1. Scope

A. This section contains minimum manufacturing requirements for utility metering and service equipment rated 0-600V.

B. The following general notes, pages 1 through 14 apply to all drawings in this section where applicable; each drawing may also contain additional notes which should be considered unique to that drawing unless reference is made to another specific drawing or section.

C. Refer to Section RPI for typical application and installation requirements.

2. Metering Equipment Requirements, General

These requirements are based on practices that are necessary in order to supply uniform satisfactory and safe service. Interpretations or clarifications of intent of these requirements are subject to NVE approval. Installations shall also conform to the provisions of applicable codes and ordinances of local inspection authorities, and all other NVE standards.

A. Grounding, General

Lugs for terminating the customer's ground wire (or other grounding conductors) shall be located outside of the sealable section and shall be designed to readily permit the customer's neutral system to be isolated, when necessary, from NVE facilities.

B. Meter Sequence

The metering arrangement approved as standard and required by NVE provides for the line current to enter first the meter and then the disconnecting means and overload protective devices, (meter-switch-fuse sequence). In multi-meter installations, electric codes require the installation of a main service switch or breaker on the supply side of any group of seven or more meters. In these instances, contact NVE Meter Services for approval before the equipment is installed.

C. Meter Access

Customer locking means for meter enclosures shall provide for independent access by NVE.

D. Meter Heights

Meters shall be located not more than 75 inches and not less than 48 inches above the ground or standing surface when installed outdoors. When meters are enclosed in a cabinet or indoors in a meter room, the minimum height may be reduced to 36 inches. The meter height shall be measured from a level standing surface to the center of the meter.

E. Meter Sockets, General (Provisions outlined per line 8 and 9 of this section will be **effective June 14, 2011**)

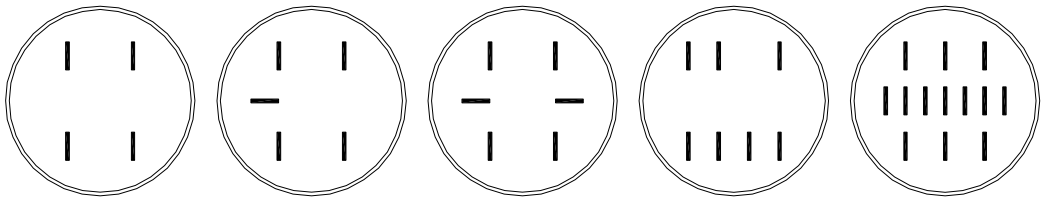
1. The socket and enclosure shall be designed in accordance with the latest revision of AEIC-EE-NEMA Standards for Watt-hour Meter Sockets, Publication ANSI C12.7, Underwriters Laboratories Standard for Meter Sockets UL414.
2. Sockets for self-contained meters shall be furnished, installed and wired by the customer. Diagrams of connections can be found in Section RPI of this manual.
3. When self-contained meter sockets are installed in switchboards, they are not to be wired by the switchboard manufacturer.
4. Sockets for instrument transformer installations shall be furnished and installed by the customer. NVE will furnish and install the normal secondary wiring from the instrument transformers to the meter socket.

5. Potential taps, including the neutral potential tap, shall be located behind a sealed panel. The customer's grounding electrode shall not be located within the meter socket or socket area of a combination CT/ meter enclosure.
6. When instrument transformer-rated sockets are installed on panels, they shall be fabricated and installed by the manufacturer for back connection. The meter socket shall be attached with machine screws so that it may be interchanged or replaced. Sheet metal self-tapping screws are not acceptable; see RPM-32 & RPM-33.
7. All self-contained meter sockets shall be rigidly attached to the back wall of the socket enclosure or to a stationary support connected to the enclosure. The meter sockets shall be installed in a manner that will assure alignment of the socket ring to the socket jaws. Sheet metal or self-tapping screws are not acceptable.
8. Tensioning spring for meter socket jaws shall be installed so that the spring cannot be dislodged if the tension is lost.
9. Meter socket jaws shall be retained in the socket base by threaded fasteners or by metal fasteners that are installed parallel to the direction of force of meter insertion or removal. Jaws held in place by tension spring or friction are not acceptable.

