WAUBONSEE
COMMUNITY COLLEGE

BIDDER: _____

BID NAME: **Replacement of Data Systems UPS**

BID NUMBER: **01-19-002**

BIDS DUE: **Wednesday, January 23, 2019 at 2:00 p.m. Central**

A mandatory attendance pre-bid meeting will be held on Wednesday, January 16, 2019 at 2:00 p.m. in Dickson Center, 2nd Floor Main Area, Sugar Grove Campus.

RETURN BIDS TO:

Purchasing
Waubonsee Community College
4S783 State Route 47
Dickson Center, Room 259
Sugar Grove, IL 60554-9903

Responses to this IFB shall be submitted in a sealed envelope to the address above. **Envelopes must be clearly identified with the name of the BID and Due Date/Time.** Proposals received after the date and time specified in this BID will not be considered.

All correspondence or questions concerning this BID should be addressed to purchasing@waubonsee.edu.

To Be Returned with Bid

- ☐ BID FORM
- ☐ CERTIFICATIONS
- ☐ AUTHORIZATION PAGE
- ☐ CONFLICT OF INTEREST DISCLOSURE AND NON-COLLUSION FORM
- ☐ STATE OF ILLINOIS BUSINESS ENTERPRISE INFORMATION FORM
- ☐ REFERENCES

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COLLEGE OVERVIEW

Waubonsee Community College (WCC), located forty-five miles west of Chicago, Illinois, has served more than 300,000 students since its inception. As one of 48 public community colleges in the Illinois Community College System, WCC is governed by a board of trustees composed of seven community members elected from the district at large and a student trustee selected by the student body. WCC serves 22 municipalities, 12 public high school districts and nine private high schools in a five-county, 600-square-mile district. In order to proactively address student and community needs, WCC has cultivated a learning-centered culture that values, and an infrastructure that advances, continuous quality improvement.

Campus Locations

Main Campus

Waubonsee Community College Sugar Grove, Rte. 47 at Waubonsee Drive, Sugar Grove, Illinois 60554

Extension Campuses

Waubonsee Community College Plano Campus, 100 Waubonsee Drive, Plano, Illinois 60545
Waubonsee Community College Aurora Downtown Campus, 18 South River St. Aurora, Illinois, 60506
Waubonsee Community College Fox Valley Campus, 2060 Ogden Ave, Aurora, Illinois 60504

GENERAL REQUIREMENTS

Summary

Waubonsee Community College (WCC) seeks sealed bids from qualified contractors to provide services for the replacement of data systems UPS in Dickson Center, Collins Hall and the Shelter.

A mandatory attendance pre-bid meeting will be held on Monday, January 14, 2019 at 2:00 p.m. in Dickson Center, 2nd floor, Main Area.

Schedule

- Bid Publication Date — Wednesday, January 9, 2019
- Pre-Bid Meeting — Wednesday, January 16, 2019 at 2:00 p.m. in Dickson Center
- Last Day for Submittal of Questions — Monday, January, 21, 2019
- Bids Due to the college — Wednesday, January 23, 2019 at 2:00 p.m.
- Recommendation of Award — Wednesday, February 20, 2019
- Substantial Completion — TBD

Information

1. Bid documents are available for download from the college's purchasing webpage at **https://www.waubonsee.edu/local-businesses-employers-and-vendors/bidrfprfi-opportunities**.
2. Bids may be withdrawn by written request from Bidder or his agent prior to the date and time established for opening of Bids.
3. All late, faxed or emailed Bids will be rejected.
4. All Bid prices must be good for a period of ninety (90) days from the date of opening.
5. The award of the contract will be made within ninety (90) days after the opening of BIDS to the lowest responsive and responsible bidder whose bid complies with all requirements prescribed herein.
6. Bid summary will be posted to the college's purchasing webpage after award of orders.
7. If the Bid is not awarded within ninety (90) days after the opening of bids, a Bidder may file a written request with the Purchasing Manager on the withdrawal of their bid, and the Purchasing Manager will permit such withdrawal.
8. The price bid for each item is the full purchase price, including delivery to destination, rigging expenses, balancing provisions no matter what the cause for imbalance, and includes all transportation and handling charges, premiums on bonds, material or service costs, patent royalties and all other overhead charges of every kind and nature. Unless otherwise specified, prices shall remain firm for the contract period. List all costs individually on a separate sheet.
9. The college reserves the right to award this project to one vendor or split the award based on the best interests of the college.
10. Vendors involved in providing servicing under this project require a minimum of five years' experience.
11. The college reserves the right to reject or accept any or all Bid responses, to extend the bidding period, to waive technicalities in the documents or rebid prior to award of the Contract.
12. The college will issue a purchase order after award of orders.
13. Invoices will be paid monthly for work completed. The college's payment terms are net 30 days.
14. Waubonsee Community College's Standard Terms and Conditions are included and made part of this bid package by reference. Contact purchasing@waubonsee.edu to obtain a copy of the standard terms and conditions.
15. Any **Change Work Orders** must be submitted to the college in writing and approved by the college in writing.
16. The **Prevailing Wage Act** requires contractors and subcontractors to pay laborers, workers and mechanics employed on PUBLIC WORKS construction projects no less than the general prevailing rate of wages (consisting of hourly cash wages plus fringe benefits) for work of a similar character in the county where the work is performed.
17. Waubonsee Community College encourages the participation of qualified businesses owned by minorities, females and persons with disabilities in contracts the college awards. This policy shall be furthered by complying with the **Business Enterprise for Minorities, Females and Persons with Disabilities Act**, 30 ILCS 575/0.01 et seq. and by cooperating with the Illinois Business

Enterprise Council.

18. WCC belongs to the following consortiums and Group Purchasing Organizations: E&I (Educational and Institutional Cooperative Purchasing); Sourcewell, US Communities; TCPN/National IPA; Midwest Higher Education Compact Consortium, and the Illinois Public Higher Education Cooperative. If you have pricing agreements with any of these organizations, pricing should minimally reflect these discounts. The college expects to be provided with the best available pricing.
19. All bid responses will become the property of Waubonsee Community College. All materials received or created by the college are considered ***public records*** and subject to disclosure to third parties in accordance with the **Freedom of Information Act (FOIA)**. These records include but are not limited to bid or proposal submittals, agreement documents, contract work product, or other information submitted by a vendor to the college.
    a. If the Respondent requests that the college withhold their trade secrets, commercial information or financial information from disclosure to a third party in response to a FOIA request, the Respondent must include in its submittal:
        i. A written notification specifically identifying such information
        ii. A statement that disclosure of such information will cause competitive harm to the Respondent
    b. Any content not so marked by the Respondent at the time of submittal will be presumed to be open to public inspection

Instructions

1. Provide one (1) original and two (2) copies of your Bid in a sealed envelope.
2. Provide one original of the Bid Bond.
3. Bid submittals must include all pages noted on the cover page of this bid document.
4. Erasures or changes in bids must be initialed. White-out is NOT permitted.
5. Bidders may not contact any college employee to discuss this IFB. **All correspondence or questions concerning the IFB should be addressed to purchasing@waubonsee.edu.** All questions must be submitted in writing and will be responded to by addendum. Do not expect an immediate answer. Include your email address and/or fax number for any necessary communication.
6. Bidders are responsible for checking the college's purchasing webpage for updates to the IFB and will be required to acknowledge receipt of the addenda in the IFB response.
7. **Bid Bond**
    a. None required

8. **Performance and Payment Bond**
    a. The awarded Contractor shall furnish a Performance and Payment Bond in the full amount of the Contract. The Surety issuing the Performance and Payment Bond must have a general rating of "A" and shall be a Class V or higher in the financial size category as defined by Best's Key Rating Guide – Property and Casualty.

In the event the Bidder fails to furnish the Performance and Payment Bond within fourteen (14) calendar days after award, the college may elect to retain the Bidder's bid deposit as liquidated damages and not as a penalty and the Contract may be terminated.

9. **Subcontracting**
    a. Provide the names and full contact information of any subcontractors to be used on this project. Subcontractors are subject to college approval.

BID FORM

All Bidders are required to complete and sign this form. Please print clearly. Attach a detailed proposal with a breakdown of costs for all equipment, delivery, installation and training.

Total Base Bid

Having examined the bid documents, as prepared by Waubonsee Community College, and having inspected the site and the conditions affecting and governing the construction of said Project, the Bidder hereby proposes to furnish all labor and materials, supervision, coordination, transportation, services and equipment for the sum of:

Base Bid **$** _____ Total

Cost for Performance and Labor Bond **$**_____ Total

TOTAL BID **$** _____ **Total**

In Figures

_____

In Words

Acknowledgement of Addenda

I acknowledge having received addenda # _____.

Bid Authorization

I HEREBY AUTHORIZE THIS BID, ACKNOWLEDGING THAT I UNDERSTAND AND AGREE TO THE PROVISIONS OF THIS BID. I WARRANT THAT ALL INFORMATION PROVIDED IN THE SUBMITTED BID IS TRUE AND ACCURATE. I FURTHER WARRANT THAT FAILURE TO HAVE READ ALL THE PROVISIONS OF THIS SOLICITATION SHALL NOT BE CAUSE TO ALTER ANY RESULTING CONTRACT OR REQUEST ADDITIONAL COMPENSATION. BY SIGNING THIS DOCUMENT.

_____

Name of Company

_____

Address

_____

City State Zip Code

_____

Telephone Number Fax Number

_____

Authorized Signature Date

_____

Print Name Title

_____

Email Address

CERTIFICATIONS

All Bidders are required to complete and sign this form.
Completed form must be returned with Bid no later than the advertised Bid deadline. Failure to return this completed form may result in disqualification.

Bidders are cautioned to carefully read these certifications prior to signing below. Signing this page shall constitute a warranty by the undersigned that all of the statements, certifications and information set forth within these certifications are true, complete and correct as of the date signed. The undersigned is notified that if the college learns that any of the following certifications were falsely made, any contract entered into with the undersigned shall be subject to termination.

1. Prevailing Wage Act. To the extent required by law, Contractor shall not pay less than the prevailing wage as established pursuant to an Act Regulating the Wages of Laborers, Mechanics, and Other Workman employed under Contract for Public Workers 820 ILCS 130/1 et seq. Our company certifies that it is eligible for bidding on public contracts and has complied with section 11a of the Prevailing Wage Act, 820 ILCS 130.01-12.
2. Human Rights Act. To the extent required by law, Contractor shall abide by the Illinois Human Rights Act, 775 ILCS 10/0.01 et seq.
3. Drug Free Workplace. To the extent required by law, Contractor shall abide with the requirements of the Drug Free Workplace Act 30 ILCS 580.1 et seq.
4. Sexual Harassment Policy. Contractor represents by the signing of this agreement that it has a written sexual harassment policy that is in accordance with 775 ILCS 5/2-105 (A) (4).
5. Non-debarment. By executing this agreement Contractor certifies that it has not been debarred from public contracts in the State of Illinois for violating either 33E-3 or 33E-4 of the Public Contracts Act, 720 ILCS 5/33E-1 et seq.
6. Fair Employment Practice: Company is in compliance with all State and Federal laws regarding Fair Employment Practice as well as all rules and regulations.
7. Our company has an Equal Employment Opportunity and Affirmative Action Program which complies with Executive Order 11246, the Vietnam Era Veterans' Readjustment Assistance Act of 1974, and the Rehabilitation Act of 1973.
8. Our company certifies that it is eligible for bidding on public contracts and is not in violation of either paragraph 33E-3 or 33-E-4 of Public Act 86-150, 720ICLS 5 with regards to bid rigging/bid rotating.
9. When required by law, the bidder and all bidder's subcontractors must participate in applicable apprenticeship and training programs approved by and registered with the United States Department of Labor's Bureau of Apprenticeship and Training as required by Illinois Public Act 093-0642.

Authorized Signatory: _____ ***Date:*** _____

CONFLICT OF INTEREST DISCLOSURE AND NON-COLLUSION FORM

All Bidders are required to complete and sign this form. Completed form must be returned with Bid no later than the advertised Bid deadline Failure to return this completed form may result in disqualification of Bid.

Conflict of Interest Disclosure

Waubonsee Community College is requiring that any and all relationships with the college, its administrators, trustees, committee member, or any other employee of the college be disclosed in writing as a part of any bid submitted. Contact in regards to this Bid with any employee of Waubonsee Community College during the pre-award period, except as noted in the solicitation, is strictly forbidden and is considered sufficient grounds for dismissal from the IFB/RFP process.

Define the relationship with any Waubonsee Community College administrator, trustee, committee members, or their immediate family member, with which your company or any of its owners, officers, trustees, employees does business with, or for which there is an opportunity to influence a related college decision.

_____

_____

_____

_____

☐ Bidder certifies that there is no known conflict of interest with any WCC administrator, trustee, committee member or employee of the college.

Non-Collusion Statement

The undersigned affirms that he/she is duly authorized to execute this contract and that this company, corporation, firm, partnership or individual has not prepared this Bid in collusion with any other Bidder, and that the contents of this Bid as to prices, terms or conditions of said Bid have not been communicated by the undersigned, nor by any employee or agent to any other person engaged in this type of business prior to the official opening of this Bid.

The undersigned further affirms that this Bid was prepared independently for this project and that it contains no fees or amounts other than for legitimate execution of this work as specified and that it includes no understandings or agreements in restraint of trade.

Firm Name: _____

By:_____
(Authorized Signatory)

_____ Title

STATE OF ILLINOIS BUSINESS ENTERPRISE FOR MINORITIES, FEMALES, AND PERSONS WITH DISABILITIES ACT INFORMATION

Vendor shall provide the following information on the status of its business so that the College can comply with the Business Enterprise for Minorities, Females, and Persons with Disabilities Act, 30 ILCS 575/1, et seq.

Identify Business Status (___MBE ___WBE ___DBE ___VOB)

- ☐ African American
- ☐ Alaskan Native/Native American
- ☐ Asian American
- ☐ Disabled
- ☐ Female
- ☐ Hispanic American
- ☐ Veteran
- ☐ Not Applicable

Small Business

- ☐ HUBZone small business
- ☐ Service-disabled veteran-owned small business
- ☐ Small Business
- ☐ Small disadvantaged business
- ☐ Veteran-owned small business
- ☐ Women-owned small business
- ☐ Not Applicable

Certifying Organization

- ☐ DCMS (Department of Central Management Services) Business Enterprise Program
- ☐ CMBDC (Chicago Minority Business Development Council)
- ☐ IDOT (Illinois Department of Transportation)
- ☐ WBDC (Women's Business Development Center)
- ☐ Other (Please Specify)
- ☐ Not Applicable

For more information please visit:

http://www.illinois.gov/cms/business/sell2/bep/Pages/Default.aspx

REFERENCES OF SIMILAR WORK PERFORMED

Name

Company Name

Address

City State ZIP Code

Name

Company Name

Address

City State ZIP Code

Name

Company Name

Address

City State ZIP Code

INSURANCE AND INDEMNITY REQUIREMENTS

1. SAFETY**:** The Contractor, its agents, employees, material men and its Subcontractors will perform all work on the project in a safe and responsible manner, and in compliance with all Federal, State and local safety requirements and standards.
2. INDEMNIFICATION**:** The work performed by the Contractor shall be at the risk of the Contractor exclusively. To the extent permitted by law, Contractor shall indemnify, defend, and hold harmless Owner, affiliated companies of Owner, their partners, joint venturers, representatives, members, designees, officers, directors, shareholders, employees, agents, successors, and assigns ("Indemnified Parties"), from and against any and all claims for bodily injury, death or damage to property, demands, damages, actions, causes of action, suits, losses, judgments, obligations and any liabilities, costs and expenses (including but not limited to investigative and repair costs, attorney's fees and costs, and consultants' fees and costs) which arise in whole or in part or are in any way connected with the Work performed, Materials furnished, or Services provided under this Agreement by Sub-Contractor or its agents.
3. INSURANCE: The insurance required shall be written for the duration of the Contract in amounts not less than the following minimum limits or as required by law whichever is greater. The Insurer must give the college at least 30 days prior written notice of cancellation and termination of the firm's coverage thereunder. All subcontractors the firm hires must comply with the same requirements.
    a. Comprehensive General Liability including Contractor's protective liability, Contractual liability, Completed Operations and Products liability. The latter shall be written for a period of one year from the date of acceptance by the Owner, to be renewed annually as long as the contract is in force. Minimum limits shall be as follows:
        i. Not less than $1 million dollars Each Occurrence, $2 million Products/Completed Operations aggregate, $1 million Personal and Advertising Injury limits, and $2 million General Aggregate subject to a per project aggregate.
        ii. Firm shall provide Waubonsee Community College with a Certificate of Insurance and endorsement naming Waubonsee Community College District No. 516, its officers, agents, employees and assigns as Additional Insured thereunder on a primary and noncontributory basis.

    b. Workman's Compensation as required by all applicable laws including employer's liability in the amount of $500,000.00 or as otherwise limited by law.
    c. Comprehensive Business Automobile Liability including non-ownership and hired car coverage as well as owned vehicles. Minimum limits shall be as follows:
        i. Written in the amount of not less than $1 million each accident and covering any auto.

    d. Umbrella Liability Insurance: Written in the amount of no less than $5 million each accident.

4. PROPERTY INSURANCE: It is agreed that the Contractor shall purchase and maintain property insurance for its material left at the job site. Contractor waives all rights of subrogation against Owner for loss of, or damage to, Contractor's work, tools, machinery, equipment, materials or supplies.

SCOPE OF WORK

Approach, Plan of Work and Timeline

1. Waubonsee Community College estimates a start date in March 2019 and completion in May 2019. Contractors should identify if this timeline is reasonable or if more time would be required.

General Conditions

1. Safety of Persons and Property
    a. The Owner is NOT in charge of the Work or in control of the Work. The obligation of the Contractor shall be construed to include, but not be limited to injury or damage upon failure to use or misuse by the Contractor, his agents and em-ployees of any scaffold, hoist, crane, stay, ladder, support of other mechanical contrivance erected or constructed by any person or any or all other kinds of equipment, whether or not owned or fur-nished by the Contractor. The Contractor expressly agrees that he is exclusively responsible for compliance with OSHA and local regulations for construction and that he is the "employer" with-in the meaning of those regulations. Any provision in the Contract Documents in conflict with this paragraph shall be null and void.

