

Lighting Panelboards EPLU and D2LU Series

Installation & Maintenance Information

SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE

APPLICATION

EPLU and D2LU Series panelboards provide a centrally controlled switching system and short circuit protection for feeder or branch circuits to control lighting, heating, appliance, heat tracing, motor and similar circuits. GFI and EPD options offer personnel and equipment protection respectively.

EPLU Series panelboards are designed for use in Class I, Div.1 and 2, Groups B, C, D; Class II, Groups E, F, G hazardous (classified) areas as defined by the National Electrical Code[®](NEC) and Canadian Electrical Code (CEC) as

well as in damp, wet locations - indoors or outdoors. D2LU Series panelboards are designed for use in Class I, Div. 2, Groups B, C, D.

Panelboards should be installed, inspected, maintained, and operated by qualified and competent personnel. Read entire instructions before starting installation of this product. Contact your Crouse-Hinds Sales Representative, Crouse-Hinds Customer Service or your Crouse-Hinds Distributor if you have any questions.

INSTALLATION

⚠ WARNING

To provide protection against fire or shock hazard, the electrical power must be OFF before and during installation and maintenance.

1. Select a mounting location that will provide suitable strength and rigidity for supporting the panelboard and all contained wiring. Figure 1 shows the mounting dimensions. Approximate shipping weight of panelboard fully loaded with breakers is 460 lbs.

A mechanical lifting means is provided.

⚠ CAUTION

The steel plate provided for lifting the enclosure during installation, is designed to accept a maximum 2 ton hook.

2. Install detachable mounting feet while enclosure is on the floor or work bench. (See Figure 2).

- Insert four wedge shaped mounting feet into dovetail slots in enclosure body.
- Tap each foot to securely tighten into slot.

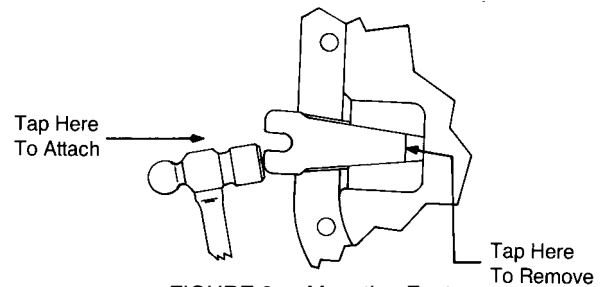


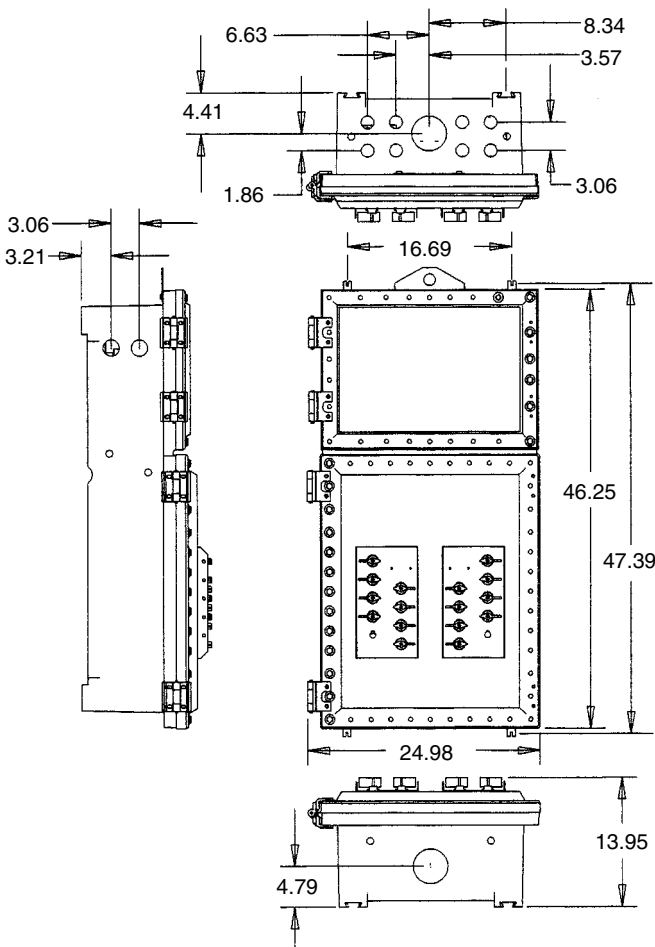
FIGURE 2 • Mounting Feet

3. Position enclosure on surface with mounting feet on the lower mounting bolts. While continuing to support the enclosure in position, install the top two bolts. Tighten all four mounting bolts securely in place.
4. Remove the cover bolts of the junction box and swing open on its hinges.

⚠ WARNING

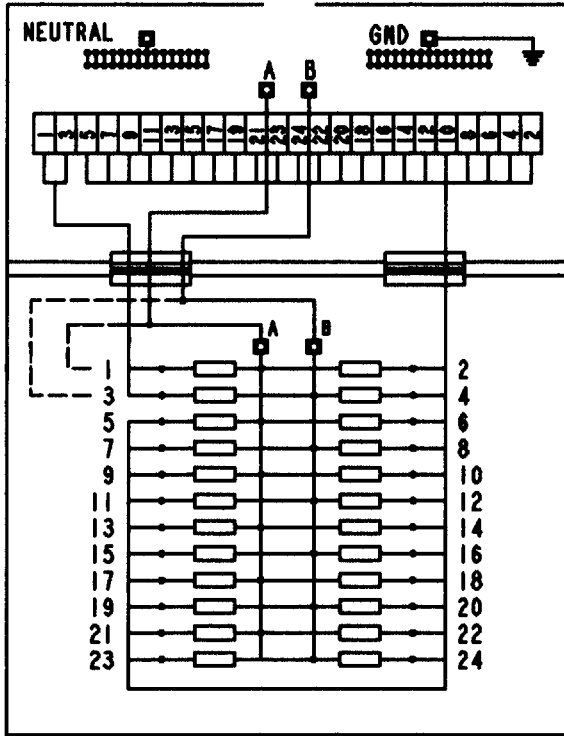
To maintain the integrity of the enclosure, do NOT damage or scratch the flange surface.

