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Introduction

Welcome to another course in the STEP series, **Siemens Technical Education Program**, designed to prepare our distributors to sell Siemens Industry, Inc. products more effectively. This course covers **Basics of Meter Mounting Equipment**.

Upon completion of **Basics of Meter Mounting Equipment** you will be able to:

- Identify the more common power supply systems used in residential and commercial applications
- List and describe the main components of a single-position meter socket
- Describe the advantage of a side-wire meter socket design for an underground-feed application
- Explain why a bypass is sometimes needed and list the types of bypasses available for use with meter sockets
- Describe important characteristics of Siemens residential and commercial meter sockets
- Describe the configurations available for Siemens gang meter sockets.
- Explain the difference between a transformer-rated meter socket and a K-Base meter socket
- Explain the difference between a meter main and a meter load center combination
- Explain what the term EUSERC means
- Explain the difference between a continuous current rating and an interrupting rating for an overcurrent protection device
- Explain the difference between the full rating method and the series rating method for overcurrent protection devices
- Describe the key differences between the standard Uni-Pak Metering design and Siemens exclusive Ringless Uni-Pak Metering with Lever Bypass,
- Describe how features of Siemens Power Mod modular metering simplify installation
- List the types of modules available for Siemens Power Mod modular metering and describe the primary use for each module type

This knowledge will help you better understand customer applications. In addition, you will be able to describe products to customers and determine important differences between products. You should complete **Basics of Electricity** before attempting **Basics Meter Mounting Equipment**. An understanding of many of the concepts covered in **Basics of Electricity** is required for **Basics Meter Mounting Equipment**.

After you have completed this course, if you wish to determine how well you have retained the information covered, you can complete a final exam online as described later in this course. If you pass the exam, you will be given the opportunity to print a certificate of completion from your computer.

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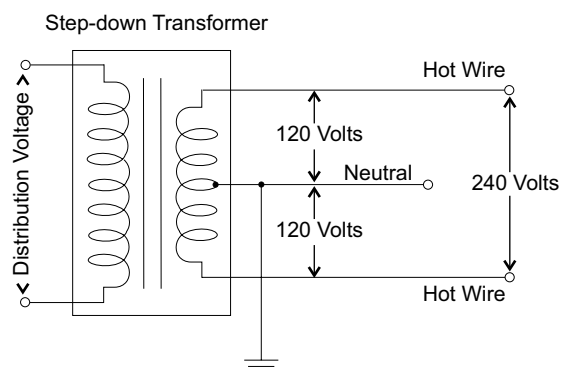
Power Distribution

Power, generated at a power plant and stepped up to a high transmission voltage, is brought to a local substation. Here, it is stepped down to a lower distribution voltage. When it reaches its final destination at a residential customer, it is stepped down to 240 volts. Only single-phase power is used in a typical residential application.



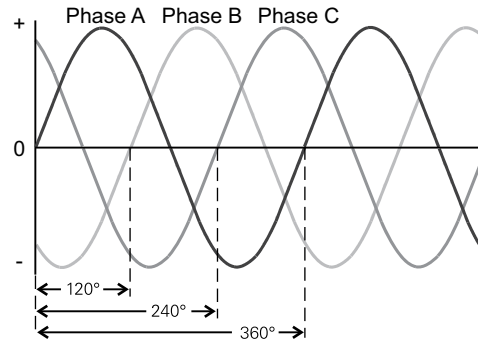
Power Supply

The most common supply system used in U. S. residential applications today is a **single-phase, three-wire supply system**. In this system, the voltage between either hot wire and neutral is 120 volts and the voltage between the two hot wires is 240 volts. The 120-volt supply is used for general-purpose receptacles and lighting. The 240 volt supply is used for heating, cooling, cooking, and other high-demand loads.



Three-Phase Voltage

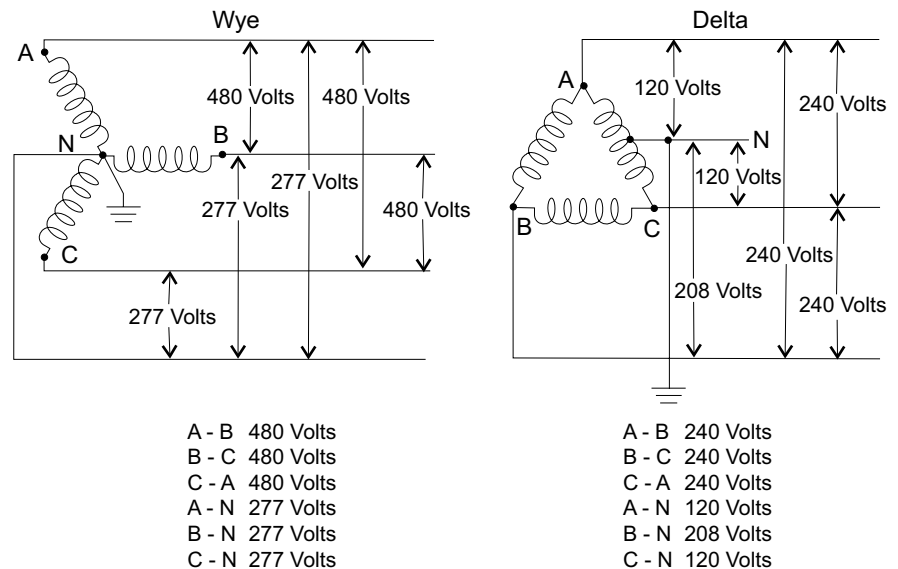
While single-phase power is needed for most residential applications, **three-phase** power is used in many other applications. In a three-phase system, the generator produces three voltages. Each voltage phase rises and falls at the same frequency (60 Hz in the U.S., 50 Hz in many other countries); however, the phases are offset from each other by 120° .



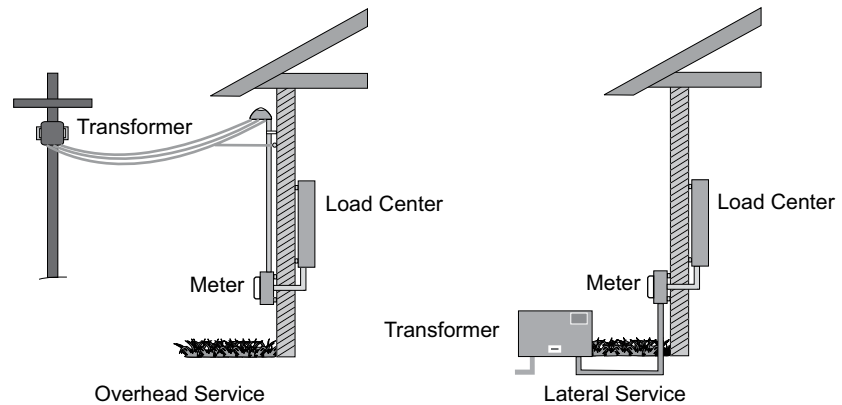
Three-Phase Transformers

Transformers used with three-phase power require three interconnected coils in both the primary and the secondary. These transformers can be connected in either a **wye** or a **delta** configuration. The type of transformer and the actual voltage depend on the requirements of the power company and the needs of the customer.

The following illustration shows the secondary of a wye-connected transformer and the secondary of a delta-connected transformer. These are only examples of possible distribution configurations, the specific voltages and configurations vary widely depending upon the application requirements.

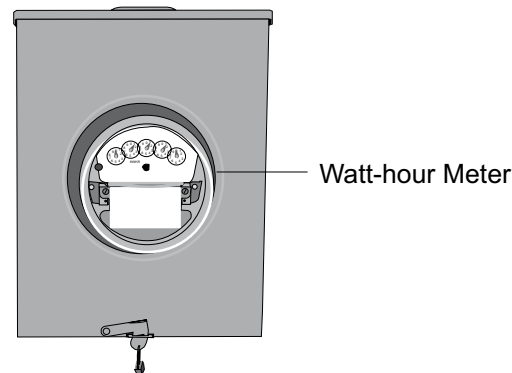


Power, purchased from a utility company, enters the house through a metering device and connects to a load center. This is the **service entrance**. Service can come from an overhead utility transformer or from a lateral service run underground.



Watt-hour Meter

Most of us are familiar with the **watt-hour meter** located outside our homes. The watt-hour meter is typically provided by the power company and is used to determine how much electricity has been consumed for billing purposes.



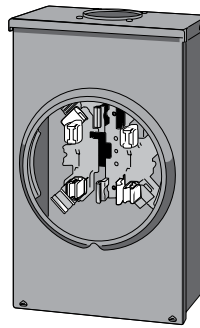
Watt-hour meters used in most residential applications are designed for use with single-phase power, but meters used in many commercial applications are often designed for use with three-phase power.

Residential applications often use a watt-hour meter designated as **self-contained (SC)**. SC meters are directly connected to the power source and the load. Watt-hour meters designated as **transformer-rated (TR)** use **current transformers (CTs)** and voltage transformers (also called **potential transformers or PTs**) to reduce the energy applied to the meter. TR meters are common in commercial applications because of the higher load current required for these applications.

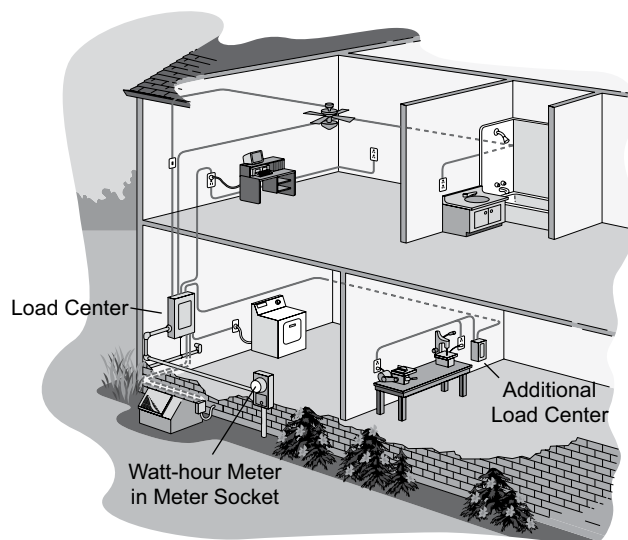
Meter Sockets

Each watt-hour meter requires a meter socket to safely and securely connect it to the electrical service. Because meter designs and utility requirements vary, Siemens offers a variety of single-position and multiple-position **meter sockets**.

Single-position meter sockets are used for single-family homes and in some commercial applications. Multiple-position meter sockets, also called **gang sockets**, are used in multi-family and other commercial applications requiring two to six meters. Requirements for meter sockets with maximum voltage ratings of 600 volts or less and continuous current ratings of 320 amps or less per socket are covered by **American National Standards Institute (ANSI) standard C12.7** and **UL standard 414**.

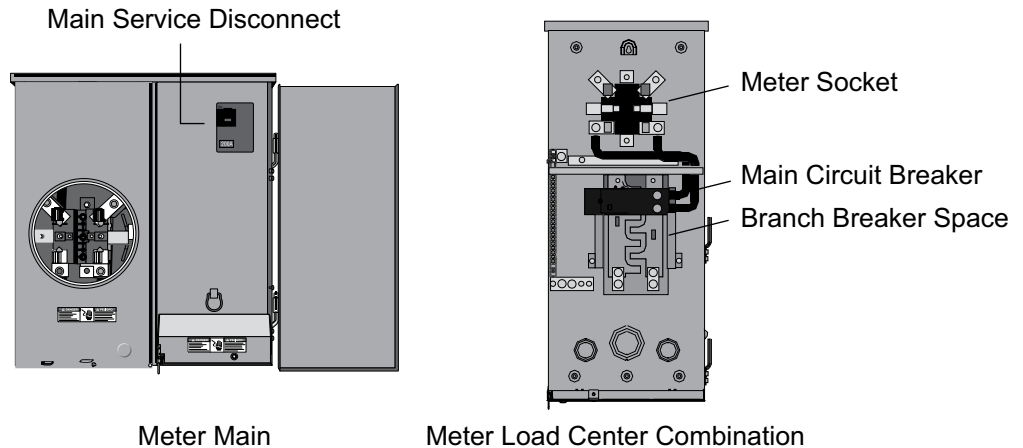


From the watt-hour meter, the incoming power then goes to a load center which provides circuit control and overcurrent protection. The power is distributed from the load center to various branch circuits for lighting, appliances, and electrical outlets.



Meter Mains and Meter Load Center Combinations

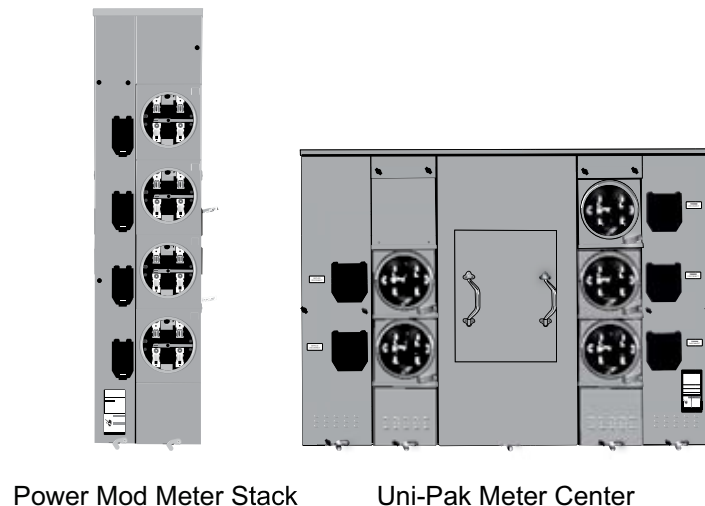
Most commonly, the load center enclosure is separate from the meter socket. In some cases, however, circuit breakers are housed in the same enclosure as the meter socket. This type of product is referred to as a **meter combo**. When only a main circuit breaker is included, the device is called a **meter main**. If branch circuit breakers are also included, the device is called a **meter load center combination**.



