuit is returned to its normal setting (OFF). <p>NOTE: You can turn the timer up to a maximum of two hours if necessary to perform maintenance.</p> <ul style="list-style-type: none"> To continue the bypass operation, just turn the timer again when time gets low.
<ul style="list-style-type: none"> Turning the Liebert® SmartRow™ DCX emergency power-off override timer. Turn the timer past the 1 hour position. 	<ul style="list-style-type: none"> Temporarily bypass the EPO circuit. This allows manual restart of the UPS after an EPO event. <p>NOTE: You can turn the timer up to a maximum of two hours if necessary to perform maintenance.</p> <ul style="list-style-type: none"> To continue the bypass operation, just turn the timer again when time gets low.
<ul style="list-style-type: none"> Turning the key to activate the manual fire suppression release. 	<ul style="list-style-type: none"> If you see smoke and/or fire in the system, but the smoke detector is malfunctioning, you can manually discharge the fire suppression material into the system.
<ul style="list-style-type: none"> Fire suppression system abort. 	<ul style="list-style-type: none"> Prevents the fire suppression system from dumping due to a false alarm.

Table 6.1 Component Operation for the Vertiv™ Liebert® SmartRow™ DCX Control Panel and Fire Suppression System (continued)

Action	Operation
<ul style="list-style-type: none"> Control Power Available light illuminated (green). 	<ul style="list-style-type: none"> Control system is powered via TB1 positions (1 & 2) or (3 & 4).
<ul style="list-style-type: none"> Control Power Available light is NOT illuminated. 	<ul style="list-style-type: none"> Green LED indicates all doors are closed.
<p>Main Circuit Breaker with Shunt Trip Assembly (If applicable):</p> <ul style="list-style-type: none"> To enable power flow to the control panel, flip the breaker switch to the UP position (On/Closed). To disable power flow to the control panel, flip the breaker switch to the DOWN position (Off/Open) 	<ul style="list-style-type: none"> Eliminates power to all loads connected to and downstream of the load distribution center both locally and remotely. <p>IMPORTANT! The shunt trip assembly requires a dedicated, field supplied source of 120V power to TB1 Pins 9 & 10.</p> <ul style="list-style-type: none"> If the breaker is tripped (EPO activation), you must reset the breaker before beginning the restart protocols. See Recovering from a Fire Suppression System Activation on the facing page, for details.

6.4 Recovering from EPO Circuit Activation

If the EPO circuit is activated by the local EPO button on the Vertiv™ Liebert® SmartRow™ DCX or by a field supplied REPO button and the system is shut down, the following steps must be taken to recover:

1. If a shunt trip main circuit breaker is being used, reset the shunt trip main circuit breaker.
2. Disengage the EPO circuit.

NOTE: You must reset the EPO or REPO button that activated the circuit to reset the circuit. Pressing a button that did not trigger the circuit will not reset the circuit.

- a. If the local EPO button on the Liebert® SmartRow™ DCX activated the circuit, pull the latching button back to disengage the circuit.
- b. If a remote EPO (REPO) button activated the circuit, reset the REPO button that activated the circuit using the reset function of the field supplied button.
- c. Once cleared, the thermal management units in the Liebert® SmartRow™ DCX automatically start via their dedicated power supply.
3. Turn the Local Emergency Power Off Override Timer past the half hour position.

NOTE: If needed, you may turn the timer to a maximum of 2 hours. If time is running low, turn the timer past the half hour mark again to continue the bypass.

4. Reset the UPS that powers the Liebert® SmartRow™ DCX control circuit and fire suppression control circuit.
 - If the Liebert® SmartRow™ DCX is powered by a stand alone Liebert® Liebert® UPS, see the corresponding procedure in the manual for the UPS to start the UPS. If it will not restart, put the UPS in bypass and restart the remaining equipment. For assistance putting a Liebert three-phase UPS in bypass and for service support, call 800-543-2378. For a Liebert single-phase UPS, call 800-222-5877, option 1.

The Fire Suppression System is protected from commercial power failures by an integrated battery and battery charger. In the event of a commercial power failure, the Fire Suppression System continues to operate in idle mode from this battery for up to 48 hours. Upon restoration of commercial power, the battery charger automatically recharges the battery to float state.

6.5 Recovering from a Fire Suppression System Activation

In the event of a Fire Suppression System activation, contact your local fire suppression representative for guidance on bringing your system back online.

6.6 System Set Up and Commissioning

1. Perform UPS startup.
2. Perform Vertiv™ Liebert® CRV startup.
3. Perform fire suppression startup.
4. Set up PDU networking.

6.7 Fire Detection and Suppression System Operation Overview

The Vertiv™ Liebert® SmartRow™ DCX Control Panel and Fire Suppression System monitors the air in the Liebert® SmartRow™ DCX for evidence of combustion. If the smoke detector, mounted in the rear expansion channels down the entire row of equipment, senses combustion products, the system activates the audible horn and visual strobe on the upper right corner of the Liebert® SmartRow™ DCX Control Panel and Fire Suppression System panel (see **Figure 6.1** on page 19).

After a 30 second delay, the system releases fire suppression agent into the cabinets, locks out the Emergency Fans and shuts down any connected UPS's and the Liebert® CRV. This sequence may differ if NFPA 2001 is applicable and coordinated with the local fire officials.

NFPA 2001 authorizes discretion of the owner and local fire officials to leave UPS and cooling systems operational when the system is protected by a clean fire suppression agent.

The Liebert® SmartRow™ DCX Control Panel and Fire Suppression System should be field connected as a separate zone to the building fire detection system.

6.8 Restarting after Liebert® SmartRow™ DCX Control Panel and Fire Suppression System has Shut Down

If the Liebert® SmartRow™ DCX Control Panel and Fire Suppression System rack supply has shut down:

1. Turn Emergency Power Off Override timer beyond the 1/2 hour position (see **Figure 6.2** on page 20 and **Table 6.1** on page 21).
2. Confirm that input power is available.
 - a. If the Liebert® SmartRow™ DCX is powered bystand alone Liebert UPS and will not restart, put the UPS in bypass and restart the remaining equipment. Call 800-543-2378 for assistance in putting the UPS in bypass and for service support. For a Liebert three-phase UPS, call 800-543-2378 and for a Liebert single-phase UPS, call 800-222-5877, option 1.
 - b. If the Liebert® SmartRow™ DCX controls, emergency fans and emergency fan controls are connected to rack mounted UPSs, manually restart the UPSs.

The Liebert® SmartRow™ DCX Control Panel and Fire Suppression System have an internal battery for the fire suppression system. The system will continue operating on this battery up to 48 hours unless power is restored earlier.

The Vertiv™ Liebert® CRV is set up to restart when power is restored.

Fire Suppression Control Bypass Timer

To allow servicing the Liebert® SmartRow™ DCX Control Panel and Fire Suppression System, this timer is turned to its maximum position by a qualified service representative. The timer provides a normally closed circuit bypassing the internal, normally closed relays in the fire suppression panel. Once the timer expires, the circuit is returned to its normal setting (OFF).

7 Installation Checklist

7.1 Cooling and Power Component Installation Checklist

1. All cabinets and expansion channels have been installed.
2. All gaskets and edge guards are installed.
3. All external cable and piping entrances are sealed.
4. All electrical and piping connections have been made.
5. All cabinet doors close and seal securely.
6. Verify that the all doors closed light illuminates.
7. All Emergency Power Off interlocks to the UPSs and to the Vertiv™ Liebert® CRV are connected.
8. All rack power strips are installed and connected to the Vertiv™ Liebert® MBX for UPS power.
9. 2T temperature sensors are installed at the top, front of each Vertiv™ Liebert® SmartRow™ DCX rack and their DIP switches set.
10. Make sure that no cables are routed through any of the expansion channels.
11. Liebert® CRV has been started up and factory commissioned.
12. Vertiv™ Liebert® EXM UPS has been started up and factory commissioned.
13. Emergency Power Off has been tested and verified to shut down systems as designed.
14. Test Emergency backup fan operation by turning Off all Liebert® CRV units.
15. The Vertiv™ Liebert® iCOM™ displays the supply air temperature.
16. All monitoring points are communicating to the network management system.
17. Computer equipment is installed so that the heat load is evenly distributed among the Liebert® SmartRow™ DCX racks.
18. Power and temperature monitoring are fully operational.
19. Perform all installation checks as stated in manuals for Liebert® SmartRow™ DCX components.

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8 Troubleshooting

Table 8.1 Troubleshooting

Problem/Alarm	Recommended Action
Cabinet overheating	Ensure that the Vertiv™ Liebert® CRVs are operating.
	Adjust cooling setpoints to increase cooling.
	Check for proper cooling air flow.
	Check that the load is evenly distributed between racks and that individual racks are not overloaded.
Liebert® CRV in alarm	Consult a properly trained and qualified service representative or see the Liebert® CRV operation and maintenance manual, SL-19800, shipped with the Vertiv™ Liebert® SmartRow™ DCX and available at http://www.vertiv.com/en-us/support/ . For assistance call 800-543-2378.
UPS system has shut down	If the 3-phase Liebert® UPS and will not restart, put the UPS in bypass and restart the remaining equipment. Call 800-543-2738 for assistance in putting the UPS in bypass and for service support
Liebert® CRV has shut down	The Liebert® CRV will restart automatically once power has been restored. For assistance call 800-543-2378.

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9 Maintenance

9.1 Vertiv™ Liebert® CRV

The air conditioning system should be checked quarterly by Vertiv certified technician. The trained technician who started your system is available to provide maintenance and onsite support.

9.2 UPSs and Rack PDUs

The UPSs should be checked at least twice a year. Vertiv Services can be contacted at 800-543-2378.

For single-phase Liebert® UPS, rack power strips and Vertiv™ Liebert® DCX racks, call 800-222-5877: Outside North America call +00800 1155 4499; or e-mail: liebert.upstech@vertiv.com.

For three-phase UPS and power systems, call 800-543-2378; outside North America call 614-841-6598. For information about the warranty, contact your local Vertiv representative or go to www.vertiv.com.

9.3 Electrical System

All electrical components, including the load distribution center breakers, should be inspected at least twice a year by a licensed electrical contractor. Any loose connections should be tightened.

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Appendices

Appendix A: Technical Support and Contacts

A.1 Technical Support/Service in the United States

Vertiv Group Corporation

24x7 dispatch of technicians for all products.

1-800-543-2378

Liebert® Thermal Management Products

1-800-543-2378

Liebert® Channel Products

1-800-222-5877

Liebert® AC and DC Power Products

1-800-543-2378

A.2 Locations

United States

Vertiv Headquarters

505 N Cleveland Ave

Westerville, OH 43082

Europe

Via Leonardo Da Vinci 8 Zona Industriale Tognana

35028 Piove Di Sacco (PD) Italy

Asia

7/F, Dah Sing Financial Centre

3108 Gloucester Road, Wanchai

Hong Kong

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Appendix B: Submittal Drawings

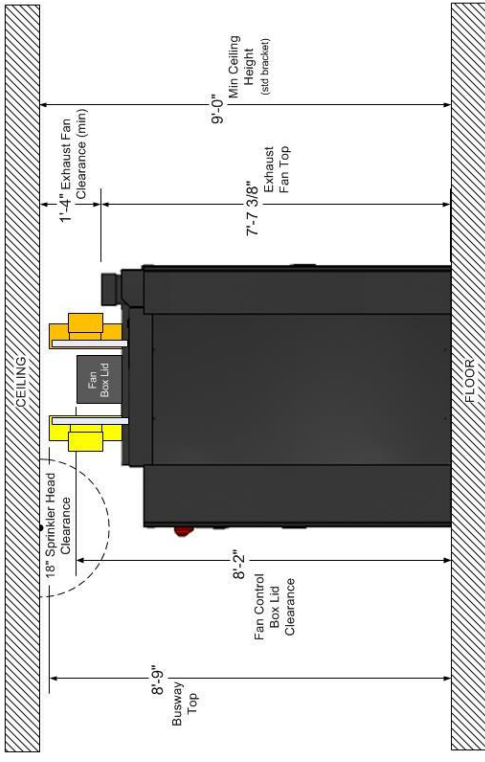
Table 11.1 Submittals

Submittal Number	Title	
BC68AWBHBJAAB 40kW_5Rack Red r4	DCX 40kW Redundant, 5-8 Racks Layout	
BAAGAHAAJAAA r4	Overview	
SRDCX001	DCX MECHANICAL ASSEMBLY REFERENCE	
SRDCX012	FAN CONTROL BOX & vNSA NETWORK SWITCH	
552770	SMARTROW DCX EC INSTALL INSTR - CRV600 COOLING	
562117	SMARTROW DCX EXM EC INSTALL INSTRUCTIONS	
558659	SMARTROW DCX EC INSTALL INSTR - DCE RACK	
SRDCX015	DCX DIMENSIONAL SPECIFICATIONS - FIRE DETECTION & SUPPRESSION 35 CYLINDERS	
SRDCX003	DCX DIMENSIONAL SPECIFICATIONS - CRV600	
SRDCX007	DCX DIMENSIONAL SPECIFICATIONS - RACKS	
SRDCX022	DCX DIMENSIONAL SPECIFICATIONS (EC) eXM BDC 208 V 10-100 kW (600 mm) eXM DC 480 V 50-150 kVA (600 mm)	
SRDCX017	DCX DIMENSIONAL SPECIFICATIONS (EC) eXM BATTERY CABINET (600 mm)	
SRDCX020	DCX DIMENSIONAL SPECIFICATIONS (EC) eXM UPS 208 V 40 & 100 kVA FRAME or eXM UPS 480 V 200 kVA FRAME	
SRDCX010	DCX RACK, SERVER (600 W)	
SRDCX011	DCX RACK, NETWORK (800 W)	
120781-M01	Liebert DCX Control Logic	
120781-E01	Liebert DCX Control Logic	
558078	KIT SPACER UPS/BDC/BATTERY	

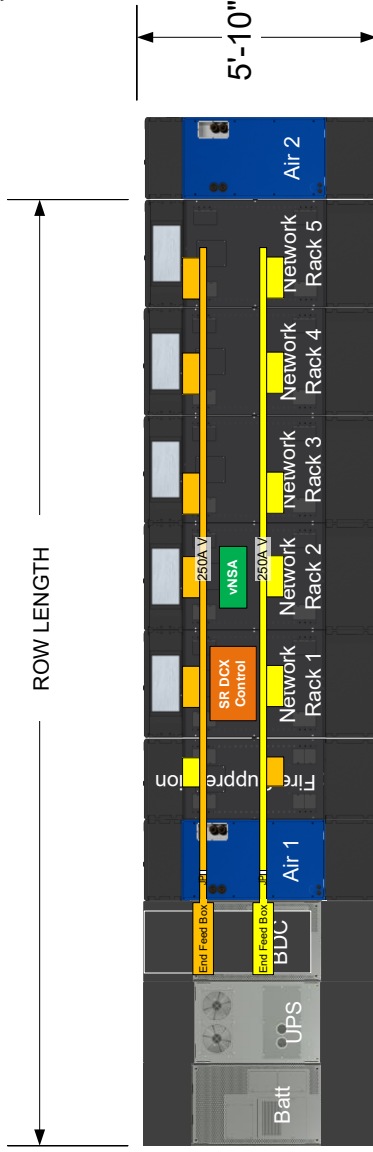
SmartRow DCX Solution

Nominal Capacity: 40kW (minimum 12kW load)
 Max kW per Rack: 8.6kW
 UPS System: 40kW w external battery, 18 min; internal, 9 min
 Power Redundancy: N+1 UPS; N+1 or 2N rack PDUs (2N busway shown)
 Cooling Redundancy: N+1 plus automatic backup ventilation fans, air cooled
 Containment: Expansion Channels Front and Rear

Base Model Number: BC68AWBHBJAAB



Side Elevation



Front

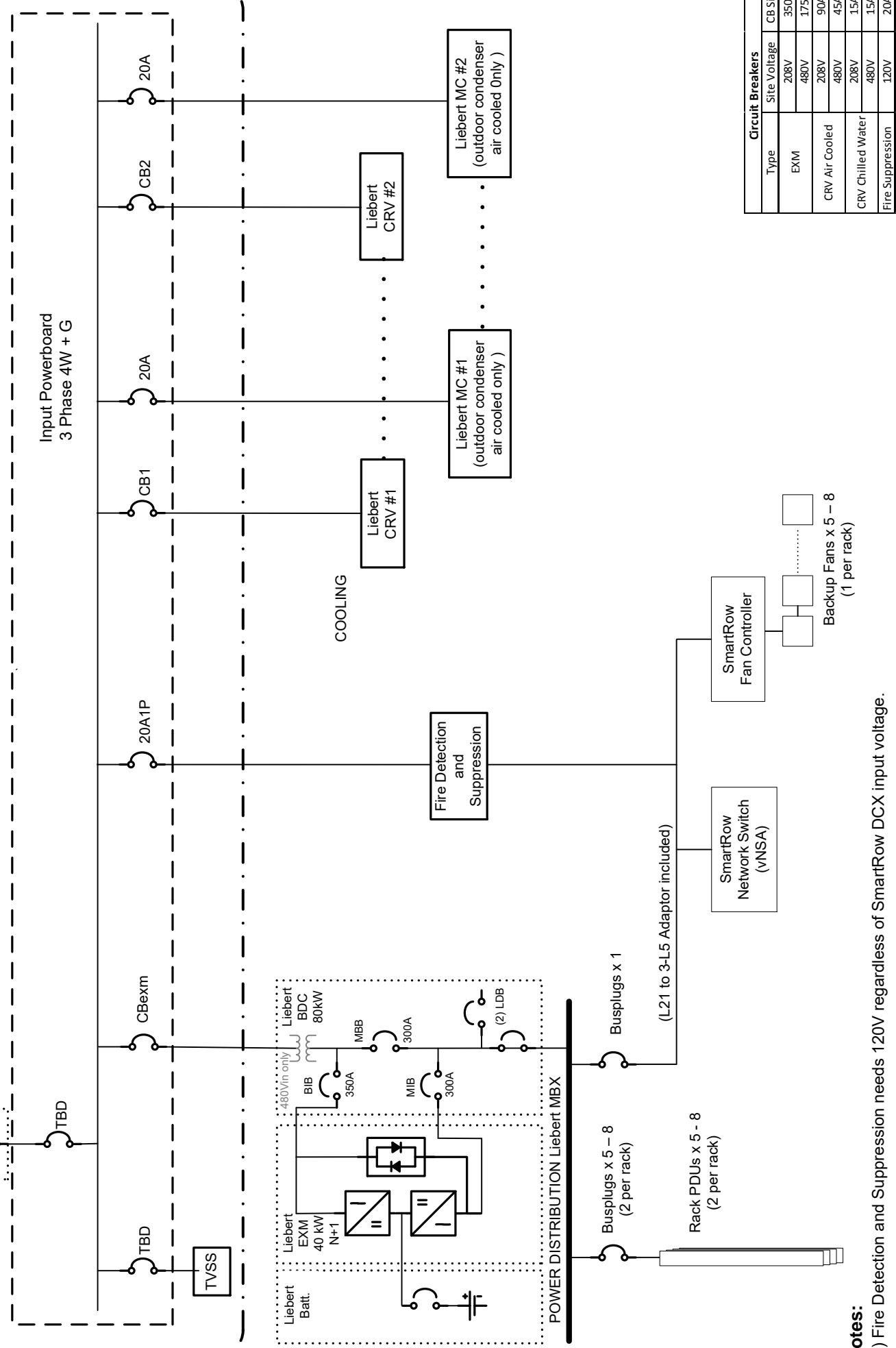
RACK QUANTITY	5	6	7	8
CRV QUANTITY	2			
ROW LENGTH Ft - In	25'5"	28'1"	30'8"	33'4"

Notes:

- 1.) System Environmental Conditions: Indoors, 50°F to 85°F dry bulb and less than 60°F dew point.
- 2.) Floor surface must be level (+/-3/8 per 10ft) and continuous (expansion joints sealed, raised floor tile gaps sealed, no floor drains, etc).
- 3.) No building sprinkler head should be within 18 inches of SmartRow
- 4.) 16 inches clearance required above emergency fan outlet (107" from floor)
- 5.) Contrasting busplug used to power SmartRow DCX control
- 6.) Row length calculated using all 2' 8" Network Racks. Reduce row length by 7.75" per Server Rack substitution.
- 7.) Reduce length by 2' each when fire suppression and/or external battery options are not included.



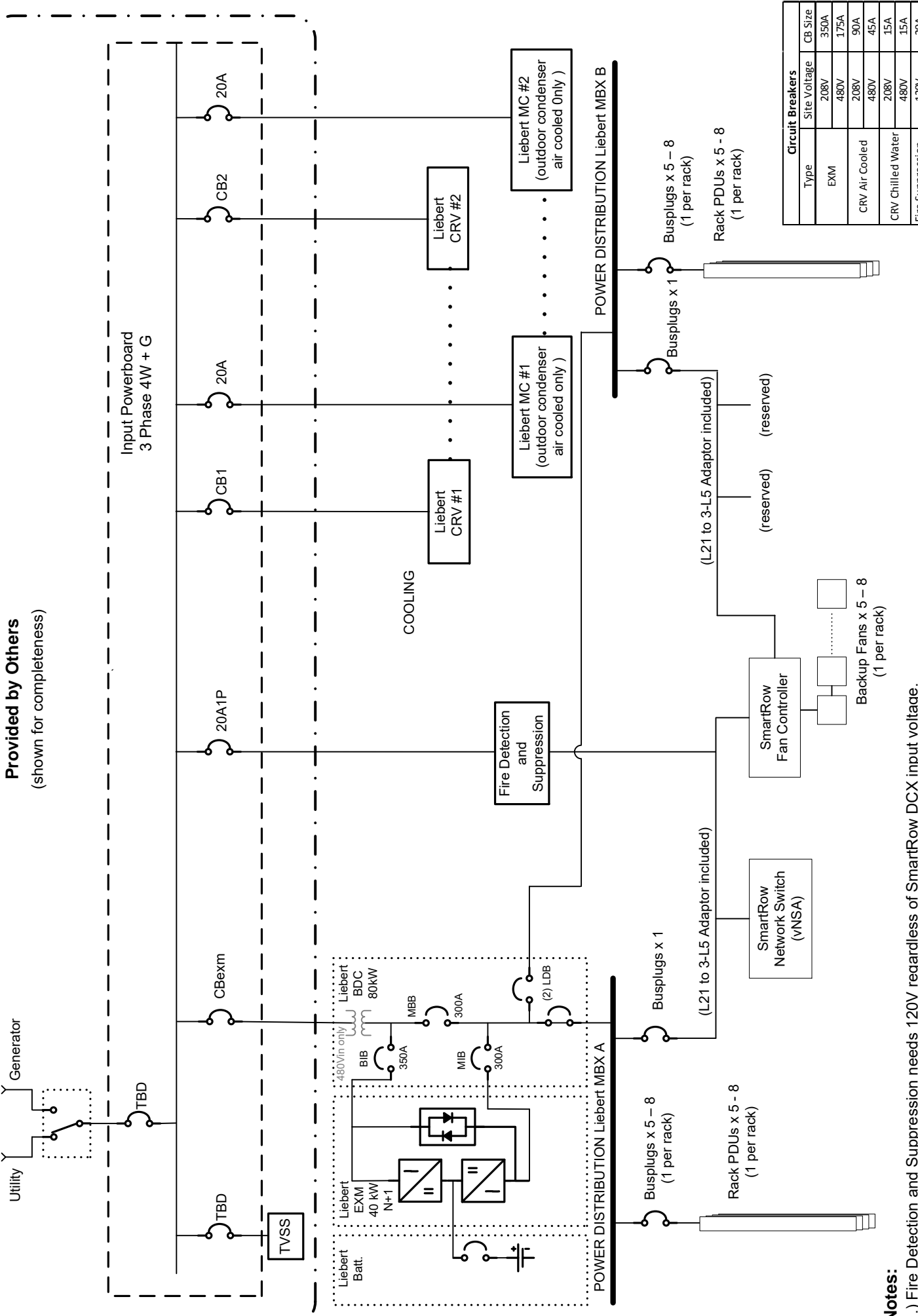
Provided by Others
(shown for completeness)



Circuit Breakers		
Type	Site Voltage	CB Size
EXM	208V	350A
	480V	175A
CRV Air Cooled	208V	90A
	480V	45A
CRV Chilled Water	208V	15A
	480V	15A
Fire Suppression	120V	20A

Notes:
1.) Fire Detection and Suppression needs 120V regardless of SmartRow DCX input voltage.

Provided by Others
(shown for completeness)



Circuit Breakers		
Type	Site Voltage	CB Size
EXM	208V	350A
	480V	175A
CRV Air Cooled	208V	90A
	480V	45A
CRV Chilled Water	208V	15A
	480V	15A
Fire Suppression	120V	20A

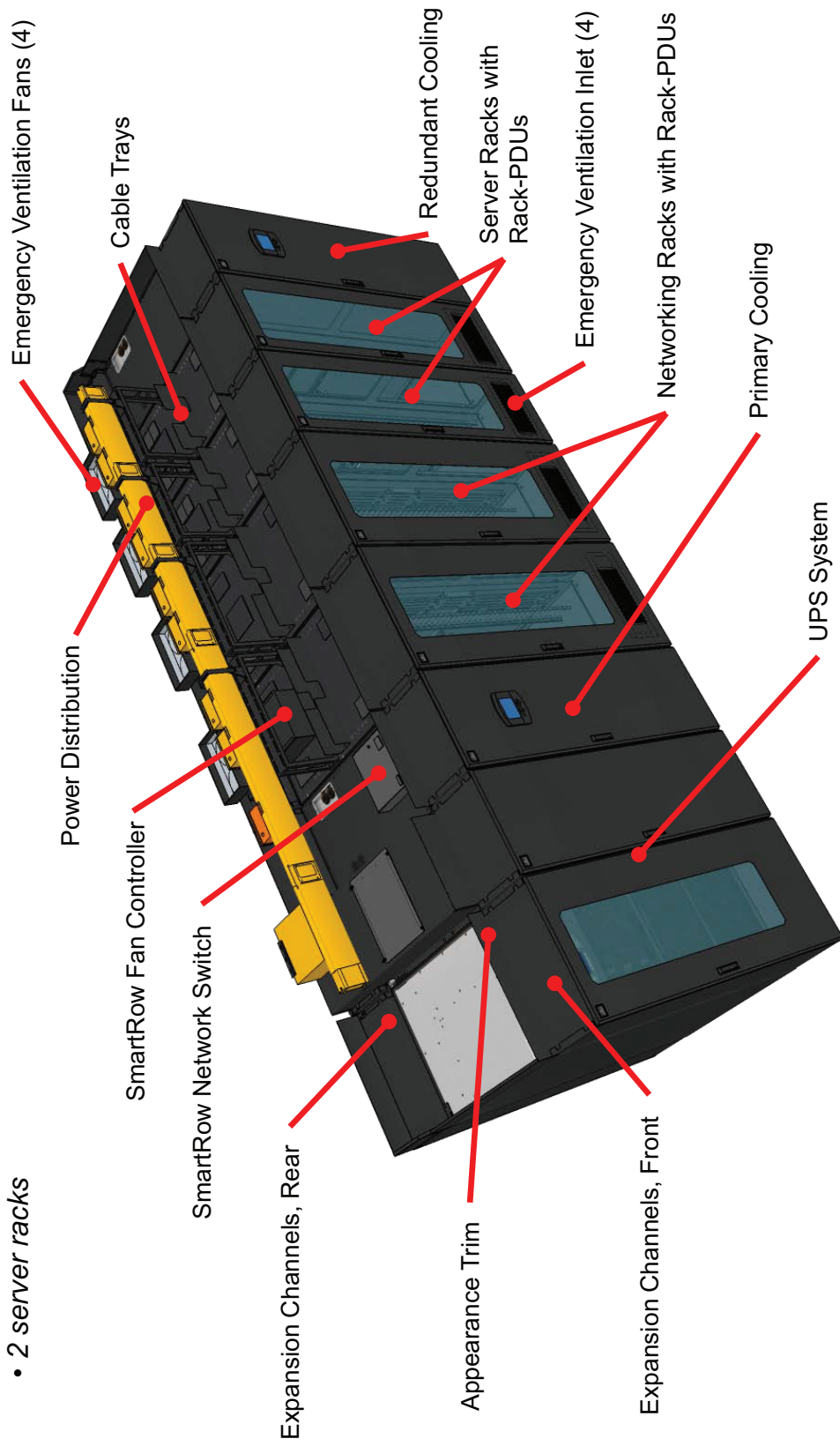
Notes:
1.) Fire Detection and Suppression needs 120V regardless of SmartRow DCX input voltage.



• 4 racks at 7.5kW average • **System Capacity 30 kW, N+1**

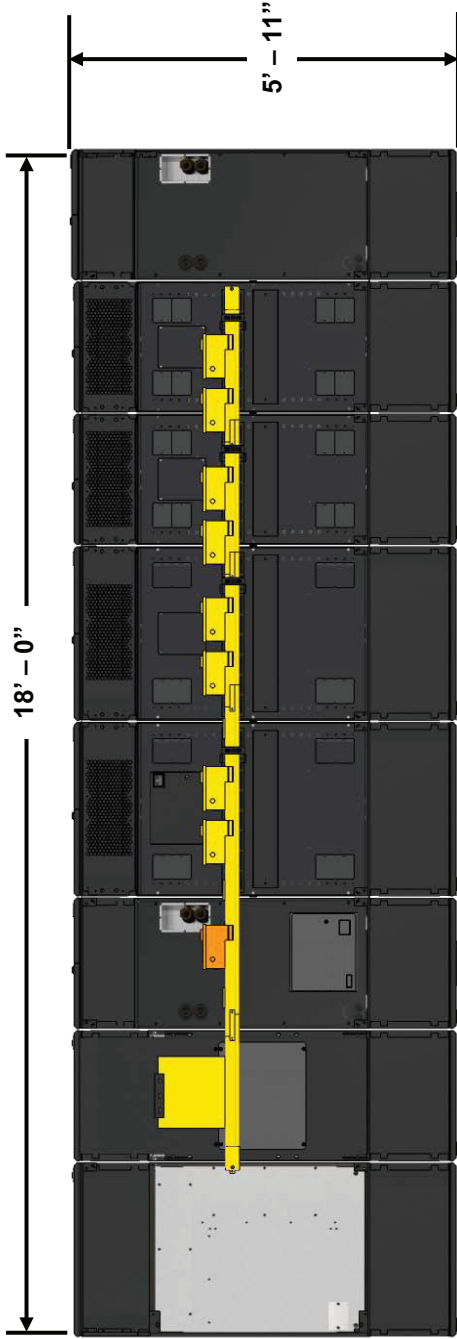
(8.6 kW/rack max)
(7 kW minimum load)

- 2 networking racks
- 2 server racks



Note: Cabling between overhead MB power distribution and row equipment not shown.