NOTE: Do not open cover of the circuit breaker enclosure. Unless optional Alternate main feed is provided to circuit breaker compartment, it is not necessary nor recommended to remove the cover during panelboard installation. If it becomes necessary, see "Removing and Reinstalling Panelboard Cover". Standard units are factory sealed and do not require any disassembly for installation of panelboard.

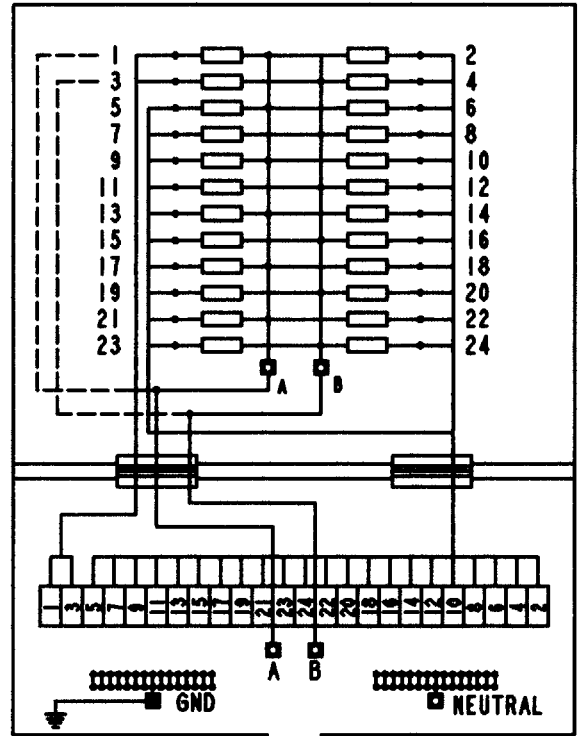


Mounting Dimensions
FIGURE 1

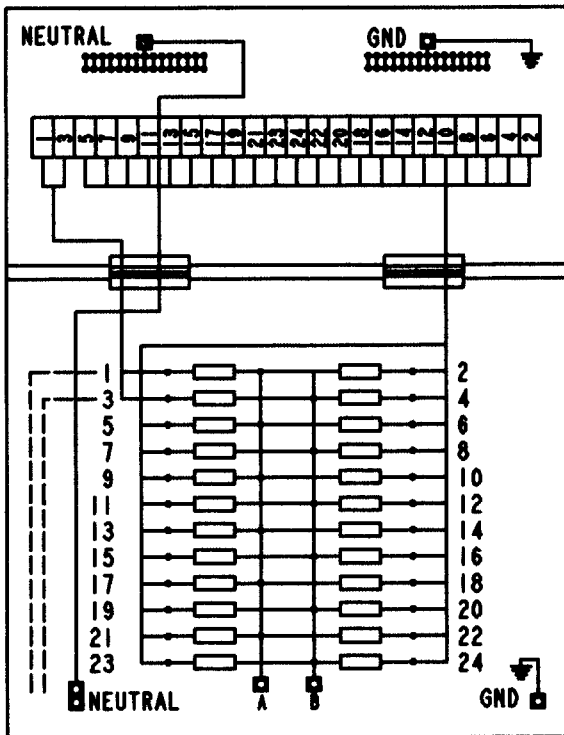
SINGLE PHASE
EPLUI...* OR D2LUI...*



SINGLE PHASE INVERTED
EPLUI...*-1 OR D2LUI...*-1