Multi-Family Metering

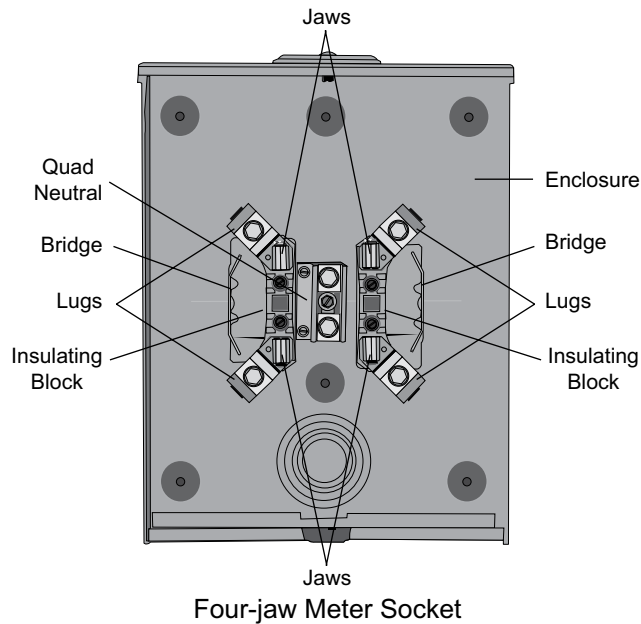
Uni-Pak meter centers are an option for multi-family dwellings. These are self-contained systems with two to six meter compartments. Individual branch circuit breakers for each tenant are located in a separate compartment adjacent to each meter socket.

Power Mod modular metering is used for multi-family dwellings or other commercial applications where more than six meters are required. As the name indicates, Power Mod incorporates modules that can be quickly combined to meet varied application requirements. Basic modules include circuit breaker mains, fusible switch mains, tap boxes, and residential and commercial meter stacks.



Single-Position and Gang Meter Sockets

A basic meter socket has five components: the enclosure, lugs, neutral connections, jaws, and insulating blocks. However, other components are often added to meet application requirements.

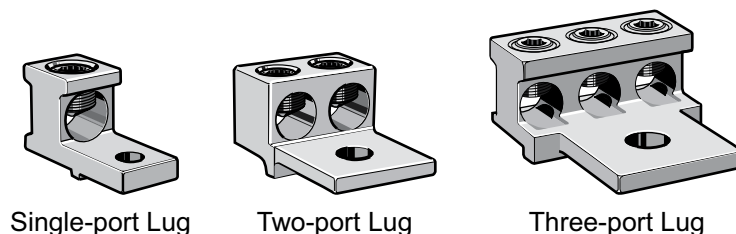


Enclosure

The **enclosure** is simply the box and cover, which are made of galvanized steel or aluminum. Steel enclosures are painted, but aluminum enclosures may be painted or unpainted. The enclosure protects internal components and limits access to the meter and live circuit elements. All meter sockets have a NEMA type 3R enclosure.

Lugs

The **lugs** connect the wire to the meter socket. Lugs may be factory-installed or field-installed and are available with single or multiple ports. Multiple port lugs allow for the use of multiple wires. Lay-in lugs are also available. Lay-in lugs are fixed and may not be changed in the field to accept other wire sizes or parallel conductors.



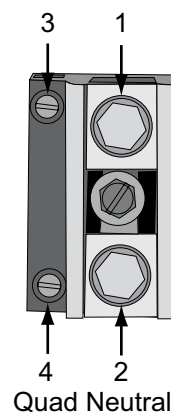
Stud terminals accept either lugs or compression fittings. Common uses for the studs include applications where the field wiring may be either single or parallel. Terminals may be mixed on the line and load sides. For example, a socket can have studs on the line side and lay-in lugs on the load side.

Neutral Connections

All sockets include a **neutral** connection. The neutral conductor serves as the current return path. The neutral conductor is connected to ground at the service entrance. This is accomplished in a meter socket by connecting the service ground and neutral conductors to the same point in the meter socket enclosure. A bonding screw at this connection point secures the ground to the interior of the meter socket enclosure. Keep in mind that neutral conductors are not connected to ground at any point downstream from the service entrance.

There are three types of meter socket neutral connection configurations.

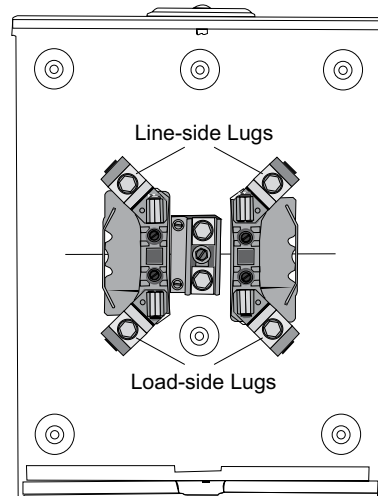
- Two-connection neutrals, also called **double** or **duplex neutrals**, have one connection for the incoming conductor and one connection for the outgoing conductor.
- Three-connection points, also called **triplex neutrals**, have one incoming and one outgoing connection for neutral conductors and one connection for ground.
- Four-connection points, also called **quad neutrals**, have one incoming and one outgoing connection for neutral conductors and one incoming and one outgoing connection for ground conductors.



Jaws

Jaws are connections that accept the blades of the utility meter and establish secure electrical connections between the meter and the meter socket. The number of jaws is directly related to the number of phases. Some jaws have springs to increase the amount of pressure on the meter blades.

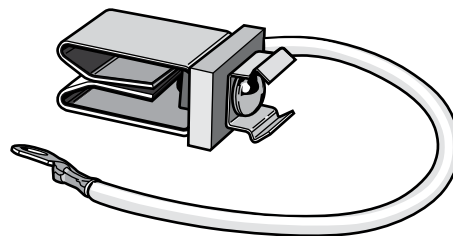
A **four-jaw socket** is designed for a single-phase application and has one line-side and one load-side connection for each of the two hot wires. After the line, load, neutral, and ground connectors are installed, the meter can be plugged in.



Four-jaw Meter Socket

The watt-hour meter used in this application has four blades that plug into the jaws of the meter socket. Once installed, the meter completes the circuit by providing a path for current from the line to the load.

A **five-jaw socket** is similar to a four-jaw socket, but also has a neutral connection for the meter. The fifth jaw can be factory-installed or field-installed.



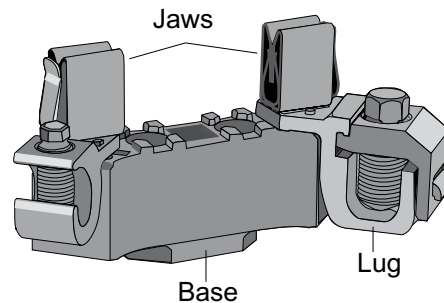
Fifth Jaw Accessory

Landis & Gyr offers a special five-jaw socket for three-phase, three-wire applications with the fifth terminal in the six o'clock position.

A **seven-jaw socket** is used for three-phase application where there is one line connection and one load connection for each phase and a neutral connection for the meter. It should also be noted that the number of phases is not the number of wires.

Insulating Blocks

An **insulating block** secures the lugs, jaws, and bussing to the enclosure.



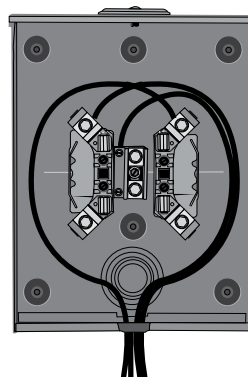
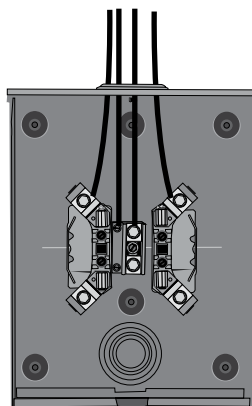
Service Conductors

A **service entrance** is the place where electrical service conductors enter a building. **Service conductors** can enter from overhead, entering the socket at the top, or from underground, entering the socket at the bottom. Sockets designed for underground service are usually wider in order to provide space for the conductors to loop around the block to the top connectors.

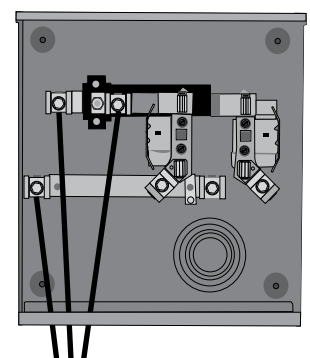
Combination overhead-underground sockets are designed for use with either service. A cover plate for openings at the top of the socket is required in underground-feed applications.

Some meter sockets have a **side-wire design** with an offset socket to provide more wire bending space for easier underground wiring.

Overhead (OH)
Service Conductors

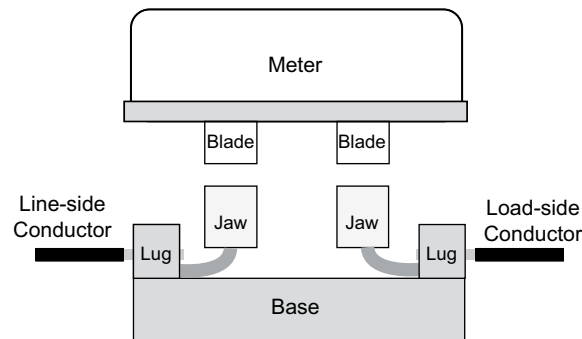


Underground (UG)
Service Conductors



Side Wire (SW) Offset Socket
Service Conductors

When in operation, electrical current flows from the service (line-side) conductors through the meter to the load-side conductors and then to the load center or panelboard for distribution to branch loads.



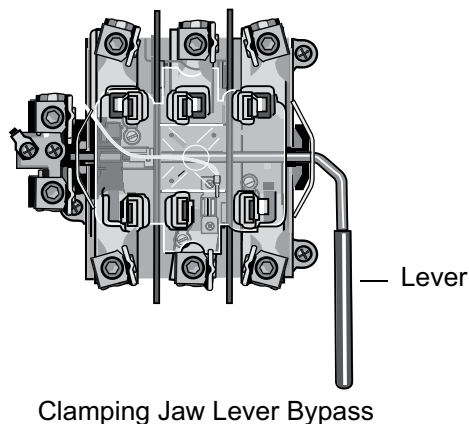
Bypasses

Because a self-contained meter completes the circuit between the utility and the customer, in order to change the meter, the circuit must be broken. This is often not acceptable in some applications and can be a safety hazard to utility personnel. Therefore, some meter sockets have a **bypass** that, when engaged, provides a path for un-metered current flow when the meter is pulled out. Common types of bypasses include: lever bypasses, horn bypasses, test block bypasses, and plunger bypasses. The type of bypass used depends on electric utility requirements.

Lever Bypass

Landis & Gyr invented the **lever bypass socket**. The basic design of this bypass has not changed since its original inception, making this a solid, time-proven design. A lever bypass has a manually-operated lever that controls a bypass link that runs between the meter socket jaws.

With a **clamping jaw lever bypass**, the lever applies pressure to the jaws which grasp the terminals of the meter. With a **non-clamping lever bypass**, the lever has no effect on the pressure the jaws put on the meter.

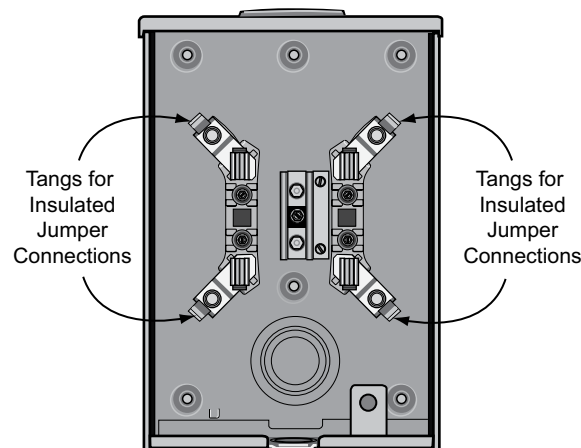


Utilities generally prefer the clamping jaw lever bypass because the meter cannot be pulled or installed unless the bypass is engaged. When the bypass is not engaged, the meter is locked into position by the jaw assemblies.

A clamping jaw lever bypass has a nylon cylinder with a copper strap running through it. When the lever is moved to engage the bypass, it moves the copper strap into contact with the upper and lower jaws. The strap also forces the jaws open, releasing the meter.

Horn Bypass

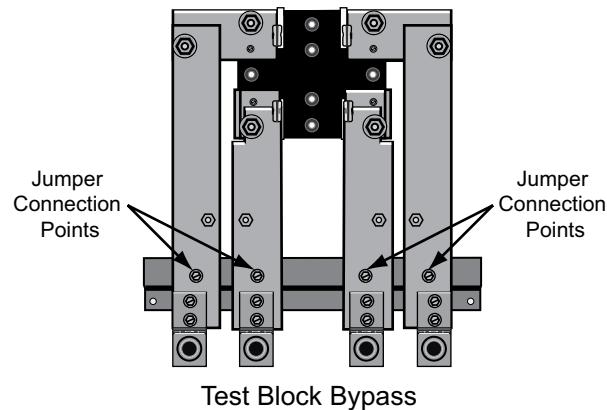
Horn bypasses, which are a factory-installed option on residential sockets, are metal tangs attached to each lug in the socket. The tangs provide attachment points for insulated jumper leads. A single-phase socket requires two jumpers and a three-phase socket requires three jumpers.