F. Meter Sockets, Requirements

The number of socket clips and their arrangement varies with the type of service supplied to the customer. The following table lists these requirements:

Type of Service	Number of Clips Self-Contained	Number of Clips Transformer Rated
1 Phase, 3 Wire, 120/240 Volt	4	6
3 Wire Network, Form 12S, 120/208 Volt	5	NA
3 Phase, 4 Wire, 120/208 Volt Wye	7	13
3 Phase, 4 Wire, 120/240 Volt Delta	7	13
3 Phase, 4 Wire, 277/480 Volt Wye	7	13
3 Phase, 4 Wire, 240/480 Volt Delta	7	13



4-CLIP | 5-CLIP (Network Type) | 6-CLIP | 7-CLIP | 13-CLIP

G. Meter Sockets with Test-Bypass, Disconnect Facilities

Sockets equipped with test-bypass disconnect facilities are required for commercial applications. They are also required for residential applications using Class 320 socket-type meters. The bypass will be used to maintain service continuity to the customer while the meter is removed for test or inspection.

H. Meter & Cover Panels, General

1. The hinged meter panels shown on RPI-32 & RPI-33 are designed to accommodate only transformer-rated socket meters. Self-contained sockets shall not be mounted on hinged panels.
2. Non-hinged meter panels shall not be used in front of a current transformer section.
3. Not more than two meters shall be mounted on any removable meter panel.
4. Additional space may be required for recording or graphic demand meters (see RPM-33).
5. Hinged meter panels and filler panels shall be equipped with stops to prevent inward swinging beyond the front surface of the switchboards.
6. A hinged instrument transformer cabinet cover may be used provided there is proper clearance to open the cover when the cabinet is installed. A cabinet with hinged cover shall be designed so that the cover cannot be removed by tampering with the hinges when the cabinet cover is closed. Provisions shall be made for sealing the cabinet cover by use of an approved method.
7. All pull and termination section cover panels shall be removable, sealable, provided with two lifting handles and limited to a maximum size of nine square feet in area.
8. All screws used for the attachment of meter and cover panels shall be captive.

I. Lifting Handles

When lifting handles are required on panels and covers, each handle shall be sized for full hand grasping, securely attached and have strength to withstand handling stresses of a minimum of 75 pounds. Lifting handles shall be permanently attached and designed so that they cannot be removed when the cover or panel is in place.

J. Sealing

1. All removable panels and covers to compartments used for terminating or routing unmetered conductors shall be sealable.
2. Sealable latches, stud and wing-nuts, or sealing screws shall be provided as the means of sealing removable or hinged access covers.
3. Hinged cover panels shall be sealed on the side opposite the hinges.
4. Removable cover panels shall be sealed with stud and wing-nut assemblies on opposite sides of the cover. Alternate sealing methods may be used if the removable covers are self-supporting with the captive screws and sealing provisions removed.
5. Sealing and securing devices shall be provided as follows:
   a. Stud and wing-nut assemblies shall consist of a ¼" x 20 (min) stud and an associated wing-nut, each drilled 0.0635 inches (min) for sealing purposes. The stud shall be securely attached so as to not loosen or screw out when being fastened.
   b. Sealing screws shall be drilled .0635 inches (minimum) for sealing purposes.
   c. Latching devices shall be designed to permit positive locking and made of a durable corrosion resistant material.
   d. All securing screws shall be captive.
6. All removable access covers for compartments containing unmetered conductors shall be sealable. When a raceway or conduit for a meter secondary wiring is necessary, such a raceway or conduit shall be sealable. No removable panel or cover requiring sealing shall be located behind other panels, covers or doors (except rain tight enclosure doors).
7. All sealing screw shall be drilled .0635" (minimum) for sealing purposes. All cover panels (top and sides, except for removable compartment access panels) providing access to unmetered conductors shall be secured in place with devices that may not be loosened from the outside. Screws or bolts requiring special tools for installation or removal are not acceptable.

8. All service switches or breakers shall have provisions for sealing in the open position.

K. Cover Panel Labeling

Test-bypass block compartment cover panels shall have a caution sign on the front saying “Do Not Break Seal—No Fuses Inside.”