SINGLE PHASE ALTERNATE FEED
EPLUI...*-A OR D2LUI...*-A



SINGLE PHASE ALTERNATE FEED INVERTED
EPLUI...*-A-1 OR D2LUI...*-A-1

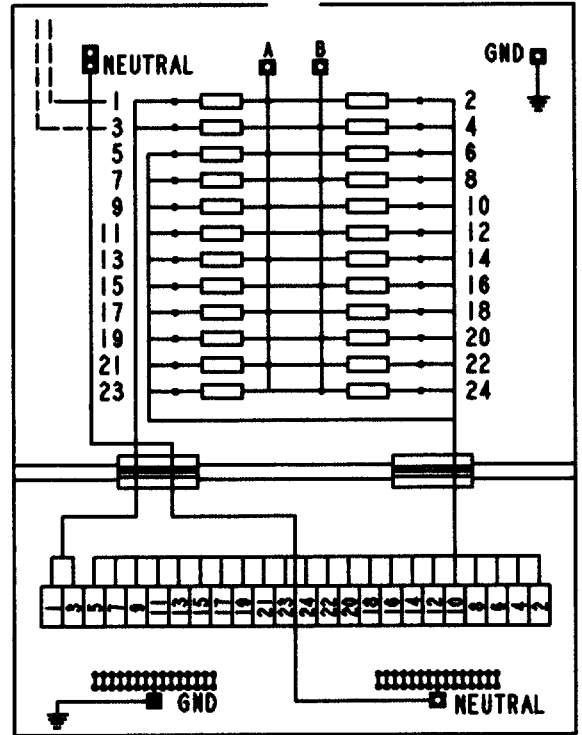
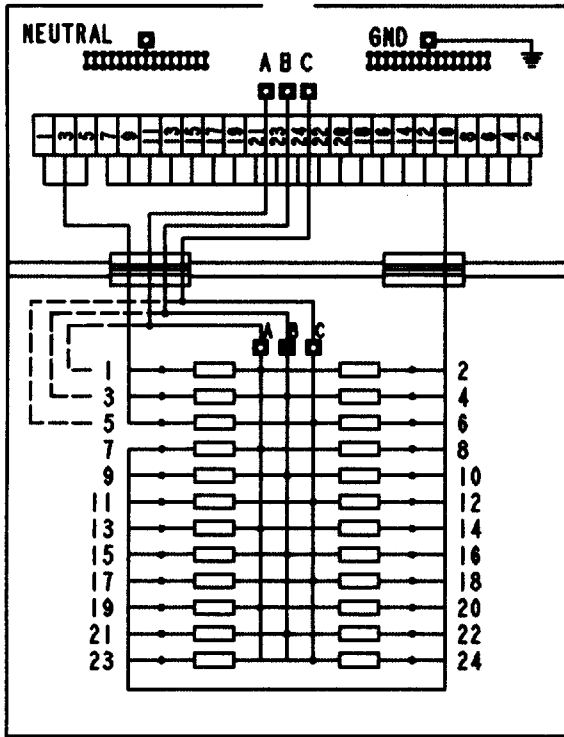
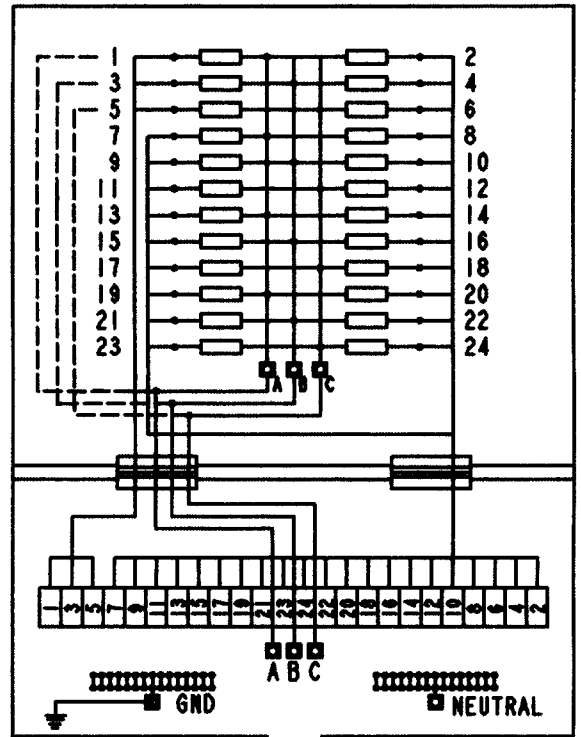


Figure 3 Wiring Diagrams

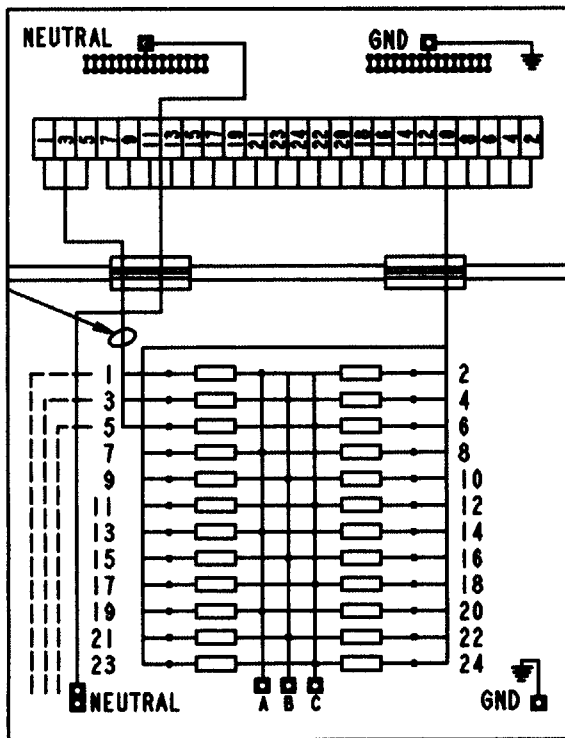
THREE PHASE
EPLU3...* OR D2LU3...*



THREE PHASE INVERTED
EPLU3...*-1 OR D2LU3...*-1



THREE PHASE ALTERNATE FEED
EPLU3...*-A OR D2LU3...*-A



THREE PHASE ALTERNATE FEED INVERTED
EPLU3...*-A-1 OR D2LU3...*-A-1

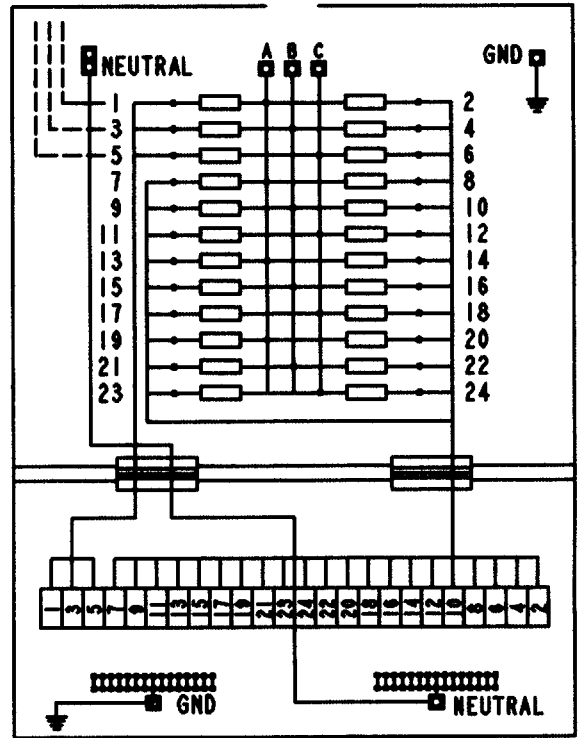


Figure 3 Wiring Diagrams
(continued)

