Power Distribution Substation
Instruction Manual

Larson Electronics MPD/MGS Series power distribution substations convert electrical current into the necessary voltage required by the operator. This unit provides operators the ability to safely tap into and distribute the required voltage from a variety of sources. Do not attempt installation or operation until you are familiar with all warnings, precautions, and procedures outlined within this document.

Safety Warnings

For personal safety, always follow the safety instructions in this manual to ensure safe and long-term use. Failing to do so can result in damage to the product or serious bodily injury.

WARNING

DO NOT place in a location where the power substation has the potential to roll or tip over.
DO NOT perform maintenance while energized.
DO NOT stand under power substation while elevated for transport.
DO NOT use this product for other than its intended use.
DO NOT open or modify power substation.
Always ensure a clear area while maneuvering power substation.



⚠ WARNING:

Electrical potentials hazardous to human life can exist within this equipment when energized. Disconnect all input power before opening case or touching internal parts. Use proper lock-out/tag-out procedures.

The information contained herein may not cover all variations in equipment or provide for all contingencies which might be met in installation, operation and maintenance.

Failure to follow instructions may result in death or serious injury

Inspection upon Receiving

Power distribution should be carefully inspected upon receipt to ensure that no damage has occurred during shipment. Any damage should be reported at once and a claim should be placed against the shipping company.

⚠ WARNING:

Only qualified personnel should install, inspect, or maintain transformers since the normal operating voltages can be hazardous.
Do not place combustible materials on or near transformer or mount transformer closer than 6 inches from any adjacent wall.
The nameplate rating on the unit should be checked against the job specifications to ensure installation of the correct transformer.

Power distribution substation should never be operated without access covers securely mounted in place.
A safety program must be established, verified and followed by all personnel involved with the power distribution unit.

OPERATION:

Place the power substation on a level surface near a power source. The power substation provides multiple options for maneuvering. These vary upon model purchased:

- **Skid Pockets** Lift with a forklift or similar lift vehicle
- **Top Pick Eye** Lift with cable or chain hooks via crane or similar. Use equipment capable of lifting 2000lbs. minimum.
- **Locking/Standard Casters** Roll around on ground surface. Casters lock with foot plate. Keep casters locked to prevent unintentional movement (*If applicable*). Select models do not include locking casters.
- **Run Flat Tires** Roll around on ground surface. Used for dolly cart models.
- **Steel Legs** 10" steel legs with plates on each corner enables elevated stability in rugged work sites. Only maneuverable by lift.
- **Flat Base** Standard mounting platform. Only maneuverable by lift.



SKID POCKETS



PICK EYE



CASTER
(IF APPLICABLE)



RUN FLAT TIRES
(IF APPLICABLE)

Ensure all power is disconnected prior to wiring substation and there is no load on the system. Turn off all disconnect switches and primary panel main circuit breaker before energizing substation.

Feed power substation with the primary voltage. See specifications listed on product nameplate. Power substation is fed via cord whip or direct to primary disconnect depending on model. See wire diagram attached to your power distribution substation. Connection cables must be rated for at least 90°C insulation and 75°C ampacity. Connection cables must meet NEC and local electrical codes. Use appropriate measures and follow all applicable local, state, NEC codes when wiring.

Grounding: Transformer is grounded to the frame via a ground lug toward the base of the frame for earth ground. Please check all motor loads for dual rated motors that will work 208 or 240.





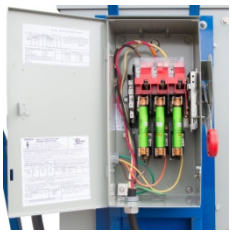
STEEL LEG
(IF APPLICABLE)

***NOTE: PICTURES SHOWN MAY VARY.**

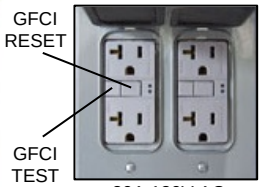
Once power is supplied, energize substation. Switch the primary breaker ON or for models with disconnect switch, pull the lever and switch primary disconnect ON. **Note:** *Disconnect box will lock itself with the lever turned ON and won't unlock until switched OFF.* Connect equipment to available receptacles.

