

Section 11

Electric Switchboards: 601 Volts Through 25,000 Volts and Primary Services

11.1. Scope

This section provides application and installation details for high-voltage switchboard metering equipment ranging from 601 volts through 25,000 volts.

11.2. General Requirements

The following general requirements apply when installing high-voltage electric switchboards and primary services.

- A. The specific switchboards voltages represented in this section are:
- 2,400
 - 4,160
 - 12,000
 - 17,200
 - 20,780
- B. Applicants must ensure that manufacturers contact PG&E *before* fabricating the switchboards and request the specific information listed below.
- Service voltage, phase, and wiring.
 - Meter panel requirements for the applicable rate schedule.
 - Service-termination location.
 - Switchboard and/or meter location.
 - Size and number of service conductors.
 - Other information and specifications necessary for fabricating switchboards (e.g., Equipment Utility Service Requirements Committee [[EUSERC](#)] Section 400 requirements).
- C. A manufacturer must submit three sets of drawings of the proposed equipment to PG&E for approval *before* manufacturing the equipment. The drawings must include the contractor's name and address, the applicant's name, and the job location. Field-design changes are *not* permitted without obtaining PG&E's approval before making the changes.
- D. PG&E must furnish and install fuses for voltage transformers (VTs), as well as for the following equipment.
- Meters
 - Metering transformers
 - Test switches
 - All secondary wiring from the metering transformers to the meters

When more than one switchboard is required, install a separate service section. Ensure that it is separated completely (i.e., barriered) from other service sections, pull sections, or service switches and disconnects.

11.3. Specific Requirements for High-Voltage Switchboards

The applicant must ensure that the equipment described below is provided and that the included construction requirements are followed precisely when installing high-voltage switchboards.

- A. Provide and install the insulation barrier between the potential transformer (PT) disconnect switches and the PT section. The voltage disconnect switch **must** be visible when the outer door of the switchboard is opened.
- B. Ensure that the insulated cables and conductors are made available to PG&E. PG&E personnel will make the connections between the PT fuse holders and metering PTs. Use only the “no-load” types of PT disconnect switches.
- C. Provide individual pulling eyes above each of the current transformer (CT) positions to aid CT lifting.
- D. Ensure that all ground buses are solid bus bars with dimensions of at least 1/4 inch x 2 inches. Ground buses must be constructed from either **copper** or **aluminum**.
- E. Do **not** use flex braid on any section of ground buses.
- F. Ensure that a ground bus bar is used for the VT disconnect.
- G. Ensure that ground buses do **not** obstruct openings, conduits, or accesses to utility facilities, equipment, or work areas.
- H. Ensure that the ground bus is located in front of the panel to provide better accessibility for any work to be performed.
- I. Only use a gang-operated disconnect. The disconnect must have grounds in a blade-and-jaw configuration when it is opened. Do **not** use fused-drawer disconnect devices or fused, removable, section-type disconnect devices.
- J. Ensure that workspaces and clearances meet the required state and local codes. Ensure that there is an unobstructed, 8-foot area cleared in front of all access doors. This area is required for installing and removing PG&E’s safety grounds. Maintain this clearance area at all times.
- K. Ensure that a neutral lug is provided in the PT section. Use this lug to terminate the neutral circuit that is connected to the ground bus section on the CT compartment.
- L. Nonresidential customers with meter panel ratings of 200 kilowatts (kW) or more must follow the telemetry requirements provided in [Section 5](#), “Electric Metering: General.” Also, nonresidential customers must provide a dedicated, nominal, 1-inch conduit for telephone cables joining the two (or more) switchboards. A means for terminating the communication circuit must be provided at the meter panel sections of each switchboard.
- M. Ensure that permanent marking or labeling that indicates the service voltage being supplied is included on all electric meter panels and all equipment doors or panels that provide access to PTs and CTs.

- N. Provide a bare bus that is 4 inches above *and* below the CTs. PG&E will use this bare bus as a safety ground.

As an alternative, applicants may provide a grounding knob on both the line and load sides of the bus at the location of each CT.

- O. Ensure that the primary taps for PTs are connected to the line side of the metering CTs.

Another alternative allows applicants to mount the meter panel in front of the CT termination compartment if, when the meter panel is open, the compartment is isolated fully by a removable or hinged barrier. This barrier must be sealable using stud and wing assemblies.

Connect the primary taps for the VTs only to the line side of metering CDs.

