

EPM-PMS-35-311P-E6

Three Phase – Two Ways per Phase
600 Amp Elliott Air-Insulated Bushings
NEMA Standard Outdoor Instrument Transformer Provisions
21.1/36.6 kV Grounded Wye Max Design, 150 kV BIL

EPM-PMS-35-321P-E6

Three Phase – Three Ways per Phase
600 Amp Elliott Air-Insulated Bushings
NEMA Standard Outdoor Instrument Transformer Provisions
21.1/36.6 kV Grounded Wye Max Design, 150 kV BIL

EPM-PMS-35-312P-E6

Three Phase – Three Ways per Phase
600 Amp Elliott Air-Insulated Bushings
NEMA Standard Outdoor Instrument Transformer Provisions
21.1/36.6 kV Grounded Wye Max Design, 150 kV BIL

EPM-PMS-35-322P-E6

Three Phase – Four Ways per Phase
600 Amp Elliott Air-Insulated Bushings
NEMA Standard Outdoor Instrument Transformer Provisions
21.1/36.6 kV Grounded Wye Max Design, 150 kV BIL

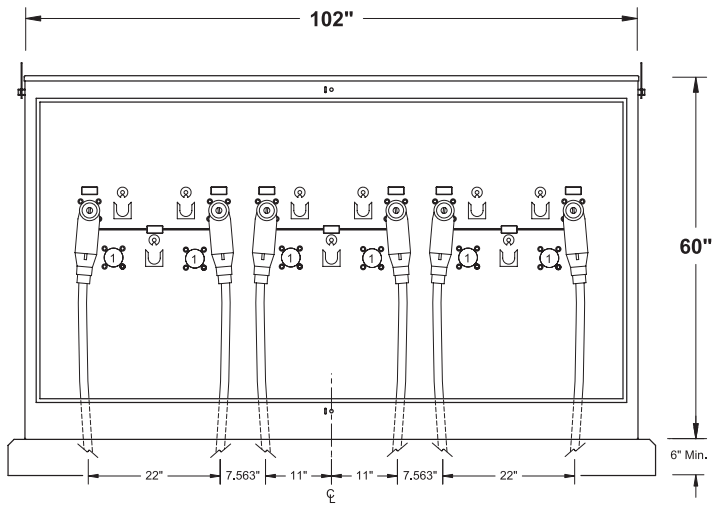


35-kV Safefront 600 Amp Primary Metering Station

Pad-Mounted – Outdoor

Bulletin
500-304
Page 2 2016

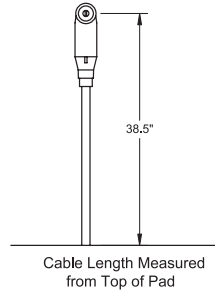
Cable Training and Anchor Bolt Locations



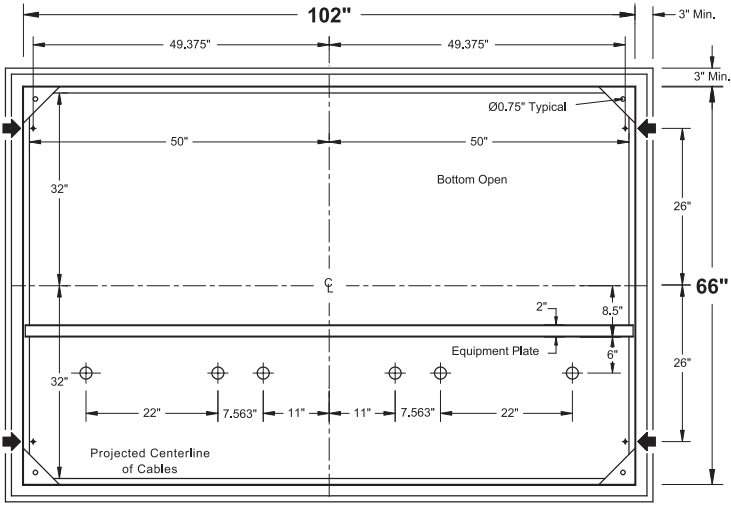
Front View

Doors Removed

① Bushings may be added if circuit requirements

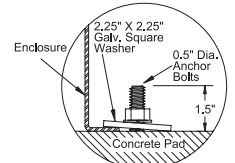


Cable Length Measured
from Top of Pad

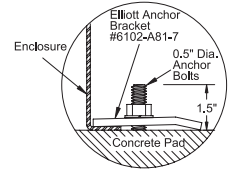


Section BB

and Typical Pad Dimensions



Alternate #1



Alternate #2

Catalog Number	Non-Fusible
EPM-PMS-35-311P-E6	600 Amp Elliott Air-Insulated Bushings

When additional cable terminating space is required, a 66" or 72" high enclosure can be supplied to increase cable terminating space by 6" or 12". To order a 66" high enclosure, suffix the catalog number "-66H". To order a 72" high enclosure, suffix the catalog number "-72H".

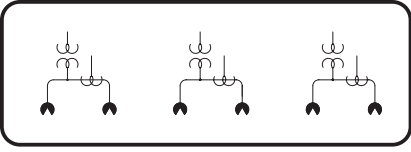
Elastimold® is a registered trademark of ABB Asea Brown Boveri Ltd.



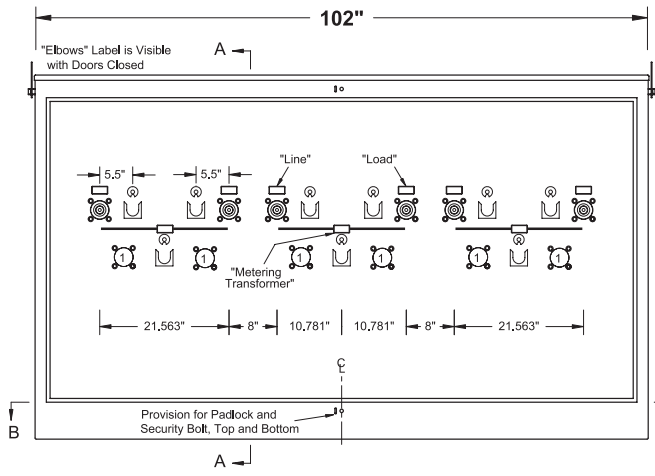
35-kV Safefront 600 Amp Primary Metering Station