		REV #	4	SmartRow DCX Solution Overview		FILE NAME	1050 DEARBORN DRIVE P.O. BOX 29186 COLUMBUS, OHIO 43229
		DRAWN BY	MG	DATE	05 / 13 / 16	SHEET	1
				DIMENSIONS IN FEET, APPROXIMATE			

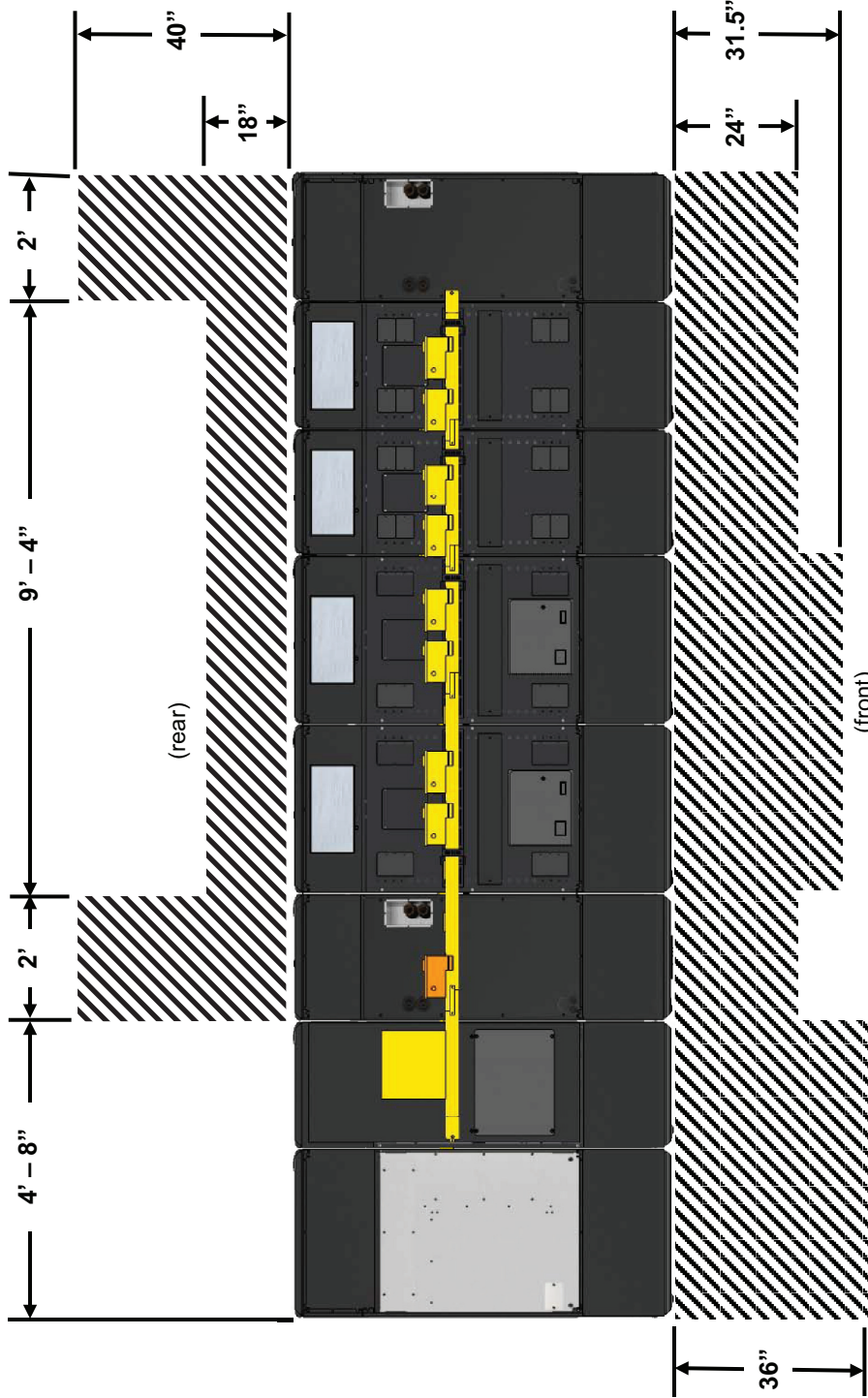


TOP VIEW



FRONT VIEW

	SmartRow™ DATE 05 / 13 / 16	REV # 4	SmartRow DCX Solution Dimensions		FILE NAME BAAGAHHAJAAA r4.pdf	1050 DEARBORN DRIVE P.O. BOX 29186 COLUMBUS, OHIO 43229	
	DRAWN BY MG	SHEET 2	DIMENSIONS IN FEET, APPROXIMATE		© VERTIV CO. - CONFIDENTIAL AND PROPRIETARY - ALL RIGHTS RESERVED. GRAPHICS FOR ILLUSTRATION AND ESTIMATION PURPOSES ONLY.		



TOP VIEW

NOTE:

1. This drawing supersedes product specific drawings where conflicts exist.
2. Adhere to all local codes and egress.



DRAWN BY MG	DATE 05 / 13 / 16	REV # 4	SHEET 3
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SmartRow DCX Solution
Door and Service Clearance

DIMENSIONS IN FEET, APPROXIMATE

FILE NAME

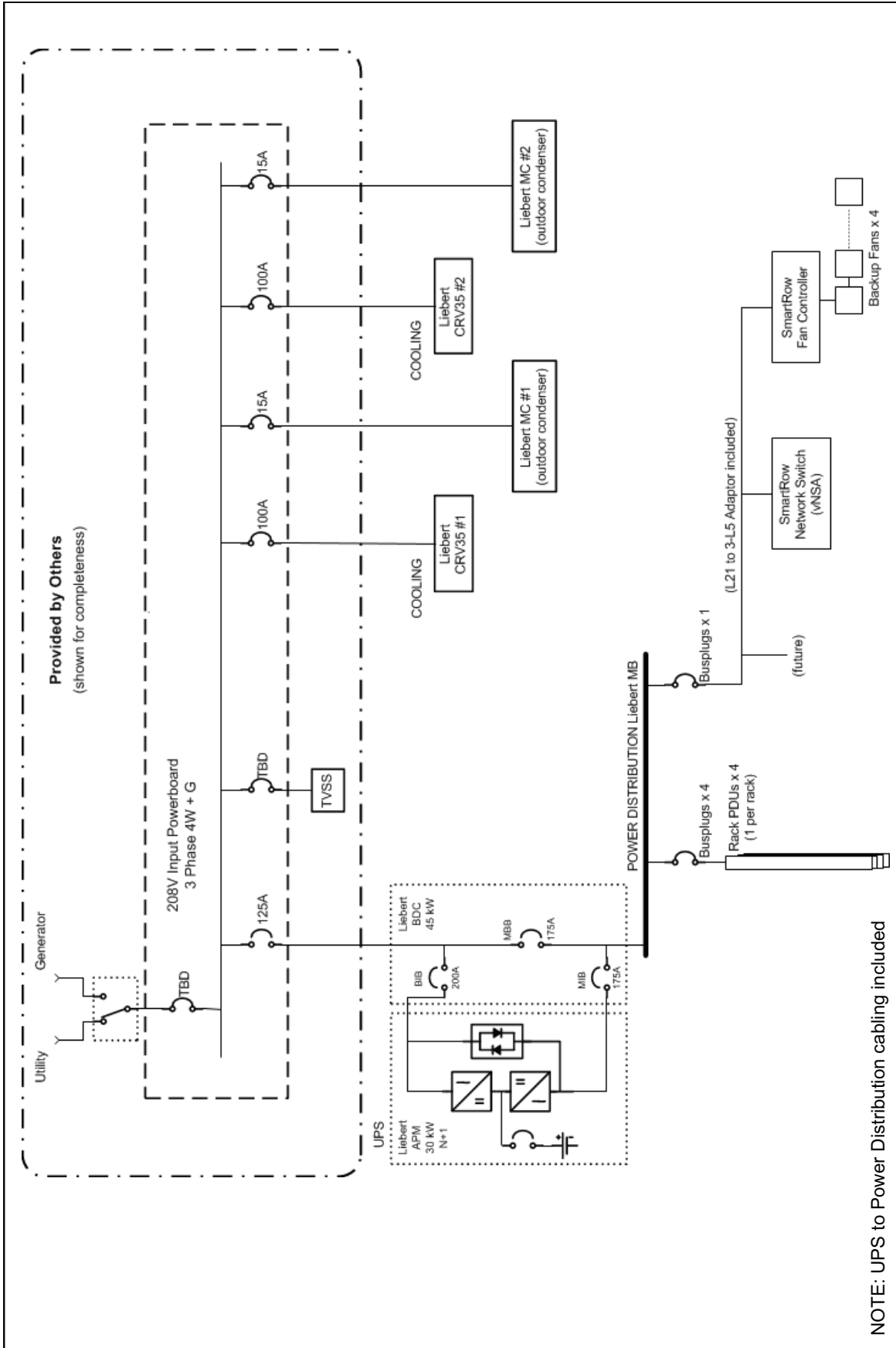
BAAGAHHAJAAA r4.pdf

1050 DEARBORN DRIVE
P.O. BOX 29186
COLUMBUS, OHIO 43229

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VERTIV

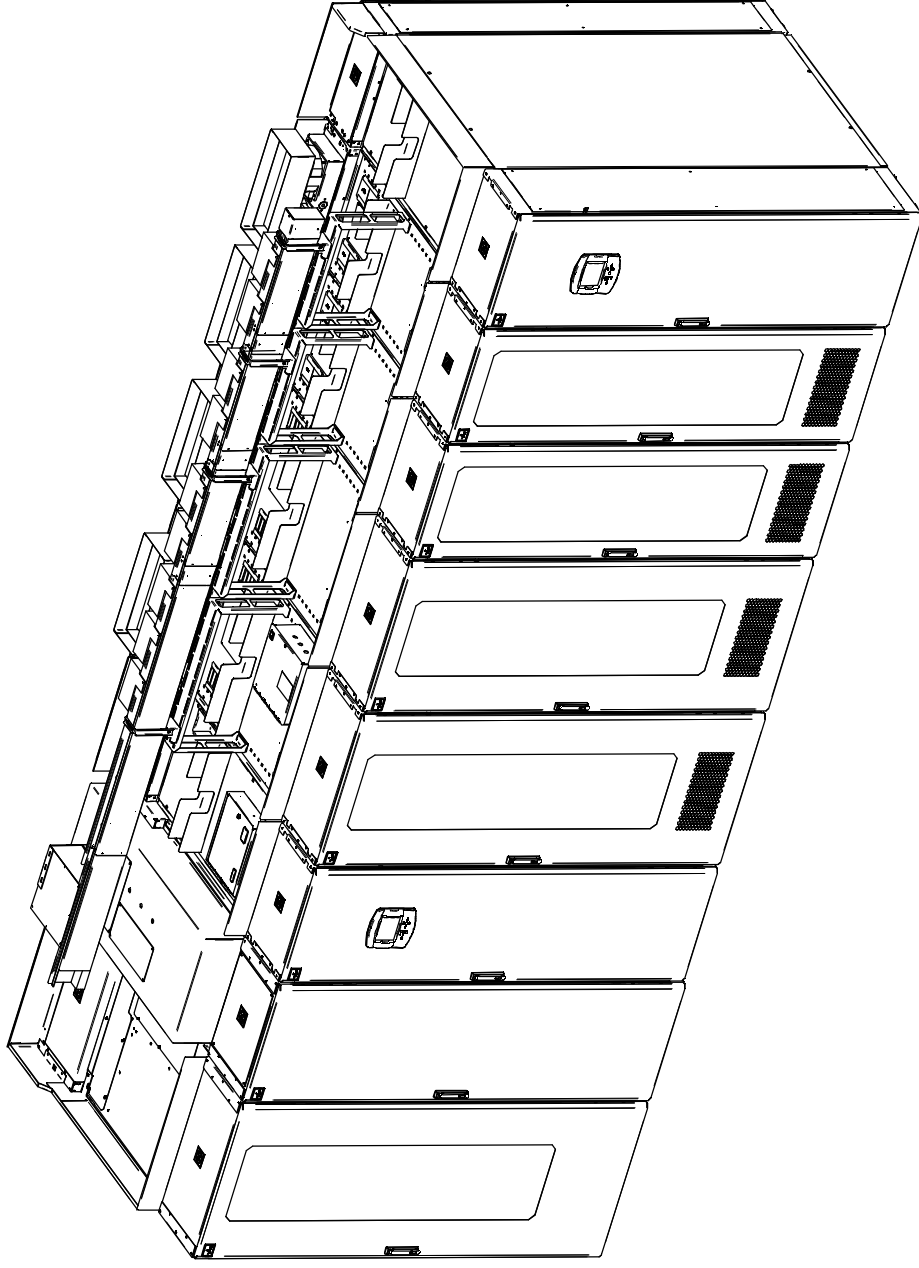


Provided by Others
(shown for completeness)

NOTE: UPS to Power Distribution cabling included

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	SHEET	4	
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MG			
SmartRow DCX Solution Electrical One-Line		FILE NAME BAAGAHAAJAAA r4.pdf	1050 DEARBORN DRIVE P.O. BOX 29186 COLUMBUS, OHIO 43229
DIMENSIONS IN FEET, APPROXIMATE		© VERTIV CO. - CONFIDENTIAL AND PROPRIETARY - ALL RIGHTS RESERVED. GRAPHICS FOR ILLUSTRATION AND ESTIMATION PURPOSES ONLY.	

- NOTES:
1. TYPICAL SMARTROW DCX SHOWN FOR REFERENCE. ACTUAL EQUIPMENT ORDER AND LAYOUT MAY VARY.
 2. EACH SHEET REPRESENTS TYPICAL ASSEMBLY STAGES.
 3. REFER TO DCX USERS MANUAL FOR DETAILED INSTRUCTIONS.
 4. POWER AND NETWORK CABLING ARE PROHIBITED FROM BEING RAN IN AND / OR THROUGH EXPANSION CHANNELS (EC).



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BTL	1 OF 5
CHECKED BY:	ECN NUMBER:
BLR	
REFERENCE DRAWING:	QUOTE NUMBER:

TITLE / DESCRIPTION
DCX MECHANICAL ASSEMBLY REFERENCE

CUSTOMER / JOB
 SMARTROW DCX

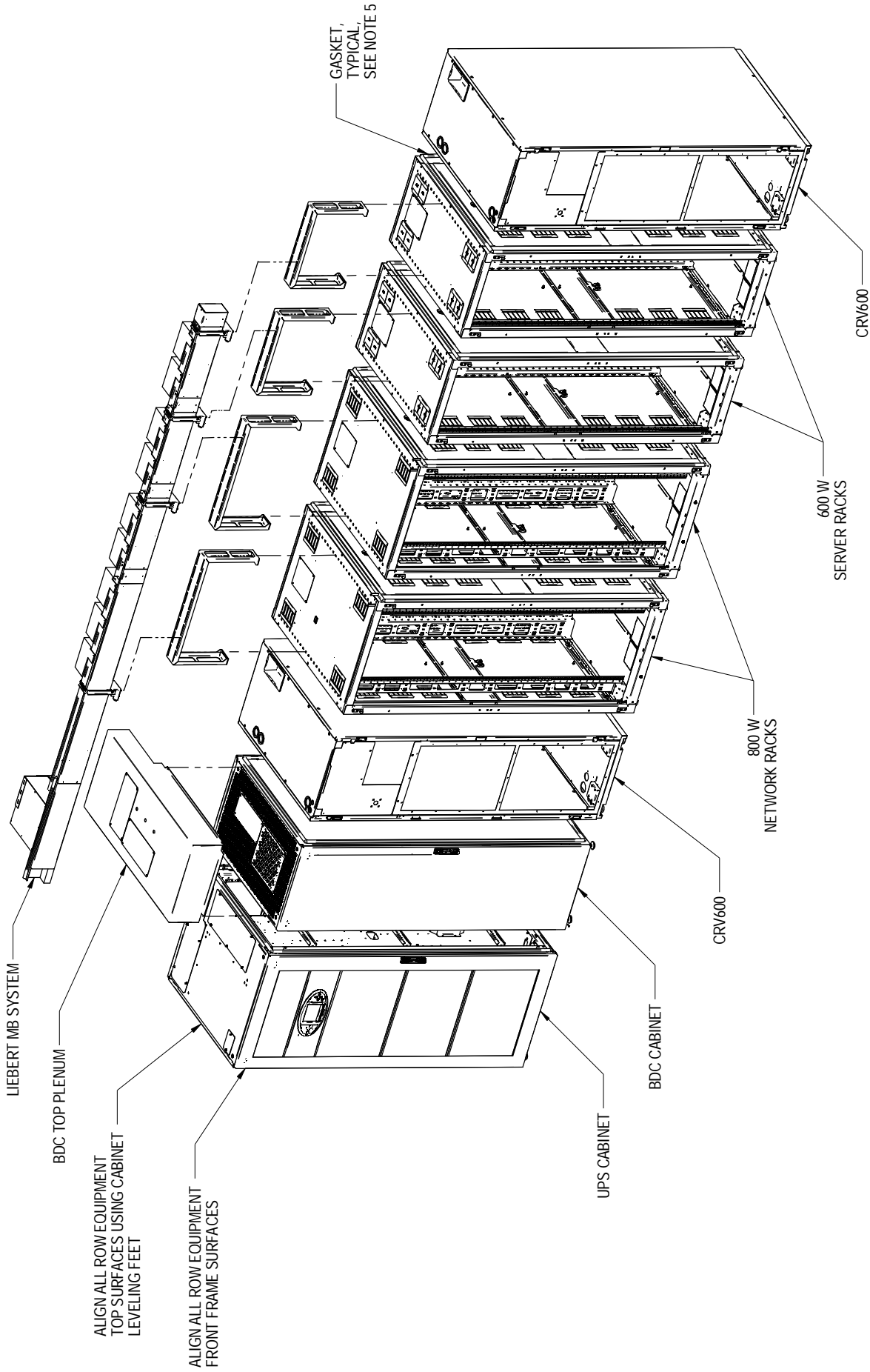
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SRDCX001	07-25-2017	2	

1050 BEAVERBARK DRIVE
 P.O. BOX 27186
 COLUMBUS, OHIO 43229



NOTES:

- 5. ALL COMPONENTS SHOWN SHIP SEPARATELY.
- 6. FACTORY SUPPLIED GASKETS TO BE APPLIED BETWEEN EACH ADJACENT CABINET.
- 7. FACTORY SUPPLIED HARDWARE TO BE USED TO BAY EACH ADJACENT CABINET.



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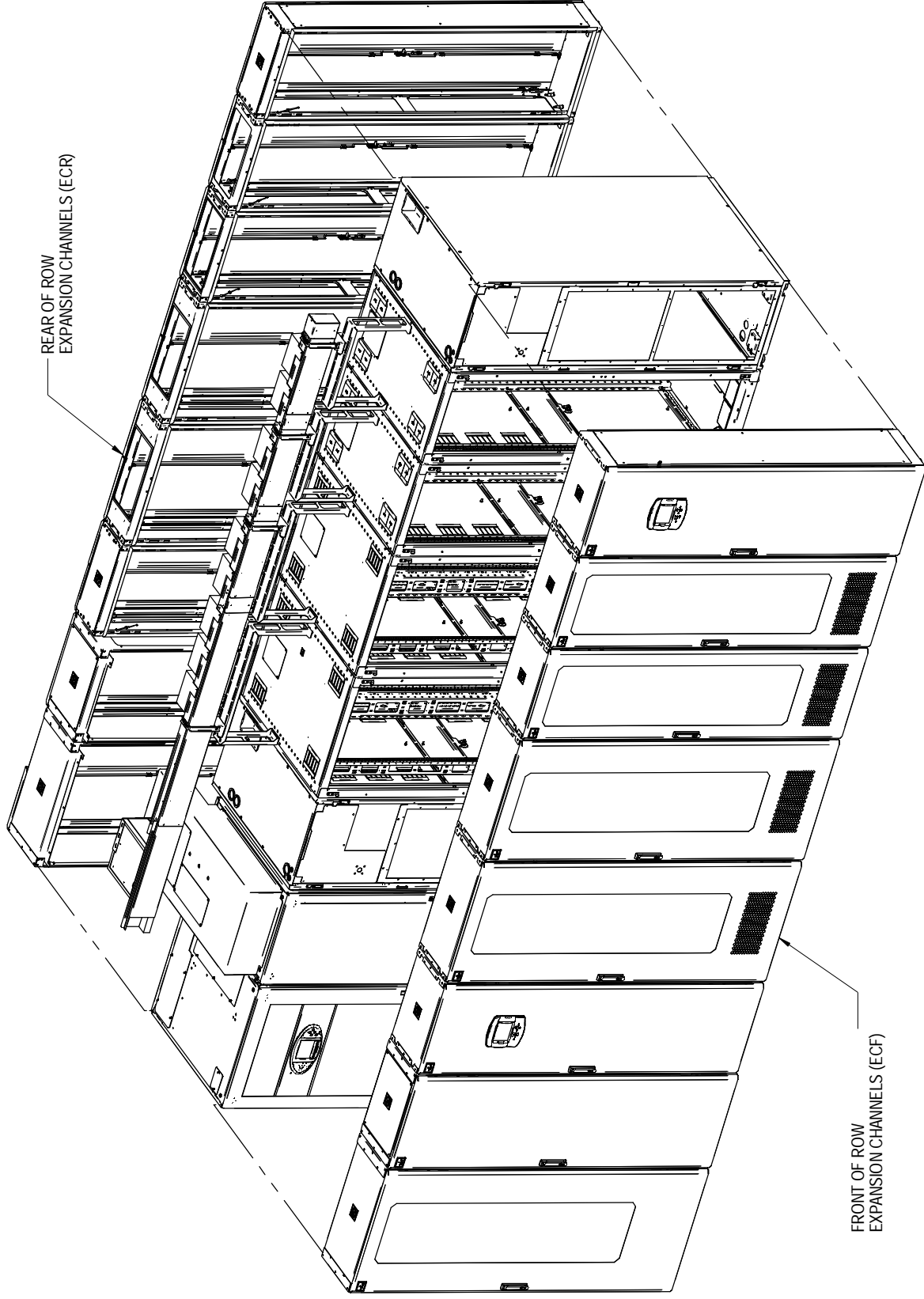
DCX MECHANICAL ASSEMBLY REFERENCE

CUSTOMER / JOB
SMARTROW DCX

DRAWING NUMBER:	REV#:	DATE:	1090 DEARBORN DRIVE P.O. BOX 29186 COLUMBUS, OHIO 43229
SRDCX001	2	07-25-2017	



- NOTES:
 8. FACTORY SUPPLIED GASKETING TO BE APPLIED BETWEEN EACH ADJACENT EC.
 9. ATTACH EC'S TO ROW EQUIPMENT.



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REFERENCE DRAWING:

SHEET NUMBER:
3 OF 5

ECN NUMBER:

QUOTE NUMBER:

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CUSTOMER / JOB
 SMARTROW DCX

DATE:
07-25-2017

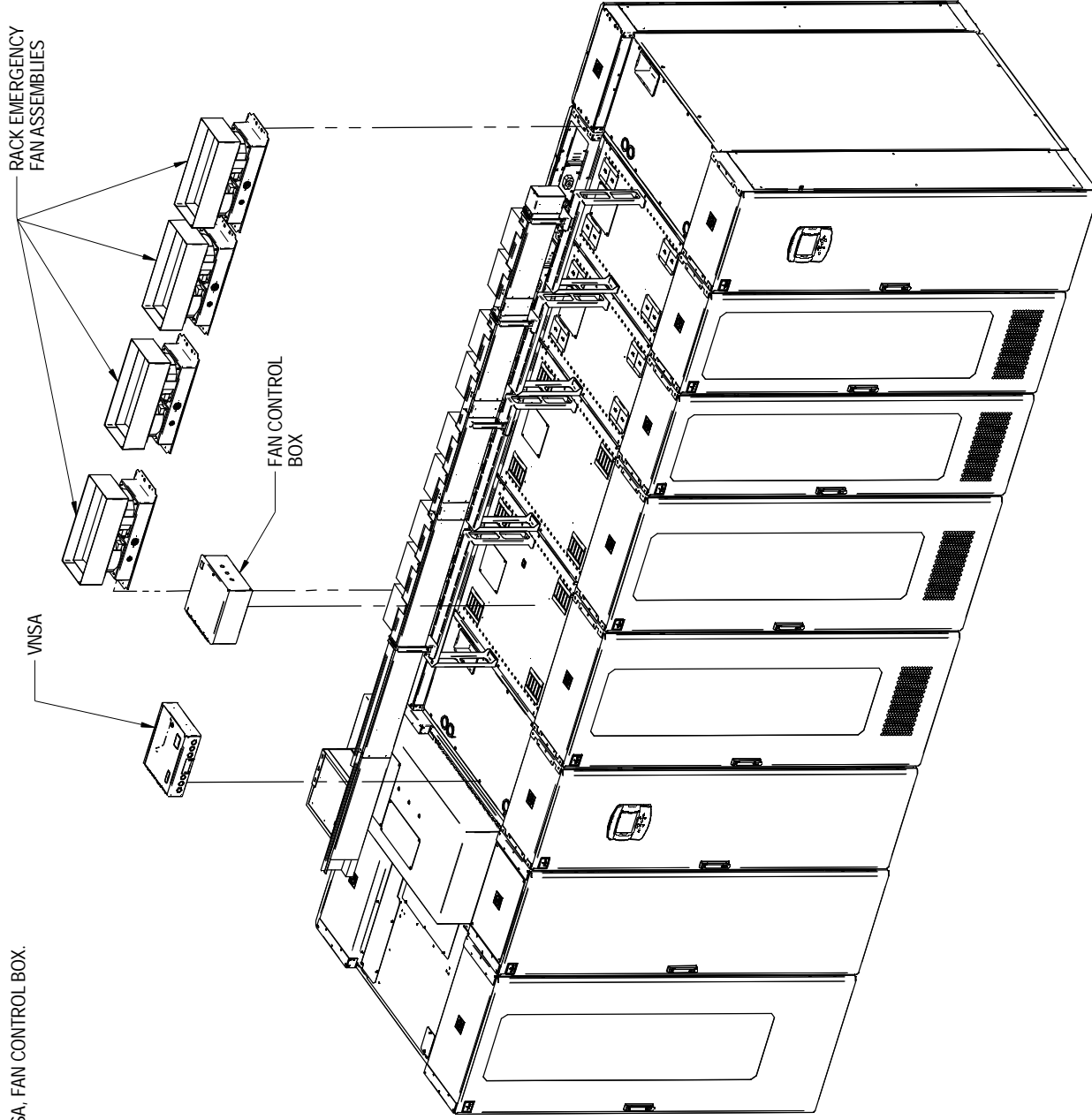
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DRAWING NUMBER:
SRDCX001



1050 RESEARCH DRIVE
 P.O. BOX 29186
 COLUMBUS, OHIO 43229

NOTES:
 10. INSTALL RACK EMERGENCY FANS, VNSA, FAN CONTROL BOX.



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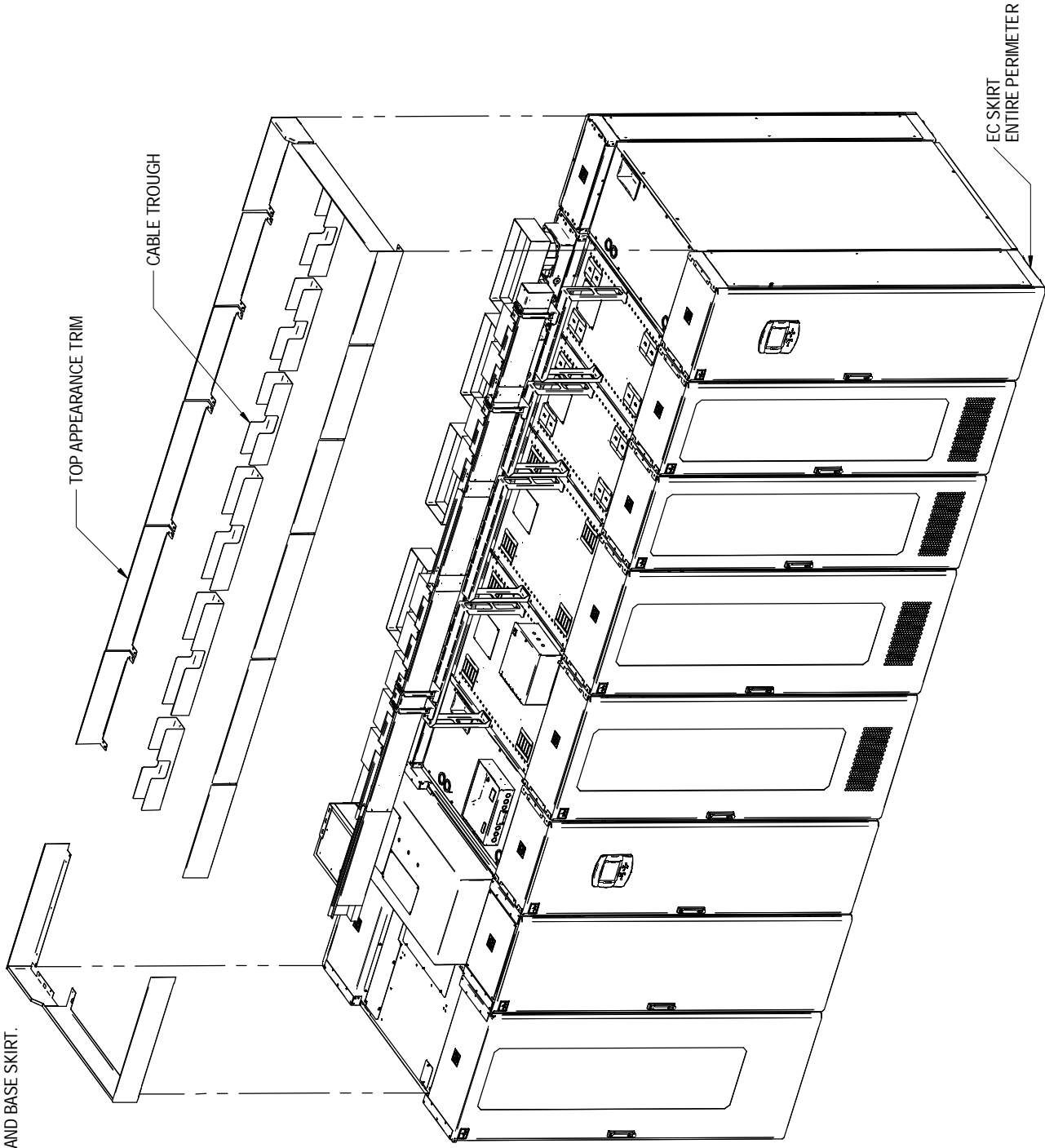
CUSTOMER / JOB
 SMARTROW DCX

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SRDCX001	2	07-25-2017



10190 BEAVERBARK DRIVE
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 COLUMBUS, OHIO 43229

NOTES:
 11. INSTALL TOP TRIM, CABLE TROUGH, AND BASE SKIRT.