L. Unmetered Conductors

Customer unmetered service wires and metered load wires are not to be run in the same conduit, raceway or wiring gutter. Metered and unmetered wires shall be separated by suitable barriers. Metered wires from the customer’s distribution section (branch circuits) shall not pass through sealable sections.

M. Ventilation Openings

A ventilation opening – slot, louver, or the like in covers and doors with provisions for utility seals, shall be protected by one or more baffles, barriers, or other obstructions of such dimensions and locations that any wire, or similar material, will be deflected two times after it is inserted, at any possible angle, through the ventilation hole or mesh. One deflection shall be at least 90° from the direction of travel. In addition, if the minor dimension of a ventilation opening is larger than ¼”, it shall be protected by a screen having a minor dimension no larger than ¼”.

N. Bus Bar

1. Ampacity

a. The dimensions in these requirements are based on the use of a rectangular bus bar. Ampacities of bus bar conductors based on UL-891. Standard for Dead-Front Switchboard, including ampacities based on thermal limits provided for therein.

b. Ampacity of instrument transformer compartment bus shall conform to NEMA Standards Publication PB2, Part 6.04, Paragraph A, for Section Bus.

2. Plating

a. Manufacturers using aluminum bus bar construction must use a plating process approved by EUSERC. Approved bus bar plating processes are as follows:

Plating Process	Plating Process	Plating Thickness	
		Minimum (inches)	Maximum (inches)
Alstan 70	Bronze	0.00003	0.00005
Alstan 70	Tin	0.00020	0.00035
Alstan 80	Bronze	0.00003	0.00005
Alstan 80	Tin	0.00020	0.00035
Alstan 88 (*)	Tin	0.00010	0.00030
Alstan 88 (*)	Silver	0.00010	0.00030
Alumon D-79	Copper	0.00075	0.00100
Alumon D-79	Tin	0.00100	0.00125

(*) Per applicable formula

b. Aluminum bus bar shall be identified with the approved plating process designation stamped or indented where service cables are terminated and current transformers are installed.

3. Attachment to the Enclosure

Bus bars, and other hardware, attached to the outer walls of the enclosure shall be secured with devices that may not be loosened from the outside. Screws or bolts requiring special tools for installation or removal are not acceptable.

O. Service Disconnects

1. Meter Disconnects, General

a. For each and every meter, the customer shall furnish and install a circuit breaker, fused switch, or other approved disconnecting means with over-current protection referred to in these requirements as a meter disconnect.

b. The meter disconnect shall control all of and only, the energy registered by its related meter.

c. The meter disconnect may consist of up to two separate devices for self-contained meters.

d. The number of meter disconnects for instrument rated systems must not exceed the maximum outlined in NEC Article 230.71 for service disconnects.

i. All disconnect devices must be installed in groups in accordance with NEC Article 230.72 for service disconnects. The exceptions of NEC Article 230.72 will apply except in the case of optional standby service which must be grouped.

ii. All meter disconnects must be permanently marked to identify it as a meter disconnect and by its value relative to the total amount of service disconnects, i.e. “1 of 6”, “2 of 6”, “3 of 6”,….

iii. A visible and permanent plaque outlining the relative location of all meter disconnects must be place at all locations in which a meter disconnect is installed.

2. Meter Disconnects, Locking Provisions

a. Meter disconnects supplied from instrument-transformer compartments shall be capable of being locked in the open (off) position.

b. Locking Provisions may be:

i. A lockout device which is incorporated as an integral part of each meter disconnect, or

ii. A lockable cover for each meter disconnect where the lock prevents the operation of the disconnect and prevents removal of the cover, or

iii. A lockable cover fro multiple meter disconnects where the lock prevents the operation of any of the disconnects, prevents removal of the cover, and all disconnects are supplied from a single instrument transformer compartment.

iv. Items 1, 2, and 3 shall be permitted to be accomplished by a maximum of two locking provisions per disconnect.

v. For fused disconnects, the fuse access cover shall be lockable when the disconnect is locked in the off (open) position.

vi. All locking provisions for disconnects rated less than 400 amps shall accept a lock shank of not less than ¼”.

vii. All locking provisions for disconnects rated 400 amperes and above shall accept a lock shank of not less than 5/16”.