Pad-Mounted – Outdoor

Bulletin
500-304
Page 3 2016



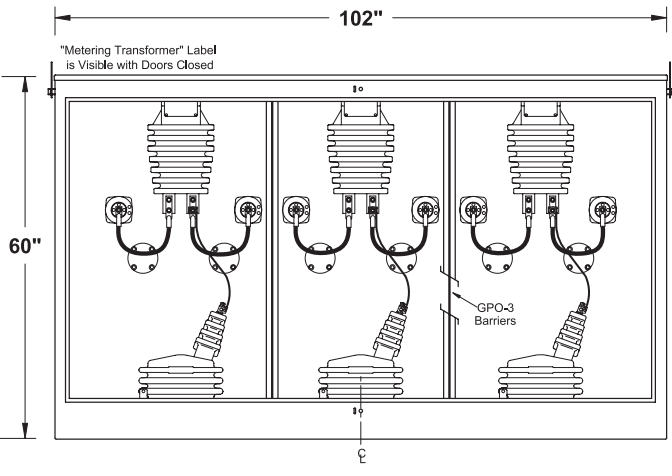
Three Phase – Two Ways per Phase
600 Amp Elliott Air-Insulated Bushings
NEMA Standard Outdoor Instrument Transformers
21.1/36.6 kV Grounded Wye Max Design
150 kV BIL



Front View
Doors Removed

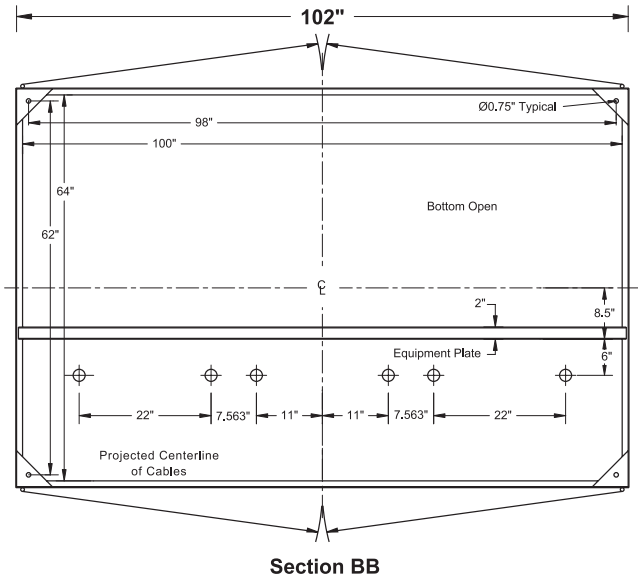
① Bushings may be added if circuit requirements

Accepts G.E. JKW-7 & JVV-7 and
ABB KOR-20, VOY-20G, & VOZ-20
NEMA Standard Outdoor Instrument
Transformers

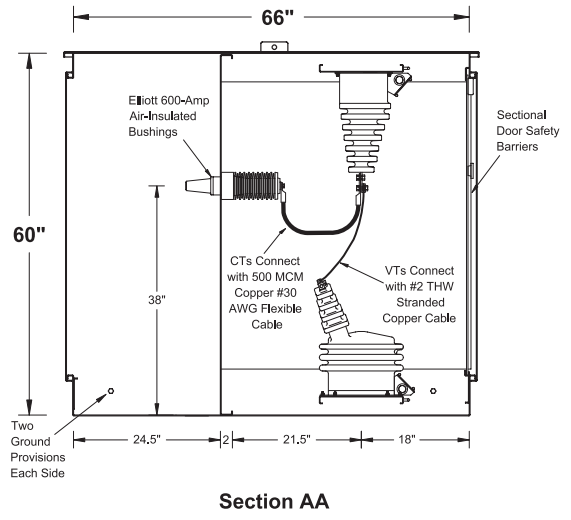


Rear View

Doors & Door Safety
Barriers Removed



Section BB



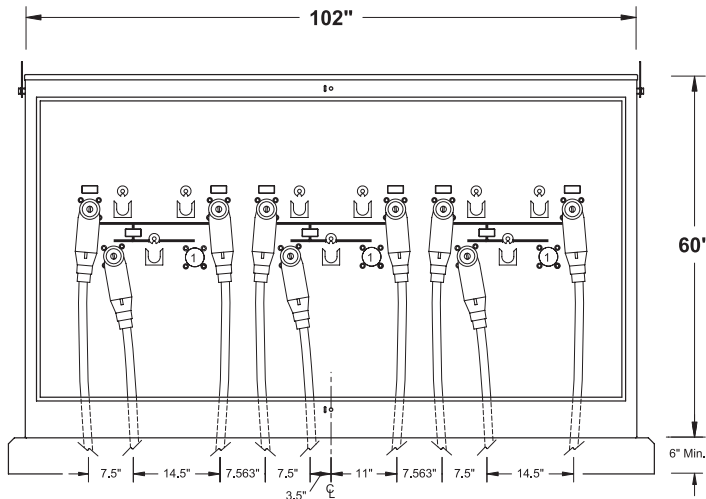
Section AA

Catalog Number	Non-Fusible
EPM-PMS-35-311P-E6	600 Amp Elliott Air-Insulated Bushings

When additional cable terminating space is required, a 66" or 72" high enclosure can be supplied to increase cable terminating space by 6" or 12". To order a 66" high enclosure, suffix the catalog number "-66H". To order a 72" high enclosure, suffix the catalog number "-72H".

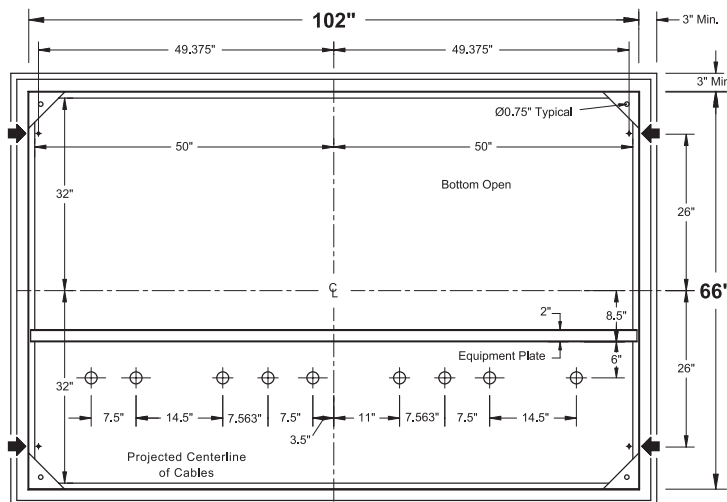
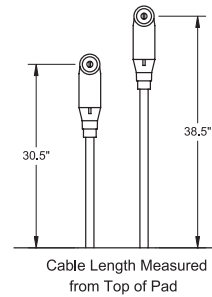
Elastimold® is a registered trademark of ABB Asea Brown Boveri Ltd.