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 BTL
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CUSTOMER / JOB
 SMARTROW DCX

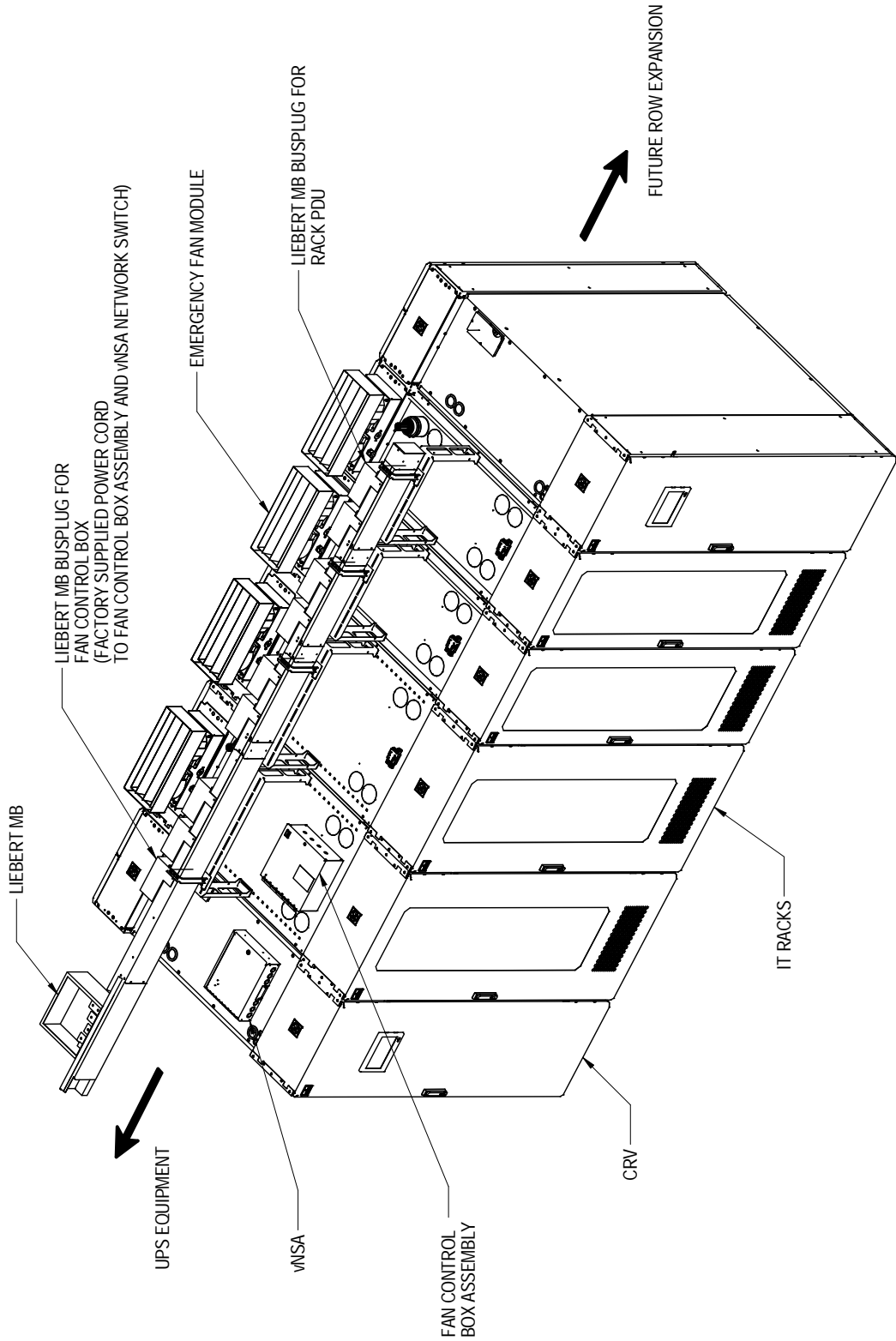
DRAWING NUMBER: SRDCX001
 DATE: 07-25-2017
 REV#: 2



1019 BEAVERHAWK DRIVE
 P.O. BOX 29186
 COLUMBUS, OHIO 43229

NOTES:

1. EXAMPLE SMARTROW DCX SHOWN FOR REFERENCE. ACTUAL EQUIPMENT ORDER AND LAYOUT MAY VARY.
2. THE FAN CONTROL BOX ASSEMBLY SHALL BE LOCATED ON TOP OF A RACK AT THE END OF THE ROW, FURTHEST AWAY FROM POSSIBLE ROW EXPANSION.
3. THE FAN CONTROL BOX ASSEMBLY CAN BE POWERED FROM EITHER THE OVERHEAD LIEBERT MB OR A RACK PDU.
4. FAN CONTROL BOX ASSEMBLY INPUT RECEPTACLES ARE NEMA L5-20P, 125V, 3W, 20A.
5. ONE FAN CONTROL BOX ASSEMBLY CAN SUPPORT UP TO (10) BACKUP FAN MODULES AND (4) CRV'S.
6. IF THE CONFIGURATION EXCEEDS THESE REQUIREMENTS, A SECOND FAN CONTROL BOX ASSEMBLY WILL BE REQUIRED.
7. CRV'S WITH SRDCX PACKAGE REQUIRED.
8. CRV DRY CONTACT CONTROL WIRING TO FAN CONTROL BOX ASSEMBLY MUST BE HOMERUNS. FIELD SUPPLIED WIRING CLASS 1, 1A, 24VAC.
9. WNSA SHALL BE LOCATED ON TOP OF CRV, OR RACK NEAR FAN CONTROL BOX.



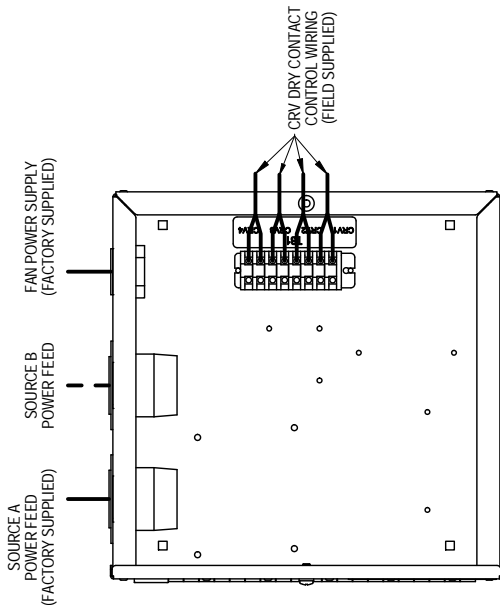
DRAWN BY:	SHEET NUMBER:
BLR	1 OF 2
CHECKED BY:	EQUIPMENT:
TB	N/A
REFERENCE DRAWING:	QUOTE NUMBER:
N/A	N/A

TITLE / DESCRIPTION	
FAN CONTROL BOX & WNSA NETWORK SWITCH	

DRAWING NUMBER: SRDCX012		CUSTOMER / JOB: SMARTROW DCX	
DATE: 10/30/2017	REV.#: 3	1850 BEAVERBROOK DRIVE P.O. BOX 29186 COLUMBUS, OHIO 43229	



NOTES:
8. VNSA NETWORK CONNECTIONS NOT SHOWN.



TOP VIEW
FAN CONTROL BOX ASSEMBLY
ALL PARTS NOT SHOWN FOR CLARITY.

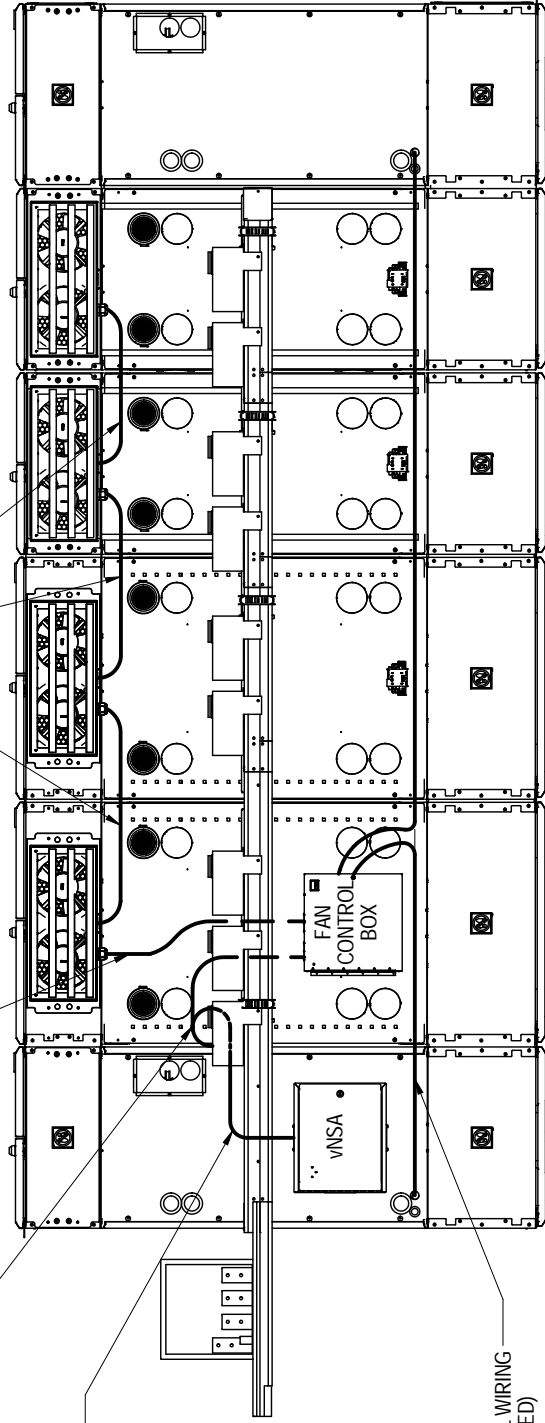
EMERGENCY FAN MODULE
POWER CORD - DAISY CHAINED
(FACTORY SUPPLIED)

EMERGENCY FAN MODULE
POWER CORD
(FACTORY SUPPLIED)

POWER CORD ADAPTER
(FACTORY SUPPLIED)

VNSA POWER CORD
(FACTORY SUPPLIED)

CRV CONTROL WIRING
(FIELD SUPPLIED)



TOP VIEW

TITLE / DESCRIPTION

FAN CONTROL BOX & VNSA NETWORK SWITCH

CUSTOMER / JOB

SMARTROW DCX

DRAWING NUMBER:

SRDCX012

DATE:

10/30/2017

REV.#:

3

DRAWN BY:

BLR

SHEET NUMBER:

2 OF 2

CHECKED BY:

TB

QUOTE NUMBER:

N/A

REFERENCE DRAWING:

N/A



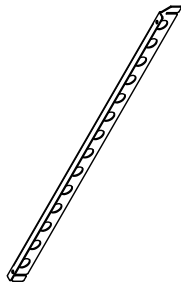
1850 BEAVERHURST DRIVE
P.O. BOX 29186
COLUMBUS, OHIO 43229



SMARTROW DCX EC INSTALL INSTR - CRV600 COOLING

THE FOLLOWING INSTALLATION PROCEDURE INSTRUCTIONS COVER EXPANSION CHANNELS (EC) THAT ARE INSTALLED ON BOTH THE FRONT AND REAR OF THE CRV:

HARDWARE INCLUDED:



HOOK LOCATOR BRACKET (x1)



"D" GASKET (34 FT)



M6x12 SCREWS (x18)



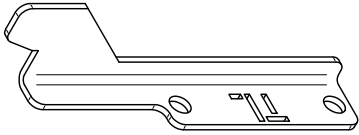
M6 FLAT WASHER (x4)



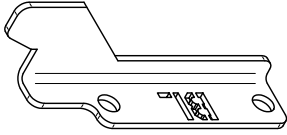
LOCK WASHER (x4)



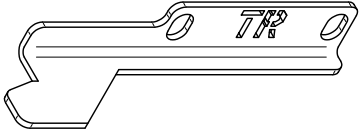
EXTERNAL TOOTH 1/4 (x2)



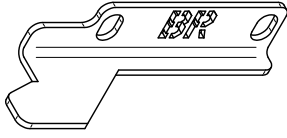
HOOK TOP LEFT (X2)



HOOK BOTTOM LEFT (x2)



HOOK TOP RIGHT (x2)



HOOK BOTTOM RIGHT (x2)

TOOLS REQUIRED:

- T30 DRIVER BIT
- 10mm SOCKET & RATCHET

FOLLOWING INSTRUCTION SHEETS:

- SHEET 2: FRONT AND REAR EC HOOK INSTALLATION
- SHEET 3: FRONT AND REAR EC BAYING & GROUND WIRE INSTALLATION
- SHEET 4: CRV TOUCHSCREEN INSTALLATION AND CABLE ROUTING.

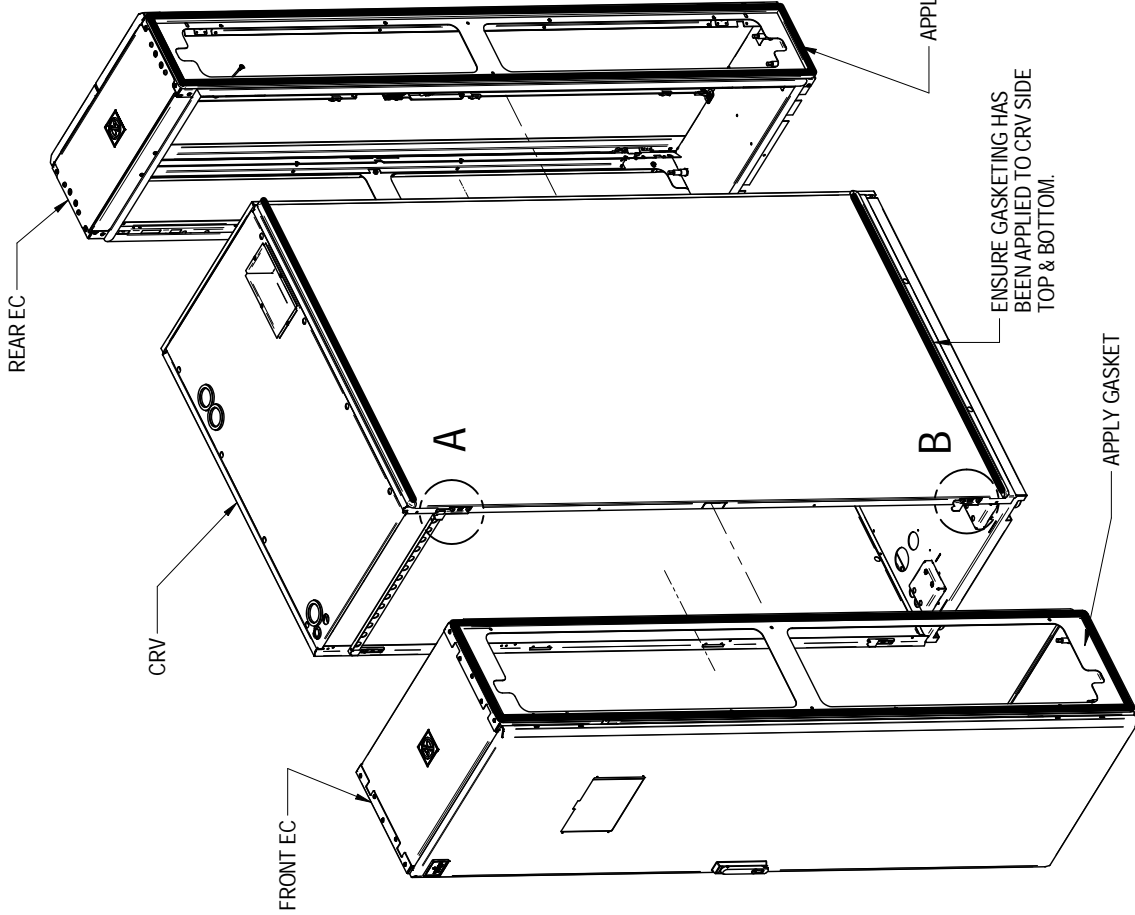
DRAWN: JAMESON THOMPSON
 CHECKED: BRAD REINBOLT
 ENGR : JAMESON THOMPSON

DATE: 7/27/2017
 DATE: 7/27/2017
 DATE: 7/27/2017

SHEET: 1 / 4
 REV: 10
 DRAWING NUMBER: 552770



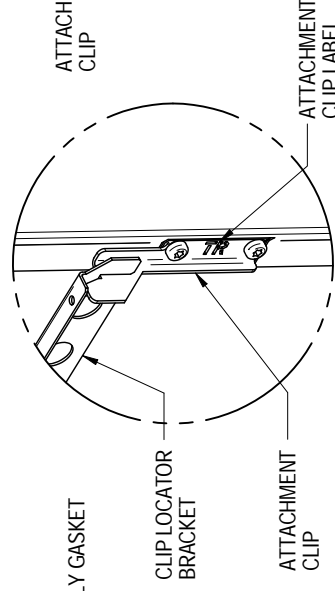
FRONT AND REAR EC HOOK INSTALLATION



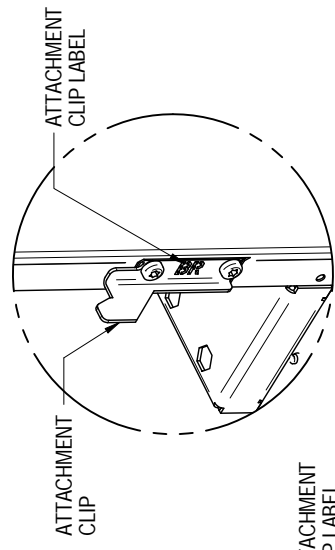
EXPLODE FRONT ISOMETRIC VIEW

INSTALLATION INSTRUCTIONS:

1. ENSURE CRV IS PROPERLY LEVELLED AND ALIGNED AS INSTRUCTED IN DCX USERS MANUAL.
2. INSTALL RIGHT SIDE ATTACHMENT HOOKS TOP (DETAIL A) AND BOTTOM (DETAIL B) AND LEAVE SCREWS SLIGHTLY LOOSE.
3. INSTALL LEFT SIDE ATTACHMENT HOOKS TOP AND BOTTOM AND TIGHTEN SCREWS.
4. PLACE HOOK LOCATOR BRACKET ON TOP HOOKS AS SHOWN IN DETAIL A. SLIDE RIGHT HOOK TO THE LEFT UNTIL THE HOOK BOTTOMS OUT ON HOOK LOCATOR BRACKET. TIGHTEN RIGHT SIDE HOOK SCREWS.
5. REPEAT STEP 4 PROCESS FOR BOTTOM HOOKS. REMOVE AND SET ASIDE LOCATOR BRACKET.
6. LIFT AND INSTALL EC ON TO ATTACHMENT HOOKS. ENSURE EC IS COMPLETELY SEATED ON HOOKS.
7. RUN DOWN ALL FOUR LEVELING FEET UNTIL THEY CONTACT THE FLOOR.
8. REPEAT PROCESS FOR REAR EC.
9. APPLY SUPPLIED GASKETING TO SIDE OF EC THAT WILL HAVE ADJACENT EQUIPMENT WITH ECS.



DETAIL A



DETAIL B

DRAWN: JAMESON THOMPSON
 CHECKED: BRAD REINBOLT
 ENGR : JAMESON THOMPSON

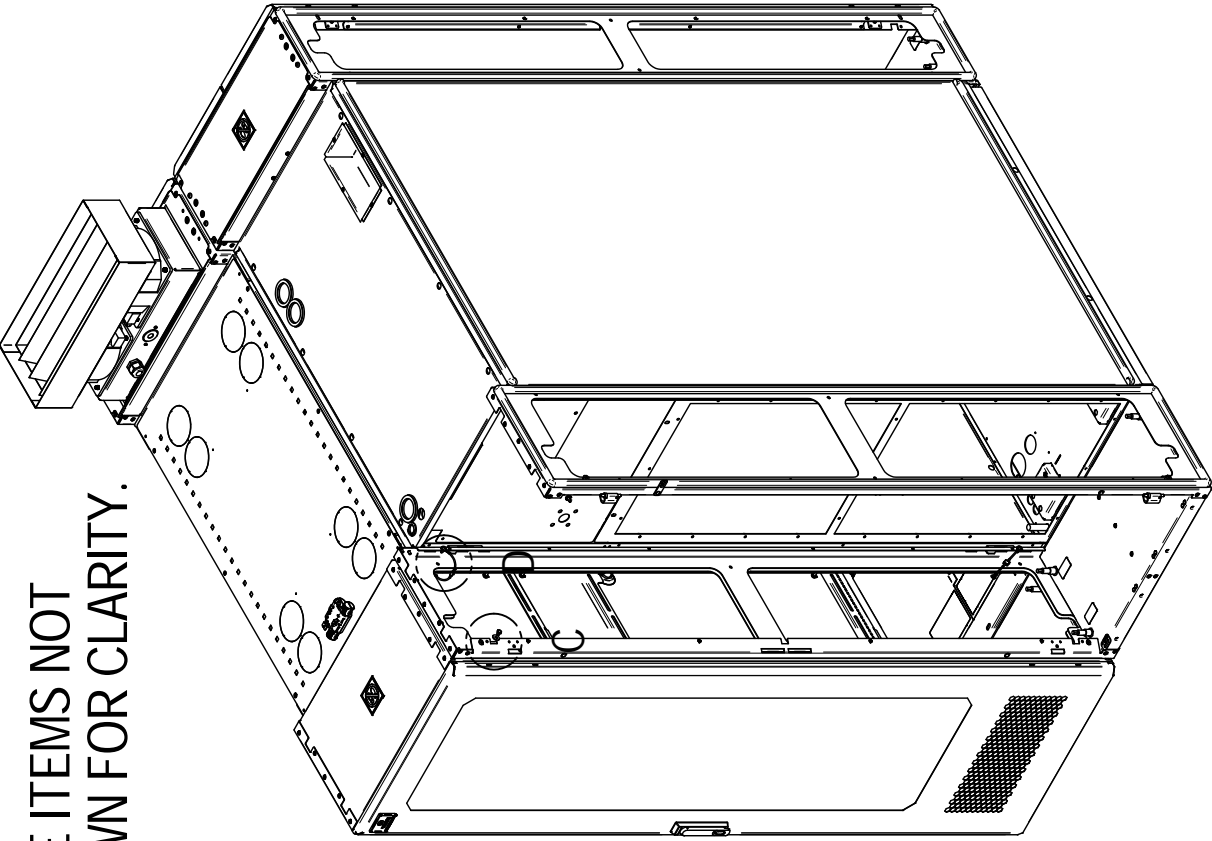
DATE: 7/27/2017
 DATE: 7/27/2017
 DATE: 7/27/2017

SHEET: 2 / 4
 REV: 10
 DRAWING NUMBER: 552770



VERTIV™ FRONT AND REAR EC BAYING & GROUND WIRE INSTALLATION

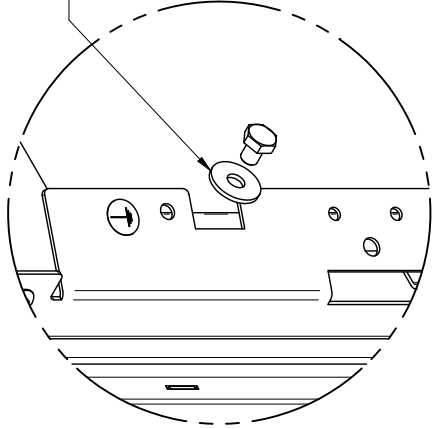
SOME ITEMS NOT SHOWN FOR CLARITY.



FRONT ISOMETRIC VIEW

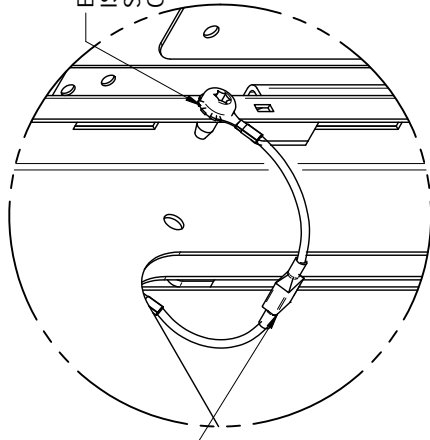
INSTALLATION PROCEDURE (CON'T):

- 10. BAY EC TO ADJACENT RACK EC USING M6 HEX HEAD SCREW AND M6 FLAT WASHER. SEE DETAIL C
- 11. CRV EC'S ARE GROUNDED TO ADJACENT RACK EC'S USING ATTACHMENT POINTS IN THE TOP REAR OF EC SIDE PANELS. SEE DETAIL D FOR LOCATION.
- 12. REPEAT STEPS 10 & 11 FOR REAR EC.



M6 FLAT WASHER & BOLT
TOP & BOTTOM OF BOTH FRONT & REAR EC'S

DETAIL C



ENSURE STAR WASHER IS PLACED BETWEEN SHEET METAL AND GROUND WIRE.

GROUND WIRE SUPPLIED WITH EC'S

DETAIL D

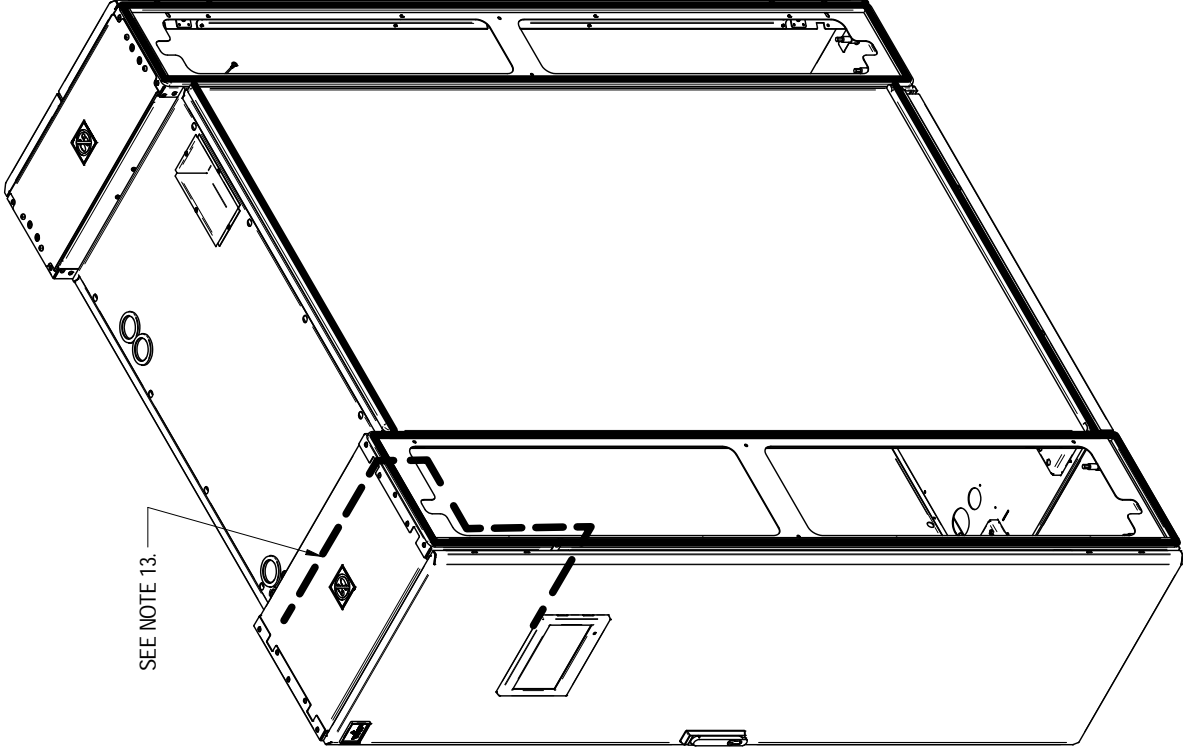
DRAWN: JAMESON THOMPSON
 CHECKED: BRAD REINBOLT
 ENGR : JAMESON THOMPSON

DATE: 7/27/2017
 DATE: 7/27/2017
 DATE: 7/27/2017

SHEET: 3 / 4
 REV: 10
 DRAWING NUMBER: 552770



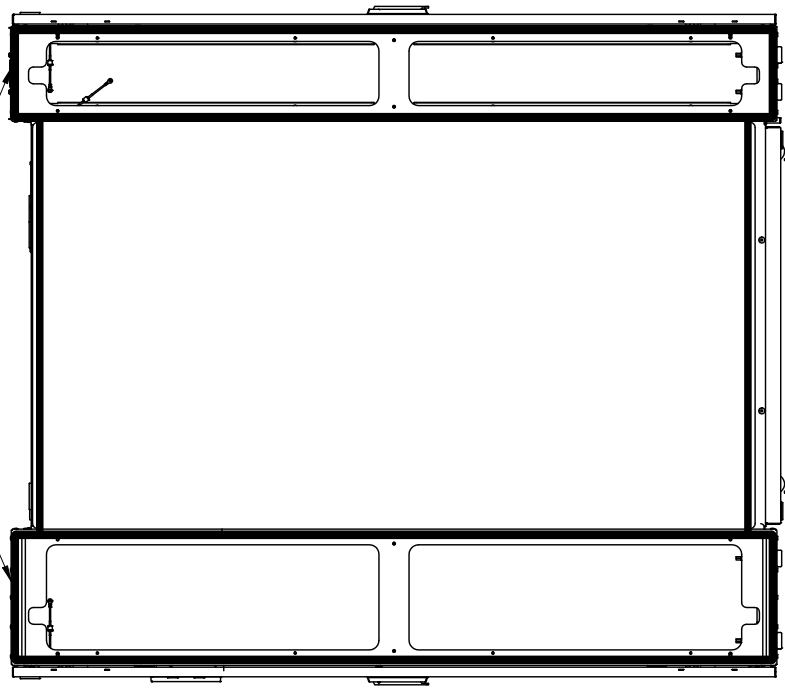
VERTIV™ CRV TOUCHSCREEN INSTALLATION AND CABLE ROUTING



INSTALLATION PROCEDURE (CON'T):

- 13. REMOVE TOUCHSCREEN DISPLAY KIT FROM CRV AND INSTALL IN EC FRONT DOOR USING HARDWARE SUPPLIED WITH TOUCHSCREEN.
- 14. ROUTE AND CONNECT CABLES FROM CRV TO TOUCHSCREEN.