- With panelboard securely fastened to the mounting surface, attach conduit system. Tapped conduit openings are provided for main circuit and branch circuits in the junction box as shown in Figure 1. To reduce the risks from hazardous atmospheres in Division I, and comply with national codes, conduit runs 2 inch size and larger must have a sealing fitting connected within 18 inches of the enclosure. Use explosionproof Crouse-Hinds type RE reducers for conduit smaller than tapped opening.

For main feed conduit entries in circuit breaker panelboard compartment (**Alternate option**) install approved sealing fittings within 2 inches of the enclosure as required by Section 501-5 and/or 502-5 of the National Electrical Code plus any other applicable codes. Hazardous location information specifying class and group listing is marked on the nameplate of the panelboard.

⚠ WARNING

To avoid dangerous overheating and fire, do not use aluminum wiring. Use copper wiring only. Use 60PC or 75PC conductors.

⚠ CAUTION

To prevent external fire or explosion, external conduit sealing fittings are required on all conduit entrances (within 18" of the enclosure) for enclosures when used in Class I, Group B hazardous areas. Use Crouse-Hinds type EYS seals. For other sealing requirements, consult the National Electrical Code® or Canadian Electrical Code.

Sealing fittings must be installed in accordance with the NEC/CEC and properly poured. See instructions supplied with sealing fittings. NOTE: Select nipple lengths sufficient to permit sealing fittings and unions to clear the flange.

- Hazardous location information specifying Class and Group listing is marked on the nameplate of each panelboard.
- No conduit openings are to be added in the field.

All unused conduit openings must be plugged with explosionproof plugs. Plugs must be a minimum of 1/8" thick, use Crouse-Hinds type PLG, and engage a minimum of five full threads.

EPLU/D2LU - Panelboard Sealing Requirements

	Terminal Housing		Breaker Housing All Conduit
	Conduit ≥ 2"	Conduit < 2"	
Cl. 1 Div. 1, Grp C&D	Within 18"	Not required	Within 18"
Cl. 1 Div. 1, Grp B,C&D	Within 18"	Within 18"	Within 18"
Cl. 1 Div. 2	Not required	Not required	Within 18"

⚠ CAUTION

To prevent external fire or explosion, DO NOT connect to a supply circuit capable of delivering more than 10,000 RMS symmetrical amperes. DO NOT install equipment which will produce external surface temperatures exceeding the ignition temperature of the flammable or combustible materials which may surround this enclosure. DO NOT install arcing components or high temperature producing components such as relays, switches or transformers in the terminal enclosure. Circuit interrupting devices such as circuit breakers which may be installed in the enclosure may fail electrically or mechanically unless they have been investigated and found suitable for operation in the hazardous location involved.

- After enclosure is positioned and secured in its permanent location, pull wires into panelboard junction box making sure that they are long enough to make the required connections.

Make connections per Figure 3 of either single or three phase circuits.

For Ground Fault Interruption (GFI) or Electrical Protection Device (EPD) branch circuits, make connections using typical wiring diagrams per Figure 4.

OPENING COVER

EPLU and D2LU Series panelboards are furnished with captive triple lead bolts, that utilize a spring to aid and indicate full retraction of the bolts into the cover when opening and closing. Make sure all cover bolts are fully retracted into the cover before attempting to open or close the cover.

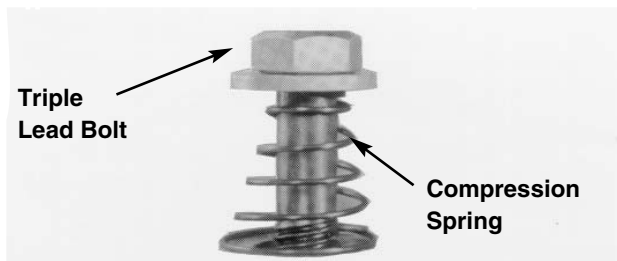


FIGURE 5 • Cover Bolt

When bolts are disengaged from the body flange threads, the bolts will withdraw and be held in this position by the spring and washer under the bolt heads. (See Figure 5)

After all bolts are fully disengaged, firmly grasp the bottom and right side of the cover and carefully swing cover aside. To prevent damage to the ground joint surface, avoid striking cover, or devices in cover, on neighboring enclosures or structures.

⚠ CAUTION

To maintain the integrity of the enclosure, hammers or prying tools must not be allowed to damage the flat joint surfaces. Do not handle cover roughly, or, if removed, do not place it on surfaces that might damage or scratch the flat ground joint surfaces.

REMOVING AND REINSTALLING PANELBOARD COVER

⚠ CAUTION

Panelboard cover weighs approximately 75 lbs., to avoid injury, handle appropriately for this weight.

⚠ CAUTION

DO NOT use cover bolts nor circuit breaker operators as a means to lift the enclosure. Excessive force on the fully retracted bolts or operators may damage the shaft or bolt/spring assembly.

