

<b>Owner: Engineering</b>	<b>Vertiv Co.</b>	SUBTL SR2-3xIT racks 10kW-No Redundancy	SR2N03010NAA1 -SUBTL
<b>Author: Michael Gmerek</b>		<b>SmartRow 2 Submittal</b>	<b>Rev B</b>
<b>Date: 4/1/2024</b>			

## Contents

Contents .....	1
SmartRow 2 Site Planning Guide .....	2
Interconnection Guide (ICG).....	3
SmartRow 2 600mm IT Rack Outline.....	26
SmartRow 2 PMC Basic Outline .....	27
SmartRow 2 PMC Components .....	28
SmartRow 2 Row Cooling w Plenum Outline .....	30
SmartRow 2 PMU Detail .....	31
SmartRow 2 Cable Trough 300mm Outline.....	33
SmartRow 2 Cable Trough 600mm Outline .....	34
SmartRow 2 Assembly Scope of Work.....	35

## Smart Row 2 Site Planning Datasheet (208V, 3 phase, 4 wire + PE)

Configuration Number	Part Number	Max Row Capacity (kW)	IT Racks per Row	Capacity per Rack (kW)	Cooling Units per Row	pdu count	Main Input Breaker Size <sup>6</sup>	Per Condenser Breaker Size	Per Condenser Dry Weight kg (lbs)	Row Dimensions (L x H x D) mm (in)7	Row Weight kg (lbs)	Min. Staging Area m2 (ft2)
1	SR2N02010NAA1	10	2	5	1	2	100A	N/A <sup>5</sup>	60 (132.3)	2100 (82.7) x 2271 (107) x 1400 (55.2)	1463 (3227)	14.41 (155.2)
2	SR2N02010PAA1	10	2	5	1	4	100A	N/A <sup>5</sup>	60 (132.3)	2100 (82.7) x 2271 (107) x 1400 (55.2)	1491 (3288)	14.99 (161.4)
3	SR2N02010FAA1	10	2	5	2	4	100A	N/A <sup>5</sup>	60 (132.3)	2400 (94.5) x 2271 (107) x 1400 (55.2)	2112 (4656)	17.67 (190.2)
4	SR2N03010NAA1	10	3	3	1	3	100A	N/A <sup>5</sup>	60 (132.3)	2700 (106.3) x 2271 (107) x 1400 (55.2)	1633 (3601)	15.76 (169.7)
5	SR2N03010PAA1	10	3	3	1	6	100A	N/A <sup>5</sup>	60 (132.3)	2700 (106.3) x 2271 (107) x 1400 (55.2)	1675 (3694)	16.34 (175.9)
6	SR2N03010FAA1	10	3	3	2	6	100A	N/A <sup>5</sup>	60 (132.3)	3000 (118.2) x 2271 (107) x 1400 (55.2)	2296 (5061)	19.02 (204.8)
7	SR2N03020NAA1	20	3	6	1	3	175A	15A	118 (260.2)	2700 (106.3) x 2271 (107) x 1400 (55.2)	1863 (4108)	18.46 (198.8)
8	SR2N03020PAA1	20	3	6	1	6	175A	15A	118 (260.2)	2700 (106.3) x 2271 (107) x 1400 (55.2)	1905 (4201)	20.51 (220.8)
9	SR2N03020FAA1	20	3	6	2	6	175A	15A	118 (260.2)	3000 (118.2) x 2271 (107) x 1400 (55.2)	2526 (5568)	24.42 (262.9)
10	SR2N04020NAA1	20	4	5	1	4	175A	15A	118 (260.2)	3300 (130) x 2271 (107) x 1400 (55.2)	2033 (4483)	19.81 (213.3)
11	SR2N04020PAA1	20	4	5	1	8	175A	15A	118 (260.2)	3300 (130) x 2271 (107) x 1400 (55.2)	2089 (4607)	21.86 (235.3)
12	SR2N04020FAA1	20	4	5	2	8	175A	15A	118 (260.2)	3600 (141.8) x 2271 (107) x 1400 (55.2)	2710 (5974)	25.77 (277.4)
13	SR2N05020NAA1	20	5	4	1	5	175A	15A	118 (260.2)	3900 (153.6) x 2271 (107) x 1400 (55.2)	2203 (4858)	21.16 (227.8)
14	SR2N05020PAA1	20	5	4	1	10	175A	15A	118 (260.2)	3900 (153.6) x 2271 (107) x 1400 (55.2)	2273 (5012)	23.21 (249.9)
15	SR2N05020FAA1	20	5	4	2	10	175A	15A	118 (260.2)	4200 (165.4) x 2271 (107) x 1400 (55.2)	2894 (6380)	27.12 (292)

**Notes:**

1. System Environmental Conditions: Indoors, 41 °F to 104 °F (5 °C to 40 °C), RH to 80% with Max dew point of 82.4 °F (28 °C)
2. Floor surface must be level and continuous (expansion joints sealed, raised floor tile gaps sealed, no floor drains, etc).
3. No building sprinkler head should be within 19.7 in (0.5 m).
4. Install in accordance with national and local electrical codes
5. 10kW condenser power is sourced from the indoor unit
6. Cable Sizing: 100A = 3 AWG ; 175A = 2/0 AWG
7. Row Dimensions do not include necessary space needed for access including per ADA or local codes.

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REF. DWG.	APPROVED BY:		REVISION
		565 N. CLEVELAND AVE WESTERVILLE, OHIO 43081	

# Vertiv Row Solution

Knowledge to Build Optimized Infrastructure Solutions



## Vertiv™ SmartRow™ 2: 3x IT Rack 10kW



Row IT Load Capacity: 10 kW  
Power Redundancy UPS: No  
Power Redundancy rPDU: No  
Cooling Redundancy: No  
Dimensions:  
Length: 8.85 ft  
Depth: 4.6 ft  
Height: 7.38 ft

SHEET NO.	1 / 23	DRAWN BY:	Nilesh Patil
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PAGE DESCRIPTION:	1- Title page / cover sheet		

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## Structure identifier overview

Full designation	Structure description
Function designation	
=vRow	
+PMC	UPS, Network Switch, FC Controller, PMU
+Rack1	vRack 1
+Rack2	vRack 2
+Rack3	vRack 3
+Thermal	Thermal Components and Condenser

### Please note:

This document is intended to provide guidance to a qualified electrical installer. The installer, owner, and end user are responsible for adhering to all applicable building and electrical codes, regulations, laws, and standards, and nothing in this document is intended to conflict therewith.

Vertiv is not responsible for any failure to conform therewith. In addition, nothing in this document is intended to conflict with the applicable product manuals, installation guides, or other product documentation, which documents take precedence over this design document.

You are responsible for adhering to guidance in the appropriate product documentation, but for your convenience, some such documents are accessible here:



Before installing, connecting to supply or start operation, please review the provided safety and regulatory statements. This system represents a functional unit of an IT infrastructure solution, and the installer, owner, and end user are responsible for its proper operation.



# WARNING

**Arc flash and electric shock hazard.**  
**Failure to comply can cause serious injury or death.**  
**Before installing, connecting to supply or start operation, please review the provided Safety and Regulatory Statements.**  
**Electrical work may only be carried out by qualified personnel.**

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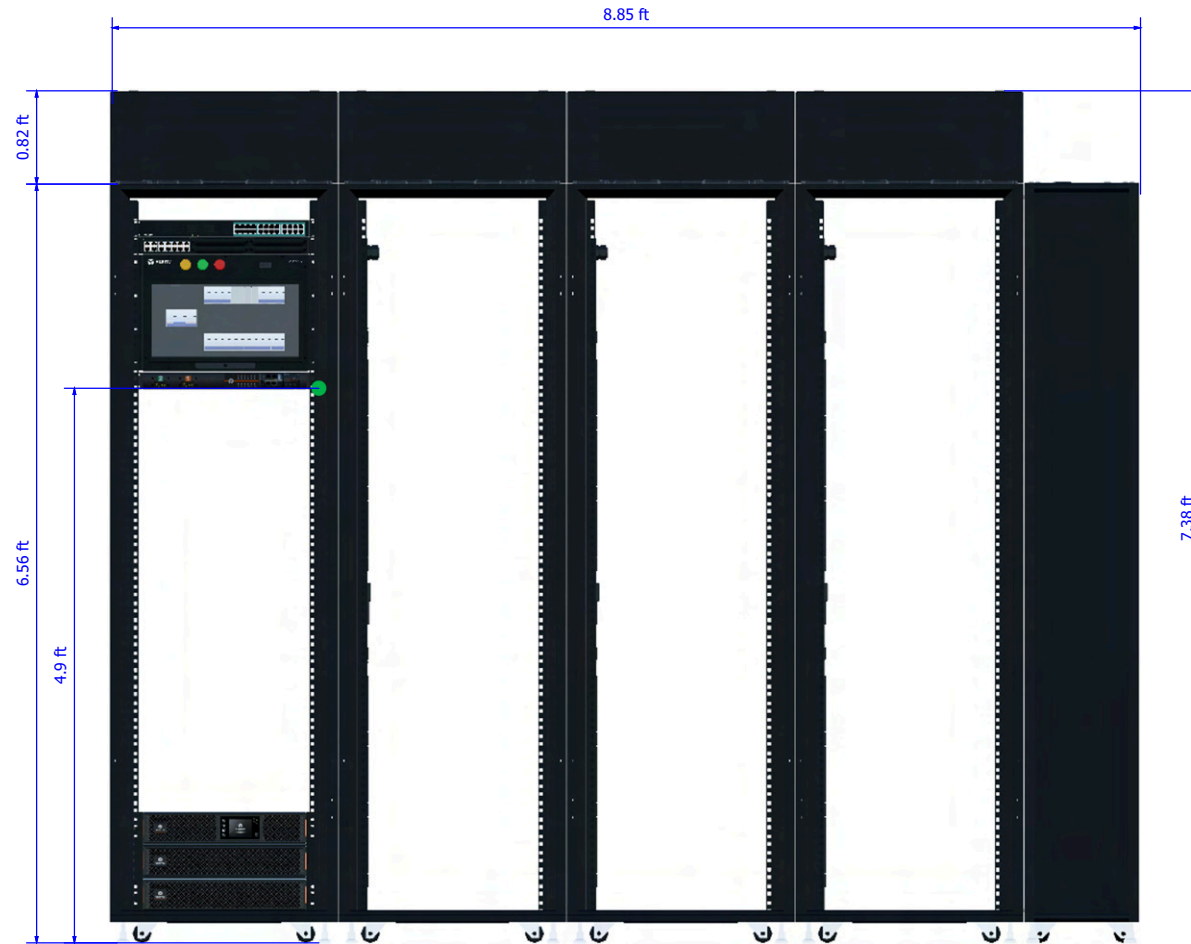
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# Vertiv™ SmartRow™ 2

Row IT Load Capacity: 10 kW  
 Max kW per Rack: 3.33 kW  
 UPS System: 10 kW w internal battery  
 Power Redundancy UPS: No  
 Power Redundancy rPDU: No  
 Cooling Redundancy: No  
 Containment: Yes  
 Dimensions:  
 Length: 8.85 ft  
 Depth: 4.6 ft  
 Height: 7.38 ft

- +PMC
- +Rack1
- +Rack2
- +Rack3
- +Thermal-CRD1



vRow Front View

### Notes:

1. Row IT Load Capacity is driven by number of IT-Racks (IT-Rack x 3.33 kW per rack).
2. System Environmental Conditions: Indoors, 41 F to 104 F (5 C to 40 C), RH to 80% with Max dew point of 82.4 F (28 C).
3. Floor surface must be level and continuous (expansion joints sealed, raised floor tile gaps sealed, no floor drains, etc).
4. No building sprinkler head should be within 19.7 in (0.5 m).

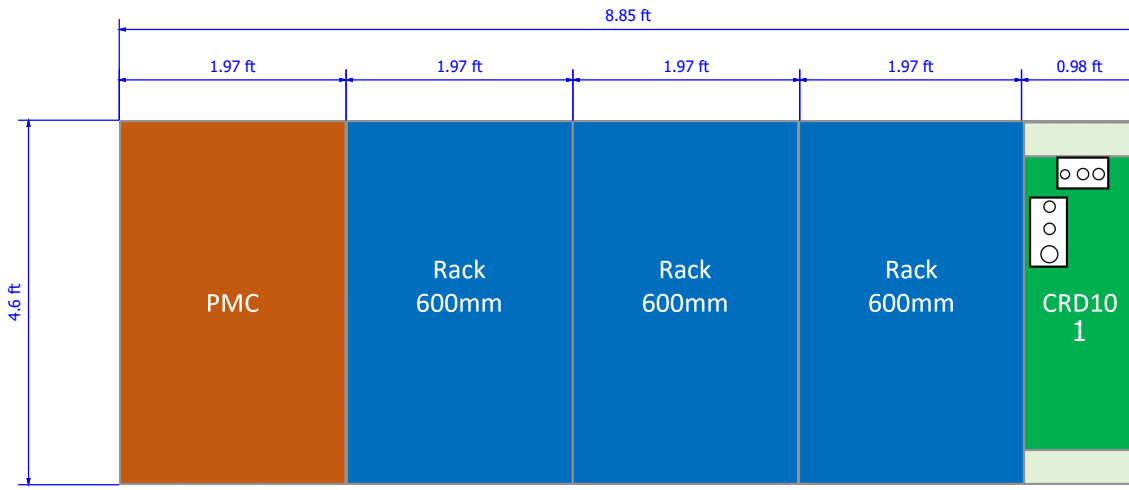


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Front of Unit

vRow Top View

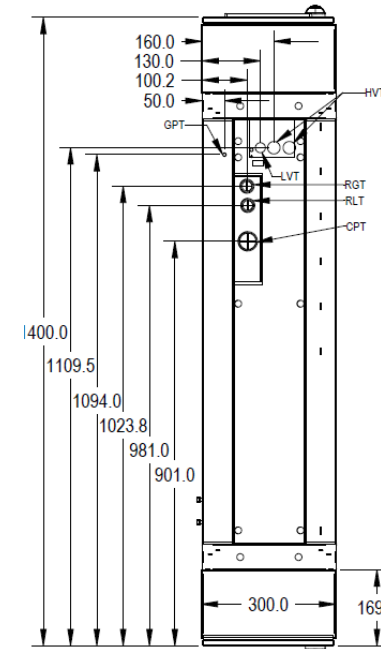
Unit Top Connections			Unit Bottom Connections		
RLT	Refrigerant Liquid Line Inlet	1/2" O.D Copper Sweat	RLT	Refrigerant Liquid Line Inlet	1/2" O.D Copper
RGT	Refrigerant Gas Line Outlet	5/8" O.D Copper Sweat	RGT	Refrigerant Gas Line Outlet	5/8" O.D Copper
CPT	Condensate Pump	1/2" NPTF FEMALE	CPT	Condensate Pump	1/2" NPTF FEMALE
HVT	High Voltage Bottom Connection	Combination knockout 1-1/8" (29mm)	HVT	High Voltage Bottom Connection	Combination knockout 1-1/8" (29mm)
LVT	Low Voltage Bottom Connection	Knockout Hole Diameter 7/8" (22 mm)	LVT	Low Voltage Bottom Connection	Knockout Hole Diameter 7/8" (22 mm)
GPT	Grounding Point	Thread Hole M8	CGT	Condensate Gravity	1/2" NPTF FEMALE

**Note:- Piping and Electrical connections available at the top and bottom of unit.**

### Connection Details

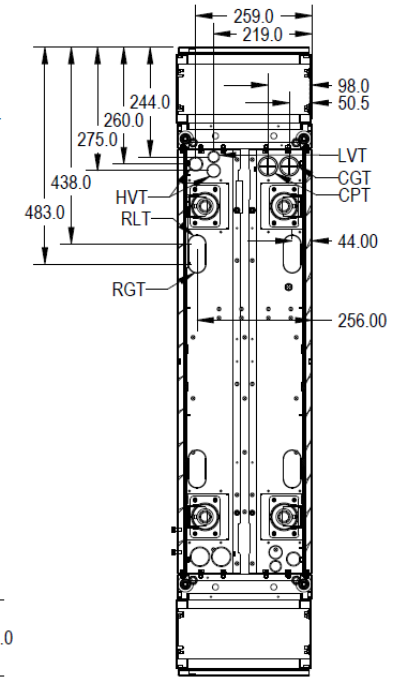
NOTE: ALL DIMENSIONS ARE IN "MM"

Top View Showing Top Connections



Front of Unit

Top View Showing Bottom Connections (Possible with raised floor)



Front of Unit (Internal Piping and top of unit hidden for clarity)

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# SR2 Main Components

**9-inch Touchscreen Panel:**  
User-friendly display enables easy access to system running status & condition.

**Centralized Infrastructure Management:**  
Enables central management of all intelligent equipment and IT devices within the system. Reading & data are consolidated into single platform.

