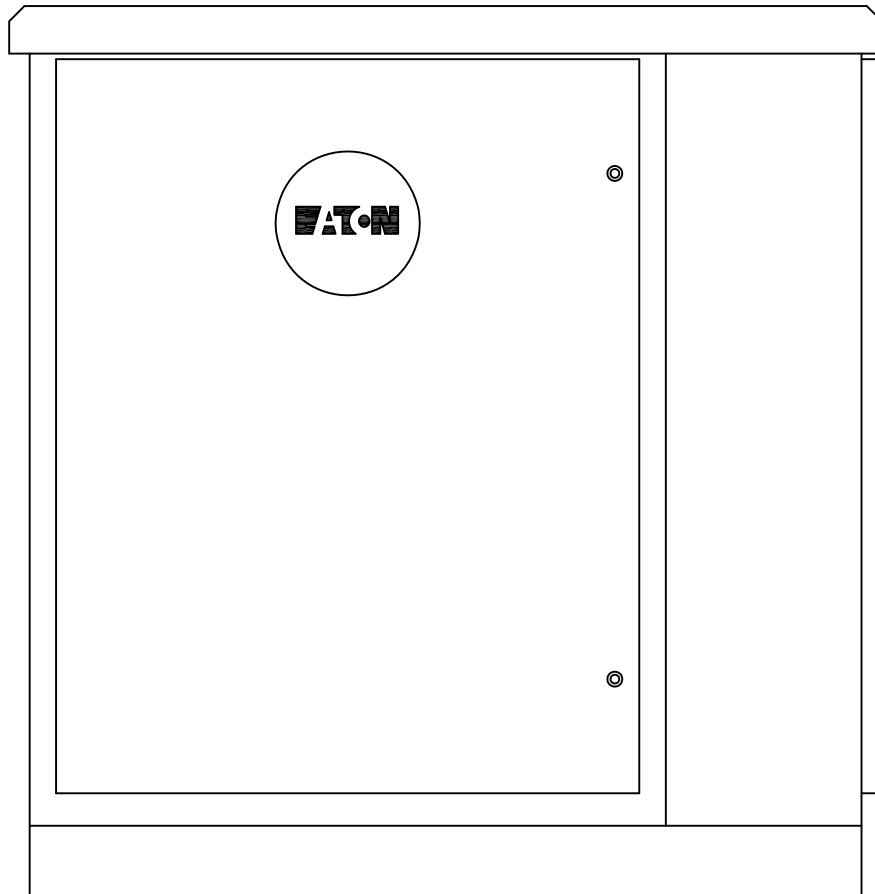




# Operation And Maintenance Manual

## Substation (Stainless Steel)

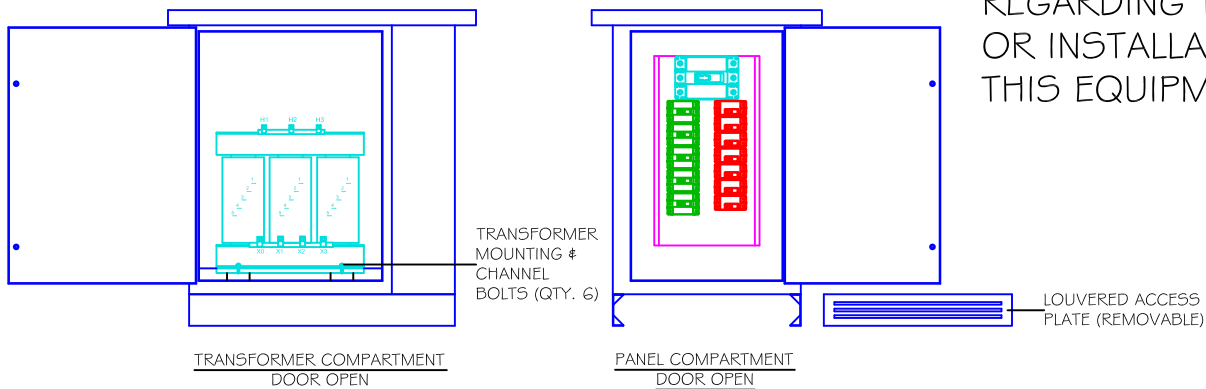
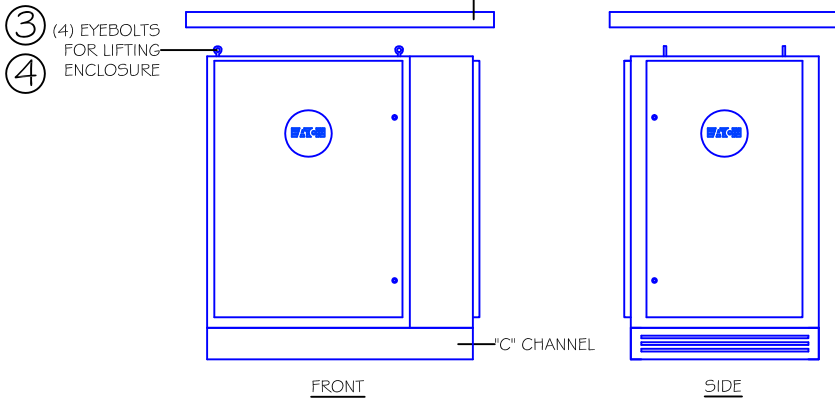
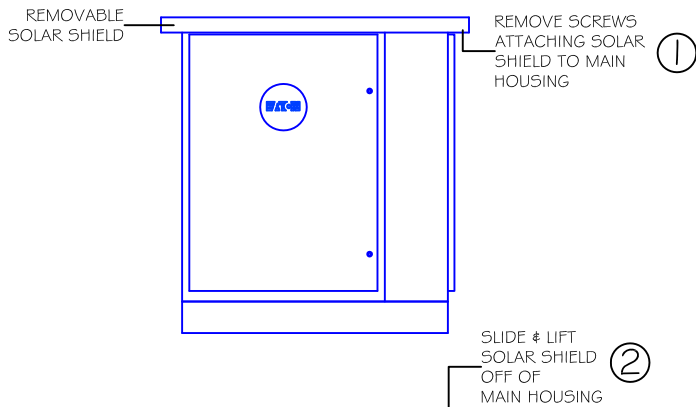
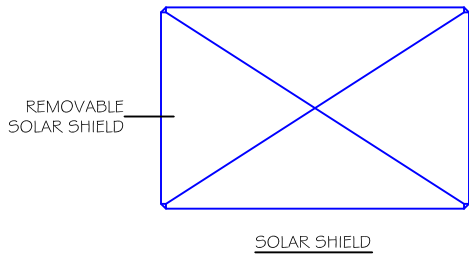


***READ CAREFULLY BEFORE INSTALLATION -  
FAILURE TO DO SO COULD RESULT IN  
DAMAGED EQUIPMENT AND / OR SERIOUS  
INJURY***

Eaton Electrical - Marina Power & Lighting  
149 Warwick Ct.  
Williamsburg, VA 23185  
(800) 723-8009 Phone  
(757) 258-8805 Fax

## IMPORTANT LIFTING INSTRUCTIONS

1. REMOVE THE SOLAR SHIELD FROM THE ENCLOSURE BY REMOVING ALL OF THE SCREWS ON THE FRONT, BACK, AND TWO SIDES OF THE MAIN HOUSING.
2. SLIDE AND LIFT SOLAR SHIELD OFF OF THE MAIN HOUSING.
3. FOUR EYEBOLTS ARE LOCATED UNDER THE SOLAR SHIELD.
4. USE THE FOUR EYEBOLTS TO LIFT THE ENCLOSURE.
5. *FAILURE TO LIFT THE SUBSTATION ENCLOSURE USING THE EYEBOLTS COULD CAUSE DAMAGE TO THE ENCLOSURE AND / OR CAUSE BODILY HARM TO INDIVIDUALS INSTALLING THE EQUIPMENT.*
6. VERIFY TRANSFORMER MOUNTING BOLTS ARE SECURE PRIOR TO RIGGING.
7. PLEASE CONTACT THE FACTORY AT 800-723-8009 WITH ANY QUESTIONS REGARDING THE LIFTING OR INSTALLATION OF THIS EQUIPMENT.