- Loosen all cover bolts until each bolt is fully retracted into the cover by the stainless steel spring under the bolt head. Next, support the cover and remove the two 5/16-18 hinge bolts that attach each hinge to the body. Do NOT remove the two 5/16-18 bolts that attach hinge to cover. Using the hinge sections still attached to the cover, grasp the cover under opposite edges and lift from body.
- To replace cover, make sure cover and body ground joint surfaces are clean and not scratched. Orient cover so hinge side of cover will align with hinge on body. Lift cover to approximate position, and line up bolt holes of cover with body. Avoid sliding cover ground joint surface over ground joint surface of body. Cover body bolt holes must match up. Slide the cover over the guide pin protruding from the back flange. Hand start the corner bolts. Fully tighten all cover bolts (torque to 40-45 ft. lbs.) and then reinstall the two 5/16-18 hinge bolts

(torque to 8ft.-lb.) for each hinge in the cover. Follow procedures in Opening Cover section once hinges are reinstalled.

ACCESS TO CIRCUIT BREAKER ENCLOSURE

- For alternate feed panelboards or addition/removal of circuit breakers, it will be necessary to open the circuit breakers enclosure. Follow steps under "Opening Cover" to obtain access to the circuit breaker enclosure. For panelboards with alternate feed, pull wires into the enclosure so that they are long enough to make the required connections (to the main lugs or main circuit breaker). Make connections per Figure 3 for either single or three phase circuits. An EYS type seal will need to be installed for this 3 1/2" entry to meet the NEC requirements.

When adding or removing circuit breakers, the final configuration should begin with position #1 through the total number of spaces used without leaving intermittent spaces. This is done to ensure the panelboard is evenly loaded by phase. Use bolts on the bus bars to fasten the line side of each breaker added. Connect the load side of each breaker to the appropriate wire after cutting it to correct length.

- Test wiring for correctness with continuity checks and for unwanted grounds with an insulation resistance tester.

CAUTION

To maintain the integrity of the enclosure, clean dirt or foreign material from both flange surfaces of body and cover before closing. This will ensure a proper explosionproof joint.

- Align main circuit breaker operator with toggle position of the main circuit breaker. Be sure all bolts are retracted into the flange. Close cover and securely tighten all cover bolts. Use only bolts supplied with the panelboard. Torque all cover bolts to 40-45 ft. lb.
- Mark circuit card directory located on junction box cover with appropriate descriptions for each branch circuit number. Place circuit card directory inside clear plastic jacket before inserting in its holder.

NOTE: EPLU and D2LU Series panelboards must be protected during hose down operations. These panelboards are watertight but the breathers and drains are not hose tight.

GROUND FAULT CIRCUIT BREAKER INSTALLATION INSTRUCTIONS

Connect the GFCB line neutral pigtail(s) to the breaker housing isolated neutral block.

Select the hot load lead(s) on the branch terminal block in the terminal housing that correspond(s) to the circuit location number in the breaker housing; ring out to locate the same wire(s) in the breaker housing and insert into breaker terminal. Do not tighten breaker terminal screw at this time (on 2-pole breakers, tighten one terminal screw).

Select the selector switch wire that corresponds to the GFCB designation number (**G1 - G21**).

- If the GFCB is on the **LEFT** side of the chassis, select the lowest available GFCB **ODD** designation number.
- If the GFCB is on the **RIGHT** side of the chassis, select the lowest available GFCB **EVEN** designation number.

NOTE: Because of wire capacity, a fully loaded GFI panelboard with a main circuit breaker can be wired with:
 G21 - 1 phase panelboard
 G19 & G21 - 3 phase panelboard
 on the right side instead of the left hand side.

Insert selector switch wire into the hot load side of the GFCB and tighten the breaker terminal screw with the two wires in it.

Select the highest available branch terminal block number in the terminal housing (odd or even number depending on the breaker location).

Re-label terminal block to indicate the correct GFCB circuit location number, and with the letter "N" for the neutral identification.

Selecting the highest available branch terminal block number ensures the maximum breaker capacity in the panelboard.

Ring out to locate same wire in the breaker wire housing and connect it to the GFCB load neutral terminal.

Record the GFCB location and designation numbers (**G1 - G21**) on the Breaker Directory Card.

Place GFCB designation sticker (**G1 - G21**) on the lockout plate.