**Racks with Containment:**  
EIA310 19-inch rack system coupled with tempered glass door enables fully enclosed system design. Allows focused cooling in IT environment.

**Precision Cooling:**  
Row-based solution designed to provide maximum cooling in a compact footprint. Cooling modulation enables cooling on demand and quickly adapts to load fluctuation.

**Electronic Lock:**  
Enables rack level security and access log is recorded intelligently. Supports local & remote door authorization.

**Power Management & Distribution:**  
Pre-assembled & pre-integrated switchboard with surge protection.

**Power Protection:**  
On-line double conversion UPS with unity power factor ensures clean power feeding to critical IT equipment.

- Power Management & Protection
- Thermal Management
- Management & Monitoring



**Emergency Ventilation:**  
Activates automatically in the event of overheating or cooling unit failure.

**Environmental Sensor:**  
Report critical environmental information and alarm notification. Ensure IT equipment is kept in desired condition.

- Explanation of terms:**
- FU Emergency Fan Control Unit
  - FDS Front Door Switch
  - RDS Rear Door Switch
  - FDL Front Door Lock Handle
  - RDL Rear Door Lock Handle
  - DC\_PS DC Power Supply



[Link to Vertiv™ SmartRow™ 2](#)

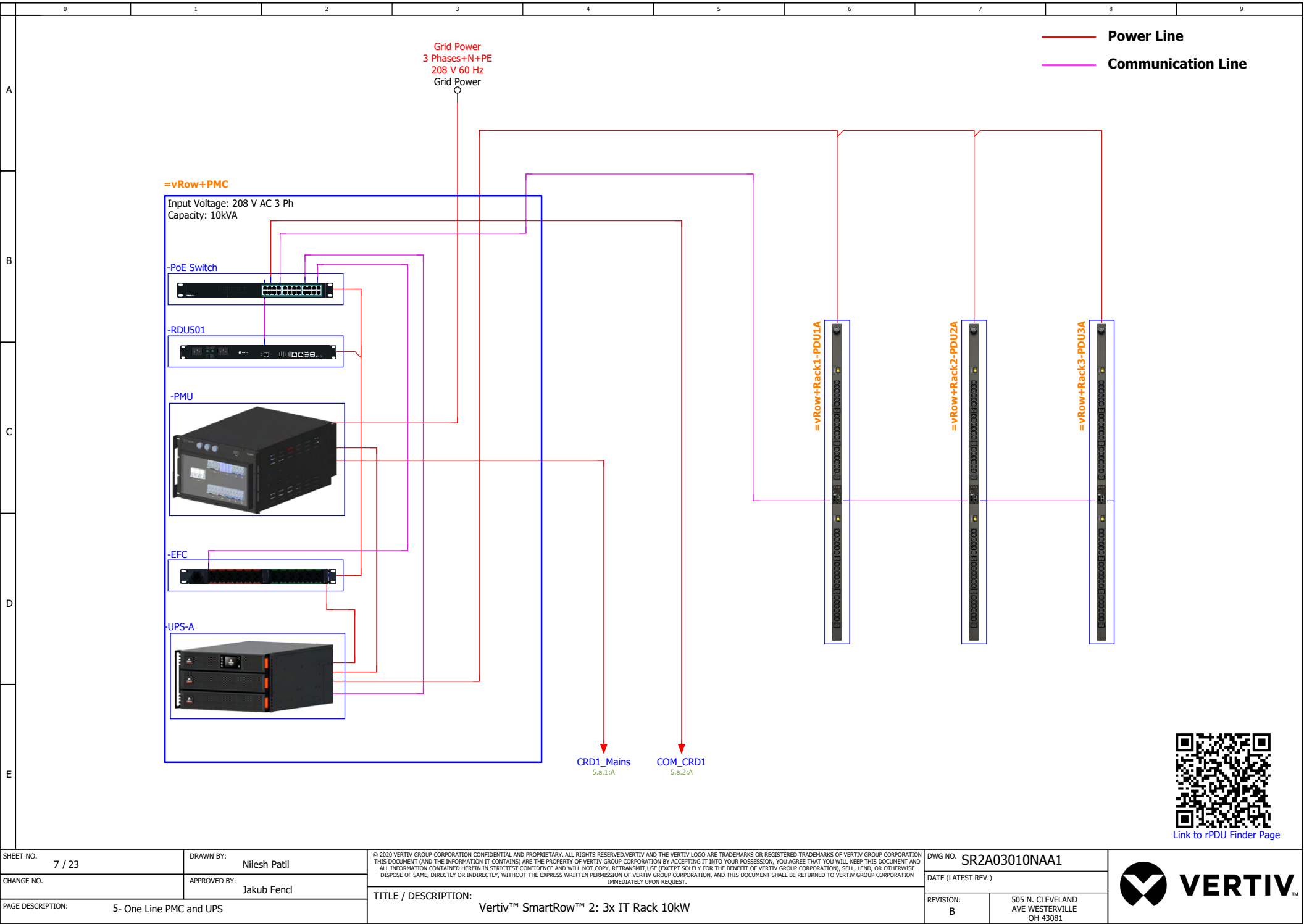
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— Power Line  
 — Communication Line

=vRow+PMC

Input Voltage: 208 V AC 3 Ph  
 Capacity: 10kVA

-PoE Switch

-RDU501

-PMU

-EFC

-UPS-A

=vRow+Rack1-PDU1A

=vRow+Rack2-PDU2A

=vRow+Rack3-PDU3A

CRD1\_Mains  
5.a.1:A

COM\_CRD1  
5.a.2:A



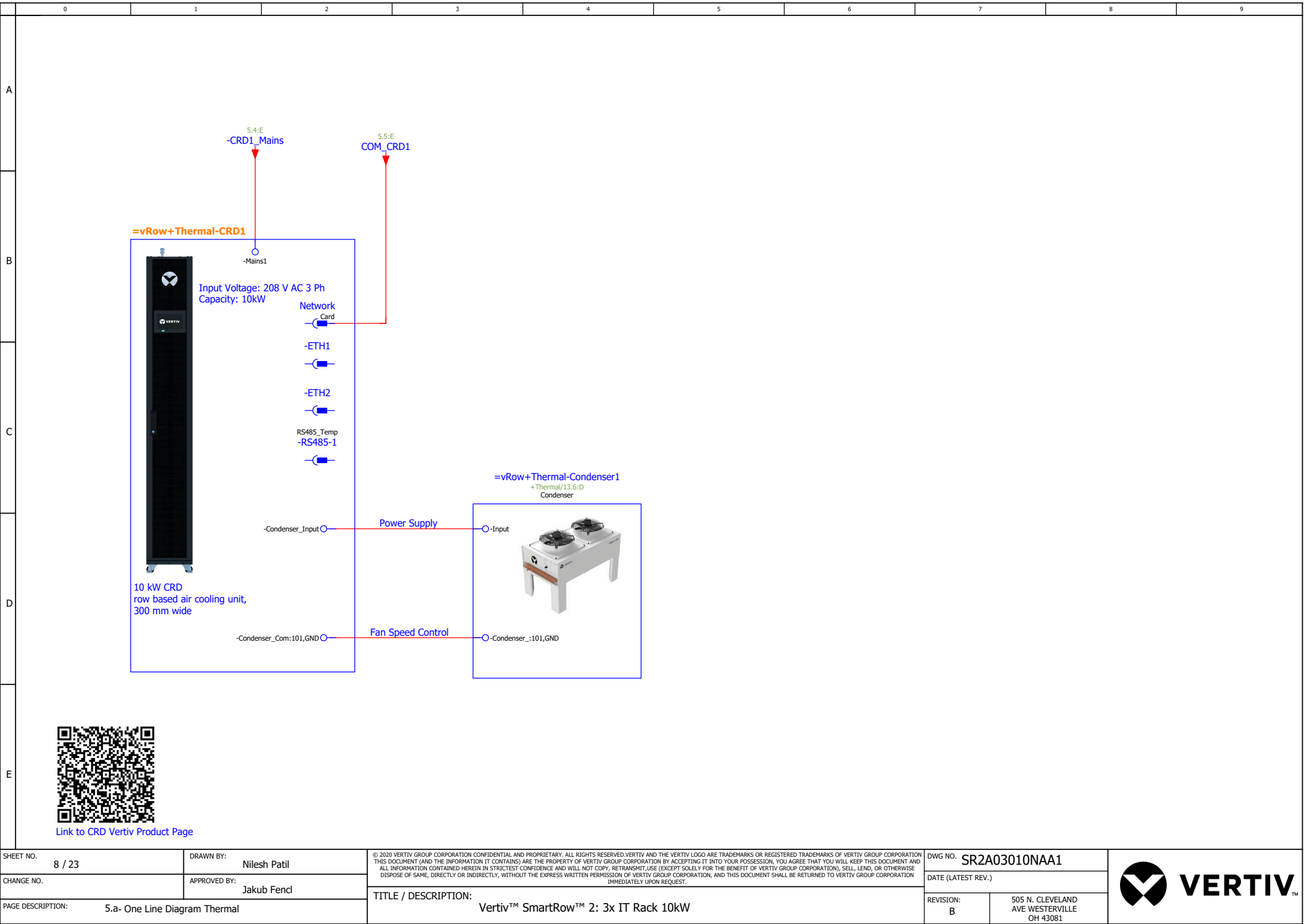
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[Link to CRD Vertiv Product Page](#)

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# Cable overview

Cable type	Function text	Device tag	Conductors	Cross-section (AWG)	Length (m)
Smart door lock cascade	PMC to RACK1 power cascade cable	+PMC-W201	2	22	0.85
	RACK1 to RACK2 power cascade cable	+Rack1-W201	2	22	0.85
	RACK2 to RACK3 power cascade cable	+Rack2-W201	2	22	0.85
	RACK3 to CRD1 power cascade cable	+Rack3-W202	2	22	0.85
Communication cable	PMU to 4DI SPD communication network cable	+PMC-PMU-W104	1		1.7
	PMU to RDU501 COM3 meter communication network cable	+PMC-PMU-W105	1		1.8
	PMU to RDU501 D02 Control Red Light Cable	+PMC-PMU_LED Control-W102	1		1.8
	PMU to RDU501 DO1 Strobe siren control cable	+PMC-PMU_LED Control-W103	1		
	PMC to RDU501_COM1 intelligent door lock front door com. cable	+PMC-W101	1		0.9
	4DI to RDU501 Sensor2 SPD Communication Network Cable	+PMC-W106	1		0.3
	PMC to RDU501_COM1 intelligent door lock rear door com. cable	+PMC-W107	1		0.9
	RDU501 COM2 to HMI communication cable	+PMC-W108	1		0.8
	PMC to RDU501 to PMC cabinet THD communication cable	+PMC-W109	1		0.7
	FC to Switch communication cable	+PMC-W114	1		0.8
	PDU to Switch communication cable	+Rack1-W115	1		3.5
	PDU1A to PDU2A communication cable	+Rack2-W116	1		3
	PDU2A to PDU3A communication cable	+Rack3-W116	1		3
	CRD1 to Switch communication cable	+Thermal-W110	1		3.5
Emergency fan to FC	Smoke1 to CRV-Door microswitch cable	+Thermal-W401	1		3.5
	PMC Emergency fan to FC controller cable	+PMC-W209	3	18	1.2
	Rack1 Emergency fan to FC controller cable	+Rack1-W208	3	18	4.5
	Rack2 Emergency fan to FC controller cable	+Rack2-W208	3	18	4.5
Front door light cascade	Rack3 Emergency fan to FC controller cable	+Rack3-W208	3	18	5.5
	PMC to Rack1 front door LED light power cable	+PMC-PMU_LED Control-W210	4	20	1
	RACK1 to RACK2 front door LED light cascade cable	+Rack1-W210	4	20	0.75
Front door light cascade	Cascaded cable for the end RACK front door light	+Rack2-W211	4	20	0.75
	Front door microswitch cascade	PMC to RACK1 front door microswitch cascade cable	+PMC-PMU_LED Control-W212	2	20

Please note: Always when "conductor" = 1, or "Cross-section" is empty, it represents a network/communication cable.