When the jumpers are attached, they provide a path for current to flow directly from the socket's line-side connections to its load-side connections. The meter can then be pulled from the socket without disconnecting the load from the power source. Siemens also offers an insulated jumper for use by utility personnel. The jumper is for temporary use and is only rated for up to 200 amps.

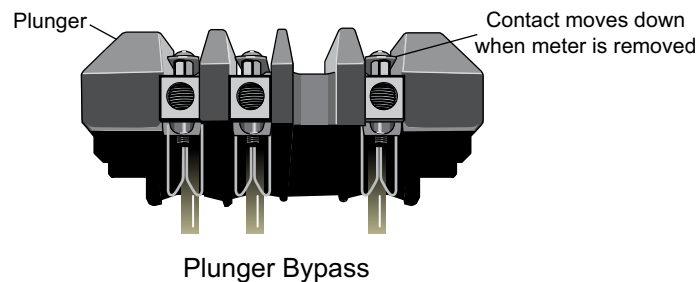
Test Block Bypass

With a **test block bypass (TBB) socket**, the line and load connectors are mounted parallel to one another. This provides for a provision to bypass the meter by placing jumpers to connect the line and load buses. This type of bypass is used primarily by utilities subscribing to EUSERC metering standards. EUSERC is the Electric Utility Service Requirements Committee. EUSERC requirements are mainly used in western states.



Plunger Bypass

A **plunger bypass** has a spring-loaded bridging contact contained within each housing. This contact is driven away from the spaced end portions of the associated contact brackets by a plunger that is engaged when a watt-hour meter is installed. When the meter is removed from the socket, the plunger bypass contacts automatically close, providing a path for current to flow from the line to the load. The plunger bypass is only used in CT sockets.

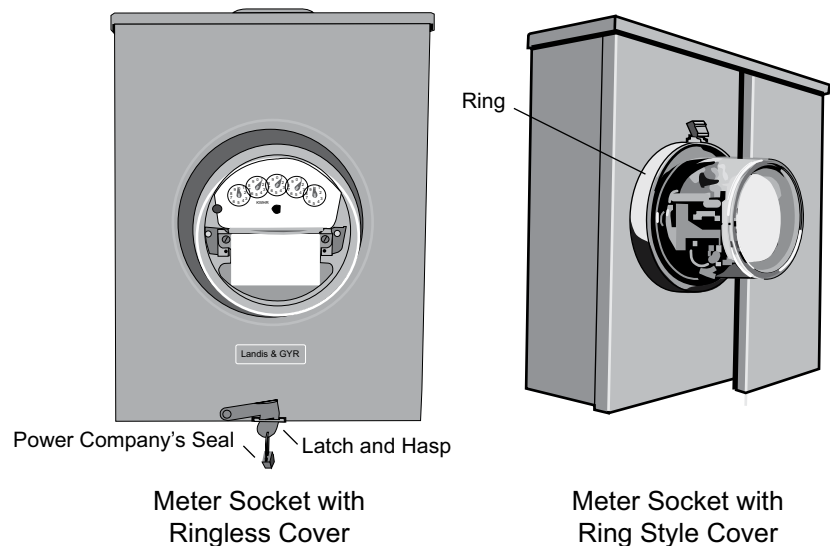


Meter Socket Covers

There are two types of meter covers, **ring** and **ringless**. A ring-type meter has a cover that must be installed before the meter can be installed. This means that the cover does not have to be removed to remove the meter. A metal sealing ring secures the cover and meter to the socket. A power company seal is attached to the sealing ring to prevent tampering.

There are two types of sealing rings. One type has a snap to secure it in place. The other type is secured with a screw type mechanism. Both types of rings are made of stainless steel or aluminum.

A ringless type meter socket requires the meter to be installed before the cover is closed. After the cover is closed, a latch and hasp mechanism holds the cover in place. A power company seal is attached to the mechanism to prevent tampering.



Meter Socket Voltage and Current Ratings

Single-position meter sockets have an AC voltage rating of 300 or 600 volts per Underwriter's Laboratory (UL) specification 414. UL 414 also identifies two operational current ratings for single position meter sockets, a **continuous current rating** and a **maximum current rating**. Both ratings are in amperes, amps for short.

As the name implies, the continuous current rating is the amount of current that the meter socket can handle continuously without damage. The maximum current ratings is the maximum current the socket can handle without damage for a short time. UL 414 allows the maximum current rating for a meter socket designed for a single-phase, three-wire service to be no greater than 125% of the continuous current rating.

Because gang sockets have bussing that must carry the current for all the sockets in the assembly, UL 414 requires that they also have an **overall assembly continuous current rating** in amperes. This overall rating is also referred to as the **line bus rating**.

Review 1

1. _____ watt-hour meters are directly connected to the power source and the load, but _____ meters use current transformers to tap off a portion of the current for measurement.
2. A _____ neutral has four connection points for neutral and ground conductors.
3. A four-jaw socket is designed for _____ applications and a seven-jaw socket is designed for _____ applications.
4. A _____ design has an offset socket to allow more wire bend space for easier installation.
5. A _____ is used to keep the electrical service connected to the load when the meter is removed.

Residential Sockets

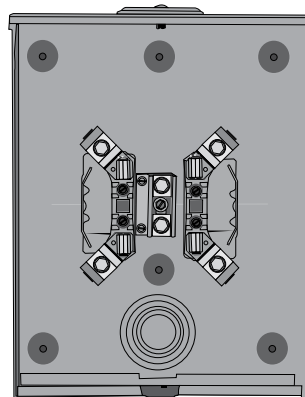
Landis & Gyr offers both ringless and ring-style residential meter sockets. The enclosures are made of steel or aluminum and accept type RX hubs (0.75" to 2.5"). Continuous current ratings range from 135 to 200 amps.

Residential sockets are available for overhead-feed-only, underground-feed-only, overhead-or-underground feed, or underground feed with a side-wire design.

Four-jaw and five-jaw sockets are available. A fifth jaw can be installed in the field in the three or nine o'clock position. A horn bypass is also available as a factory-installed option.

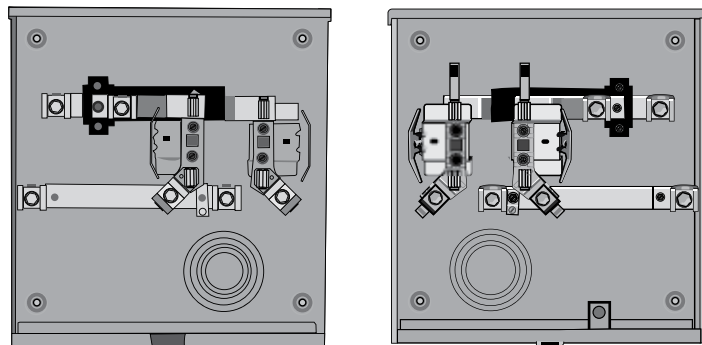
2/0 (two aught) oversized lay-in lugs on 135 amp sockets make wiring easier. Oversized 350 kcmil lay-in lugs are available for 200 amp devices.

UAT1, UAT3, and UAT4 socket designs are made of modular blocks, meaning there are only five parts to every residential device. UAT1, 3, and 4 designs have a quad neutral as standard.



UAT4 Meter Socket

UAS8 offset or **side-wire sockets**, however, have more than 5 parts and do not have the quad neutral.

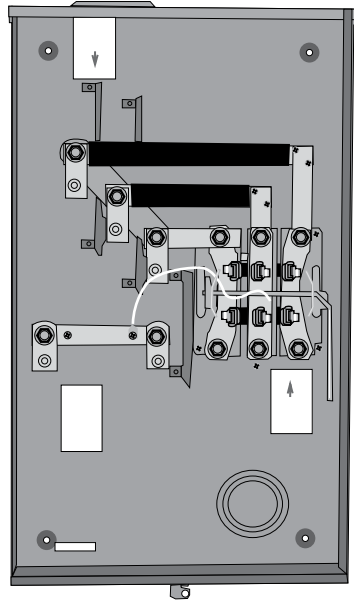


UAS8 Side Wire Meter Sockets

HQ Commercial Sockets

HQ commercial sockets have a clamping jaw lever bypass design that has been the quality standard for meter mounting equipment for over half a century.

HQ sockets are available in the following configurations: overhead-feed-only, underground-feed-only, overhead-or-underground feed, and the side-wire design shown in the following illustration.



These sockets have a maximum voltage rating of 600 volts and are available with 200 or 320 amp continuous current ratings. However, 200 amp rated sockets are built to the same specifications as 320 amp rated sockets.

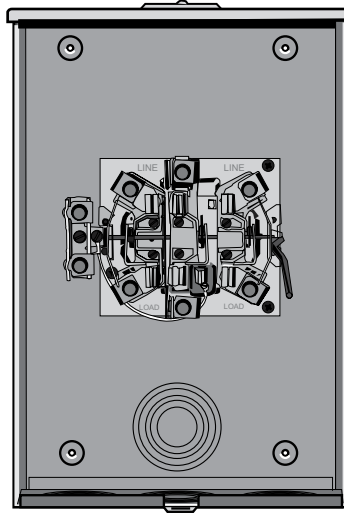
200 amp rated sockets can either have lay-in lugs or studs. 320 amp rated sockets generally have studs, but some sockets offer lay-in lugs pre-installed at the factory. Studs can be either 3/8" or 1/2" in diameter. Siemens lugs have either a 13/32" opening to fit 3/8" studs or a 9/16" opening to fit 1/2" studs. It is important to make sure that the lugs ordered fit over the stud sizes in the meter socket.

200 amp sockets accept type RX hubs, which fit 0.75" to 2.5" hub sizes. 320 amp sockets accept type HD hubs, which fit 3" to 4" hubs. HD and RX hubs are all interchangeable with Milbank hubs. A hub adapter plate, part number H9747-1113, is available to adapt an HD hub to an RX opening.

HQ sockets are available with four, five, or seven jaws. For 200 amp rated sockets, a fifth jaw can be installed in the 9 o'clock position in the field, but requires the user to run a wire to ground the jaw. The fifth terminal kit part number is H35815-2.

CQ Commercial Sockets

CQ commercial sockets have a non-clamping lever bypass design and are available in the following configurations: overhead-feed-only, underground-feed-only, or overhead-or-underground feed.



These sockets have a maximum voltage rating of 600 volts, a continuous current rating of 200 amps, and a maximum current rating of 250 amps. Bypasses are 50% rated, which means that they can safely handle the same current as the meter socket.

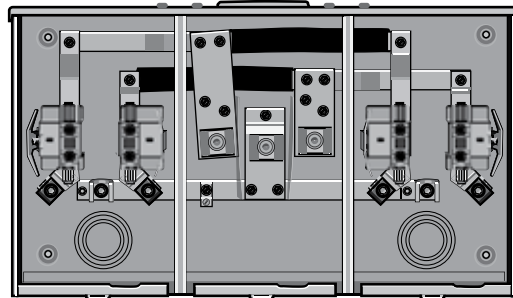
CQ sockets are available with four, five, or seven jaws and include lay-in lugs. They accept RX hubs which fit 0.75" to 2.5" hub sizes and are interchangeable with Milbank hubs.

The CQ socket should not be interchanged with HQ lever bypass sockets. Utilities usually require one or the other.

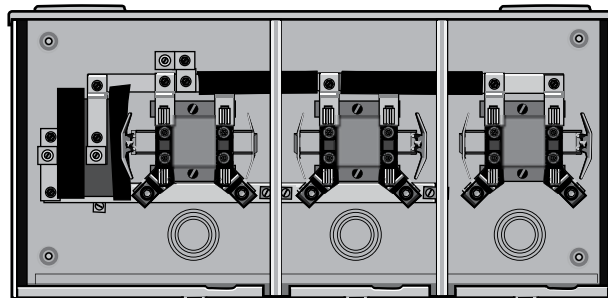
Gang Sockets

Multi-position sockets, also called **gang sockets**, group multiple sockets and a **pull section** in the same enclosure. In general, gang sockets have the same features as single-position sockets. Available configurations include: two-position through six-position gang sockets in a horizontal design and two-position or three-position gang sockets in a vertical designs. A gang socket can come with no bypass, a horn bypass, or a lever bypass on each socket.

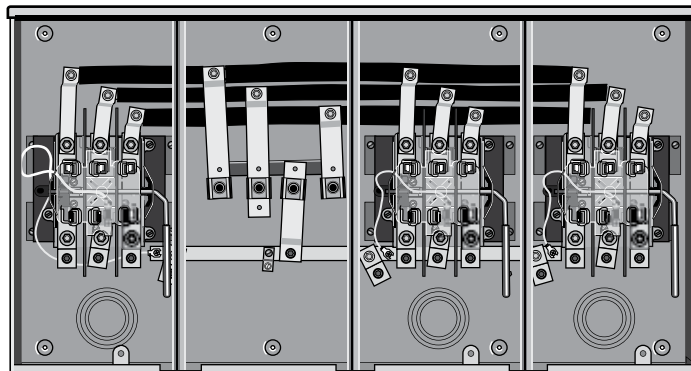
The following illustration shows examples of three configurations, a two-position gang socket with a center pull section, a three-position, end-fed gang socket, and a three-position gang socket with one socket to the left of the pull section and two sockets to the right.