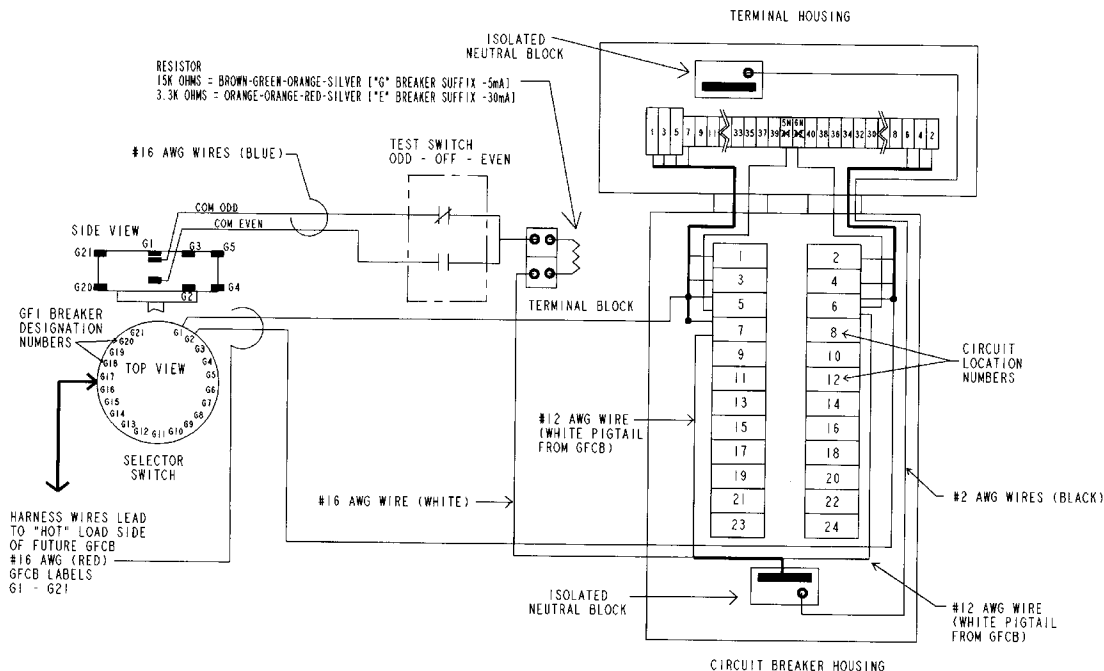


FIGURE 4 • GFCB / EPD Electrical Test System Wiring Diagram

GROUND FAULT CIRCUIT BREAKER INSTALLATION EXAMPLE

Example: Two GFCB's, one 2-pole and one single pole, are to be added to a Group B standard (no -A or -I suffix) panel. See Figure 4. Positions #1 through #4 are occupied with single pole non-GFCB (QOB type) breakers.

The 2-pole GFCB is installed on the odd numbered (left) side of the chassis in the next available location (#5 & #7). Connect GFCB line neutral pigtail to the breaker housing isolated neutral block.

Select wire #5 & #7 in the terminal housing branch terminal block, which are the next available locations on the terminal strip. Ring out the wires to locate them in the breaker housing. Connect the wires to the GFCB and tighten only one terminal screw on the breaker.

Select wire labeled "G1" from the selector switch. "G1" indicates the GFCB number assigned to this first GFCB on the left (odd) side. Insert this wire along with the hot load wire of which the breaker terminal screw was left loose. Then tighten the breaker terminal screw.

Select the load neutral wire #41 (for this example #41 is the highest odd number location on the branch terminal block). Then #41 is crossed out and re-labeled with 5N ("5" being the circuit location & "N" identifying the load neutral) on the blank terminal strip located on the side of the branch terminal block. Ring out to find #41 in the breaker housing, then connect to load neutral terminal on the GFCB.

The single pole GFCB is installed on the even numbered (right) side of the chassis in the next available location. For this example, #6 is the next available location.

Following the above procedure, the GFCB line neutral pigtail is connected to the breaker housing isolated neutral block.

Select wire #6 in the terminal housing branch terminal block, which are the next available even number location on the terminal strip. Ring out the wires to locate the wire in the breaker housing. Connect the wire to the GFCB without tightening terminal screw on the breaker.

Select wire labeled "G2" from the selector switch. "G2" indicates the GFCB number assigned to this second GFCB. Connect this wire along with the hot load wire of which the breaker terminal screw was left loose. Then tighten the breaker terminal screw.

Select the load neutral wire #42 (for this example #42 is the highest even number location on the branch terminal block). Then #42 is crossed out and re-labeled with 6N ("6" being the circuit location & "N" identifying the load neutral) on the blank terminal strip located on the side of the branch terminal block. Ring out to find #42 in the breaker housing, then connect to load neutral terminal on the GFCB.

Record GFCB's location (#5/#7 and #6) and designation (G1 & G2) numbers on the Circuit Directory Card.

Place GFCB designation stickers (G1 & G2) on the lockout plate.

GROUND FAULT CIRCUIT BREAKER TESTING PROCEDURE

CAUTION

Per manufacturer's instructions for maximum protection against electrical shock hazard, operate test circuit on the unit at least once a month.

To test a single GFCB:

1. Position selector switch at desired breaker number (See Figure 4).

2. Turn test switch to "ODD" or "EVEN" to match the breaker number selected, "ODD" if breaker # is an odd number and "EVEN" if breaker # is an even number.
3. Note if GFCB handle indicated trip or check if power was cut off on that circuit.
4. Reset test and selector switches to "OFF".
5. Reset GFCB

To test all ODD or EVEN numbered breakers:

1. Turn test switch to appropriate setting, "ODD" or "EVEN".
2. Rotate selector switch pausing briefly at each number being tested. Note whether breaker handle indicated tripped or loss of power on that circuit.
3. Reset test switch to "OFF".
4. Reset selector switch to "OFF".
5. Reset GFCB's.

NOTE: A full panel of GFCB's with main circuit breaker will have one or two ODD GFCB's on the EVEN side, refer to "NOTE" under the Ground Fault Circuit Breaker Installation Instructions.

MAINTENANCE

WARNING

To avoid electrical shock, fire and or explosion, always disconnect primary power source before opening enclosure for inspection or service.

1. Frequent inspection should be made. A schedule for maintenance checks should be determined by the environment and frequency of use. It is recommended that it should be at least once a year.
2. Perform visual, electrical, and mechanical checks on all components on a regular basis.
 - Visually check for undue heating evidenced by discoloration of wires or other components, damaged or worn parts, or leakage evidenced by water or corrosion in the interior.
 - Electrically check to make sure that all connections are clean and tight.
 - Mechanically check that all parts are properly assembled, and operating mechanisms move freely.
 - When checking torque on main lugs, it may be necessary to move the insulating barrier to get access to the screws on the main lugs.