APPLIED GASKETING



ASSEMBLED FRONT ISOMETRIC VIEW

RIGHT SIDE VIEW

DRAWN: JAMESON THOMPSON
 CHECKED: BRAD REINBOLT
 ENGR : JAMESON THOMPSON




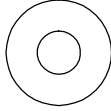

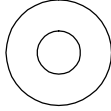



DATE: 7/27/2017
 DATE: 7/27/2017
 DATE: 7/27/2017

SHEET: 4 / 4
 REV: 10
 DRAWING NUMBER: 552770

VERTIV™ SMARTROW DCX EXM EC INSTALL INSTRUCTIONS

THIS KIT PROVIDES PARTS AND INSTRUCTIONS TO ASSEMBLE THE eXM UPS SYSTEM EXPANSION CHANNELS (EC) TO THE ROW EQUIPMENT.

HARDWARE INCLUDED:

								
M6 X 12 HH (X 8)	M12 X 16 HH (X 4)	M12 STAR WASHER (X 4)	M12 FLAT WASHER (X 4)	M10 X 30MM (X 4)	M10 FLAT WASHER (X 4)	"D" GASKET (40 FT)	M6 X 8MM (X 4)	M6 FLAT WASHER (X 6)

TOOLS REQUIRED:

10MM SOCKET & RATCHET OR WRENCH
17MM SOCKET & RATCHET OR WRENCH
19MM SOCKET & RATCHET OR WRENCH
UTILITY KNIFE

FOLLOWING INSTRUCTION SHEETS:

SHEET 2: BDC EXPANSION CHANNEL INSTALLATION
SHEET 3: UPS EXPANSION CHANNEL INSTALLATION
SHEET 4: BATTERY EXPANSION CHANNEL INSTALLATION
SHEET 5: COMPLETE EXM EXPANSION CHANNEL ASSEMBLY

DRAWN: TED BEAVER
CHECKED: BRAD REINBOLT
ENGR : TED BEAVER

DATE: 7/12/2017
DATE: 7/12/2017
DATE: 7/12/2017

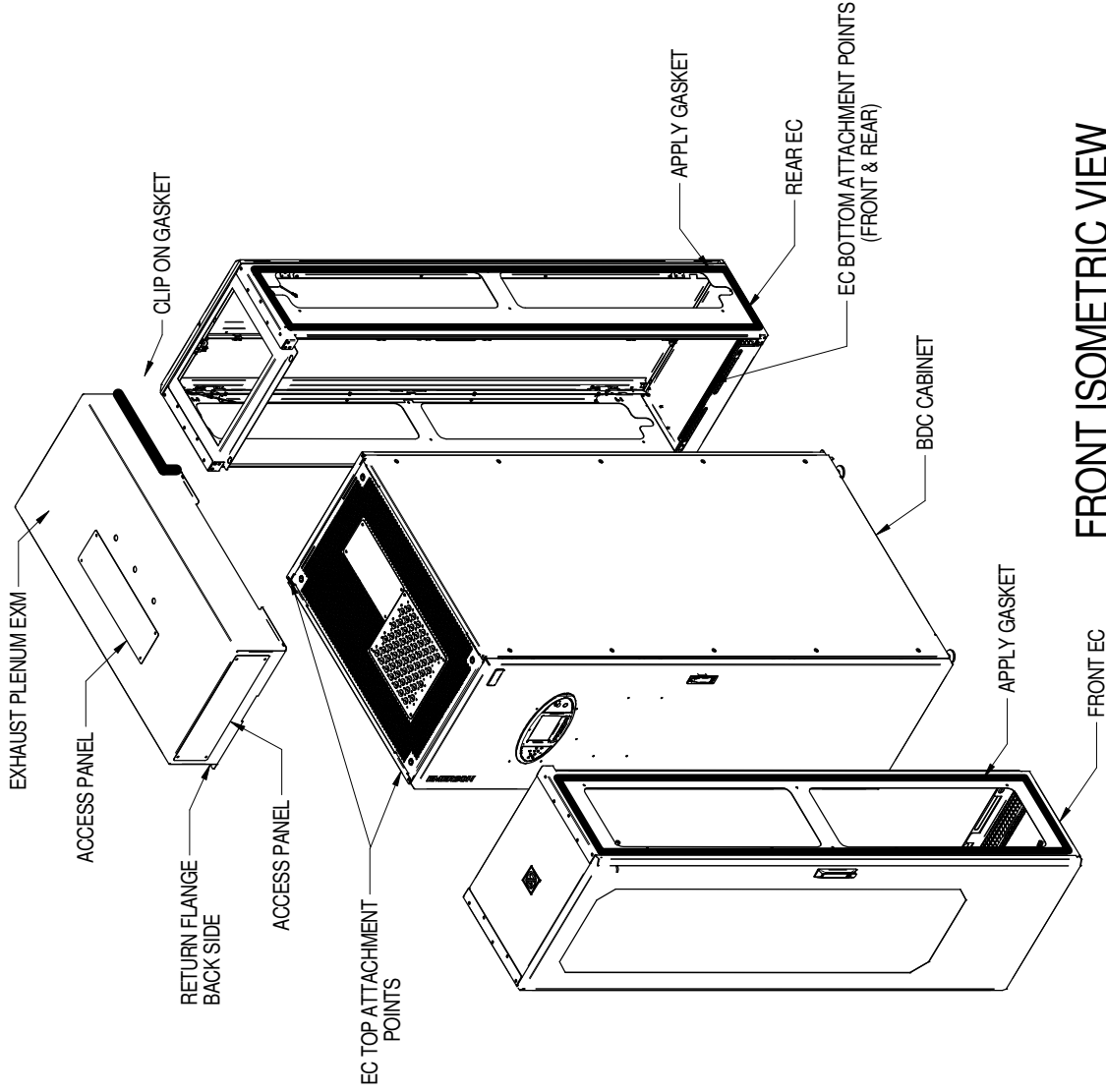
SHEET 1 / 5
REV 1
DRAWING NUMBER 562117



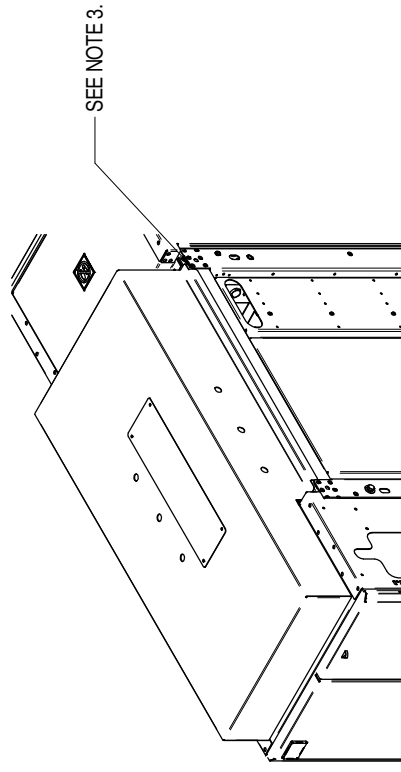
SMARTROW DCX EXM EC INSTALL INSTRUCTIONS

EXM BDC EXPANSION CHANNEL (EC) ASSEMBLY:

1. ENSURE CABINET IS PROPERLY ALIGNED AND LEVELED AS INSTRUCTED IN DCX USERS MANUAL.
2. OPEN FRONT DOOR ON BDC. REMOVE REAR PANEL.
3. PLACE EXHAUST PLENUM EXM ON TOP OF BDC CABINET PLACING THE RETURN FLANGE BETWEEN VERTICAL POST, THEN ATTACH USING (2) (M6 X 12HH) ON THE OPPOSITE SIDE.
4. APPLY GASKET TO SIDE OF EC CABINET WHEN MATING AGAINST ADJACENT UNIT.
5. SLIDE FRONT EC CABINET IN PLACE. ATTACH THE BOTTOM OF THE EC CABINET WITH BOLT(M10 X 30 HH) AND FLAT WASHER (M10). ATTACH TOP WITH (2) (M12 X 16 HH) BOLT AND (1) STAR WASHER.
6. SLIDE REAR EC CABINET IN PLACE AGAINST BACK OF BDC. ATTACH THE BOTTOM OF THE EC CABINET WITH BOLT (M10X 30 HH) AND FLAT WASHER (M10). ATTACH THE TOP WITH (2) (M12 X 16 HH) BOLT AND (1) STAR WASHER.
7. CLOSE FRONT DOOR AND REINSTALL REAR PANEL.



FRONT ISOMETRIC VIEW



REAR ISOMETRIC VIEW

DRAWN: TED BEAVER
 CHECKED: BRAD REINBOLT
 ENGR : TED BEAVER

DATE: 7/12/2017
 DATE: 7/12/2017
 DATE: 7/12/2017

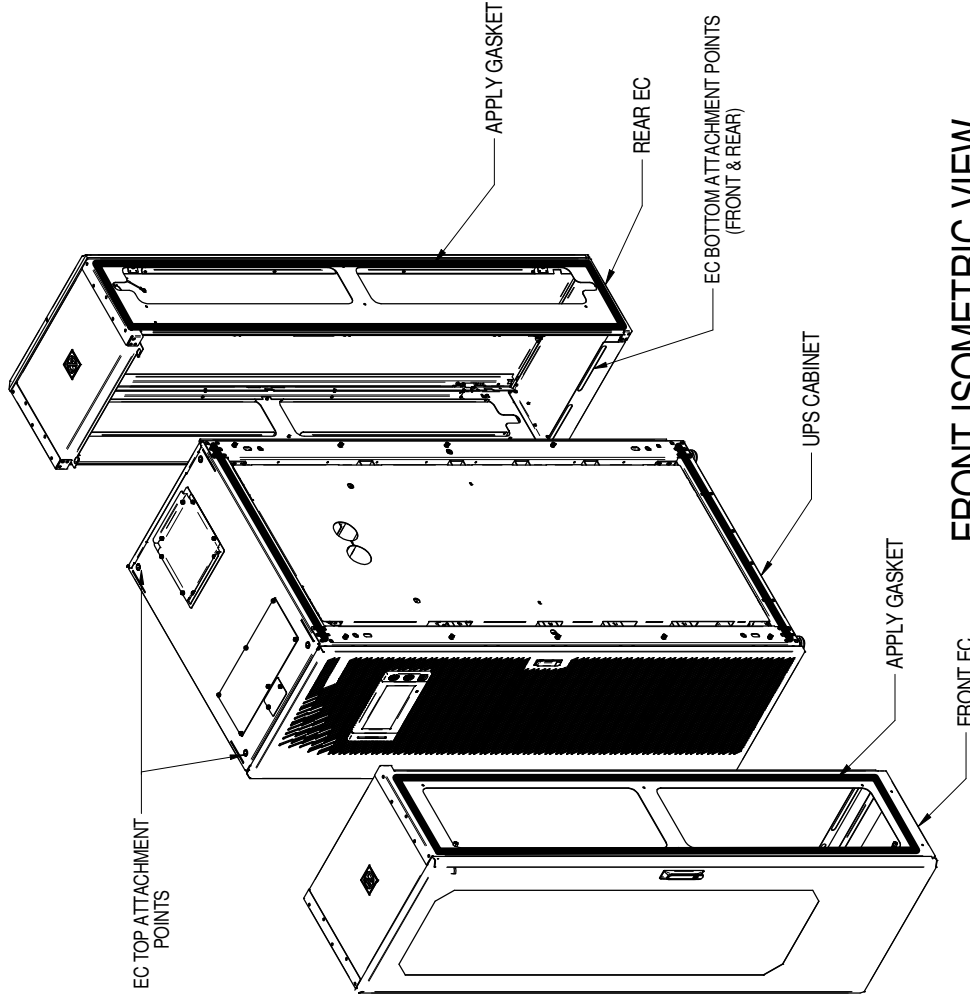
SHEET 2 / 5
 REV 1
 DRAWING NUMBER 562117



SMARTROW DCX EXM EC INSTALL INSTRUCTIONS

UPS EC ASSEMBLY:

1. ENSURE CABINET IS PROPERLY ALIGNED AND LEVELED AS INSTRUCTURED IN DCX USERS MANUAL.
2. OPEN DOOR OF UPS CABINET.
3. APPLY GASKET TO SIDE OF EC CABINET WHEN MATING AGAINST ADJACENT UNITS.
4. SLIDE FRONT EC CABINET IN PLACE. ATTACH THE BOTTOM OF THE EC CABINET WITH BOLT (M10 X 30 HH) AND FLAT WASHER (M10). ATTACH TOP WITH (2) (M12 X 16 HH) BOLT, (2) FLAT WASHER (M12), AND (1) STAR WASHER.
5. SLIDE REAR EC CABINET IN PLACE AGAINST BACK OF UPS CABINET. ATTACH THE BOTTOM OF THE EC CABINET WITH (M10 X 30 HH) BOLT AND FLAT WASHER (M10). ATTACH THE TOP WITH (2) (M12 X 16 HH) BOLT, (2) FLAT WASHER (M12) AND (1) STAR WASHER.
6. CLOSE ALL DOORS.



FRONT ISOMETRIC VIEW

DRAWN: TED BEAVER
CHECKED: BRAD REINBOLT
ENGR : TED BEAVER

DATE: 7/12/2017
DATE: 7/12/2017
DATE: 7/12/2017

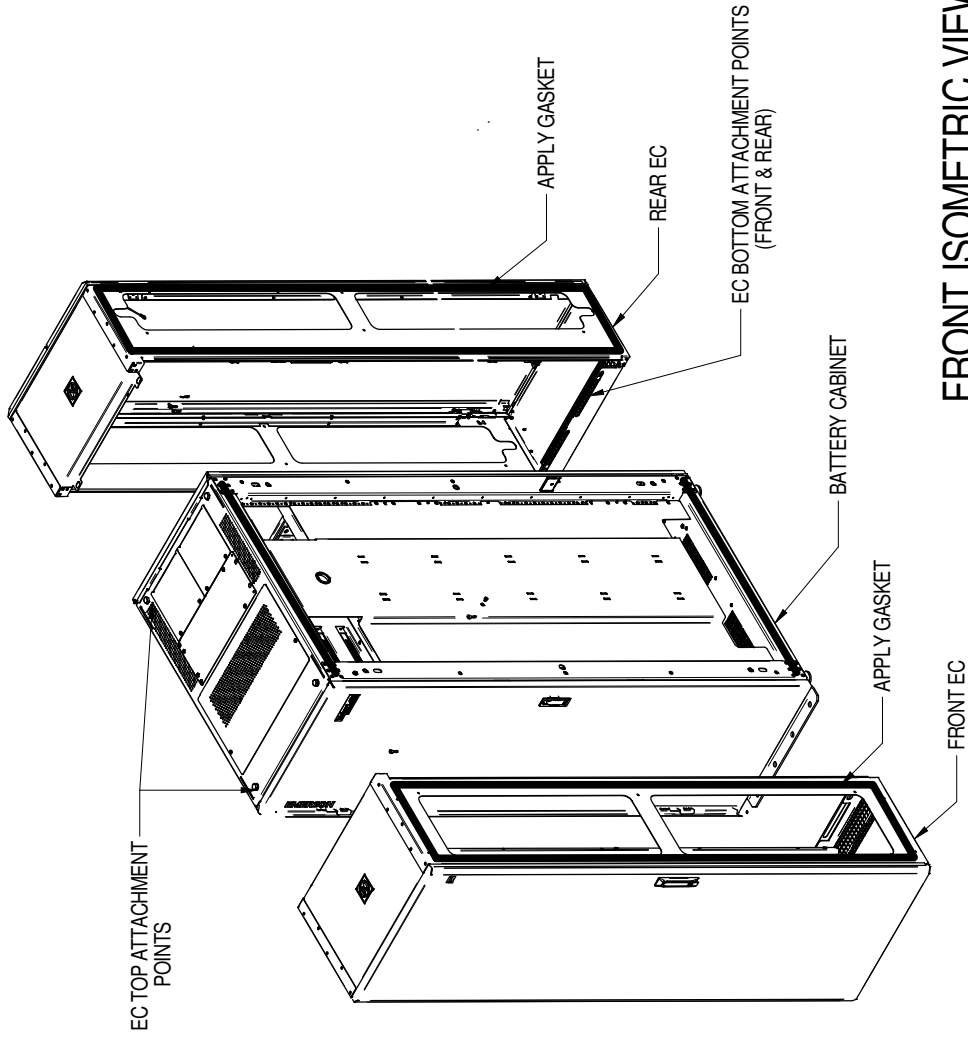
SHEET 3 / 5
REV 1
DRAWING NUMBER 562117



SMARTROW DCX EXM EC INSTALL INSTRUCTIONS

BATTERY EC ASSEMBLY:

1. ENSURE CABINET IS PROPERLY ALIGNED AND LEVELED AS INSTRUCTURED IN DCX USERS MANUAL.
2. OPEN DOOR OF BATTERY CABINET.
3. APPLY GASKET TO SIDE OF EC CABINET WHEN MATING AGAINST ADJACENT UNITS.
4. SLIDE FRONT EC CABINET IN PLACE. ATTACH THE BOTTOM OF THE EC CABINET WITH BOLT (M10 X 30 HH) AND FLAT WASHER (M10). ATTACH TOP WITH (2) (M12 X 16 HH) BOLT, (2) FLAT WASHER (M12), AND (1) STAR WASHER.
5. SLIDE REAR EC CABINET IN PLACE AGAINST BACK OF BATTERY CABINET. ATTACH THE BOTTOM OF THE EC CABINET WITH (M10 X 30 HH) BOLT AND FLAT WASHER (M10). ATTACH THE TOP WITH (2) (M12 X 16 HH) BOLT, (2) FLAT WASHER (M12) AND (1) STAR WASHER.
6. CLOSE ALL DOORS.



FRONT ISOMETRIC VIEW

DRAWN: TED BEAVER
CHECKED: BRAD REINBOLT
ENGR : TED BEAVER

DATE: 7/12/2017
DATE: 7/12/2017
DATE: 7/12/2017

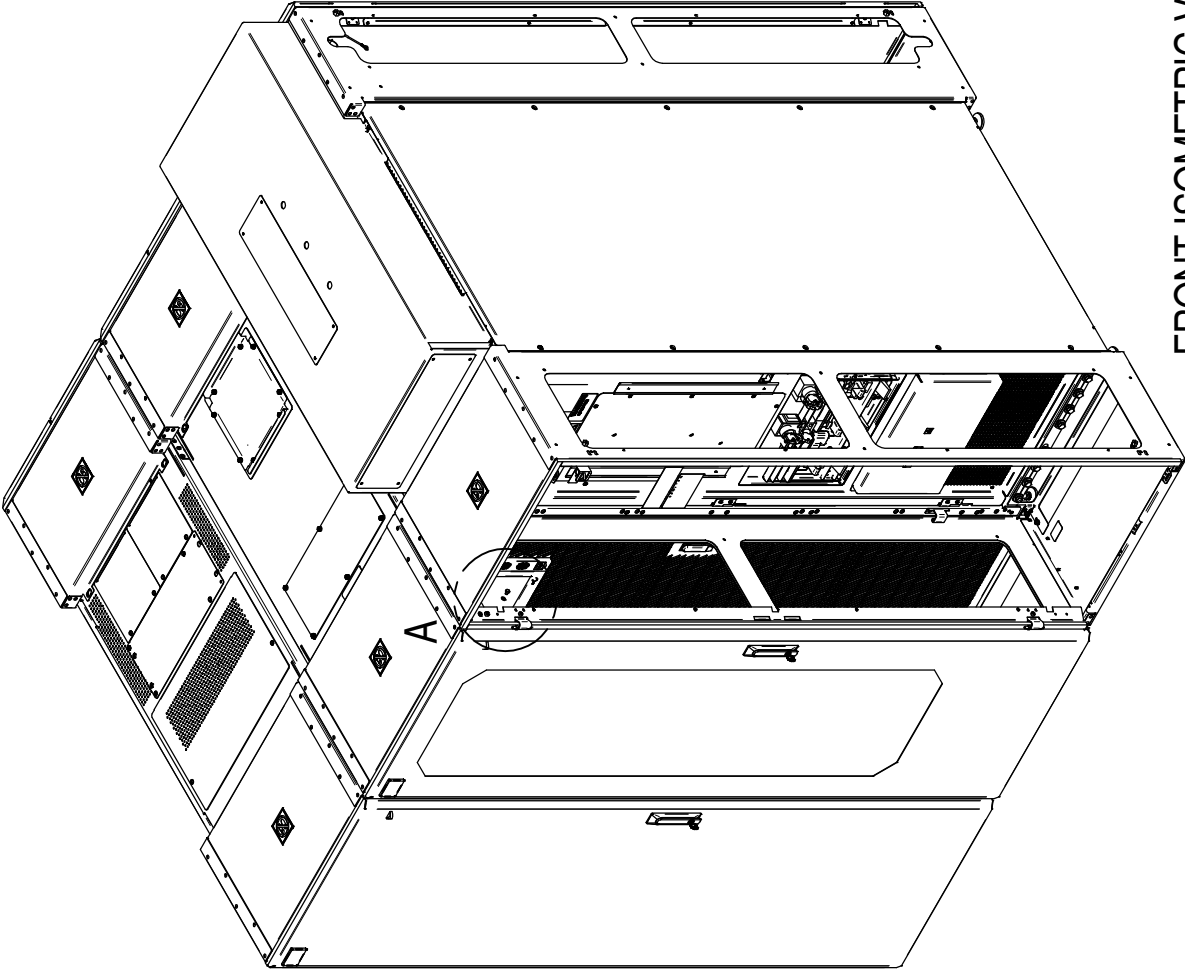
SHEET 4 / 5
REV 1
DRAWING NUMBER 562117



SMARTROW DCX EXM EC INSTALL INSTRUCTIONS

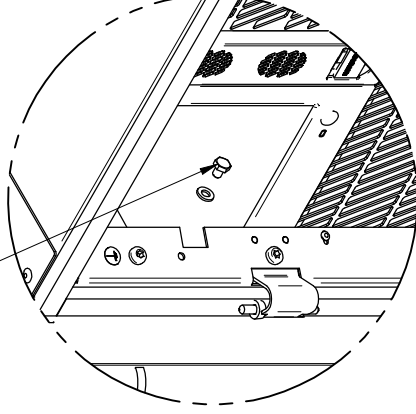
BAYING ADJACENT EC'S:

1. ISOMETRIC VIEW SHOWS AN EXAMPLE eXM SYSTEM INSTALLED AND EXPANSION CHANNELS ATTACHED. SEE DETAIL A FOR BAYING ADJACENT EC'S.



FRONT ISOMETRIC VIEW

M6 FLAT WASHER & BOLT
TOP & BOTTOM OF BOTH FRONT & REAR EC'S
THAT WILL ATTACHED TO ADJACENT EC STANDOFF.



DETAIL A

DRAWN: TED BEAVER
CHECKED: BRAD REINBOLT
ENGR : TED BEAVER

DATE: 7/12/2017
DATE: 7/12/2017
DATE: 7/12/2017

SHEET 5/5
REV 1
DRAWING NUMBER 562117



SMARTROW DCX EC INSTALL INSTR - DCE RACK

THE FOLLOWING INSTALLATION PROCEDURE INSTRUCTIONS COVER EXPANSION CHANNELS (EC) THAT ARE INSTALLED ON BOTH THE FRONT AND REAR OF THE RACK.

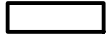
HARDWARE INCLUDED:



M6X10 FLAT HEAD SCREWS
(x2)



M6X12 SCREWS
(x16)



MAGNETIC STRIP
(10ft)



SCREW CAP M6-1X8MM
(x6)



D" GASKET
(34 FT)



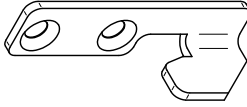
FLAT WASHER M6
(x6)



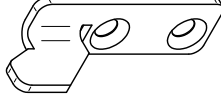
HEX NUT M6-1 ZP
(x2)



LOCK WASHER
EXTERNAL TOOTH 1/4
(x2)



TOP HOOK
(x4)



BOTTOM HOOK
(x4)

TOOLS REQUIRED:

T30 DRIVER BIT
10mm SOCKET & RATCHET

FOLLOWING INSTRUCTION SHEETS:

- SHEET 2: FRONT & REAR EXPANSION CHANNEL INSTALLATION
- SHEET 3: GASKET, FAN & COVER STRIPS INSTALLATION
- SHEET 4: BAYING TO ADJACENT EXPANSION CHANNELS

DRAWN: BRAD REINBOLT
 CHECKED: ADAM STEVENS
 ENGR : BRAD REINBOLT

DATE: 7/24/2017
 DATE: 7/24/2017
 DATE: 7/24/2017

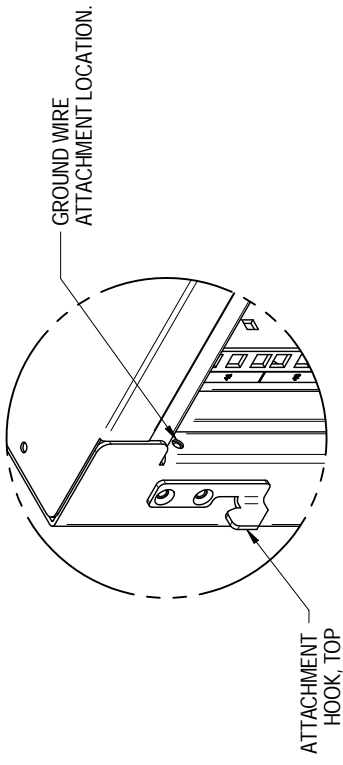
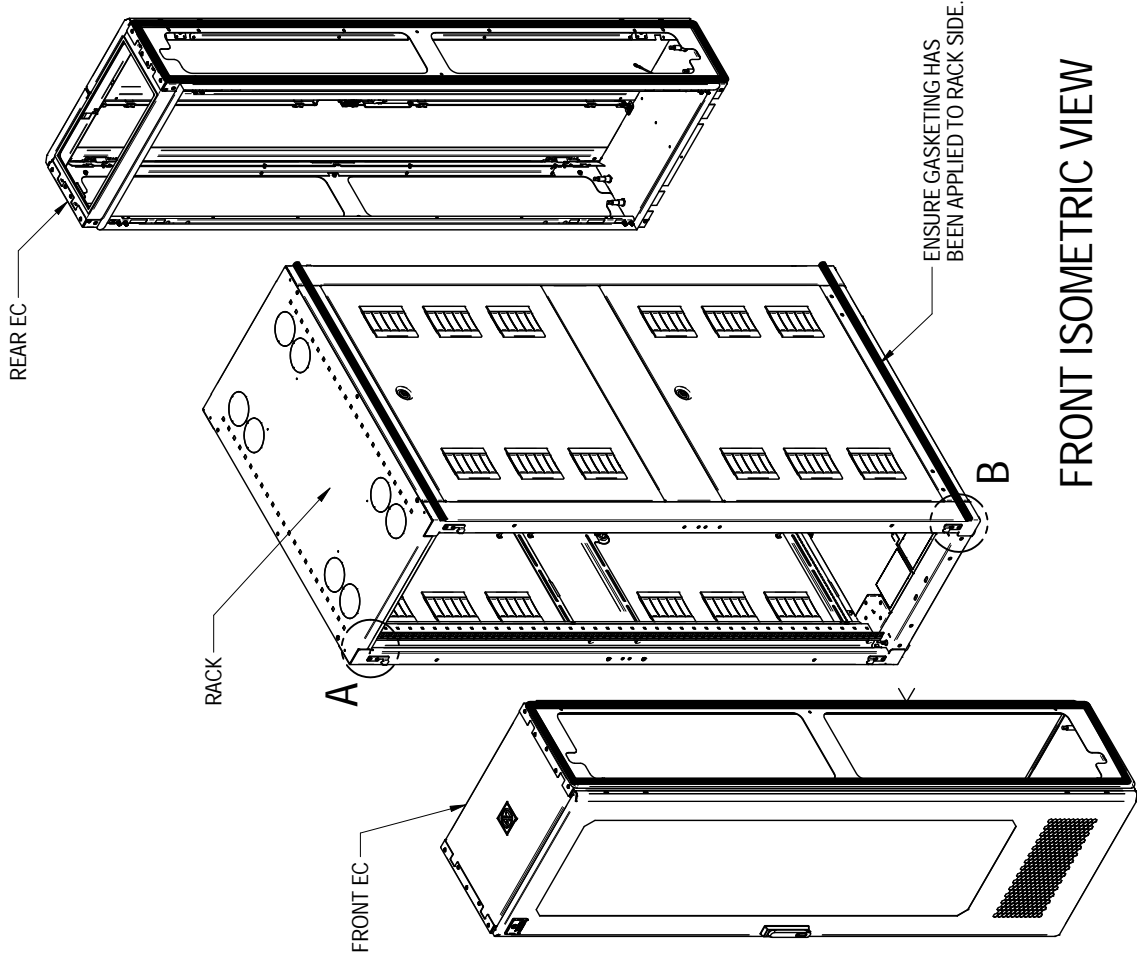
SHEET 1 / 4
 REV 1
 DRAWING NUMBER 558659



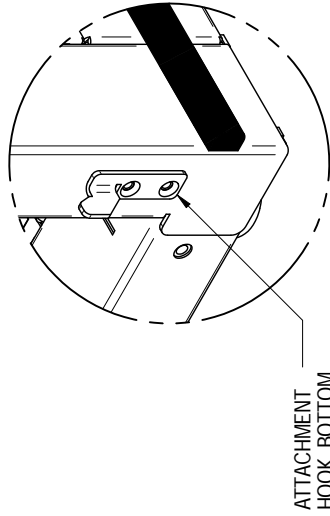
SMARTROW DCX EC INSTALL INSTR - DCE RACK

INSTALLATION INSTRUCTIONS:

1. ENSURE RACK IS PROPERLY LEVELLED AND ALIGNED AS INSTRUCTED IN DCX USERS MANUAL.
2. INSTALL ATTACHMENT HOOKS TOP (DETAIL A) AND BOTTOM (DETAIL B) USING M6X10 FLAT HEAD SCREWS.
3. LIFT AND INSTALL EC ON TO ATTACHMENT HOOKS. ENSURE EC IS COMPLETELY SEATED ON HOOKS.
4. ATTACH SUPPLIED GROUND WIRE TO RACK USING M6x12 SCREWS. SEE DETAIL A FOR RACK LOCATION.
5. RUN DOWN ALL FOUR LEVELING FEET UNTIL THEY CONTACT THE FLOOR.
6. REPEAT PROCESS FOR REAR EC.