3. Main Service Disconnects

a. A main service disconnect device is installed on the supply side of a group of meter sockets and may be a circuit breaker, fused disconnect, or other approved disconnecting means.

b. A service disconnect shall be installed on the supply (line) side of more than seven meter sockets.

c. A service disconnect is not permitted on the supply (line) side of a single meter socket (Old Sequence).

3. Self-Contained Rated Metering Installation

Self – contained meters are designed to carry rated current and be energized at line potential. They do not require auxiliary instrument transformers to step down line current or voltage.

A. Residential, General

Three types of self-contained meters are commonly used for this application.

1. Class 100 socket-type meter
2. Class 200 socket-type meter
3. Class 320 socket-type meter
4. 5-Clip network type meters for residential structures 12 or more meters.

Note: Sockets equipped with test-bypass disconnect facilities are required only on Class 320.

Note: Only ring-type sockets are acceptable for class 100, 200, 320 socket-type meters.

Note: 5-Clip network type meter sockets in a multiple meter section may only be used for multi-family residential structures with twelve meters or more, and only when pre-approved by Meter Services and the New Business District.

B. Commercial, General

Class 100, 200, and 320 socket-type meters are commonly used and test-bypass disconnect facilities are required for this application.

Note: Only ring-type sockets are acceptable for class 100, 200, 320 socket-type meters.

C. Multiple, Switchboard

1. The socket and socket enclosure shall be designed in accordance with the latest revision of AEIC-EEI-NEMA Standards for Watt-hour Meter Sockets, Publication ANSI C12.7, and with standard for Meter Sockets UL414.
2. The bussing or cables to each individual meter socket are to be installed so they can be visibly traced.
3. Multiple meter enclosures that are not factory bussed shall have non-removable, solid metal barriers, to isolate the metered conductors from the unmetered conductors.
4. The service termination enclosure, socket enclosures, raceways and sections for test-bypass or manual circuit facilities shall have separate, removable, and sealable access panels (or plates). Meter socket enclosures shall have a separate cover containing no more than two meter positions.

Note: Only ring-type sockets are acceptable for class 100 and 200 socket-type meters.

D. Metering Spacing and Clearances

1. The rules for spacing of socket meters in multiple residential meter installations shall be as follows:

Horizontal spacing – 7 1/2 inches minimum on centers.

Vertical spacing – 8 1/2 inches minimum on centers.

2. See RPM-53 for Multiple Meter clearances.

4. Transformer Rated Metering Installation

A. General Requirement

1. Instrument transformer compartments are required in the following instances:
   a. Single phase services where connected load exceeds 400 amperes.
   b. Three phase services where connected load exceeds 200 amperes.
2. Meter, instrument transformers, and test switches will be furnished and installed by NVE. Any required conduits or raceways shall be furnished and installed by the switchboard manufacturer or contractor.
3. All compartments containing unmetered conductors shall be sealable. When a raceway or conduit for meter secondary wiring is necessary, such raceway or conduit shall be sealable.

B. Switchboard Service Sections, General

1. For both standard and specially engineered switchboard service or supply conductors shall enter the service section through one end and leave through the opposite end of the instrument transformer compartment. This stipulation applies to either overhead or underground service or if two or more service sections are connected together. The direction of feed shall be vertical through the instrument transformer compartment, (See RPM-45).
2. In case where more than one switchboard is to be installed, a separate service section will be installed which is completely barriered from other service sections, termination sections or service switches and disconnects.
3. Except where otherwise specified in theses requirements, barriers used in switchboard installations to separate customer sections from utility sections (i.e., pull sections and metering sections) and sections containing unmetered conductors or bus shall be constructed from 16 gauge (minimum) steel and shall be secured with devices that are not removable from either the customer sections or the exterior of the switchboard.
4. When two or more switchboard service sections are supplied from one set of service conductors, the supply conductors are to be arranged so they are readily accessible without disturbing the instrument transformers and associated secondary wiring.
5. Additional service connections may be made in the main service termination and pull section where more than one metering installation is necessary. Additional service connections shall not be made in the instrument transformer compartment. Consult NVE Meter Services for approval.
6. Meter installations of six meters or less, shall be connected “new sequence”.