Cable Training and Anchor Bolt Locations

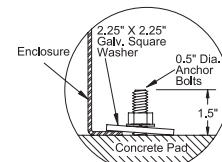


Front View
Doors Removed

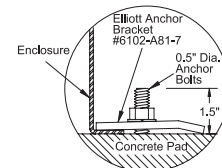
① Bushings may be added if circuit requirements



Section BB
and Typical Pad Dimensions



Alternate #1



Alternate #2

Catalog Number	Non-Fusible
EPM-PMS-35-321P-E6	600 Amp Elliott Air-Insulated Bushings

When additional cable terminating space is required, a 66" or 72" high enclosure can be supplied to increase cable terminating space by 6" or 12". To order a 66" high enclosure, suffix the catalog number "-66H". To order a 72" high enclosure, suffix the catalog number "-72H".

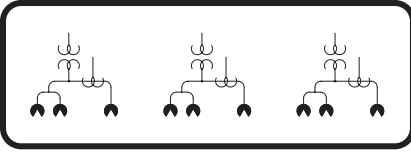
Elastimold® is a registered trademark of ABB Asea Brown Boveri Ltd.



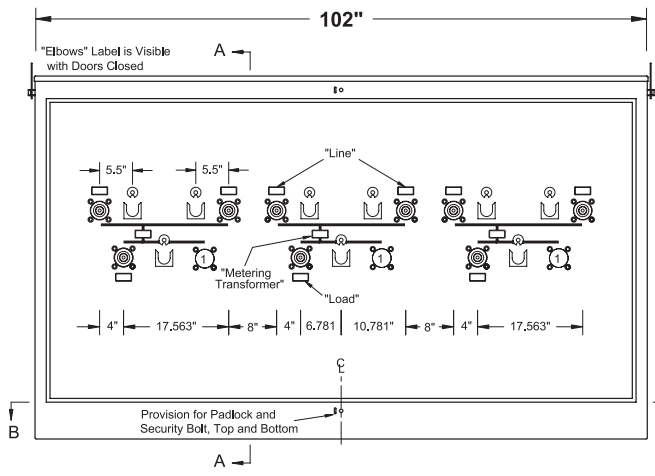
35-kV Safefront 600 Amp Primary Metering Station

Pad-Mounted – Outdoor

Bulletin
500-304
Page 5 2016



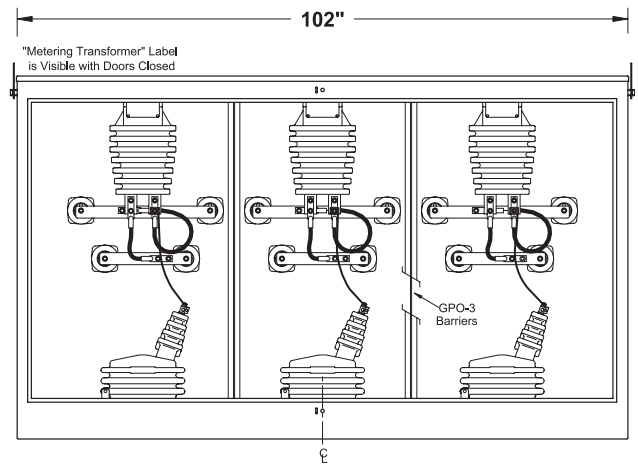
Three Phase – Three Ways per Phase
 600 Amp Elliott Air-Insulated Bushings
 NEMA Standard Outdoor Instrument Transformers
 21.1/36.6 kV Grounded Wye Max Design
 150 kV BIL



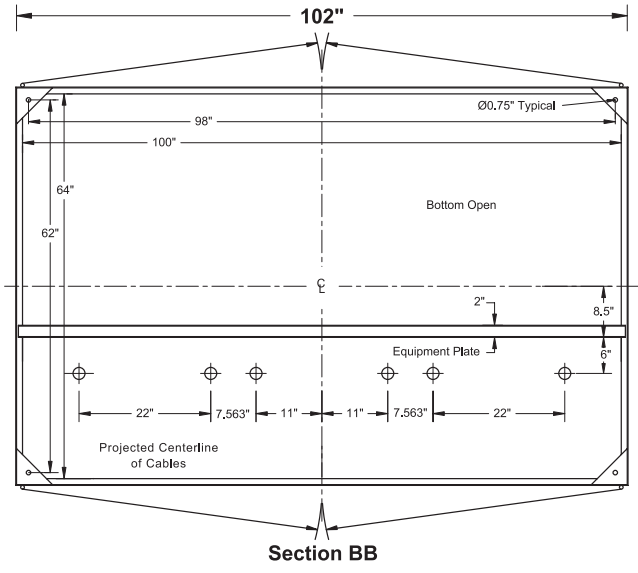
Front View
Doors Removed

① Bushings may be added if circuit requirements

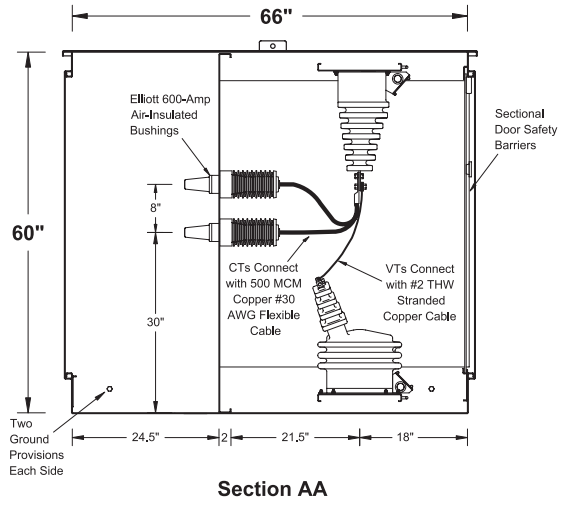
Accepts G.E. JKW-7 & JVV-7 and
ABB KOR-20, VOY-20G, & VOZ-20
NEMA Standard Outdoor Instrument
Transformers



Rear View
Doors & Door Safety
Barriers Removed



Section BB



Section AA

Catalog Number	Non-Fusible
EPM-PMS-35-321P-E6	600 Amp Elliott Air-Insulated Bushings

When additional cable terminating space is required, a 66" or 72" high enclosure can be supplied to increase cable terminating space by 6" or 12". To order a 66" high enclosure, suffix the catalog number "-66H". To order a 72" high enclosure, suffix the catalog number "-72H".