Single-phase, Four-jaw, Two-position Gang



Single-phase, Four-jaw, Three-position Gang



Three-phase, Seven-jaw, Three-position Gang with Lever Bypass

Each position is has a continuous current rating from 135 to 320 amps depending on the model. The maximum current rating is 400 amps per position for lever bypass sockets and 250 amps per position for horn bypass sockets.

Gang sockets with 100 amp continuous current ratings per position are also available in center-feed or end-feed versions. Center-feed models are designed so that wires can come in from a hub opening over the pull section or from a center knockout below the pull section. An end-feed unit has hub openings for wires on both the right and left ends.

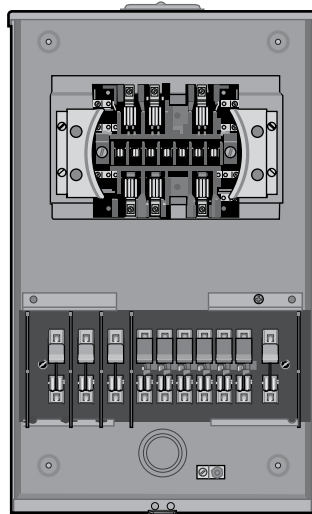
Transformer-rated Sockets

For larger applications, where it is necessary to meter loads which have a continuous current above 320 amps and/or when the applied voltage is three-phase, 480 volts, transformer-rated watt-hour meters are often used. These meters are also used in off-peak metering applications where the utility controls the power applied to a device such as a water heater to limit energy consumption during peak demand periods.

PTS Transformer-rated Meter Sockets

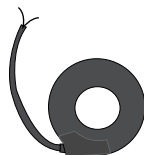
PTS transformer-rated meter sockets come with six, eight, or 13 terminals and are constructed of 16 gauge galvanized steel with polyester powder coat finish. 12 gauge aluminum is available as an option. Both solid and split covers are also available. The block assembly is glass fiber reinforced polyester, which is strong and arc and track resistant.

PTS sockets have a 600 volt maximum voltage rating and a 20 amp continuous current rating. They come equipped with screw-type terminals and pressure plate and spacing for multiple test switch configurations. A ground lug is available for all units and a plunger bypass is available on eight-terminal or 13-terminal sockets.



PTS Transformer Rated Meter Socket

Transformer-rated watt-hour meters use **current transformers (CTs)** mounted internal or external to the meter. A CT is a precision-wound coil of wire through which a conductor is passed.



Current Transformer (CT)

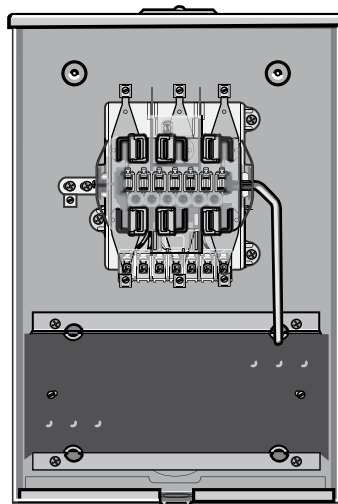
Each service conductor passes through its own CT and, when power is applied, current from a service conductor induces a proportional current in its CT. Current from each CT is supplied to the transformer-rated meter that measures and displays the energy used. CTs are often housed in an enclosure called a CT cabinet located at the service entrance. However, off-peak CT metering systems often do not use a CT cabinet.

One safety issue associated with CTs is that they must remain connected to the load when current is applied. Otherwise, the voltage induced across the CT will rise to a dangerous level.

Instrument-rated meter sockets with test switches provide an excellent method of shorting CT circuits as well as disconnecting voltage sources to the potential coils in the meter. By utilizing these test switches, meters may be changed safely and efficiently. Test switches also provide an opportunity to energize individual stators in the meter. This is important when verifying that an instrument-rated metering installation has been wired correctly. Color-coded test switch handles may be ordered to match the utilities wiring color code. This enhancement simplifies wiring of the meter socket.

HQ-T and HQ-TS Transformer-rated Meter Sockets

HQ-T and HQ-TS transformer-rated meter sockets are constructed of 16 gauge galvanized steel with polyester powder coat finish. 12 gauge aluminum is available as an option. The block assembly is glass fiber reinforced polyester which is strong and arc and track resistant.



HQ-13T Transformer Rated Meter Socket

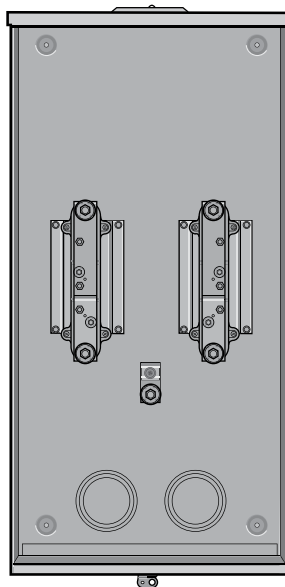
HQ-T and HQ-TS meter sockets have a 600 volt maximum voltage rating and an 80 amp continuous current rating. They come equipped with screw-type terminals and a pressure plate. Some sockets come with spacing for multiple test switch configurations. A ground lug is available.

All sockets are equipped with a 200% rated, clamping jaw lever bypass. A removable bypass handle is available as an option. With the handle removed, a solid cover can be placed on the box with the bypass closed when it is necessary to remove the meter for in-shop repair or testing.

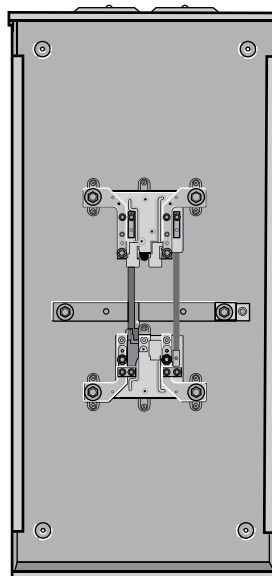
K-Base Meter Sockets

Type **K-4, K-5, and K-7 meter sockets** offer **extended-range metering**, which is the direct metering of loads above 320 amps without separate current transformers. K-Base sockets are available with steel or aluminum enclosures and in overhead service, underground service, and off-set socket (side-wire) designs. All K-Base sockets use Landis + Gyr bolt-in, self-contained meters.

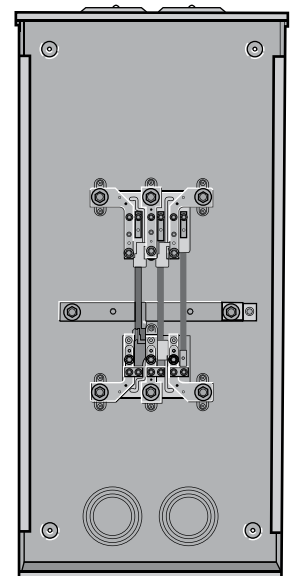
For single-phase residential and commercial applications, K-4 and K-5 meter sockets are available for 400 amp continuous-duty or 480 amp continuous-duty (600 amps maximum). For three-phase applications, type K-7 sockets provide 480 amps continuous-duty (600 amps maximum). Lugs are available in one, two, and three conductor configurations for K-4 and K-7 sockets.



K-4 Meter Socket

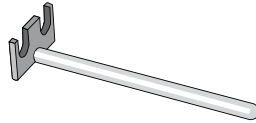


K-5 Meter Socket



K-7 Meter Socket

A bypass is generally not included with K-base sockets, but can be ordered separately and installed in the field. K-Base bypasses are clamped onto the studs before the meter is removed. Two types of bypasses are available for K-Base sockets, rake-type and rotating-link-type. The rotating link type bypass is the only bypass that can be used with K-7 sockets.



Rake-type Bypass

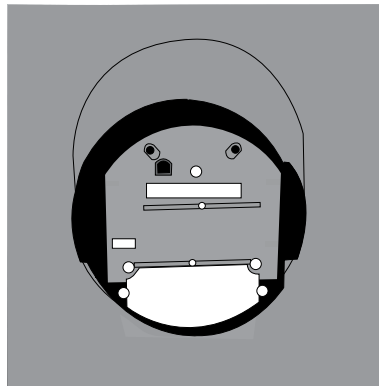


Rotating-link-type Bypass

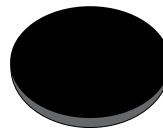
The **rake-type bypass** clamps from the line to the load bus and is capable of carrying 480 amperes continuously. The insulated handles on the bypasses prevent the enclosure cover from being installed with the bypass in place.

K-Base sockets provide for studs in two positions. The in-service studs are positioned so the meter cannot be installed upside down. The other set of studs provides for out-of-service storage.

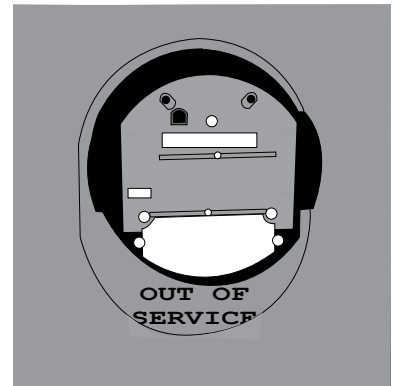
The out-of-service storage position for the watt-hour meter allows utilities to store the meter in the socket when it is taken out of service. A sliding plate with the words "Out of Service" printed on it identifies the meter's status. A plastic blank meter hole cover could also be used when the meter is out of service.



Meter in Service Position



Blank Meter
Hole Cover



Meter in Out-of-Service Position

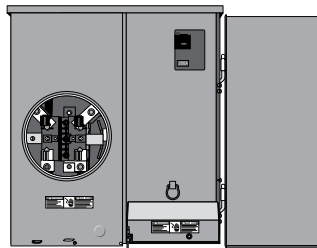
Review 2

1. Landis & Gyr and Siemens residential meter sockets have continuous current ratings from 135 to _____ amps.
2. HQ commercial meter sockets are available with continuous current ratings up to _____ amps. CQ commercial meter sockets have a continuous current rating of _____ amps.
3. Gang sockets are available with up to _____ positions in a horizontal design and _____ or _____ positions in a vertical design.
4. PTS transformer-rated meter sockets have a continuous current rating of _____ amps. HQ-T and HQ-TS transformer-rated meter sockets have a continuous current rating of _____ amps.
5. K-4, K-5, and K-7 meter sockets offer _____, which is the direct metering of loads above 320 without separate current transformers.

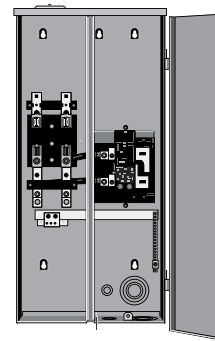
Meter Combos

Meter Combos

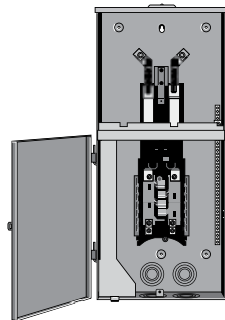
Siemens **meter combos** include two product families, meter mains and meter load center combinations. Each family is further divided into EUSERC approved and non-EUSERC products. All products are UL listed as suitable for use as service entrance equipment and have padlocking provisions. Continuous current ratings for all four categories of Siemens meter combos range from 100 to 400 amps except for meter load center combinations which range from 125 to 400 amps.



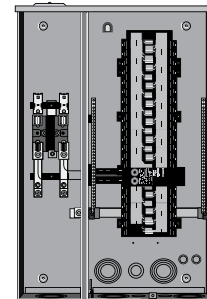
Meter Main



EUSERC Meter Main



Meter Load Center
Combination



EUSERC
Meter Load Center
Combination

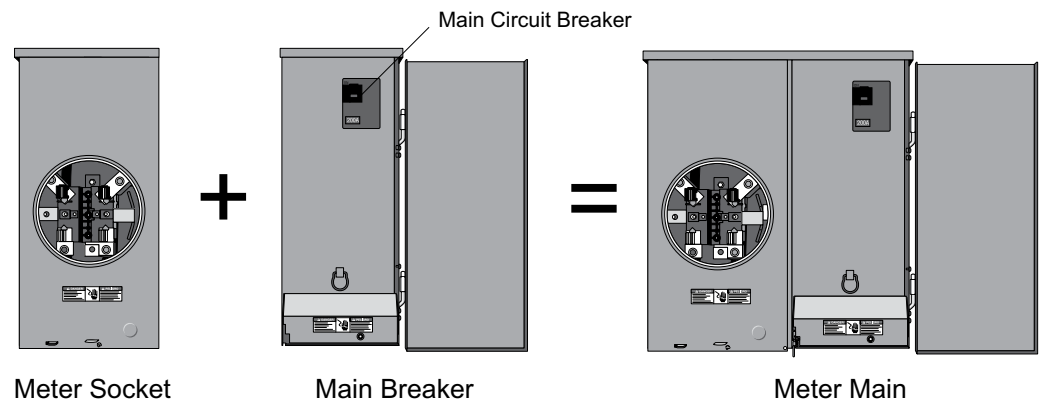
EUSERC

Equipment Utility Service Requirements Committee

(EUSERC) is an organization of approximately 80 utilities in 12 western states. One of the functions of EUSERC is to specify manufacturing and installation requirements for metering and service equipment. Utility companies dictate when EUSERC conforming equipment must be used, but EUSERC equipment can also be used in areas where it is not required by the utility.

