



BATTERY CABINET

MODEL

UD-100528

SERVICE AND INSTALLATION MANUAL

Preface

Revision 0 JULY 24, 17
U-ENM00044



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HOW TO USE THIS MANUAL

This manual is designed for ease of use, giving the user easy and quick reference to information.

This manual uses notice icons to draw attention to important information regarding the safe operation and installation of the battery cabinet. The notice icons used in this manual are explained below, and should be taken into account and adhered to whenever they appear in the text of this manual.



Warning: A warning symbol shows potentially hazardous situations or conditions which could result in personal injury or death, if not avoided.



Caution: A caution symbol shows potentially hazardous situations or conditions which could result in personal injury or equipment damage, if not avoided.



Note: A Note symbol shows the information the user or the service personnel should observe while operating the battery cabinet or conducting service work.



Prohibit: A prohibit symbol shows the acts the user or service personnel should NEVER perform during the battery cabinet installation, operation or service work.

Safety Recommendations: If any problems are encountered while following this manual, Mitsubishi Electric field service group assistance and correspondence is recommended.

1 GENERAL DESCRIPTION

This manual provides information to authorized service personnel required for proper start-up and maintenance of the UD-100528 Battery cabinet. Following the proper procedures is important to the operation and reliability of the battery cabinet.

2 SAFETY PRECAUTIONS

In order to maintain safety during installation and maintenance to the battery cabinet, certified service personnel familiar with the operation of this equipment must be present. The following safety practices should always be followed.

PRECAUTIONS DURING INSTALLATION

CAUTION

- Install the battery cabinet according to the installation drawings provided.
- Install the battery cabinet using adjustable leveling legs to ensure the cabinet is level and stable. Ensure the surface supporting the battery cabinet is rated to withstand the weight of the equipment.
- Do not block the ventilation holes. The cabinet should be installed in a place where walls and/or ceilings do not block ventilation. If ventilation holes are blocked the interior temperature of the cabinet could rise to levels that are unsuitable for battery storage.
- Do not use or store the battery cabinet in any of the following environments:
 1. Places where the ambient temperature exceeds the recommended 77°F (25°C).
 2. Outdoors or in a place that is subjected to direct sunlight.
 3. Directly in front of a heat source.
 4. Wet places.
 5. Places that are subjected to vibration and shocks.
 6. Areas that contain dust, particles, corrosive gas, sodium, or flammable gas.
- Install the cabinet in a room that is ventilated at all times.

PRECAUTIONS FOR WIRING

CAUTION

- Wiring work should be done by certified personnel. Inappropriate wiring may cause electric shock, injury, or fire.
- For wiring information, see the drawings delivered with the equipment.
- Electric shock may be caused if ground cables from the load devices are not connected.
- Connect the ground cables to the specified places. Grounding impedance should be less than 10 ohms.

PRECAUTIONS TO CERTIFIED PERSONNEL

CAUTION

- Select the electric wire size of which the rated current is equal to or over that of the battery cabinet input/output wiring. Temperature rise or short-circuit may be caused if the electric wire diameter is too small.
- Use wires that have a dielectric strength corresponding to the circuit voltage. Wires with inappropriate dielectric strength may cause electric shocks.
- Follow the size specified, regarding the diameter of the ground cable. If the ground cable is smaller than the specified size, it may cause electric shock.

OPERATIONAL PRECAUTIONS **CAUTION**

Do not remove the battery cabinet cover.

- Stop the system immediately upon failure or if abnormal odors or noise are coming from the system.
- Do not place any materials on the cabinet. If ventilation openings are blocked it will cause the temperature inside the cabinet to rise. If materials fall inside the system they may cause a fire.

 **WARNING**

Do not remove the battery cabinet cover.

- Do not touch uninsulated battery terminals, it may cause electric shocks.
- Do not insert metal, sticks, or fingers into the ventilation holes.
- Do not operate the system with the cover panel removed.

PRECAUTIONS FOR MAINTENANCE AND INSPECTION **CAUTION**

- Certified personnel only
- Keep the cover closed and secured during normal operations.
- Replace the batteries according to manufacturer instructions.
- Certified personnel must conduct maintenance, inspection, or repair. Otherwise electric shock, injury, burns, fire, and short-circuit may be caused.
- Do not remove the cover; it may cause electric shocks or burn injuries.
- Read the manual completely before beginning any installation, maintenance, inspection or repair work.
- Take off metal such as watches or jewelry before working on the cabinet.
- Work should be done after breakers are switched off, and the power is turned off.
- Use insulated tools suitable for working on batteries.
- Replace parts with parts that are of the same type, with equal ratings.