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# Cable overview

Cable type	Function text	Device tag	Conductors	Cross-section (AWG)	Length (m)
Front door microswitch cascade	RACK1 to RACK2 front door microswitch cascade cable	+Rack2-W212	2	20	0.75
	Cascade cable for the end RACK front door microswitch	+Rack3-W213	2	20	0.75
Interconnection CRV/Condenser	Fan speed control	+Thermal-WB1	2	22	
Power Cable	CRD to condensor power cable	+Thermal-WA1	3	16	
Power cable	PMU to PMC rear door LED light power cable	+PMC-PMU_LED Control-W07	2	20	1.2
	PMU to PMC front door LED light power cable	+PMC-PMU_LED Control-W09	4	20	1.75
	PMU to PMC front door microswitch power cable	+PMC-PMU_LED Control-W11	2	20	1.25
	PMU to PMC rear door microswitch power cable	+PMC-PMU_LED Control-W12	2	20	1.25
	PMU to UPS-A input cable	+PMC-W01	4	6	2.4
	UPS-A to PMU output cable	+PMC-W03	3	20	0.8
	PMU to CRD1 output cable	+PMC-W05	4	12	1.5
	PMU to PMC intelligent door lock power cable	+PMC-W06	2	22	0.85
Rear door light cascade	PMU to HMI power cable	+PMC-W08	2	22	2.2
	PMC to Rack1 rear door LED light power cable	+PMC-PMU_LED Control-W216	2	20	1
	RACK1 to RACK2 rear door LED light power cable	+Rack1-W216	2	20	0.75
Rear door microswitch cascade	Cascading cable for rear door light of the end RACK	+Rack2-W217	2	20	0.75
	PMC to RACK1 rear door microswitch cascade cable	+PMC-PMU_LED Control-W214	2	20	0.75
	RACK1 to RACK2 rear door microswitch cascade cable	+Rack2-W214	2	20	0.75
	Cascade cable for rear door microswitch of end RACK	+Rack2-W215	2	20	0.75
Smart door lock cascade	=	+Rack3-W215	2	20	0.75
	RACK1 to RACK2 communication cascade cables	+Rack1-W205	1		0.85
	RACK2 to RACK3 communication cascade cables	+Rack2-W205	1		0.85
THD cascading	RACK3 to CRD1 communication cascade cables	+Rack3-W206	1		0.85
	PMC to RACK1 Cascade Cable	+PMC-W207	1		2
	RACK1 to RACK2 Cascade Cable	+Rack1-W207	1		
	RACK2 to RACK3 Cascade Cable	+Rack2-W207	1		

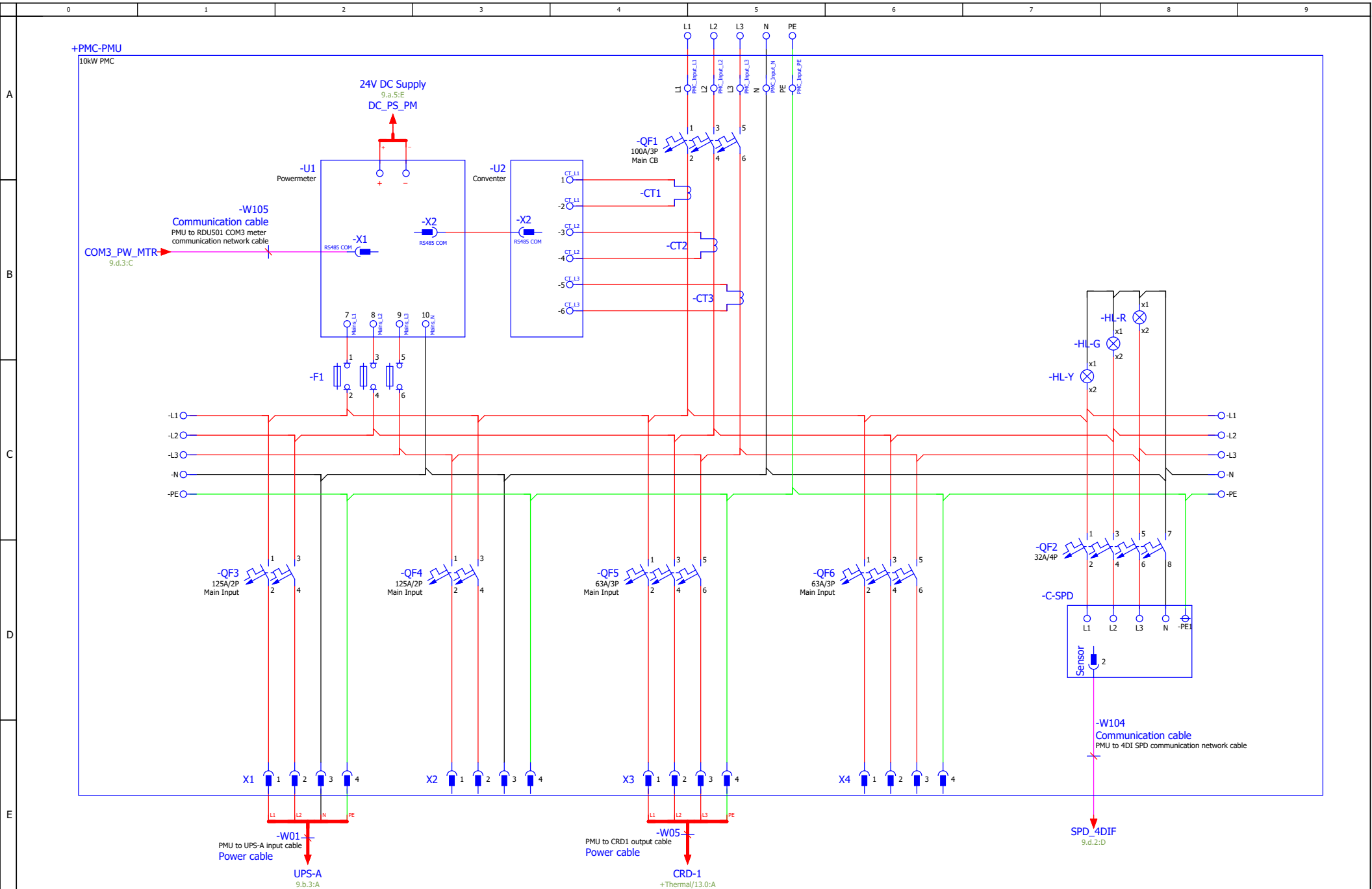
Please note: Always when "conductor" = 1, or "Cross-section" is empty, it represents a network/communication cable.

SHEET NO. 12 / 23	DRAWN BY: Nilesh Patil
CHANGE NO.	APPROVED BY: Jakub Fenc
PAGE DESCRIPTION: 8.a- Cable overview : =vRow+Rack2-W212 - =vRow+Rack2-W207	

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TITLE / DESCRIPTION: Vertiv™ SmartRow™ 2: 3x IT Rack 10kW

DWG NO. SR2A03010NAA1
DATE (LATEST REV.)
REVISION: B
505 N. CLEVELAND AVE WESTERVILLE OH 43081



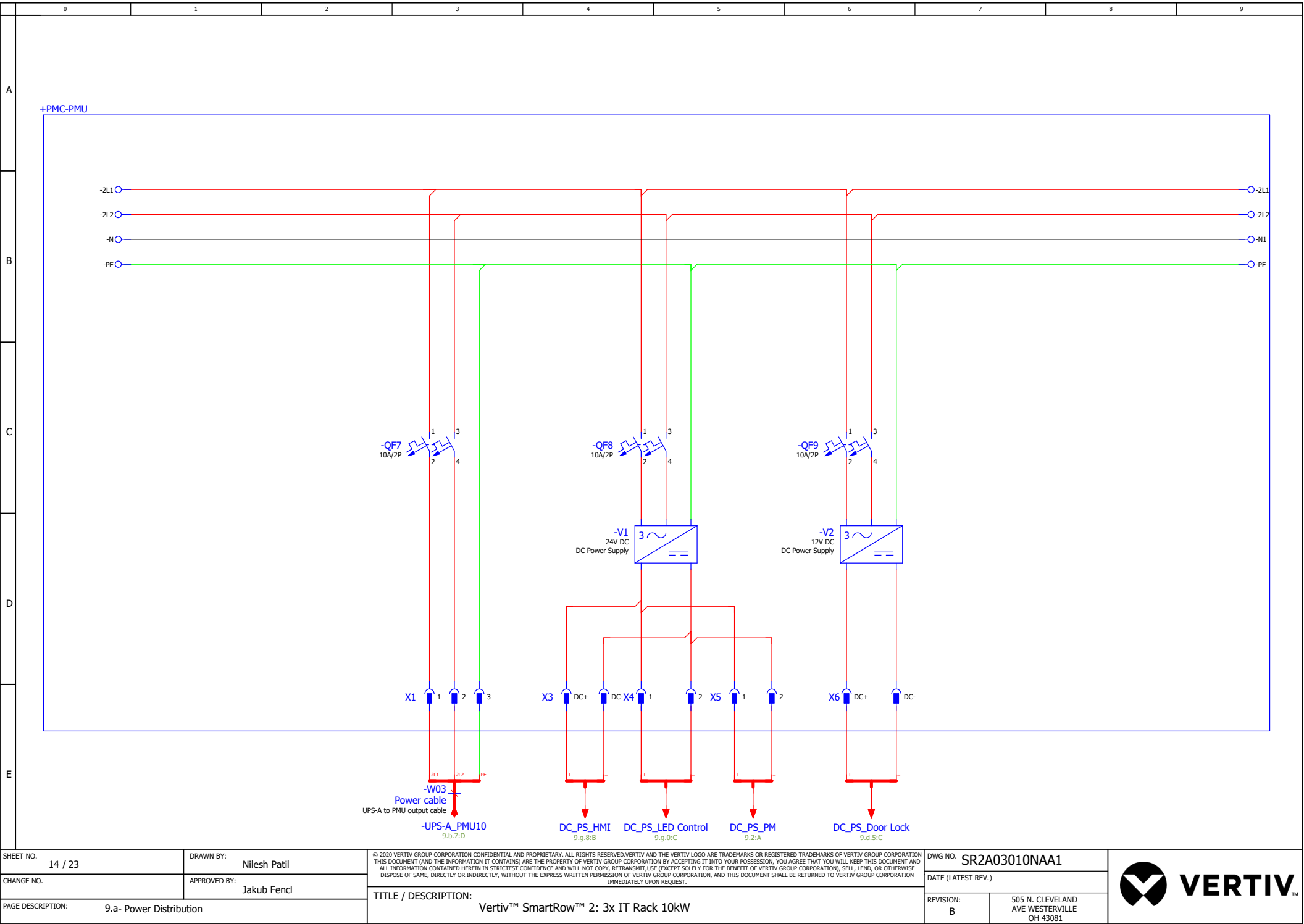


SHEET NO. 13 / 23	DRAWN BY: Nilesh Patil
CHANGE NO.	APPROVED BY: Jakub Fenc
PAGE DESCRIPTION: 9- PMU Power Distribution	

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SHEET NO. 14 / 23	DRAWN BY: Nilesh Patil
CHANGE NO.	APPROVED BY: Jakub Fenc
PAGE DESCRIPTION: 9.a- Power Distribution	

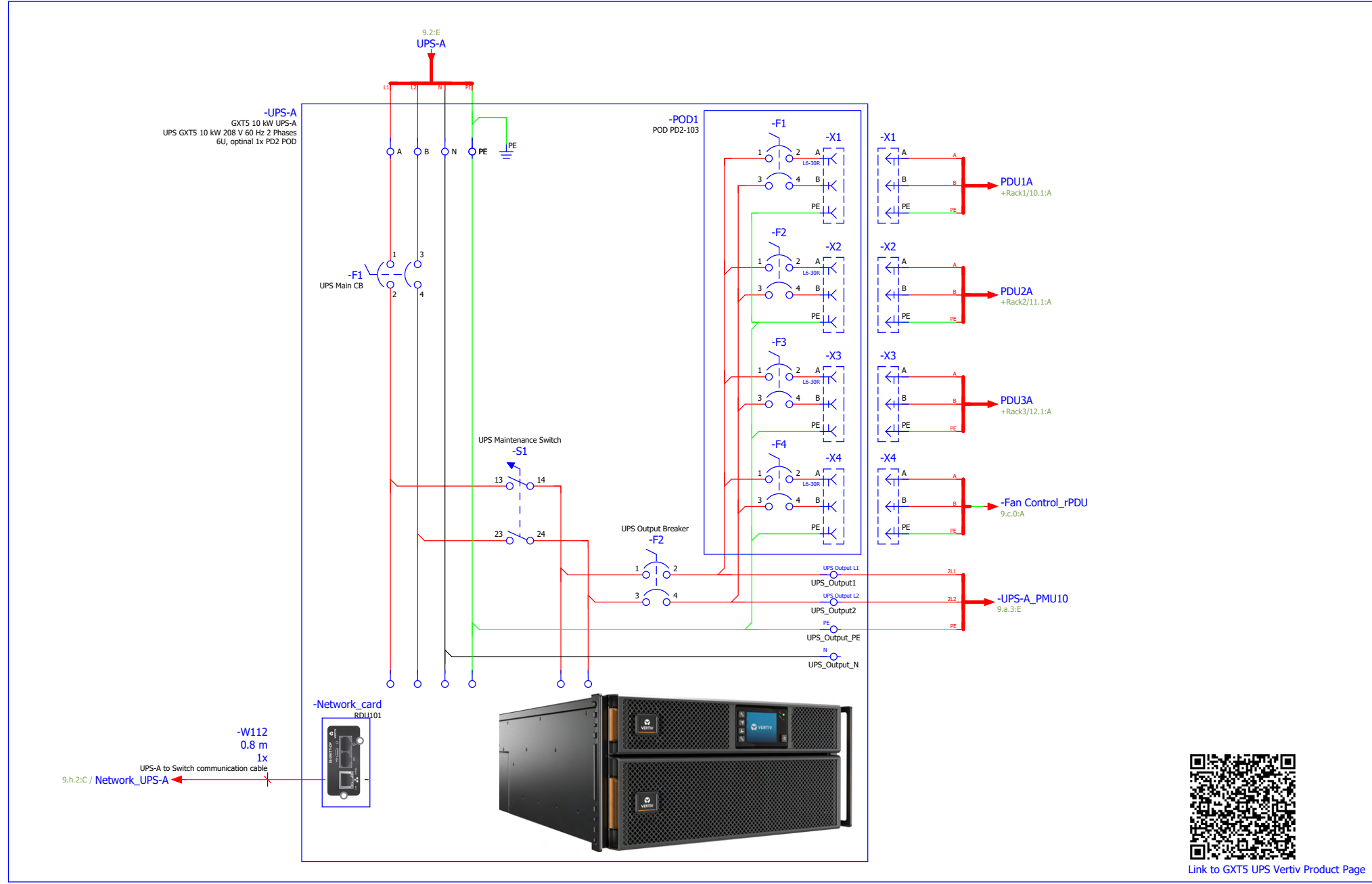
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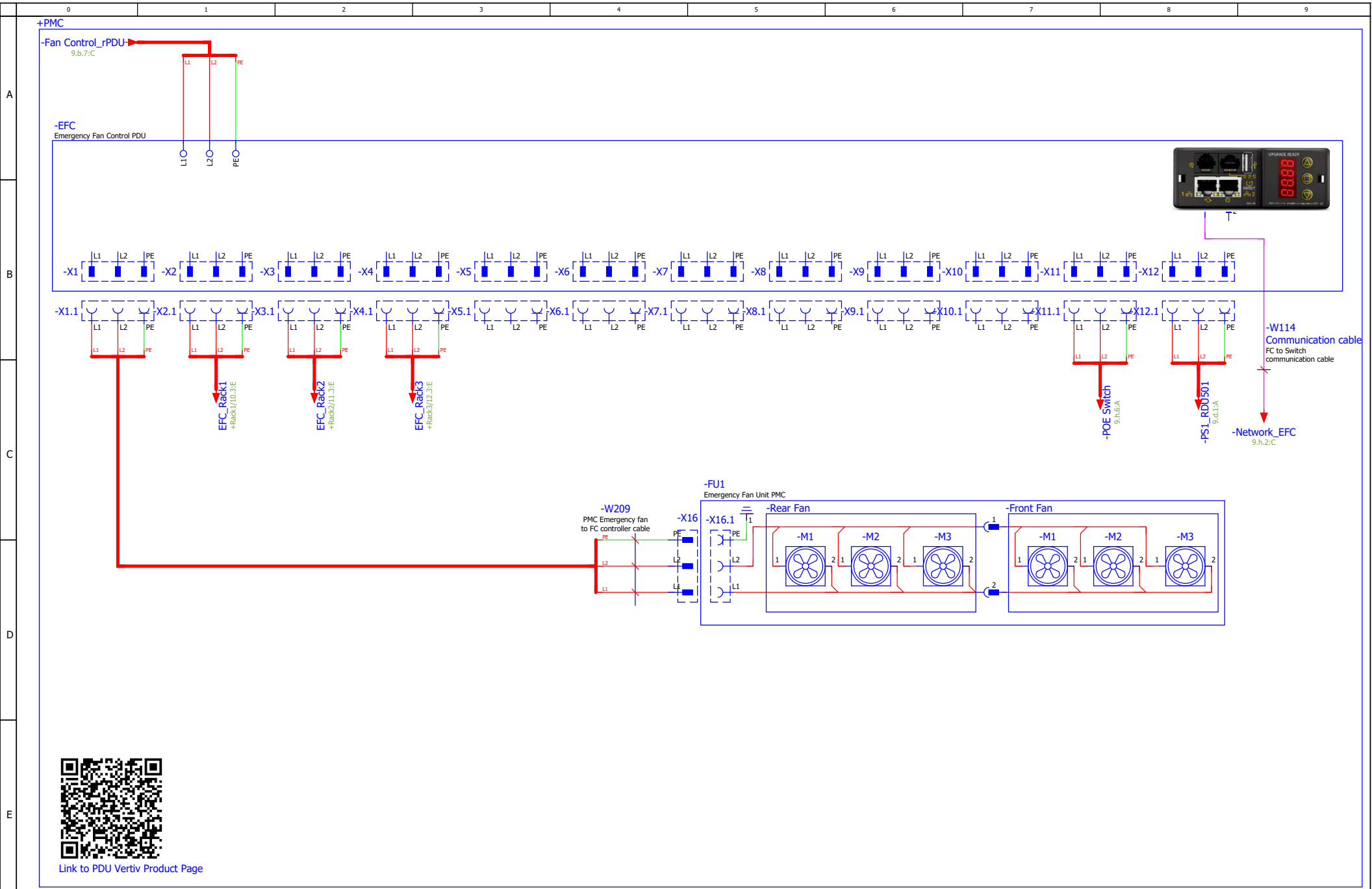
[Link to GXT5 UPS Vertiv Product Page](#)