Meter Mains

A **meter main** is a meter socket combined with a main circuit breaker in one enclosure. This arrangement is sometimes required by utilities because it places the main breaker external to the residence, making it easier for service personnel to disconnect power.

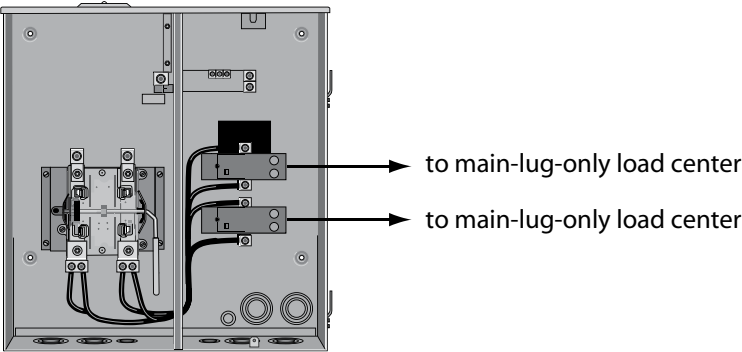


All the specified information needed to select a meter socket is also needed when selecting a meter main. This includes the amperage rating, ring type, bypass type, service conductor feed (underground or overhead), and number of jaws. In addition, the frame type, continuous current rating, and interrupting rating for circuit breakers is also needed.

Six Disconnect Rule

The *National Electrical Code*® requires that the electrical service to a building must have a disconnecting means consisting of no more than six devices (switches or circuit breakers). This means that a load center with more than six branch circuit breakers must have a main circuit breaker unless a main circuit breaker is provided separately. Where a meter main is used, a breaker in the meter main can provide the disconnecting means for a downstream main-lug-only load center and the load center is not limited to only six branch circuit breakers.

For example, meter main MM0404L1400RLM is shown in the following illustration. This meter main allows for up to two circuit breakers. Each breaker can function as the main circuit breaker for downstream equipment. This means that, if both circuit breakers are installed, two main-lug-only load centers could be located downstream and each could contain more than six branch circuit breakers and still comply with the six disconnect rule.

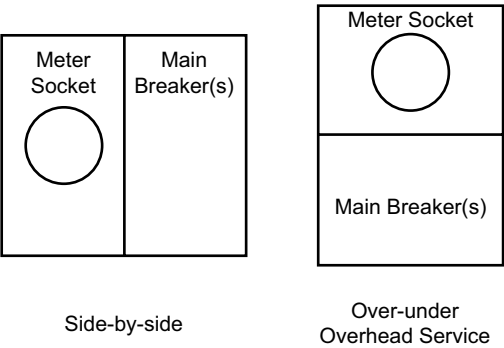


Non-EUSERC Meter Mains

Siemens non-EUSERC meter mains are designed for a single-phase, three-wire, 120/240 VAC service and have 100 to 400 amp continuous current ratings and a 22,000 amp interrupting rating. Most feature a side-by-side design; however, a 100 amp over-under meter main (meter socket on top) with a 10,000 amp interrupting rating is also available. Some Siemens meter mains contain a limited number of extra spaces to provide easy wiring of outdoor circuits such as air conditioning units and spas.

Options include factory-installed or field-installed main breakers, two or six circuits, ringless or ring-type meter socket, and overhead or overhead-underground service entry.

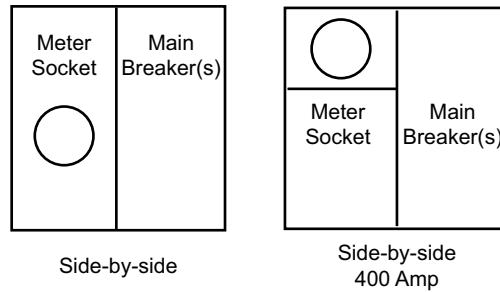
Siemens non-EUSERC meter mains are available in the following configurations.



Siemens Non-EUSERC Meter Main Configurations

EUSERC Meter Mains

Siemens EUSERC meter mains have the same features as other Siemens meter mains and are available in the following configurations.



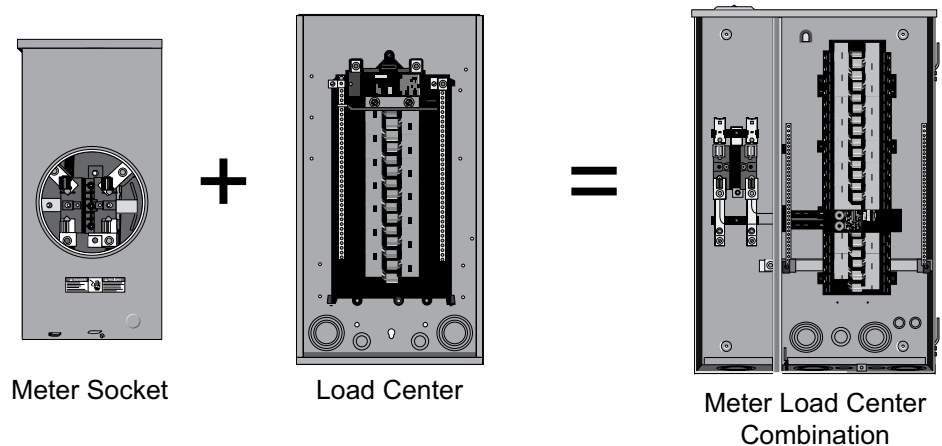
Siemens EUSERC Meter Main Configurations

Side-by-side construction meter mains have 100 to 200 amp continuous current ratings and a 22,000 amp interrupting rating.

Side-by-side, 400 amp construction meter mains have a 320 amp continuous current rating (400 amps maximum current) and a 22,000 amp interrupting rating.

Meter Load Center Combinations

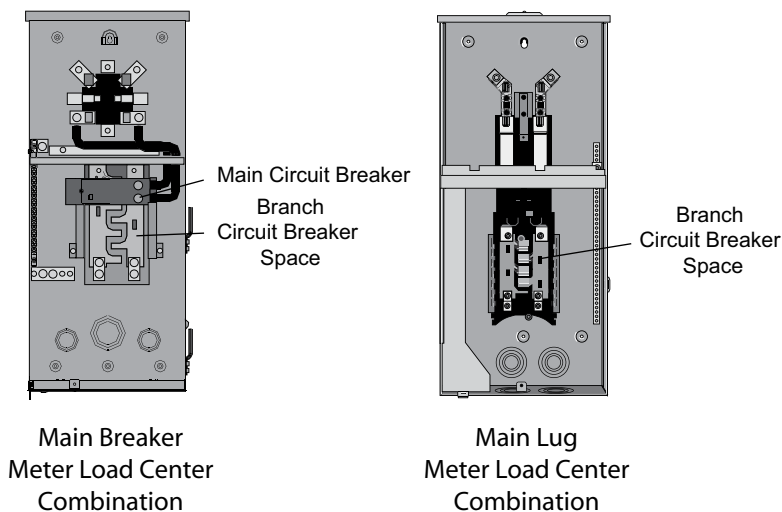
A **meter load center combination** is a meter socket combined with a main breaker and load center. However, when only six or fewer branch circuit breakers are needed, the *National Electrical Code*® does not require a main breaker.



Meter load center combinations are gaining in popularity because having the meter socket, main breaker, and load center in one location allows contractors to save on labor and material.

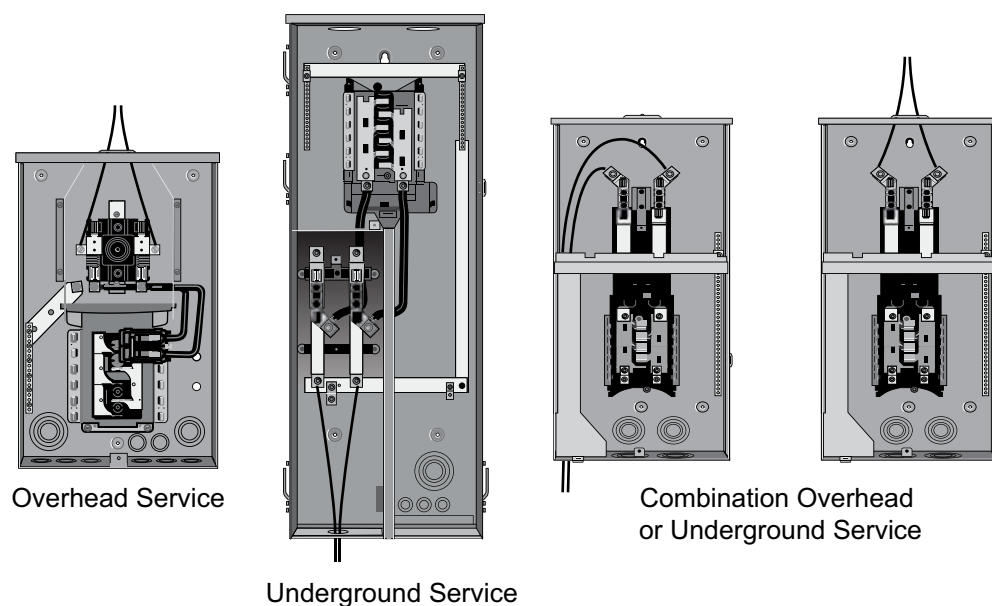
Main Breaker or Main Lug Meter Load Center Combinations

Most Siemens meter load center combinations include a main circuit breaker which serves as both the main service disconnect device and the main circuit protection device. Some meter load center combinations, however, do not include a main breaker and are referred to as main-lug-only or, more simply, main lug meter load center combinations. Main lug meter combos must still comply with the six disconnect rule.



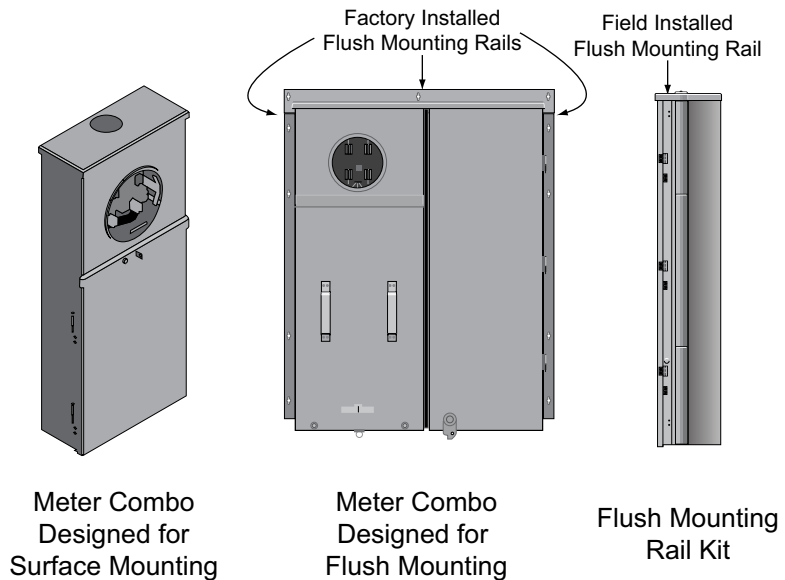
Service Entrance

Some Siemens meter load center combinations are designed for overhead service entrance, others are designed for underground service entrance. Most, however, are designed for either overhead or underground service and include a wire trough for use with underground service conductors.



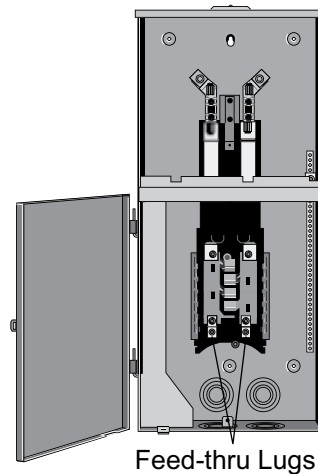
Mounting

Some Siemens meter load center combos are designed for surface mounting and others are designed for flush mounting. Units designed for surface mounting can be adapted to flush mounting with use of a flush rail kit.



Feed-thru Lugs

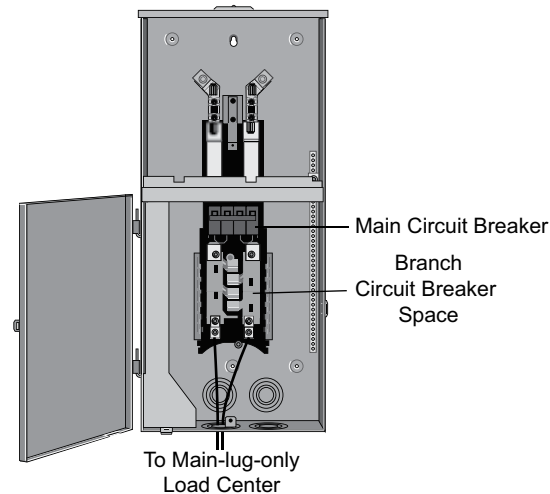
Some Siemens meter load center combinations have feed-thru lugs on the opposite end of the load center bus from the main breaker. This allows cables to be connected to a downstream main-lug-only load center, provided that the meter load center current ratings are not exceeded.