In the event of an overload or power failure, check all breakers. For disconnects, turn off and de-energize prior to servicing. Check to ensure GFCI receptacles are not tripped. If they are, reset them via button on each 5-20R receptacle or by circuit breaker for other receptacles.

PRIMARY/SECONDARY PANELS AND RECEPTACLES VARY BY MODEL, THESE INCLUDE:


DISCONNECT


SECONDARY PANEL



20A 120V AC
5-20R GFCI


30A 250V AC
L15-30R


50A CS8169

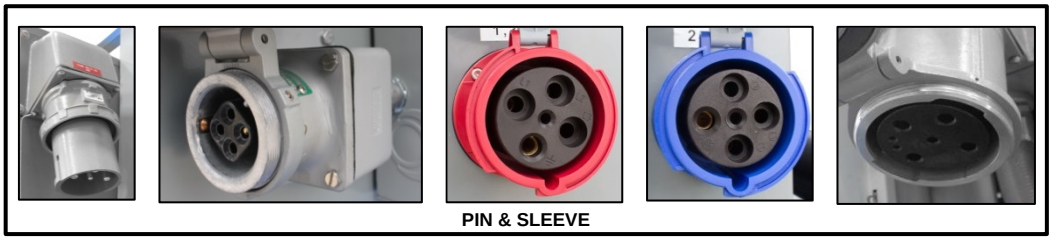

50A 250V 6-50R


CAM LOK

***NOTE: PICTURES SHOWN MAY VARY.**


FEED-THRU DISCONNECT

PRIMARY DISCONNECT



PIN & SLEEVE

THIS LIST DOES NOT SHOW ALL COMPATIBLE PANELS, DISCONNECTS, AND RECEPTACLES AVAILABLE FOR POWER SUBSTATIONS. UNIT RECEIVED MAY INCLUDE DEVICE(S) NOT SHOWN HERE. SEE PHYSICAL UNIT AND SPECIFICATION SHEET FOR ADDITIONAL INFORMATION.

Definition of a ground fault:
Instead of following its normal safe path, electricity passes through a person's body to reach the ground. For example, a defective appliance can cause a ground fault.

A GFCI receptacle does NOT protect against circuit overloads, short circuits, or shocks. For example, you can still be shocked if you touch bare wires while standing on a non-conducting surface, such as a wood floor.

NOTE:
GFCI's contain a lockout feature that will prevent RESET if:

- There is no power being supplied to the GFCI.
- The GFCI is mis-wired due to reversal of the LINE and LOAD leads.
- The GFCI cannot pass its internal test, indicating that it may not be able to provide protection in the event of a ground fault.
- GFCI TEST

Plug an electrical device, such as a lamp into the receptacle on which you are working. Turn the lamp or device ON. Then, unplug the power cord or find the breaker or fuse that protects that receptacle. Place the breaker in the OFF position or completely remove the fuse. The lamp or device must turn OFF.

Next, plug in and turn ON the lamp or device at the receptacle's other outlet to make sure the power is OFF at both outlets. If the power is not OFF, stop work and call an electrician

MAINTENANCE

⚠ WARNING:

Only qualified personnel should inspect, or maintain transformers and power distribution since the normal operating voltages can be hazardous.

⚠ WARNING:

Hazard of electrical shock, explosion or arc flash. Turn off power supplying this equipment before working on it. Discharge all static charges held by coils. Failure to follow these instructions may result in death or serious injury.

Transformers contain no moving parts and require very little maintenance. Periodic inspection and care are recommended practices especially if the transformer is operating in a harsh environment.
Inspect for loose connections, condition of terminal board, condition of splices, overheating, rust, paint deterioration and general condition of the unit. Corrective measures should be taken if necessary. Removal of dust, dirt and debris from the external enclosure surfaces is encouraged and may be performed while the transformer is in operation.
If maintenance includes removal of enclosure panels, the transformer must be de-energized. The use of lockout/tag-out practices is

required.
Internal maintenance would include:

- Inspection and tightening of bolted connections.
- Inspection of coil ducts. Removal of dirt can be accomplished using a vacuum cleaner or low pressure (<20 psi) dry compressed air.