DETAIL A



DETAIL B

DRAWN: BRAD REINBOLT
 CHECKED: ADAM STEVENS
 ENGR : BRAD REINBOLT

DATE: 7/24/2017
 DATE: 7/24/2017
 DATE: 7/24/2017

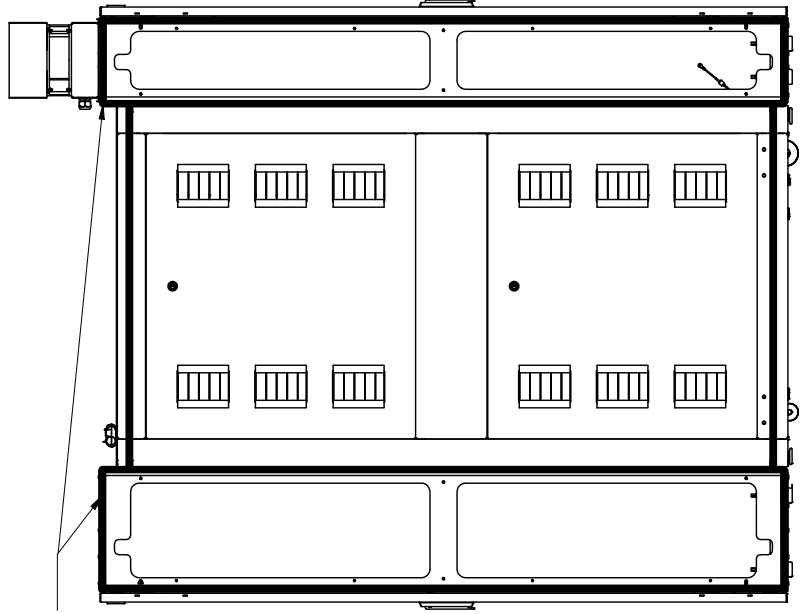
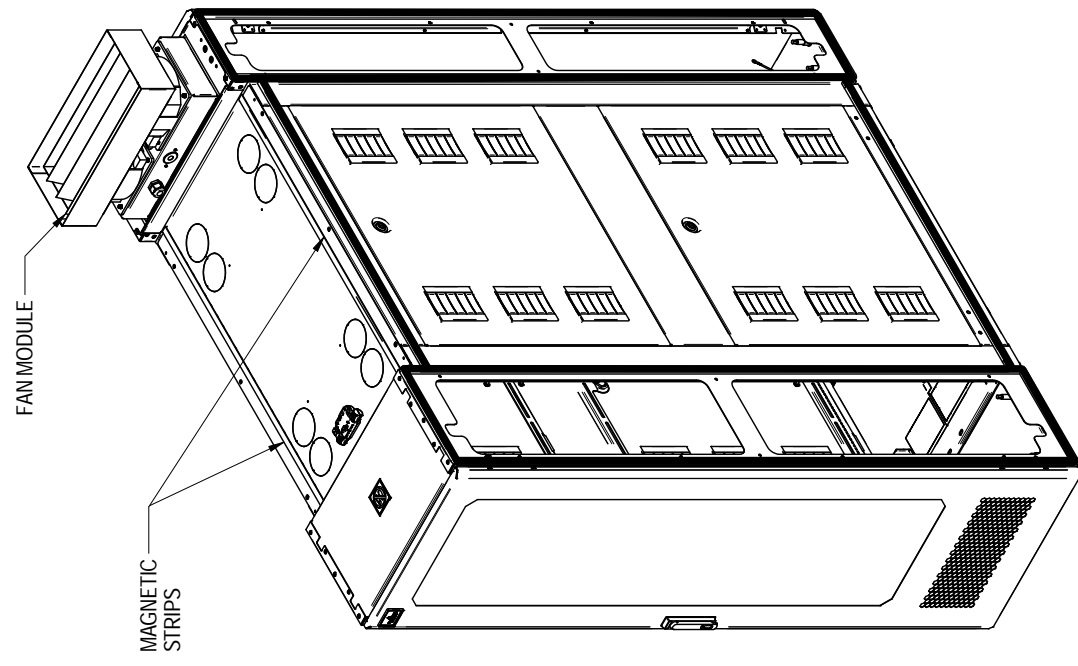
SHEET 2 / 4
 REV 1
 DRAWING NUMBER 558659



SMARTROW DCX EC INSTALL INSTR - DCE RACK

INSTALLATION PROCEDURE (CON'T):

- 7. APPLY SUPPLIED GASKETING TO SIDE OF RACK ECs THAT WILL HAVE ADJACENT EQUIPMENT WITH ECs. FOLLOW EC PROFILE DURING APPLICATION. SEE RIGHT SIDE VIEW.
- 8. INSTALL MAGNETIC STRIPS, COVERING 9.5MM SQUARES IN RACK TOP COVER. NOTE - SOME AREAS MAY NEED REMOVED FOR SYSTEM ACCESSORY INSTALLATION POSITION AND ATTACH FAN MODULE WITH SUPPLIED HARDWARE AS SHOWN IN ISOMETRIC VIEW.
- 10. CONNECT FAN MODULE POWER CORD TO ADJACENT FAN MODULE OR FAN CONTROL BOX MODULE.



ASSEMBLED FRONT ISOMETRIC VIEW

RIGHT SIDE VIEW

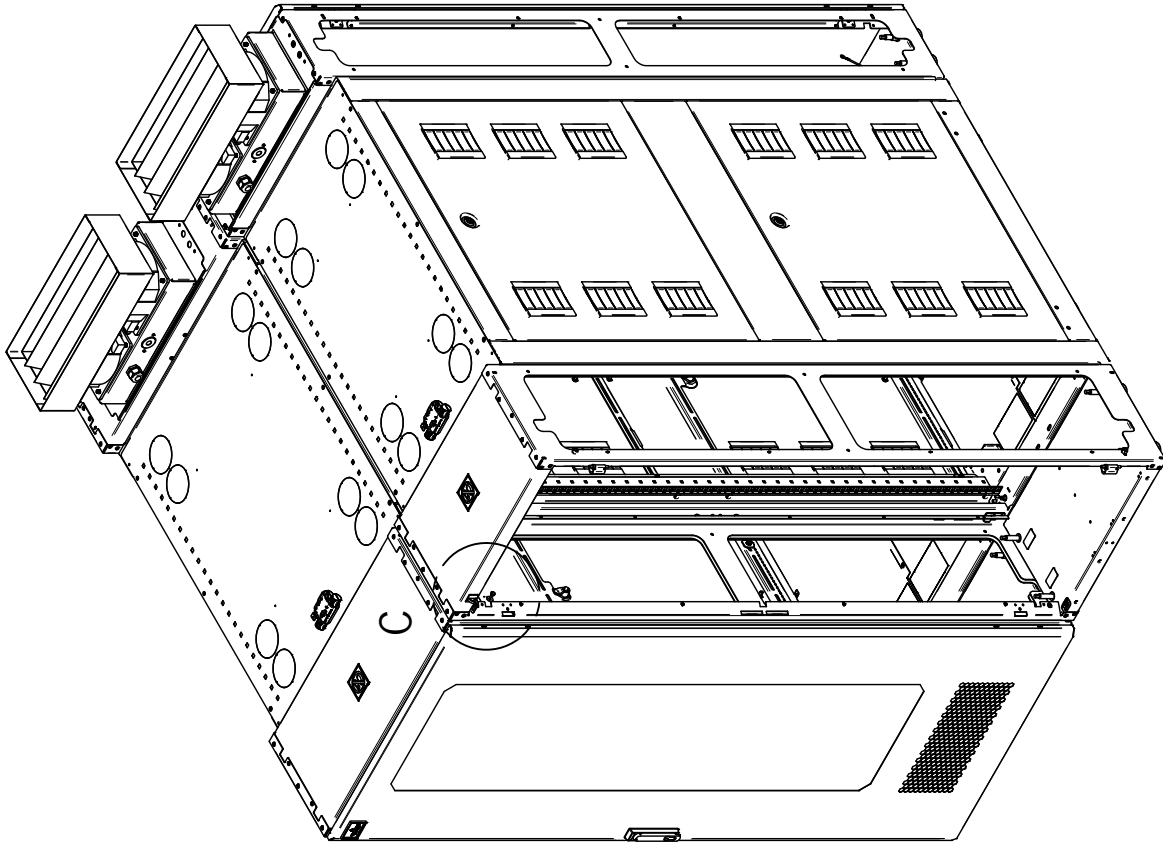
DRAWN: BRAD REINBOLT
 CHECKED: ADAM STEVENS
 ENGR : BRAD REINBOLT

DATE: 7/24/2017
 DATE: 7/24/2017
 DATE: 7/24/2017

SHEET 3 / 4
 REV 1
 DRAWING NUMBER 558659

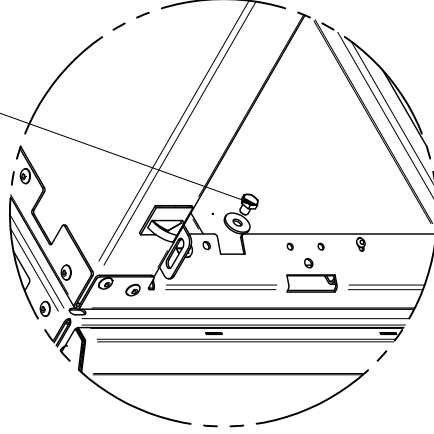


SMARTROW DCX EC INSTALL INSTR - DCE RACK



INSTALLATION INSTRUCTIONS (CONT):
11. BAY ECS TO ADJACENT EC'S AS SHOWN
IN DETAIL C.

M6 FLAT WASHER & BOLT
TOP & BOTTOM OF BOTH FRONT & REAR ECS
THAT WILL ATTACHED TO ADJACENT EC STANDOFF.



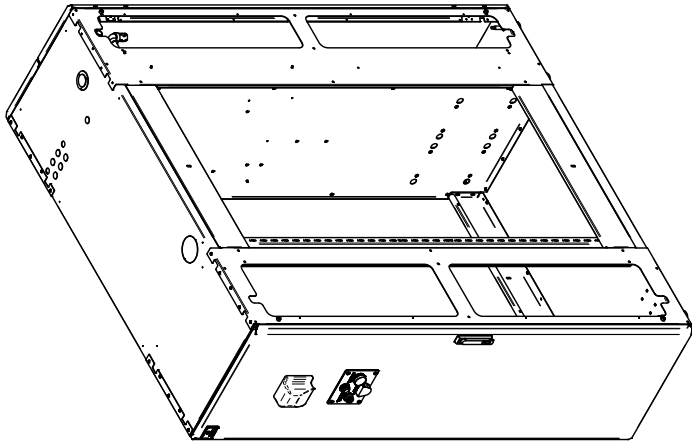
DETAIL C

FRONT ISOMETRIC VIEW

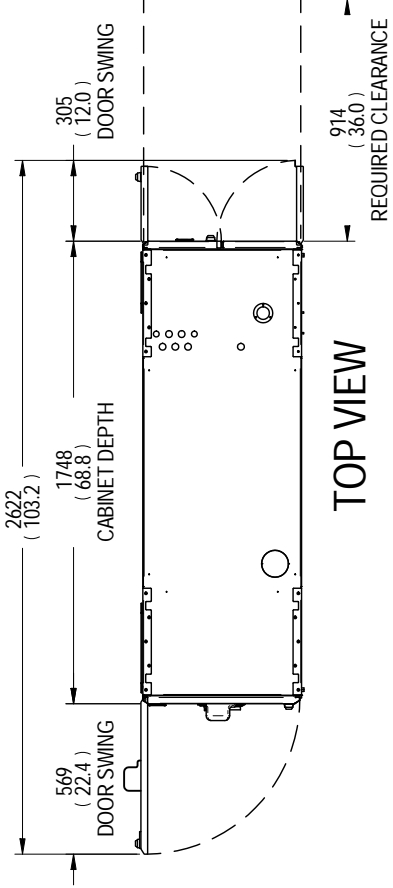
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CHECKED: ADAM STEVENS
ENGR : BRAD REINBOLT

DATE: 7/24/2017
DATE: 7/24/2017
DATE: 7/24/2017

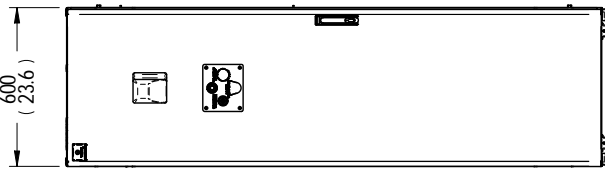
SHEET 4 / 4
REV 1
DRAWING NUMBER 558659



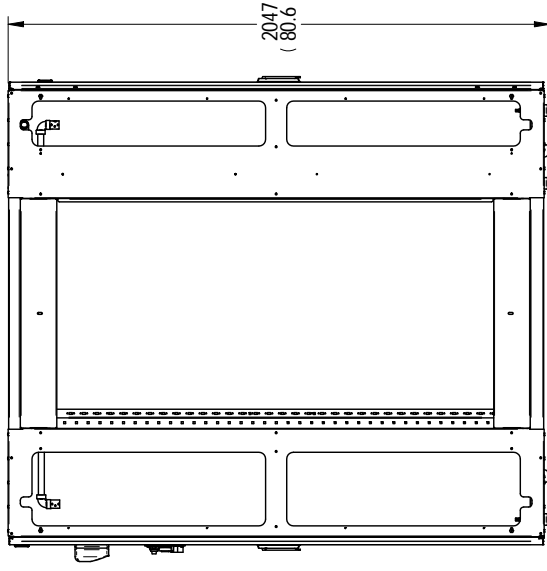
FRONT ISOMETRIC VIEW



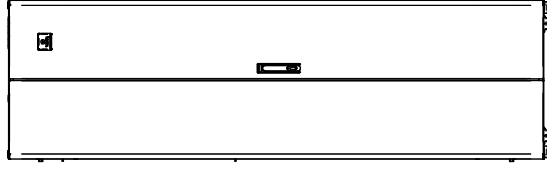
TOP VIEW



FRONT VIEW



RIGHT SIDE VIEW



REAR VIEW

- NOTES:**
1. ALL DIMENSIONS ARE IN MM (INCHES) +/-2.5mm (0.1")
 2. CABINET FRONT DOOR IS RIGHT SIDE HINGED AND IS NOT REVERSIBLE.
 3. SWING RADIUS OF 135° (FRONT AND REAR DOORS).
 4. CABINET DOORS ARE 20GA STEEL.
 5. WHEN CALCULATING FULL SMARTROW LENGTH, INCLUDE 10MM (0.39) BETWEEN EACH EC.
 6. SINGLE PIECE CABINET AND ALL COMPONENTS SHOWN ON SHEETS 1 AND 2 ARE FACTORY INSTALLED UNLESS NOTED OTHERWISE.
 7. ADJACENT CABINET DETECTION TUBING ARE SHIP LOOSE ITEMS AND SHALL BE INSTALLED ONSITE BY FIRE TECHNICIAN.
 8. SMARTROW MUST BE ASSEMBLED AND FIRE DETECTION & SUPPRESSION CABINET ENERGIZED PRIOR TO FKE TECHNICIAN ARRIVAL.
 9. ALL ELECTRICAL AND PIPING PENETRATIONS TO SMARTROW MUST BE SEALED, INCLUDING INSIDE CONDUIT.
 10. TOTAL WEIGHT FOR FD&S CABINET:
(1) 35# CYLINDER = 415 lbs (189 kg)
(2) 35# CYLINDERS = 481 lbs (219 kg)
 11. FD&S IS COMPATIBLE WITH 1100mm DEEP DCE/DCF RACKS.

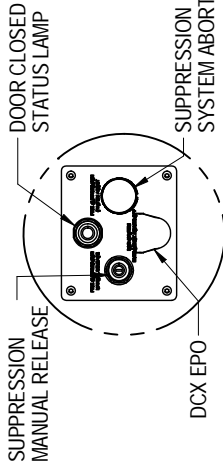
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BRAD REINBOLT	1 OF 3
CHECKED BY:	ECN NUMBER:
BRAD REINBOLT	N/A
REFERENCE DRAWING:	QUOTE NUMBER:
N/A	N/A

TITLE / DESCRIPTION	
DCX DIMENSIONAL SPECIFICATIONS - FIRE DETECTION & SUPPRESSION 35# CYLINDERS	

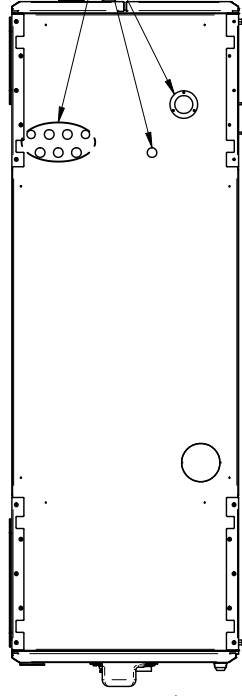
DRAWING NUMBER: SRDCX015	
DATE: 7/25/2017	REV.#: 1
CUSTOMER / JOB SMARTROW DCX	



1850 BEAVERDALE DRIVE
P.O. BOX 29186
COLUMBUS, OHIO 43229



DETAIL A
SMARTROW DCX
FIRE SUPPRESSION SYSTEM
AND EPO CONTROLS

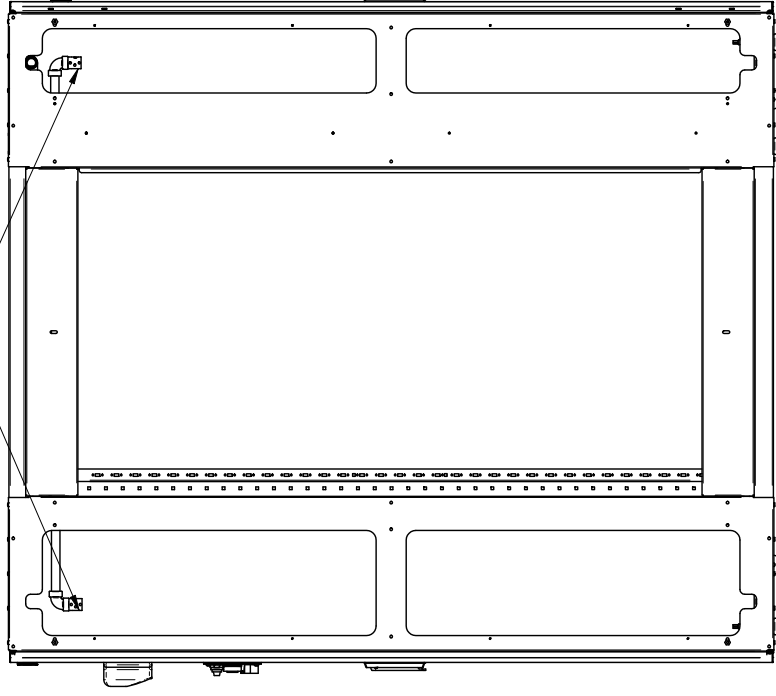
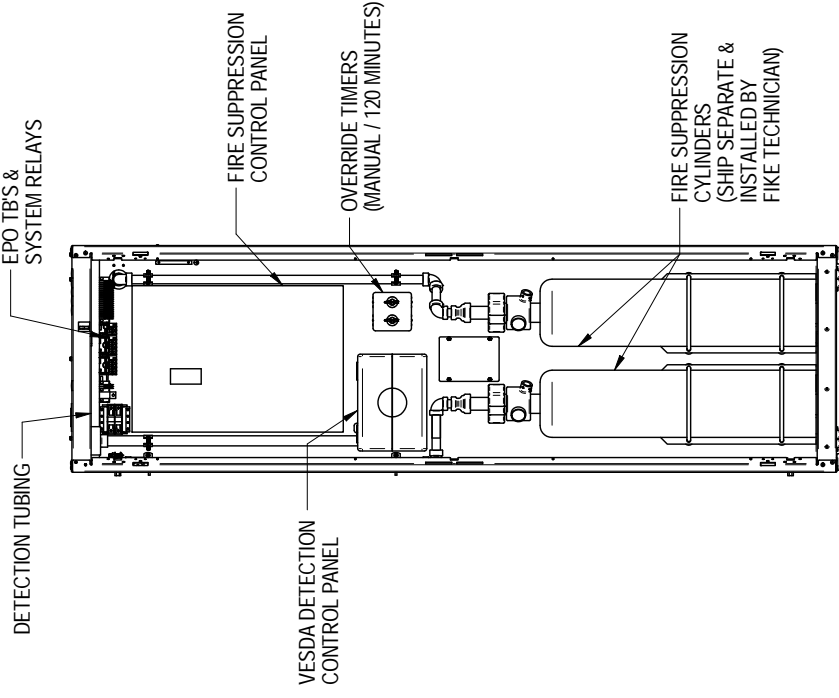


TOP VIEW

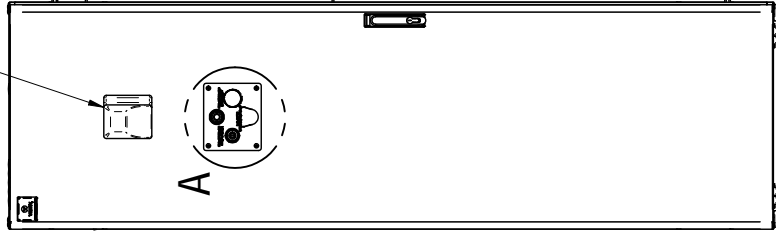
FIRE STROBE / HORN

DISCHARGE NOZZLES

DETECTION TUBING



RIGHT SIDE VIEW



FRONT VIEW

REAR VIEW
(SANS SPLIT DOORS)

DRAWN BY:	SHEET NUMBER:
BRAD REINBOLT	2 OF 3
CHECKED BY:	EQUIPMENT NUMBER:
BRAD REINBOLT	N/A
REFERENCE DRAWING:	QUOTE NUMBER:
N/A	N/A

TITLE / DESCRIPTION
DCX COMPONENT LAYOUT -
FIRE DETECTION & SUPPRESSION
35# CYLINDERS

CUSTOMER / JOB
SMARTROW DCX

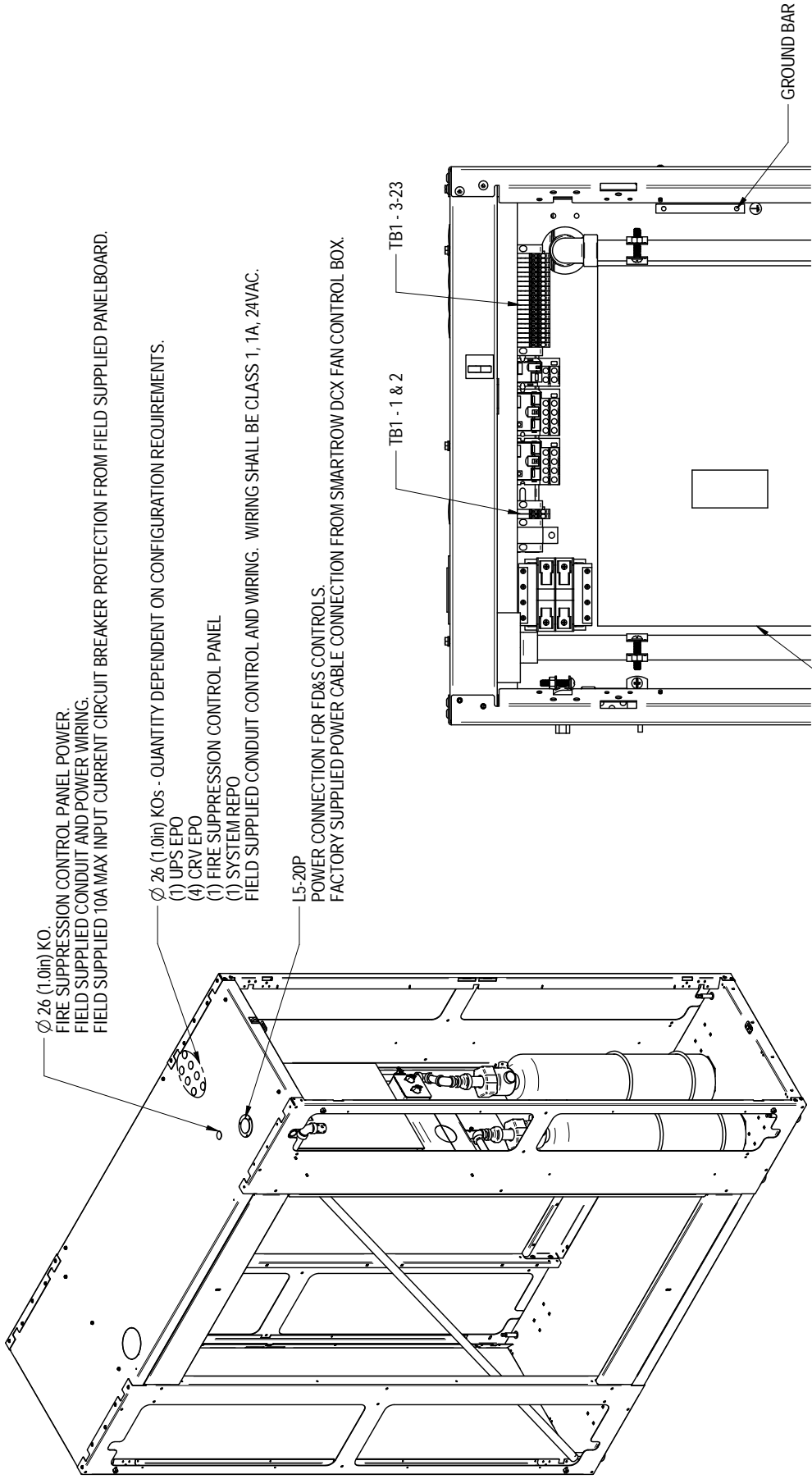
DRAWING NUMBER:	DATE:	REV.#:	1
SRDCX015	7/25/2017		



1850 BEAVERBROOK DRIVE
P.O. BOX 29186
COLUMBUS, OHIO 43229

NOTES:

- 12. SEE REAR ISOMETRIC VIEW FOR POWER AND CONTROL CONNECTIONS.
- 13. INSTALLATION MUST BE IN ACCORDANCE WITH NATIONAL AND LOCAL ELECTRICAL CODES.
- 14. POWER WIRING AND CONTROL WIRING MUST BE RAN IN SEPARATE CONDUITS.
- 15. POWER CABLES MUST BE SUITABLE FOR AT LEAST 90 DEG. C AND MUST BE COPPER CONDUCTORS ONLY.