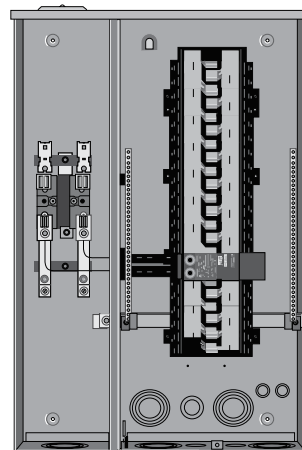
Circuit Capacity

Each meter load center combination has a circuit capacity. For Siemens meter load center combinations, the most common circuit capacity is eight one-inch spaces and 16 possible circuits.

For example, the MC0816B115CT meter load center combination shown in the following illustration, provides a main circuit breaker and space for additional outdoor circuits such as for an air conditioner or well pump. The unit's feed-thru lugs can be used to supply power to a downstream main-lug-only load center which protects circuits inside the house.



When a meter load center combination is used without another panel to power the entire home, more circuits are needed than an 0816 configuration can provide. For such applications, Siemens offers large capacity meter load center combinations such as the MC4040B1200SECW shown in the following illustration. This meter combo has a socket area on the left and a full-size load center interior on the right with 40 one-inch spaces for 40 circuits.

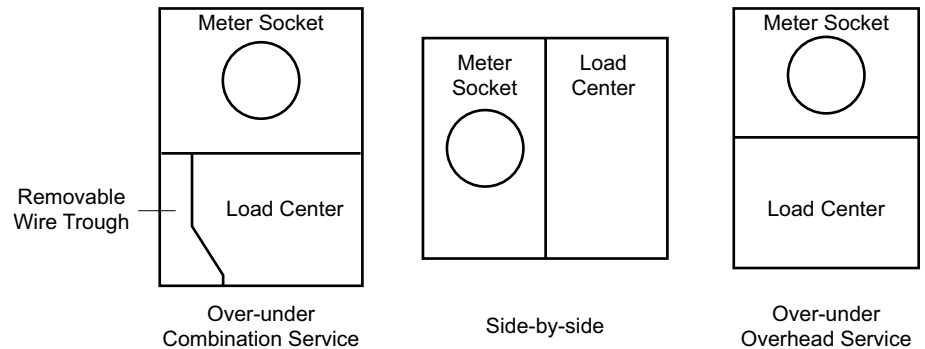


Meter Combo with a Full-size Load Center

Non-EUSERC Meter Load Center Combinations

Siemens non-EUSERC meter load centers are designed for single-phase, three-wire, 120/240 VAC service and have 125 to 400 amp continuous current ratings and a 22,000 amp interrupting rating. All non-EUSERC meter load centers are designed for surface mounting.

Siemens non-EUSERC meter load centers meter load centers are available in the following configurations.



Siemens Non-EUSERC Meter Load Center Configurations

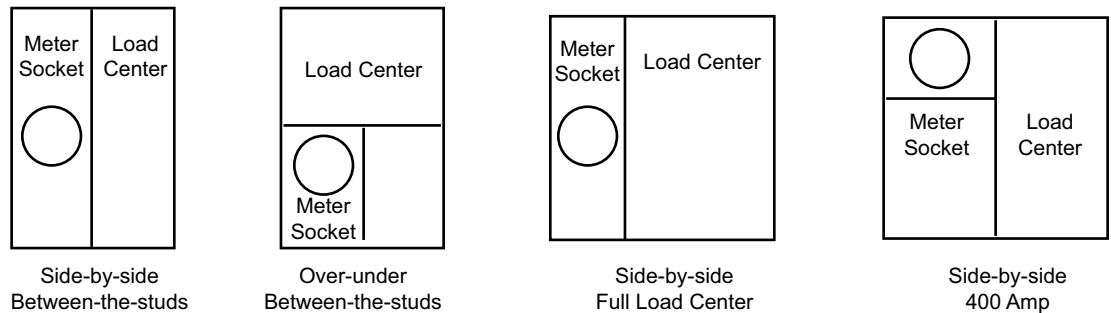
Over-under, combination-service meter load centers have a meter socket on top and a load center on the bottom. They can accept an overhead service or can be fed from underground through a removable gutter trough, as previously shown in the service entrance section. They are available with 150 or 200 amp continuous current ratings. Load center circuit capacities range from eight to 40 circuits.

Side-by-side meter load centers can be fed from overhead or underground. They are available with 125 to 400 amp continuous current ratings. The load center circuit capacities range from eight to 40 circuits. 350 and 400 amp side-by-side meter load centers are sometimes also referred to as **house panels**; however, these devices are not only used for single-family home applications, but also for apartments, condominiums, clubhouses, and other applications.

Over-under, overhead service meter load centers have a meter socket on top and a load center on the bottom. They are available with 150 or 200 amp continuous current ratings. The load center has eight circuits. These meter load centers are sometimes referred to as **trailer panels** because they can be easily mounted to a telephone pole near a trailer.

EUSERC Meter Load Center Combinations

Siemens EUSERC Meter Load Centers are available in following configurations.



Siemens EUSERC Meter Load Center Configurations

Side-by-side, between-the-studs meter load centers have rails to adjust semi-flush mounting depths, but surface mounted products are also available. These meter load centers have a meter socket on the left and a half load center on the right. They can be fed from overhead or underground. They are available with 100 to 225 amp continuous current ratings. Load center circuit capacities range from six to 48 circuits.

Over-under, between-the-studs meter load centers have the load center on top and are underground-feed only. Both semi-flush and surface-mounted versions are available. They are available with 200 or 225 amp continuous current ratings. Load center circuit capacities range from 12 to 42 circuits.

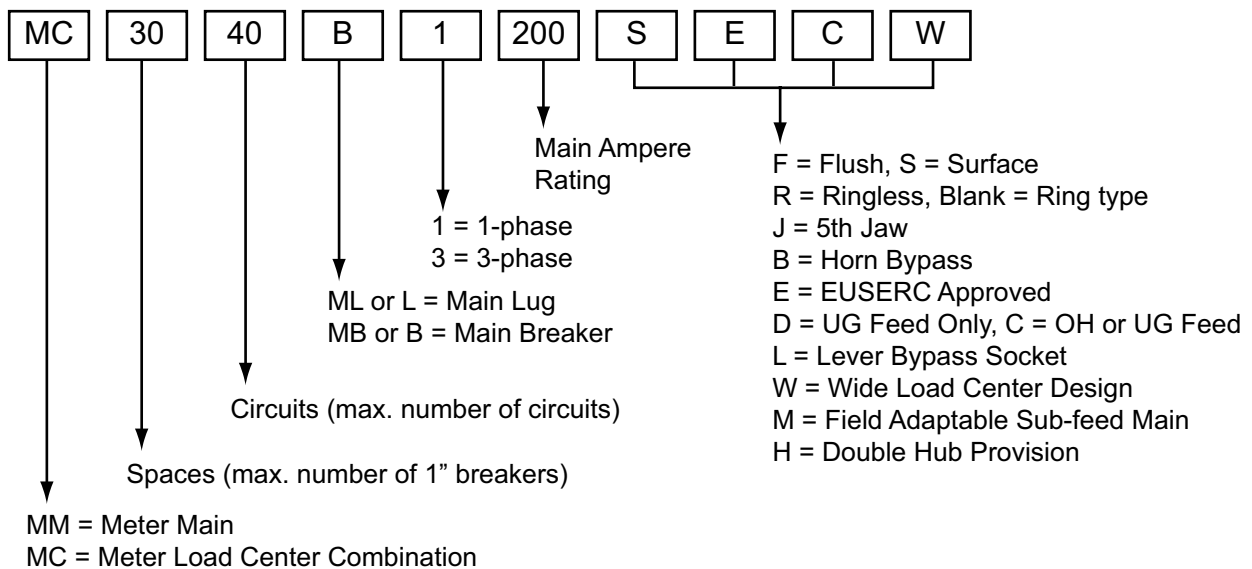
Side-by-side, full load center products must be surface mounted, but offer the greatest amount of wiring space. These meter load centers can be fed from overhead or underground. They have a 200 amp continuous current rating. The load center has a 40 circuit capacity.

Side-by-side, 400 amp construction meter load centers have a meter socket on the left and a full load center on the right. Both underground and underground-overhead feed products are available. Surface-mount and flush-mount versions are available. All versions have a 320 amp continuous current rating (400 amp maximum current). Load center circuit capacities range from two (main breaker only) to 42 circuits.

Meter Combo Part Numbers

Reviewing the meter combo part numbering system is useful to understand how to correctly select and order a specific item. As shown in the following example, MC3040B1200SECW is the correct part number for a meter combo with the following characteristics:

- meter load center combination
- 30 one-inch spaces
- 40 circuits
- main breaker
- single-phase power
- 200 amp continuous current rating
- surface mounting
- EUSERC approved
- overhead or underground feed
- wide load center design



Review 3

1. Siemens offers the following four categories of meter combos _____, _____, _____, and _____.
2. _____ is an organization of utilities in 12 western states that specifies manufacturing and installation practices for metering and service equipment.
3. A _____ is a meter socket and main breaker in the same enclosure.
4. A _____ is a meter socket combined with a load center.
5. The *National Electrical Code*® requires that the electrical service to a building must have a disconnecting means consisting of no more than _____ devices.
6. Some Siemens meter load center combinations have _____ lugs which can be used to supply power to a downstream main-lug-only load center.
7. Siemens offers non-EUSERC meter load center combinations in the following configurations: _____, _____, and _____.
8. Siemens offers EUSERC meter load center combinations in the following configurations: _____, _____, _____, and _____.

Overcurrent Protection Device Ratings

Voltage Rating

Overcurrent protection devices, such as circuit breakers and fusible switches, are rated according to the maximum voltage they can handle. The **voltage rating** of the overcurrent protection must be at least equal to the circuit voltage. The voltage rating of an overcurrent protection device can be higher than the circuit voltage, but never lower.

Some circuit breakers have what is referred to as a “slash” voltage rating, such as 120/240 volts. In such cases, the breaker may be applied in a circuit where the nominal voltage between any conductor and ground does not exceed the lower rating and the nominal voltage between conductors does not exceed the higher rating.

Continuous Current Rating

Every circuit breaker or fusible switch also has a **continuous current rating**. For a circuit breaker, this is the maximum continuous current a circuit breaker is designed to carry without tripping. For a fusible switch, it is the maximum continuous current that the fuse is designed to carry without opening. The current rating is sometimes referred to as the **ampere rating** because the unit of measure is amperes, or, more simply, amps.

Conductors are also rated for how much current they can carry continuously without exceeding their temperature rating. This is commonly referred to as the conductor’s ampacity. In general, the ampere rating of a circuit breaker or fusible switch and the ampacity of the associated conductors must be at least equal to the sum of any non-continuous load current plus 125% of the continuous load current.

Interrupting Ratings

When selecting equipment with overcurrent protection devices, it is also essential to know available fault current. Each overcurrent protection device is rated according to the maximum level of current it can interrupt. This is the device’s **interrupting rating (IR)** or **ampere interrupting rating (AIR)**.

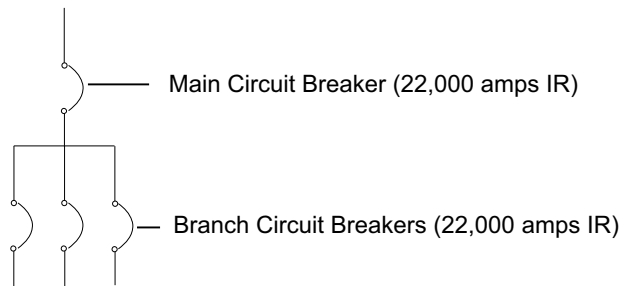
When designing an electrical power distribution system, a main circuit breaker or fusible switch must be selected that can interrupt the largest potential fault current that can occur in the selected application.

The interrupting ratings for circuit protection devices downstream from the main device must also be taken into consideration, but these interrupting ratings will depend upon the rating method applied. The *National Electrical Code*® provides for two methods to meet overall system interrupting requirements, the full rating method and the series rating method.

Full Rating Method

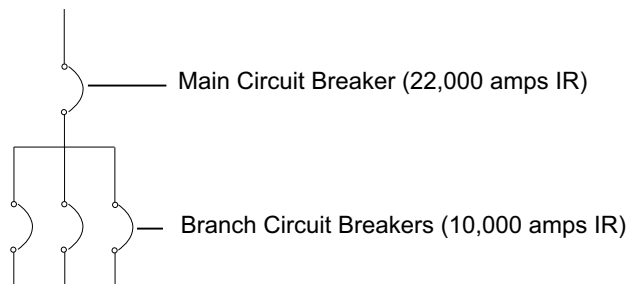
The **full rating method** requires selection of circuit protection devices with individual ratings equal to or greater than the available fault current. For single-family homes, the available fault current normally does not exceed 10,000 amperes. This makes it inexpensive to use the full rating method.

For commercial applications, the available fault current often exceeds 10,000 amperes. For example, when the full rating method is used in the case of a building with 22,000 amperes of fault current available at the service entrance, every circuit breaker must have an interrupting rating of at least 22,000 amperes as shown in the following example.