SHEET NO.	15 / 23	DRAWN BY:	Nilesh Patil
CHANGE NO.		APPROVED BY:	Jakub Fenc
PAGE DESCRIPTION:	9.b- GXT5 10k-A		

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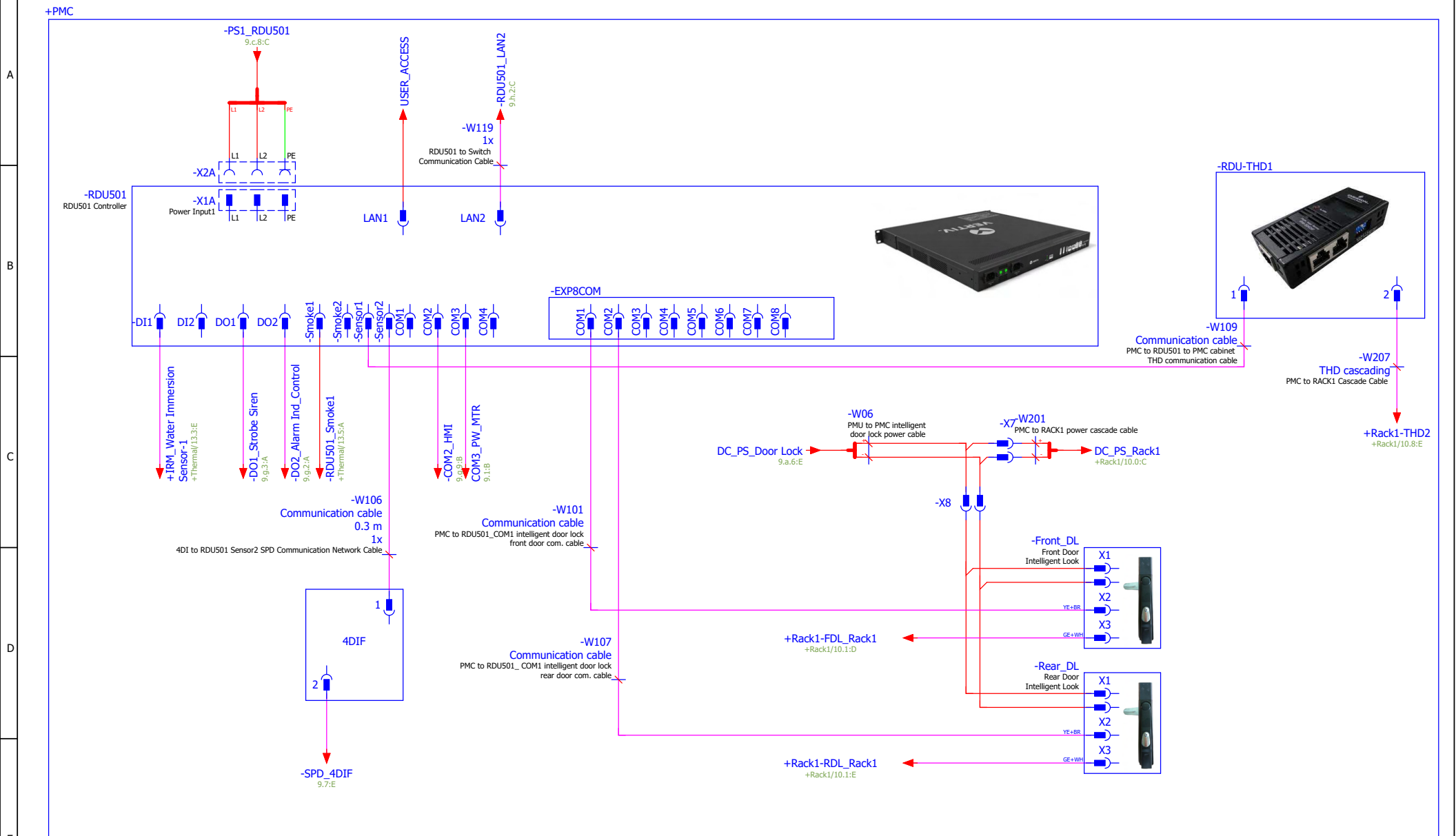
[Link to PDU Vertiv Product Page](#)

SHEET NO. 16 / 23	DRAWN BY: Nilesh Patil
CHANGE NO.	APPROVED BY: Jakub Fenc
PAGE DESCRIPTION: 9.c- Emergency Fan Control	

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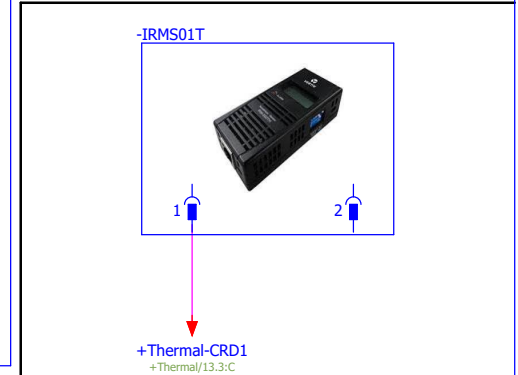
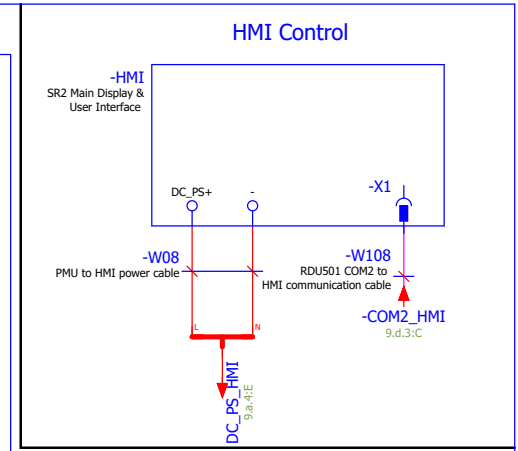
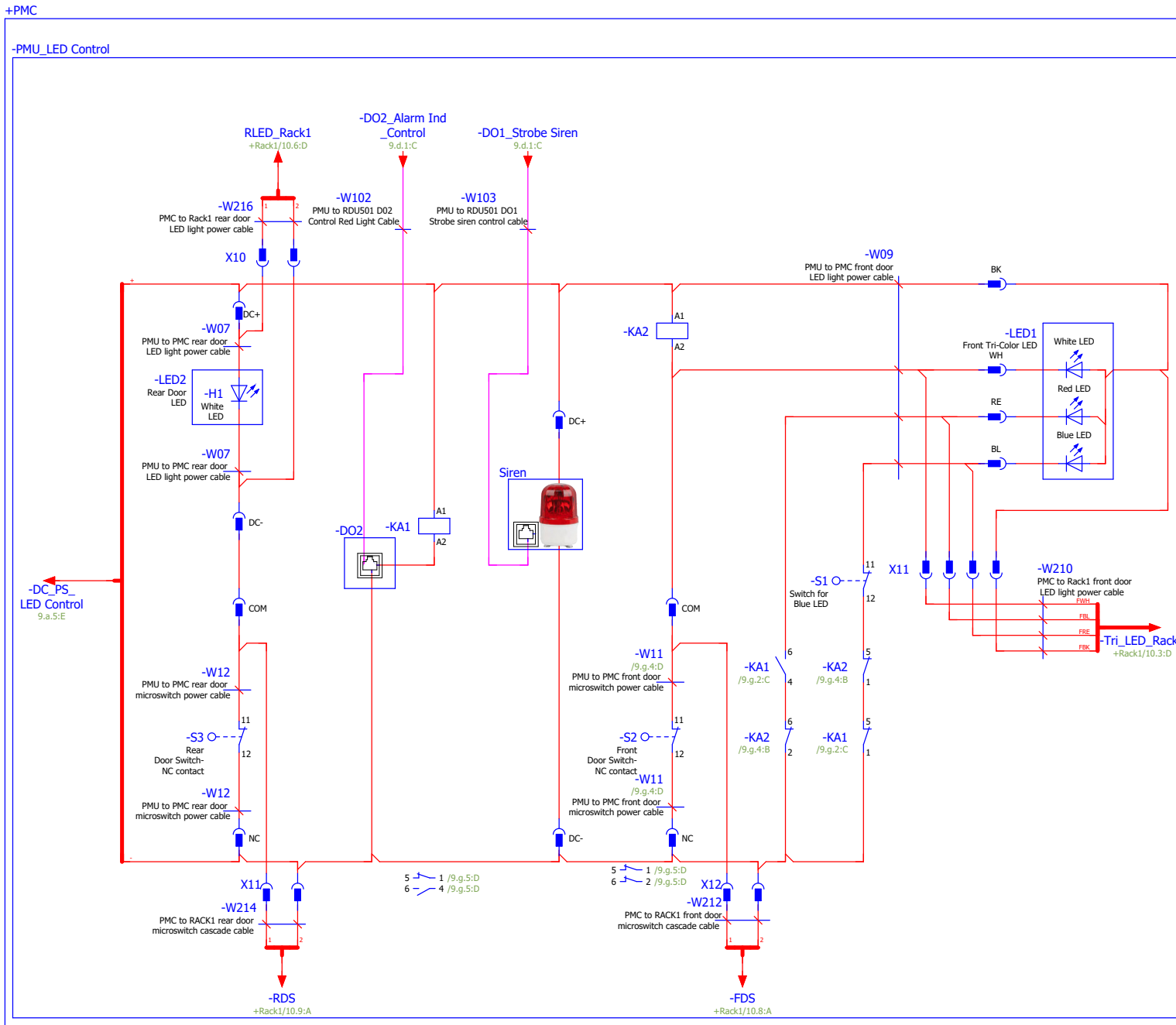


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CHANGE NO.		APPROVED BY:	Jakub Fenc
PAGE DESCRIPTION:	9.d. RDU501		

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CHANGE NO.		APPROVED BY:	Jakub Fenc
PAGE DESCRIPTION:	9.g. PMC Logic		

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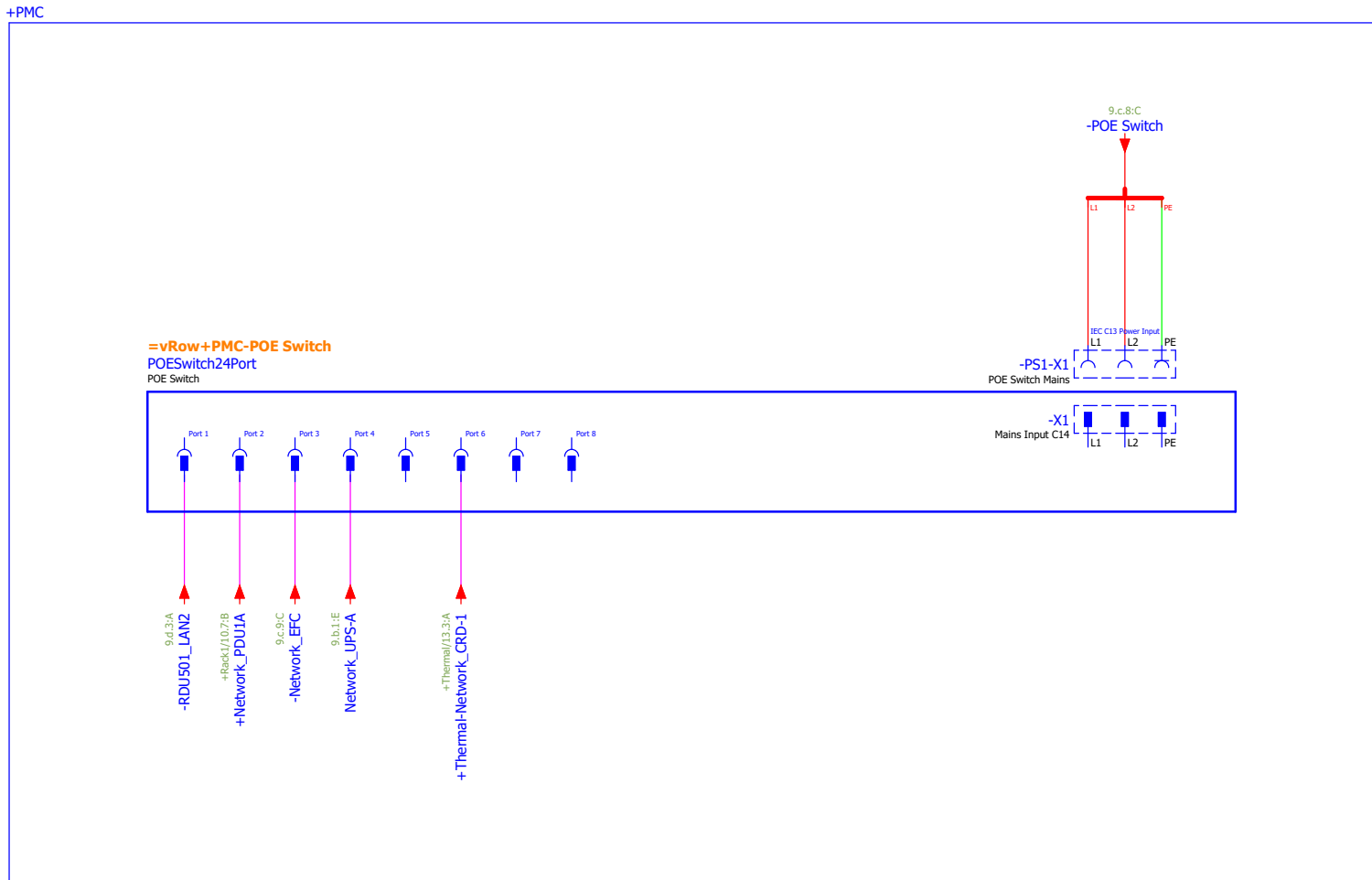
A