**EATON**

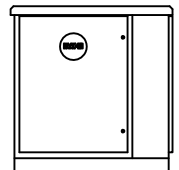


EATON ELECTRICAL  
MARINA POWER & LIGHTING

PRODUCT:  
SUBSTATION

PRODUCT  
SPECIFICATION

LIFTING  
INSTRUCTIONS



**Eaton Electrical - Marina Power and Lighting**  
**General Specifications for the Marina Power Distribution Substation**

**All Substations Must Meet the Following:**

**Part I. General:**

**1.1 General Requirements-**

- A.) Shall be tested and certified to be in compliance with UL 1062 entitled “Unit Substations”
- B.) Shall be certified to be in compliance with UL 1561 entitled “Dry Type General Purpose and Power Transformers”
- C.) Shall be certified to be in compliance with UL 67 entitled “Panelboards”
- D.) Shall be certified to be in compliance with UL 489 entitled “Molded Case Circuit Breakers”
- E.) Shall be certified to be in compliance with UL 50 entitled “Cabinets and Boxes”
- F.) Shall be certified to meet all sections NFPA 303 DTD “2006 Marinas and Boatyards”.
- G.) Overload capacity shall meet ANSI L57.96-01.250.

**Part II. Products:**

**2.1 Acceptable Manufacturers – Distribution Substations, Transformers, Panelboards-**

- A.) Eaton Electrical - Marina Power and Lighting  
149 Warwick Court, Williamsburg, VA 23185  
Phone: 800-723-8009 Fax: 757-258-8805  
Bettywheat@eaton.com

**2.2 Distribution Substations – General**

**A.) Housing:**

1.) Stainless Steel-

- Heavy 1.5mm 316 Stainless Steel housing which will be powder coated with a polyester resin.

2.) Heat-

- The housing has a solar shield top to reduce heat transfer from the sun and to reduce the heat transfer from the transformer. Thermostatically controlled fans are installed to dissipate heat for greater equipment efficiency.

**B.) Transformer-**

1.) Transformer:

- Eaton - Marina Power & Lighting transformers are wound with, class H heavily insulated copper bar and are double dipped in tough insulating varnish that protects the copper as well as reduces the hum that is typical in a transformer that is not double dipped. Temperature rise is not to exceed 150° C, 220° C insulation class per UL standards. Frequency shall be designed for 60-Hertz operation. 50-Hertz operation available for Canadian or European applications. Taps shall be 2(+) and 2(-) at 2.5% each.

### C.) Installation-

#### 1.) Stainless Steel Unit:

- Two heavy-duty stainless steel “C” channels are provided for easy mounting of the unit to the dock. A louvered skirt is provided to cover the mounting area for a neat and clean appearance after installation. A cable sealing plate is provided on both the primary and secondary side of the unit base. **Four stainless steel eyebolts are provided with each unit, located under the solar shield. All lifting of the unit should be performed with the four eyebolts. Failure to lift the substation using the eyebolts could cause extreme damage to the equipment and / or cause bodily harm to individuals installing the equipment.**

### D.) Internal Wiring-

- 1.) All secondary wire is completed with 600 V insulated copper wire. This wire passes through a special molded grommet assembly between the transformer and the distribution panel chambers.

### E.) Panelboard-

#### 1.) CH:

- Marina Power & Lighting offers the Cutler-Hammer Pow-R-Line 4 Distribution panel as a standard in the substation. All busses are density rated copper and breakers are the bolt-on type. Panelboards can be 120/240V 1 Phase or 120/208V 3 Phase based on your system requirements. They can have a main breaker or main lug. Branch breakers are provided based on customer’s requirements.