2. Storage of Materials:
    a. Contractors to store all materials and equipment in a place that it will not serve as a barrier to entrances or become a nuisance as determined by the Owner.
    b. Materials are to be stored per manufacturer requirements/recommendations.

3. Work Restrictions, General:
    a. On-Site Work Hours: Work shall be generally performed outside the existing building during normal business working hours of 8:00 a.m. to 5:00 p.m., Monday through Friday, except otherwise indicated.
        i. Weekend Hours: Consult with Owner
        ii. Early Morning Hours: Consult with Owner
        iii. Hours for Utility Shutdowns: Consult with Owner
    b. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
        i. Notify Owner not less than 2 (two) days in advance of proposed utility interruptions
        ii. Do not proceed with utility interruptions without Owner's written permission

    c. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.

i. Notify Owner not less than 2 days in advance of proposed disruptive operations

d. Nonsmoking Campus: Smoking is NOT permitted on the Waubonsee Community College Campus. Smoke breaks may be taken inside vehicles.
e. Controlled Substances: Use of tobacco products and other controlled substances is not permitted within the building or on Project Site.
f. On premises restrooms may be used by workers for the duration of the project.

Closeout Procedures

1. Project Close-out Meeting:
    a. Schedule and conduct a post construction meeting with owner to review and ensure project has been satisfactorily completed and all close-out requirements are understood.

2. Substantial Completion
    a. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
        i. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete
        ii. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents
        iii. Prepare and submit Project Record Documents, operation and maintenance manuals, and similar final record information
        iv. Complete startup testing of systems
        v. Submit changeover information related to Owner's occupancy, use, operation, and maintenance

Waste and Disposal

1. Contractor is responsible for disposal of all demolition and waste from installation.
2. Dumpster location to be coordinated with owner.
    a. Plywood or other protection is required to be placed under dumpster to protect pavement from damage.
3. Contractor shall be responsible for all cleaning required for work under the Contractor's jurisdiction as well as for keeping all work areas, passageways, ramps, stairs and all other areas of the premises free of accumulation of surplus materials, rubbish, debris and scrap which may be caused by the Contractor's operations.
4. Remove rubbish, debris and scrap promptly upon its accumulation and in no event later than the end of each workday. Contractor is responsible for the management and removal of waste materials, including hazardous materials, to be disposed of in accordance with all applicable laws, regulations, codes, rules, and standards.

5. Burning of rubbish or debris is not allowed at the site. Rubbish, debris and scrap is not to be thrown through any window or other opening, or dropped from any great height; it shall be conducted to the ground, to waiting truck(s) or removable container(s) by means of approved chutes or other means of controlled conveyance.
6. Spillages of oil, grease or other liquids that could cause a slippery or otherwise hazardous situation or stain a finished surface shall be cleaned up immediately.
7. If rubbish and debris is not removed, or if surfaces are not cleaned as specified above, the college reserves the right to have said work done by others and the related cost(s) will be deducted from monies due the Contractor.

Protection

1. All landscaping and hardscape/pavement are to be protected.
2. Plywood or other means should be used to protect pavement from damage by dumpsters or any other equipment as needed.
    a. Owner is to be consulted in advance, if existing landscaping must be altered to allow for work to progress.
    b. Owner is to be notified immediately if landscaping is damaged in the course of performing work.

3. Extreme care shall be taken by Contractor to safeguard all existing facilities, site amenities, utilities, irrigation systems, windows, and vehicles on or around the job site. Damage done to public and/or private property by the Contractor, shall be the responsibility of the Contractor and shall be repaired and/or replaced by Contractor at no additional cost to the college.
4. The Contractor shall use all means to protect existing objects, structures and vegetation. In the event of damage, the Contractor shall immediately make all repairs, replacements and dressings to damaged materials, to the approval of the college, at no additional cost to the college.

Additional scope of work and specifications appear on the following pages.

Summary

Dickson 50KVA

Dickson 50 KVA will require power run from Dickson Penthouse to server area and then to location in data room with dedicated circuit breaker distribution panel on output of UPS (see spec).

Quantity of 12-EMI104-10 PDU (Power Distribution Units).

Provide five (5) quad receptacles using five (5) dedicated 20 amp circuits at Dickson Data rack in room where the Dickson 50 KW UPS resides.

Provide underfloor power twist lock connections for the 12 (Eaton PDU units) at proper locations below current server racks. (12)

Dickson UPS optional battery capacity required see spec sheet attached.

Circuit breaker distribution panel specification:

"B-side" UPS load distribution panel, a 175A main C/B, 208Y/120V 3ph-4w + Ground, 42-spaces, wall-mount load distribution panel
Fifteen (15) 30A 2-pole
Nine (9) 20A 1-pole
One (1) 100A 3-pole
All remaining of the 42-spaces filled with 20 amp circuit breakers

Panel Board Specification on next page.

Collins 10 KVA and 8 KVA

Collins installed UPS systems will require a neutral run to new UPS locations from adjacent electrical distribution room. UPS will be installed on raised flooring please verify path. Standard UPS Swap, one for one. 2 separate UPS units installed in Collins 155 which also supports Collins 149 fed from Collins 114. Units are installed on a raised IT floor area.

Shelter 8KVA

Shelter UPS system will require an aluminum diamond floor plate insert to better distribute weight on a soft floor. Standard UPS Swap, one for one.

Lighting and Power Distribution Panelboards

P1C42Q4175CTST

Specifications

Main Breaker:	400A Maximum
Main Lugs only:	400A Maximum
Voltages:	480Y/277V AC Maximum 250V DC Maximum 3Ø3W, 3Ø4W, 1Ø3W, 1Ø2W

General — P1 panelboards comply the with following standards:

- NEMA Standards PB-1, 250
- UL Standards
  - Enclosure — UL 50
  - Panelboards — UL 67
- National Electric Code (NFPA 70)
- Federal Specification W-P 115c

Main Breakers — BL, BLH, BQD, NGB, FD6, FXD6, HBL, HFD6, HFXD6,HJD6, JD6, JXD6, HJXD6, ED2, ED4, ED6, HED4, HED6, HFXD6, QJ2, QJ2H and QJH2 main breakers are bolted to the busbars.

Box — Fabricated from galvanized steel. Removable end walls.

Bussing — Main bus is tin plated aluminum temperature rated per UL 67 as a standard. See panel submittals for optional call outs. Branch bus is copper as a standard. Copper bus is available as option.

Front — Fabricated from cold rolled steel and equipped with the concealed hinges, flush lock and a holder for directory card. Trim screws are concealed behind a lockable door.

type P1

NOTES:

SIEMENS

Main Lug or Main Breakers

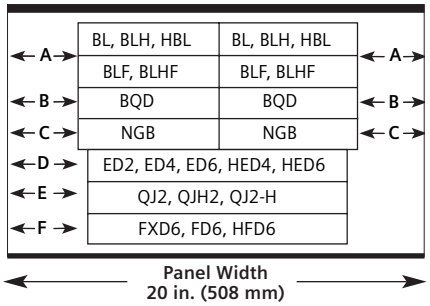
Maximum Ampere Rating	Main Breaker Types	Maximum Number of Poles	Box Height Inches (mm)	Connectors Suitable for Cu or Al
100	BL, BLH	18 30 42	32 (813)	#8-#6 AWG Cu or Al
	HBL		38 (965)	#8-6 AWG Cu or #8-4 AWG Al
	BQD		44 (1118)	#8-#1 AWG Cu or #6-#1/0 AWG Al
125	NGB		32 (813) 38 (965) 44 (1118)	15-30 amp #14-#6 Cu or #12-#6 Al 35-125 amp #6-1/0 Cu. #4-2/0 Al
	ED2, ED4		32 (813)	#14-#10 AWG Cu or #12-10 AWG Al
	ED6, HED4		38 (965)	#3-3/0 Cu or
	HED6			44 (1118)#1-2/0 Al
225	QJ2		32 (813)	#6 AWG-300 Kcmil (Cu)
	QRH2		38 (365)	or
	QJ2-H		44 (1118)	#4 AWG-300 Kcmil (Al)
250	FXD6		32 (813)	#6 AWG-350 Kcmil (Cu)
	FD6		38 (365)	or
	HFD6, HFXD6		44 (1118)	#4 AWG-350 Kcmil (Al)
≤250	MLO		32 (813) 38 (365) 44 (1118)	(1) #4 - 350 Kcmil
400	JD6, JXD6,	18 30 42	56 (1422)	3/0-500 Kcmil (Cu)
	HJD6,		62 (1575)	or
	HJXD6		68 (1727)	4/0-500 Kcmil (Al)
	MLO		56 (1422) 62 (1575) 68 (1727)	(1) 250-600 Kcmil or (2) #3/0 - 500 Kcmil

Side Gutter Wiring Space Inches (mm) (Fig. P1-1)

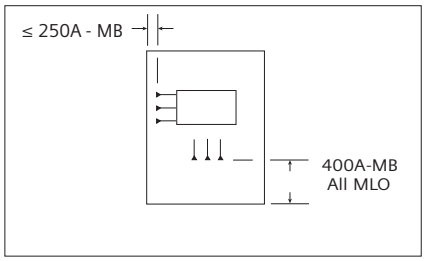
Reference Letter	Panel Width 20"	Panel Width 24" Optional
A	6.375 (162)	8.375 (213)
B	5.500 (140)	7.500 (191)
C	5.000 (127)	7.000 (178)
D ①	6.125 (156)	8.125 (206)
E ①	6.500 (165)	8.500 (216)
F ①	5.250 (133)	7.250 (184)

① Subfeed mounting limit 1 per panel.

Fig. P1-1



Main Device Gutter



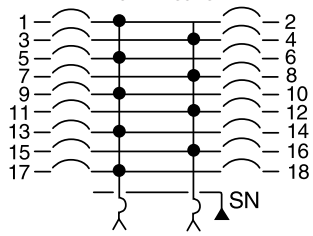
Main Breaker Gutter Dimensions Inches (mm)

Main Breaker	Gutter		Neutral Location
	20" wide box	24" wide box	20" wide box
BL, BLH, HBL, BQD	8.500 (216)	10.500 (267)	11.500 (292)
ED2, ED4, ED6, HED4	6.125 (156)	8.125 (206)	11.500 (292)
QJ2, QJH2, QJ2-H	6.500 (165)	8.500 (216)	11.500 (292)
FD6, FXD6, HFD6	5.250 (133)	7.250 (184)	11.500 (292)
JD6, JXD6 ①	15.000 (381)	15.000 (381)	26.750 (680)

① JD frame mounted vertically.

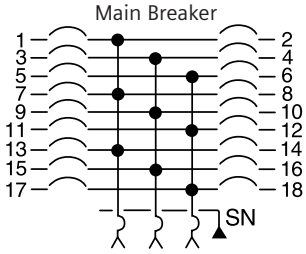
Typical Panelboard Wiring Diagrams

Main Breaker



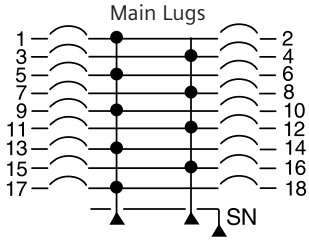
1 Phase, 3 Wire

Main Breaker



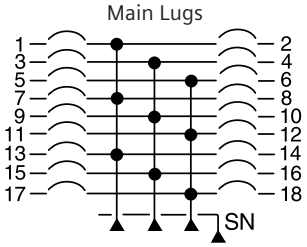
3 Phase, 4 Wire,
3 Phase, 3 Wire (No SN)

Main Lugs



1 Phase, 3 Wire

Main Lugs



3 Phase, 4 Wire,
3 Phase, 3 Wire (No SN)

Breaker Mounting Kit – Main or Subfeed w/o Breaker

Amp Rating	Breaker Frames	Service	Catalog Number
100	BL, BLH, HBL	1 Phase	**MBKBL1**
		3 Phase	**MBKBL3**
	BQD	3 Phase	**MBKBC3**
125	NGB	1 Phase	**MBKNB1**
		3 Phase	**MBKNB3**
	ED2, ED4, ED6, HED4, HED6	1 Phase	**MBKED1**
		3 Phase	**MBKED3**
225	QJ2, QJH2, QJ2-H	1 Phase	**MBKQJ1**
		3 Phase	**MBKQJ3**
250	FXD6, FD6, HFD	1 Phase	**MBKFD1**
		3 Phase	**MBKFD3**
400 ①	JD2, JD6, JXD6, HJD6, HJXD6	1 Phase	**MBKJD1**
		3 Phase	**MBKJD3**

Lug Kits – Main or Feed-thru

Amp Rating	Material	Wire Range	Service	Catalog Number
250	Al	(1) #6 AWG-350 Kcmil (Cu or Al)	1 Phase	**MLKA1**
		(1) #6 AWG-350 Kcmil (Cu or Al)	3 Phase	**MLKA3**
	Cu	(1) #6 AWG-350 Kcmil (Cu or Al)	1 Phase	**MLKC1**
		(1) #6 AWG-350 Kcmil (Cu or Al)	3 Phase	**MLKC3**
400	Al	(2) 3/0 - (1) 600 Kcmil	1 Phase	**4MLKA1**
		(2) 3/0 - (1) 600 Kcmil	3 Phase	**4MLKA3**
	Cu	(2) 3/0 - (1) 600 Kcmil	1 Phase	**4MLKC1**
		(2) 3/0 - (1) 600 Kcmil	1 Phase	**4MLKC3**

200% Neutral Lug Kits – 250A

No. of Circuits	Description	Catalog Number
18	2 Branch Neutral Strips, 2 Main Neutral Lug, Hardware	**2NLK18**
30	2 Branch Neutral Strips, 2 Main Neutral Lug, Hardware	**2NLK30**
42	2 Branch Neutral Strips, 2 Main Neutral Lug, Hardware	**2NLK42**

200% Neutral Lug Kits – 400A

No. of Circuits	Description	Catalog Number
18	2 Branch Neutral Strips, 4 Main Neutral Lug, Hardware	**42NLK18**
30	2 Branch Neutral Strips, 4 Main Neutral Lug, Hardware	**42NLK30**
42	2 Branch Neutral Strips, 4 Main Neutral Lug, Hardware	**42NLK42**

Copper Neutral Lug Kits – 250A and 400A

No. of Circuits	Description	Catalog Number
18	2 Branch Neutral Strips, 1 Main Neutral Lug, Hardware	**CNLK18**
30	2 Branch Neutral Strips, 1 Main Neutral Lug, Hardware	**CNLK30**
42	2 Branch Neutral Strips, 1 Main Neutral Lug, Hardware	**CNLK42**

Branch Circuit Breakers

Max. Amp Rating	Breaker Type	No. of Poles	Amp Rating	Maximum Interrupting Rating (kA) Volts – AC 120	120/240	240	277	480	600	DC 250	Load Connectors	
100	BL	1	15 - 70	10	—	—	—	—	—	—		
		2	15 - 100	—	10	—	—	—	—	—		
		3	15 - 100	—	—	10	—	—	—	—		
	BL HID	1	15 - 30	10	—	—	—	—	—	—		
		2	15 - 30	—	10	—	—	—	—	—		
	BLR	2	15 - 100	—	—	10	—	—	—	—		
	BLE	1	15 - 30	10	—	—	—	—	—	—	15-20A	#14-#10 AWG Cu #12-#10 AWG Al
		2	15 - 60	—	10	—	—	—	—	—		
	BLEH	1	15 - 30	22	—	—	—	—	—	—	25-35A	#8-#6 AWG Cu #8-#6 AWG Al
		2	15 - 60	—	22	—	—	—	—	—		
	BLF	1	15 - 30	10	—	—	—	—	—	—	40-50A	#8-#6 AWG Cu #8-#4 AWG Al
		2	15 - 60	—	10	—	—	—	—	—		
	BLHF	1	15 - 30	22	—	—	—	—	—	—	55-70A	#8-#4 AWG Cu #8-#2 AWG Al
		3	15 - 60	—	22	—	—	—	—	—		
	BGL ②	2	15 - 30	10	—	—	—	—	—	—	80-100A	#4-#1/0 AWG Cu #2-#1/0 AWG Al
		3	15 - 30	—	10	—	—	—	—	—		
	BAF	1	15, 20	10	—	—	—	—	—	—		
	BAFH	1	15, 20	22	—	—	—	—	—	—		
	BLH	1	15 - 70	—	22	—	—	—	—	—		
		2	15 - 100	—	22	—	—	—	—	—		
		3	15 - 100	—	—	22	—	—	—	—		
	HBL	1	15 - 70	—	65	—	—	—	—	—		
		2	15 - 100	—	65	—	—	—	—	—		
		3	15 - 100	—	—	65	—	—	—	—		
	BQD	1		—	65	—	14	—	—	14	15-40A	#14-#6 AWG Cu #12-#6 AWG Al
		2	15 - 100	—	65	—	—	14	—	14	45-100A	#8-#1 AWG Cu #6-#1/0 AWG Al
		3		—	—	65	—	14	—	14		
125	NGB ③	1		100	—	—	25	—	—	14	15-30A	#14-#6 Cu #12 - #6 Al
		2	15 - 125	—	100	100	—	25	—	—	35-125	#6-1/0 Cu #4-2/0 Al
		3		—	100	100	—	25	—	—		

① Main Only
② Two pole breaker is one phase and neutral. Three pole is two phase and neutral.
③ P1 panel with NGB branch devices will not accept BL or BQD frames in the same panel as branch devices.
NOTE: BL, HBL, BLH and BQD breakers are mounted in common mountings in 3" or (6) pole increments.