**REAR ISOMETRIC VIEW
(SANS SPLIT DOORS)**

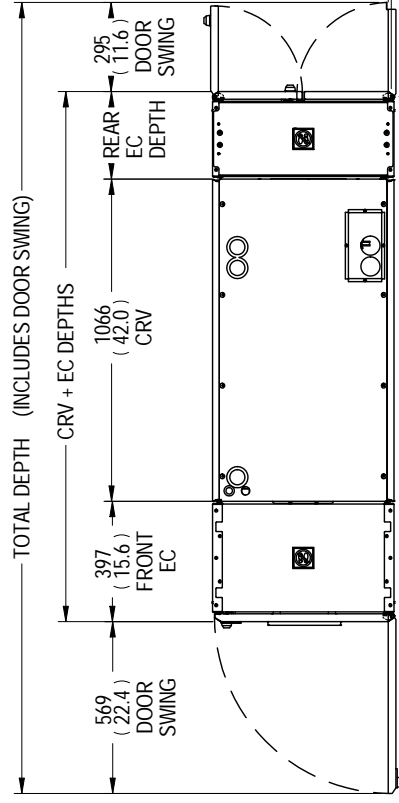
**REAR VIEW
(SANS SPLIT DOORS)**

DRAWN BY:	SHEET NUMBER:
BRAD REINBOLT	3 OF 3
CHECKED BY:	ECN NUMBER:
BRAD REINBOLT	N/A
REFERENCE DRAWING:	QUOTE NUMBER:
N/A	N/A

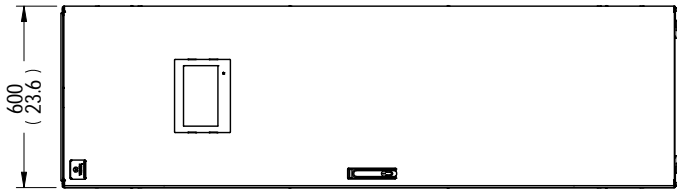
TITLE / DESCRIPTION	
DCX CONNECTIONS	
FIRE DETECTION & SUPPRESSION	
35# CYLINDERS	

DRAWING NUMBER: SRDCX015	
DATE: 7/25/2017	REV.#: 1
CUSTOMER / JOB SMARTTROW DCX	

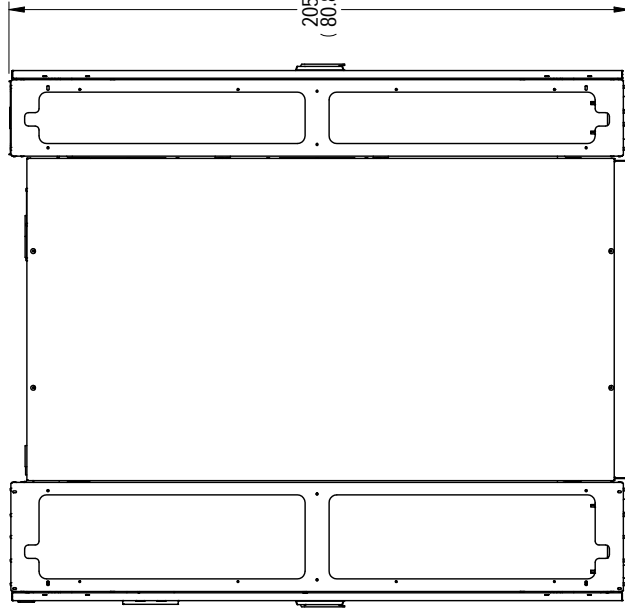




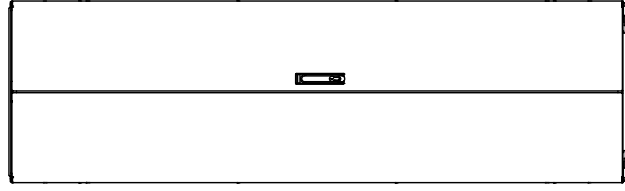
TOP VIEW



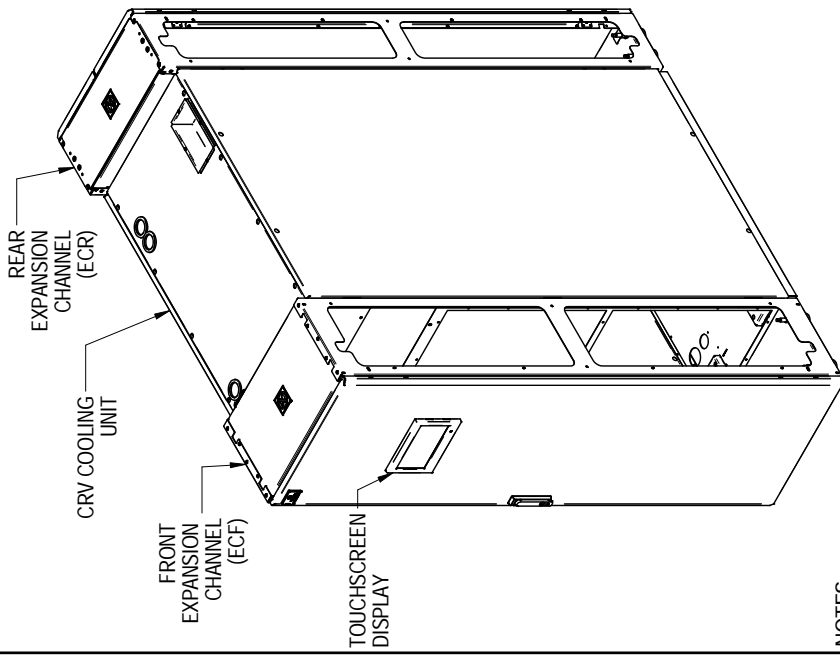
FRONT VIEW



RIGHT SIDE VIEW



REAR VIEW



- NOTES:
1. ALL DIMENSIONS ARE IN MM (INCHES) +/-2.5mm (0.1").
 2. EXPANSION CHANNEL (EC) FRONT DOOR IS RIGHT SIDE HINGED AND IS NOT REVERSIBLE.
 3. SWING RADIUS OF 135° (FRONT AND REAR DOORS).
 4. EC DOORS ARE 20GA STEEL.
 5. EC'S SIDE PANELS NOT SHOWN FOR CLARITY. PANELS ARE 20GA STEEL. PANELS ADD NO ADDITIONAL WIDTH. EC'S CAN BE REMOVED INDIVIDUALLY AT ANY TIME, BUT DO NOT NEED TO BE REMOVED TO PERFORM SERVICE.
 7. WHEN CALCULATING FULL SMARTROW LENGTH, INCLUDE 10MM (0.39) BETWEEN EACH EC.
 8. TOTAL WEIGHT FOR CRV600 ECF AND ECR: 99 KG (218 LBS) REFER TO CRV SUBMITTAL DRAWING FOR CRV CONFIG WEIGHT.

RACK DEPTH - REF	REAR EC DEPTH		CRV + EC DEPTHS		TOTAL DEPTH	
	MM	IN	MM	IN	MM	IN
1061 (1100)	41.8	290	11.4	1759	69.2	2623
1161 (1200)	45.7	390	15.3	1859	73.2	2723

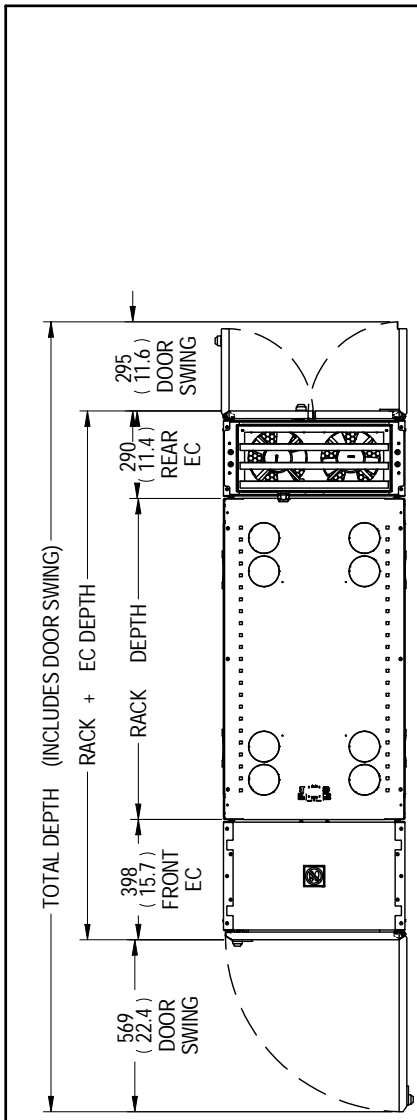
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CHECKED BY:	BLR	ECN NUMBER:	
REFERENCE DRAWING:		QUOTE NUMBER:	

TITLE / DESCRIPTION
DCX DIMENSIONAL SPECIFICATIONS - CRV600

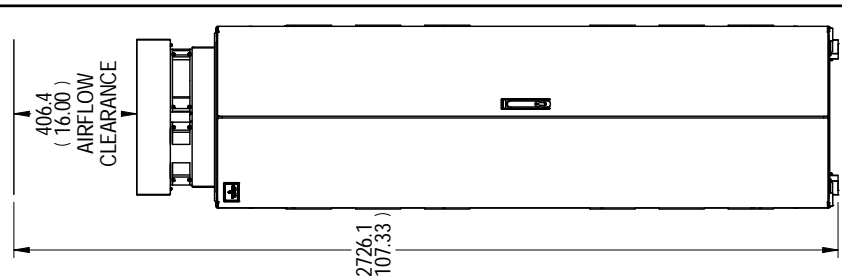
CUSTOMER / JOB
SMARTROW DCX

DRAWING NUMBER: SRDCX003
 DATE: 6/27/2017
 REV#: 2
 1850 BEAVERHARVE DRIVE
 P.O. BOX 29186
 COLUMBUS, OHIO 43229

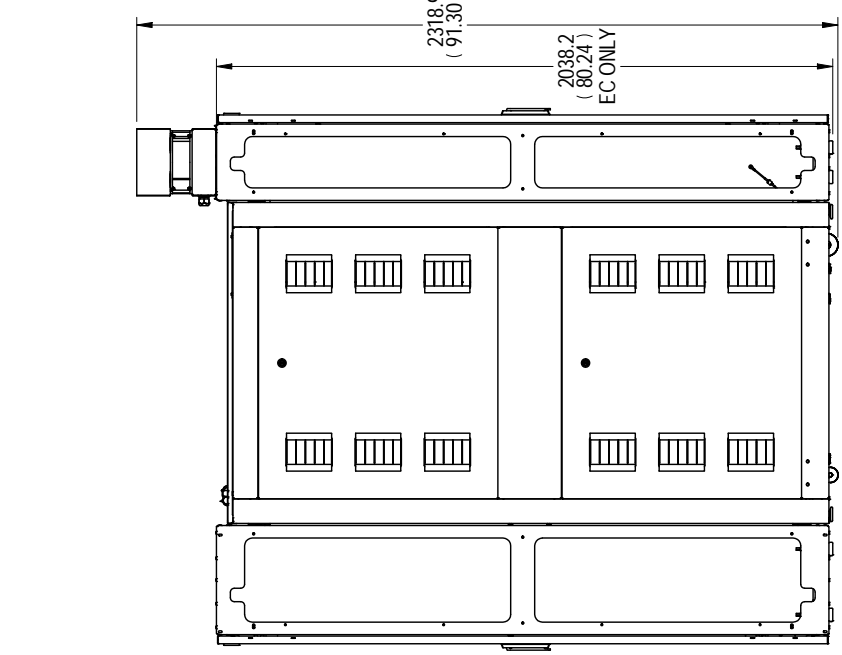




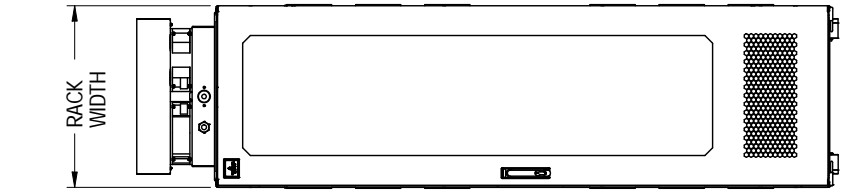
TOP VIEW



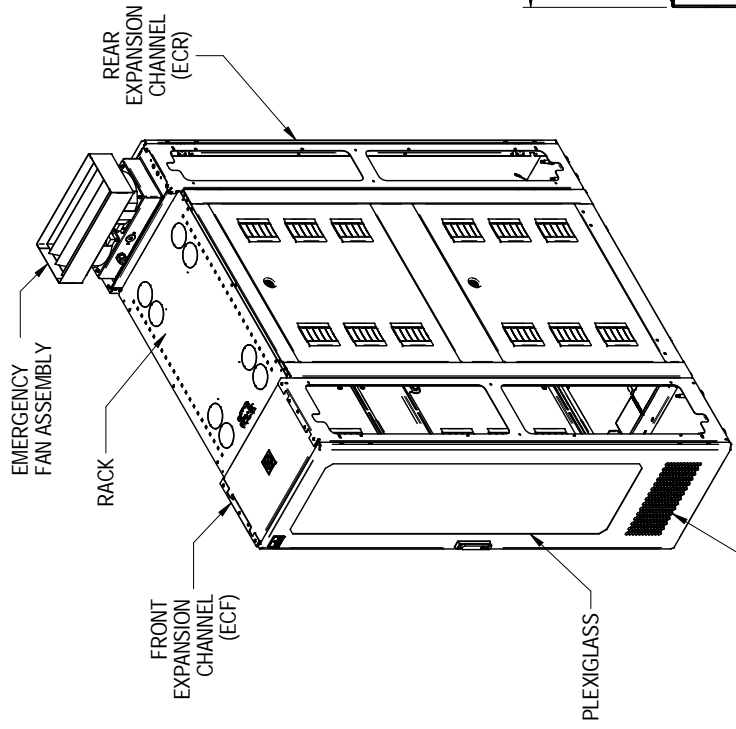
FRONT VIEW



RIGHT SIDE VIEW



REAR VIEW



- NOTES:
1. ALL DIMENSIONS ARE IN MM (INCHES) +/- 2.5mm (0.1")
 2. EXPANSION CHANNEL (EC) FRONT DOOR IS RIGHT SIDE HINGED AND IS NOT REVERSIBLE.
 3. SWING RADIUS OF 135° (FRONT AND REAR DOORS).
 4. EC DOORS ARE 20GA STEEL.
 5. STANDARD LOCK OPTION (SHIPS WITH TOTAL OF 4 KEYS).
 6. EC'S SIDE PANELS NOT SHOWN FOR CLARITY.
 7. EC'S ARE 20GA STEEL. PANELS ADD NO ADDITIONAL WIDTH. BUT DO NOT NEED TO BE REMOVED INDIVIDUALLY AT ANY TIME.
 8. REFER TO TABLE FOR TOTAL DEPTH.
 9. WHEN CALCULATING FULL SMARTROW LENGTH, INCLUDE 10MM (0.39) BETWEEN EACH EC.
 10. TOTAL WEIGHT FOR RACK EC: AND ECR: 118.937 KG (262.21 LBS) REFER TO RACK SUBMITTAL DRAWING FOR RACK CONFIGURATION WEIGHT.

RACK WIDTH	RACK DEPTH		RACK + EC DEPTHS		TOTAL DEPTH	
	MM	IN	MM	IN	MM	IN
600	23.6	1061 (41.00)	41.8	1749	68.9	2613
600	23.6	1161 (45.70)	45.7	1849	72.8	2713
800	31.5	1061 (41.00)	41.8	1749	68.9	2613
800	31.5	1161 (45.70)	45.7	1849	72.8	2713

TITLE / DESCRIPTION

DCX DIMENSIONAL SPECIFICATIONS - RACKS

CUSTOMER / JOB
SMARTROW DCX

DRAWING NUMBER: SRDCX007

DATE: 6/27/2017

REV.#: 2

1650 BEAVERDALE DRIVE
P.O. BOX 29186
COLUMBUS, OHIO 43229

VERTIV

DRAWN BY: BTL

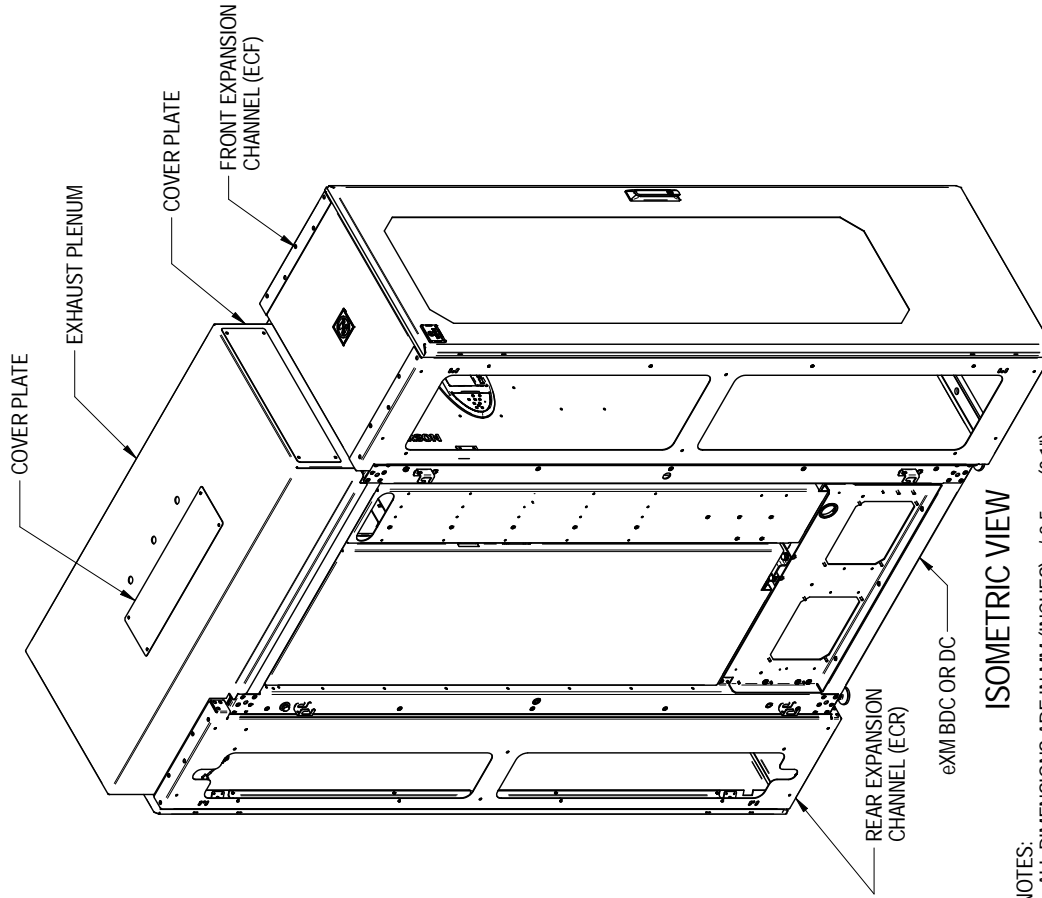
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REFERENCE DRAWING:

SHEET NUMBER:
1 OF 1

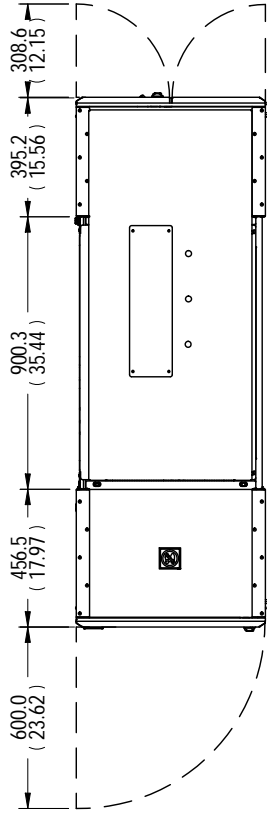
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QUOTE NUMBER:

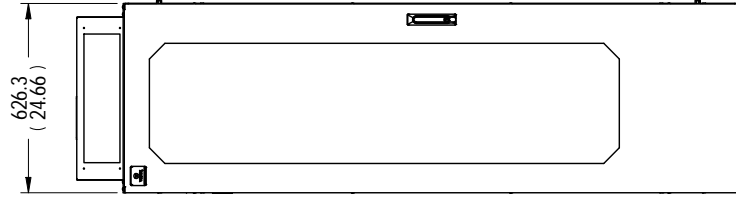


ISOMETRIC VIEW

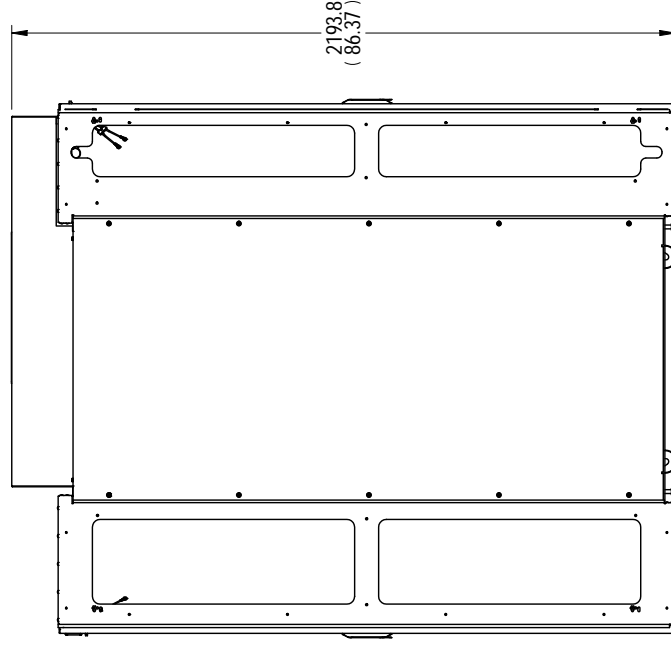
- NOTES:**
1. ALL DIMENSIONS ARE IN MM (INCHES) $\pm 2.5\text{mm}$ (0.1")
 2. EXPANSION CHANNEL (EC'S) FRONT DOORS ARE LEFT SIDE HINGED AND ARE NOT REVERSIBLE.
 3. SWING RADIUS OF 135° (FRONT AND REAR DOORS).
 4. EC DOORS ARE 20GA STEEL
 5. EC'S SIDE PANELS NOT SHOWN FOR CLARITY. PANELS ARE 20 GA. STEEL. PANELS ADD NO ADDITIONAL WIDTH.
 6. EC'S CAN BE REMOVED INDIVIDUALLY AT ANY TIME. BUT DO NOT NEED TO BE REMOVED TO PERFORM SERVICE.
 7. WHEN CALCULATING FULL SMARTROW LENGTH, INCLUDE 10MM (0.39) BETWEEN EACH EC
 8. TOTAL WEIGHT FOR BDC CABINET ECF ECR: 71.00KG (156.5 LBS) AND EXHAUST PLENUM: 12.04KG (26.5LBS).
 9. ECR IS COMPATIBLE WITH 1100mm DEEP. DCE/DCF RACKS.



TOP VIEW



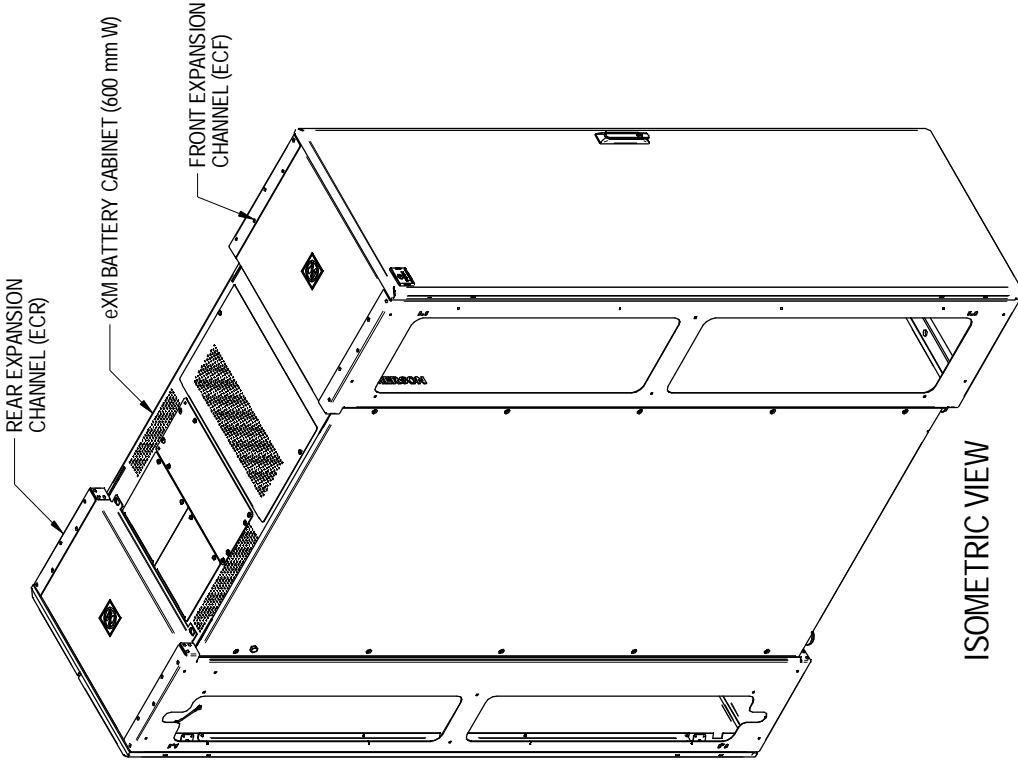
FRONT VIEW



RIGHT SIDE VIEW

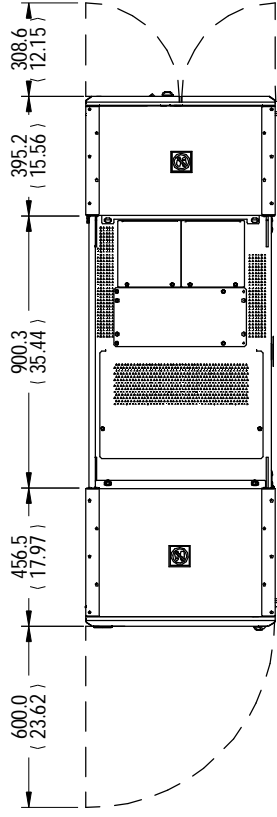
DRAWN BY: TED BEAVER		SHEET NUMBER: 1 OF 1	
CHECKED BY: BRAD REINBOLT		ECR NUMBER:	
REFERENCE DRAWING:		QUOTE NUMBER:	
TITLE / DESCRIPTION DCX DIMENSIONAL SPECIFICATIONS (EC) eXM BDC 208V 10-100kW (600mm) eXM DC 480V 50-150kVA (600mm)		CUSTOMER / JOB SMARTROW DCX	
DRAWING NUMBER: SRDCX022		DATE: 6-7-17	REV.#: 0
		1850 BEAVER DRIVE P.O. BOX 29186 COLUMBUS, OHIO 43229	



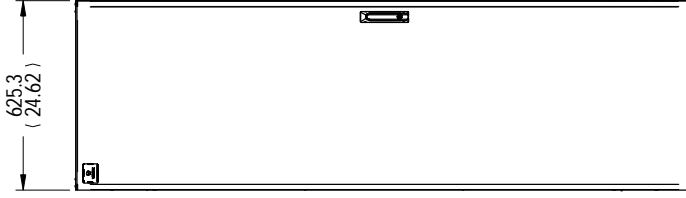


ISOMETRIC VIEW

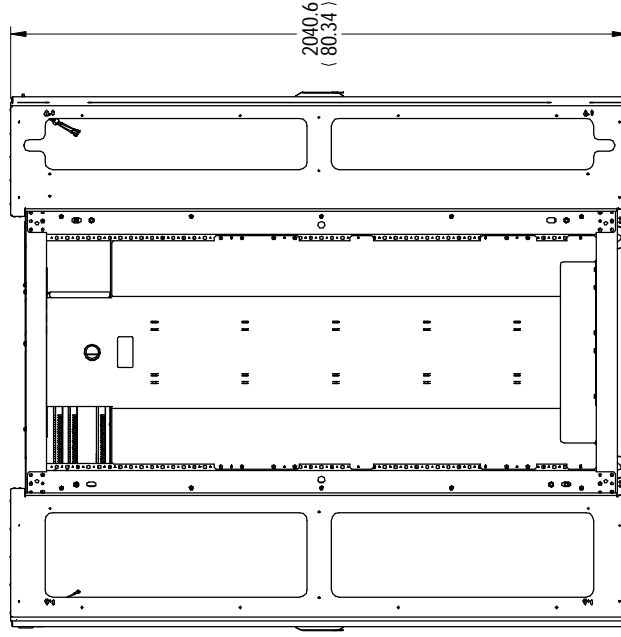
- NOTES:
1. ALL DIMENSIONS ARE IN MM (INCHES) +/-2.5mm (0.1").
 2. EXPANSION CHANNEL (EC'S) FRONT DOOR IS LEFT SIDE HINGED AND IS NOT REVERSIBLE.
 3. SWING RADIUS OF 135° (FRONT AND REAR DOORS).
 4. EC DOORS ARE 20GA STEEL.
 5. EC'S SIDE PANELS NOT SHOWN FOR CLARITY. PANELS ARE 20 GA. STEEL. PANELS ADD NO ADDITIONAL WIDTH.
 6. EC'S CAN BE REMOVED INDIVIDUALLY AT ANY TIME, BUT DO NOT NEED TO BE REMOVED TO PERFORM SERVICE.
 7. WHEN CALCULATING FULL SMARTROW LENGTH, INCLUDE 10MM (0.39) BETWEEN EACH EC BATTERY CABINET SUBMITTAL DRAWING FOR BATTERY CONFIGURATION WEIGHT.
 8. TOTAL WEIGHT FOR BATTERY CABINET ECF AND ECR: 70.76KG (156 LBS). REFER TO eXM BATTERY CABINET SUBMITTAL DRAWING FOR BATTERY CONFIGURATION WEIGHT.
 9. ECR IS COMPATIBLE WITH 1100mm DEEP, DCE/DCF RACKS.



