// INSTALLATION & OPERATING MANUAL

UL 67 Panelboard

Receiving, mounting, installation, branch and feeder connections, energization, operation, and maintenance for lighting and power distribution panelboards supplied by Bet Power.

DOCUMENT	APPLIES TO
BP-IOM-PB67-001	100 – 1200 A · 120 – 600 V · up to 200 kA SCCR

Built for Speed. Priced for Reality.

// READ BEFORE INSTALLING

This equipment carries lethal voltages. Installation, connection, and maintenance must be performed only by qualified personnel following the NEC (NFPA 70), NFPA 70E, OSHA 29 CFR 1910 Subpart S, and the site arc-flash study. Keep this manual with the panelboard for the life of the equipment.

// CONTENTS

What's in this manual

// HOW TO USE THIS MANUAL

Sections 03 through 10 are sequential. Complete each section's checklist before moving on. Section 11 onward is for the life of the equipment.

The interior label, enclosure label, approved drawings, and the breaker schedule govern over any general value in this manual. If they disagree, stop and call Bet Power Engineering.

> // NAMEPLATE FIRST
> Record the catalog number, voltage, main rating, SCCR (or series rating), and enclosure type from the interior label into Appendix A before the panel leaves the receiving area.

// DIRECT LINES

Engineering	engineering@bet-power.com
Field support	support@bet-power.com
Logistics (24/7 desk)	logistics@bet-power.com
Orders	orders@bet-power.com

// 01 Safety

A panelboard is the most-handled piece of distribution gear on a site and the one most often opened energized. Nothing here replaces your site's lockout/tagout procedure, the arc-flash study, or NFPA 70E.

> // DANGER — HAZARDOUS VOLTAGE
> De-energize the feeder upstream, lock out, and test for absence of voltage at the main lugs or main breaker line side before removing the dead-front or trim. The line side of a main breaker stays live when the main is open.

Signal words used in this manual

WORD	MEANING
DANGER	Will cause death or serious injury if not avoided.
WARNING	Can cause death, serious injury, or major equipment damage.
CAUTION	Can cause minor injury or equipment damage.
NOTE	Information that affects performance, warranty, or the next step.

Rules that apply to every section

1. Only qualified persons (NFPA 70E definition) remove the dead-front, install breakers, or make connections.
2. Wear arc-rated PPE matched to the incident energy on the arc-flash label. A 480 V panelboard fed from a large transformer can exceed 8 cal/cm^2; do not assume "it's just a panel."
3. Keep the dead-front and trim installed and the door closed whenever personnel are not actively working inside. Fill every unused breaker space with a listed filler plate.
4. Install only breakers listed for this panelboard interior (per the label inside the door). A breaker that physically fits is not the same as a breaker that is listed.
5. Do not install a panelboard in a bathroom, clothes closet, or over the steps of a stairway (NEC 240.24).
6. Confirm the equipment grounding bar is bonded to the enclosure and the feeder ground is landed before any phase conductor is landed.
7. Do not exceed the number of overcurrent devices on the label. Tandem or twin breakers count as two.

> **// WARNING — BACKFEED**
> A panel with a backfed breaker (PV, generator, ATS) can be energized from a branch position. Backfed breakers must have the hold-down kit installed (NEC 408.36(D)). Isolate every source before working inside.

// 02 Scope and product description

This manual covers Bet Power lighting and appliance and power distribution panelboards listed to UL 67, in enclosures listed to UL 50 / UL 50E.