C. Standard Switchboard Service Section

1. The general arrangement of a standard switchboard section is shown on RPM-25 and 26.
2. A standard switchboard service section has a hinged meter panel located in front of the instrument transformer compartment. RPM-33 shows spacing for various combinations of multiple meters.
3. Hinged meter panels must have handles and open a minimum of 90° with meters and test switches mounted to permit safe and ready access to the instrument transformers. When hinged panels are recessed, the section shall have additional width to meet this requirement. A recessed panel requires NVE Meter Services approval as a specially engineered section, see RPM-54.
4. Hinged meter panels must be sealable, and easily removable with the hinges readily interchangeable from the right or the left side on the job site.
   a. The hinged meter panels on RPM-32 and RPM-33 are designed for transformer-rated, socket-type meters.
   b. Meter panels and filler panels shall be equipped with stops to prevent inward swinging beyond the front surface of the switchboard.

c. Not more than two meters shall be mounted on any removable meter panel.

5. For hinged socket meter panels, see RPM-32 and RPM-33.

6. For underground service application of Standard Switchboard Service Sections, see RPM-45.

D. Specially Engineered Service Sections

1. Switchboards which do not conform to standard design criteria are considered specially engineered and include installations:

   a. Rated over 3000 amperes or 600 volts.

   b. Where service breaker ampacity rating exceeds that of the standard service section.

   c. Where multiple metering sections are used.

   d. Where recessed meter panels are used.

2. When a specifically engineered service section is necessary, drawings in triplicate of the proposed section shall be submitted to NVE Meter Operations Department for approval prior to manufacture and bidding. Such drawings shall indicate the contractor's and the customer's name and address and job location.

3. The general arrangement of Specially Engineered Switchboard Service Sections should follow, as nearly as practicable, that of the Standard Service Sections, and the following general requirements shall be observed:

   a. Instrument transformer-rated socket meters, used with current transformers, shall be mounted on hinged panels.

   b. If a hinged meter panel is located behind a door, a clear space of at least 11 inches between the meter panel and the door is required, and designed to open 90° with meters and test switches in place. If needed, additional section width shall be provided to meet this requirement.

   c. A clear space in back of a meter panel shall be provided for the secondary wiring. For minimum dimensions between the hinged meter panel and the nearest bus, see RPM-19 through RPM-24.

   d. For minimum clearance between meters, see RPM-6, RPM-33 and RPM-53.

   e. Not more than two meters shall be mounted on any removable meter panel.

   f. Busses shall be adequately supported in the metering transformer compartment to withstand the mechanical stresses of short circuit. The bus supports shall not interfere with installation or removal of current transformers. Current transformers shall not be used to support the busses. The busses shall be entirely self-supporting.

   g. The busses and current transformer mountings shall be designed so that each of the current transformers may be withdrawn from its mounting position directly through the access panel without disturbing any other current transformer. When multi-leaf busses are used, the busses shall be oriented so that they appear "edgewise" when viewed from the access panel.

E. Instrument-Transformer Compartment

1. For details of instrument transformer compartments, see RPM-19 through RPM-22.

2. Covers for instrument transformer compartment shall be made of cold gauge metal: if non-hinged panels are used as covers, they shall be provided with lifting handles and be attached with sealable studs and wing-nuts or by other approved means.

3. Copper or aluminum bus bar shall be used on both the line and load sides of all current transformers. When aluminum bus is used the bus bars shall be plated, see Bus Bar Plating.

4. Instrument transformers supplied by NVE for metering shall not be used for any other purpose

5. The ends of the current transformer bus stubs shall be located so the current transformers can be installed without removing adjacent panels.

6. The current transformer bus stub supports in the instrument transformer compartment shall be sufficiently rigid to maintain alignment of the bus when the conductors are installed. The current transformers or bus links shall not provide bus support or alignment.

5. Service Termination Equipment, General

A. Switchboards Excluded

This paragraph of the Requirements applies to all meter and service equipment when not installed on switchboards.