Elastimold® is a registered trademark of ABB Asea Brown Boveri Ltd.

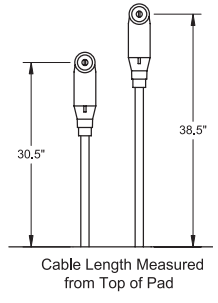
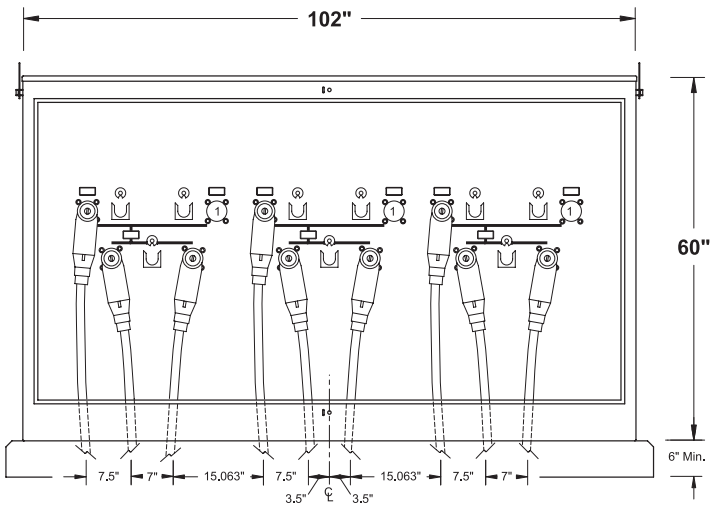


35-kV Safefront 600 Amp Primary Metering Station

Pad-Mounted – Outdoor

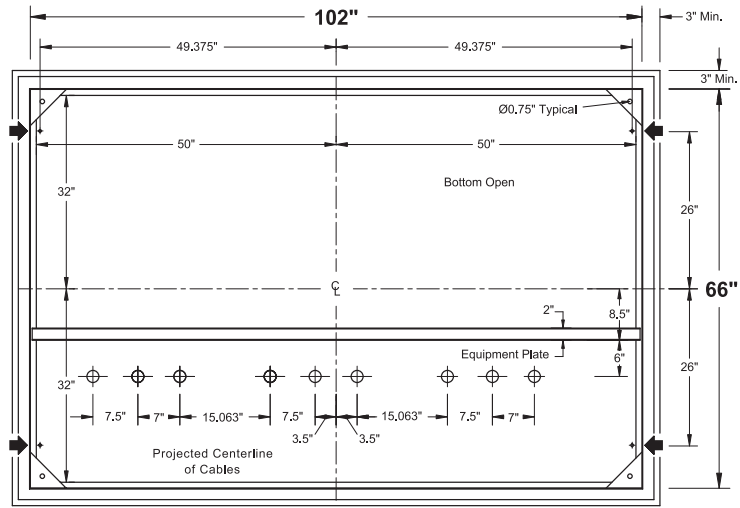
Bulletin
500-304
Page 6 2016

Cable Training and Anchor Bolt Locations

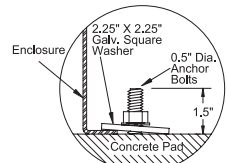


Front View
Doors Removed

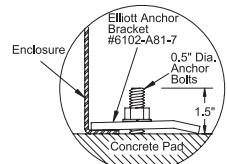
① Bushings may be added if circuit requirements



Section BB
and Typical Pad Dimensions



Alternate #1



Alternate #2

Catalog Number	Non-Fusible
EPM-PMS-35-312P-E6	600 Amp Elliott Air-Insulated Bushings

When additional cable terminating space is required, a 66" or 72" high enclosure can be supplied to increase cable terminating space by 6" or 12". To order a 66" high enclosure, suffix the catalog number "-66H". To order a 72" high enclosure, suffix the catalog number "-72H".

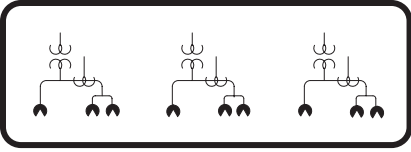
Elastimold® is a registered trademark of ABB Asea Brown Boveri Ltd.



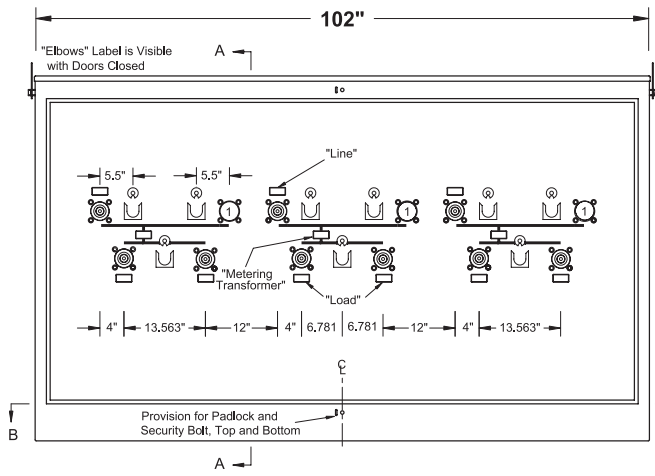
35-kV Safefront 600 Amp Primary Metering Station

Pad-Mounted – Outdoor

Bulletin
500-304
Page 7 2016



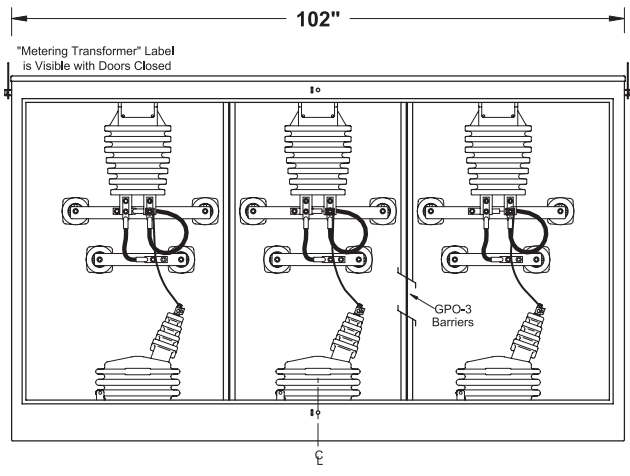
Three Phase – Three Ways per Phase
600 Amp Elliott Air-Insulated Bushings
NEMA Standard Outdoor Instrument Transformers
21.1/36.6 kV Grounded Wye Max Design
150 kV BIL