Typical ratings

PARAMETER	STANDARD RANGE
System voltage	120/240 1-ph 3W; 208Y/120, 240 Delta, 480Y/277, 480 Delta, 600Y/347 V 3-ph 3W or 4W
Main rating	100 – 1200 A main lugs only (MLO) or main circuit breaker (MCB)
Bus material	Copper (tin plated) standard; aluminum optional

Neutral	100% standard; 200% for harmonic loads, as ordered
Ground bar	Bonded equipment ground bar standard; isolated ground bar optional
Short-circuit current rating	10 – 200 kA, fully rated or series rated (per label); bus bracing ≥ SCCR
Branch devices	Bolt-on molded-case breakers, 15 – 400 A frames (lighting panels: 1-, 2-, 3-pole up to 100 A; power panels: up to 400 A frame)
Circuits	18 – 84 poles per interior; column-width, standard, or wide box
Enclosure	NEMA 1 surface or flush standard; NEMA 3R, 4, 4X, 12 optional; door-in-door optional
Feed	Top or bottom, as ordered; sub-feed lugs, through-feed lugs, or feed-through breaker optional
Options	SPD, ground-fault (GFCI/GFEP) breakers, shunt-trip breakers, lighting contactors, power meter, key locks

> // NOTE
> The values above are the standard range. The interior label, enclosure label, and the breaker schedule define the exact ratings and listed devices for the panel in hand.

Standard construction

Box and trim

- Galvanized steel box with removable endwalls and pre-punched knockouts (or blank endwalls for field-cut)
- Trim with hinged door, flush lock, and directory card holder; door-in-door trim gives dead-front access without exposing the gutter
- Adjustable interior mounting for flush or surface installs
- Sizes per the enclosure drawing; 20 in wide standard for lighting panels, 32 – 42 in for power panels

Interior

- Phase bus with distributed-phase branch stabs; sequence phase A-B-C top to bottom, left to right
- Main lugs or main breaker at the feed end; lugs rated AL9CU
- Neutral bar with one wire per terminal; isolated from the box unless the main bonding jumper is installed (service equipment only)
- Equipment ground bar bonded to the box
- Interior label listing catalog number, ratings, SCCR, and listed breaker types

// 03 Receiving and inspection

Panelboards ship as a box, a separate interior, and a trim, or as one assembled unit. Inspect before the carrier leaves.

01 Match the catalog number and label against the packing list and your PO. Photograph the interior label.

02 Check the carton and pallet for crush, puncture, or water. Unwrap and check the box for dents and racked corners; a racked box will not take the trim.

03 Check the interior: bus straight, stabs undamaged, lugs present and tight, neutral and ground bars present, no loose hardware in the carton.

04 Count breakers against the schedule if factory-installed. Confirm handles move and none are cracked.

05 Confirm loose-shipped items: trim, door keys, filler plates, mounting hardware, breaker hold-down kits, directory card, SPD (if ordered), and drawings.

06 Record everything in Appendix A. Note any damage on the bill of lading **before signing**.

> // WARNING
> Bent bus or a cracked stab support cannot be straightened in the field. Do not energize; contact logistics@bet-power.com within 24 hours with photos and the bill of lading.

// 04 Storage

Store indoors, dry, in the original carton. Boxes can go in early for rough-in; keep the interior and trim in storage until the walls are closed and the room is dust-free.

- Keep interiors flat, in the carton, off the floor. Never stack more than three cartons.
- If the box is installed during rough-in, tape a temporary cover over the opening so drywall dust and mud do not reach the bus area.
- Storage over 12 months: megger the interior before energizing.

CONDITION	LIMIT
Storage temperature	−20°C to +60°C
Relative humidity	≤ 80%, non-condensing
Outdoor storage	Not permitted, any enclosure type

// 05 Handling and mounting

A 1200 A power panel interior can weigh over 150 lb. Two people or a lift for any interior over 60 lb.

- Carry interiors by the mounting pan, never by the bus or lugs. Do not set the interior face-down.
- Mount the box plumb and level. The interior mounts to the box on adjustable studs; the trim will not fit an out-of-square box.
- Surface mount: fasten through the back at all four corners (and center for boxes over 48 in tall) into structure, not just drywall. Use 1/4 in minimum anchors in masonry.

- Flush mount: set the box so the front edge is flush to 1/4 in proud of the finished wall. Trim covers up to 1/4 in gap, no more.
- Mounting height: the highest breaker handle no more than 6 ft 7 in above the floor (NEC 240.24(A)). Center of the panel 54 – 60 in is typical.