1. General

a. Service termination facilities shall be specifically designed to receive the NVE underground service lateral conductors as a single cable entry. Enclosures designed for either overhead or underground cable are acceptable provided they meet requirements for both types of cable entry.

b. Service cable termination lugs or connectors shall be suitable for use with both aluminum and copper conductors.

c. Socket enclosures designed for single sockets rated up to, and including 200 amperes, shall have service terminating lugs independently mounted from the socket jaw support.

d. Test for meter sockets shall be in accordance with the current Standard for Meter Sockets UL414.

e. Service terminating space in enclosures rated greater than 200 amperes with multiple meter sockets shall accommodate compression-type. All bussing or cable conductors beyond the terminating lugs shall be provided by the manufacturer or the customer's contractor. Bus stubs or bussing in the service terminating space used for terminating the utility service lateral shall have mounting bolts spaced in accordance with NEMA Standards. For termination bus details, see RPM-43.

f. The service cable termination compression lugs shall be compatible with the size and type of service being installed (i.e., aluminum-bodied AL-CU with aluminum cables, etc.). The termination lug landings for the neutral and each phase conductor shall be rigidly and permanently affixed in the service termination space and all grouped at one location.

g. Wireways in the service termination space designed for terminating the utility service lateral shall be clearly identified for such use. Service termination shall be made in the service termination enclosure or in specially designated space of a meter panel which has a separate removable and sealable access plate.

h. The layout design of the service termination enclosure which requires bending the utility service conductors, should provide space to permit a minimum cable bending radius equal to four times the overall diameter of the cable measured from the inner surface of the cable (from Minimum Bending Radius for Thermo-Plastic Insulated Cables, IPCEA S-61-402 and NEMA WC-5 Standards).

Note: The overall termination enclosure size is not predicated solely on the cable bending radius. Adequate working space and electrical clearances are also considered in establishing enclosures dimensions in these requirements.

i. The service termination enclosure, socket enclosure, and test-bypass disconnect block section shall be sealable and isolated or barriered from other integral enclosure sections which are accessible to the customer.

j. The manufacturer's rating label, or other markings used in lieu of a label, shall show among other things:

i. Whether the socket or socket enclosure is designed for overhead service entry or underground service entry, or both

ii. That the termination lugs are designed for both aluminum and copper conductors.

iii. The wire size range of the termination lugs.

2 Single Self-Contained Meter Termination, Underground Service

a. The socket and enclosure shall be specifically designed to receive service cables from an underground supply system. Separate service terminating lugs supported independent of the socket and connected to it by bus bars are required for single family residential meter socket enclosures, see RPM-1.

b. Wiring space for service lateral conductors shall be clearly identified as intended for such use, shall be clear of all projections, and shall be used exclusively for such purposes.

c. A separate removable cover, independent of the meter panel, is required in front of the termination section, see RPM-1.

d. Knockouts in cable wireways shall be positioned to minimize service lateral cable bending.

e. The service cable entry section and the meter socket section shall be sealable and isolated or barriered from other integral enclosure sections which are accessible to the customer.

f. The load wires from the distribution section (branch circuits) shall not pass through any sealable section.

3. Multiple Self-Contained Meter Termination, Underground Service

a. When self-contained meters are installed on switchboards, the service termination requirements for switchboards shall be followed (see Switchboards).

b. hen self-contained meters are installed in multiple arrangements, in separate meter enclosures, the GENERAL service equipment requirements shall be followed. (See RPM-43 for termination enclosure requirements, and installation guides section for typical arrangements).

6. Metering and Service Equipment (601-27,000V)

A. High Voltage Metering and Service Equipment (0-27,000V)

This Section applies only to revenue metering compartments of in door and outdoor metal-clad switchgear in 601 through 27,000 volt installations and will address two general designs:

1. Enclosures without Voltage Transformer Disconnect 4160 Volts (See Drawings RPM-403 and RPM-404)

2. Enclosures with Voltage Transformer Disconnect 2400 Volts to 27,000 Volts (See Drawing No. RPM-401 and RPM-G page 14)

7. Switchgear, With Fused or Unfused Voltage Transformers

A. General

1. Drawing Approval

The manufacturer shall contact NVE Meter Service for specific requirements and final approval of high voltage metering equipment for 601-27,000 Volt Services, generally 0-200 Amps. Feeder sizing and coordination limitations may impact maximum ampacity of the equipment (see paragraph 11 of this section). Copies of drawings must be provided to NVE Meter Services and NVE System Protection prior to fabrication of the equipment. Such drawings will contain the following information:

a. Customer Name
b. Job Name and Address
c. Contact Address
d. Telephone number of manufacture's representative
e. NVE Work Request Number

2. Utility Compartment Labeling

Compartments of the metering enclosure shall be permanently labeled with machine engraved laminated phenolic (or equal) tags. Quarter-inch white letters and numbers on red colored material which is readily visible and mechanically attached to the face of the following designated compartment.

a. Utility voltage transformer compartment.
b. Utility voltage transformer fuse compartment.
c. Utility current transformer compartment.
d. Utility service termination compartment.
e. Utility metering panel.