CONNECTOR WIRE TORQUE		
LOCATION	WIRE SIZE	TORQUE (lb. in.)
TERMINAL STRIP	22-8 AWG	8
	10-1/0 AWG	25
GROUND-NEUTRAL STRIPS	18-10 AWG	35
	8 AWG	40
	6-4 AWG	45
NEUTRAL LUG	2-1/0 AWG	50
	6 AWG - 250 MCM	200
ENCLOSURE GROUND LUGS	14-2/0 AWG	120
MAIN TERMINAL BLOCK	8 AWG - 500 MCM	375
MAIN AND BRANCH CIRCUIT BREAKERS	AS MARKED ON DEVICE	AS MARKED ON DEVICE

BUS BAR CONNECTOR TORQUE	
BOLT SIZE	TORQUE (lb. in.)
#10	30
1/4	65
5/16	130

3. A desiccant packet has been included in this enclosure at the factory. The purpose of the desiccant is to absorb and remove water on contact or from the atmosphere, and protect the enclosed equipment from damage. The desiccant packet will expand 3 to 4 times its original size. Desiccant should be checked and replaced at regular equipment service intervals or every 3 to 6 months. Remove the desiccant packets from their packaging and install in the appropriate enclosures.

This desiccant is non-toxic, emits no fumes, and generates no heat during use. No gloves, masks or special clothing is required to handle this packet.

4. Make sure all cover bolts are fully retracted into cover before closing cover on body. Align main circuit breaker operator with toggle position of the main circuit breaker. Close cover and start cover bolt threads by hand. Torque all cover bolts securely to 40-45 ft. lbs.

⚠ CAUTION

Clean both ground joint surfaces of body and cover before closing. Dirt or foreign material must not accumulate on flat ground joint surfaces. Surfaces must seat fully against each other to provide a proper explosionproof seal.

Replacement parts are available through your Crouse-Hinds distributor. Replace circuit breakers only with Square D breakers as follows:

CIRCUIT BREAKER
240/120 - 120/208 VAC

	Max. Amps	Breaker Type
Back Feed Main and Branch	100	QOB
GFI or EPD	50	QOB

5. We recommend an Electrical Preventive Maintenance program as described in the National Fire Protection Association Bulletin NFPA No. 70B.

ADDING OR REMOVING BREAKERS

Breaker actuator kits are used to change the configuration of an existing panelboard. EPLU-K1 provides breaker operators while EXDU-K2 provides operator plugs. Changing present breaker pole combinations is solved by choosing the appropriate kit.

Before adding or removing any breakers, see "OPENING COVER" section. If adding breakers, determine the quantity, trip rating and number of poles for each. Remove the circuit breaker slider bracket and hardware. Before removing the circuit breaker sliders, note their positioning. Remove the trim plate on the chassis and set aside. Add or remove circuit breakers as necessary.

Terminate any necessary additional wires to the newly added circuit breakers by making sure that they are long enough to make the required connections. Make connections per Figure 3 of either single or three phase circuits.

Test wiring for correctness with continuity checks for unwanted grounds with an insulation resistance tester.

With breakers installed in new panelboard configuration, determine the location and orientation of breaker operators to be added and circuit positions to be plugged, see Figure 8.

Reinstall trim plate with necessary circuit breaker sliders positioned properly. Fasten slider bracket to trim plate making sure each slider has full travel. Install necessary breaker operators or plugs to the cover of the breaker housing, see "ADDING BREAKER OPERATORS" or "ADDING PLUGS." Close cover per instructions in "ADDING PLUG" section.

ADDING BREAKER OPERATORS

1. Remove plug from opening.
2. Apply a small amount of non-petroleum based lubricant, such as Crouse-Hinds STL or HTL to operating bearing threads.
3. Thread in operating bearing from the outside of the panel until the bearing bottoms out (see Figure 6).
4. Slide spring over square end of operating shaft until it seats against roll pin.
5. Thread shaft from the inside of enclosure thru operating bearing until O-ring groove is exposed.
6. Place the O-ring onto shaft groove with a touch of white grease.
7. After installation of O-ring, back off shaft one or two turns so that the O-ring is not exposed. The square section of the shaft should be just above the bearing.
8. The roll pin should be parallel to the bottom of the enclosure.
9. Install the operating fork sliding roll pin into fork groove. Secure with lock washer and screw. Fork should be facing bottom of panel (see Figure 7).

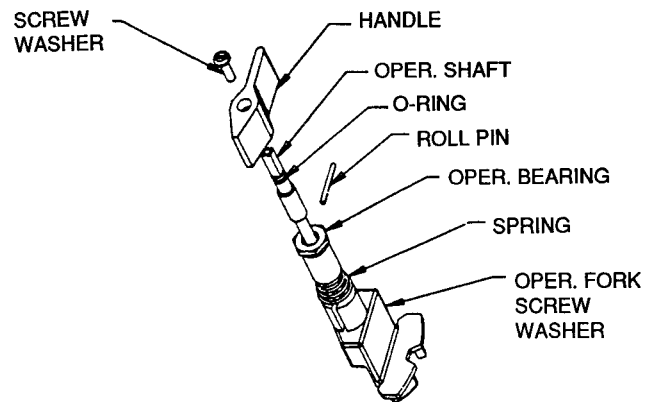


FIGURE 6 • Typical Branch Circuit Breaker Handle Assembly

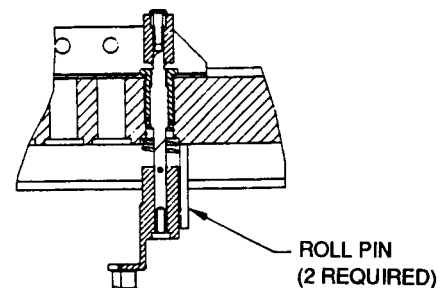


FIGURE 7 • Fork Stop Assembly

10. Install operating handle with counter bore facing up and shorter end pointing towards the center of the breaker enclosure using the lock washer and screw provided.