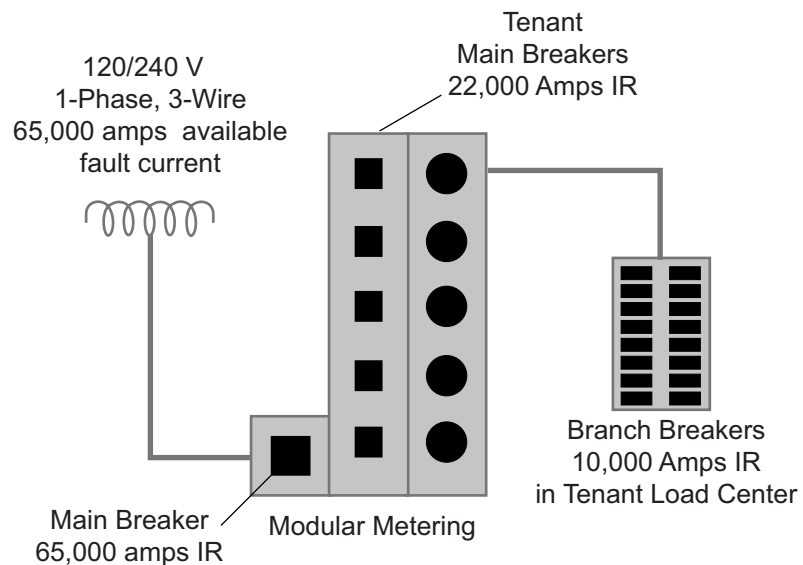
Series Rating Method

The **series rating method** also requires that the main circuit protection device have an interrupting rating equal to or greater than the available fault current of the system, but subsequent downstream circuit protection devices connected in series can be rated at lower values. For example, a building with 22,000 amperes of available fault current could have a main breaker at the service entrance with an interrupting rating of 22,000 amps, but downstream branch breakers could be rated at a lower value. In this example, the downstream branch circuit breakers have a 10,000 amp interrupting rating.



The series rating method is less expensive to the customer because it allows use of branch circuit breakers with a lower interrupting rating.

In larger installations, such as apartments, condominiums, and commercial facilities, the available fault current is usually greater than 10,000 amperes. In these situations it is not uncommon to see three or more breaker series combinations. For example, the main power of an apartment complex might have 65,000 amperes of available fault current. The main disconnect must be capable of interrupting this fault current. The tenant main breakers, however, may only have to be rated for 22,000 amperes of fault current, and the branch circuit breakers in tenant load centers may only have to be rated for 10,000 amperes of fault current.



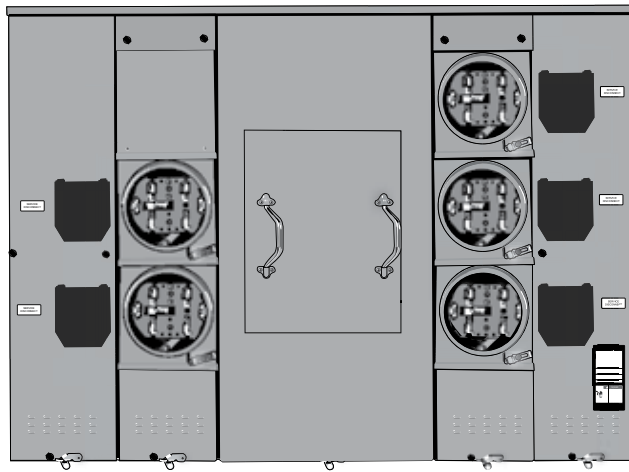
Series-rated circuit breaker combinations must be tested in series in order to be UL recognized. In addition, **NEC® Article 110.22** requires the series ratings to be marked on the service entrance equipment enclosure. Refer to the Speedfax catalog for additional information on Siemens series-rated circuit breakers.

Uni-Pak Metering

In addition to the gang meter sockets discussed earlier, Siemens offers the following options for **multi-family metering**, also referred to as **group metering**.

- Uni-Pak Metering
- Power Mod Modular Metering

Uni-Pak metering is a self-contained system with two to six meter compartments.

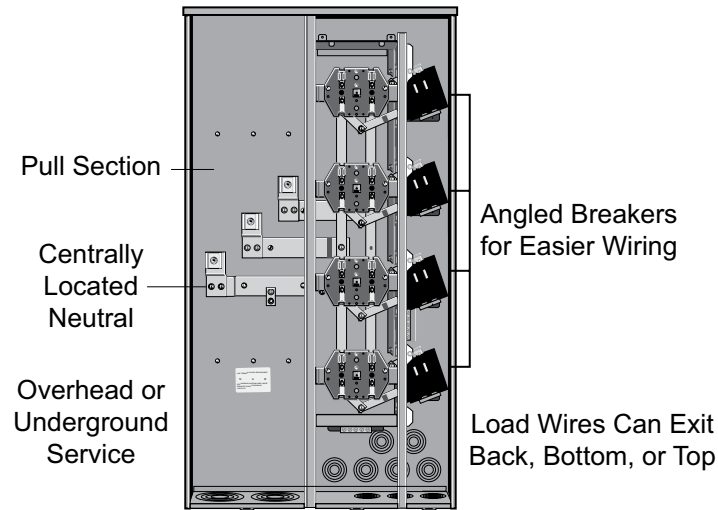


Uni-Pak Metering

Uni-Pak metering operates on single phase, three-wire 120/240 VAC power. A fifth jaw accessory kit is available for use when power is supplied from a single-phase, three-wire 120/208Y source. The pull section accepts either underground or overhead service conductors.

A Uni-Pak configuration always consists of a utility pull section with main lugs or stud terminations, two to six 125 amp meter sockets (up to 65,000 amp interrupting rating) or 200 amp meter sockets (up to 100,000 amp interrupting rating), tenant circuit breaker provisions, and a floating dead front. Both ring-type and ringless meter covers are available.

Because this design limits the number of meter compartments to six, a main switch or main circuit breaker is not required to comply with the *National Electrical Code*® six disconnect rule.

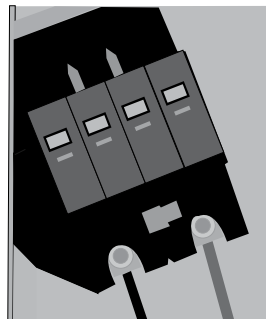


Four-Position Uni-Pak Configuration

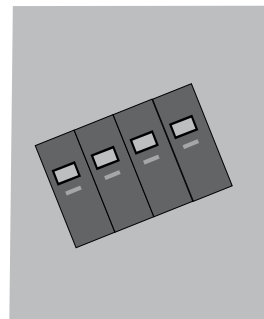
A unique feature of our standard Uni-Pak devices is the angled breaker design. The slight angle of the breaker reduces the enclosure size, which saves wall space and reduces weight. In addition, the angle also makes circuit breaker wiring easier.

Lugs are included in standard Uni-Pak metering and cannot be changed out to increase the wire size. Each unit has a wiring diagram on the inside cover that specifies the wire size and accessories available. Using alternate lugs and wire size from what is stated in the wiring diagram voids the Siemens warranty.

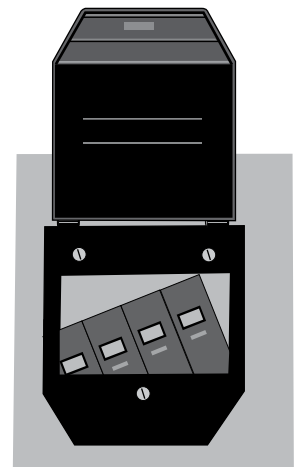
125 amp Uni-Pak units accept QP circuit breakers and 200 amp units accept QPP breakers. All Uni-Pak metering comes with a **floating deadfront**. The deadfront mounts over the breaker section. The twist-outs on the floating deadfront serve as filler plates to prevent access to live components when installing a 100 amp circuit breaker instead of a 200 amp circuit breaker.



Breaker correctly installed
(Angled for ease of wiring)



Twist-outs removed and
deadfront installed



Breaker cover installed
(Cover open)

Meter covers and breaker covers are replaceable and have part numbers to simplify ordering. Flush rail kits that allow Uni-Pak Metering to be semi-flush mounted are also available separately.

A NEMA stud kit is available to allow Uni-Pak Metering to meet EUSERC requirements. The stud kit can be installed for overhead or underground feed.

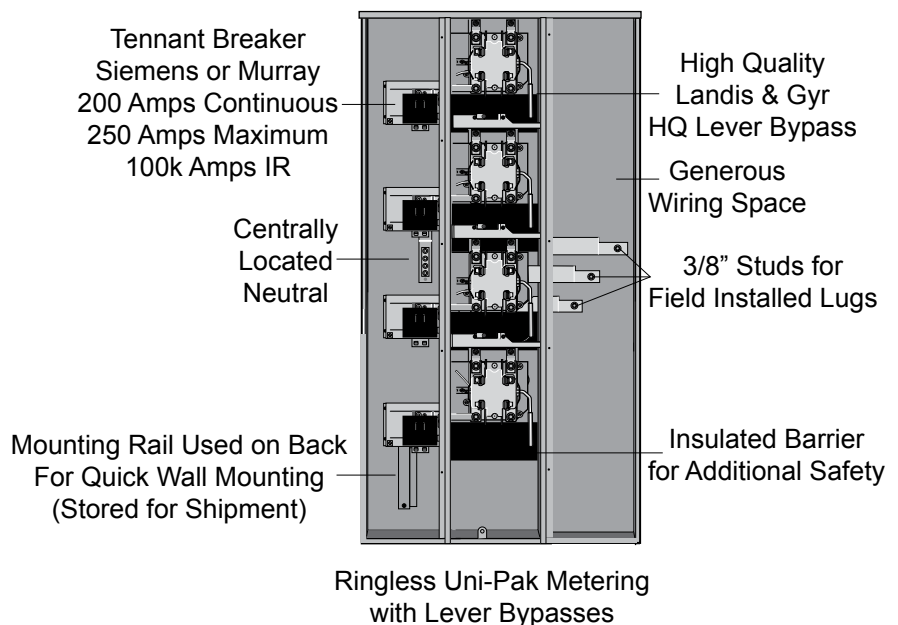
Ringless Uni-Pak Metering with Lever Bypass

Ringless Uni-Pak metering with lever bypass is a variation of the standard Uni-Pak Metering design. This newer design was needed to comply with the lever bypass requirement of many utilities.

As with the standard design, ringless Uni-Pak metering with lever bypass configurations have two to six socket positions. However, all positions have a 200 amp continuous current rating (250 amps maximum) with a 100,000 amp interrupting rating. Positions are labeled for both Siemens and Murray circuit breakers. Bus current rating options are 400 or 600 amps.

Ringless Uni-Pak metering with lever bypass does not feature angled breakers; however, the ample space between meters allows sufficient wire bending space, so the units are just as easy to wire as the standard Uni-Pak metering.

The high quality HQ lever bypass sockets come with a fifth jaw installed in the nine o'clock position. Neutrals are centrally located, and ground lugs are independent for each position. Multiple lug kits and hub kits are available.



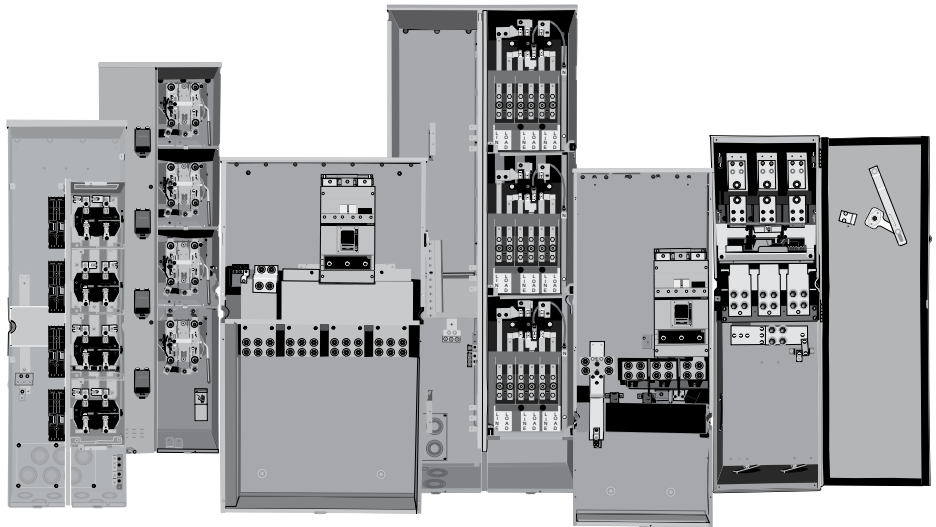
Handles are included on either side of the enclosure to help in lifting and mounting the unit. A mounting rail on the back of the unit simplifies installation.

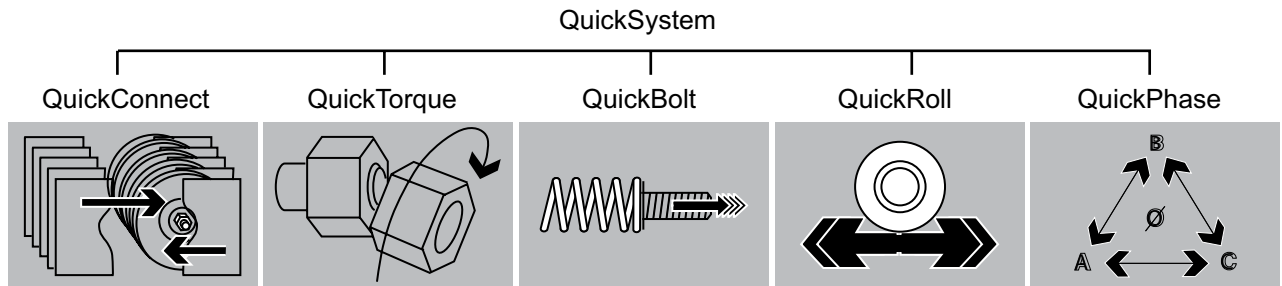
QP and QPP circuit breakers are used in ringless Uni-Pak metering with lever bypass, as specified on the wiring diagram and series rating labels included on the inside cover of every unit. These labels also specify which hubs and lugs can be used. Lugs are not included in the pull section and must be purchased separately.