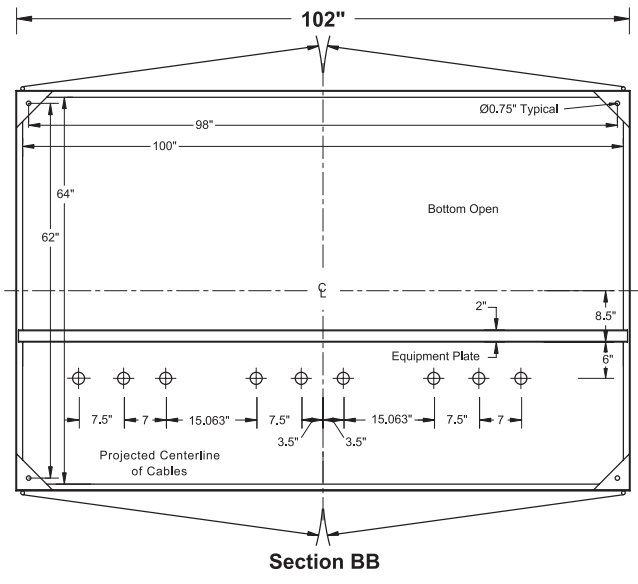
Front View
Doors Removed

① Bushings may be added if circuit requirements

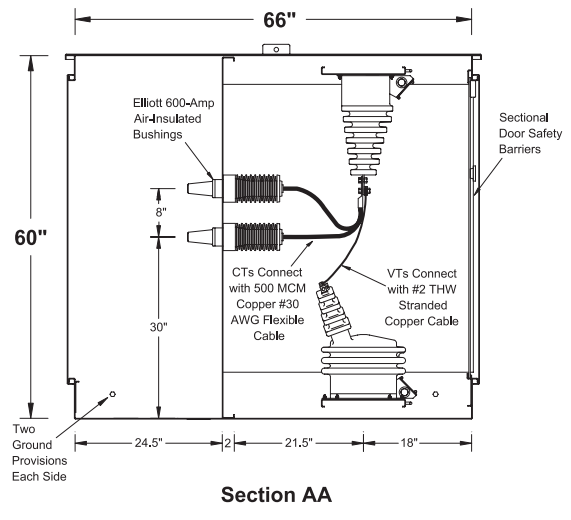
Accepts G.E, JKW-7 & JWV-7 and
ABB KOR-20, VOY-20G, & VOZ-20
NEMA Standard Outdoor Instrument
Transformers



Rear View
Doors & Door Safety
Barriers Removed



Section BB



Section AA

Catalog Number	Non-Fusible
EPM-PMS-35-312P-E6	600 Amp Elliott Air-Insulated Bushings

When additional cable terminating space is required, a 66" or 72" high enclosure can be supplied to increase cable terminating space by 6" or 12". To order a 66" high enclosure, suffix the catalog number "-66H". To order a 72" high enclosure, suffix the catalog number "-72H".

Elastimold® is a registered trademark of ABB Asea Brown Boveri Ltd.

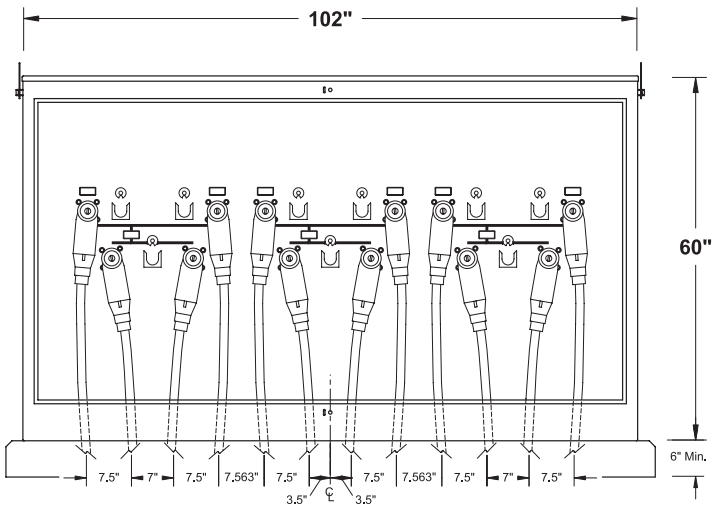


35-kV Safefront 600 Amp Primary Metering Station

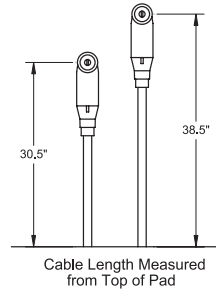
Pad-Mounted – Outdoor

Bulletin
500-304
Page 8 2016

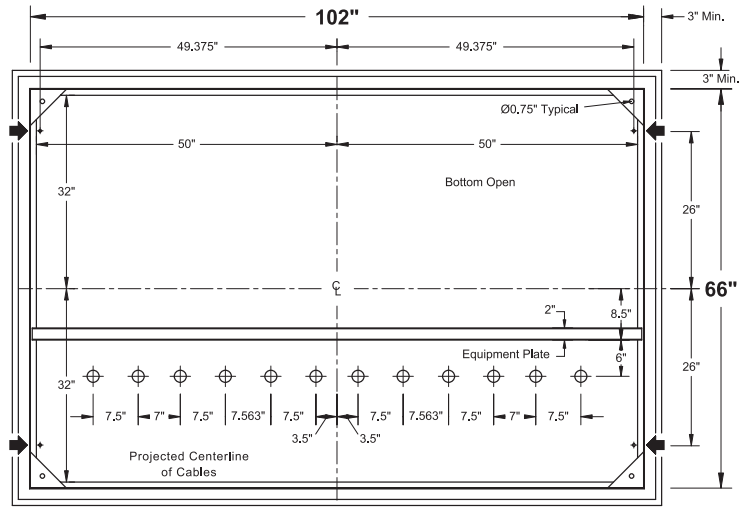
Cable Training and Anchor Bolt Locations



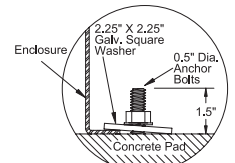
Front View
Doors Removed



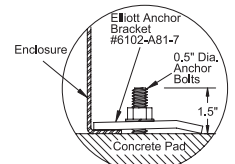
Cable Length Measured
from Top of Pad



Section BB
and Typical Pad Dimensions



Alternate #1



Alternate #2

Catalog Number	Non-Fusible
EPM-PMS-35-322P-E6	600 Amp Elliott Air-Insulated Bushings

When additional cable terminating space is required, a 66" or 72" high enclosure can be supplied to increase cable terminating space by 6" or 12". To order a 66" high enclosure, suffix the catalog number "-66H". To order a 72" high enclosure, suffix the catalog number "-72H".