## MAINTENANCE, OPERATING AND INSTALLATION INSTRUCTIONS DRY-TYPE GENERAL PURPOSE TRANSFORMERS

### 1. GENERAL:

Your transformer is designed for safe, cool and quiet operation for many years with minimum maintenance, provided certain guidelines are observed during installation.

**Warning - DANGER:** Power must be off before working inside a transformer.

### 2. INSPECTION UPON RECEIPT:

Upon receipt of transformers, check them against the shipping list. If any damage is discovered, file a claim immediately with the carrier.

### 3. HANDLING:

Core and coil units should be left on the skid for handling because the mounting structure is not designed for sliding or rolling. Holes on the core & coil frames are provided to allow overhead lifting.

**CAUTION** - Never attempt to lift a transformer from points other than the lifting points provided on the enclosure. No transformer should be laid on its side or end for any reason. The windings, structure and vibration isolators are designed to handle the normal weight and stress from shipment and usage. These parts are not designed to accept stresses from tipping or similar actions. Damage beyond repair can occur if transformer is turned on its side or end.

### 4. STORAGE:

Transformers not installed and energized immediately should be stored in a dry clean space having a uniform temperature to prevent condensation.

### 5. INSTALLATION:

Enclosure Type: Dry type transformers are for indoor use unless the enclosure is specifically designed for outdoor service.

Ventilation: Provide adequate and unrestricted room for air flow through the vent openings of the enclosure.

Location: Install in a dry, clean and accessible area. Dry-Type Transformers must be installed in an upright position.

Sound Level: Transformer hum is an inherent characteristic and can not be completely eliminated. To minimize it, use resilient mounting pads and avoid locations (such as centre of long wall) that amplify the sound.

**CAUTION** - Installation should be performed only by experienced and qualified personnel.

5.1 Connections: Refer to the nameplate or the enclosed connection diagram for the primary and secondary voltages, tap arrangements, phases and ratings at each tap. Do not make any connections other than those shown on the diagrams supplied.

**CAUTION:**

- Prior to rigging and upon final installation, verify transformer and channel mounting bolts are secure.
- Before energizing, check all bolted connections for tightness to ensure good electrical connections.
- To prevent any damage to the load, energize the transformer with the load disconnected. Insure that output voltages agree with the name plate ratings before the load is connected.

5.2. Grounding: A transformer ground lug or ground bus is provided, follow the national codes for grounding the transformer.

6. OPERATION: To maintain safe operating conditions, do not remove panels or covers on the enclosure while the transformer is energized.

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**7. MAINTENANCE:**

7.1 Inspection: Inspection for the following should be made at regular intervals:

- a)- Dirt accumulation on the insulating surface or restricting air flow.
- b)- Loose connections.
- c)- Signs of overheating and of voltage creepage over the insulating surfaces as evidenced by tracking or carbonization.
- d)- Check cooling fans once a month

7.2 Cleaning: To permit free air circulation and to guard against the possibility of insulation breakdown. Dirt should be removed. The windings may be cleaned with a vacuum cleaner, blower, or with dry compressed air.

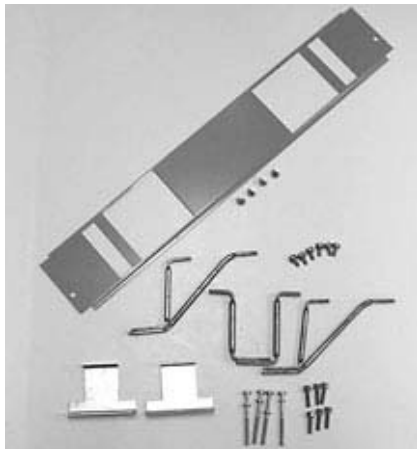
## PRL4 Breaker Connector Kits

### Breaker Connector Kits

Each kit includes copper connectors, mounting brackets, covers, hardware and instructions for mounting breaker(s) in a PRL4. **Breakers are not included.** Contact your local Satellite plant for availability and application information (see **Page 4**).