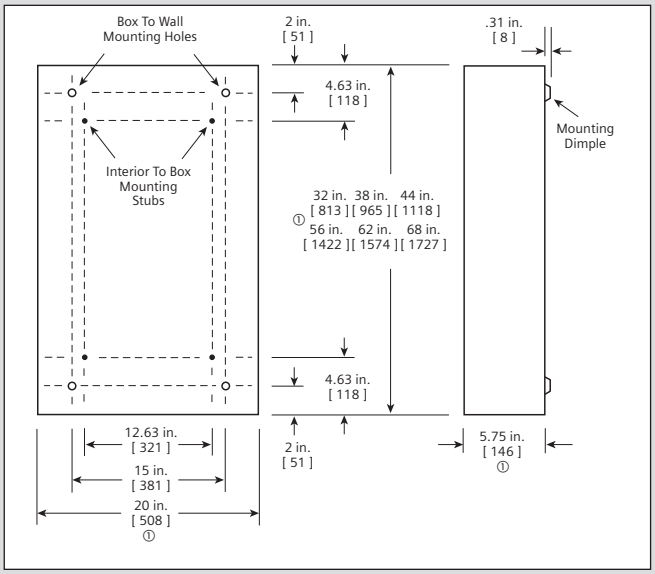
Modifications and Dimensions

Panel Options, Enclosures

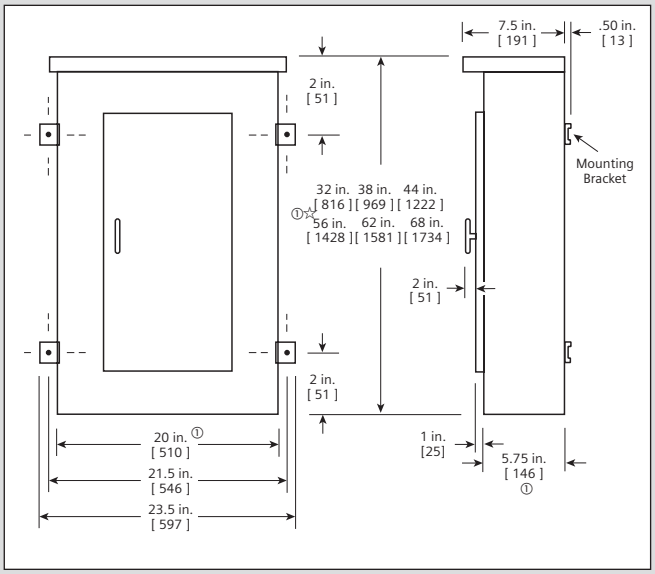
- Extra gutter to sides or ends of the can
- 24" wide boxes
- Hinged trims
- Door-in-door trims
- Screw to the box trims
- Trim mounted devices (Devices mountedand wired to the trim should also have hinged trim specified.)
  - Pilot lights
  - Toggle switches
  - Push buttons
- Painted boxes
- Custom colors
- Increase gauge trims and boxes
- Stainless steel trims and boxes, Type 1
- Aluminum trims and boxes, Type 1
- NEMA 3R enclosures
- NEMA 3R/12 enclosures
- NEMA 4 enclosures
- NEMA 4X enclosures
- Special keyed locks
  - TEY
  - TEU1
  - Cat 60
  - LL803
  - LL806
  - Yale
- Meters (Contact application engineering for space requirements.)
- Panel skirts
- Gaskets between trim and box

Type P1Dimensions

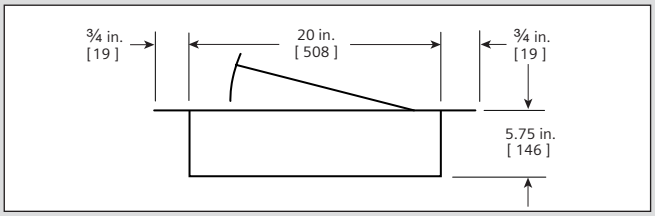
Type 1 Box (Box is Symmetrical)



Type 3R and 3R/12 Box



Flush Mounting



① Dimensions are interior of the box. Add 5/8" to width for absolute dimension. Add 1/8" to height for absolute dimension. Dimensions shown in inches and millimeters [ ].

Siemens Energy & Automation, Inc.
3333 Old Milton Parkway
Alpharetta, GA 30005

1-800-964-4114
info.sea@siemens.com

www.sea.siemens.com/power

PBSS-20301-0407 1M0407PP Printed in USA

Dickson "B" side UPS
Qty (1) Eaton 93PM-50KW-3phase 480-208Y/120V UL-Listed UPS System is provided with:

- **50kVA at 1.0 (unity) power factor = 50kW**
- **Nominal System Input: 480V 3ph-3w + G 60Hz (feed with 100A upstream E C/B)**
- **Nominal System Output: 208Y/120V 3ph-4w + G (to feed external distribution)**
- Double Conversion, rectifier-inverter UPS on-line technology (Three Level Inverter)
- Very High 97% UPS module double conversion rectifier-inverter mode efficiency
- UL 1778 certified, listed and labelled for all system cabinets
- Automatic Internal 100% rated solid state static bypass switch
- Automatic UPS restart and load pickup
- IGBT Transistorized Rectifier with wide +10% to -15% (408-528V) input range, high 0.99 input power factor and very low 3% reflected input current THD
- IGBT Transistorized Sinewave inverter with low output voltage THD for IT type loads
- All front access design with no rear or side access necessary for servicing
- **Internal 5-string battery system provides 10 minutes full load runtime with (180) sealed lead-acid UL flame-rated batteries on slide-out shelves is "base battery"**
- Advanced Battery Management Technology (ABM) – uses unique 3-stage charging technique that significantly extends battery service life and optimizes recharge time
- **Touch Screen** display with comprehensive metering, events log, mimic bus & more
- Emergency Power Off (EPO) and external EPO
- Four (4) open/unfilled X-slot™ comm. ports for optional X-slot™ comm. cards
- **One (1) #PXGMS X-slot™ WEBCARD-MS allows network monitoring of the UPS**
- Predict Pulse™ compatible; 7x24 remote factory monitoring of 43 UPS and battery alarms, daily heartbeat check and monthly report via WEBCARD) included in 1st year
- UL 1778 certified, listed and labelled for the UPS module and all matching cabinets
- **UPS module only: 74"H x 22"W x 42"D; 1,950 lbs., black, casters and levelers**

Qty (1) Eaton Matching External IAC-D 50 Transformer Cabinet is provided with:

- Internal 50kVA 480V to 208Y/120V isolation transformer, K-13 rated & 98% efficient
- Cables included to allow installer to bolt the Transformer Cabinet to a side of the UPS
- **IAC-D-50 only: 74"H x 32"W x 42"D; 1,150 lbs., black, casters and levelers**

Qty (1) Eaton Matching External 3-C/B Maintenance Bypass Side-Car Cabinet with:

- Three (3) Circuit Breaker Maintenance Bypass with Interlock
- Cables included to allow installer to bolt the Bypass Cabinet to a side of the UPS
- **3-C/B bypass only: 74"H x 8"W x 42"D; 250 lbs., black, casters and levelers**

Included Eaton 7x24 Startup and 1-Year Parts & Labor Standard System Warranty:

- One (1) trip 7x24 startup is included (scheduled subject to Eaton tech availability)
- Standard: factory tests, site startup tests and procedures, load and battery tests
- Owner training at same time/same trip as startup
- 1-year parts & labor system warranty from Eaton startup date with 8-hour, 7x24 site response. All warranty provisions and terms are per Eaton.
- 1st year factory 7x24 Predict Pulse™ remote monitoring of the UPS via the web card
- One (1) Installation and Operation Manual, ships loose with the UPS module

Sub-total price for above (base battery
ADD to ABOVE for estimated freight cost FOB factory to 48"H dock via semi-truck with no unload, excludes: RE-delivery/storage costs, lift-gate delivery
< RECOMMEND Eaton drop-ships the UPS to the 48"H dock of your installer's RIGGER >

- **60 Minutes at full load** with (40) #E54 batteries in a matching external “IBC-LW” battery cabinet (deletes UPS internal batteries). 74”H x 35”W x 42”D; 4,900 lbs

Dickson Side “B” will require circuit breaker panel output from new UPS installed in the same location of the new UPS. Contractor will provide power in Data room from a distribution circuit breaker panel to allow additional circuits for expansion providing power source to the existing data rack -Four 20 amp circuits with a quad receptacle for each - in the Dickson MDF room. Contractor will also provide power beneath the current server rack system (underfloor) at each of the Server rack locations as verified by field installer to power New underfloor receptacles feeding up to the 12 PDU’s.

Include a quantity of 12, Eaton EMI104-10 PDU

Collins Hall 10 KW and 8KW 2 UPS units Collins Data Room room

Eaton 9155-Series Single-Phase Double-Conversion UPS *Features and Benefits:*

• Protects mission-critical applications with innovative backup power technology designed specifically for high-density computing environments
• Supports the constant changes of today's dynamic data center with a slim tower design
• A true online double conversion rectifier-inverter topology protects connected equipment from all nine of the most power problems
•Provides more real power in less space (up to 4.8kW per SQ. foot) with a 0.9 output power factor – protects more equipment for every dollar and leaving more room for IT expansion
• Reduces energy costs and cooling needs through high 90% UPS efficiency performance
• Maximum battery life has microprocessor-controlled ABM Advance Battery Management technology, resulting in longest possible battery lifespan for fewer battery replacements
• 10-years field proven design with over 12,000 systems shipped are made in Raleigh, NC

One (1) Eaton 9155-8kVA 1ph UL-listed Uninterruptible Power Supply System with:

- **8kVA 1ph at 0.9 power factor = 7.2kW**
- **Nominal Input: 120/208V 1ph-3w + G 60Hz, single input (requires input neutral)**
- **Nominal Output: 120/208V 1ph-3w + G 60Hz = 33A per 120V output leg at 0.9 PF**
- UPS Efficiency Rating > 90% across all load ranges in normal operation (reduces utility costs, extends battery runtimes and produces cooler operating conditions
- Automatic Internal 100% Rated Solid State Static Bypass Switch protects in case of high overload condition, output load fault or internal failure
- **Internal optional make-b4-break rotary maintenance bypass switch is included**
- Automatic UPS restart and load pickup with power failure > UPS battery runtime
- IGBT Transistorized Rectifier with <5% input current THD and 0.98 input PF
- IGBT Transistorized Sine Wave Inverter with low output voltage THD for IT loads
- Fan cooled, temperature microprocessor monitored, front air entry, rear air exhaust
- **Optional internal batteries for 60 min at 4kW load (30min at full 7.2kW) with (64) lead-acid UL flame-rated sealed batteries on eight (8) front slide-out shelves**
- Advanced Battery Management Technology (ABM) – significantly extends and maximizes battery service lifespan with Eaton-unique three-stage charging technique
- LCD Control Panel with comprehensive metering, events log, mimic bus, UPS status
- Emergency Power Off (EPO) and external EPO contacts
- Two (2) open-unfilled X-slot™ comm.-ports for optional Eaton X-slot™ comm. cards
- **One (1) PXGX X-slot™ WEBCARD allows owner network monitoring of the UPS**
- **64-Battery UPS module: 48"H x 12"W x 34"D; 590 lbs., black, casters & levelers**

Included Eaton 7x24 Site Startup and 1-Year Parts & Labor System Warranty with:

- One (1) trip **7x24 startup** any-time hours scheduled subject to Eaton tech availability
- 1-year parts & labor system warranty from Eaton startup date with 8-hours, any-time (7x24) hours site response; all warranty standard provisions and terms are per Eaton

OPTIONAL EXTRA-COST ADDERS (priced EACH when order WITH the above UPS system)

- **#EMP Environmental Monitor Probe** allows temperature / humidity ambient monitoring via optional WEBCARD; #EMP can monitor (2) sets of alarm contacts
- **External wall-mount maintenance bypass switch** (above 9155 series UPS includes an optional internal maintenance bypass switch so this option is **not** required) allows all UPS repair and UPS swap-out w/o load shutdown 26"H x 18"W x 6"D; 35 lbs

- **ALTERNATE Eaton 9155-10kVA UPS** (same as above except 10kVA size with optional "64-battery" internal battery system) = 41.7A per 120V output leg

IMPORTANT NOTE! Eaton 9155 series UPS REQUIRE A SOURCE (INPUT) NEUTRAL WIRE! Existing 1ph UPS to be replaced have an internal transformer so they are NOT fed a neutral! Installer will need to run a neutral.

Dickson UPS

Installation of a secondary 3-phase 480 volt 50 KVA UPS with wired EPO safety shutoff switch and a circuit breaker distribution panel installed in adjacent Data Room DKN 116 - UPS will be fed from Dickson Penthouse 480 volt 3 phase distribution spare

The new ups system will allow the server room network power infrastructure to have alternate A+ B power support.

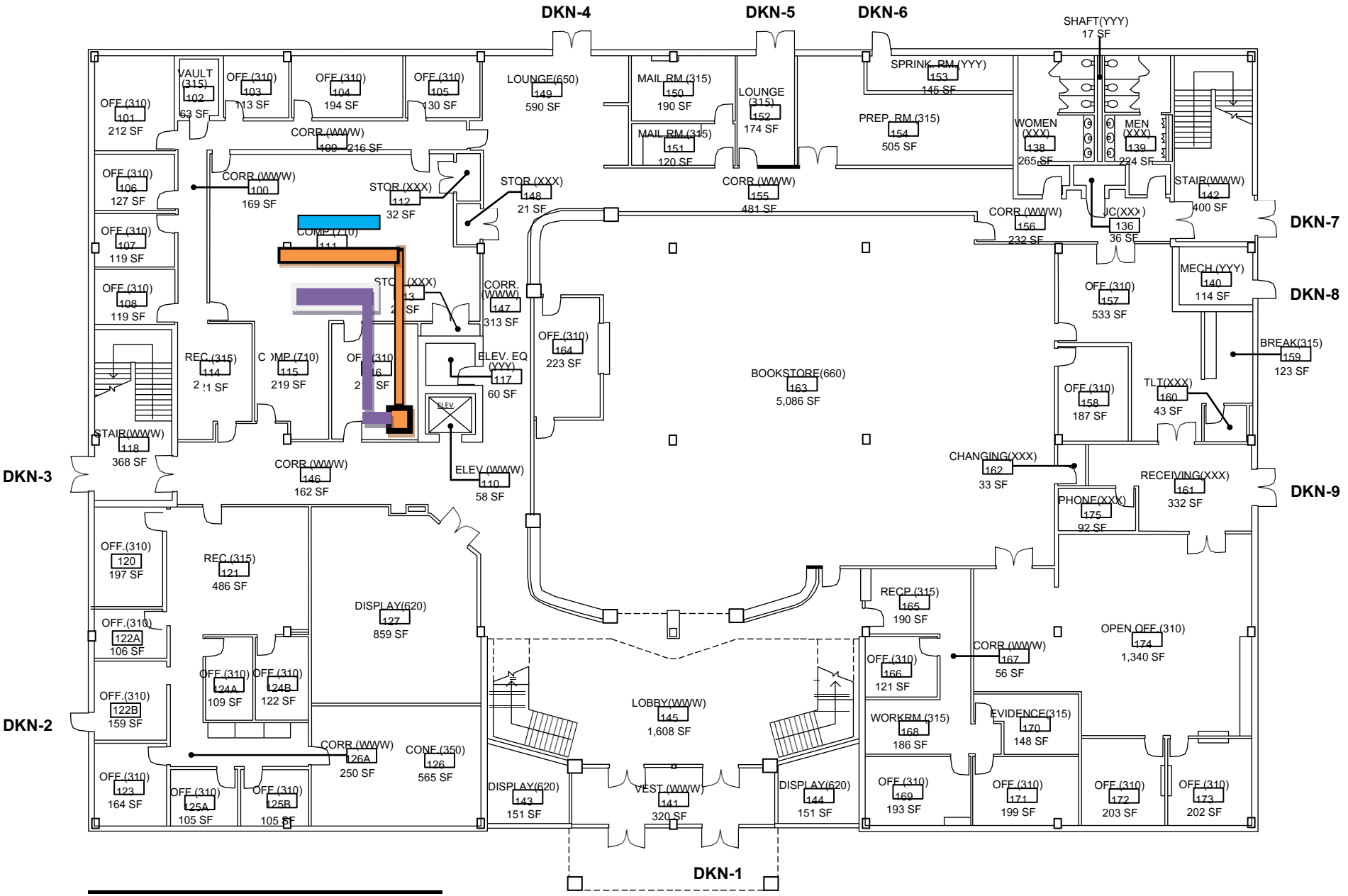
Each server power supply will be split into the 2 available sources so even if one UPS goes off line the servers will continue to operate.

New UPS will require an additional panel installed at the UPS location.

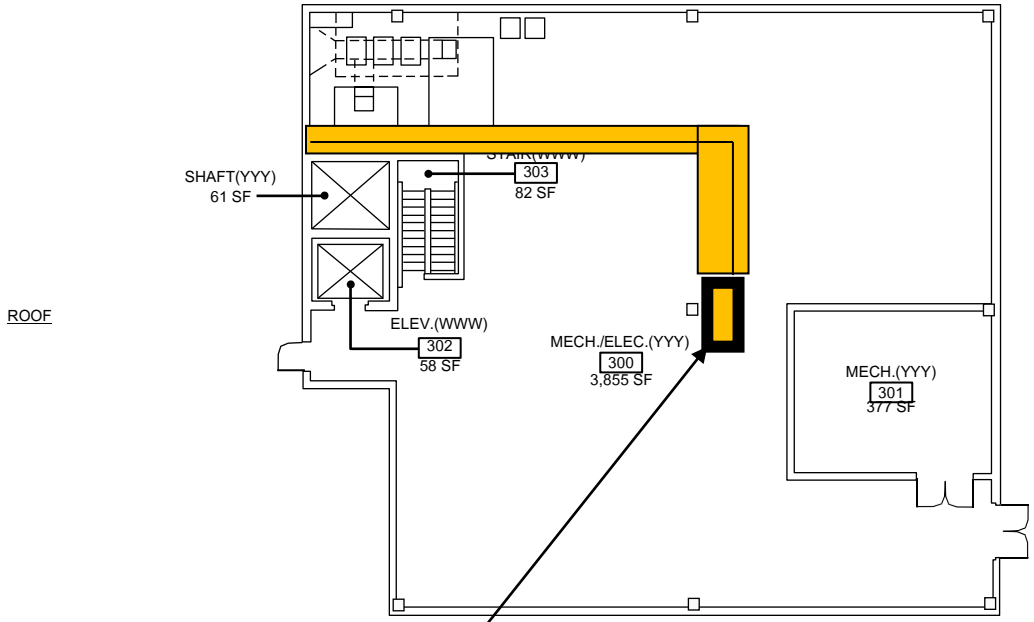
The new circuit panel be piped into the underfloor area at the first server row and to outlets
This new feed will be piped in the void below each server data cabinet and provide a 30 amp twist receptacle that will be mated to the appropriate PDU's at the proper spacing to accommodate the PDU within the server rack.