B

C

D

E



SHEET NO. 19 / 23	DRAWN BY: Nilesh Patil
CHANGE NO.	APPROVED BY: Jakub Fenc
PAGE DESCRIPTION: 9.h- POE Switch	

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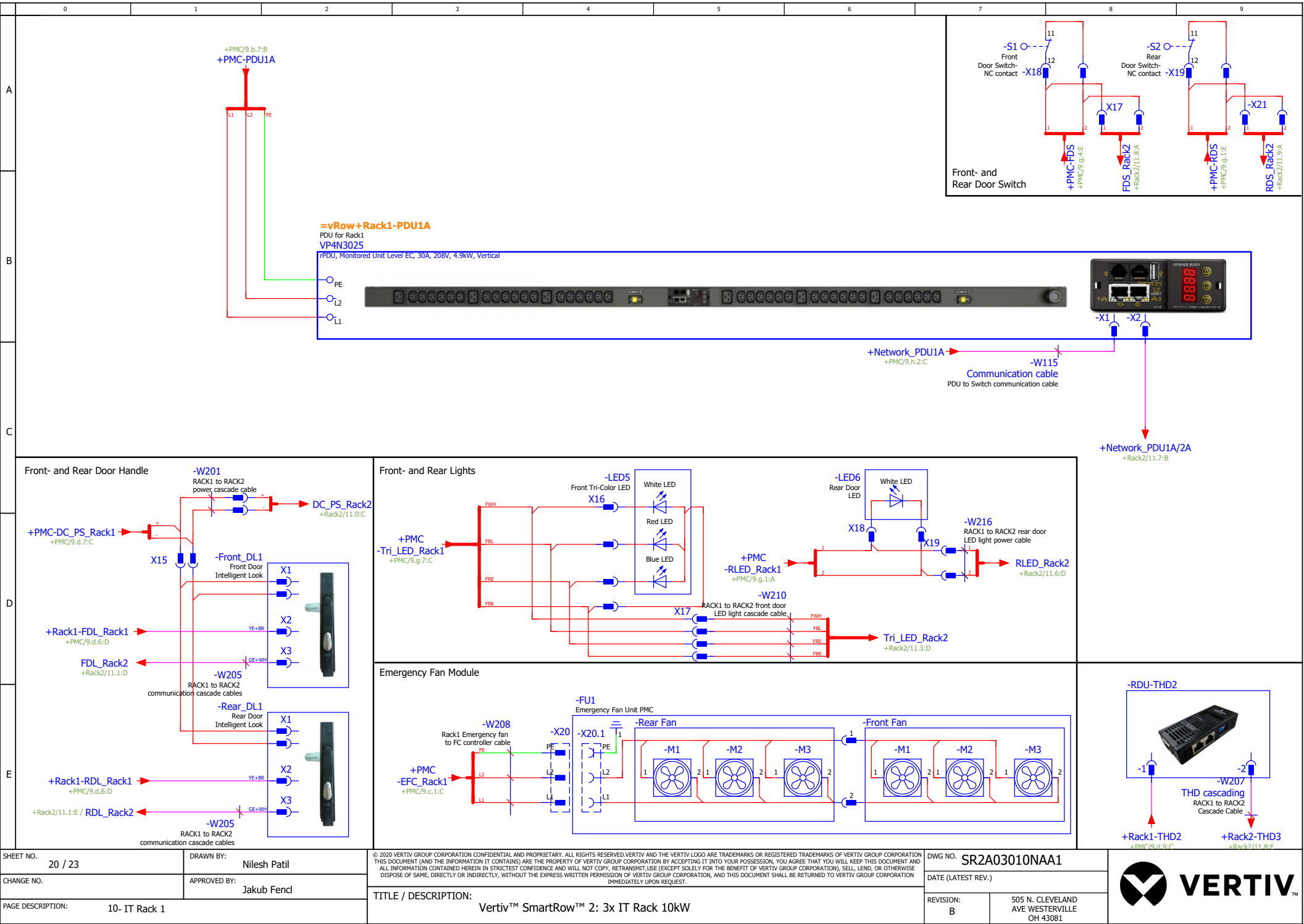
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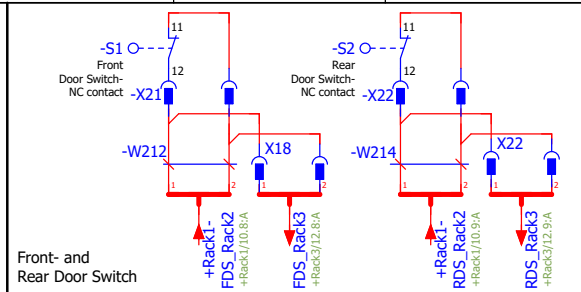
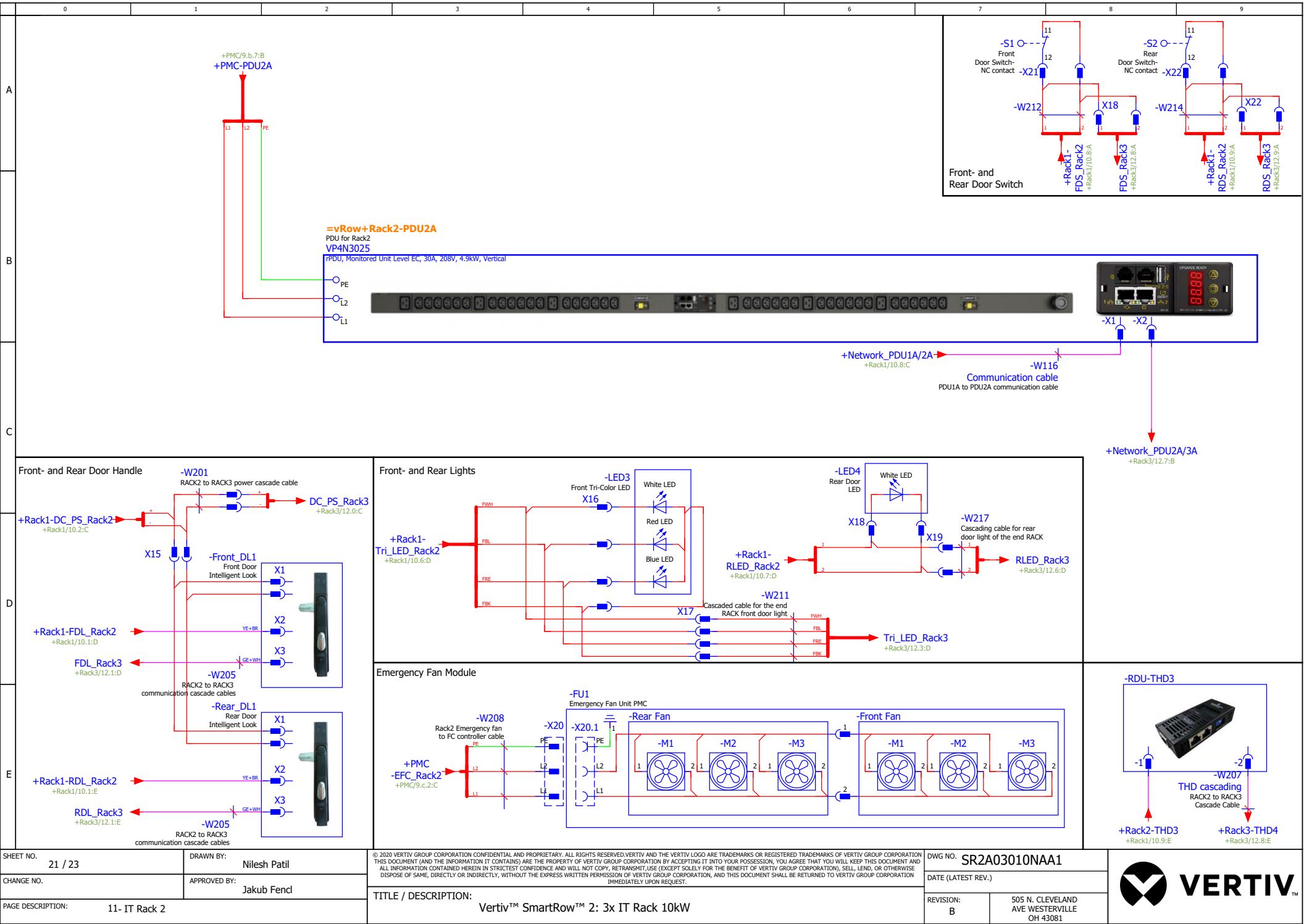


SHEET NO.	20 / 23	DRAWN BY:	Nilesh Patil
CHANGE NO.		APPROVED BY:	Jakub Fenc
PAGE DESCRIPTION:	10- IT Rack 1		

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**=vRow+Rack2-PDU2A**  
 PDU for Rack2  
 VP4N3025  
 PDU, Monitored Unit Level EC, 30A, 208V, 4.9kW, Vertical



SHEET NO.	21 / 23	DRAWN BY:	Nilesh Patil
CHANGE NO.		APPROVED BY:	Jakub Fenc
PAGE DESCRIPTION:	11- IT Rack 2		

TITLE / DESCRIPTION: Vertiv™ SmartRow™ 2: 3x IT Rack 10kW

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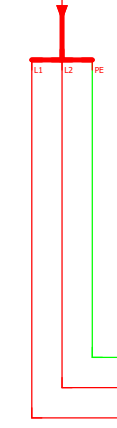
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C

D

E

+PMC/9.b.7:C  
+PMC-PDU3A



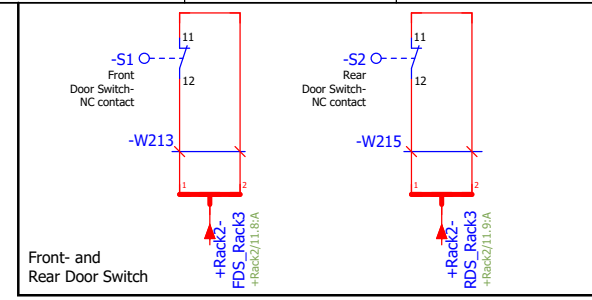
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PDU for Rack3  
VP4N3025

PDU, Monitored Unit Level EC, 30A, 208V, 4.9kW, Vertical

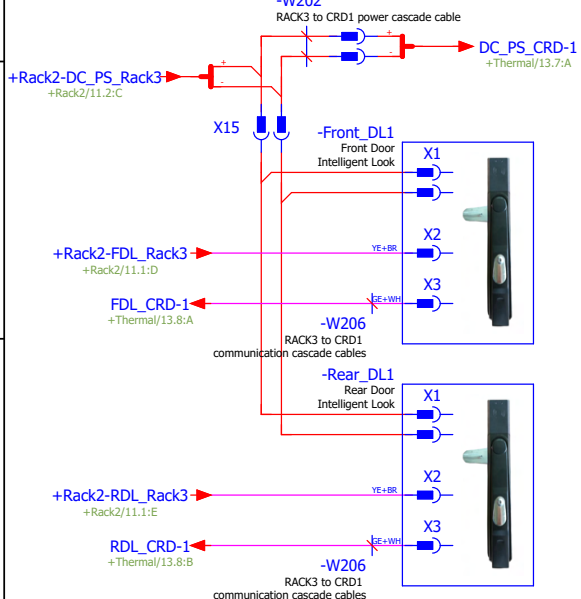


+Network\_PDU2A/3A  
+Rack2/11.8:C

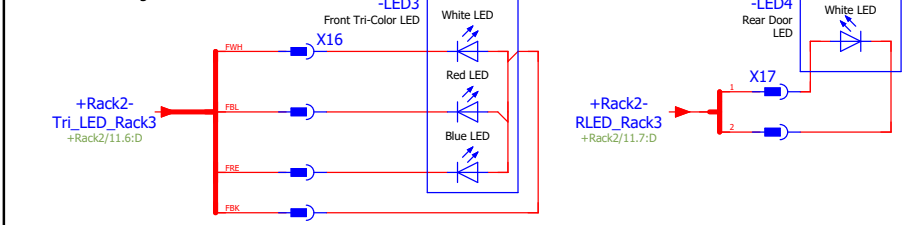
-W116  
Communication cable  
PDU2A to PDU3A communication cable