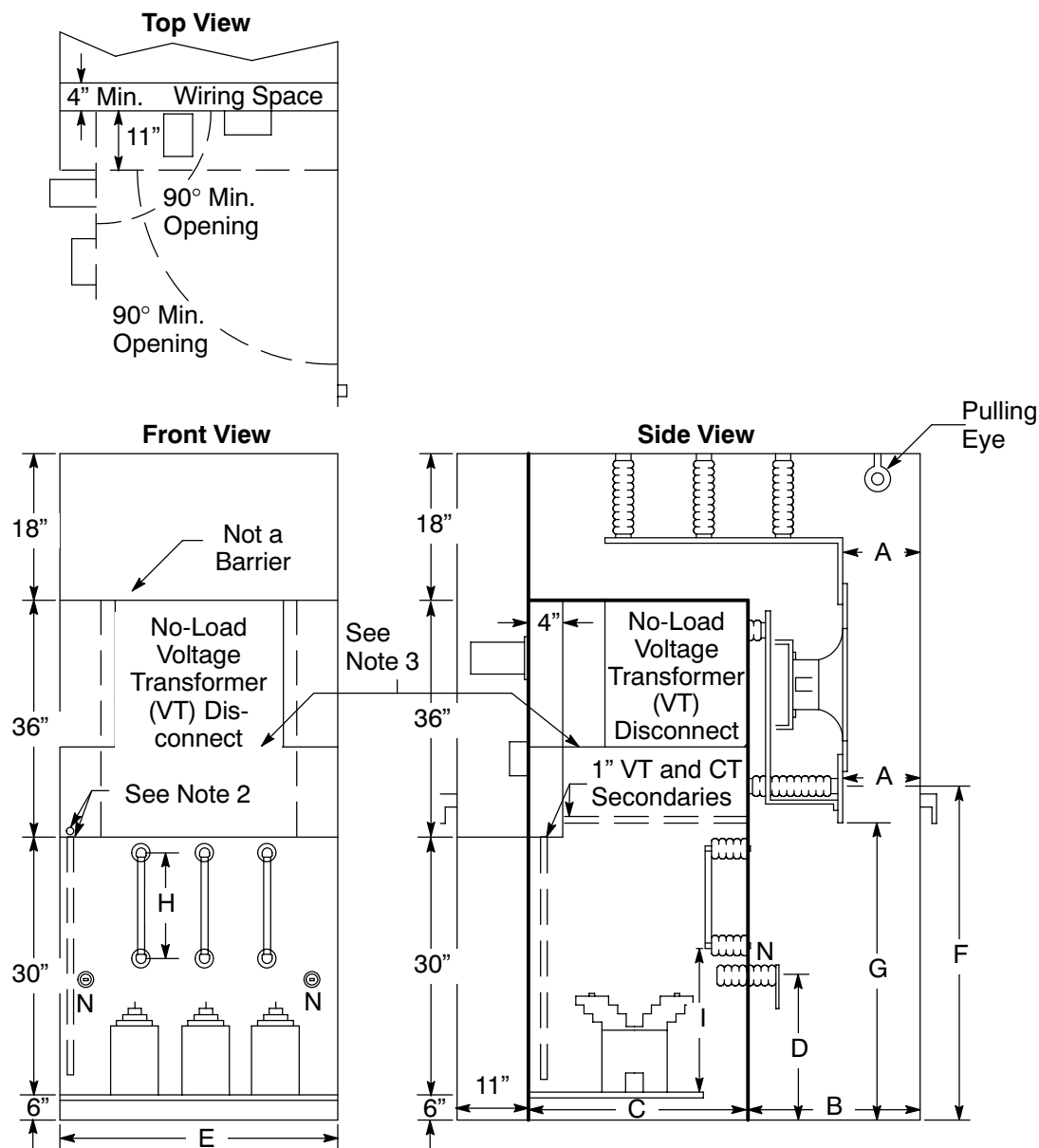


Figure 11-1
Typical, High-Voltage Metering Enclosure: 2,400-Volt Through 25,000-Volt Service

Notes in reference to Figure 11-1.

1. Install the meter's panel hinge on the opposite side from the enclosing door hinge on a weatherproof unit. This allows the meter panel to be opened a full 90°.
2. Locate the 1-inch VT and CT secondary circuits on the same side as the meter's panel hinges.
3. Electrically insulated barrier.
4. Applicants must contact their local PG&E service planner to ensure that the types and models of instrument transformers they intend to install (i.e., VTs and CTs) are approved for use in high-voltage switchgear. See the "2008-2009 Service Planning Contact Information" at the front of this manual on Page iv for specific contact numbers listed by area.

Table 11-1 Dimensions for High-Voltage Meter Enclosures

Specifications	Voltage Rating			
	2,400	4,160/4,800	7,200/17,000	20,800/25,000
	(In Inches)			
Minimum, Bare-Bus Clearance Ø to Ground	3-1/2	3-1/2	6	7-1/2
Minimum, Bare-Bus Clearance Ø to Ø	5	5	7-1/2	9
Dimension A	5 Min. 10 Max.	5 Min. 10 Max.	8 Min. 10 Max.	9 Min. 15 Max.
Dimension B	24 Min.	24 Min.	24 Min.	36 Min.
Dimension C	24 Min.	24 Min.	24 Min.	36 Min.
Dimension D	12 Min.	12 Min.	12 Min.	12 Min.
Dimension E	36 Min.	48 Min.	48 Min.	60 Min.
Dimension F	42 Min. 48 Max.	42 Min. 48 Max.	42 Min. 48 Max.	56 Min. 60 Max.
Dimension G	36 Min.	36 Min.	36 Min.	48 Min.
Dimension H Fuse-Mounting Clip: Center	8-1/2	8-1/2	11-1/2	16-1/8
Dimension H Fuse Ferrule Diameter	1-5/8	1-5/8	1-5/8	1-5/8
Dimension I To Bottom of Fuse Clip or Bus Extension	18	18	18	18

11.4. Interconnection Requirements and Primary Services

When new or existing applicants request services above 600 volts, or intend to interconnect their generation facilities to PG&E's power system, they must refer to the [PG&E Distribution Interconnection Handbook](http://www.pge.com/biz/transmission_services/contracts_tariffs/distribution_handbook_toc.html) (http://www.pge.com/biz/transmission_services/contracts_tariffs/distribution_handbook_toc.html).

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