There are 6 standing server racks -we would like the contractor to install 12-30 amp twist locks in the new “B” power supply conduit run below the raised floor. The required PDU quantity would be 12 of spec attached. Please note! NO flex conduit as we will require install with Liquid Tight vinyl covered flex conduit with adequate length to move and service unit. EPO disconnect is required in this install-old equipment removal and disposal by contractor.

Maintenance bypass, network ready equipment startup by *Eaton *Specified Manufacturer-Model-Eaton 3 Phase 480 volt UPS system. Please no substitutes.



DICKSON CENTER - FIRST FLOOR



480 volt 3 phase power supply from existing power distribution cabinet located in penthouse (spare).
Power run to existing riser location down 2 floors to server room then back to room DKN 116.

DICKSON CENTER - PENTHOUSE

AUGUST 2018

NORTH

WAUBONSEE COMMUNITY COLLEGE / SUGAR GROVE, IL DICKSON HALL IT ROOM
SPECIFICATION FOR 50KW 480 - 208Y/120V UNINTERRUPTIBLE POWER SUPPLY SYSTEM (UPS)

PART 1 - GENERAL

1.01 SUMMARY

A. This specification describes a three-phase continuous duty, on-line, double conversion, rectifier-inverter solid-state uninterruptible power system, hereafter referred to as the UPS. The UPS shall operate in conjunction with the existing building electrical system to provide power conditioning, back-up and distribution for critical electrical loads. The UPS shall consist of, as required by the project, the UPS module, batteries, or other DC storage systems, and accessory cabinets for transformers, maintenance bypass, and distribution applications, and other features as described in this specification.

1.02 UPS SYSTEM DESCRIPTION

A. UPS System Components: The 50kW at 1.0 (unity) power factor 480-208Y/120V UPS system shall consist of the following main components:

1. UPS module containing Rectifier(s), Inverter(s), Battery Charger(s), Solid State Static Bypass Switch, and associated Control and Touch Screen Display Panel.
2. Battery string(s) in Line-and-Match External UL Listed Battery Cabinets.
3. Line-Up and Matching accessory “options” cabinets for an internal isolation transformer, maintenance bypass, parallel tie and distribution applications.

B. UPS Module Modes of Operation: The UPS Module shall operate as an on-line, fully automatic system in the following modes:

1. Normal: Utilizing commercial AC power, the critical load shall be continuously supplied by the Inverter. The Inverter shall power the load while regulating both voltage and frequency. The Rectifier shall derive power from the commercial AC source and shall supply DC power to the Inverter. Simultaneously, the Battery Charger shall charge the battery.
2. Battery: Upon failure of the commercial AC power, the critical load shall continue to be supplied by the Inverter, which shall obtain power from the batteries without any operator intervention. There shall be no interruption to the critical load upon failure or restoration of the commercial AC source. The UPS system shall include a matching external nominal 480VDC battery cabinet system.
3. Recharge: Upon restoration of the AC source, the Charger shall recharge the batteries and simultaneously the Rectifier shall provide power to the Inverter. This shall be an automatic function and shall cause no interruption to the critical load.
4. Bypass: If the UPS module must be taken out of the Normal mode for overload, load fault, or internal failures, the static bypass switch shall automatically transfer the critical load to the commercial AC power. Return from Bypass mode to Normal mode of operation shall be automatic. No-break transfer to and from Bypass mode shall be capable of being initiated manually from the front panel.
5. Energy Saver: The UPS shall continuously monitor the voltage and frequency of the bypass source. When the source parameters are within acceptable limits, the UPS will utilize a minimal/optimal combination of its internal subsystems to ensure acceptable power is always delivered to the critical load, at a system

efficiency of up to 99.1%. The Energy Saver System shall be enabled by the user and shall be adjustable. It shall incorporate a “High Alert Mode” to automatically (without user intervention) provide maximum power conditioning any time bypass source variation levels exceed preset, adjustable limits. When Energy Saver System is utilized, the UPS shall attenuate ANSI C62.41-type line transients to within IEC and ITIC limits. The Energy Saver System shall be able to distinguish between upstream (utility) faults and downstream (load) faults and react appropriately to protect and support the critical load, without interruption.

1.03 REFERENCES

A. UL 1778 (Underwriters Laboratories) – Standard for Uninterruptible Power Supply Equipment. Product safety requirements for the United States, 4th Edition.
B. CSA C22.2 No 107.1(Canadian Standards Association) – Commercial and Industrial Power Supplies. Product safety requirements for Canada.
C. NEMA PE-1 – (National Electrical Manufacturers Association) – Uninterruptible Power Systems standard.
D. IEC 62040-2 C3
E. IEC 62040-3 (International Electrotechnical Commission) – Uninterruptible power systems (UPS) – Part 3: Method of specifying the performance and test requirements.
F. IEEE 587 (ANSI C62.41) Category A & B (International Electrical and Electronics Engineers) – Recommended practices on surge voltages in low voltage power circuits.
G. CISPR 22 and 24, FCC Rules and Regulations 47, Part 15, Class A (Federal Communications Commission) – Radio Frequency Devices.

1.04 SUBMITTALS

A. The UPS shall be supplied with sufficient documentation, including the following manuals:

1. Installation and Operation Manual: One copy of the installation and operation manual shall be furnished. It shall possess sufficient detail and clarity to enable the owner’s technicians or representatives to install and operate the UPS equipment and accessories. The manual shall include the following major items:

a) UPS description

b) UPS site planning and unpacking

c) UPS installation

d) Optional accessory installation

e) UPS theory of operation

f) Operating procedures

g) System events

h) UPS maintenance

i) Performance and technical specifications

j) Wiring requirements and recommendations

k) Physical features and requirements

l) Cabinet dimensions

1.05 QUALIFICATIONS

A. The UPS manufacturer shall have a minimum of thirty years’ experience in the design, manufacture and testing of solid-state UPS systems. A list of installed UPS systems of the same type as the manufacturer proposes to furnish for this application shall be supplied upon request.

B. The UPS manufacturer shall have ISO 9001 certification for engineering/R&D, manufacturing facilities and service organization.

C. The UPS manufacturer shall maintain a staffed 7x24x365 call center with factory employees located in the United States for technical support and emergency support.

D. Field Engineering Support: The UPS manufacturer shall directly employ a nationwide field service department staffed by factory-trained field service engineers dedicated to startup, maintenance, and repair of UPS equipment. The organization shall consist of local offices managed from a central location. Field engineers shall be deployed in key population areas to provide on-site emergency response within 24 hours. A map of the United States showing the location of all field service offices shall be submitted with the proposal. Third-party service or third-party maintenance is not acceptable.

E. Spare Parts Support: Parts supplies shall be located in the field to provide 80% of all emergency needs. The factory shall serve as the central stocking facility where a dedicated supply of all parts shall be available within 24 hours.

F. Product Enhancement Program: The UPS manufacturer shall make available feature upgrade service offerings to all users as they are developed. These upgrades shall be available as optional field-installable kits.

G. Maintenance Contracts: A complete range of preventative and corrective maintenance contracts shall be provided and offered with the proposal. Under these contracts, the manufacturer shall maintain the user's equipment to the latest factory revisions.

1.06 ENVIRONMENTAL REQUIREMENTS

A. The UPS shall withstand any combination of the following external environmental conditions without operational degradation.

1. Operating Temperature: 5 degrees C to + 40 degrees C (41 degrees F to 104 degrees F) without de-rating (excluding batteries).

2. Storage Temperature: - 25 degrees C to + 55 degrees C (-13 degrees F to 131 degrees F). Prolonged storage above + 40 degrees C (104 degrees F) will cause rapid self-discharge and permanent damage to the battery.

3. Relative Humidity (operating and storage): 5-95% non-condensing.

4. There shall be at least a 1.8^0F (1.0^0C) difference between the dry bulb temperature and the wet bulb temperature, at all times, to maintain a non-condensing environment

5. The maximum rate of temperature change shall be limited to 3^0F over 5 minutes (36^0F/hour), based on the ASHRAE Standard 90.1-2013

6. Elevation:

(1) Operational: 5000 ft. (1500 m) maximum without de-rating. Above this rating, altitude de-rating as per IEC 62040-3

(2) Transportation: Capable of air transport, up to 15,000m.

1.07 SAFETY

A. The entire UPS system including all matching system cabinets shall be certified, listed and labelled by Underwriters Laboratories in accordance with UL 1778, 4th Edition.

B. The UPS shall be certified by the Canadian Standards Association in accordance with CSA C22.2 NO.107.1-M91.

PART 2 - PRODUCTS

2.01 APPROVED MANUFACTURERS

A. Eaton

2.02 UPS MODULE STANDARD FEATURES

The UPS module shall consist of the following standard components, housed in a 50kW frame:

A. One (1) 50kW Power Module containing:

1. Rectifier/Charger: The rectifier/charger shall convert incoming AC power to regulated DC output for supplying the inverter and for charging the battery. The rectifier/charger shall be a high-frequency PWM design, using Insulated Gate Bi-polar Transistors (IGBTs). The modular design of the UPS shall permit safe and fast removal and replacement of the rectifier/charger module. Mean time to repair (MTTR) for the module shall be no more than 30 minutes in order to return UPS to normal mode. The rectifier/charger module shall also provide the following:
2. The rectifier shall draw AC system input power with an input power factor of 0.99 and reflected input current distortion of <3% under nominal AC input conditions.
3. The rectifier shall feature protection circuitry that prevents the IGBTs from sourcing current in excess of their published safe operating area.
4. Inverter: The inverter shall feature an IGBT pulse-width-modulation (PWM) design with high speed switching. The inverter shall also have the following features:
5. The inverter shall be capable of providing the specified quality output power while operating from any DC source voltage (rectifier or battery) within the specified DC operating range.
6. The modular design of the UPS shall permit safe and fast removal and replacement of the power module, while in maintenance bypass. Mean time to repair (MTTR) for the module shall be no more than 30 minutes in order to return UPS to normal mode.
7. The inverter shall feature protection circuitry that prevents the IGBTs from sourcing current in excess of their published ratings.

B. Static Bypass: The bypass shall serve as an alternative source of power for the critical load when an abnormal condition prevents operation in normal mode. The automatic internal static bypass shall consist of a fully rated, continuous duty, naturally commutated solid state static transfer switch for high-speed transfers. The bypass shall feature the following transfer and operational characteristics.

1. Transfers to bypass (for stand alone, and parallel capacity systems) shall be automatically initiated for the following conditions:

a) Output overload period expired.

b) Critical bus voltage out of limits.

c) Internal over temperature period expired.

d) Total battery discharge.

e) UPS failure.

2. Parallel Redundant UPS systems shall transfer to bypass on conditions (a), (b), and (d) above. Conditions (c) and (e) will result in the affected UPS isolating itself from the parallel bus, allowing the remaining UPS(s) to support the critical load.

3. Uninterrupted automatic re-transfer shall take place whenever the inverter is capable of assuming the critical load within its ratings capacity and specifications.

4. Uninterrupted automatic re-transfers shall be inhibited for the following conditions:

a) When transfer to bypass is activated manually or remotely.

b) In the event of multiple transfers/re-transfer operations the control circuitry shall limit “cycling” to three (3) operations in any ten-minute period. The third transfer shall lock the critical load on the bypass source, for 60 minutes.

c) UPS failure.

5. Uninterrupted manual transfers shall be initiated from the control panel. Uninterrupted manual transfers to bypass and from bypass shall be possible with the inverter logic. During manual transfers to bypass mode, the inverter must verify proper bypass operations before transferring the critical load to the bypass.

6. All transfers to bypass shall be inhibited for the following conditions:

a) Bypass voltage out of limits (+10%, to -10% of nominal)

b) Bypass frequency out of limits (+/- 4 Hz, adjustable, factory set)

c) Bypass out of synchronization

d) Bypass phase rotation / installation error

7. Static transfer time: No break, complete in less than 4ms.

8. The bypass shall be manually energized using the control panel or remotely through a building alarm input.

C. Monitoring and control components: The following components shall provide monitor and control capability:

1. Control panel: color LCD, touch sensitive, with LED status indicators.

2. Alarm and metering display.

3. Building alarm monitoring.

4. Communication ports: RS-232 and USB.

D. Battery management system: The UPS shall contain a battery management system which has the following features:

1. The battery management system shall provide battery time remaining while operating in normal mode and battery mode. Battery time available information shall be displayed real-time, even under changing load conditions. Upon commissioning, battery runtime information shall be available.

2. The battery management system shall automatically test the battery system to ensure that the battery is capable of providing greater that 80% of its rated capacity. Testing the batteries shall not jeopardize the operation of the critical load. Upon detection of the battery string(s) not capable of providing 80%, the

UPS system will alarm that the battery needs attention/replacement. The battery test shall be able to detect the following:

Open battery string
Shorted battery string (current limit)
Battery capacity (runtime) less than 80% of “new” battery capacity

E. Wiring Terminals: The UPS 50kW frame module shall contain mechanical compression terminals adequately sized to accommodate 75-degree C wiring.

1. Nominal 480V 3ph-3w + G 60Hz System Single Input with a 100 Amp source.
2. Bypass input connections (for a dual source input configurations): Not required.
3. DC connections for 480V battery cabinets (positive and negative and ground).
4. AC system output connections 208Y/120V 3ph-4w + Ground single output.

2.03 UPS SYSTEM OPTIONS AND ACCESSORIES

The UPS system shall include the following options and accessories:

A. Integrated Maintenance Bypass, Distribution, Accessory Cabinet: Integrated Line-and-Matching cabinets shall be provided that include:

1. All hardware and interconnecting cable for connection to UPS module.
2. Matching 3-circuit breaker manual maintenance bypass to isolate the UPS module from commercial AC input and critical load. The bypass cabinet may be mounted on either side of the UPS module. The 3-circuit breaker bypass shall provide complete isolation of UPS for servicing. Switch shall be make-before-break, interlocked between UPS and bypass, to prohibit improper operation.
3. Matching Transformer Cabinet. This may be positioned on either side of the UPS module and includes an internal K-13 harmonic rated system output isolation and step down transformer. The internal isolation transformer shall meet EPA TP-1 efficiency specifications.
    a) UPS system output load distribution is by others.
4. Parallel Tie Cabinet. Not required for this project.

B. Network Adapter and UPS Power Monitoring Software shall be included. A network gateway card adapter internal to the UPS module shall provide a communications interface between the UPS module and the following network management systems.

1. SNMP v.1, v.3
2. Modbus TCP
3. BACnet/WS or /IP
4. IPv6

This capability shall allow the unit to be monitored remotely over an Ethernet network using a standard web browser.

UPS Power Monitoring Software: This system shall continuously monitor critical power elements associated with the UPS, using the communications port on each module and a customer furnished PC. The system shall automatically alarm if any problems arise and notify local or remote personnel of the alarm condition via email, page, or text message.

C. A Dry, Form-C Relay Contacts Monitoring Card shall be provided. Serial dry contact card providing 4 isolated dry output contacts, 1 isolated input with user programmable relays.

D. External Battery Cabinet: The battery cabinet shall feature valve regulated, high-rate discharge, lead-acid batteries which provide energy to the support the critical load during a momentary loss of input power to the rectifier. The batteries shall be flame retardant in accordance with UL 94V2 requirements and shall be made by the same manufacturer as the UPS system. The battery cabinet shall have the following features:

1. The battery cabinet shall be the same depth and height as the UPS module and shall match the UPS module and be provided by the UPS manufacturer. Buyout and non-matching external battery cabinet systems are not acceptable.
2. The battery cabinet shall feature a mechanical enclosure of like appearance to the UPS module and shall feature casters for easy installation. Each battery cabinet shall require front access only for installation, service and maintenance. The battery cabinet shall provide bottom cable entry standard and top entry capability via sidecar.
3. Power wiring internal to each battery cabinet shall be factory provided. Each battery cabinet shall feature ten (10) front slide-out battery trays with four (4) batteries per tray which can be individually disconnected from the battery cabinet power wiring with quick front DC disconnect devices. Each battery tray shall be firmly secured to the battery cabinet frame with fasteners. Each battery tray shall be removable from the front of the battery cabinet.
4. Up to two (2) line and matching battery cabinets may be connected to the UPS module to achieve the desired battery runtime.
5. For parallel systems, each UPS frame shall have a discrete battery system. A single battery system may not be shared across multiple UPS frames.
6. Each battery cabinet shall feature an internal DC rated shunt trip circuit breaker. The circuit breaker within the battery cabinet shall only provide protection to the battery string(s) within that battery cabinet. For battery configurations involving multiple battery cabinets, the batteries in one battery cabinet may be isolated from the DC link via its circuit breaker without disconnecting other battery cabinets from the DC link and the UPS module.
7. The circuit breaker in each battery cabinet shall feature an A/B auxiliary switch. The UPS module shall be capable of monitoring and alarming an open battery cabinet circuit breaker condition.
8. The circuit breaker in the battery cabinet shall feature a 48VDC shunt trip device. The shunt trip shall operate to trip the battery breaker(s) for an emergency power off command or battery disable command from the UPS unit.
9. Power and Control wiring between the co-located battery cabinet and the UPS shall be factory provided.
10. The batteries shall be optionally configured with a ¼" spade type connector for attaching sense leads to each jar to facilitate the future addition of a battery monitoring system.
11. Expected battery life: 200 complete full load discharge cycles when operated and maintained within specifications.
12. The battery system shall provide a minimum of 60 minutes runtime with a 50kW UPS connected load.