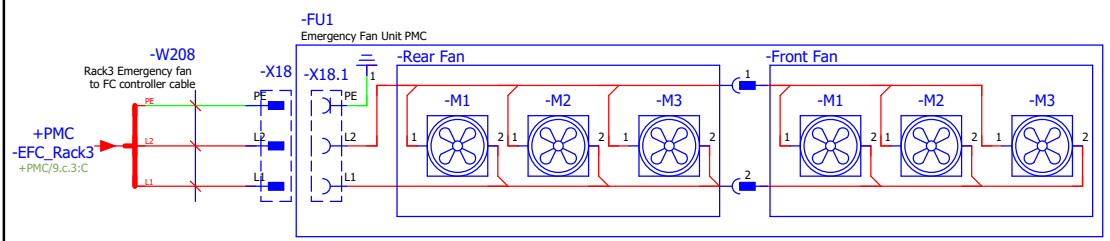
Front- and Rear Door Handle



Front- and Rear Lights



Emergency Fan Module



-RDU-THD4



+Rack3-THD4  
+Rack2/11.9:E

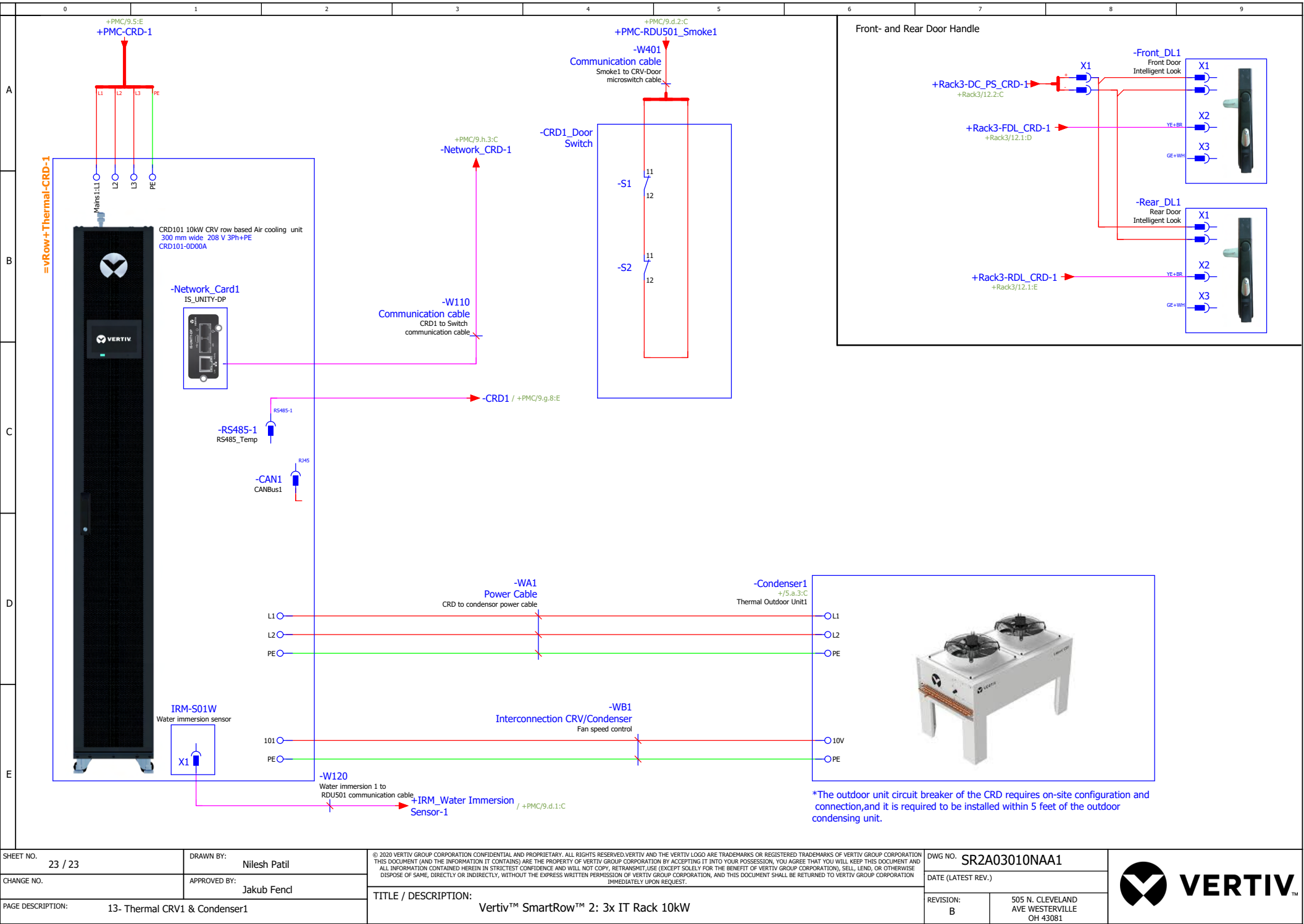
SHEET NO. 22 / 23	DRAWN BY: Nilesh Patil
CHANGE NO.	APPROVED BY: Jakub Fenc
PAGE DESCRIPTION: 12- IT Rack 3	

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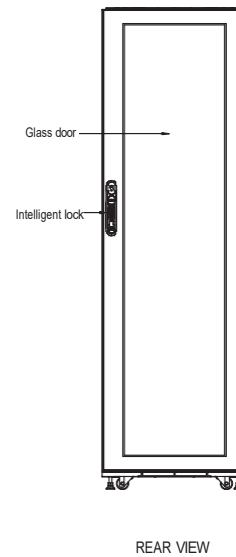
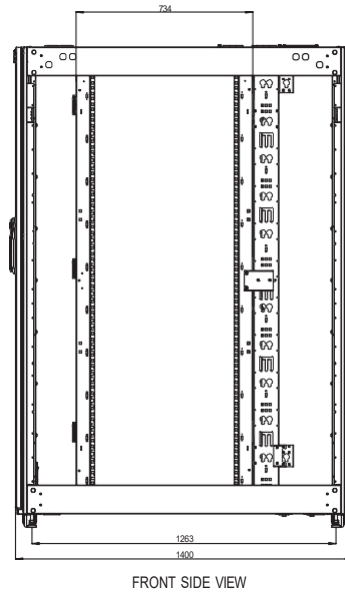
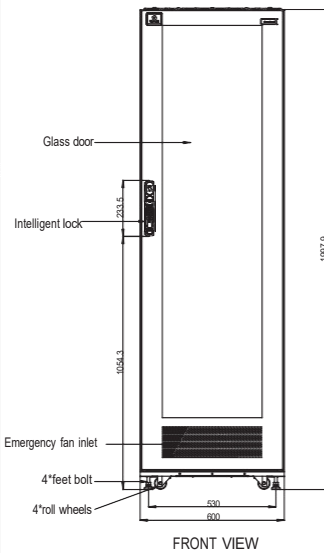
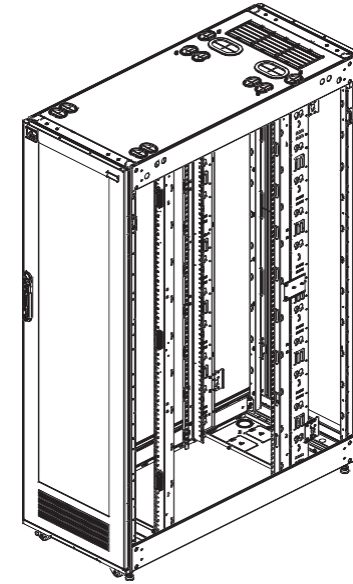
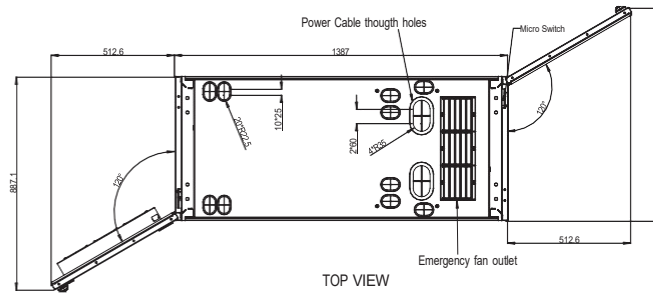


SHEET NO.	23 / 23	DRAWN BY:	Nilesh Patil
CHANGE NO.		APPROVED BY:	Jakub Fenc
PAGE DESCRIPTION:	13- Thermal CRV1 & Condenser1		

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B	





- NOTES:
1. ALL DIMENSIONS ARE IN MM
  2. FRONT AND REAR DOOR WITH THE GLASS AND INTELLIGENT LOCKS.
  3. SWING RADIUS OF 120° (FRONT AND REAR DOORS).
  4. EACH RACK HAS FOUR FEET 40LT AND ROLL WHEELS;
  5. ON THE BOTTOM FRONT DOOR SIDE, THERE IS A EMERGENCY FAN UNIT(3 FANS); ON THE TOP OF REAR DOOR SIDE, THERE IS A EMERGENCY FAN UNIT(3 FANS);
  6. ON THE TOP FRONT FRAME SIDE, THERE IS A TRI COLOR LED AND MICRO SWITCH; ON THE TOP REAR FRAME SIDE, THERE IS A WHITE COLOR LED AND MICRO SWITCH.

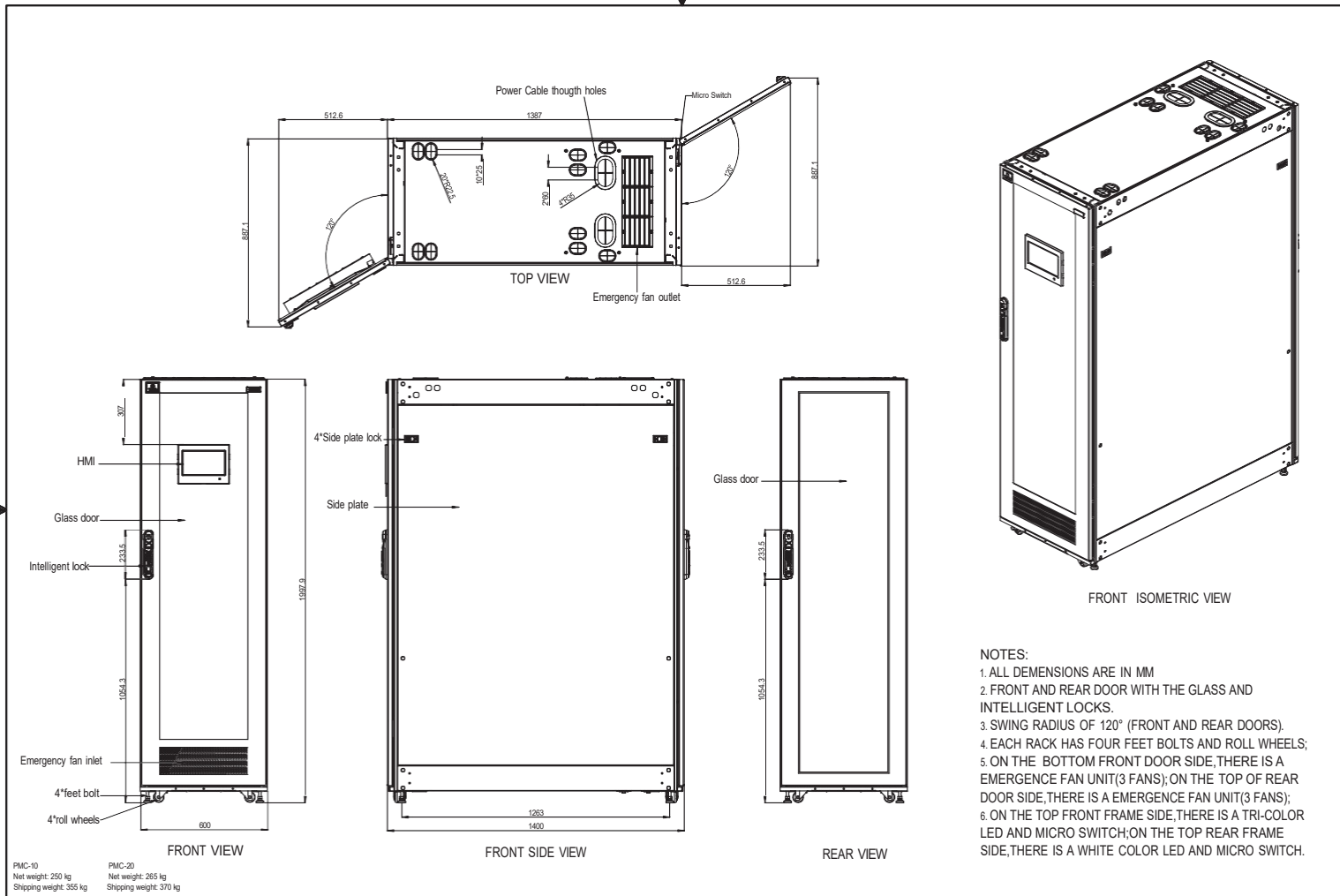
Net weight: 150 kg  
Shipping weight: 250 kg

SHEET NO.	DRAWN BY:
1 OF 1	Terry
CD. NO.	DESIGNED BY:
-	
REF DWG.	APPROVED BY:
-	

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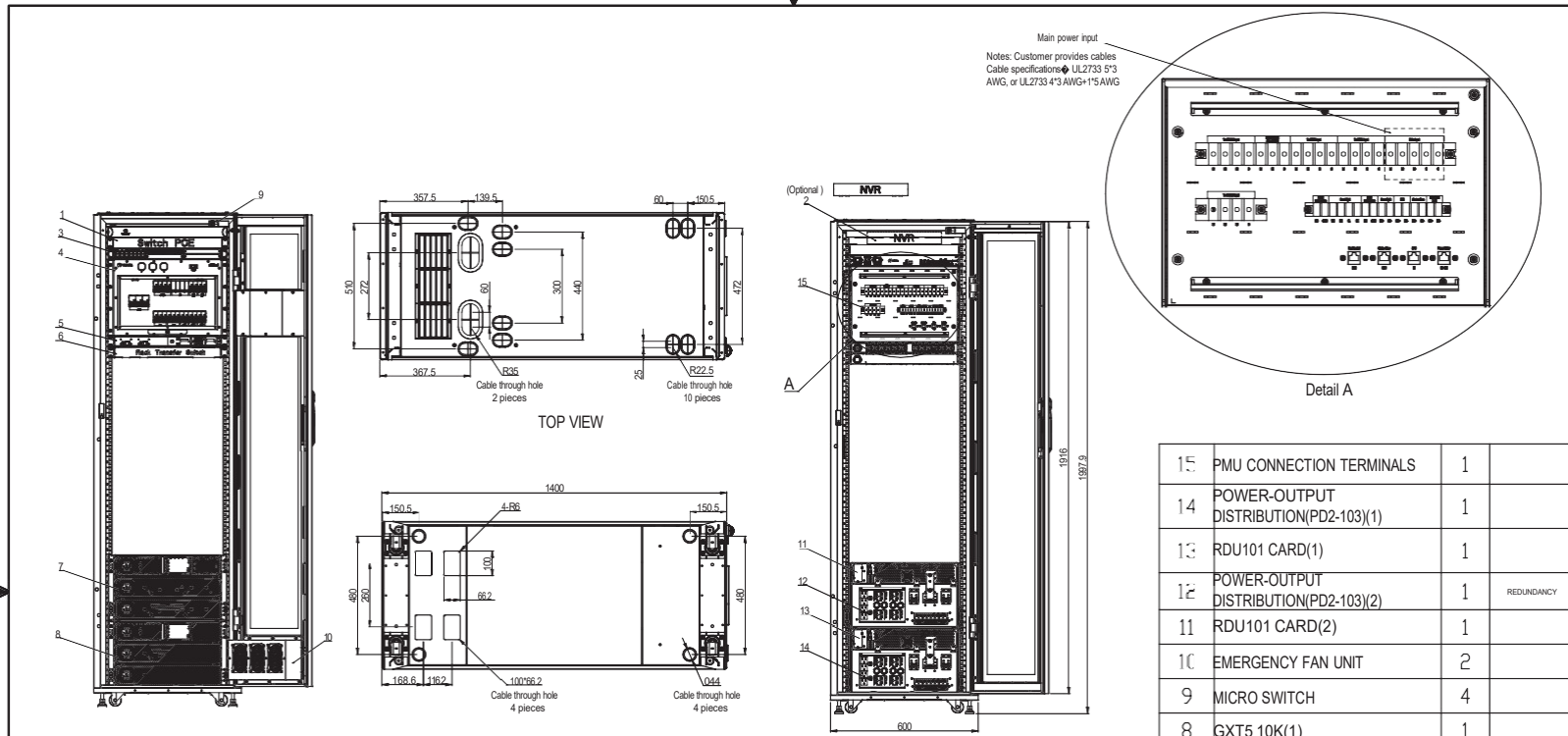


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1 OF 1	Terry
CD. NO.	DESIGNED BY:
-	
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DWG. NO.	MSR2-PMC
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REVISION	505 N. CLEVELAND AVE WESTERVILLE, OHIO 43082





- NOTES:
- POWER REDUNDANCY FOR PMC10
  - FAN CONTROLLER IS A GU2.0 GEIST PDU WITH UNIT LEVEL MONITORING,HORIZONTAL (12) COMBINATION C13/C19.OUTLET 1-6 IS ONLY FOR FAN POWER SUPPLY,THE OTHERS IS FOR RDU501/NVR/POE SWITCH POWER SUPPLY.
  - THE POWER-OUTPUT DISTRIBUTION(PD2-103) INSTALLED IN GXT5 UPS,WHICH WILL PROVIDE POWER FOR RACK PDU AND FAN CONTROLLER.
  - THE GXT5 UPS INTEGRATS THE INTERNAL BATTERY,BUT NEED INSTALL ON SITE.
  - ON THE TOP FRONT FRAME SIDE,THERE IS A TRI-COLOR LED AND MICRO SWITCH;ON THE TOP REAR FRAME SIDE,THERE IS A WHITE COLOR LED AND MICRO SWITCH.ONE MICROSWITCH IS FOR DETECTING THE DOOR STATUS,THE OTHER ONE IS FOR CONTROL LED(DOOR IS OPNE,THE LED WHITE IS ON).
  - RACK TRANSFER SWITCH IS AN AUTO SWITCHING -IN EVEBR OF POWER FAILURE. ENSURE CONTINUOUS FC POWER SUPPLY.