⚠ WARNING:

Although transformers are static devices, it is necessary to use forethought coupled with care in installation. This will result in satisfactory performance over a long period of time. The minimum requirements for installation and maintenance and limitations of operation have been set forth in this manual. Following these procedures will result in satisfactory performance, whereas disregarding them can void the warranty.

SYSTEM LOADING

Overloading, operating in ambient temperatures greater than 40°C and/or elevation greater than 3300 feet will result in reduction of transformer life unless de-rating of the unit is calculated using IEEE Loading Guide in IEEE C57.96.

Fully loaded transformers may appear excessively warm to the touch, particularly on the top cover of the unit. Standards permit the cover temperature to reach 65°C over ambient temperature. This represents normal heating and should not cause concern.

Overloads can be tolerated without exceeding the maximum allowable insulation temperature provided the overload is of short time duration and is preceded and followed by a period of operation at less than rated kVA. The actual conditions and characteristics of the loading cycle must be known in order to calculate the proper kVA rating of the transformer. Refer to Guide for Loading of Dry Type Transformers IEEE C.57.96.

Ambient temperatures above 30° C average with a 40° C maximum require either larger kVA ratings or special low temperature rise transformers.

Altitude correction for application of a standard transformer in altitudes above 3300 feet can be made by reducing the load. Refer to Altitude Correction Factor in IEEE C57.96.

TRANSFORMER SOUND

Transformers, like other electromagnetic devices, produce sound whose primary cause is the magnetic energy in the transformer core. The relative loudness of the sound depends upon the construction of the transformer, the manner of installation, the ambient sound level of the installation and the sensitivity of the individual listener. Transformers are designed to have an average sound level below industry sound level limits when tested in accordance with NEMA ST 20 (IEEE C57.12.91 sec 13).

DISCONNECT - SAFETY

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Never operate energized switch with door open.
- Turn off switch before removing or installing fuses or making load side connections.
- Always use a properly rated voltage sensing device at all line and load fuse clips to confirm switch is off.
- Turn off power supplying switch before doing any other work on or inside switch.
- Do not use renewable link fuses in fused switches.

Failure to follow these instructions will result in death or serious injury.

DISCONNECT - ANNUAL MAINTENANCE PROCEDURES

1. Turn off power supplying the switch before performing any work on or inside the switch.
2. Open the switch blades by moving the operating handle to the OFF (O) position.
3. Lock out or tag the switch, per local procedures.
4. Open the enclosure door.
5. Always use a properly rated voltage sensing device at all line and load-side lugs (teminals) to confirm power is off.
   NOTE: Do not remove any parts from the switch or operating mechanism unless specifically instructed to do so in the following procedures. Vacuum any loose material from inside the switch. Wipe internal parts and the inside of the enclosure with a damp, lint-free cloth.
6. Visually inspect the switch for loose parts or hardware:
   a. Retighten the hardware as needed. Refer to the wiring diagram.
   b. Do not re-energize the switch if any worn or damaged parts are found. Replace them before re-energizing the switch.

DISCONNECT - PARTS REMOVAL

1. Remove the arc supressor(s) or arc shield(s) from the switches by loosening the fastener(s) holding the suppressor(s) / shield(s) in place. **See Figures 1 and 2.**

FIG. 1 : Examples of Arc Suppressors

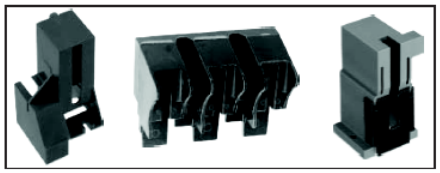


FIG. 2 : Examples of Arc Shields

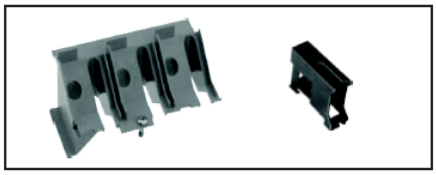
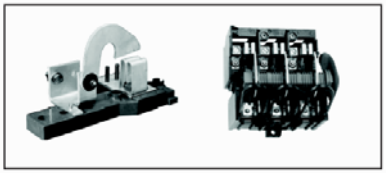


FIG. 3 : Examples of Line Base Assemblies



CAUTION

HAZARD OF EQUIPMENT DAMAGE

Do not disassemble the switch line base assembly or remove the blade rotor when cleaning the line-side jaw or the switch blade. See Figure 3.