3. Safety Grounding Provisions

Bare bus 4 inches above and below the current transformers shall be provided to permit application of serving agency safety grounds. As an alternate, a grounding knob may be provided on the line and load side of the bus at each current transformer location.

4. Meter Panel

Meter panel and hinges are to be designed to adequately support a 25 pound load applied at the unsupported end with 1/8" maximum sag when open. A #4 AWG flexible braided bond wire shall be installed across the hinges. See drawing RPM-409 and RPM-410 for meter panel Layout.

5. Lifting Handles

When lifting handles are required on panels and covers, each handle shall be sized for full hand grasping, securely attached, and have strength to withstand handling stress of a minimum of 75 pounds.

Note: Chest type handles with a folding bale grasp are not acceptable.

6. B.I.L. Rating

B.I.L. (Basic Impulse Level) for the metering enclosure shall be not less than that for the customer's associated switchgear. Reference shall be made to ANSI Standards for the minimum acceptable B.I.L. ratings for high voltage switchboards built to the listed nominal voltages shown in the applicable tables "Voltages and Insulation Levels for AC Switch gear assemblies and as tabulated for Metal Enclosed Interrupter Switchgear. The metering cubicle shall be labeled with the B.I.L. rating.

7. Ventilation Openings

A ventilation opening-slot, louver, or the like-shall be protected by one or more baffles, barriers, or other obstructions of such dimensions and locations that any wire, or similar material, will be deflected two times after it is inserted, at any possible angle, through the ventilation hold or mesh. One deflection shall be at least 90 degrees from the direction of travel. In addition, if the minor dimension of a ventilation opening is larger than ¼", it shall be protected by a screen having a minor dimension no larger than ¼".

8. Rear Door Access to Metering Cubicle

Working clearances at the customer's job site may determine if the manufacturer is to furnish either a single or double full height hinged rear door access. In addition to provisions for a three point locking mechanism with hardware for attachment of the utility-furnished padlock, each door shall, when closed, be secured in place with the standard "stud and wing nut assembly" for sealing. All external doors shall, when opened, be equipped with a device to hold door at 90 degrees or more.

9. Weatherproofing and Locking

Enclosure sketches on the following drawings show equipment with weatherproof doors. The meter panel shall be hinged on the side opposite that of the outer door on weatherproof units to permit 90 degrees opening with the meters and test facilities in place. The weatherproof doors may be omitted if the equipment is located indoors. If the outer door is omitted, the meter panel must be lockable. The front weatherproof door shall be a single

10. CT and VT Installation

Current transformers and voltage transformers, meters, testing facilities, and all normal secondary wiring from the transformers, to the meters will be furnished and installed by the serving agency.

11. Service Fusing and Protection

All service fusing and other protective equipment schemes such as relays, etc., must have approval from NVE System Protection prior to fabrication to ensure proper coordination with our distribution system. The S & C SM-4 or SM-5 175E fuse is the largest that will coordinate with NVE 12.5kV substation feeder breakers in non-rural areas within the Las Vegas Valley. Services in rural areas may require smaller size fuses to coordinate. The System Protection Department will provide specific requirements once the actual location is determined.

B. Bus Bar and Conductors

1. Approved Bus Material

Only copper or EUSERC approved plated aluminum bus shall be used in the metering enclosure. Aluminum bus shall be identified with the plating process where the service cables are terminated and the current transformers are mounted. NOTE: At any time, EUSERC may require certification and supporting documentation or manufacturing process to meet electroplating thickness requirements.

2. Bus Dimensions and Spacing

Maximum bus size shall be 3/8" x 4". Minimum bus size shall be ¼" x2" unless otherwise indicated on specific drawing. Bus size outside of these limits require special engineering and consultation with the serving agency.

