



Installation Guidelines

Underground Power Supply

p/n 9251

! DANGER

Do not install the split-core CT over bare conductor. The CT is insulated at 600V and is intended to be installed over MV power cable that is jacketed with its own insulation at the rated voltage of the cable. Installation of the CT on bare conductor may result in high voltage at the CT and can result in serious injury or death.

! DANGER

The power supply and CT must be applied within stated electrical ratings. Application of the power supply and/or CT in excess of these ratings can result in immediate or delayed electrical or mechanical failure. Failure to apply the power supply or the CT within stated ratings can result in serious injury or death, or in premature failure of the power supply or CT.

! WARNING

Keep fingers clear of the opening of the CT when attaching to an energized cable. The electric field of the energized cable will produce magnetic forces in the two halves of the CT, causing the halves to become strongly attracted to each other as the non-hinged opening between the two halves come close to closing. The resulting force can cause the CT to suddenly close with great force and may result in serious injury to fingers or other body parts that may be in the opening.

! CAUTION

The connectors attached to the supplied cables must remain dry and protected from inclement weather. The connectors are weatherproof once joined, but may allow moisture in the cable if the male or female connectors are left exposed to the elements. Moisture in the cable will result in deterioration in the operation of the power supply.

! CAUTION

The underground power supply can be attached to metallic housings by the magnetic feet on the back of the housing cabinet. Be careful when removing the protective spacers from the magnetic feet as the magnets are very strong and can cause serious injury to the hand when handling during mounting.



! CAUTION

The power supply and CT must remain in packaging during transportation to the installation site. Transportation without its protective packaging may result in damage to the power supply, CT, or the supplied cables. Physical damage can result in premature failure of the power supply and/or CT or reduced electrical performance.

Specifications:

Electrical Ratings:	
CATALOG NUMBER SEQUENCE	9251
INSULATION CLASS	600V
MAX. PRIMARY CURRENT THROUGH CT's	600A
MAX. OUTPUT CURRENT	4A
MAX. OUTPUT VOLTAGE (OPEN CIRCUIT)	14.6V
BATTERY	LiFePO4; 4.5 or 9.0 A-Hr
Mechanical:	
TEMPERATURE RANGE	-20° C to 60° C
WEIGHT (lbs.)	15
SHIPPING WEIGHT (lbs.)	20

Characteristics:

The model 9251 underground power supply installs quickly and easily in metal-clad, padmount, and submersible medium voltage switchgear to provide a self-contained source of DC power for meters, radios, and controls. Continuous power back-up is provided via an integral self-protected battery.

The power supply uses a split-core CT to generate 12VDC power, made available at the output leads from the power supply. Excess power is automatically routed to charge the built-in battery. In the event of low levels, or total loss, of input power, the battery provides continuous power to the connected devices.

Application Instructions:

The split-core CT harvests power from any non-magnetically shielded phase of a 200A/600A underground cable system. The power supply harvests approximately 1A at 12VDC for each 100A of line current (4A output maximum). If the amount of power required by the connected control and/or communication equipment exceeds the power produced by the harvesting circuit, the balance is drawn from the battery. If more power is produced by the harvesting circuit than needed, the excess is used to charge the battery. Additional CTs are available to lower the minimum current required. Consult factory for more information.

Note that it is not necessary for any particular minimum amount of line current to be flowing at all times for the power supply to operate properly. What is important is the 24-hour average line current. The average daily line current needed to operate the power supply ($I_{24HR-AVE}$) over a 24 hour period is:

$$I_{24HR-AVE} = (\text{Required DC Current} \times 63) + 11 \text{ Amps}$$

Example:

You wish to connect communications and control equipment that draws a total of 700mA at 12VDC to the power supply. Required Average Daily Line Current = $(0.7 \times 63) + 11 = 55A$. An example daily current profile is shown below in Figure 1. If the cable circuit to which the power supply is connected is de-energized and the 4.5 A-Hr battery in the power supply is fully charged, it will be able to supply the full 700mA at 12VDC for a period of 6.4 hours ($4.5 \text{ Amp-hours} / 0.7 \text{ A}$). If the power supply is equipped with the 9.0 A-Hr battery, it would operate for 12.8 hours.

Note:

A minimum of 11A is required for charging to occur. Below 11A of line current, the power supply draws some, or all, of the needed power from the self-contained battery.

Underground power supplies with serial numbers below 1100 follow the formula $I_{AVE} = (I_{DC} \times 66) + 27$

U.S. Patent 7,633,262B2. Specifications subject to change without notice.

Installation:

1. Remove the spacers from the magnet mounting feet and place the Power Supply to the desired location. **Note:** Be careful to avoid metal objects coming into contact with the magnet mounting feet as the magnets are very strong.
2. Remove hose clamp from the CT with a 5/16" nut driver. The hose clamp will be reinstalled on the CT after it is placed onto the circuit.
3. Connect the CT to the Power Supply. **Important:** This step has to be done before you install the CT onto a live circuit.
4. Open the latch then the CT and apply additional silicone grease (provided in the box) evenly to the core element faces. Make sure there is no debris on both contact surfaces. This will allow the CT to operate with less vibration.
5. **Note:** Be careful installing the CT onto a live circuit, as it will snap shut from the magnetic force. Align the CT properly then close the latch.
6. Install and tighten the hose clamp that was removed in Step 2.
7. Charging sounds from the CT change as the battery charges and the load changes. It is normal to hear sounds coming from the CT.
8. Connect the pigtail power cord to the control/communication equipment. The red wire is +12VDC and the black wire is ground. The installation is complete.

Figure 1.