2.05 UNINTERRUPTIBLE POWER SUPPLY RATINGS AND OPERATING CHARACTERISTICS

A. The UPS system shall be continuously rated 50kW at 1.0 (unity) power factor = 50kVA.

Units may be upgraded to their maximum UPS frame rating when sufficient power modules are installed, and appropriate firmware settings are implemented.

UPS Rating (max) is the maximum output possible from the UPS (for a load power factor range of 0.8 lagging to 0.8 leading). The UPS shall not require de-rating when supporting a leading power factor load of 0.8 or greater.

B. Acceptable UPS input source:

1. 480V 3-wire plus ground, 60Hz input to the UPS system. A source (input) neutral input conductor shall not be required for the UPS system.

   a) Single source input to the UPS: 480V 3ph-3w + Ground as obtained from a 480Y/277V 3ph-4w grounded neutral wye source with a 100 Amp feed.

   b) Dual system input is not required for this project (Single Input System).

C. 2. The 480V 3-wire plus ground input UPS system shall provide 208Y/120V three-phase, four-wire plus ground, grounded wye output. Rectifier/charger input:

1. Nominal three phase input voltage: 480V 3ph-3w + Ground, 60Hz, Single Input.

2. Operating input voltage range: +10%, -15% (408V – 528V) of average nominal input voltage without battery discharge. Note the UPS shall “power share” with the battery system down to -30% of nominal input voltage at full rated load.

3. Operating input frequency range shall be 40 to 72Hz.

4. Input power factor 0.99 lagging and <3% reflected input current THD at full load.

5. Normal input current limit: The UPS shall have the following programmable input current limit settings while operating in normal mode:

   a) Rectifier/charger input current limit shall be adjustable from 100 to 115% of UPS kW rating.

   b) Battery input current limit shall be adjustable from 0 to 16.5A. This input current limit may be extended up to 29.3A for loads less than 80%.

6. On generator rectifier input current limit: The UPS shall have the following user programmable input current limit settings while operating in normal mode on generator:

   a) Rectifier/charger input current limit shall be adjustable from 100% to 115% of UPS full load kW rating.

   b) Battery recharge input current limit shall be adjustable from 0 to 16.5A. This input limit may be extended to 29.3A for loads less than 80%.

7. Input current total harmonic distortion (THD) shall be less than 3% at nominal line voltage and 5% nominal source impedance.

8. Power walk-in: Ramp-up to full utility load adjustable from 10 amps per second to 1 amp per second.

D. Bypass input:

1. Synchronizing bypass voltage range shall be +10, -15% (408V – 528V) of average nominal input voltage.

2. Synchronizing bypass frequency range is +/- 0.5 Hz to +/-4 Hz, user adjustable, and is centered on the nominal frequency. Default setting is +/- 4 Hz.

3. Slew rate: 0.8 Hz per second, maximum.

4. Bypass and rectifier inputs can be supplied from out of phase sources if required.

5. Input surge withstand capability: The UPS shall be in compliance with IEEE 587 (ANSI C62.41), category A & B (6kV).

E. Rectifier/charger output:

1. Nominal DC voltage shall be 480 VDC with forty, 12V batteries with a 540V float.
2. Capacity: The rectifier/charger shall support a fully loaded inverter and recharge the battery to 90% of its full capacity within 10 times the discharge when input current limit is set at maximum.
3. Low line operation: The rectifier/charger shall be capable of sharing the DC load with the battery when the input voltage falls below the specified operation input voltage range, the “on battery” indicator shall annunciate operation in this mode.
4. DC sensing: DC voltage sensing methods shall be incorporated for providing battery over-voltage protection.
5. Battery charger characteristics: The UPS battery charging system shall have the following characteristics:
    a) The charger shall be capable of being configured for several charge modes including:
        (1) A charging mode that increases battery life by allowing the battery to rest, reducing positive plate corrosion
        (2) A charging mode floating the battery at a set level, which can be adjusted via software.
    b) UPS module will automatically adjust battery shutdown based upon loading and battery capacity.
        (1) The UPS module shall automatically adjust the final discharge voltage between 1.67 and 1.75 Volts per cell based on the existing load and the rate and length of discharge.
        (2) The absolute minimum operational voltage is 1.67 V per cell (adjustable upward).

F. UPS output in normal mode

1. The UPS system shall provide 208Y/120V three-phase, four-wire plus ground nominal output.
2. Steady-state voltage regulation (in inverter) shall be within +/- <1% average from nominal output voltage.
3. Transient voltage response shall be per EN62040-3, Class 1, VFI-SS-111.
4. Transient voltage recovery shall be compliant to EN62040-3, Class 1, VFI-SS-111.
5. Inverter linear load harmonic distortion capability: Output voltage THD of less than 1% for a 100% linear load.
6. Inverter non-linear load harmonic distortion capability: Output voltage THD of less than 5% for 100% non-linear load when tested using the non-linear load described in IEC 62040-3.
7. Line synchronization range shall be +/- 4Hz, adjustable to+/-0.5 Hz.
8. Frequency regulation shall be +/- 0.1Hz free running.
9. Frequency slew rate shall be 0.8 Hz/second maximum (adjustable).
10. Phase angle control:
    a) Balanced linear load shall be <1 degree from nominal 120 degrees

11. Phase voltage control:

    a) Balanced linear loads shall be +/- 1% from average phase voltage

    b) Unbalanced linear loads shall be less than <2% from average phase voltage for 100% load unbalanced

12. Overload current capability (with nominal line and fully charged battery, non-paralleled systems):
    a) Double Conversion mode: The unit shall maintain voltage regulation for 102% to <110% of resistive/inductive load for 10 minutes, 111% to <125% for 60 seconds, and 126% to 150% for 10 seconds, >151% for 300ms.
    b) Stored energy mode (typically on battery): The unit shall maintain voltage regulation for 102% to <110% of resistive/inductive load for 10 minutes, 111% to <125% for 60 seconds, and >126% for 300ms
    c) Energy Saver System operation: Continuous = 110%. Transient = 1000% peak current for 10ms.
    d) On bypass (single UPS systems): Continuous = 125%. Transient = 1000% peak current for 10ms.

13. Fault clearing current capability: See section 12 above.

14. Static transfer time, inverter to bypass: No break, completed in less than 4ms.

15. Static transfer time, Energy Saver to inverter: No break, completed in less than 4ms maximum, typically <2ms.

16. Common mode noise attenuation:

    a) 100dB minimum

17. Acoustical noise: Noise generated by the UPS under normal operation shall not exceed 65dbA at one meter from any operator surface, measured at 25 degrees C (77 degrees F) and full load, per ISO 7779 standard.

18. EMI Suppression: The UPS shall meet FCC rules and regulation 47, part 15, for Class A devices, CISPR22, and IEC62040-2 C2 and C3.

19. Electrostatic discharge (ESD): The UPS shall meet IEC61000-4-2 level 3; 4kV contact/8kV air discharge.

20. Efficiency: The UPS have a tri-level power inverter-converter design for highest possible efficiency. Full load UPS module efficiency shall be 97%, 50% UPS load efficiency shall be 96.5% and 25% UPS load efficiency shall be minimum 95.0%.

G. UPS Output with Energy Saver System option

1. The Energy Saver System acts to optimize the internal components of the UPS power train to maximize system efficiency when the bypass source is within the following (adjustable) limits: Voltage: +/-10% (432-528V) and Frequency: +/-3Hz.
2. 208Y/120V 3ph-4w + Ground nominal UPS system output.
3. Steady-state voltage regulation shall be within +/- 10% from nominal output voltage.
4. Line synchronization range shall be +/- 4 Hz, adjustable.
5. Frequency regulation shall be +/-4 Hz when bypass source is within the limits in (1) above, and +/- 0.1Hz free running,
6. Overload current capability (with bypass source within the limits of (1) above) Continuous: 110%, Transient: 1000% for 10msec.
7. Static transfer time: No break, typically completed in less than 2ms, including detection time.
8. Acoustical noise: Noise generated by the UPS under normal operation shall not exceed 65dbA at one meter from any operator surface, measured at 25 degrees C (77 degrees F) and full load.
9. EMI Suppression: The UPS shall meet FCC rules and regulation 47, part 15, for Class A devices, CISPR22, and IEC62040-2 C2 and C3.
10. Electrostatic discharge (ESD): The UPS shall meet IEC61000-4-2 level 3; 4kV contact/8kV air discharge.
11. Efficiency: The UPS module efficiency shall greater than 99% over the range of 25% to 100% load.

2.06 MECHANICAL DESIGN

A. Enclosures: The UPS shall be housed in free-standing double front enclosures (safety shields behind doors) equipped with casters and leveling feet. The enclosures shall be designed for computer room applications. Front doors shall have key pin tumble cylinder locks to prevent unauthorized entry.

B. Modular construction: The UPS shall be comprised of one (1) 50kW Power Module that includes the rectifier, inverter, and battery converter power and control circuitry. The Power Module shall be a draw-out assembly that can be quickly exchanged or replaced as necessary.

C. Ventilation: The UPS and shall be designed for forced-air cooling. Air inlets shall be on the front of the unit. Air outlet configuration for the UPS, and its accessory cabinet(s) shall be user selectable at time of order to exhaust warm air at the top of the cabinet (row or wall installations), or exhaust at the rear of the cabinet for “hot aisle” configurations. Eighteen inches of clearance over the UPS outlets shall be required for proper air circulation (top exhaust) or working space (rear exhaust). An air filter shall be mounted in the front door of the UPS module.

D. No rear or side clearance or access shall be required for the UPS system. The rear and sides enclosure covers shall be capable of being located directly adjacent to a wall.

E. Cable entry: Top or bottom feed.

F. Front access: All serviceable subassemblies shall be modular and capable of being replaced from the front of the UPS (front access only required). Systems that require any rear or side access for any system cabinets are not acceptable.

G. Service area requirements: The system shall require (48) inches of front service access room per the NEC and shall not require side or rear access for service or installation.

2.07 CONTROLS AND INDICATORS

A. Microprocessor controlled circuitry: The UPS controls shall have the following design and operating characteristics:

1. Fully automatic operation of the UPS shall be provided through the use of microprocessor controlled Digital Signal Processing. Start-up and transfers shall be automatic functions and will not require operator intervention.

B. Digital Front Panel Touch Screen Display: The UPS control panel shall be a 7" touch sensitive, backlit LCD front panel display that includes LED indicators for basic UPS status. Large, luminous, color coded LED pillars (vertical bars) shall show the UPS status (green, amber, red), and be visible up to 30m from the UPS. The LCD shall display:

1. UPS status (home screen): the LCD screen shall have a color-coded border (header) that turns red on alarm and shows basic UPS status in the header of the display, visible at all times. The header shall alternately show UPS status output voltage and battery time remaining and be visible constantly in all display screens. The home screen shall show load level, average efficiency, and power consumption in kWh. The home screen shall show a system mimic diagram with a color-highlighted power path, operating mode, and active events.
2. Controls tab: Shall provide touch sensitive button controls, with a confirm prompt, for turning the UPS on and off, transfer to/from bypass, and enabling or disabling the battery charger, initiating a battery test, and enabling or disabling Energy Saver System (ESS).
3. Metering tab: The metering screen shall show voltages currents, temperatures, kW, kVA, and power factor (as applicable) for the UPS input, output, bypass source, and battery. Color coded (green, amber, red) bar graph indicators will accompany power and temperature measurements
4. Logs tab: alarm/event queue, active alarms and alarm history, events, status changes and commands, all timed to the 1/1000th second for tracking and analysis.
5. Statistics tab: Numerically and graphically displays the estimated savings afforded by ESS operation over time.
6. Settings tab: shall provide button access to user adjustable settings such as, but not limited to: date/time, building alarm designations, communications parameter setup, UPS name, user passwords, and display language.

C. Control Panel Lamp Indicators: The UPS control panel shall provide the following monitoring functions with indicator (icon) LED's:

1. NORMAL: This green LED shall indicate that the commercial AC utility or generator source is supplying power to the rectifier and the inverter is supporting the critical load.
2. BYPASS: This amber LED shall indicate that the UPS has transferred the load to the bypass circuit.
3. BATTERY: This amber LED shall indicate that the commercial AC utility or generator source has failed and the battery is supplying power to the inverter, which is supporting the load.
4. ALARM: This red LED and the accompanying audible alarm horn, shall indicate that the UPS detects an alarm condition, outlined in detail in the Logs tab from the home screen and in the operator's manual.

D. Interface panel: The UPS shall be equipped with an interface panel, located behind a protective cover, which provides the following signals and communication features in a Class 2 environment:

1. Alarm contact: A dry contact for annunciating a summary alarm shall be provided for customer use. This contact shall be Form "C" capable of supplying both N/O and N/C contacts. Contact ratings shall be 5A max at a voltage not to exceed 28VDC or 277VAC.
2. RS232 (EIA / TIA-232) and USB communications interfaces: Circuitry shall be provided for one "host", and one "device" USB connector, and one RS232 (EIA / TIA-232) communication port for connection to automated service department diagnostic tools. This port may be used with simple ("dumb") terminals to gain remote access to all unit operation information.
3. Building alarms: Five (5) inputs shall be provided for monitoring the status of external dry contacts. Building alarms shall be set up through the UPS configuration mode function on the UPS front panel display or via the RS232 (EIA / TIA-232) port.
4. External REPO contacts: Shall be provided to connect an external remote emergency power off switch to shut down the UPS and de-energize the critical load. Normally open or normally closed contacts shall be acceptable.
5. Battery control contacts: Contacts shall be provided to connect the battery shunt trip and auxiliary contact signals from a battery breaker or battery disconnect switch.
6. External bypass indicator connection: A connection point shall be provided to acknowledge that an external maintenance bypass has been closed around the UPS, placing the critical load on utility power.

2.08 COMMUNICATIONS

A. Communications Bay: The UPS shall be equipped with field configurable communications bays that will accommodate four (4) plug-in communication devices

B. Remote Monitoring:

1. WEB/SNMP communication capabilities shall be included.
2. The UPS shall be able to be monitored remotely via communications devices. UPS manufacturer shall provide optional communications devices capable of communicating via various industry standard protocols such as RS232, SNMP,

BACnet and ModBus. Monitoring of UPS status may also be performed through isolated dry contact Form C relays that shall be included.

The UPS communication capability should be able to integrate into any industry standard Building Management System (BMS) and/or Network Management System (NMS). The UPS must also be able to be monitored via any standard Internet browser.

All optional hardware interfaces shall be “Hot-swappable” (UPS maintains power to critical applications while changing interfaces).

C. Shutdown:

1. There shall be a mechanism that provides graceful, orderly, unattended, sequential shutdown of one or multiple computers powered by one UPS. This shutdown shall be performed via in-network or out-of-network means. The order of shutdown shall be user-defined, allowing the maximization of runtime on battery for more critical systems.

2. The UPS shall also be capable of interfacing with an operating system’s built-in shutdown routine. This shall be done through a cable connection to the communication interface card.

D. Notification:

1. There shall be a mechanism to send alerts to key personnel via email or SNMP traps. An alarm notification may also be sent by a network message.

2.08 UPS MODULE PROTECTION

A. Rectifier/Charger and Bypass protection shall be provided through individual fusing of each phase.

B. Battery protection shall be provided by thermal-magnetic molded-case circuit breakers in each battery cabinet (if standard battery pack is provided) or external protective device for an external battery.

C. Electronic current limiting circuitry and fuses in the Inverter circuit shall provide output protection.

D. To comply with agency safety requirements, the UPS module shall not rely upon any disconnect devices outside of the UPS module to isolate the battery cabinet from the UPS module.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer’s instructions.

3.02 COMMISSIONING

A. Factory start-up shall be included during any-time (7x24) hours. Start-up service shall include one visit to perform all procedures and tests specified within UPS Installation and Operation manual. UPS manufacturer shall also include the following services:

1. Pre-energize visit to inspect installation and provide guidance to installers as required.

2. Post-start-up visit for alarm notification configuration, operator training, generator testing, etc.

B. The following procedures and tests shall be performed by Field Service personnel during the UPS startup:

1. Visual Inspection:

   a) Visually inspect all equipment for signs of damage or foreign materials.

   b) Observe the type of ventilation, the cleanliness of the room, the use of proper signs, and any other safety related factors.

2. Mechanical Inspection:

   a) Check all the power connections for tightness.

   b) Check all the control wiring terminations and plugs for tightness or proper seating.

3. Electrical Pre-check:

   a) Check the DC bus for a possible short circuit.

   b) Check input and Bypass power for proper voltages and phase rotation.

   c) Check all lamp test functions.

4. Initial UPS Startup:

   a) Verify that all the alarms are in a “go” condition.

   b) Energize the UPS module and verify the proper DC, walkup, and AC phase on.

   c) Check the DC link holding voltage, AC output voltages, and output waveforms.

   d) Check the final DC link voltage and Inverter AC output. Adjust if required.

   e) Check for the proper synchronization.

   f) Check for the voltage difference between the Inverter output and the Bypass source.

   g) Full-load, step-load, and battery discharge tests using supplier furnished resistive load bank shall be included.

5. Operational Training: Before leaving the site, the field service engineer shall familiarize responsible personnel with the operation of the UPS. The UPS equipment shall be available for demonstration of the modes of operation.

3.03 WARRANTY

All components of the entire UPS system, including all batteries, shall be covered by a standard one-year parts and labor limited factory warranty with factory service. Third party service for startup and any emergency service is not acceptable.

One-year limited factory system warranty shall include replacement coverage for the UPS parts, including batteries, for a period of up to 18 months from factory shipment or up to 12 months from start-up, whichever occurs sooner.

One-year parts and labor system warranty shall include 7x24 on-site repair/replacement labor for UPS parts and batteries; 7x24 technical support coverage; and 7x24 remote monitoring service (with monthly reports for UPS and battery performance). Factory tech site response time shall be 8 hours minimum from receipt of call with factory employed technician. Third party service is not

acceptable. Factory service contracts shall be available as options for the UPS system to provide 7x24 parts, labor and travel emergency service and include essential preventive maintenance.