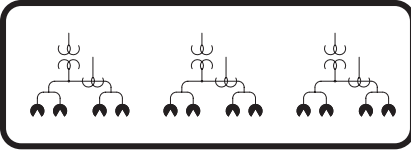
Elastimold® is a registered trademark of ABB Asea Brown Boveri Ltd.



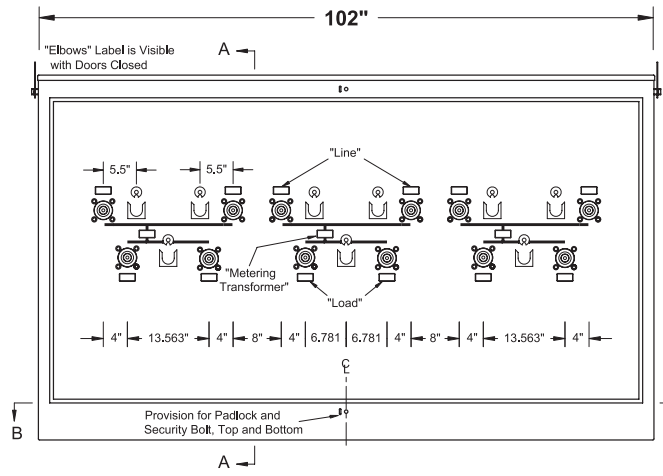
35-kV Safefront 600 Amp Primary Metering Station

Pad-Mounted – Outdoor

Bulletin
500-304
Page 9 2016

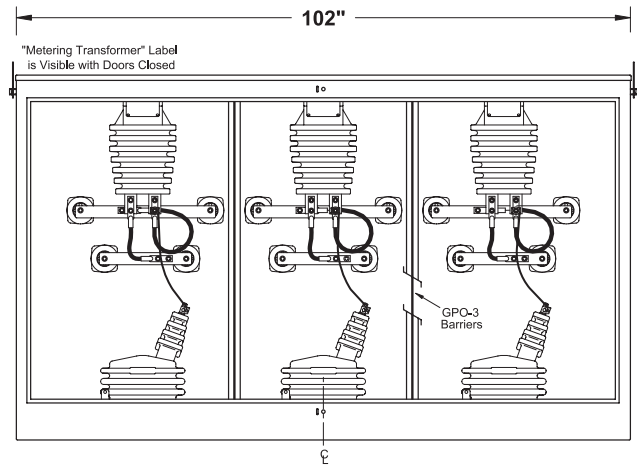


Three Phase – Four Ways per Phase
600 Amp Elliott Air-Insulated Bushings
NEMA Standard Outdoor Instrument Transformers
21.1/36.6 kV Grounded Wye Max Design
150 kV BIL

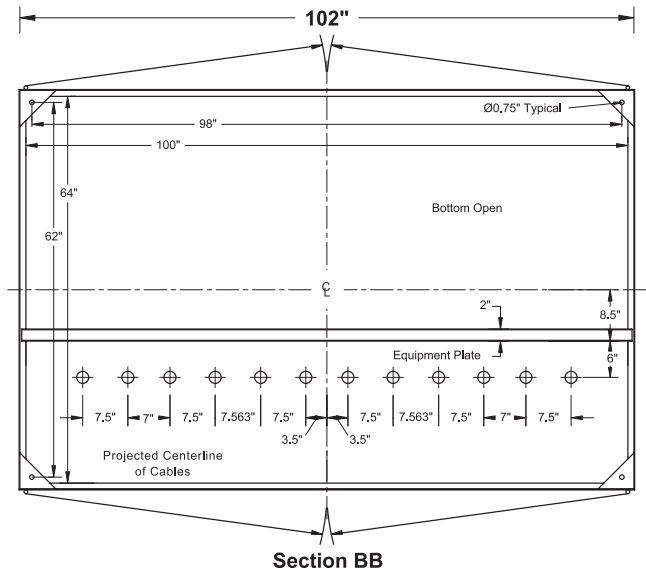


Front View
Doors Removed

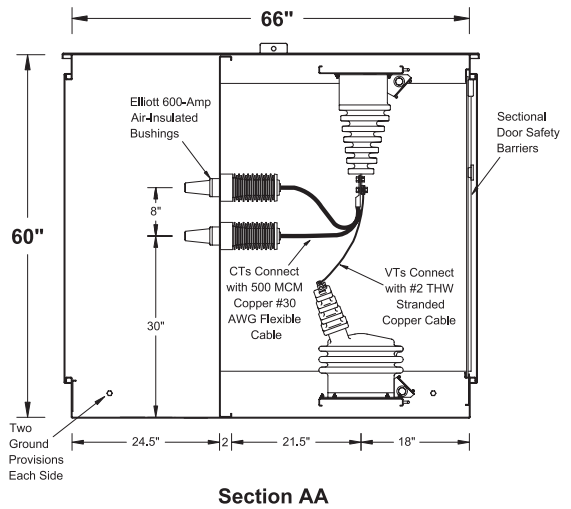
Accepts G.E. JKW-7 & JVV-7 and
ABB KOR-20, VOY-20G, & VOZ-20
NEMA Standard Outdoor Instrument
Transformers



Rear View
Doors & Door Safety
Barriers Removed



Section BB



Section AA

Catalog Number	Non-Fusible
EPM-PMS-35-322P-E6	600 Amp Elliott Air-Insulated Bushings

When additional cable terminating space is required, a 66" or 72" high enclosure can be supplied to increase cable terminating space by 6" or 12". To order a 66" high enclosure, suffix the catalog number "-66H". To order a 72" high enclosure, suffix the catalog number "-72H".