TOP VIEW



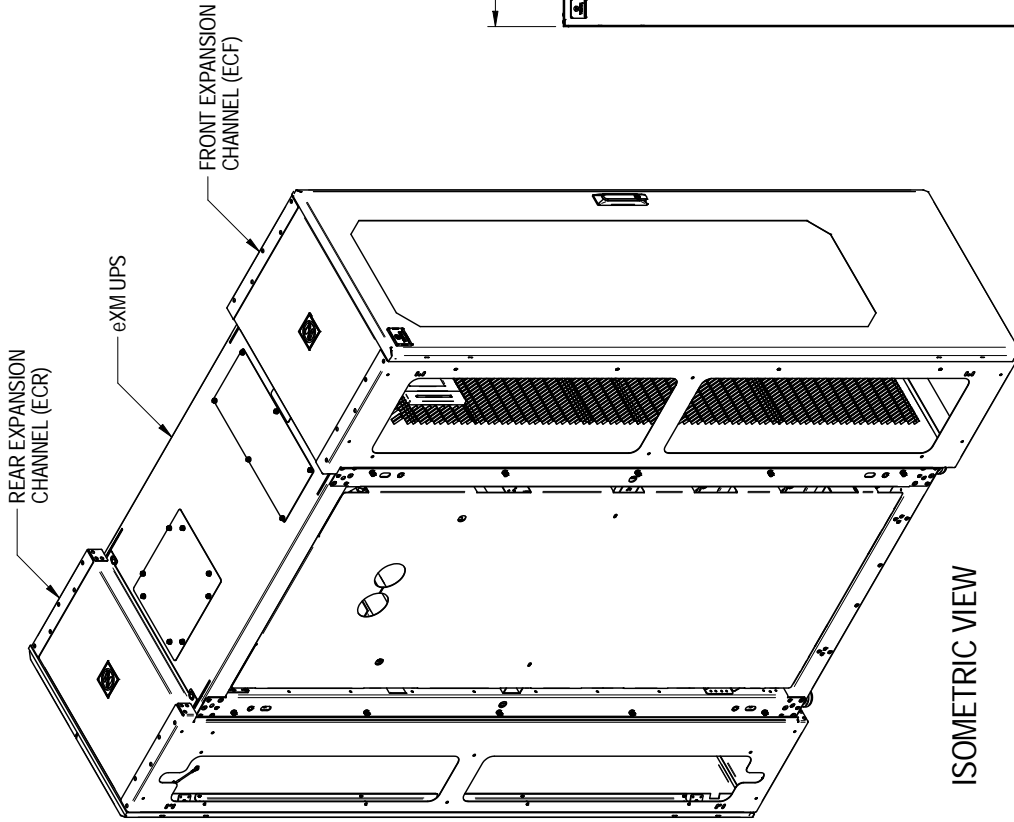
FRONT VIEW



RIGHT SIDE VIEW

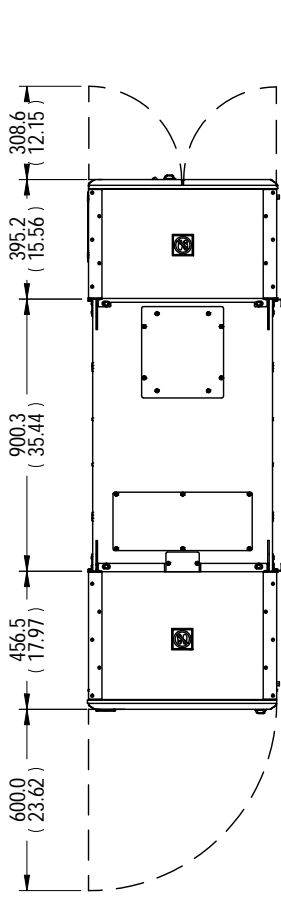
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CHECKED BY: BRAD REINBOLT		ECONUMBER:	
REFERENCE DRAWING:		QUOTE NUMBER:	
TITLE / DESCRIPTION DCX DIMENSIONAL SPECIFICATIONS (EC) eXM BATTERY CABINET (600 mm)		CUSTOMER / JOB SMARTROW DCX	
DRAWING NUMBER: SRDCX017		DATE: 6-7-17	REV#: 0
1050 BEAVER DRIVE P.O. BOX 29186 COLUMBUS, OHIO 43229			



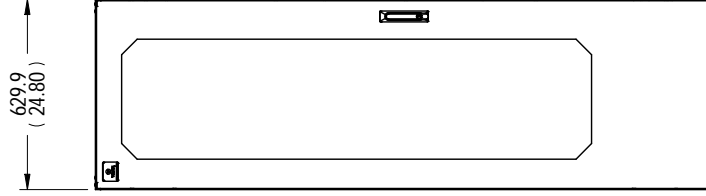


ISOMETRIC VIEW

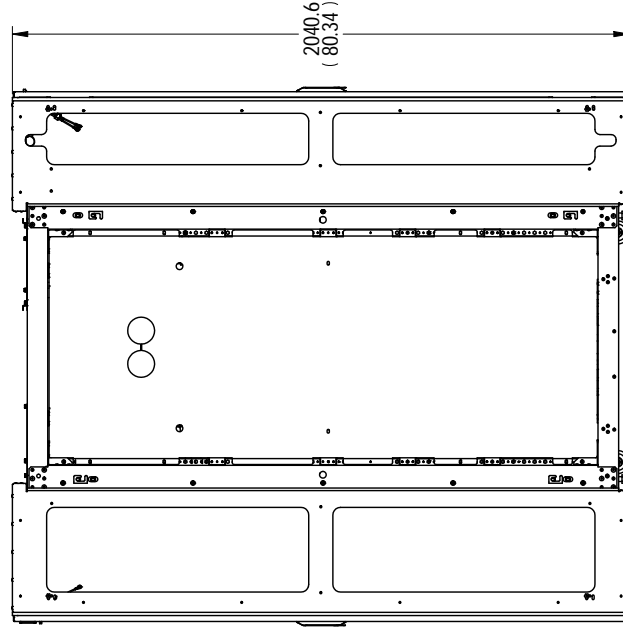
- NOTES:**
1. ALL DIMENSIONS ARE IN MM (INCHES) +/-2.5mm (0.1").
 2. EXPANSION CHANNEL (EC'S) FRONT DOOR IS LEFT SIDE HINGED AND IS NOT REVERSIBLE.
 3. SWING RADIUS OF 135° (FRONT AND REAR DOORS).
 4. EC DOORS ARE 20GA STEEL.
 5. EC'S SIDE PANELS NOT SHOWN FOR CLARITY. PANELS ARE 20 GA. STEEL. PANELS ADD NO ADDITIONAL WIDTH.
 6. EC'S CAN BE REMOVED INDIVIDUALLY AT ANY TIME, BUT DO NOT NEED TO BE REMOVED TO PERFORM SERVICE.
 7. WHEN CALCULATING FULL SMARTROW LENGTH, INCLUDE 10MM (0.39) BETWEEN EACH EC
 8. TOTAL WEIGHT FOR UPS CABINET ECF AND ECR: 78.02 KG (172 LBS); REFER TO eXM UPS SUBMITTAL DRAWING FOR UPS CONFIGURATION WEIGHT.
 9. ECR IS COMPATIBLE WITH 1100mm DEEP. DCE/DCF RACKS.



TOP VIEW



FRONT VIEW



RIGHT SIDE VIEW

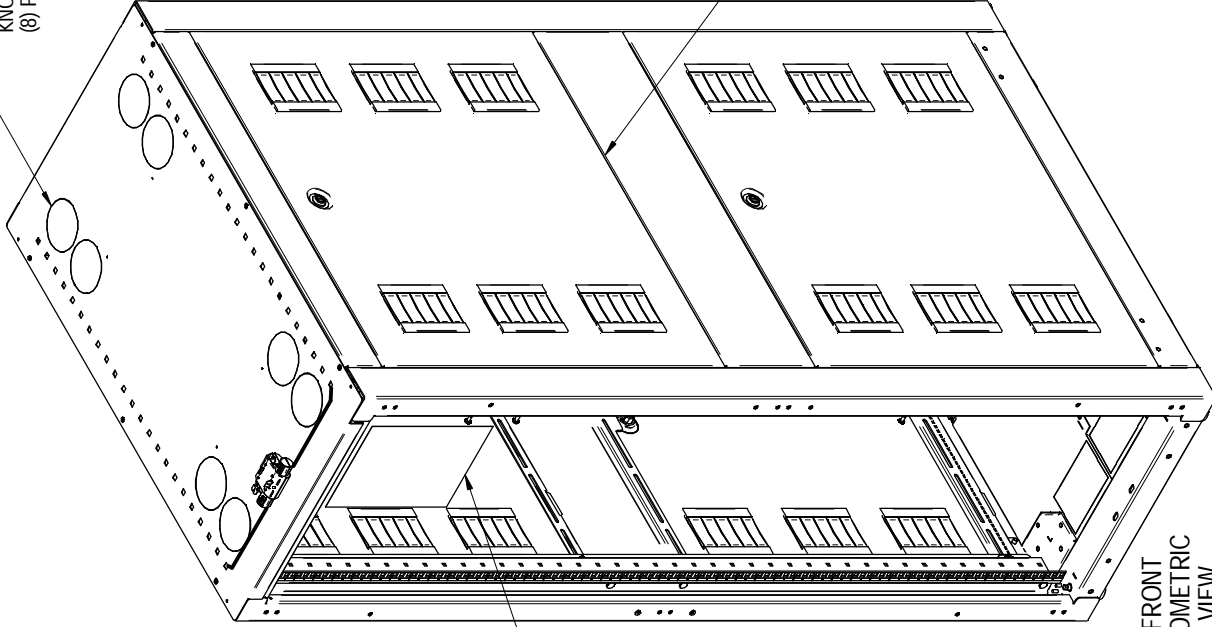
DRAWN BY: TED BEAVER	SHEET NUMBER: 1 OF 1	TITLE / DESCRIPTION DCX DIMENSIONAL SPECIFICATIONS (EC) eXM UPS 208V 40 & 100kVA FRAME of eXM UPS 480V 200kVA FRAME
CHECKED BY: BRAD REINBOLT	ECN NUMBER:	
REFERENCE DRAWING:	QUOTE NUMBER:	

DRAWING NUMBER: SRDCX020	DATE: 8/22/2017	REV#: 0	CUSTOMER / JOB SMARTROW DCX
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1850 BEAVERCREEK DRIVE
P.O. BOX 29186
COLUMBUS, OHIO 43229

CABLE MANAGEMENT
KNOCKOUTS (Ø4.00in)
(8) PLCS



RACK ID TAG,
ROW LINE-UP LOCATION
(LEFT ROW END,
CENTER OF ROW,
OR RIGHT ROW END)

PASS-THRU PANEL (2 PER SIDE) SHOWN
(FOR RACKS DEPLOYED INTERNAL TO ROW)
SOLID PANELS USED ON RIGHT SIDE WHEN
RACK DEPLOYED AT RIGHT ROW END.
SOLID PANELS USED ON LEFT SIDE WHEN
RACK DEPLOYED AT LEFT ROW END.

FRONT
ISOMETRIC
VIEW

- NOTES:
1. ALL DIMENSIONS ARE IN MM (INCHES) +/- 2.5 mm (+/- 0.1")
 2. UNIT WEIGHT: 157 KG (345 LB)
 3. WEIGHT CAPACITY: 1361 KG [3000 LB] STATIC LOAD
REF - DOORS EXCLUDED FOR USE WITH ECD
 4. KITS INCLUDED
 - (1) BAY PLATE & GASKET
 - (2) SEALED CABLE ENTRANCE
 - (1) QTY (50) M6 SCREWS & CAGE NUTS

DRAWN BY:	SHEET NUMBER:
BTL	1 OF 2
CHECKED BY:	ECD NUMBER:
BLR	
REFERENCE DRAWING:	QUOTE NUMBER:

TITLE / DESCRIPTION

DCX RACK, SERVER (600W)

CUSTOMER / JOB
SMARTROW DCX

DRAWING NUMBER:	DATE:	REV#:	1090 BEAVERCREEK DRIVE P.O. BOX 29186 COLUMBUS, OHIO 43229
SRDCX010	5/12/2017	2	





CUSTOMER / JOB
SMARTROW DCX

1050 REARSHAW DRIVE
P.O. BOX 29186
COLUMBUS, OHIO 43229

REV# 2

DATE: 5/12/2017

DRAWING NUMBER: SRDCX010

TITLE / DESCRIPTION

DCX RACK, SERVER (600W)

SHEET NUMBER:
2 OF 2

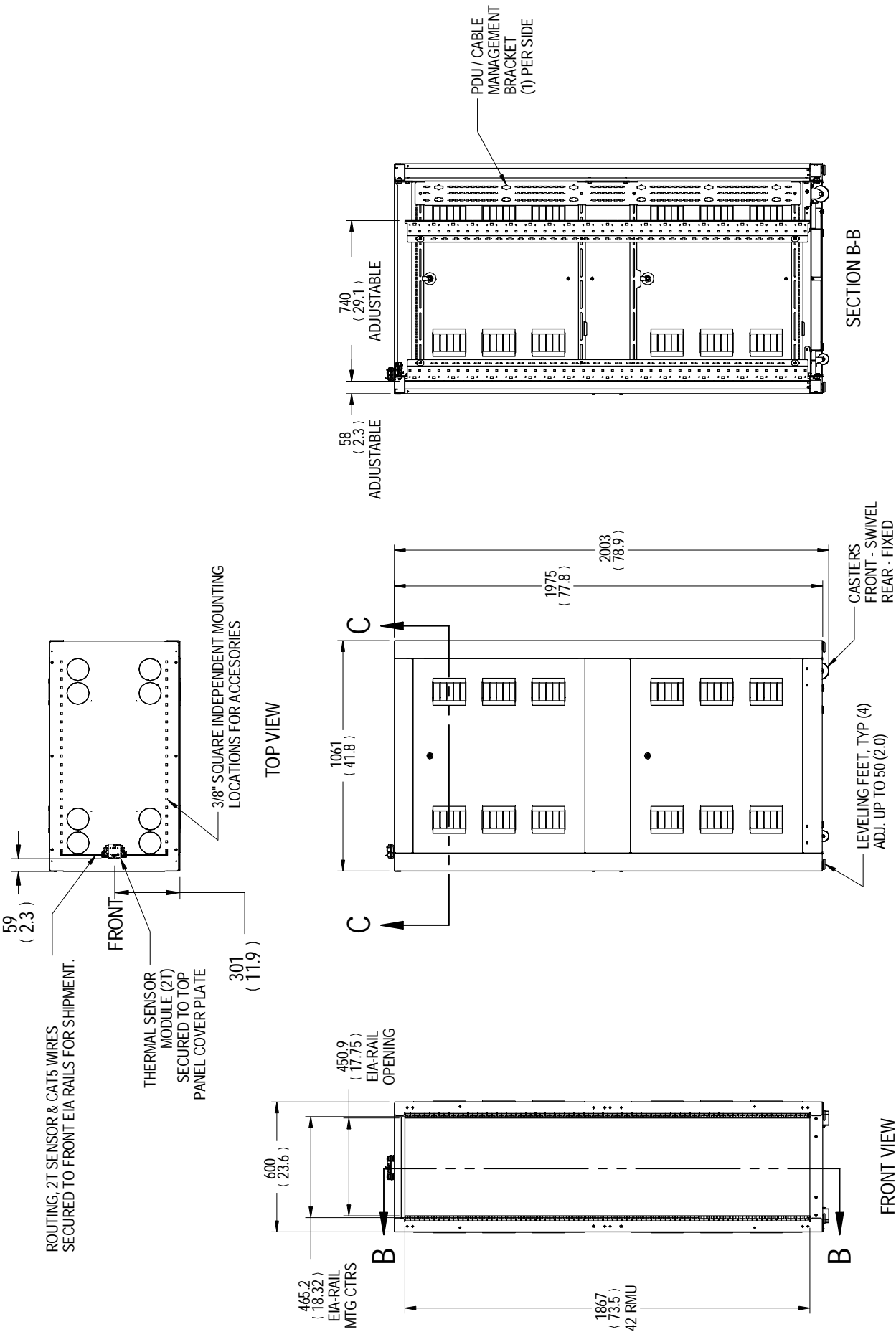
ECON NUMBER:

QUOTE NUMBER:

DRAWN BY:
BTL

CHECKED BY:
BLR

REFERENCE DRAWING:



CABLE MANAGEMENT
KNOCKOUTS (Ø4.00in)
(8) PLCS

PASS-THRU PANEL (2 PER SIDE) SHOWN
(FOR RACKS DEPLOYED INTERNAL TO ROW)
SOLID PANELS USED ON RIGHT SIDE WHEN
RACK DEPLOYED AT RIGHT ROW END.
SOLID PANELS USED ON LEFT SIDE WHEN
RACK DEPLOYED AT LEFT ROW END.

RACK ID TAG,
ROW LINE-UP LOCATION
(LEFT ROW END,
CENTER OF ROW,
OR RIGHT ROW END)

BRUSH STRIPS
EACH FRONT EIA RAIL

CABLE FINGERS
EACH FRONT EIA RAIL

FRONT
ISOMETRIC
VIEW

- NOTES:
1. ALL DIMENSIONS ARE IN MM (INCHES) +/- 2.5 mm (+/- 0.1")
 2. UNIT WEIGHT: 157 KG (345 LB)
 3. WEIGHT CAPACITY: 1361 KG (3000 LBI) STATIC LOAD
REF - DOORS EXCLUDED FOR USE WITH ECD
 4. KITS INCLUDED
 - (1) BAY PLATE & GASKET
 - (2) SEALED CABLE ENTRANCE
 - (1) QTY (50) M6 SCREWS & CAGE NUTS

DRAWN BY:
BRIAN LYNCH

CHECKED BY:
BRAD REINBOLT

REFERENCE DRAWING:

SHEET NUMBER:
1 OF 2

ECD NUMBER:

QUOTE NUMBER:

TITLE / DESCRIPTION

DCX RACK, NETWORK (800W)

CUSTOMER / JOB
SMARTROW DCX

DRAWING NUMBER: SRDCX011

DATE: 5/22/2017

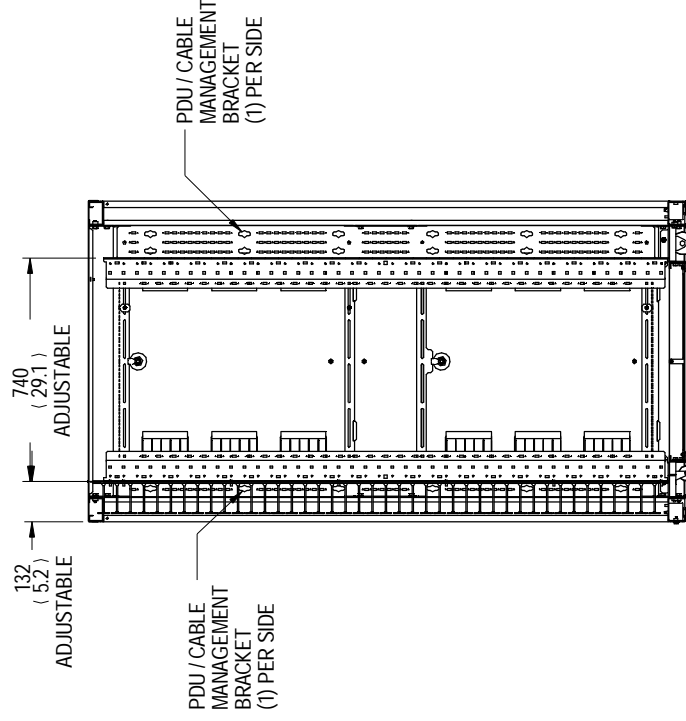
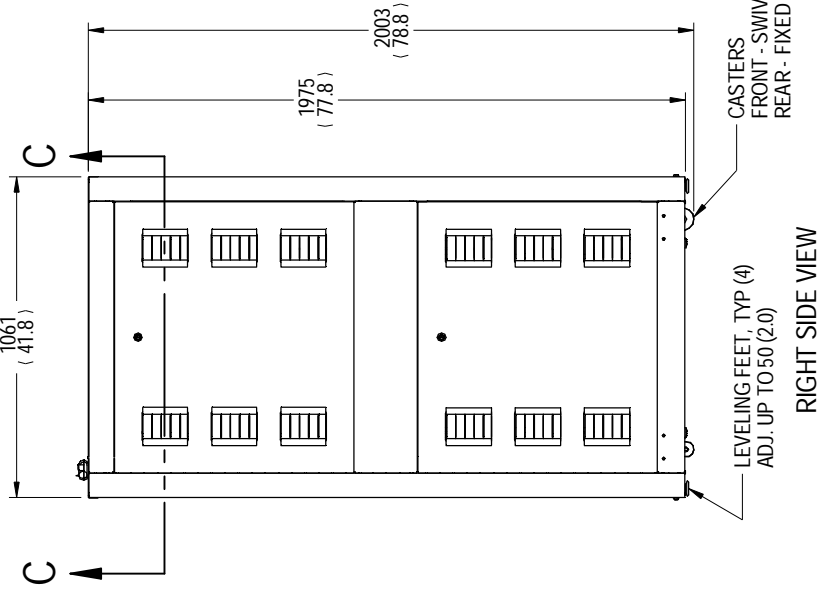
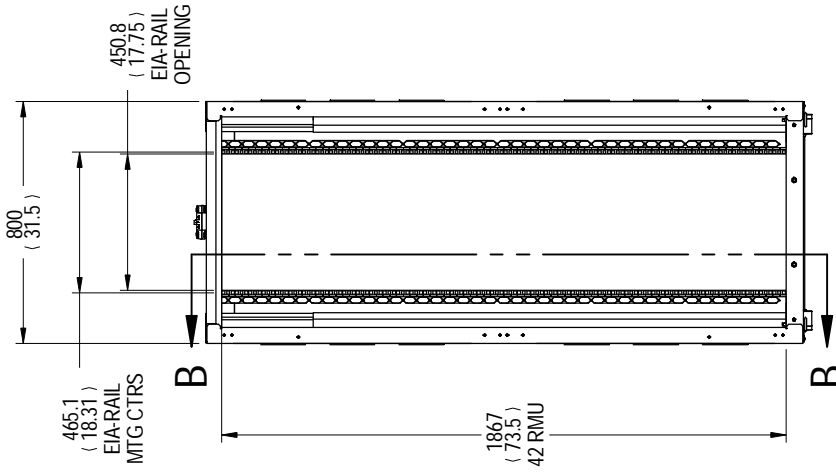
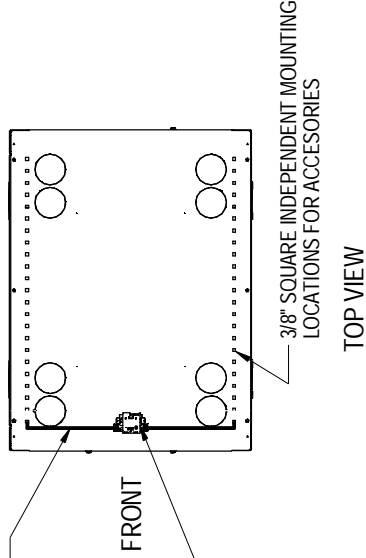
REV#: 2

1010 BEAVERHAWK DRIVE
P.O. BOX 29186
COLUMBUS, OHIO 43229



ROUTING, 2T SENSOR & CAT5 WIRES
SECURED TO FRONT EIA RAILS FOR SHIPMENT.

THERMAL SENSOR
MODULE (2T)
SECURED TO TOP
PANEL COVER PLATE



DRAWN BY:
BRIAN LYNCH

CHECKED BY:
BRAD REINBOLT

REFERENCE DRAWING:

SHEET NUMBER:
2 OF 2

ECON NUMBER:

QUOTE NUMBER:

TITLE / DESCRIPTION

DCX RACK, NETWORK (800W)

CUSTOMER / JOB
SMARTROW DCX

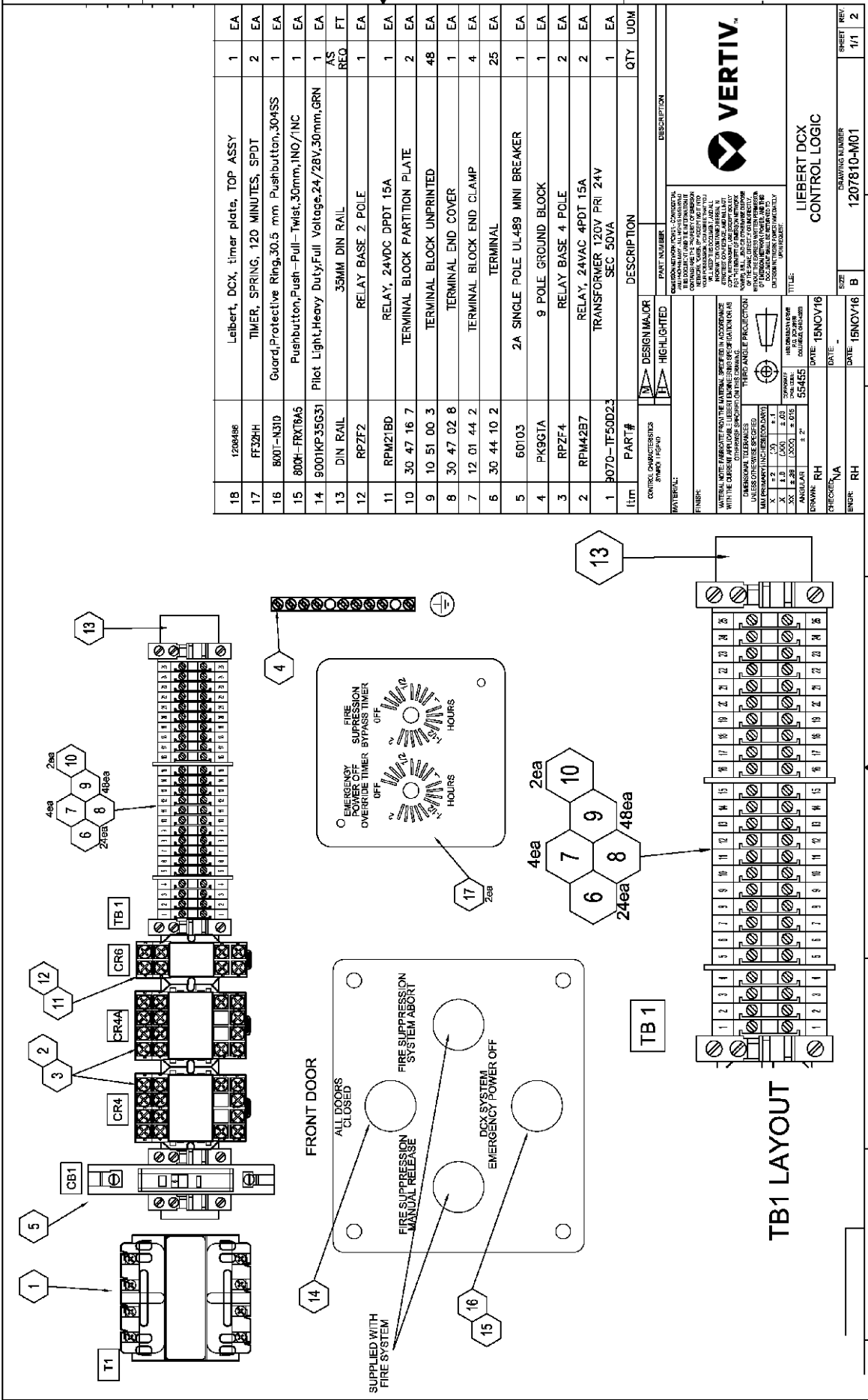
DRAWING NUMBER:
SRDCX011

DATE:
5/22/2017

REV#:
2

1010 BEAVERHAWK DRIVE
P.O. BOX 29186
COLUMBUS, OHIO 43229





18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Leibert, DCX, timer plate, TOP ASSY	TIMER, SPRING, 120 MINUTES, SPDT	Guard,Protective Ring,30.5 mm Pushbutton,304SS	Pushbutton,Push-Pull-Twist,30mm,1NO/1NC	Pilot Light,Heavy Duty,Full Voltage,24/28V,30mm,GRN	35MM DIN RAIL	RELAY BASE 2 POLE	RELAY, 24VDC DPDT 15A	TERMINAL BLOCK PARTITION PLATE	TERMINAL BLOCK UNPRINTED	TERMINAL END COVER	TERMINAL BLOCK END CLAMP	TERMINAL	2A SINGLE POLE UL-489 MINI BREAKER	9 POLE GROUND BLOCK	RELAY BASE 4 POLE	RELAY, 24VAC 4PDT 15A	TRANSFORMER 120V PRI 24V SEC 50VA
1 EA	2 EA	1 EA	1 EA	1 EA	AS REQ	1 EA	1 EA	2 EA	48 EA	1 EA	4 EA	25 EA	1 EA	1 EA	2 EA	2 EA	1 EA

Part #	Description	Qty	UOM
1208486	Leibert, DCX, timer plate, TOP ASSY	1	EA
FF52HH	TIMER, SPRING, 120 MINUTES, SPDT	2	EA
800T-N310	Guard,Protective Ring,30.5 mm Pushbutton,304SS	1	EA
800H-FRX18A5	Pushbutton,Push-Pull-Twist,30mm,1NO/1NC	1	EA
9001KP35G31	Pilot Light,Heavy Duty,Full Voltage,24/28V,30mm,GRN	1	EA
DIN RAIL	35MM DIN RAIL	AS REQ	FT
RPZF2	RELAY BASE 2 POLE	1	EA
RPM21BD	RELAY, 24VDC DPDT 15A	1	EA
30 47 16 7	TERMINAL BLOCK PARTITION PLATE	2	EA
10 51 00 3	TERMINAL BLOCK UNPRINTED	48	EA
30 47 02 8	TERMINAL END COVER	1	EA
12 01 44 2	TERMINAL BLOCK END CLAMP	4	EA
30 44 10 2	TERMINAL	25	EA
60103	2A SINGLE POLE UL-489 MINI BREAKER	1	EA
PK9G1A	9 POLE GROUND BLOCK	1	EA
RPZF4	RELAY BASE 4 POLE	2	EA
RPM42B7	RELAY, 24VAC 4PDT 15A	2	EA
8070-TF50D23	TRANSFORMER 120V PRI 24V SEC 50VA	1	EA



LIBERT DCX CONTROL LOGIC

DRAWING NUMBER: 1207810-M01

DATE: 16NOV16

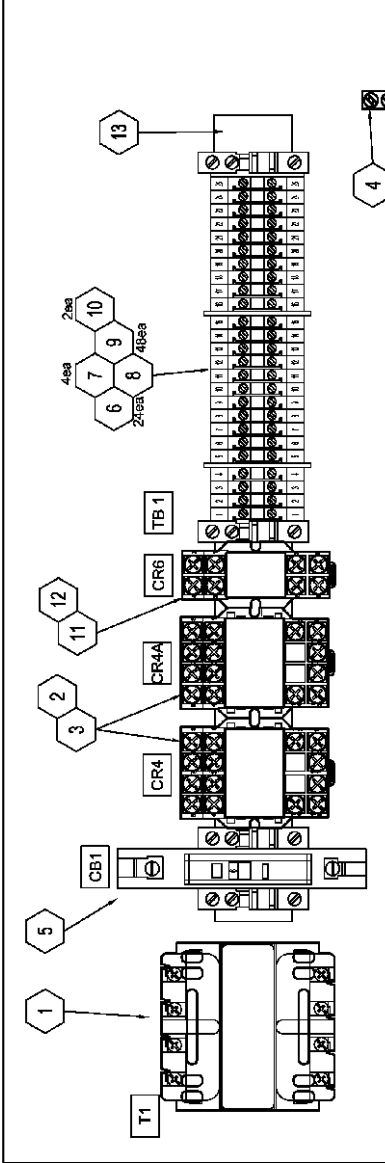
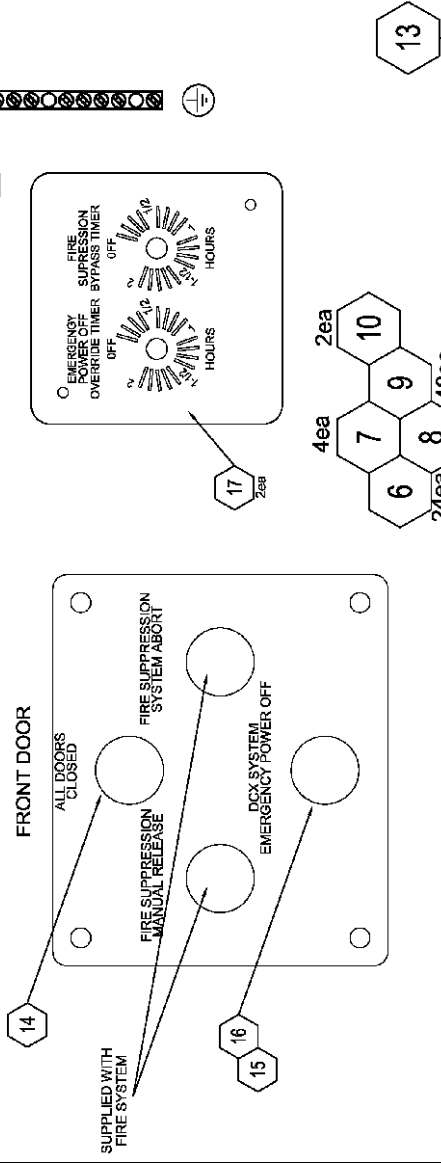
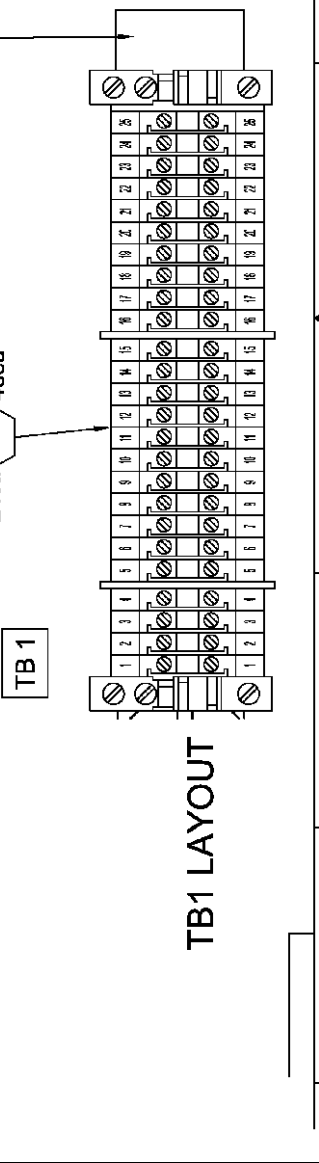
ENGINEER: RH

DATE: 16NOV16

SIZE: B

SHEET: 1/1

TOTAL SHEETS: 2


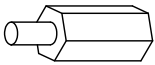
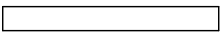
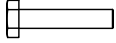
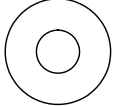









KIT SPACER UPS/BDC/BATTERY

THIS KIT PROVIDES PARTS AND INSTRUCTIONS TO ASSEMBLE THE eXM UPS SYSTEM CABINETS TOGETHER FOR USE IN THE SMARTROW DCX.