INSTALLED WEIGHT: 525 Ng

15	PMU CONNECTION TERMINALS	1	
14	POWER-OUTPUT DISTRIBUTION(PD2-103)(1)	1	
13	RDU101 CARD(1)	1	
12	POWER-OUTPUT DISTRIBUTION(PD2-103)(2)	1	REDUNDANCY
11	RDU101 CARD(2)	1	
10	EMERGENCY FAN UNIT	2	
9	MICRO SWITCH	4	
8	GXT5 10K(1)	1	
7	GXT5 10K(2)	1	REDUNDANCY
6	RACK TRANSFER SWITCH	1	
5	FAN CONTROLLER	1	
4	PMU-10	1	
3	RDU501	1	
2	NVR	1	Optional
1	POE SWITCH	1	
NO.	NAME	4t	REMARK

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2

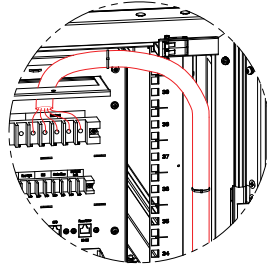
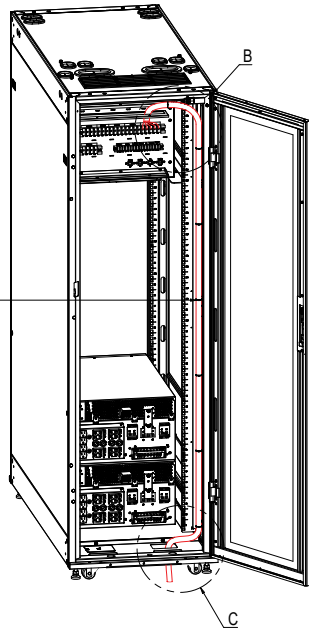
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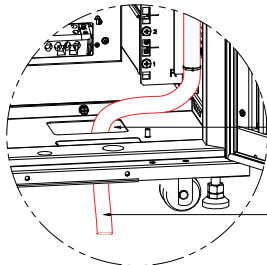
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A

A



Detail B



PMC bottom panel cable entry hole

The main input cable

Detail C

NOTES:

When the main input cable enters the PMC from the bottom panel cable entry hole, it is bundled along the cable management board and connected to the PMU

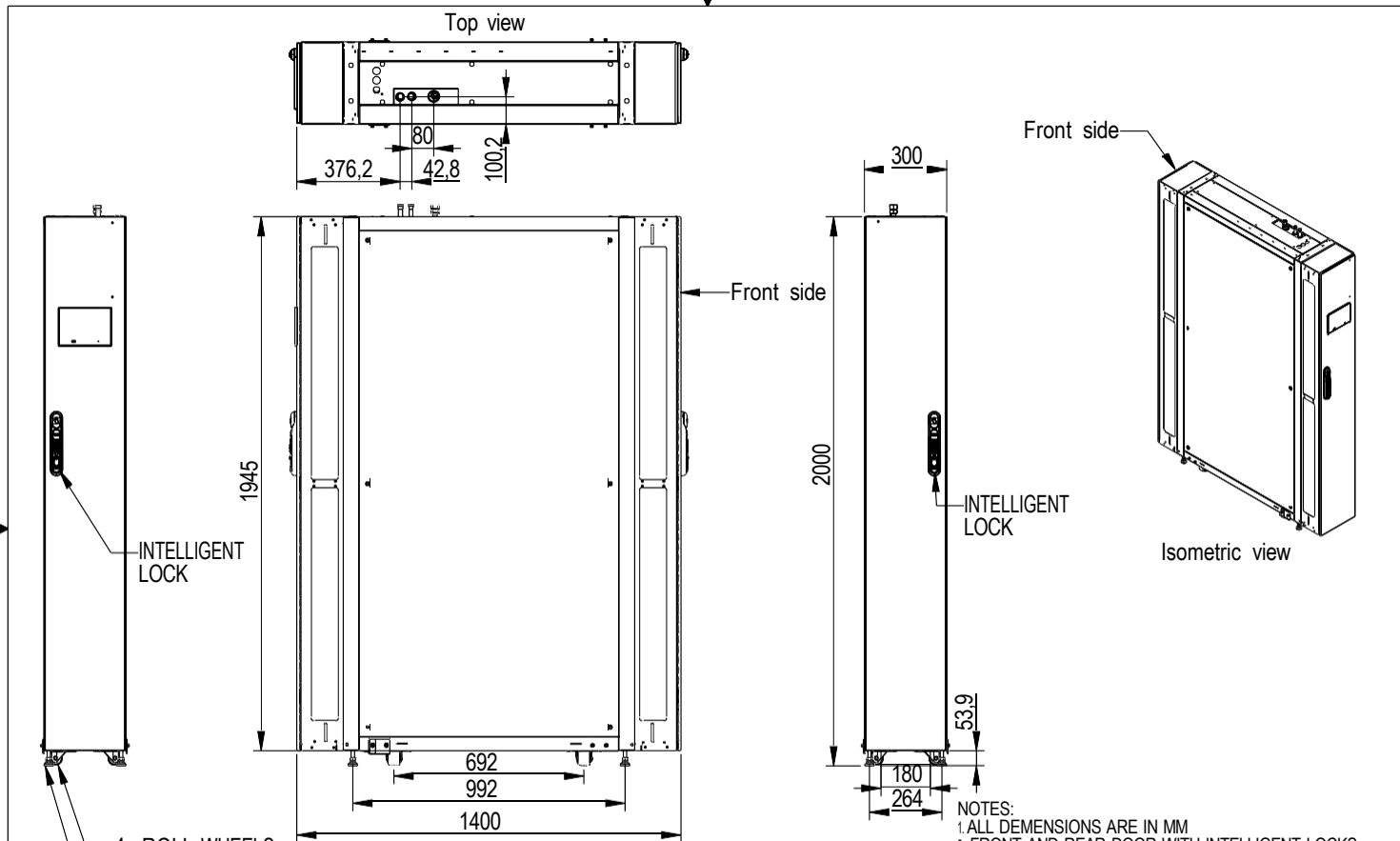
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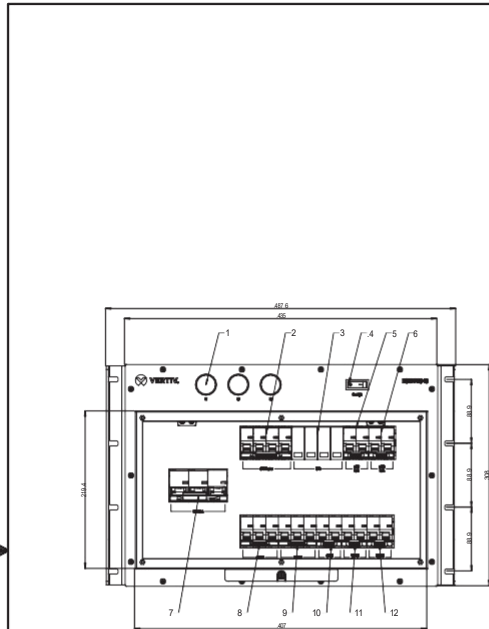
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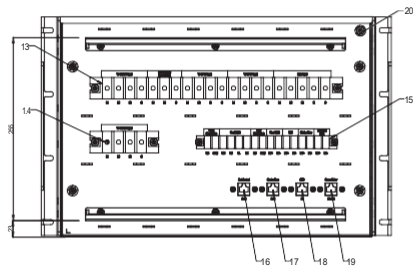


- NOTES:
1. ALL DIMENSIONS ARE IN MM
  2. FRONT AND REAR DOOR WITH INTELLIGENT LOCKS.
  3. SWING RADIUS OF 120° (FRONT AND REAR DOORS).
  4. EACH RACK HAS FOUR FEET BOLT AND ROLL WHEELS.
  5. FRONT AND REAR DOOR WITH DOOR SENSOR.
  6. WEIGHT 280Kg

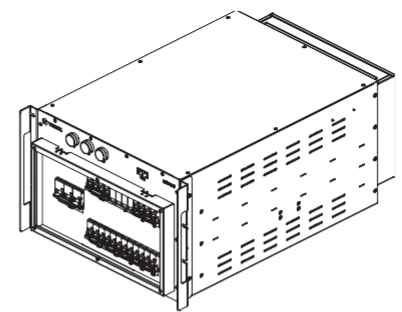
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TITLE CRD10 WITH PLENUM			



FRONT VIEW



REAR VIEW  
(PMU COVER REMOVED)



FRONT ISOMETRIC VIEW

20	GROUND SCREWS	1	
19	POWER METER RS.485(RJ.45)	1	
18	SPD DI(RJ.45)	1	
17	STOBE SIREN CONTROL DO1(RJ.45)	1	
16	RED CONTROL DO2(RJ.45)	1	
15	DC POWER TERMINAL BLOCKS	1	
14	TO CRV2 POWER TERMINAL BLOCKS	1	
13	POWER TERMINAL BLOCKS	1	
12	24VDC BREAKER	1	
11	12VDC BREAKER	1	
10	AC/DC BREAKER	1	
9	CRV2 BREAKER	1	
8	CRV1 BREAKER	1	
7	MAIN INPUT BREAKER	1	
6	UPS2 INPUT BREAKER	1	
5	UPS1 INPUT BREAKER	1	
4	BOATLIKE SWITCH FOR BLUE LIGHT	1	
3	SPD	1	
2	SPD BREAKER	1	
1	POWER LIGHT(L1/L2/L3)	3	
NO	NAME	Qty	REMARK

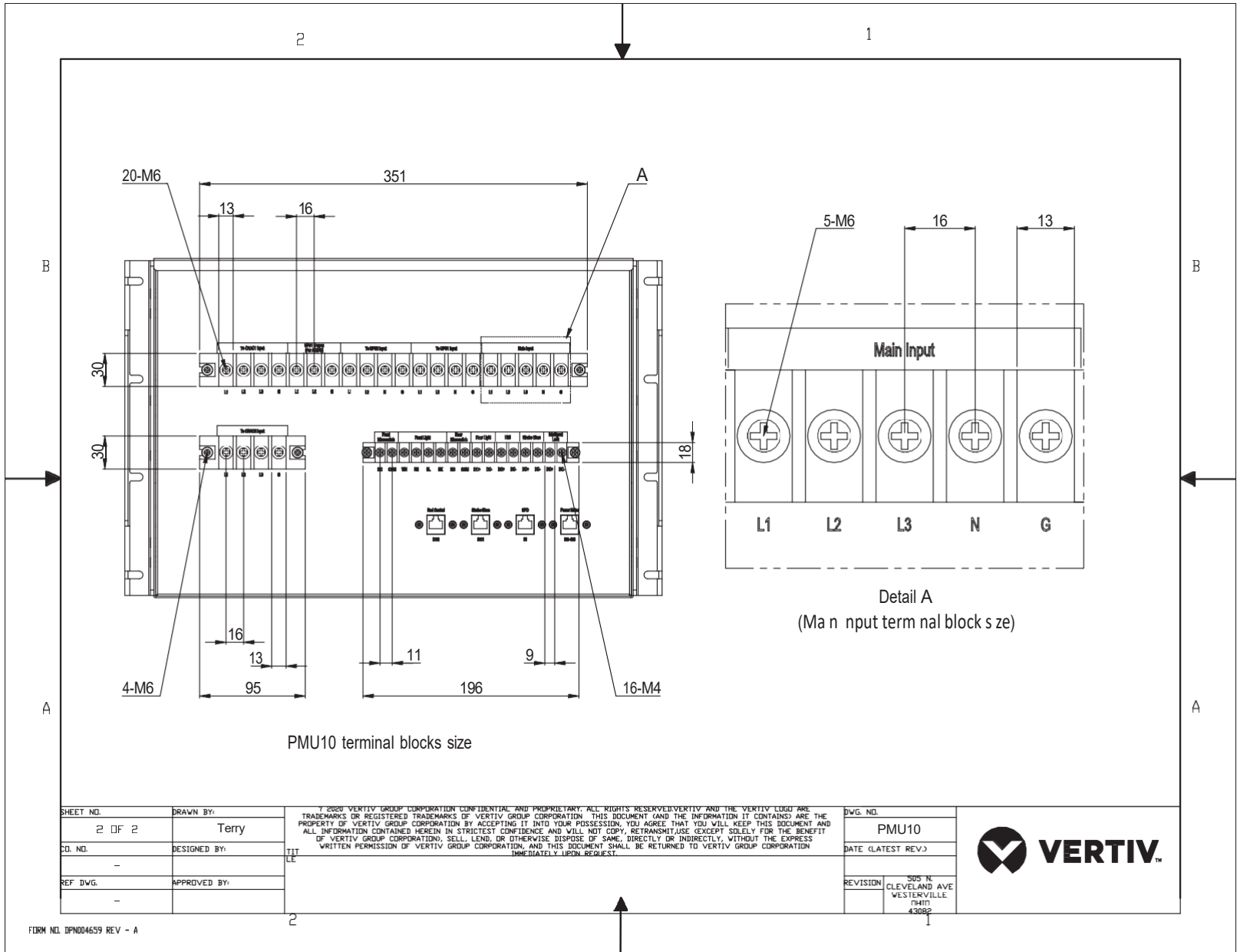
NOTES:  
PMU10 is used in Power Redundancy and No Power Redundancy PMC  
Net weight: 36 kg