3. Bus Installation, Main Switch Ahead of Metering

When the main switch or circuit breaker enclosure is adjacent to and on the source side of the metering enclosure, connections from the load side of the main switch or circuit breaker to the line side of the current transformers shall be made using bus bars.

4. Conductors Passing Through Compartment Walls

   Where cables or buses pass through compartment walls, through-the-wall bushings with full voltage rating of the switchboard must be used.

C. Termination

1. Service Cable Terminations

   For service ampacities up to 800 amperes, one landing position (*) shall be provided on each phase and neutral bus for each 400 amperes, or portion thereof, of service ampacity. All bolts shall be secured in place and provided with nuts, flat washers and pressure maintaining spring washers. All parts must be plated to prevent corrosion. Consult the serving agency for termination requirements when the ampacity exceeds 800 amperes.

   (*) Two ½" steel bolts on 1 ¾" vertical centers, extending 2 inches minimum to 2 ½" maximum from the mounting surface.

2. Insulated Neutral Termination

   An insulated neutral is required. It shall have full-voltage rated insulation from the metering cubicle.

D. Instrument Transformer Mounting Bases and Bus Links

Voltage transformer and current transformer mounting bases are to be provided by the manufacturer (See DWG. RPM-408).

1. Voltage Transformers

   Locate the front or leading set of voltage transformer mounting holes 9" from the voltage transformer compartment door.

2. Current Transformers and Bus Link

   Bus drilling and spacing shall accommodate 800 ampere or less current transformers of the proper voltage insulation class (See Dwg. RPM-414). Current transformer center phase position shall be bused straight through for three-phase, three-wire service voltage installations. This bus shall consist of a removable link dimensioned the same as the current transformer bars on the metered phases.

3. Phase and Neutral Taps for Fuse and VT's

   Lugs for voltage transformer phase and neutral connections shall be provided in the voltage transformer compartment.

4. Fuse Specification

   Voltage transformer fuses shall be furnished and installed by the serving agency. The manufacturer shall provide mounting clips for indoor current limiting fuses with mounting clip separation and fuse ferrule diameter appropriate for the voltage rating of the equipment. Fuses shall be accessible through V.T. interlocked compartment door.

8. Metering Compartment, With Disconnect for V.T.

A. Voltage Transformer Disconnect Requirements:

1. Kirk Key interlocking is required between the voltage transformer disconnect and the voltage transformer compartment door so that, for personal safety, the voltage transformer compartment cannot be entered until all of the following conditions are met:

   a. The disconnect is visibly open and visibly grounded.

   b. When the voltage transformer disconnect is fully open, the disconnect blades must ground automatically.

   c. The disconnect is locked open with a key interlock system.

2. The interlock system must prevent closing of the disconnect without first closing and locking the voltage transformer compartment
3. NVE will be provided with two keys for the interlock system.
4. Primary contacts for the voltage disconnect shall be of the blade and jaw design or equivalent to assure continued adequate contact. Wiping contact or pressure contact is not acceptable.
5. Operating handle or lever of the voltage transformer disconnect switch shall be pad lockable in the closed position.
6. The Voltage Transformer Compartment Door shall provide unobstructed access to the Voltage Transformers and Fuses.

B. Alternate Meter Panel Location

1. As an alternate, the meter panel may be mounted in front of the CT/Termination compartment, provided that when the meter panel is opened, the compartment is fully isolated by a removable or hinged barrier.
2. All external and interior doors providing access to the CT buss including the outer door and hinged barrier shall, when opened, be equipped with a device to hold them at 90° or more.

9. Instrument Transformer Mounting

See Drawing No. RPM-408

10. Fuse Specification

Voltage transformer fuses shall be furnished and installed by NVE. The manufacturer shall provide mounting clips for indoor current limiting fuses with mounting clip separation and fuse ferrule diameter dimensions as indicated under dimension H on Drawing No. RPM-401.

11. 20.8 To 27 kV Service Voltage

A. Vertical busing in the pull section and C.T. compartment shall be spaced 18 inches on centerline between phases, and the center phase shall be on the enclosure centerline.

B. Current and voltage transformers will be outdoor type. Provide transformer mounting bases and busing configuration (in the C.T. compartment) to accommodate this style transformer.