### Connector Kit

Each kit includes copper connectors mounting brackets, cover, hardware and instructions.



Connector Kit

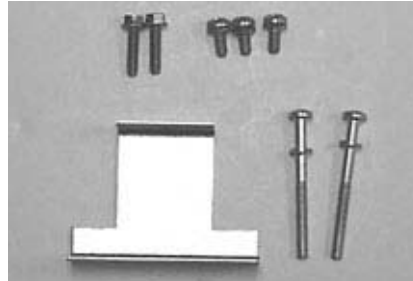
Table 32. Breaker Connector Kits

Breaker Frame	Space Required		Poles	Mounting Type	Connector Kit Catalog Number
	Inches (mm)	"X"			
EHD, FD, HFD EHD, FD, FDB, HFD, FDC ED, EDH, EDC	2.75 (69.9)	2X	1 ① 2 2	Twin Twin Twin	KPRL4FD1 KPRL4FD2 KPRL4ED2
EHD, FD, FDB, HFD, FDC FCL, FB-P, FD/LFD ED, EDH, EDC JD, JDB, HJD, JDC JD, JDB, HJD, JDC	4.13 (104.9)	3X	3 3 3 2, 3 2,3	Twin Twin Twin Single Twin	KPRL4FD KPRL4FBP KPRL4ED KPRL4JDS KPRL4JDT ②
DK, KD, KDB, HKD, KDC DK, KD, KDB, HKD, KDC CKD, CHKD	5.50 (139.7)	4X	2, 3 2,3 2,3	Single Twin Single	KPRL4KDS KPRL4KDT ③ KPRL4CKD ④
LCL LA-P LD, LDB, HLD, LDC, CLD, LC MDL, HMDL NB-P CND, CHND ND, HND	8.25 (209.5)	6X	2, 3 2, 3 2, 3 2, 3 2, 3 3 2, 3	Single Single Single Single Single Single Single	KPRL4LCL ② KPRL4LAP ② KPRL4LD ② KPRL4MC ② KPRL4NBP ③ KPRL4CND ③④ KPRL4ND ②

- ① Two sets of twin mounted 1-pole breakers.
- ② 36.00-inch (914.4 mm) minimum box width required.
- ③ 44.00-inch (1117.6 mm) box width required.
- ④ Requires density rated bus in existing panel chassis.

### Hardware Kit

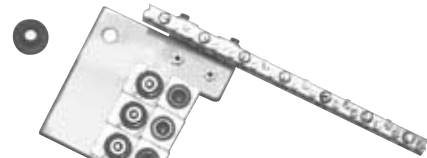
Each kit includes mounting bracket(s) and mounting hardware only. Use the appropriate Connector Kit catalog number and add an "H" to designate hardware only (example: KPRL4FD-H).



Hardware Kit

### Standard Ground Bus

Copper bus with (3) 6 – 300 kcmil lugs plus a 24-circuit terminal bar with #14 – 1/0 wire range.



6572C746G01



### **Limited Lifetime Warranty - Substation**

**Eaton - Marina Power and Lighting, Inc.** warrants to the end user, the customer (you), that the Eaton - Marina Power & Lighting Substation, fiberglass or stainless steel, housing will be free from defects in materials and workmanship for the life of the product. If breakage occurs during this period the broken part shall be replaced at no charge.

There is a full 1-year warranty on all panel parts and circuit breakers for defects in material and workmanship in normal use.

There is a full 1-year warranty on all parts of the transformer for defects in material and workmanship in normal use.

The limited warranty covers only those defects that arise in the normal use of the product.

This limited warranty does not apply to any product that has been damaged, altered, subjected to abuse or misuse, or acts of Nature.

Eaton - Marina Power and Lighting will not accept back charges for any work performed by an outside contractor that has not been previously authorized in writing by Eaton - Marina Power and Lighting.