Manufacturer shall also include Start-up services consisting of: one (1) 7x 24 start-up service of UPS and batteries. On-site user training, Site Audit, installation and commissioning of monitoring service, and validation of one-year limited factory warranty will be performed during the start-up.

Manufacturer shall also offer an optional service plan to provide 7x24 on-site coverage (preventive and corrective) for UPS and batteries, guaranteed response time, remote monitoring, Web access to service site history, annual Site Audit, UPS and battery preventive maintenance visit, and discounts on upgrade and modification kits. Manufacturer shall also provide an optional battery service plan to provide parts-and-labor coverage for partial and full battery strings, either with preventive maintenance or replacement coverage.

END OF SECTION

Dickson 50KW 480 volt 3phase

Product Brochure

20-400kW

Eaton 93PM UPS

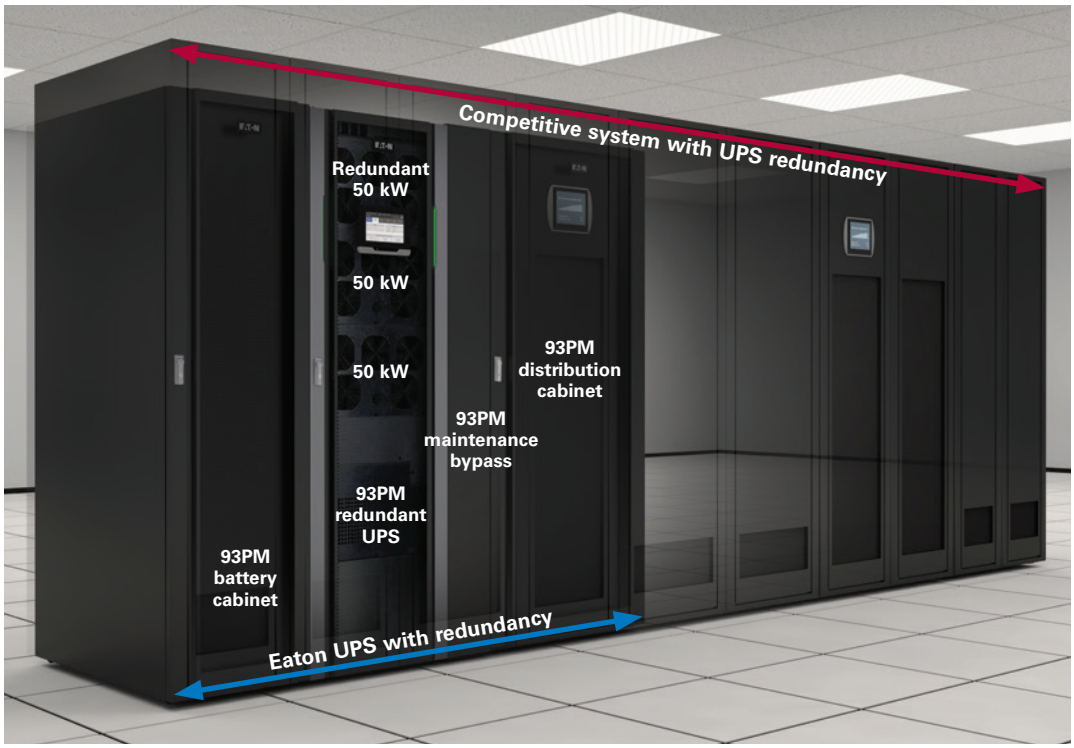
Efficient. Scalable. Innovative.

EATON

Powering Business Worldwide

93PM features and benefits

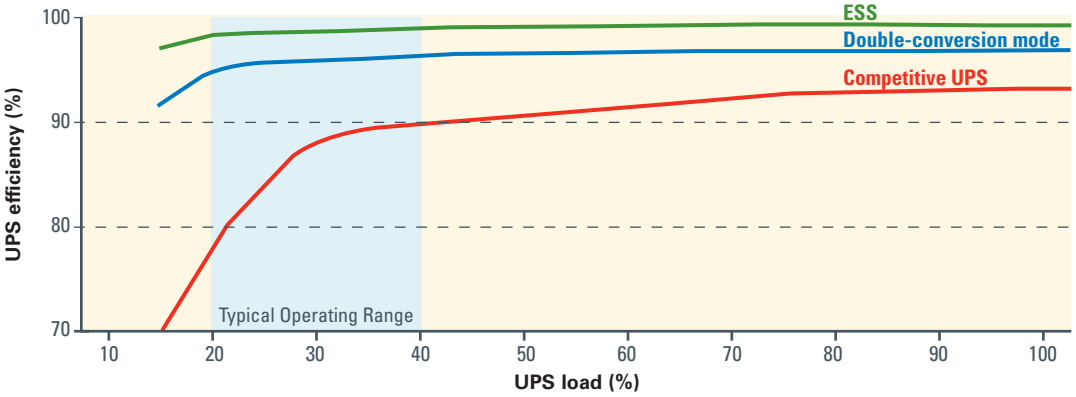
The Eaton 93PM UPS combines unprecedented efficiency and reliability with an eye-catching design. A space-saving, scalable and flexible device that's as easy to deploy as it is to manage, it's the perfect three-phase white or grey space solution for today's data center.



The 93PM's vertical scalability, internal redundancy and compact footprint design

1. Lowest TCO (Total cost of ownership)

- **Conserves valuable data center floor space with its compact footprint and internal redundancy design**
- **Reduces cost and unexpected future growth risks with its vertical scalability, enabling you to scale as you grow**
- **Reduces power and cooling OPEX through industry-leading energy-efficiency**
  - 99% efficiency with ESS
  - Up to 97% efficiency in double-conversion mode



Eaton 93PM efficiency in double conversion and ESS

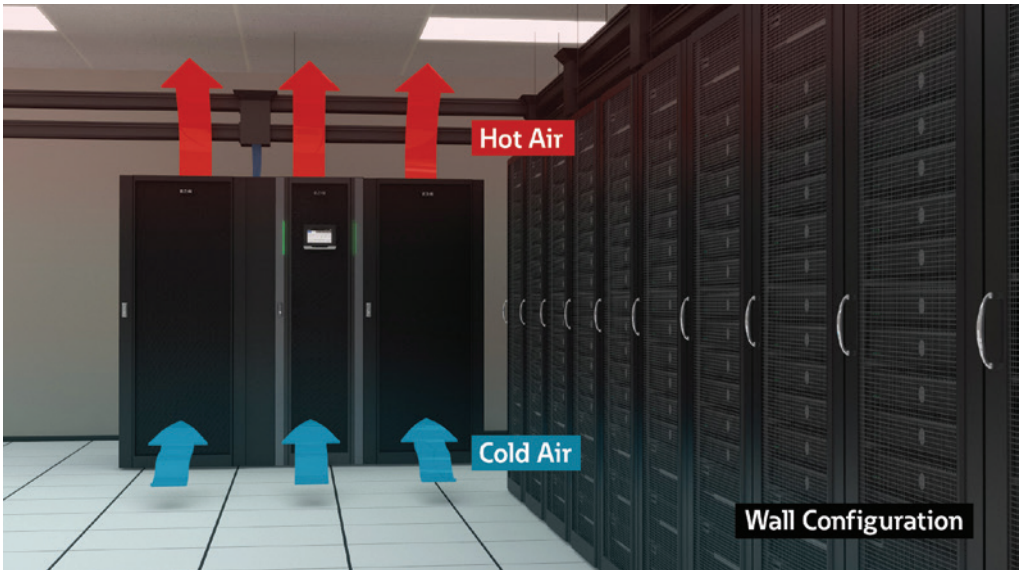
The 93PM ESS energy cost savings pay for the UPS in less than 3 years. Calculate your 93PM savings with ESS at **Eaton.com/ESS**.

Table showing 400 kW efficiency savings comparison

Load %	Leading competitor efficiency **	93PM ESS efficiency	93PM ESS annual savings($)*	93PM double-conversion efficiency	93PM double-conversion annual savings ($)*
25%	84.0%	98.4%	$27,470	95.8%	$23,121
50%	90.6%	98.9%	$29,212	96.8%	$22,294
75%	92.5%	99.1%	$34,059	97.0%	$23,724
100%	93.0%	99.1%	$41,746	96.8%	$26,623

*** Savings calculated using $0.10 kW/hr. and 80% cooling ratio (currency in US dollars)**
**** Leading competitor does not offer ESS mode**

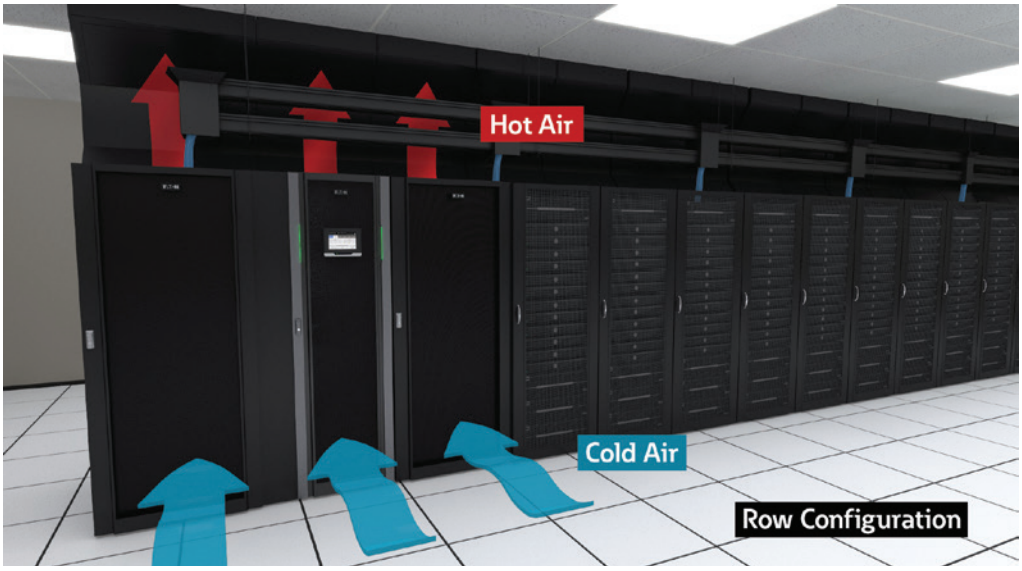
The 93PM double-conversion energy savings pay for the UPS in less than 3 years.



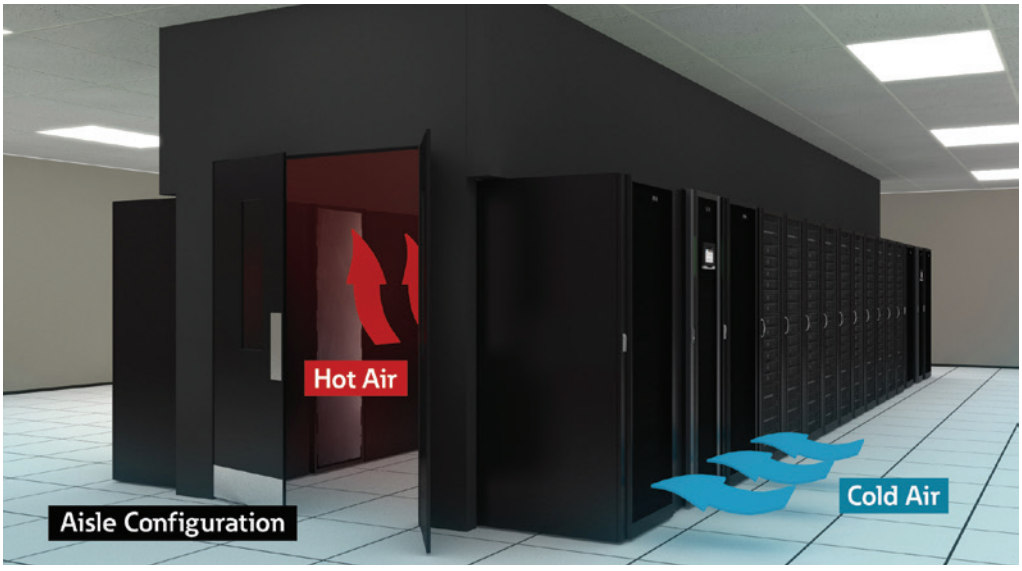
2. Easy deployment

- **Maximizes deployment flexibility by providing flexible configurability**

The 93PM supports front-to-top ventilation, ideal for against the wall configuration.



Front-to-top ventilation feature also makes the 93PM a perfect fit for in-row configurations that support slim chimneys.



The 93PM also supports front-to-back ventilation making it great for hot/cold aisle configuration.

LED light bars

Green light bars showing healthy UPS.

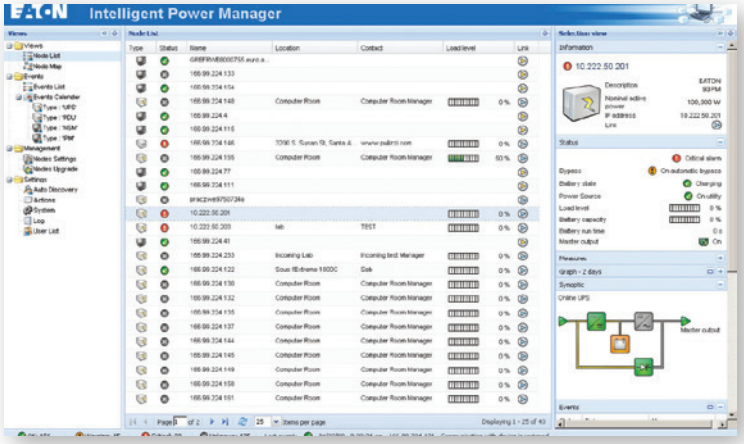
Red light bars showing alerts on system. Yellow light bars indicate battery and bypass status.

3. Easy management

- **Provides easier access to detailed status information through its large, user-friendly LCD touchscreen interface**

  With the 93PM's graphical LCD interface you can track stats on energy savings, battery time, outage tracking, load profiling and much more.

  The green/yellow/red LED light-bars make system status visible from a distance in data centers.



Intelligent Power Manager seamlessly integrates into the major virtualization platforms, including VMware®, Citrix®, Red Hat® and Microsoft® Systems Center.

- **Integrates with the leading virtual platforms through its full suite of power management and connectivity software**

  Designed for the most advanced IT environments, the 93PM supports optional communication cards that allow remote access via the HTTP(S), SNMP, MODBUS TCP/IP, Modbus RTU and BACnet IP protocols. In addition, Eaton's Power Xpert® software and Intelligent Power Software Suite give you all the tools you need to manage power devices in your physical or virtual environment. Learn more at **Eaton.com/intelligentpower**.

- **Increases uptime through its 24x7 remote monitoring and reporting capabilities**

  Eaton's eNotify Remote Monitoring Service provides 24x7 real-time monitoring of the 93PM and alerts service technicians to take necessary measures when a problem is detected. Learn more at **Eaton.com/enotify**.

Communication card

Connectivity options:

- Power Xpert Gateway Mini-slot communication card
- Industrial relay card

Eaton's comprehensive portfolio

Integrated data center products and services

- A Overhead Cable Management Solutions
- B Thermal Management Solutions
- C Busway
- D ePDUs
- E Aisle based Power Management Solutions (UPSs)
- F Rack Monitoring Solutions
- G Rack-based Power Management Solutions (UPSs)
- H IT enclosures
- I Customized Service plans
- J Management Software

The functional core of the 93PM UPS

A Cable entry
Top and bottom cable entry options available

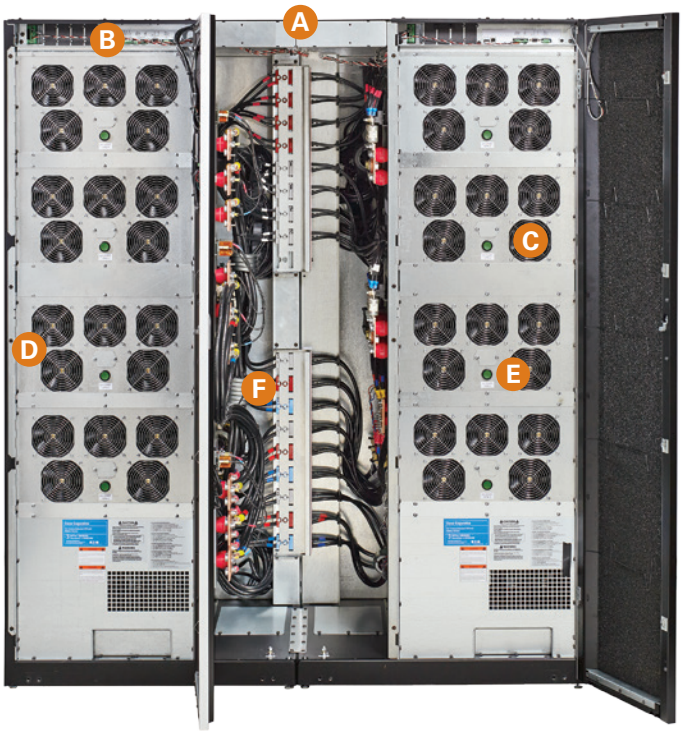
B Communications and connectivity
- Built-in device and host USB
- Five alarm inputs and dedicated EPO
- Alarm relay output
- Four communication slots

C Serviceable redundant fan assembly
Contained within each power module

D Replaceable power modules
(50 kW) with independent control and power

E Soft start controls
Contained within each power module

F Input/output connections



Open front view of 400 kW unit

Eaton 93PM UPS Technical Specifications*

Power Modules	
Power offering (kW)	20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 250, 300, 350, 400 (optional internal redundancy available)

General Characteristics	
Efficiency in Energy Saver System (ESS)	99%
Efficiency in double-conversion mode	Up to 97%

Input Characteristics	
Voltage	480V (208V with IAC-D, available up to 100kW)
Voltage range	+10% / -15%
Frequency range	50/60 Hz
Power factor	> .99
Input current distortion	< 3% @ 100% load capacity

Battery	
Battery voltage	432V, 480V
Charging method	ABM® or float technology

UPS Dimensions	
Height	74"
Depth	42"
Width	22" (20-150 kW), 32" (160-200kW), 64" (250-400kW)