PRECAUTIONS FOR MOVING AND TRANSPORTING THE UNIT **CAUTION**

- Take caution when moving or transporting the battery cabinet.
- Secure the cabinet in place before transporting. Due to the weight of the cabinet, it may cause damage or injury if not sufficiently secured.

PRECAUTIONS REGARDING BATTERIES **CAUTION**

- Do not dispose of batteries as general waste.
- Do not use batteries after the expiration dates. Batteries should be replaced periodically based on manufacturer recommendations.
- In the case the batteries catch fire, use a powdered ABC extinguisher.
- Follow the directions below when using the batteries, otherwise liquid leakage, temperature rise, and explosions may be caused.
 - a. Do not solder the batteries directly.
 - b. Do not charge the batteries with the negative and positive terminals reversed.
 - c. Do not use different types or suppliers of batteries, or old and new batteries together. Do not use batteries with different capacities together.
 - d. Do not hit or throw the batteries.
 - e. Take caution when handling the batteries, electric energy remains when the batteries are not connected.
- To prevent battery issues from occurring, ask certified personnel for regular inspection and maintenance.
- When any abnormality is found in the appearance of a battery, please contact the service company.
- The batteries contain acid; in the case liquid is leaking from the batteries do not touch it. If skin or clothing comes in contact with liquid leaking from the batteries wash with clean water. If liquid contacts the eyes, wash away with clean water and seek medical attention. If acid contacts the eyes or skin it may cause blindness or burn injuries.
- Do not use the batteries in any of the manners described below. Liquid leakage, temperature rise, or explosion may occur.
 - a. Do not heat the batteries.
 - b. Do not connect the positive and negative terminals of the batteries.
 - c. The batteries should be charged according to the manufacturer's instructions.
 - d. Do not disassemble, convert, or destroy the batteries.

3 SYSTEM OVERVIEW

During normal UPS operation the UPS uses the AC input power source to supply the load with power while also maintaining the charge on the backup batteries. When the UPS is disconnected from its input AC power source it uses the batteries in the battery cabinet to supply uninterrupted power to the load.

The amount of time the batteries can provide backup power to the UPS depends on the amount of batteries or battery cabinets that are connected in the system. After the batteries are depleted to a certain level, the UPS will stop supplying power if the AC input power source is not restored, or if a backup AC power source is not applied.

After the batteries are used to supply power to the UPS they should be recharged as soon as possible.

4 SYSTEM SPECIFICATIONS

4.1. Batteries

Please refer to battery manufacturer's documentation for model specific information.

Battery Voltage: 12 VDC Nominal

Battery Type: Valve Regulated Lead Acid (VRLA), sealed, non-spillable

4.2. System Grounding

Cabinet Ground: Each cabinet is supplied with a mechanical ground lug attached to the circuit breaker mounting plate, that accepts stranded copper wire from #14 AWG to 1/0 cable sizes.

Torque: 50 in-lb

Wire Size and Type: Ground wire should be sized per NEC and/or all applicable national and local codes.

| Battery Cabinet Breaker or Fuse Size | Minimum Copper Ground Wire Size |
|--------------------------------------|---------------------------------|
| Up to 60 amps | 10 AWG |
| 61 – 200 amps | 6 AWG |
| 201 – 300 amps | 4 AWG |

4.3. DC Output

Please refer to system drawings for model specific information

Voltage: 240 – 288 VDC Nominal

Circuit Breaker: UL Listed 500 VDC rated. See system drawings for details.

Wire Size and Type: Per NEC and/or all applicable national and local codes.

4.4. General Specifications

Cabinet Size: 32.6"W x 28.7"D x 55.1"H

Empty Cabinet Weight: 350 lbs

Operating Temperature: 68°F to 77°F (20°C to 25°C) recommended for optimum battery performance.

Ventilation: Through ventilation holes on the front, rear, and top of the cabinet. A minimum of four inches is required in front and behind the cabinet. This does not affect minimum clearance around the equipment. Follow all NEC and/or all applicable national and local codes when installing the equipment.