// 06 Site preparation

ITEM	REQUIREMENT
Working space (NEC 110.26)	**3 ft deep min. (3.5 / 4 ft for 151–600 V Condition 2 / 3), 30 in wide or the panel width whichever is greater, 6.5 ft headroom, door swings 90°**
Dedicated space (110.26(E))	Panel footprint plus 6 ft above (or to the structural ceiling) free of ducts, pipes, and foreign systems. No sprinkler directly above without a drip shield.
Location	Not in bathrooms, clothes closets, or over stairs (240.24). Not in a location subject to physical damage unless guarded. NEMA 3R minimum outdoors; NEMA 4X in washdown or corrosive areas.
Conduit entries	Use factory knockouts or hole-saw in the endwalls or back; never in the side gutters where the interior mounts. Deburr and bush every entry. Keep entries out of the area behind the interior pan.
Gutter space (312.6)	Wire-bending space at the lugs per Table 312.6(B). Do not fill the gutter with more than 40% conductor cross-section (312.8).
Ambient	**–5°C to +40°C; breakers derate above 40°C**
Lighting	Illumination in the working space (110.26(D)), not controlled solely by the panel's own circuits.

// 07 Installation

01 Install the box (Section 05). Pull feeder and branch conductors and leave enough tail to reach the lugs and breaker terminals with the bending space in Table 312.6.

02 Install the interior on the box studs. Adjust the depth so the dead-front will sit flush with the finished wall. Tighten all mounting nuts.

03 Bond the equipment ground bar to the box (factory-bonded on most interiors; verify the bonding screw or strap is in place).

04 Service equipment only: install the main bonding jumper (green screw or strap) between the neutral bar and the box per the label. **Non-service panels: leave the neutral isolated.** Document which in Appendix A.

05 Land the feeder (Section 08). Torque and stripe the lugs.

06 Install branch breakers in the positions on the schedule. Bolt-on breakers: hook the rear, seat on the stab, and tighten the mounting screw to the value on the breaker. Install hold-down kits on any backfed breaker.

07 Land branch circuits (Section 08). One conductor per breaker terminal unless the terminal is marked for two.

08 Install filler plates in every unused space. Install the SPD (if ordered) on a dedicated breaker as close to the main as possible with the shortest possible leads.

09 Install the dead-front and trim. Check that no conductor is pinched. Fill in the directory card with circuit descriptions (408.4); "spare" and "space" are the only acceptable non-descriptive entries.

10 Install the arc-flash label and, where required, the available fault current marking (110.24).

> // WARNING
> Never modify the interior to accept a different breaker type, and never file or bend a stab. Both void the UL 67 listing and the warranty.

// 08 Electrical connections

Feeder

- Main lugs and main breaker terminals are rated AL9CU for 60/75°C conductors. Use 75°C ampacity for sizing. Aluminum conductors: wire-brush and apply oxide inhibitor.
- Phase sequence A-B-C at the main lugs matches the bus phasing top to bottom or left to right (NEC 408.3(E)). Match the upstream phasing.
- Parallel feeders: same size, length, material, and conductor count per phase; one conductor per lug port.
- Land the feeder neutral on the neutral bar main lug and the feeder equipment ground on the ground bar main lug.

Branch circuits

- Breaker terminals accept one conductor unless marked otherwise. Never two conductors under one screw.
- Neutral bar: one conductor per terminal hole (408.41). Never a ground and a neutral in the same hole.
- Multiwire branch circuits (shared neutral) must originate from a multi-pole breaker or handle-tied breakers (210.4(B)) and the neutral must be grouped with its ungrounded conductors in the gutter (210.4(D)).
- Route conductors around the gutter, not across the bus or across breaker faces. Leave a service loop.
- Isolated ground circuits: land IG conductors only on the isolated ground bar, which is bonded only at the service or at the separately derived system.