HARDWARE INCLUDED:

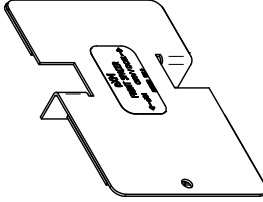
									
"D" GASKET (40 FT)	SPACER (x4)	GIC INSULATION (11 FT)	M10 X 60MM (x4)	WASHER FLAT (x4)	WASHER LOCK (x4)	CAGE NUT (x4)	M6 X 12MM (x4)	M6 FLAT WASHER (x4)	M6 X 13 T30 (x4)

TOOLS REQUIRED:

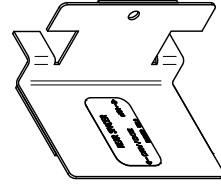
- UTILITY KNIFE
- 17MM SOCKET & RATCHET OR WRENCH
- 10MM SOCKET & RATCHET OR WRENCH
- T30 TORX SCREW DRIVER

FOLLOWING INSTRUCTION SHEETS:

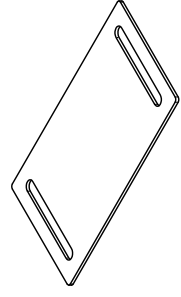
- SHEET 2: BAYING eXM CABINETS.
- SHEET 3: LOCATING ADJACENT SMARTROW DCX RACK OR COOLING MODULE TO THE eXM SYSTEM. (FRONT ALIGNMENT).
- SHEET 4: LOCATING ADJACENT SMARTROW DCX RACK OR COOLING MODULE TO THE eXM SYSTEM. (REAR ALIGNMENT).
- SHEET 5: BAYING SMARTROW DCX RACK TO BDC.
- SHEET 6: BAYING SMARTROW COOLING MODULE TO BDC.



FRONT SPACER
(x2)



REAR SPACER
(x2)



BAYING PLATE
(x2)

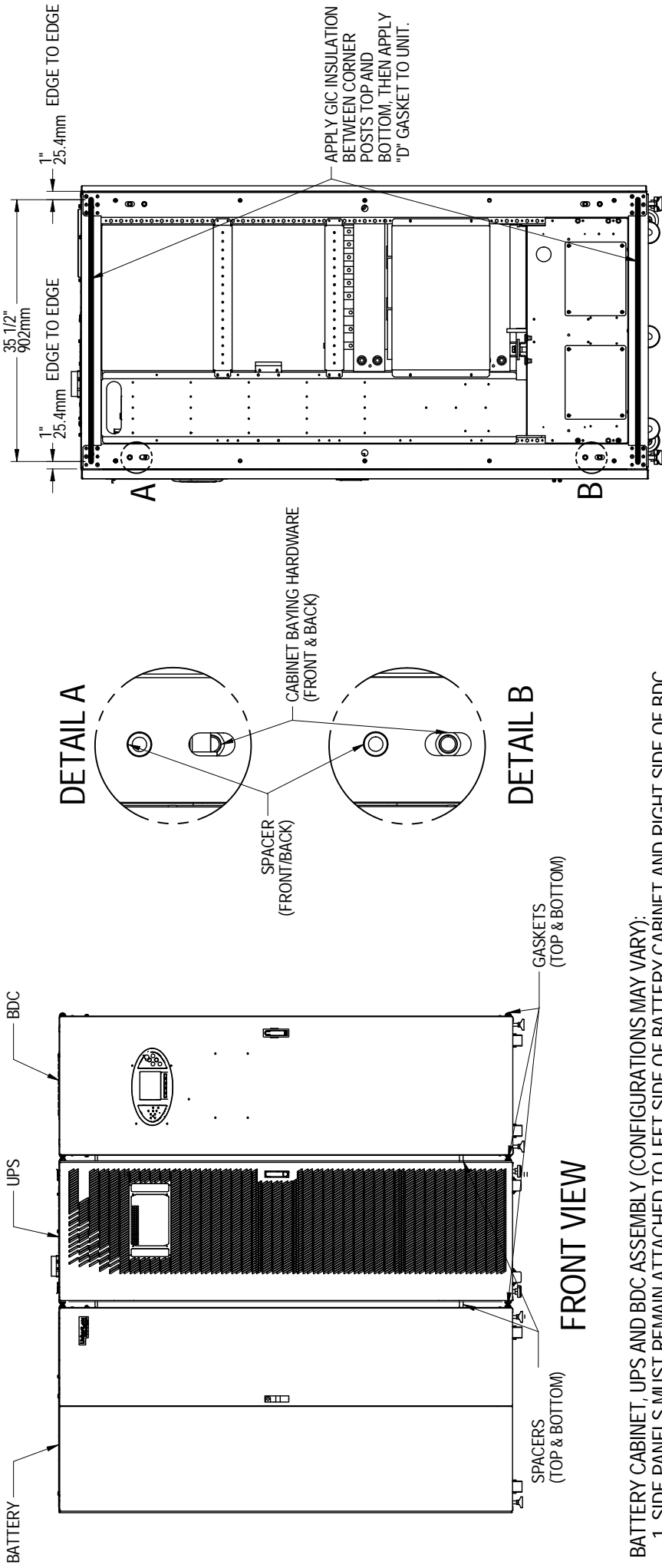
DRAWN: TED BEAVER
 CHECKED: BRAD REINBOLT
 ENGR : TED BEAVER

DATE: 7-6-2017
 DATE: 7-6-2017
 DATE: 7-6-2017

SHEET 1/5
 REV 3
 DRAWING NUMBER 558078



KIT SPACER UPS/BDC/BATTERY



RIGHT SIDE VIEW REFERENCE

- BATTERY CABINET, UPS AND BDC ASSEMBLY (CONFIGURATIONS MAY VARY):
1. SIDE PANELS MUST REMAIN ATTACHED TO LEFT SIDE OF BATTERY CABINET AND RIGHT SIDE OF BDC. ALL OTHER SIDE PANELS BETWEEN CABINETS MUST BE REMOVED.
 2. GIC INSULATION MUST BE APPLIED BETWEEN CORNER POSTS, TOP AND BOTTOM.
 3. APPLY "D" GASKET TOP & BOTTOM OF BOTH ADJACENT CABINETS BEFORE BAYING TOGETHER. SEE RIGHT SIDE VIEW FOR GASKET APPLICATION DETAILS.
 4. SCREW SPACER INTO RIGHT SIDE OF BATTERY CABINET (WHEN PRESENT) FOUR CORNERS, SCREW SPACER INTO RIGHT SIDE OF UPS CABINET FOUR CORNERS. SEE DETAILS A & B.
 5. MOVE BATTERY CABINET, UPS, AND BDC INTO PLACE AGAINST SPACER TO HOLD THE 28MM / 1.10IN SPACE REQUIRED BETWEEN CABINETS
 6. ONCE EQUIPMENT IS IN PLACE, LEVEL AND SQUARE CABINETS TO THE ROW. BOLT EQUIPMENT TOGETHER WITH M10 X 60MM SUPPLIED WITH THIS KIT.
 7. APPLY "D" GASKET TOP & BOTTOM OF BDC RIGHT SIDE PANEL. SEE RIGHT SIDE VIEW FOR GASKET APPLICATION DETAILS.

DRAWN:	TED BEAVER	SHEET 2/5
CHECKED:	BRAD REINBOLT	REV 3
ENGR :	TED BEAVER	DRAWING NUMBER 558078

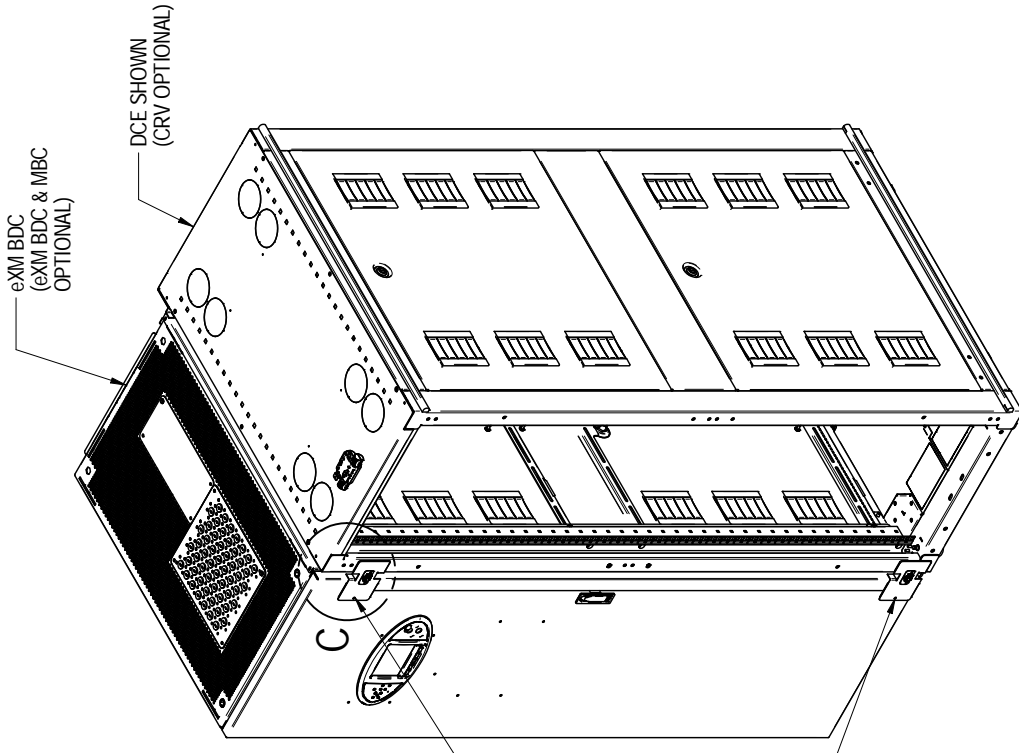


VERTIV™

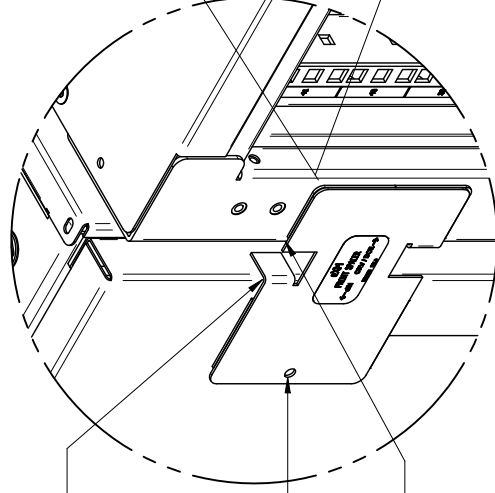
KIT SPACER UPS/BDC/BATTERY

DCE RACK, CRV OR FIRE SUPPRESSION CABINET CAN BE POSITIONED ADJACENT TO THE eXM BDC DEPENDING UPON SYSTEM CONFIGURATION. SEE FIRE SUPPRESSION CABINET KIT FOR INSTRUCTIONS AND HARDWARE. FOR DCE RACK OR CRV, FOLLOW THESE ALIGNMENT STEPS:

1. POSITION THE RACK/CRV CLOSE TO THE BDC AS SHOWN IN THE ISOMETRIC VIEW..
2. ATTACH THE FRONT SPACER TO THE BDC FRONT DOOR AS SHOWN IN DETAIL C. THE SPACER HAS MAGNETS PRE-APPLIED FOR EASY ATTACHMENT.
3. SPACER SHALL BE APPLIED TOP AND BOTTOM OF THE BDC CABINET FOR PROPER ALIGNMENT.
4. ALIGN THE RACK/CRV FRONT FACE TO MATE WITH THE SPACER'S FRONT FACE.
5. ALIGN THE RACK/CRV SIDE FACE TO MATE WITH THE SPACER'S SIDE FLANGE.
6. CONTINUE TO SHEET 4.



FRONT ISOMETRIC VIEW



DETAIL C

DRAWN: TED BEAVER
 CHECKED: BRAD REINBOLT
 ENGR : TED BEAVER

DATE: 7-6-2017
 DATE: 7-6-2017
 DATE: 7-6-2017

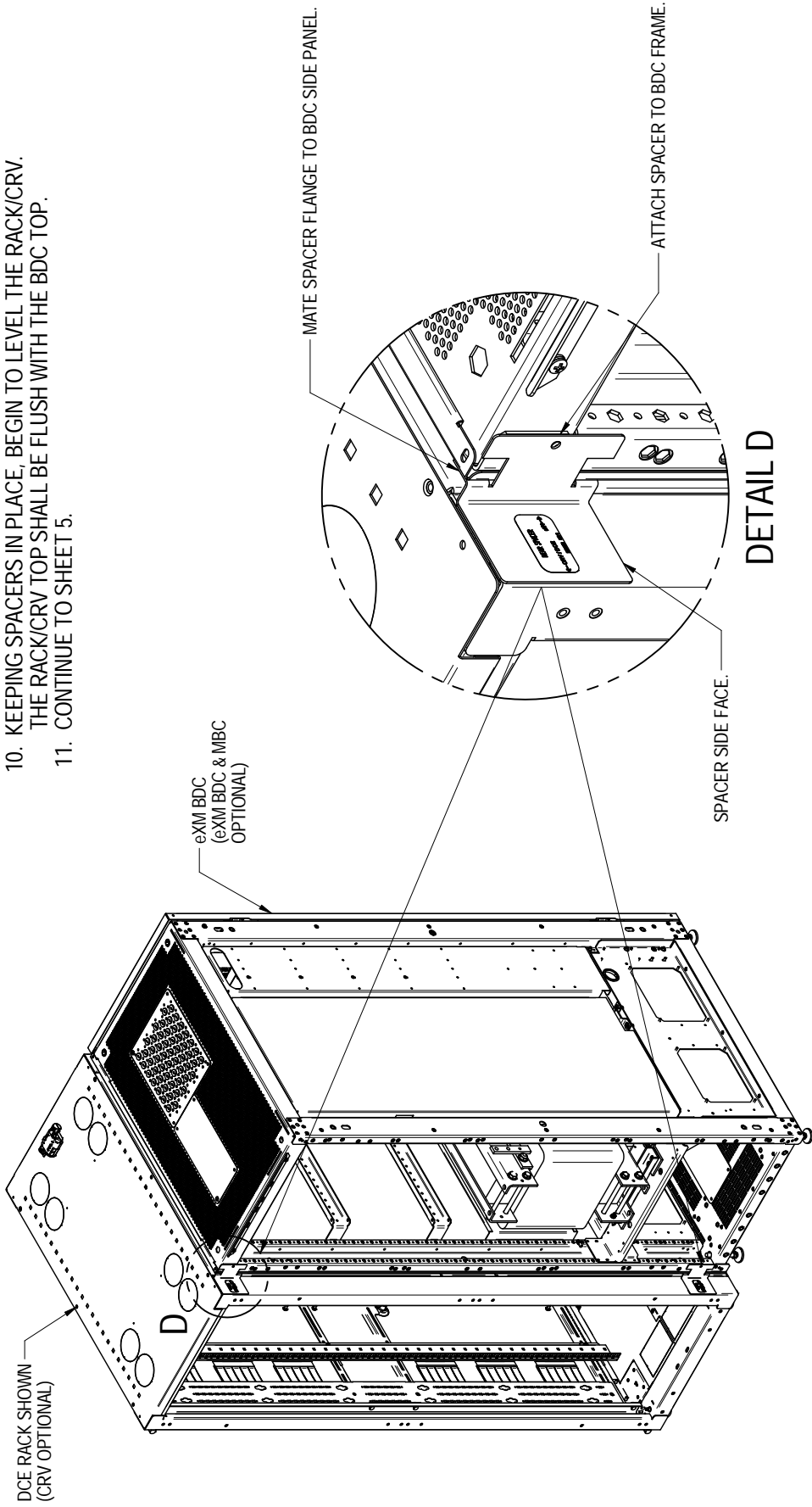
SHEET 3/5
 REV 3
 DRAWING NUMBER 558078



KIT SPACER UPS/BDC/BATTERY

ADJACENT CABINET ALIGNMENT STEPS (CONTD):

7. ATTACH THE REAR SPACER TO THE BDC AS SHOWN IN DETAIL D.
8. THE SPACER HAS MAGNETS PRE-APPLIED FOR EASY ATTACHMENT.
9. SPACER SHALL BE APPLIED TOP AND BOTTOM OF THE BDC CABINET FOR PROPER ALIGNMENT.
10. POSITION THE RACK/CRV SO ITS SIDE MATES TO THE SPACER SIDE FACE.
11. KEEPING SPACERS IN PLACE, BEGIN TO LEVEL THE RACK/CRV. THE RACK/CRV TOP SHALL BE FLUSH WITH THE BDC TOP.
11. CONTINUE TO SHEET 5.



REAR ISOMETRIC VIEW

DRAWN: TED BEAVER
 CHECKED: BRAD REINBOLT
 ENGR : TED BEAVER

DATE: 7-6-2017
 DATE: 7-6-2017
 DATE: 7-6-2017

SHEET 4/5
 REV 3
 DRAWING NUMBER 558078

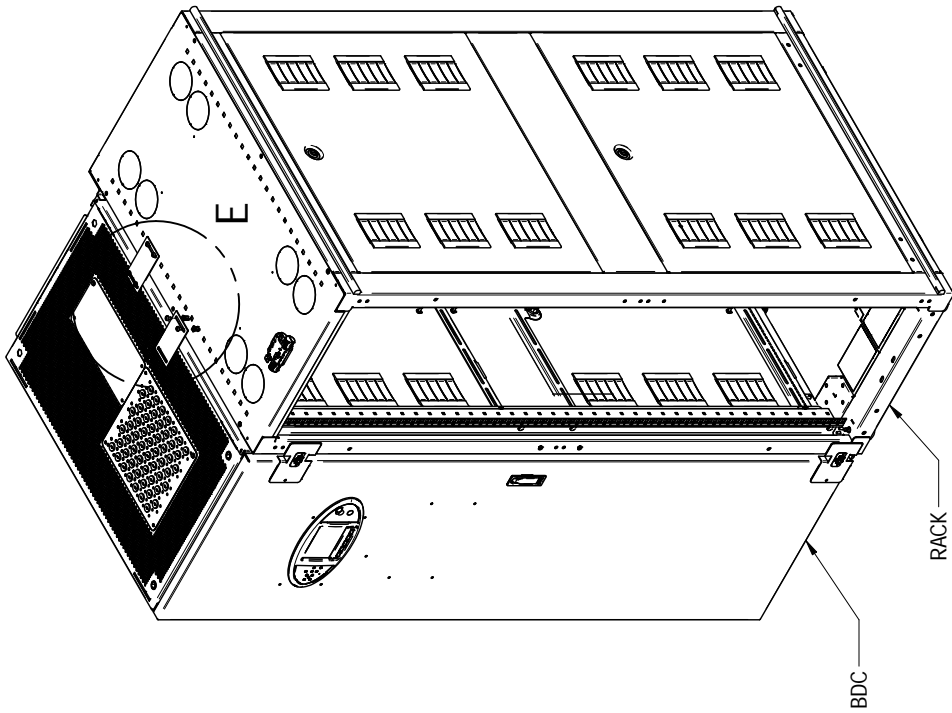


KIT SPACER UPS/BDC/BATTERY

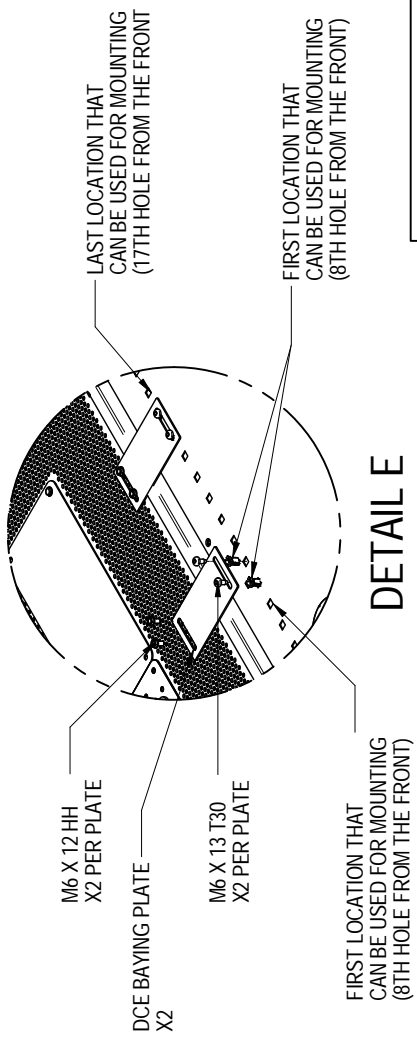
AS NOTED ON SHEET 3, DCE RACK, CRV OR FIRE SUPPRESSION CABINET CAN BE POSITIONED ADJACENT TO THE eXMI BDC DEPENDING UPON SYSTEM CONFIGURATION. FOR FIRE SUPPRESSION CABINET, SEE THE FD&S KIT FOR INSTRUCTIONS AND HARDWARE. FOR CRV, SEE SHEET 6.

FOR DCE RACK, FOLLOW THESE BAYING STEPS:

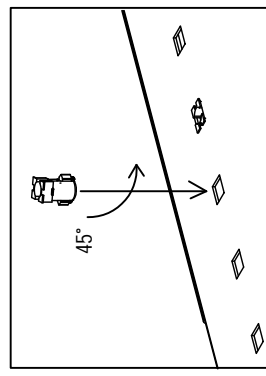
1. ENSURE RACK IS PROPERLY ALIGNED AND LEVELED.
2. INSERT CAGE NUTS INTO RACK TOP PANEL WHERE PLATE MOUNTING IS REQUIRED. REFER TO DETAIL E FOR POSSIBLE MOUNTING LOCATIONS, KEEPING IN MIND LIEBERT MB AND CABLE TROUGHS MAY BE INSTALLED AT A LATER STAGE..
3. PLACE BAYING PLATES ON RACK TOP AND ATTACH WITH SCREWS (M6 X 13 T30).
4. ATTACH BAY PLATE TO BDC WITH THREAD-ROLLING SCREWS (M6X12 HH) INTO BDC PERFORATED TOP.
5. ENSURE RACK IS PROPERLY POSITIONED RELATIVE TO THE BDC BY CHECKING THE SPACER PLATES.
6. REMOVE FRONT AND REAR SPACER PLATES.
7. BAYING THE BDC TO THE DCE IS COMPLETE.



ISOMETRIC VIEW



DETAIL E



CAGE NUT INSTALLATION ILLUSTRATION

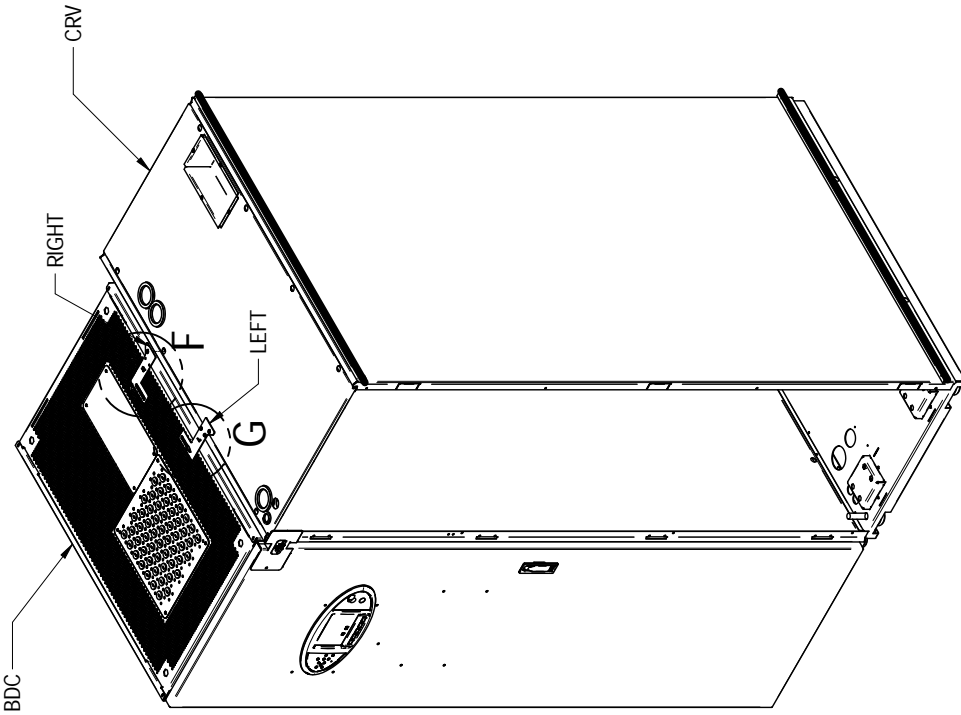
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 CHECKED: BRAD REINBOLT
 ENGR : TED BEAVER

DATE: 7-6-2017
 DATE: 7-6-2017
 DATE: 7-6-2017

SHEET 5/5
 REV 3
 DRAWING NUMBER 558078



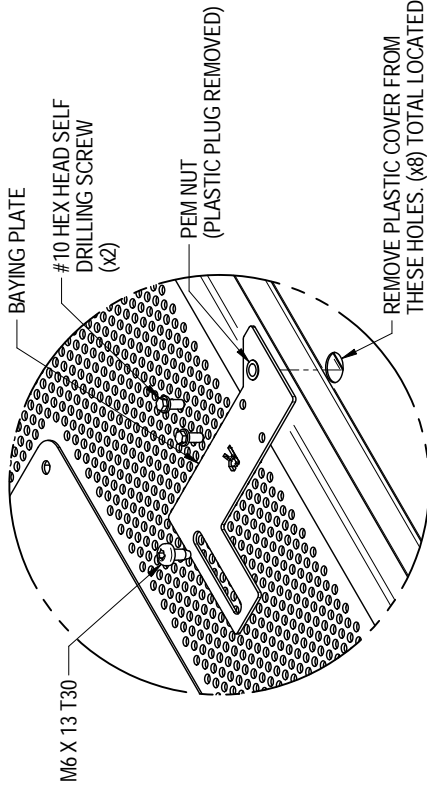
KIT SPACER UPS/BDC/BATTERY



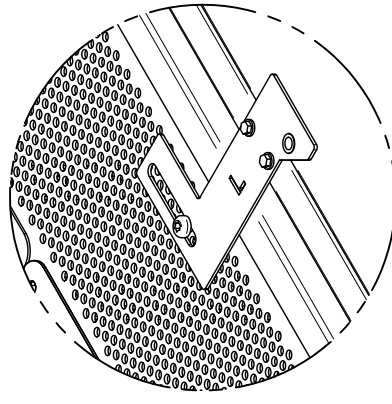
FRONT ISOMETRIC VIEW
NOT ALL PARTS SHOWN FOR CLARITY

FOR BAYING CRV TO BDC, FOLLOW THESE BAYING STEPS:

1. ENSURE CRV IS PROPERLY ALIGNED AND LEVELLED.
2. REMOVE PLUGS FROM CRV TOP PANEL WHERE NECESSARY TO INSTALL BAY PLATES. SEE DETAIL F.
3. SET BAYING PLATES (SUPPLIED WITH CRV) ON TOP OF CRV WITH PEM NUT INSIDE AVAILABLE HOLE ON CRV TOP PANEL.
4. AS SHOWN IN DETAIL G, MOUNT BAYING PLATES TO RACK USING SCREWS (M6 X 13 T30) AND CAGE NUTS, USE SUPPLIED SELF DRILLING SCREWS TO SECURE PLATE TO CRV.
5. REMOVE FRONT AND REAR SPACER PLATES.
6. BAYING THE BDC TO THE CRV IS COMPLETE.



DETAIL F
EXPLODED VIEW



DETAIL G
INSTALLED VIEW

DRAWN: TED BEAVER
 CHECKED: BRAD REINBOLT
 ENGR : TED BEAVER

DATE: 7-6-2017
 DATE: 7-6-2017
 DATE: 7-6-2017

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