Output	
Voltage	480V (208V with IAC-D, available up to 200kW)
Regulation	±1% steady state
Voltage THD	<1% (100% linear load); <5% (non-linear load)
Load power factor range	.8 leading to .8 lagging without de-rating

Certification	
Safety	UL1778, cUL
EMC	FCC Part 15 subpart B class A
Surge	IEC 61000-4-5

Optional Accessories
- External slim maintenance bypass
- Integrated distribution cabinet (with input and output transformer options)
- Integrated parallel tie cabinets
- Integrated battery cabinet (small and large)

**Due to continued improvements, specifications are subject to change.*

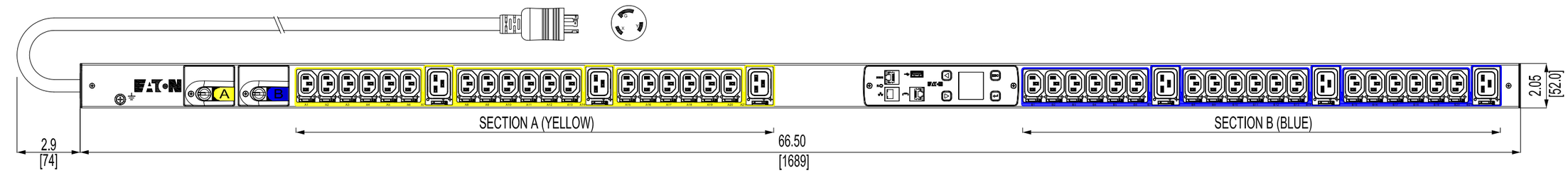
Eaton
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com

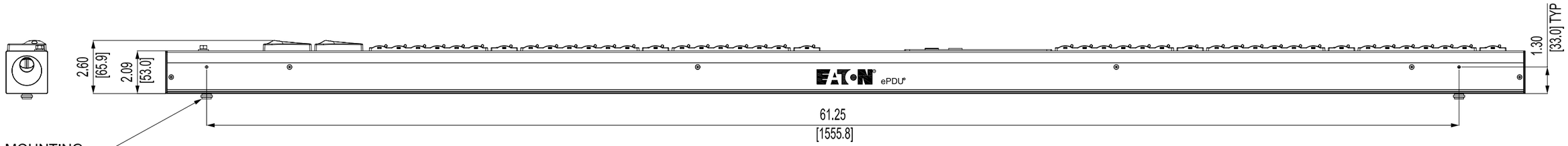
Powering Business Worldwide

Learn more at **Eaton.com/93PM**

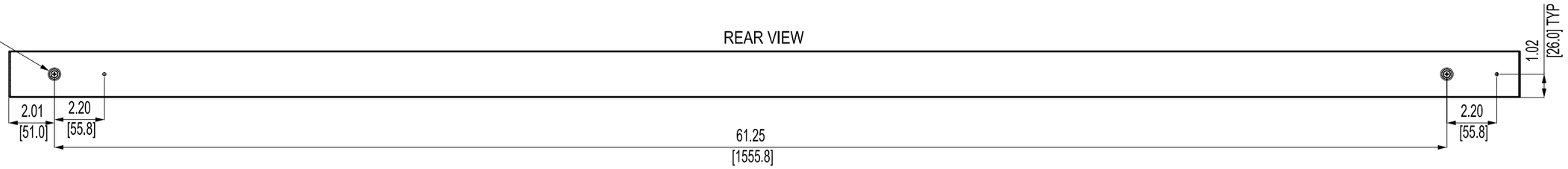
DICKSON UPS REQUIRED PDU's Require a quantity of 12 units

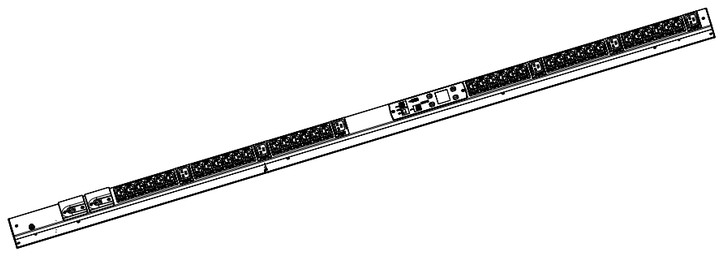
00-->01 ECO-059156
Update for Production





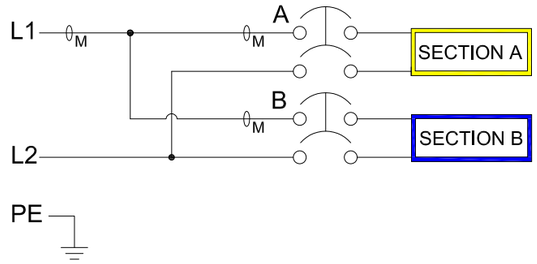
MOUNTING
BUTTON



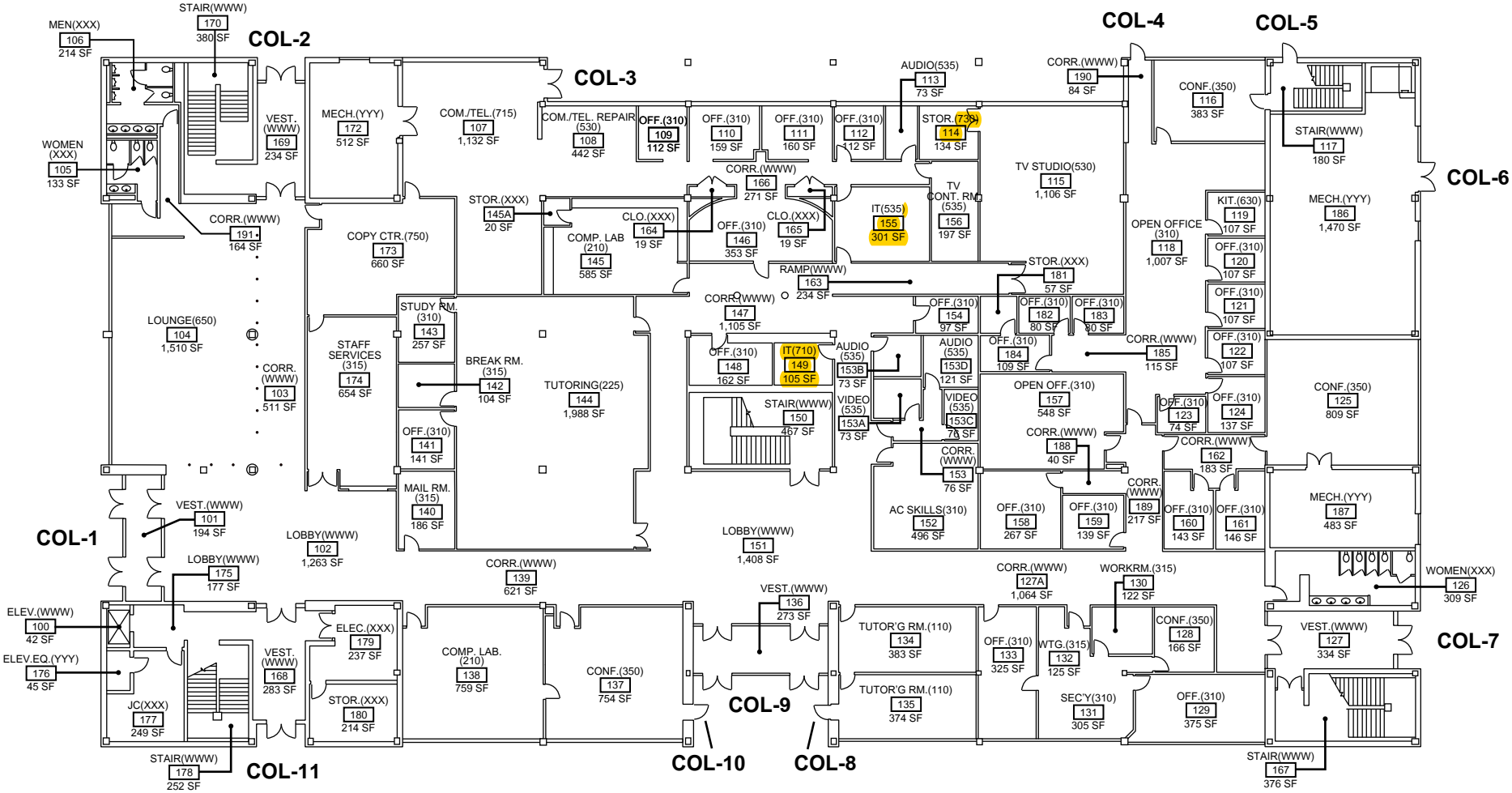


EMI104-10
G3 METERED INPUT

FUNCTIONALITY	INPUT	OUTPUT	OPERATING TEMPERATURE
CURRENT, POWER, AND ENERGY METERING FOR INPUT AND BRANCH	NEMA L6-30P 10FT 10AWG / 3C POWERCORD	(36) IEC 60320 C13 GRIP (6) IEC 60320 C19 GRIP	32° TO 140° F 0° TO 60° C
MECHANICAL	**INPUT RATING**	**OUTPUT RATING**	**CERTIFICATIONS**
66.50" (1689mm) LENGTH 2.05" (52mm) WIDTH 2.09" (53mm) DEPTH ALUMINUM CHASSIS, BLACK	200-240V~ W+N+PE 24A 50/60HZ	200-240V~ 15A PER C13 16A PER C19 16A MAX PER SECTION 24A MAX TOTAL	c UL us LISTED
CIRCUIT BREAKERS	**FILTER AND SPIKE/SURGE**	**ACCESSORIES**	**CONFIGURATION**
(2) 20A 2-POLE LISTED	NONE	INCLUDED SPK012 - INSTALLATION INCLUDED SPK013 - NETWORK OPTIONAL EMP001 - ENVIRONMENTAL PROBE	EMI3MT15JDG78AC



TITLE	ePDU G3 SPECIFICATION EMI104-10		DRAW	Spock Liu	2013-11-20
			DESIGN		
DWG NO.	B9001-221390-01P		CHECKED	Elon Guo	2013-11-20
MATERIAL			SAFETY		
COATING			APPROVED	Vicky Shen	2013-11-20
UNITS	in[mm]	A3 SCALE 1:5	EATON ELECTRICAL SECTOR		
SHEET	1/1				



BUILDING GROSS SQ. FT.=

74,836 S.F.

FIRST FLOOR GSF= 36,683 SF

SECOND FLOOR GSF= 38,153 SF

COLLINS HALL - FIRST FLOOR

JULY 2018

NORTH

Collins UPS (2)

Current install is an 8KVA and a 12 KVA single phase UPS located in the COL 155 data closet. One unit supports COL 155 and the other unit supports COL 149. The current power feed comes from the generator transfer switch panel located in COL 114.

Please note! The question of a missing neutral which will need to be pulled to support the new Eaton UPS.
Please note! No flex conduit. We require install with Liquid Tight vinyl covered flex conduit with adequate length to move and service unit.

EPO disconnect is required in this install.

Removal and disposal of old equipment by contractor.

Maintenance bypass, network ready equipment startup by Eaton.

***Specified Manufacturer- Model-Eaton 9155 Series 8kVA & 10kVA Single Phase UPS systems. Please no substitutes!**

Eaton 9155 UPS

Powering Business Worldwide

Product Introduction

9155 8-15 kVA

Product Snapshot

Technology:	Split-phase double-conversion online UPS
Power Rating:	8 kVA, 10 kVA, 12 kVA and 15 kVA at 0.9 power factor
Input Voltage:	200–240 Vac with Neutral or with optional input isolation transformer
Output Voltage:	100/200, 110/220, 120/240 Vac 180° phase displacement; 120/208, 127/220 Vac 120° phase displacement
Frequency:	50/60 Hz auto-sensing
Dimensions:	32.2" H x 12" W x 32.5" D
Configuration:	Small-footprint tower, black
Battery Backup:	Up to 29 minutes typical, extendable up to four hours (See battery backup charts)

Reliability and efficiency have never looked so attractive. The 9155 single-phase Uninterruptible Power System (UPS) delivers a combination of advanced technology, user-friendly design and low price that's absolutely unmatched by competing products. This innovative design offers high efficiency (90 percent or better across all load ranges), low input current distortion (less than 5 percent total harmonic distortion, with an active IGBT rectifier that delivers 0.99 power factor correction) and high power factor output (0.9 PF).

With advances being made in miniaturization and processing power and more equipment being served by dual-cord power supplies, the challenge of protecting that power, and doing so in a limited space, grows ever greater.

Fortunately, advances in technology have also meant that more power protection per square foot can now be provided. The 9155 delivers premium levels of efficiency, reliability and flexibility, all in a sleek tower half the size of most other units on the market today.

Features of the Eaton 9155 UPS

- A true online, double-conversion topology protects connected equipment from all nine of the most common power problems
- Delivers maximum power density in a compact tower design: 12" wide and 33" deep, including batteries
- Provides more real power in less space (5,500 watts per square foot) with a 0.9 output power factor – protecting more equipment for every utility dollar and leaving more room for expansion of the data center
- Patented Powerware Hot Sync® paralleling of multiple modules delivers extra capacity or redundancy
- Customizable output distribution provides user-specified power outlets along with terminals for connecting hard-wired equipment
- Microprocessor-controlled ABM® technology significantly increases battery life
- Provides a 0.99 input power factor and generator friendly <5% total harmonic distortion using an active IGBT rectifier to control the input power factor
- Ensures data and system integrity with complete power management software for remote monitoring, management and shutdown
- An Eaton factory limited warranty, technical support and optional service plans provide investment protection and peace of mind

Premium power protection is now easier than ever.

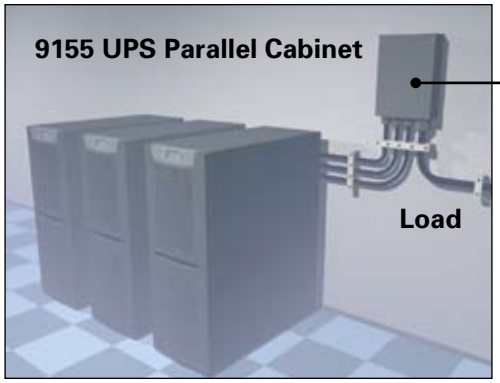
With raised-floor real estate at a premium, you'll appreciate that the 9155 requires only three to six square feet of floor space, including internal batteries. Such a small footprint gives you more location options and more space available for future expansion.

Equipment installation is inexpensive and easy – essentially plug-and-play. You can order 9155 models with your choice of more than 19 types of output receptacles. To rearrange or add data center equipment, you simply unplug from the old receptacle and plug into a new one – no need for an electrician to run new conduit and wiring.

Scalable architecture meets current and future load requirements.

Eaton 9155 UPSs are available in four models: 8, 10, 12 and 15 kVA, so you can choose the configuration that most closely meets your own capacity requirements and price point. And you can scale from there. Using our signature Hot Sync paralleling technology, up to three 9155 modules can be paralleled for extra capacity or redundancy. A 15 kVA UPS, for example, can grow to support loads of up to 45 kVA. There's no dependence on communications wiring among these modules, enhancing reliability and simplifying installation. This paralleling capability Is far more easily achieved than is the case with competitors' products.

Powerware Hot Sync Redundant/Capacity



Inside view of 9155 Parallel Cabinet Maintenance Bypass

Battery innovations optimize battery performance and service life.

Standard internal batteries provide power until auxiliary power takes over or systems are gracefully shut down. Battery runtime can be extended to hours by adding matching Extended Battery Modules (EBM).

Eaton 9155 8-15 kVA UPS Backup Times (In Minutes)

VA	Watt	UPS + Internal 32 Battery	(1) EBM 64	(2) EBM 64	(3) EBM 64	(4) EBM 64	UPS + Internal 64 Battery	(1) EBM 96	(2) EBM 96	(3) EBM 96
15000	13500	4.6	23.0	43.0	65.1	88.6	13.3	43.0	76.7	113
14500	13050	4.9	24.1	45.2	68.3	93.0	14.1	45.2	80.5	119
14000	12600	5.2	25.2	47.3	71.5	97.4	14.9	47.3	84.2	125
13500	12150	5.5	26.4	49.4	74.7	102	15.8	49.4	88.1	130
13000	11700	5.8	27.6	51.6	78.1	106	16.7	51.6	92.0	136
12500	11250	6.1	28.8	54.0	81.6	111	17.6	54.0	96.2	142
12000	10800	6.5	30.2	56.5	85.5	116	18.6	56.5	101	149
11500	10350	6.9	31.6	59.3	89.7	122	19.2	59.3	106	156
11000	9900	7.3	33.3	62.4	94.4	129	20.2	62.4	111	164
10500	9450	7.8	35.1	65.9	99.6	136	21.4	65.9	117	174
10000	9000	8.4	37.2	69.8	106	144	22.6	69.8	124	184
9500	8550	9.1	39.6	74.2	112	153	24.1	74.2	132	196
9000	8100	9.9	42.3	79.4	120	163	25.7	79.4	141	209
8500	7650	10.8	45.5	85.2	129	175	27.6	85.2	152	225
8000	7200	11.9	49.1	91.9	139	189	29.8	91.9	164	242

Eaton 9155 8-15 kVA UPS Backup Times (In Minutes)

VA	Watt	UPS + Internal 32 Battery	(1) EBM 64	(2) EBM 64	(3) EBM 64	(4) EBM 64	UPS + Internal 64 Battery	(1) EBM 96	(2) EBM 96	(3) EBM 96
7500	6750	13.1	53.2	99.7	151	205	32.3	99.7	178	263
7000	6300	14.6	58.0	109	164	224	35.2	109	194	286
6500	5850	16.3	63.5	119	180	245	38.6	119	212	314
6000	5400	18.4	70.0	131	198	270	42.5	131	234	346
5500	4950	20.1	77.6	145	220	300	47.2	145	259	383
5000	4500	22.4	86.6	162	245	334	52.6	162	289	428
4500	4050	25.2	97.4	182	276	376	59.2	182	325	-
4000	3600	28.6	110	207	313	426	67.1	207	369	-
3500	3150	32.8	127	238	359	-	77.0	238	423	-
3000	2700	38.3	148	277	418	-	89.7	277	-	-
2500	2250	45.6	176	329	-	-	107	329	-	-

Note: Backup times are approximate and may vary with equipment, configuration, battery age, temperature, etc.