NOTE: For 2 and 3 pole breaker actuators two long roll pins (provided) must be installed into the pre-drilled holes in the back of the breaker housing cover. This will prevent the actuators from rotating 360 degrees.

ADDING PLUGS

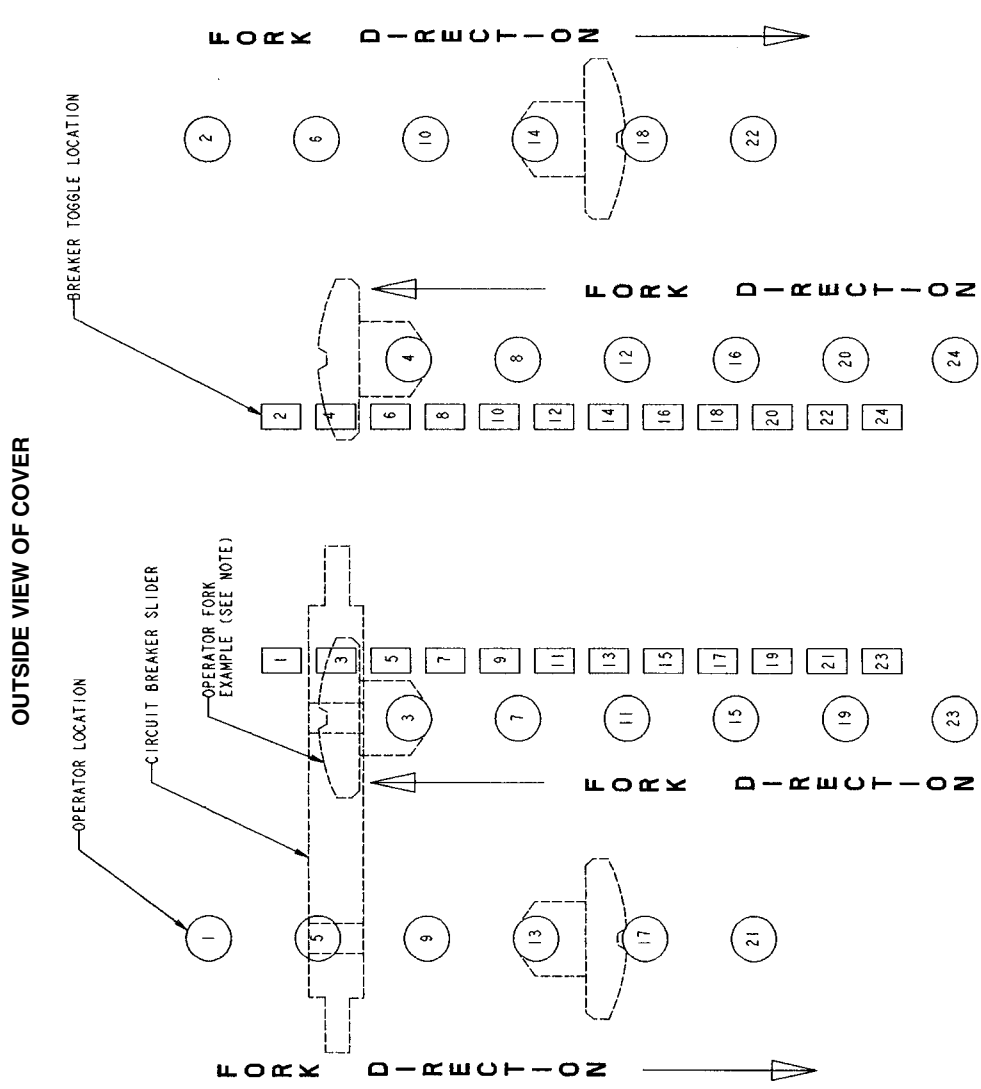
Remove breaker operator assembly and bearing and using a non-petroleum based thread lubricant, thread in plug until it is tight against face plate (see Figure 7). Install two roll pins where necessary to limit over travel of adjacent operator forks.

Securely tighten all cover bolts. Use only bolts supplied with the panelboard. Start cover bolt threads by hand then torque all cover bolts to 40-45 ft. lbs.

PANELBOARD REPLACEMENT PARTS

CAUTION
Clean dirt or foreign material from both flange surfaces of body and cover before closing.

CAT. NUMBER	DESCRIPTION
EPLU-K1	Extra circuit breaker operator assemblies and circuit breaker sliders (qty.3 each)
EXDU-K2	Replacement cover plugs for unused circuit breaker positions (qty. 5)



Note: When assembling sliders to circuit breaker toggle, match the operator location number with the breaker toggle location number.

Figure 8 - Lighting Panelboard positioning guide for breakers, sliders and operator forks

All statements, technical information and recommendations contained herein are based on information and tests we believe to be reliable. The accuracy or completeness thereof are not guaranteed. In accordance with Crouse-Hinds "Terms and Conditions of Sale", and since conditions of use are outside our control, the purchaser should determine the suitability of the product for his intended use and assumes all risk and liability whatsoever in connection therewith.