5 INSTALLATION

5.1. Inspection

Remove the equipment from the packaging and inspect for shipping damage. Verify that all necessary parts for installation are included.

5.2. Necessary Equipment and Tools

- Insulated hand tools suitable for working on batteries and cables attached to batteries.
- Digital Voltmeter

5.3. Installation Safety Precautions



Before proceeding with equipment installation, be sure to fully read the safety precautions in this manual, and any safety or installation for any other relevant equipment.



Hazardous DC Voltages are present in this system. Batteries contain hazardous DC voltages even when they are disconnected from the system. Accidental short circuits of the positive and negative terminals could cause electric shock, severe burns, fire, and possible death. Use extreme caution when working on this system.

5.4. Installation Procedure



It is important to review and become familiar with all drawings, installation instructions, and safety precautions for all equipment being installed. If there are any questions concerning the installation of this equipment, please contact a Mitsubishi Electric Power Products representative before continuing.

Prior to installation, verify that the floor loading requirements and all relevant codes for this equipment are adhered to. Ensure that the equipment is installed in a place that meets all environmental requirements listed in this manual.



Never install batteries or battery cabinets in a sealed enclosure or room. Under certain conditions, battery cabinets can vent dangerous gases.



Battery Cabinets are extremely heavy. Always use two or more people to move or set the equipment into place.

This battery cabinet is equipped with four swivel casters with leveling legs. Use the casters to move the battery cabinet into position and use the leveling feet to make sure the cabinet is mounted in a level, secure position.

If the installation or location requires the battery cabinet to be bolted in place, use the mounting brackets provided with the cabinet to secure the cabinet to the floor.

Do not drill holes into any covers that are attached to the battery cabinet.



All system ground wires should be connected back to the UPS.



For all multi cabinet systems each cabinet has to have a designated cabinet ground wire connected back to the UPS.

Connect the ground wire from the UPS to the supplied cabinet ground located on the circuit breaker mounting bracket. See section 4.2 for ground wire sizing recommendations. Wire should be sized based on the NEC and/or all applicable national and local codes.



Review all drawings and schematics of any relevant equipment for information on DC output connections.



Battery cabinets supplied without a DC output disconnect device must have an appropriate disconnect device provided external to the cabinet.



Verify that the output disconnect breaker is in the off/open position before making any connections to additional external cabinets or the UPS. Verify the UPS battery charging circuit is not active.

Open the cabinet and verify that there are no noticeable problems or damage that may have occurred during shipment.

Review the installation drawing and cabinet. A cable has been left off the center of the string of batteries. This cable is left off for safety purposes and will be installed later.

Check the torque on internal battery connections and re-torque as necessary. Battery cables may have loosened during shipping.

Connect main cables from the UPS DC input terminals to the battery cabinet output. Refer to the supplied battery cabinet drawings for information on the battery cabinet output connections. All cables should be sized according to the NEC and/or any applicable national and local codes.

Connect the battery interconnect cable that was left off during shipping. Refer to supplied battery cabinet drawings. Torque all battery terminal connections according to battery manufacturer's recommendations.

Please refer to the UPS manuals for startup and operation instructions.

6 MAINTENANCE

6.1. Battery Replacement



Replacement batteries must be installed in the proper orientation. If battery terminals are connected incorrectly it will cause a short circuit in the system. This can cause electric shock, severe burns, fire, and possible death.



Replace batteries with the same type of battery, from the same manufacturer. Installing incorrect batteries could lead to an explosion.



Do not dispose of batteries in a fire. The batteries may explode. Contact local hazardous waste or recycling centers for proper disposal of batteries.

Prepare the new batteries for installation. Ensure that the new batteries are the same type and rating as the batteries that were supplied with the system.

Verify the voltage of the battery using a digital volt meter. The battery should have a voltage of 12.4 VDC or higher.

Clean the battery terminals with a brass wire brush or abrasive pad.

Apply anti-corrosive terminal grease to the terminals.

Turn off/open the battery cabinet output disconnect breaker to disconnect the UPS from the battery string.

Remove the center jumper of the battery string to reduce the strings voltage.

Disconnect the battery jumpers from the batteries and remove them from the cabinet.