Options & service

Additional 9155 options

Wall-mount maintenance bypass panels

Eaton offers a comprehensive line of optional wall-mounted maintenance bypass panels compatible with the 9155 UPS. The wall-mounted bypass panel is used to bypass the UPS during maintenance or servicing, providing wrap-around bypass for UPS service without shutting down the load. And for more flexible power distribution, these maintenance bypass panels can be equipped with surge protection and provisions for 36 poles of distribution utilizing Eaton's Cutler-Hammer® breakers.

Proven warranty and support services

Customers consistently rank Eaton services number one in quality. Eaton's comprehensive, world-class service solutions are designed to improve costs, uptime, reliability, power quality and safety. And with 240 customer service engineers in North America and 1,200 international authorized service providers, Eaton has more service personnel than any other UPS manufacturer.

The standard factory warranty covers:

- System warranty: Two year parts / 90 days labor
- Battery warranty: Two years parts / 90 days labor

Extensive service options for enhanced reliability

For support beyond the warranty period, Eaton offers enhanced service options including onsite startup, corrective and preventive maintenance, battery solutions, training, remote monitoring and factory spare parts and upgrades. Customizable three-phase UPS services packages allow customers to select the plan that provides the right combination of system uptime, convenience and value.

Service Plans			
Features	**Service Plans**		
	Factory Warranty	**On-Site Gold**	**On-Site Gold Plus**
Comprehensive coverage of the UPS and batteries	✔	✔	✔
Telephone technical Support	✔	✔	✔
Connectivity support	✔	✔	✔
Expedited delivery of replacement parts, modules and batteries		✔	✔
On-site startup		✔	✔
On-site corrective maintenance		✔	✔
Next-day 24-hr response		✔	✔
UPS preventative maintenance			✔
Battery preventative maintenance			✔

Connectivity & manageability

Enhanced communication capabilities

The 9155 UPS is equipped with a variety of standard communications features for network connectivity and remote management applications, including:

- RS-232 serial port
- Two X-Slot® communication bays
- Relay output contacts
- Two programmable signal inputs
- Remote emergency power-off (REPO)

Easy network connectivity and monitoring

ConnectUPS-X card
The ConnectUPS-X Web/SNMP X-Slot card connects the 9155 directly to an Ethernet network and the Internet and enables graceful shutdown of multiple computers over the network. The ConnectUPS-X Web/SNMP also features a three-port switching hub.

Modbus® card
The Modbus card is an X-Slot device that allows continuous, real-time monitoring of the 9155 through a Building Management System (BMS) or industrial automation system.

Relay interface cards
The relay interface card for the X-Slot enables remote UPS shutdown and provides isolated dry contact Form-C relay outputs for utility failure, low battery, UPS alarm/OK, and on bypass.

Environmental Monitoring Probe
The environmental monitoring probe (EMP) works with the 9155 and ConnectUPS-X card to remotely monitor ambient temperature and relative humidity of the remote environment. The EMP can also be configured to provide status of two additional contact devices such as smoke detectors or open-door sensors.

Power Xpert® Gateway Series cards
Power Xpert Gateway Series X-Slot cards provide Web-enabled, real-time monitoring of UPSs, PDUs and RPPs through standard onboard Web pages, Power Xpert software or third-party software.

Power Xpert meters
Power Xpert meters combine state-of-the-art technology with next-generation power diagnostics, data trending and performance benchmarking with a twist-and-click LCD display.

Centralized control and visibility

The 9155 UPS is shipped with the Eaton Software Suite CD. The software suite includes the following applications, as well as a user-friendly wizard to guide users through software selection and installation:

- LanSafe® power management software
- Intelligent Power® Manager
- NetWatch network monitoring software

eNotify Remote Monitoring

Eaton's eNotify Remote Monitoring Service provides 24x7 real-time monitoring of the 9155 and battery systems and alerts both service technicians and the customer when a problem is detected. Proactive monitoring enables technical experts to respond immediately to more than 40 alarm conditions and, in many cases, resolve issues remotely with minimal or no downtime. Additional eNotify benefits include:

- One-way outbound status and event e-mails for security and reliability
- Fast diagnosis and notification of critical alarms
- Monthly customer reports including power event logs and overall UPS and battery health summaries

ConnectUPS-X Web/ SNMP X-Slot card

Power Xpert Gateway Card 2000

Modbus card

Relay Interface cards

Monitoring Probe

LanSafe®

Foreseer

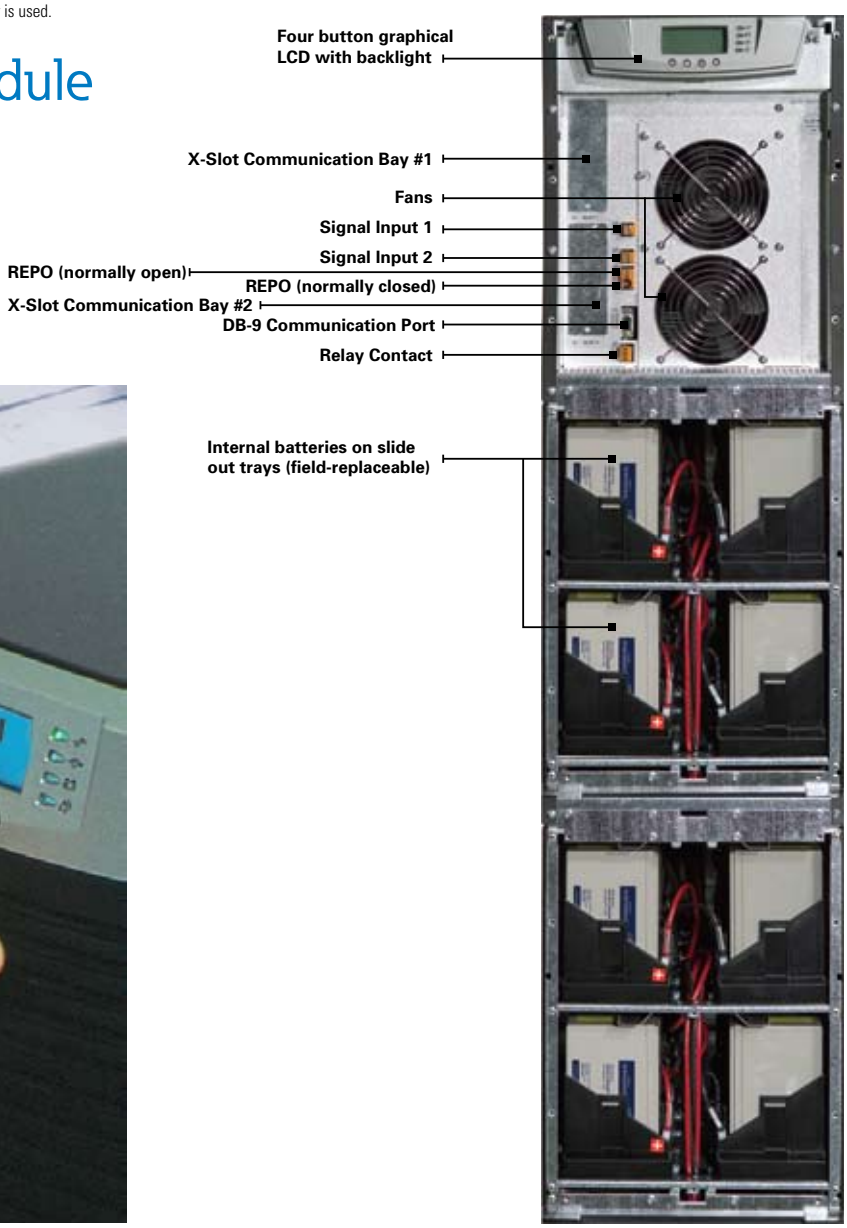
Eaton 9155 at-a-glance

Model Selection Table - Eaton 9155 UPS (8–15 kVA)

Order Number[1]	Description	Power Rating[2] (kVA/kW)	Input & Output Connection[4]	Output Receptacles	Dimensions H x W x D[5] (in)	Unit Weight[3] (lb)
K4081100000	PW9155 Model 8 - 32 Battery (2-high)	8/7.2	Hardwired	See PDM chart	32.2 x 12.0 x 32.0	352
K4081200000	PW9155 Model 8 - 64 Battery (3-high)	8/7.2	Hardwired	See PDM chart	47.8 x 12.0 x 32.0	590
K4081300000	PW9155 Model 8 - 32 Battery with Transformer (3-high)	8/7.2	Hardwired	See PDM chart	47.8 x 12.0 x 32.0	558
K4101100000	PW9155 Model 10 - 32 Battery (2- high)	10/9	Hardwired	See PDM chart	32.2 x 12.0 x 32.0	352
K4101200000	PW9155 Model 10 - 64 Battery (3- high)	10/9	Hardwired	See PDM chart	47.8 x 12.0 x 32.0	590
K4101300000	PW9155 Model 10 - 32 Battery with Transformer (3-high)	10/9	Hardwired	See PDM chart	47.8 x 12.0 x 32.0	558
K4121100000	PW9155 Model 12 - 32 Battery (2-high)	12/10.8	Hardwired	See PDM chart	32.2 x 12.0 x 32.0	352
K4121200000	PW9155 Model 12 - 64 Battery (3-high)	12/10.8	Hardwired	See PDM chart	47.8 x 12.0 x 32.0	590
K4121300000	PW9155 Model 12 - 32 Battery with Transformer (3-high)	12/10.8	Hardwired	See PDM chart	47.8 x 12.0 x 32.0	558
K4151100000	PW9155 Model 15 - 32 Battery (2- high)	15/13.5	Hardwired	See PDM chart	32.2 x 12.0 x 32.0	352
K4151200000	PW9155 Model 15 - 64 Battery (3- high)	15/13.5	Hardwired	See PDM chart	47.8 x 12.0 x 32.0	590
K4151300000	PW9155 Model 15 - 32 Battery with Transformer. (3- high)	15/13.5	Hardwired	See PDM chart	47.8 x 12.0 x 32.0	558

1. 50/60 Hz auto-sensing. All models can be used for frequency/phase conversion with de-rated 80% load. Please refer to manual for details.
2. Input voltage 200–240V with neutral or with optional input isolation transformer. Output voltages are user-selectable 100/200, 110/220, 120/240 Vac 180° phase displacement, or 120/208, 127/220 Vac 120° phase displacement.
3. Weight is installed weight; add 47 lbs (2-high models) or 50 lbs (3-high models) to determine shipping weight.
4. An input neutral is required for all configurations unless the input isolation transformer is used.
5. Depth increases to 33.7" when unit is configured with a PDM.

Front view of 3-high module with cover off



Eaton 9155 Accessories

Accessories

Order Number	Description	Dimensions H x W x D (in)	Unit Weight (lb)
Powerware Hot Sync			
124100017-001	9155 Parallel Cabinet	24.0 x 20.3 x 2.2	57.3
103004336	Powerware HotSync CAN Bridge Card	-	-
Notes: Up to three 9155 UPS and up to four 9355 UPS (available Fall 2005) UPSs can be paralleled with the Parallel Cabinet.			
Extended Battery Module (EBM) or Cabinets (EBC)			
103004192-5501	9155 and 9355 EBM 64 (2-high)	32.2 x 12.0 x 30.2	480
103004193-5501	9155 and 9355 EBM 96 (3-high)	47.8 x 12.0 x 30.2	710
Notes: up to four EBM 64 cabinets or three EBM 96 cabinets can be added to each 8-15 kVA UPS for extended runtime.			
Seismic Mounting Kit			
103004194-5501	Seismic Kit, Rated Zone 4, UL Tested, Performance rating based on NEBS GR-63-CORE Standard Vibration Test	Fits both 2- & 3-high models	136
Maintenance Bypass Module (MBM)			
BPE20MBB1A	Wall-mounted Maintenance Bypass Module for 9155	21 x 14 x 6.75	31
Eaton 9155 Parallel System Start Up			
OSTUP9155P10CX	9155 8-10 kVA 2 or 3 Unit Parallel		
OSTUP9155P15CX	9155 12-15 kVA 2 or 3 Unit Parallel		
103004626	9155 Parallel System 2 unit upgrade kit (includes Can Bridge Cards, Procedures, and Parallel User's Guide)		
103004627	9155 Parallel System 3 unit upgrade kit (includes Can Bridge Cards, Procedures, and Parallel User's Guide)		
Connectivity Options			
116750221-001	ConnectUPS-X Web/SNMP/xHub Card		
05146288-5501	ConnectUPS-MX SNMP/Modem Card (9155 only)		
1035425-5591	Modbus Card		
05146508-5501	USB Card		
1018460	Relay Interface Card (AS/400 Compatible)		
103003055	Industrial Relay Card		
116750224-001	Environmental Probe (requires ConnectUPS Web/SNMP card)		
Spare Parts			
106711155	9155 Spare Parts Kit "A"		
Upgrades			
103004195	9155 8 kVA to 9155 10 kVA		
103004196	9155 12 kVA to 9155 15 kVA		

Power Distribution Module (PDM) with Mechanical Bypass Switch

Optional Receptacle Panels	Breaker	Voltage	Phase
(4) 5-15R	15A	120V	1
(4) 5-20R UL	20A	120V	1
(4) 6-15R	15A	208V	2
(4) 6-20R	20A	208V	2
(4) L5-15R	15A	120V	1
(2) L5-20R*	20A	120V	1
(2) L5-30R*	30A	120V	1
(2) L6-15R	15A	208V	2
(2) L6-20R*	20A	208V	2
(2) L6-30R*	30A	208V	2
(2) L14-20R*	20A	120/208V	2
(2) L14-30R*	30A	120/208V	2
Blank panel			

* The combined quantity of these locking receptacle plates must not exceed four.

TECHNICAL SPECIFICATIONS for 10 AND 15 kVA

POWER	
Ratings (kVA/Watts)	8, 10, 12 and 15 kVA at 0.9 power factor
Topology	True double-conversion online UPS
Electrical Input	
Nominal Input Voltage	200V-240V with neutral or with optional input transformer
Input Voltage Range	-15%, +10% from nominal at 100% load without depleting battery
Operating Frequency	50/60 Hz (45 to 65 Hz)
Input Power Factor	P.F >0.99 typical, >0.96 frequency converter
Input Current Distortion	5% THD
ELECTRICAL OUTPUT	
Nominal Output Voltage	100/200, 110/220, 120/240 Vac 180° phase displacement; 120/208, 127/220 Vac 120° phase displacement
Output Voltage Regulation	±1% Static; ±5% dynamic at 100% resistive load change, <1 ms response time
Efficiency	90% typical
BATTERY	
Battery Type	9Ah, sealed, lead-acid, maintenance-free
Battery Runtime	See Battery Runtime Chart
Battery Replacement	Field-replaceable
Charger	Default is 3.4A per battery string. Charger current is configurable from 0.5A to 25A per string with an overall maximum of 34A (limited by input current)
Start-On-Battery	Allows start of UPS without utility input
GENERAL	
Diagnostics	Full system self-test at startup
UPS Bypass	Automatic on overload or UPS failure
Parallel for Redundancy and Capacity	Yes, using Powerware Hot Sync technology
Dimensions and Weights	See Model Selection Table
Overload	150% for 5 sec / 125% for 1 min (online), (Normal Operation) 110% for 10 min
COMMUNICATIONS	
LCD Display	Graphical LCD with blue backlight
LEDs	(4) LEDs for notice and alarm
Audible Alarms	Yes
Communication Ports	(1) RS-232, (1) relay contact, (1) REPO, (2) environmental input
Communication Slot	(2) X-Slot communication bays
Power Management	Bundled Software Suite CD Software

ENVIRONMENTAL	
Operating Temperature	10°C to +40°C, +45°C with 7.5% derating; Batteries recommended max. +25°C
Storage Temperature	-15°C to +25°C
Relative Humidity	0–95%, non-condensing
Audible Noise	Audible Noise: < 53 dBA at 1 meter (noise less room) typical
Altitude	< 1000m at +40°C, < 3000m at +25°C
CERTIFICATIONS	
Safety Certifications	NOM-0190SCFI-1993, UL 1778, CSA C22.2, No. 107.3; EN 5502 Class A (CISPR22 Class A) and IEC 60950; IEC 62040-1-1
EMC Compliance	IEC 62040-2, FCC Part 15, ICES-003, VCCI
Quality	ISO 9001: 2000 and ISO 14001:1996
Markings	UL, cUL, CSA, CE and NOM-NYCE

1. Due to continuous product improvements, program specifications are subject to change without notice.

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Finland: 358.94.52.661
France: 33.1.6012.7400
Germany: 49.0.7841.604.0
Italy: 39.02.66.04.05.40
Norway: 47.23.03.65.50
Portugal: 55.11.3616.8500
Sweden: 46.8.598.940.00
United Kingdom: 44.1753.608.700

ASIA PACIFIC
Australia: 61.2.9693.9366
New Zealand: 64.0.3.343.3314
China: 86.21.6361.5599
HK/Korea/Taiwan: 852.2745.6682
India: 91.11.4223.2300
Singapore/SEA: 65.6825.1668

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EATON
Powering Business Worldwide

Shelter 8KVA

Identical twin to Collins 8KVA unit specification.

Shelter UPS system will require an aluminum diamond floor plate insert to better distribute weight on a soft floor. Standard UPS Swap, one for one.

Current unit is a single Phase 208 Liebert 8 KVA unit. Looking to increase battery run time to better support the Tower Beacon and the Emergency broadcast radio transmitter.

Please note no flex conduit. We require install with Liquid Tight vinyl covered flex conduit with adequate length to move and service unit. EPO disconnect is required in this install. During cut over we would like the vendor to perform a temporary cut over to power critical items as a temporary measure.

Removal and disposal of old equipment by contractor.

Maintenance bypass, network ready equipment startup by Eaton.