Failure to follow this instruction can result in equipment damage.

2. Remove old grease and other contaminants from the line-side jaws and switchblades with a clean, lint-free cloth. If the lubricant has dried, remove it with CRC®-type HF Contact Cleaner, or equivalent, sprayed on a cloth.
3. Relubricate the cleaned areas with a thin film of Dow Corning® BG20 grease only.
   NOTE: *Do not substitute any other lubricant. Other lubricants may not be suitable for electrical applications and could alter the performance of the switch.*
4. Exercise the operating mechanism to ensure proper operation by opening and closing the switch five times with the door closed. Open the switch blades.

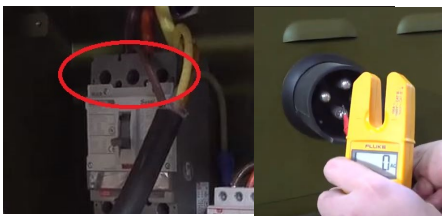
RE-ENERGIZE THE SWITCH

1. Close and latch the door.
2. Turn off all downstream loads.
3. Turn on power supplying the switch.
4. Turn on the switch.
5. Turn on all downstream loads.

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Larson Electronics for any consequences arising out of the use of this material.

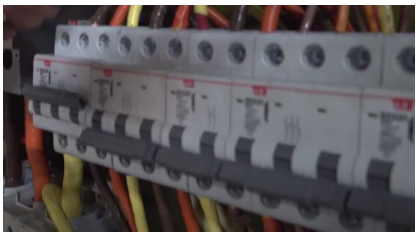
AGE Trailer Operation:

- Check continuity between the plug and the main breaker to ensure power is being received correctly.

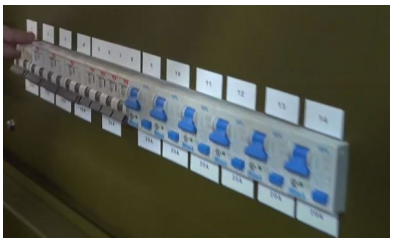


Testing Continuity between main breaker and plug.

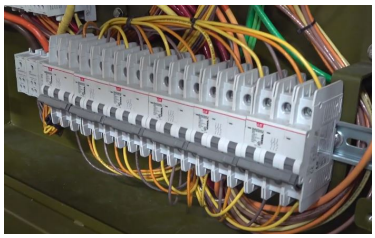
- To operate the system, flip on a breaker.
  - They will be marked 1-14 on the Low Voltage side and 1-13 on the High Voltage side.
    - These will correlate to the receptacles that are on the unit.



Breaker flipped on.



Low Voltage Breakers



High Voltage Breakers



Corresponding Receptacles labeled accordingly.

- The breakers are set up to trip automatically when receptacles receive more amperage than rated for and will shut off.

- To engage the brakes on the unit, simply locate the red levers on near the front axle and pull down. To disengage brakes, put the levels in the upright position.



Brakes in the disengaged position.

- There is a retaining pin on the trailer hitch to either have the hitch in the upright position or lowered position. The upright position is easier for users to pull around manually while the lowered position is ideal for towing the unit with a vehicle.



Retaining pin.

NOTES

Serial No.:

Save this instruction sheet for future use of the product.

THESE INSTRUCTIONS MAY NOT COVER ALL DETAILS OR VARIATIONS OF THIS PRODUCT FOR YOUR EQUIPMENT OR INSTALLATION REQUIREMENTS. SHOULD FURTHER INFORMATION NOT COVERED BY THESE INSTRUCTIONS BE REQUIRED, PLEASE CONTACT LARSON ELECTRONICS BY EMAIL AT SALES@LARSONELECTRONICS.COM OR BY PHONE AT 1-800-369-6671 FOR FURTHER ASSISTANCE.

PLEASE VISIT LARSONELECTRONICS.COM FOR **WARRANTY** AND **RETURN** INFORMATION.