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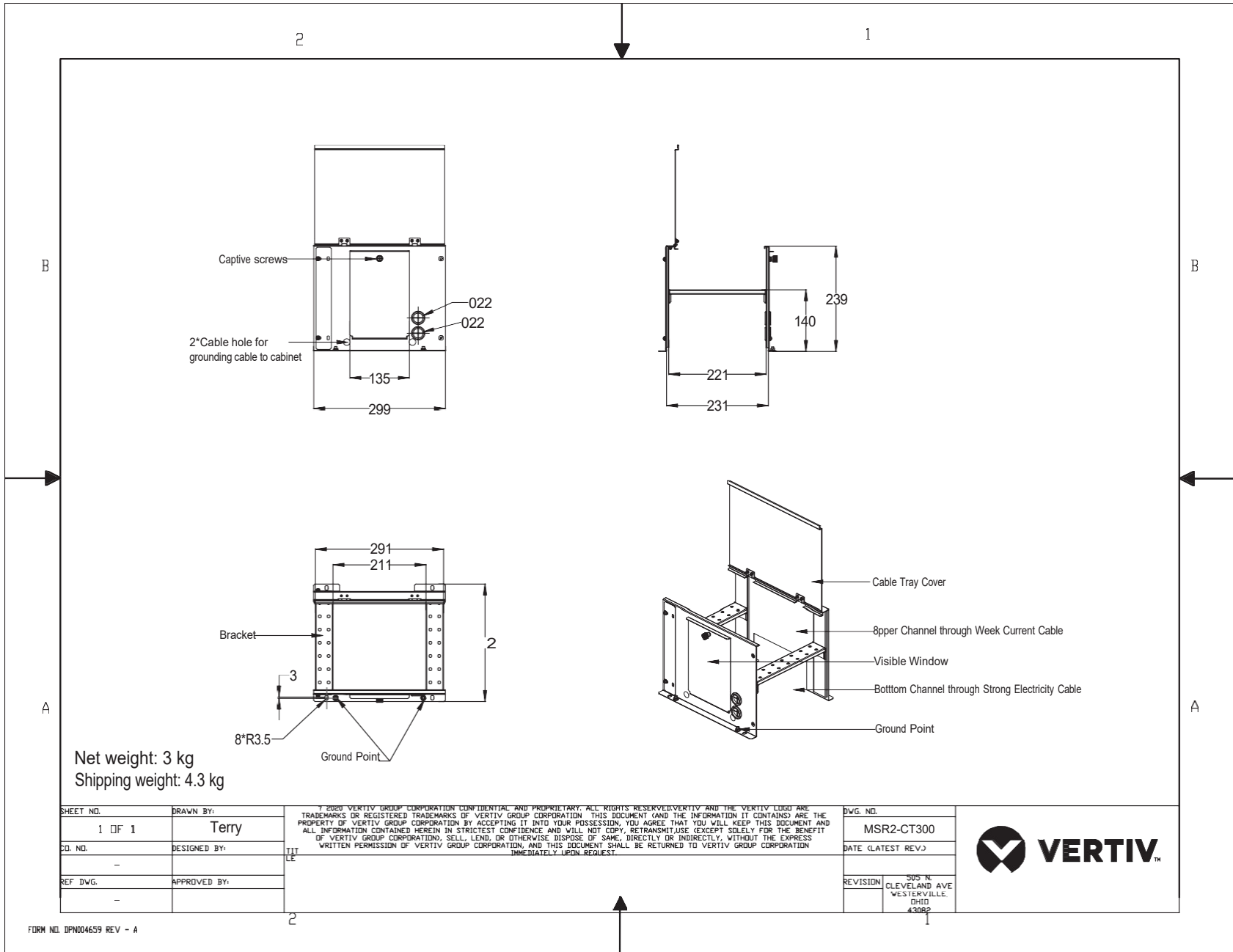
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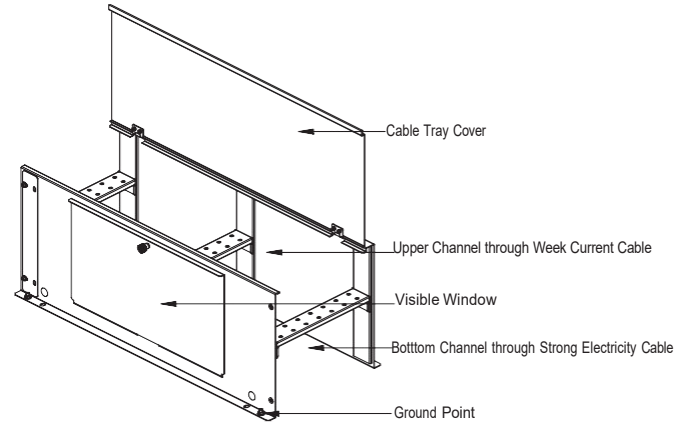
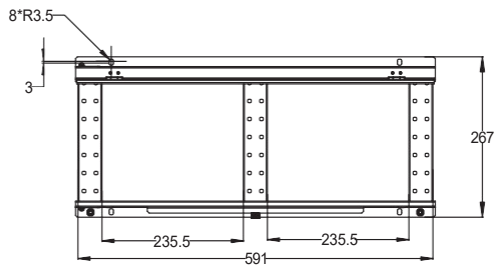
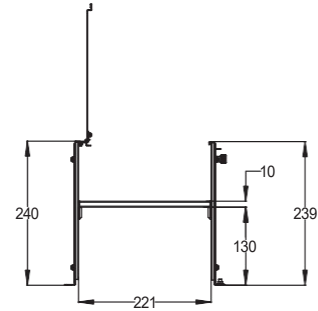
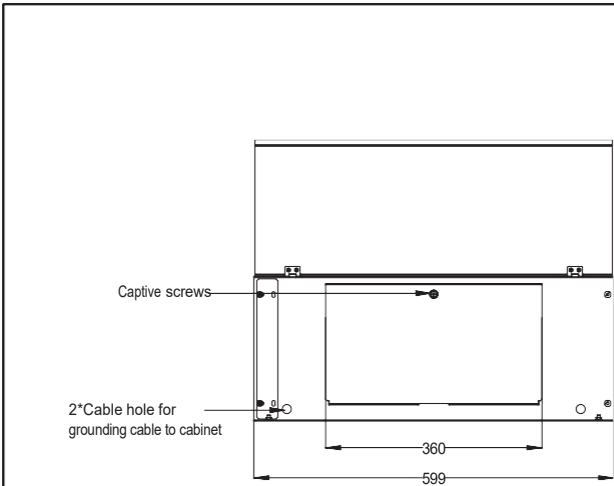


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DWG. NO.	MSR2-CT300
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Net weight: 6 kg  
Shipping weight: 8.5 kg

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# SCOPE OF WORK

## SmartRow2 Assembly

### SERVICE SUMMARY

Feature	Detail
On-Site Service	Site trip(s) within the 48 contiguous states. Visit(s) to be scheduled by the customer between 7 am-5 pm, Monday-Friday (excluding weekends & national holidays).
Customer Support	Includes access to the Customer Resolution Center (1-800-543-2378) and the Vertiv Customer Services Network Online Internet portal for extent of product warranty.
Consolidation	The SmartRow2 includes numerous shippable units (typically pallets or boxes) that originate from multiple factories and suppliers. Vertiv consolidates these items into a single customer shipment and reduces the likelihood of shippable units being lost at the customer site. This benefits the customer by relieving the burden of keeping track of multiple partial shipments.
Inside Delivery	Vertiv Service will move the shippable units from the delivery truck to the Staging Area. Vertiv Services will unpackage the shippable units and remove/dispose of the packaging material so that it is ready for assembly. Vertiv will verify that all material on the sales order has been received.
Project Management	Included with Consolidation and Inside Delivery. Vertiv will assign a project manager for the project. The Project Manager will supervise the Consolidation and Inside Delivery Process and communicate hardware shipment schedules with the customer.
Assembly	SmartRow2 is assembled onsite by Vertiv factory-trained and authorized technicians equipped with Vertiv Proprietary tools and software. Vertiv CEs and Vertiv Partners are the only approved OEM service providers for Vertiv products. These technicians are supervised by a Site Manager who also gathers site-specific requirements like safety and work procedures
Factory Startup	Warranty inspection and startup validates the warranty and initializes the warranty coverage period

### SERVICE PERFORMED

#### Consolidated Shipment

Shippable units may be available at time of order or built-to-order with a lead time. Vertiv safely stores these items in-warehouse until the customer is ready to receive the SmartRow2 in a single shipment

#### Inside Delivery

Vertiv Services will deliver the shippable units from the delivery truck to the Staging Area. Vertiv Services will unpackage the shippable units and remove/dispose of the packaging material so that it is ready for assembly. Vertiv will verify that all material has been received.

Change order option:

- There must be an appropriate loading dock with continuous, level floor from the dock to the staging area. If the shippable units must be moved up/down stairs, the customer must provide a suitable elevator, or charges for special rigging will be incurred. If the customer does not have an appropriate loading dock, nominal charges may/may-not apply for a lift-truck delivery.

## Project Management

Vertiv will assign a project manager and a site manager for the project.

The Project Manager will supervise the Consolidation and Inside Delivery Process and communicate schedules with the customer.

The Site Manager will supervise the assembly, startup, warranty inspection and turn over the SmartRow2 to the customer

## Site-Specific Requirements

All personnel will be available for up to two hours per week for Site Access, Safety Training and other site-specific requirements

Change Order Option:

- Vertiv can quote a price for additional man-hours if 2 hours per week is insufficient

## Assembly

There shall be continuous, level floor between the Staging Area and the Installation Location so that heavy items can be moved via casters/pallet jacks.

Change Order Option:

- If there is not continuous level floor, the customer must provide or pay for any necessary lift/rigging equipment.

## Vertiv PMC, including RDU501 SmartRow2 Controller/Display

Vertiv will position, level, and bay together the PMC as described in the submittal documents.

The customer is responsible for providing primary electrical power to the PMC.

Vertiv will program and configure the SmartRow2 RDU501 controller/display. This includes setting IP addresses so that the customer can monitor the system status remotely

Change Order Option:

- Vertiv will quote IP addressing of equipment on the customer network, but this would be done by other personnel and scheduled separately. This is outside the scope of SmartRow2 assembly.

## Vertiv IT Rack(s)

Vertiv will position, level, and bay together the Vertiv IT Racks as described in the submittal documents.

Vertiv will not populate racks with customer IT gear, including blanking panels, servers, shelves, etc.

The customer must define addressing conventions (1,2,3,4, right-to-left or left-to-right) prior to start of work.

## Cable Trays

Vertiv will install the SmartRow2 cable trays that are included with the SmartRow2 solution as described in the submittal documents

## Liebert® CRV's, Temperature Sensors, Modbus cables, and associated Plenums

Vertiv will position and level the Liebert® CRV and attach the associated plenums to provide cooling to the SmartRow2.

Vertiv will connect the necessary temperature sensors.

The customer is responsible for piping and primary power to the CRV along with connecting CANBus cable between the CRV and heat rejection. All specific requirements (such as piping traps and proper electrical grounding) for correct product installation are detailed in the product installation manual.

After the SmartRow2 is assembled and the Liebert® CRV is piped and powered by the customer in accordance with the product installation manual, Vertiv will perform a factory warranty inspection along with the rest of the SmartRow2

## Liebert® MC / CCD Condensers for Liebert® CRV's

### Project Management

The customer is responsible for installing the associated heat rejection. This includes primary power, CANBus communication wire, piping, refrigerant charging, and all other tasks in the Installation Manual. Any/all penetration points in the walls/ceilings/floors for any wiring or piping are also the customer's responsibility.

### Rack PDUs

Vertiv will install and connect all rack PDUs (if applicable) including GXT5 power extensions (if applicable) as described in the submittal documents

### Liebert® GXT5 Single Phase UPS's

Vertiv will install and connect all Liebert® GXT5 UPS's and connect power within the PMC cabinet and output to the PDUs as described in the submittal documents.

Additionally, Vertiv will install ancillary equipment such as Maintenance bypass and PD2-103 cabling and connectors if not already preinstalled.

After the SmartRow2 is assembled and Primary Power to the SmartRow2 is provided by the customer, Vertiv will perform factory startup of all GXT5 equipment along with the rest of the SmartRow2

### Switch

Vertiv will install and connect the switch within the PMC cabinet. as described in the submittal documents

### Firmware Updates

Vertiv will update firmware of any/all units to the current revision level. Shippable units are sourced globally and firmware evolves as products may be in stock with prior revisions

### Wiring

Vertiv will run all necessary wiring for power and communication between cabinets as part of assembly. This includes setting IP/DIP switch settings for proper communication between the device and the PMC

### Accessories

The SmartRow2 is available with lights, door locks/sensors, temperature sensors that Vertiv will connect and install.

Services associated with cameras are sold separately and out-of-scope for the SmartRow2 Assembly

### RDU Monitor SmartRow2 mobile application

Services associated with the RDU Monitor SmartRow2 mobile applications are quoted separately and out-of-scope for SmartRow2 assembly

## ASSUMPTIONS AND CLARIFICATIONS

- Vertiv start-up validates product warranty.
- Defects or damage resulting from installation not performed by Vertiv are not covered.
- Parts and Labor coverage is in accordance with Product Warranty. If a modified warranty is purchased, terms default to that specific package.
- Any customer site visit is limited to eight (8) hours per visit. Any time beyond forty (40) hours/wk or eight (8) hrs/day or additional Startup visits will be billed separately.

- Expenses incurred due to delays that are beyond the control of Vertiv may be billed at cost.
- Startup visit must be scheduled confirmation of proper installation (if Vertiv not involved with installation).
- This pricing excludes any load bank testing. This can also be quoted separately if required.
- Pricing excludes activities associated with 3<sup>rd</sup> party commissioning
- Pricing excludes any type of circuit breaker NEMA testing. This can also be quoted separately if required.
- Customer/Installing contractor is responsible for providing elevated access as necessary.
- Any additional requests beyond the scope of this document will be billed separately by Vertiv.
- Vertiv will not perform physical changes to the site building (such as drilling holes, etc.)

## CUSTOMER RESPONSIBILITIES

In order to provide timely, accurate and thorough execution of the services described herein, Vertiv requests the following:

- Point of Contact: Provide an authorized point of contact(s), specific for the scope of work, for scheduling and coordination purposes.
- Scheduling: Make dates available for scheduling service. All visits must be requested 4 weeks in advance for assembly and 10 days for startup/warranty-inspection of need by contacting the Vertiv Project Manager. Site must be available for 5 consecutive business days. Customer may choose to pay for premium time if weekend work is necessary.
- Site Access: Prior to time of scheduled work, provide site access including any customer required escort, security clearance, safety training and badging for Vertiv personnel.
- Equipment Access: Convenient access to the equipment covered by the Scope of Work. Prior to scheduled time of work, notify Vertiv personnel of any special requirements for equipment access including lifts, ladders, etc.
- Shutdown: Service may require shutdown of load to ensure electrical connection integrity.
- Notification: If for any reason the work cannot be performed during scheduled time, notify Vertiv personnel 24-hours prior to scheduled event.
- Provide Method of Procedure (MOP) requirements/ templates, and required review period(s)

## TERMS AND CONDITIONS

Subject to all Terms & Conditions as noted in the Vertiv Terms & Conditions or the terms of a Master Agreement between the parties, if any, shall apply.