Torque

TERMINAL	TYPICAL TORQUE	GOVERNS
Main lugs, 250 – 750 kcmil	275 – 375 in·lb	Value on the lug or interior label
Main lugs, #6 – 4/0	120 – 250 in·lb	Value on the lug or interior label
Branch breaker, #14 – #10	20 – 25 in·lb	Value on the breaker
Branch breaker, #8 – #1	35 – 50 in·lb	Value on the breaker
Neutral / ground bar	20 – 45 in·lb	Value on the bar
Breaker mounting screw	Per breaker label	Value on the breaker

The value stamped on the device governs. NEC 110.14(D) requires a calibrated torque tool; hand-tight is a code violation.

// 09 Pre-energization checks

Every item below is a hold point. Record results in Appendix A.

- ☐ Panel voltage, phases, and wires match the feeder and the one-line. SCCR on the label is at or above the available fault current at the panel (or the series rating with the upstream device is listed on the label).
- ☐ Every breaker on the schedule is a type listed on the interior label. No unused space without a filler.
- ☐ Main bonding jumper installed (service) or removed (non-service) per design. Isolated ground bar, if present, isolated from the box.
- ☐ Every lug and terminal torqued with a calibrated tool and striped.
- ☐ Phase sequence verified at the main lugs. All branch breakers open.
- ☐ Insulation resistance at 1000 V DC (500 V for 240 V panels), all breakers open, feeder isolated: phase-to-phase and phase-to-ground ≥ 50 MΩ; neutral-to-ground with the bonding jumper lifted ≥ 50 MΩ.
- ☐ Gutter clear of debris, drywall dust, and metal chips. Vacuum; do not blow.
- ☐ Dead-front and trim installed, door closes and latches, directory complete, arc-flash label installed.
- ☐ Backfed breaker hold-downs installed. Shunt-trip and GF breaker control wiring landed and identified.

// 10 Energization

01 Close the door. All branch breakers open, main open (if MCB).

02 Energize the feeder from the upstream device. Verify voltage at the main lugs or main breaker load side with a rated meter, phase-to-phase and phase-to-neutral, within ±5% of nominal.

03 Close the main. Listen for 30 seconds. Buzzing from the bus or a breaker means open the main and investigate.

04 Close branch breakers one at a time, checking each load. Confirm rotation at any 3-phase motor circuit before the motor is allowed to run.

05 After 2 hours at operating load, IR scan the main lugs and each loaded breaker with the dead-front removed only if the panel is then de-energized to reinstall it, or through an IR window if fitted. No terminal more than 15°C above adjacent phases.

06 Record energization date, voltages, and the completed directory in Appendix A. Send a copy of the completed record to support@bet-power.com for the unit file.

> // WARNING
> A branch breaker that trips instantly on close is closing into a fault. Do not reclose. Isolate the circuit and megger it before re-energizing.

// 11 Operation

Loading

ITEM	LIMIT
Main bus, continuous	100% of rating at 40°C ambient
Any breaker, continuous	80% of handle rating (NEC 210.20 / 215.3) unless the breaker and panel are both 100%-rated
Neutral, 100%	Phase current; consider 200% neutral where nonlinear loads exceed 30% of connected load
Phase balance	Keep single-phase loads within 10% between phases

Breaker operation

- Operate breakers with the door open and the dead-front in place. Stand to the side of the handle.
- After a trip: the handle rests in the center TRIPPED position. Move it fully to OFF, then to ON. Identify the cause before resetting a second time; do not repeatedly reset a breaker that trips.
- Do not use a breaker as a routine switch unless it is marked SWD (lighting) or HID; the contacts are not rated for daily switching duty.
- GFCI and GFEP breakers: press TEST monthly; the breaker must trip. A breaker that does not trip on TEST must be replaced.
- Panel directory: update it every time a circuit is added, removed, or repurposed.