Elastimold® is a registered trademark of ABB Asea Brown Boveri Ltd.

Typical Specification - Page 1 of 3**General**

The primary metering station shall be 35 kV class, 150 kV BIL, 600 ampere continuous current, suitable for use on 21.1/36.6 kV grounded wye max design systems. The metering station shall be constructed for connection to the utility system with separable insulated connectors as described in IEEE Standard 386—latest revision (separable insulated connectors shall be supplied by the user). The metering station shall be designed for and contain (or accept) standard outdoor instrument transformers in a compartment separated from the elbow compartment by a steel equipment plate. Separate access shall be provided for each compartment. A door safety barrier shall be provided inside the door(s) on the instrument transformer compartment as recommended in IEEE Standard C2 (National Electrical Safety Code) Rule 381G. Tamper resistance shall meet the Enclosure Security requirements of IEEE Standard C57.12.28 (Pad-Mounted Equipment—Enclosure Integrity). Together, the tamper resistance and the door safety barrier shall resist unauthorized entry, protect authorized and unauthorized persons, and provide positive safety features when installed in areas accessible to the general public. The primary metering station shall be constructed for outdoor installation in areas subject to heavy precipitation and in areas with windblown contamination. The equipment shall be “air-insulated” and completely assembled prior to shipment.

Enclosure Construction

The enclosure shall be tamper-resistant, all-welded construction utilizing 11-gauge minimum sheet steel. Corner plates and braces shall be used as necessary to assure rigidity. The enclosure top shall be cross-kinked to provide watershed and rigidity. The enclosure shall be open bottom with a 1-inch flange inside, all around. Separate compartments shall be provided for cable termination and for instrument transformers—each compartment equipped with its own individual access door(s) furnished with a stainless steel door holder that will latch the door open 100 degrees and 140 degrees and resist accidental closing. The equipment plate separating the two compartments shall be full length, constructed with 11-gauge minimum sheet steel braced to assure rigidity when operating the elbows. Doors shall be provided with provisions for padlocking and a recessed penta-head (or hex-head) security bolt to prevent unauthorized entry (coordinated to prevent installation of the padlock until the security bolt is tightened *when closing the door(s)*) and to prevent a wrench from operating the security bolt until the padlock is removed *when opening the door(s)*). The security bolt shall be made captive with a stainless steel washer compressed to an oval shape to severely discourage removal. Hinges shall be stainless steel (with stainless steel pins not less than 0.3125-inch diameter) and shall be welded to both the enclosure and the door to maintain door alignment for the life of the equipment. Instrument transformer mounting plates shall be constructed with 11-gauge

minimum sheet steel formed and reinforced to provide proper support for instrument transformers installed (or to be installed) thereon. The mounting plates shall be punched with a pattern of holes that accept installation of all NEMA Standard outdoor instrument transformers without the need to punch or drill additional holes. The pattern of holes shall be located to place the instrument transformers in a position that provides proper electrical clearance. A 0.375-inch diameter cable-lacing rod shall be welded to the front edge of each transformer mounting plate and to both inside walls of the instrument transformer compartment (with stand-off clearance of 0.75-inch) to provide support for secondary wiring to be user (or factory) installed. The enclosure shall be nonventilated to minimize the entrance of airborne contamination, insects, rodents or reptiles. The protective finish shall include necessary grinding, cleaning and phosphatizing, two-component rust-inhibiting epoxy primer and a Pad-Mount Green two-component polyurethane top coat finish (Munsell color 7GY 3.29/1.5). The primer and top coat shall be electronically monitored during application to insure proper ratio and mixing of each component. Total average thickness of paint (after curing) shall be not less than 5 mils. The protective coating shall meet the Enclosure Coating System requirements of IEEE Standard C57.12.28 (Pad-Mounted Equipment—Enclosure Integrity). Removable lift provisions, adequate to withstand handling with normal utility equipment, shall be provided on the outside of the enclosure. Threaded openings for lift provision bolts shall be blind holes to prevent the entrance of wire or other foreign objects into the enclosure when lift provisions are removed.

Bushings and Terminals

Bushings shall be 600 ampere Elliott #1202-635B2, 35 kV class (21.1 kV to ground) Air-Insulated Bushings, 150 kV BIL, per IEEE Standard 386 Fig. 13 (600 A Deadbreak Interface No. 1, 21.1 kV) *for use with 21.1/36.6 kV separable insulated connectors* (Elastimold®, Eaton's Cooper Power Systems or other approved equal). The bushings shall be pressure-molded cycloaliphatic epoxy with a 1.25-inch diameter tin-plated aluminum conductor on the “air-insulated” side that is drilled and tapped 0.625-inch – 11UNC x 1-inch deep to provide direct connection of the bus and/or live parts. Leakage distance from the apparatus connection end of the bushing to ground shall be not less than 40 inches to assure trouble-free operation in a wet and/or contaminated environment. Integral shielding shall be provided to eliminate partial discharge caused by off-center mounting and mounting holes that may have sharp edges or burrs. Bushings shall mount in a 3.125-inch diameter opening and bolt in place to allow field replacement with standard tools. The bushing mounting bolts shall be self-locking stainless steel serrated-flange hex-head bolts that “cut” through the enclosure protective finish to ground the integral shielding of each bushing. To assure adequate strength for apparatus support, the bushing shall withstand a minimum cantilever loading of 600 pounds for five minutes without damage. The bushing interface shall be

Typical Specification - Page 2 of 3

free of all voids, holes and heat sinks to assure proper mating with separable insulated connectors. Each bushing shall be tested in free air, mounted in a grounded steel plate not less than 10 inches x 10 inches, with an insulated protective cap (Eaton's Cooper Power Systems #DPC635 or equal) installed on the interface to accurately simulate operating conditions (*gas or liquid dielectric on the interface shall not be acceptable for this test*). Each bushing shall meet the requirements for 35 kV devices in accordance with the test values of IEEE Standard 386 (latest revision), including 100 percent production testing.

Instrument Transformers

Alternate 1: Instrument transformers and primary wiring shall be supplied and installed by the user.

Alternate 2: Instrument transformers shall be supplied and installed by the user. Dummy current transformers shall be provided to support factory-installed copper primary wiring suitable to connect the CTs and VTs installed by the user.

Alternate 3: Instrument transformers shall be metering accuracy, installed complete with copper primary wiring and #6 solid-copper ground conductors. CT ratio, VT ratio and acceptable brands shall be specified by the user.