Install the new batteries into the cabinet. Take care to install batteries in the proper orientation. Connect batteries according to the drawings supplied with the battery cabinet.

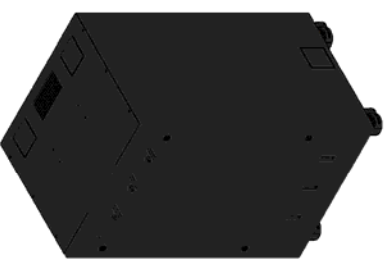
Torque all battery terminal connections according to the battery manufacturer's recommendations.

Check the battery strings voltage at the input side of the battery cabinet output disconnect breaker.

6.2. Preventative Maintenance

Preventative maintenance should be performed every 12 months by trained personnel to ensure battery reliability. Preventative maintenance should include battery health measurements, cleaning, visual inspections, and verification of proper environmental conditions.

7 REFERENCE MATERIALS

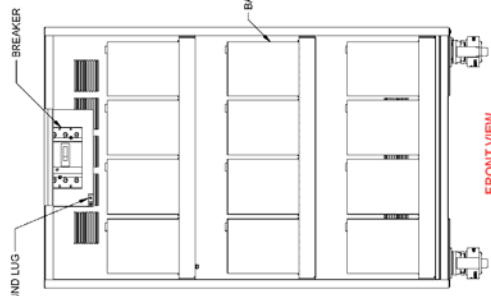


TOP VIEW

CABLE ENTRY KNOCK-OUTS

VENTILATION

28.66



FRONT VIEW

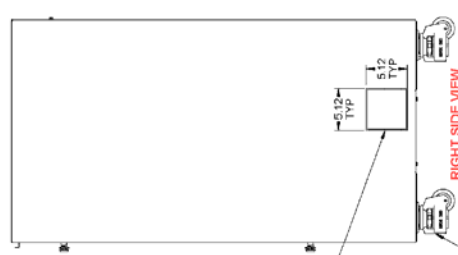
GROUND LUG

BREAKER

BATTERIES

1100A BATTERY CABINETS

| UD-100528 | # STRINGS (6-NONE) | # BATTERIES 24 | BATTERY MFR C&D | BATTERY SIZE (WATT/CELL) | KVA | DISC. | AMPS | SESMC |
|-----------|-----------------------|-------------------|--------------------|-----------------------------|-----|-------|------|---------|
| | 1=1 | | | 080 | 010 | B=BR | 50 | BLANK |
| | | | | 100 | 020 | | 60 | Z=SESMC |
| | | | | 150 | 030 | | 125 | |
| | | | | 205 | 040 | | 175 | |
| | | | | 400 | 050 | | 200 | |
| | | | | 505 | | | | |
| | | | | 540 | | | | |



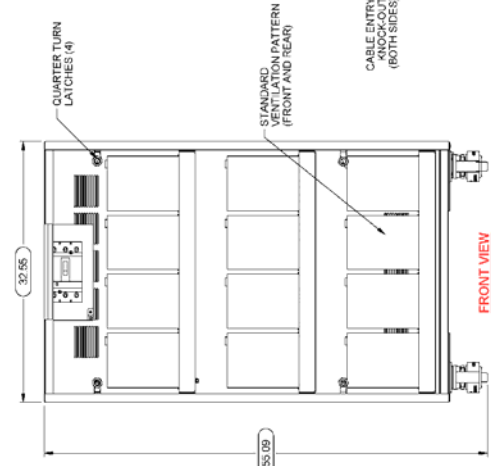
RIGHT SIDE VIEW

5.12 TYP

5.12 TYP

CABLE ENTRY KNOCK-OUT (BOTH SIDES)

SWIVEL CASTERS (4)



FRONT VIEW

32.95

55.09

QUARTER TURN LATCHES (4)

STANDARD LATCHES (FRONT AND REAR)

1100A BATTERY CABINET

CABINET NOTES:

1. NEMA 1 ENCLOSED BATTERY CABINET.
2. INTERIOR & EXTERIOR FINISH IS N15 (BLACK) POWDER.
3. COAT. OVEN BAKED FOR CHIP & CORROSION RESISTANT FINISH.
4. INTERIOR SURFACES ARE FINISHED WITH AN ANTI-STATIC FINISH.
5. CABINET IS SUPPLIED ON SKID WITH HEAVY DUTY ISAMP FOR EASY MOVING.
6. UNLOADING CABINET IS TO BE MOVED USING THE CABINET CASTERS.
7. FRONT DOOR IS LIFT OFF.
8. 6 IN. CLEARANCE REQUIRED IN FRONT OF CABINET.
9. 6 IN. CLEARANCE REQUIRED AT REAR OF CABINET.
10. BATTERY CABINET IS LISTED U.L. 1778.
11. GROUND LUG AND GROUND LUG CONNECTIONS ARE MECHANICAL LUG TYPE.
12. GROUND LUG AND GROUND LUG CONNECTIONS ARE MECHANICAL LUG TYPE.
13. BATTERY CABINET WEIGHT: 350 LBS. CABINET ONLY.
14. UPS-BATTERY CABLE KIT OPTIONAL. CONSULT FACTORY.

REVISIONS

| NO. | DESCRIPTION | DATE |
|-----|----------------|----------|
| 1 | INITIAL DESIGN | 11/11/08 |
| 2 | DESIGN CHANGES | 11/11/08 |
| 3 | DESIGN CHANGES | 11/11/08 |
| 4 | DESIGN CHANGES | 11/11/08 |
| 5 | DESIGN CHANGES | 11/11/08 |
| 6 | DESIGN CHANGES | 11/11/08 |
| 7 | DESIGN CHANGES | 11/11/08 |
| 8 | DESIGN CHANGES | 11/11/08 |
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| 10 | DESIGN CHANGES | 11/11/08 |
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| 48 | DESIGN CHANGES | 11/11/08 |
| 49 | DESIGN CHANGES | 11/11/08 |
| 50 | DESIGN CHANGES | 11/11/08 |

MITSUBISHI ELECTRIC

1100A BATTERY CABINET

UD-100528 UD-100528S

BREAKER PAN

BATTERY INTERCONNECT

ELECTRICAL NOTES:

1. ALL INTERNAL WIRING IS UNLISTED.
2. BREAKER IS UNLISTED.
3. BATTERY CABINETS WITH BREAKERS ARE SUPPLIED WITH BREAKER IN THE UPPER POSITION.
4. ALL CONTROL WIRING IS POWERED FROM AN ON-SIDE SOURCE.
5. ALL BREAKER CROCK JUG AND FUSE HOLDER CONNECTIONS ARE MECHANICAL LUGS TYPE.
6. THESE CONNECTIONS ARE TIGHTENED TO THE TORQUE SPECIFIED IN THE BATTERY CASE.
7. FOR CIRCUIT BREAKER TORQUE INFORMATION REFER TO ABBELOW BREAKER CASE.

| APPROVED FOR CHANGE | | DATE | BY | REASON |
|---------------------|--|------|----|--------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

MITSUBISHI ELECTRIC
1100A BATTERY CABINET
 UD-100528 UD-100528S 0

BATTERY CABINET NET

1100A UPS (REFERENCE)

REMOVE ANCHORS FROM BATTERY CABINET NETS AND CHECK FOR THE FOLLOWING: (1) THE BATTERY CABINET NETS ARE NOT OPENING AT THE EDGE CORNER. (2) THE BATTERY CABINET NETS ARE NOT OPENING AT OTHERS.

CONFIGURATION OPTIONS

NOTES:

1. BATTERY CABINET MAY BE INSTALLED ON EITHER SIDE OF THE 1100A UPS.
2. BATTERY CABINET WEIGHT: 3000 LBS (FULLY CHARGED).
3. CABLE TO BE USED: USE ULTYPE 3, 4 OR 5 CABLES BY OTHERS.
4. CABLE TO OTHERS VALUES: OPT. AVAILABLE IN OTHER COUNTRIES.

1100A BATTERY CABINET INSTALLATION

| | |
|---|--|
| <p>1100A BATTERY CABINET</p> <p>UD-100528</p> | |
| <p>MODEL NO.</p> <p>UD-100528</p> | <p>DATE</p> <p>2011.01</p> |
| <p>MANUFACTURER</p> <p>MITSUBISHI ELECTRIC</p> | <p>TYPE</p> <p>1100A BATTERY CABINET</p> |
| <p>DESCRIPTION</p> <p>1100A BATTERY CABINET</p> | <p>REVISION</p> <p>0</p> |