Adding circuits

New breakers must be a type on the interior label, installed de-energized, torqued, and added to the directory. Do not exceed the number of poles on the label. Do not add a breaker larger than the branch

stab rating. Adding load beyond the calculated demand on the feeder is a design change; call Bet Power Engineering.

// 12 Maintenance

Panelboards fail at loose terminals and from dust, moisture, and overloaded neutrals. Maintain per NFPA 70B and keep a log.

INTERVAL	TASK	UNIT STATE
Monthly	Door closed and latched, working space clear, no storage against the panel, no discoloration or smell at the door, GFCI/GFEP TEST buttons exercised.	Energized, door closed
Annually	IR scan of main lugs and loaded breakers through an IR window or with the dead-front off (then de-energize to reinstall). Check per-phase load with a clamp meter and rebalance if needed. Verify directory accurate. Exercise every breaker OFF-ON (schedule an outage).	IR energized; exercise de-energized
Every 3 years	De-energized: remove dead-front, vacuum, inspect bus and stabs for discoloration or pitting, torque-check all lugs and 25% of branch terminals (all if any are loose), megger, inspect breaker cases for cracks or heat damage.	De-energized, locked out
After any fault	Inspect the breaker that cleared it; replace any breaker that interrupted a fault near its interrupting rating or shows any external damage. Megger the circuit.	De-energized

Do not

- Blow out the gutter with compressed air. Vacuum only.
- Install a breaker not on the label, or a used breaker of unknown history.
- Paint the interior, bus, or breaker handles.
- Drill the box with the interior installed. Chips on the bus cause faults.
- Use the panel gutter as a splice box for circuits that do not terminate in the panel (312.8 limits apply).

// 13 Troubleshooting

SYMPTOM	LIKELY CAUSE	ACTION
Breaker trips on overload	Circuit loaded over 80%; motor or HVAC inrush; failing load	Measure load; redistribute; check load equipment.
Breaker trips instantly on close	Short circuit or ground fault downstream	Do not reclose. Isolate, megger, find the fault.

GFCI / GFEP nuisance trip	Shared neutral on a non-multiwire circuit; neutral-ground contact downstream; leakage from long runs or filters	Separate neutrals; check for downstream bonds; measure leakage.
Warm or discolored breaker	Loose terminal; loose stab connection; overloaded circuit	De-energize; retorque; if the stab is discolored, replace the breaker and inspect the bus.
Buzz or hum from the panel	Loose breaker on stab; loose lug; contactor chatter	De-energize; reseat and torque.
Neutral bar hot	Harmonic loads; unbalanced single-phase loads; loose neutral terminal	Measure neutral current and THD; rebalance; torque.
Voltage low on one phase	Loose feeder lug; upstream open phase; overloaded phase	Check feeder lug torque; check upstream; rebalance.
Trim will not fit / door binds	Box out of square or not flush; interior depth wrong	Reset box or adjust interior depth on the studs.
Water or rust inside	Conduit condensation; wrong enclosure type; wall leak	De-energize if wet; seal conduits with duct seal; correct enclosure type.

// 14 Warranty and support

Bet Power is the manufacturer of record for this panelboard and holds the warranty. The full warranty statement is published at bet-power.com/resources/documentation and governs over this summary.

- Warranty requires installation and operation in accordance with this manual, the interior label, and applicable codes, and a maintenance log per Section 12.
- Warranty does not cover damage from mis-handling, water ingress, field modification of the interior or bus, breakers not on the listing label, or operation above SCCR.
- Breakers, SPDs, meters, and contactors carry their manufacturer's warranty, administered by Bet Power.

Getting help

You talk to the person who built the quote and the engineer who reviewed the order. No ticket queue. Have the catalog number, the interior label photo, and the breaker in question ready.

Field support and warranty	support@bet-power.com
Engineering (breaker substitution, series ratings, load additions)	engineering@bet-power.com
Logistics desk, 24/7 (shipping damage, delivery)	logistics@bet-power.com
Web	bet-power.com/contact