Alternate 4: Instrument transformers shall be relay accuracy, installed complete with copper primary wiring and #6 solid-copper ground conductors. CT ratio, VT ratio and acceptable brands shall be specified by the user.

Secondary Wiring

Alternate 1: Secondary wiring shall be supplied and installed by the user.

Alternate 2: Secondary wiring shall be #10 THW/XHHW stranded-copper wire connecting the instrument transformer secondary to the 10-Terminal Test Switch and 13-Terminal Meter Socket installed on the right-hand exterior wall of the primary metering station (when facing the elbow compartment). The secondary wiring shall be color-coded as specified by the user (or the factory color code when the user does not specify a color code).

Alternate 3: Secondary wiring shall be #10 THW/XHHW stranded-copper wire connecting the instrument transformer secondary to a four-terminal block for the VTs and a six-terminal shorting block for the CTs. The terminal blocks shall be located in the instrument transformer compartment near the ground lug on the left inside wall (when facing the instrument transformer compartment). The secondary wiring shall be color-coded as specified by the user (or the factory color code when the user does not specify a color code).

Surge Arresters

Alternate 1: Mounting provisions for distribution-class metal-oxide-varistor surge arresters shall be provided in the instrument transformer compartment, located so the arresters can be installed and replaced without disturbing other components in the transformer compartment.

Alternate 2: Three 27 kV heavy-duty distribution-class metal-oxide-varistor surge arresters, with silicone-rubber housings and ground-lead isolators, shall be provided in the instrument transformer compartment, located so the arresters can be replaced without disturbing other components in the transformer compartment. One arrester terminal shall be connected to the source bushing. The ground-lead isolator shall be connected in a manner that will guide the isolator clear of other components in the event of an isolator operation.

Barriers

Phase and ground barriers shall be provided to assure correct phase-to-phase and phase-to-ground clearances for proper operation at rated voltage. These barriers shall be glass-reinforced polyester (NEMA GPO-3 class material) not less than 0.1875-inch thick.

For each phase, a removable insulating barrier with a "DANGER – Keep Out! – Hazardous voltage" sign, Elliott #7203-D2003-309, shall be located inside the door(s) on the transformer compartment as recommended in Rule 381G of IEEE Standard C2 (National Electrical Safety Code). These sectional door safety barriers shall be constructed of 0.25-inch clear-polycarbonate (Lexan or equal) and shall completely close the opening to each phase. Each barrier shall be provided with a nonconductive safety latch requiring a positive action to remove the barrier. Handles and other hardware extending through the door safety barriers shall be nonconductive material. Handles shall be keyed to prevent rotation for secure handling. Complete visual inspection of the internal components shall be possible without removing the door safety barrier.

Grounding Provisions

Four high-conductivity bronze eyebolt-type ground lugs, which accept #6 through #2/0 copper conductor, shall be installed—two in the cable terminating compartment and two in the transformer compartment—on each side of the door opening in an accessible position (as shown on the drawings).

Accessory Equipment

Stainless steel parking stands shall be provided in the quantity required to allow use of feed-thru bushings, parking bushings and grounding bushings. The parking stands shall be welded in place, in a position to allow the use of hot-line tools for installation of feed thru-bushings, etc. The parking stands shall be *unpainted* (except welds shall be painted) *to provide a ground* for feed-thru bushings and other devices that may be placed into the parking stands. *Keyed retainers* shall be welded above each parking stand *to prevent slipping or accidental removal* of portable devices such as feed-thru bushings, etc.

A corrosion proof nameplate with permanent thermal transfer printing shall be installed inside one door on the elbow compartment. It shall be located at the top corner farthest from the elbows when the door is open. The nameplate will provide Type of Equipment, Model Number, Amps



35-kV Safefront 600 Amp Primary Metering Station

Pad-Mounted – Outdoor

Bulletin
500-304
Page 12 2016

Typical Specification - Page 3 of 3

Continuous, kV Maximum, BIL, Serial Number, Job Number, Date Manufactured and Weight of Equipment.

Bus and instrument transformer connections between bushings shall be displayed (on the cable side of the equipment plate) using 0.5-inch-wide solid orange-color pressure-sensitive vinyl tape. Bushings shall be labeled as "LINE" or "LOAD" with vinyl labels using letters not less than 0.375-inch nor more than 0.625-inch high. The resulting schematic shall clearly indicate the circuit arrangement of the metering station. The schematic shall be legible at a distance of six feet or more.

When enclosures have more than one door (or other access provision) each access shall be labeled in near proximity of the locking provisions with a pressure-sensitive vinyl label using letters not less than 0.375-inch nor more than 0.625-inch high. The label shall indicate the type of equipment behind the access (elbows, transformers, etc.).

When specified, four anchor-bolt brackets, Elliott #6102-A81-7 or approved equal, shall be supplied with each

metering station to provide a means of clamping the equipment to the concrete pad.

Packaging

Each metering station shall be bolted to a solid-top wood pallet (to prevent the forks of a forklift truck from entering the open bottom of the equipment) to prevent hidden damage. The equipment shall be wrapped with 0.125-inch thick polyethylene foam or other suitable material to minimize damage to the finish during shipment.

Drawings

When specified, drawings shall be furnished for each metering station that include:

- 1) enclosure dimensions and location of components.
- 2) proposed cable-training layout and dimensions.
- 3) proposed pad dimensions and location of anchor bolts.

Information needed to provide a Primary Metering Station Quotation

Catalog Number: _____

Line Bushings per Phase: 1 2 Load Bushings per Phase: 1 2

Enclosure: Standard 11-gauge Steel 0.125" Aluminum 12-gauge Stainless Steel

Actual System Voltage (Example: 14.4/24.9 kV Grd. Wye): _____

CTs, VTs and Primary Wiring Installed: Yes No CT Ratio _____ :5 VT Ratio _____ :1

Preferred Brand of Transformers: ABB GE Either Other _____

Without Secondary Wiring:

Secondary Wiring Installed and Connected to Test Switch and Meter Socket - only when CTs and VTs are supplied:

Secondary Wiring Installed and Connected to Terminal Blocks - only when CTs and VTs are supplied:

Your Name, Company Name, Complete Postal Address and E-mail Address:

Name and Complete Shipping Address: Project Name:

NOTE: Single phase and two phase Primary Metering Stations are available. Contact our representative or the factory.