Power Mod Modular Metering

Siemens **Power Mod modular metering** includes an assortment of module types that can be configured to meet a wide range of residential and commercial group metering applications. For example, a typical application requires a main device module and one or more residential and/or commercial meters stacks. Depending on the application, additional modules such as a pullbox, tap box, or spacer may also be required.

Power Mod service can be single-phase, three-wire 120/240 VAC, three-phase, four-wire 120/208Y, or three-phase, three-wire 240 VAC delta. The cross bus that connects all modules is aluminum and has a 1200 amp continuous current rating.





Power Mod has a unique combination of five labor saving features to aid the contractor during installation. Known collectively as **QuickSystem**, these features include:

QuickConnect - a single point for phase, neutral, and ground connections

QuickTorque - a breakaway nut design that makes it easy to achieve proper torque

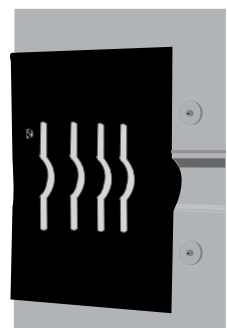
QuickBolt - spring-loaded, captive bolts that provide a more accessible connection between enclosures

QuickRoll - rear mounting brackets factory installed with wheels for easy wall installation and lineup.

QuickPhase - field-phaseable individual meter sockets that streamline ordering and phase balancing

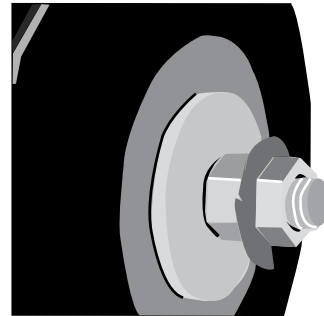
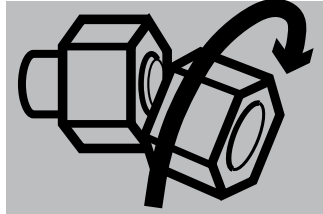
QuickConnect

QuickConnect is an exclusive Siemens feature that saves time by providing a single connection for phase, neutral, and ground, all tightened by a single nut that is externally accessible. Beveled edges on the QuickConnect allow for easy positioning of the joint.



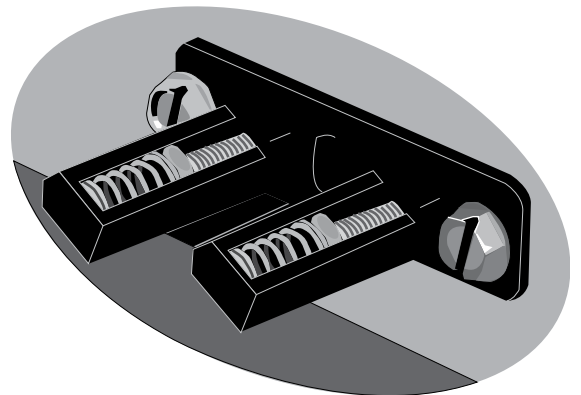
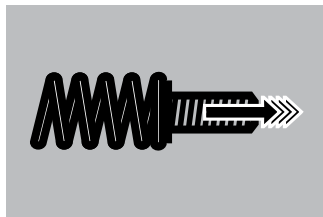
QuickTorque

QuickTorque is an exclusive Siemens feature that saves time by eliminating the need for torque readings. When tightening, the outer head twists off at the proper torque for the connection. The remaining nut allows for release of torque if future maintenance or disassembly is required.



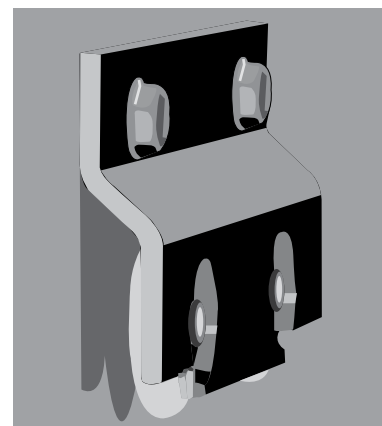
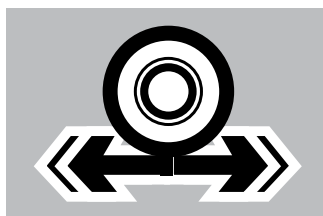
QuickBolt

QuickBolt is an exclusive Siemens feature that simplifies installation of adjacent modules. With this feature, bolts are retracted until openings line up, at which time springs push the bolts through and maintain pressure while wingnuts are attached and tightened.



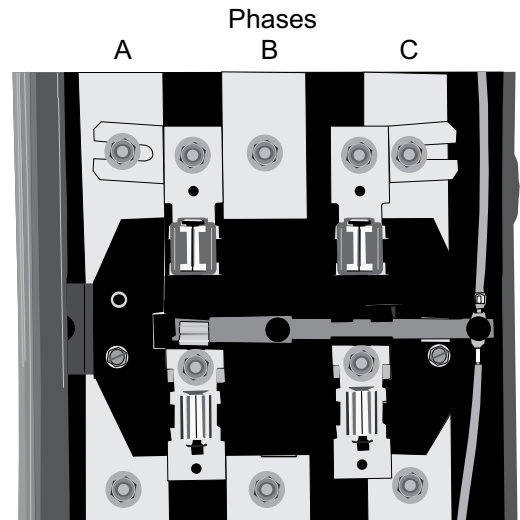
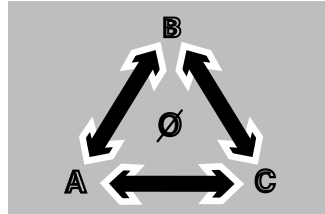
QuickRoll

QuickRoll is an exclusive Siemens feature that makes it easier to mount modules to a wall. Instead of metal scraping metal, QuickRoll allows the module to glide down the mounting rail via a durable nylon wheel inside a mounting bracket.



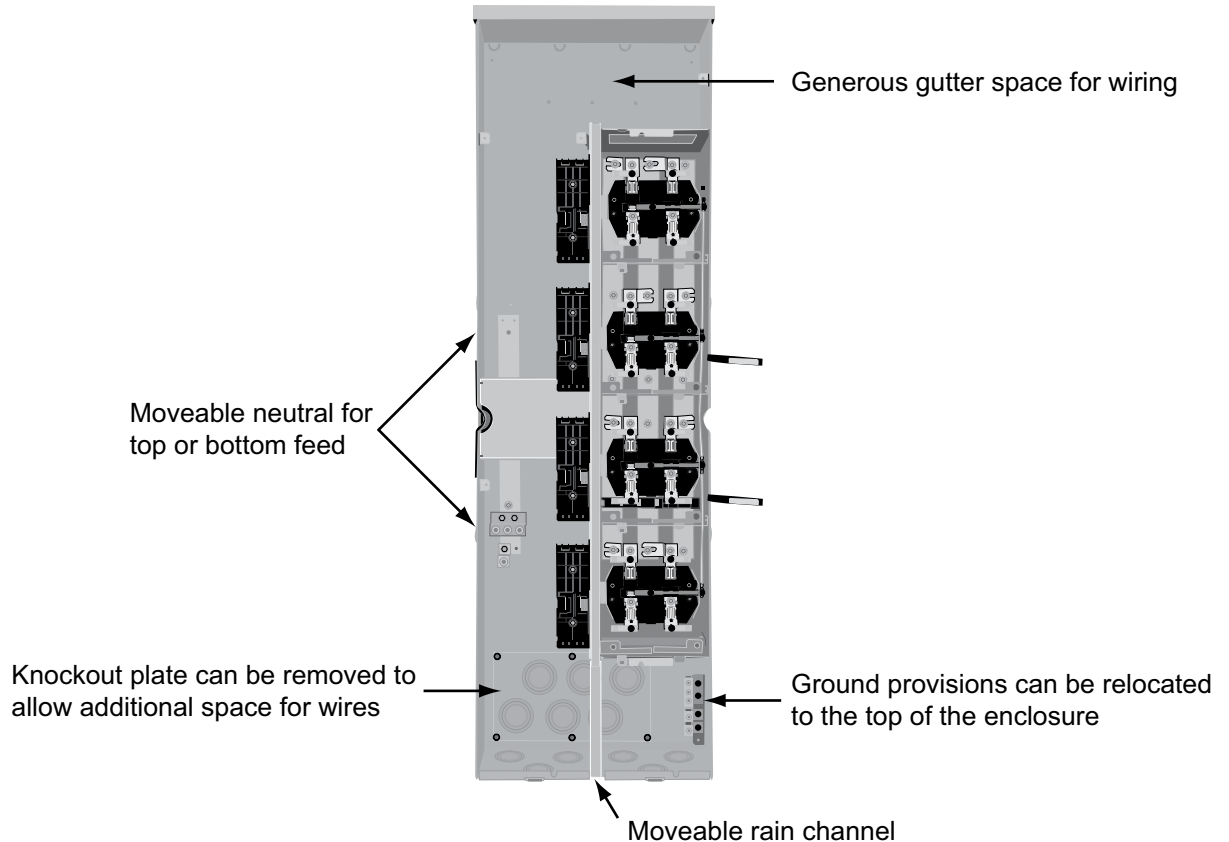
QuickPhase

QuickPhase provides maximum flexibility by allowing each individual meter position to be phased independently according to the user's needs.



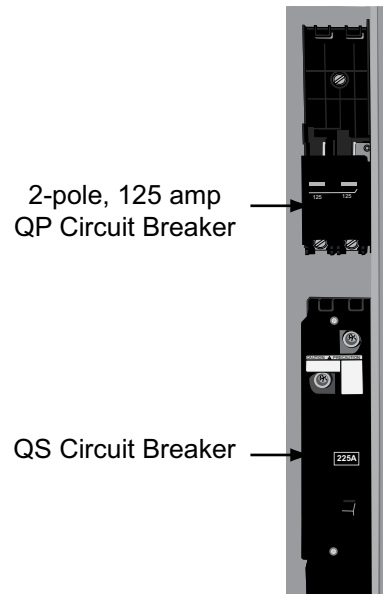
Additional Power Mod Features

Power Mod has many features designed to speed installation and provide the contractor with maximum flexibility. For example, generous gutter space, removable knockout plate, moveable ground and neutral provisions, and hinged rain channel simplify wiring.



Each 225 amp meter socket in a residential meter stack (type WMM) has a provision for a 2-pole, 225 amp, plug-in QS circuit breaker. The compact QS breaker features a side-wire design that simplifies wiring by eliminating difficult wire bends. The QS breaker is available with continuous current ratings from 100 to 225 amps and with interrupting ratings from 10,000 to 100,000 amps.

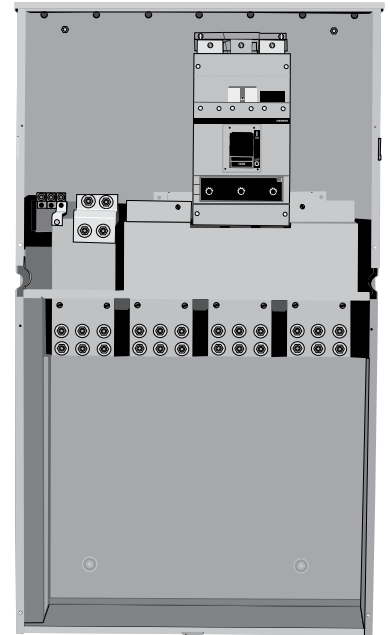
If desired, a two-pole, 125 amp QP circuit breaker can be installed in a 225 amp tenant main breaker slot without conversion kits or filler plates.



Power Mod Modules

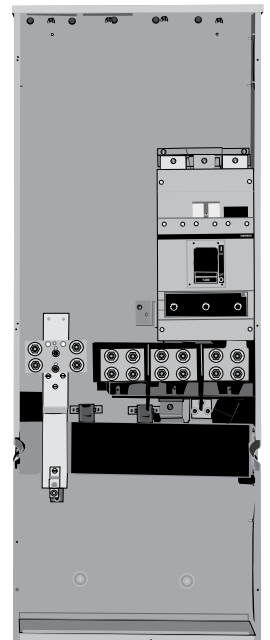
As mentioned earlier, Power Mod modular metering includes an assortment of module types that can be configured to meet a wide range of residential and commercial group metering applications.

Standard Breaker Modules (Type WB) are designed for line-side and load-side applications ranging from 200 to 2000 amps at 240 VAC max. For 1200 amp and below modules, compression lug landing pads can be field-installed and devices are rated for overhead and underground feed. 1600-2000 amp models feature dedicated feed to minimize width and come with factory installed studs to which mechanical or compression lugs can be installed. A wide variety of lug options for AL and CU wire are available to help minimize cost and customize the module to your specifications.



EUSERC-Compliant Breaker-Pullbox Combination Modules (Type WEB) are designed for 240 VAC max. line-side, bottom-feed applications, up to 1200 amps, for those areas that subscribe to the EUSERC standard, require compression lugs, or require separate compartments for the breaker and line-side terminals.

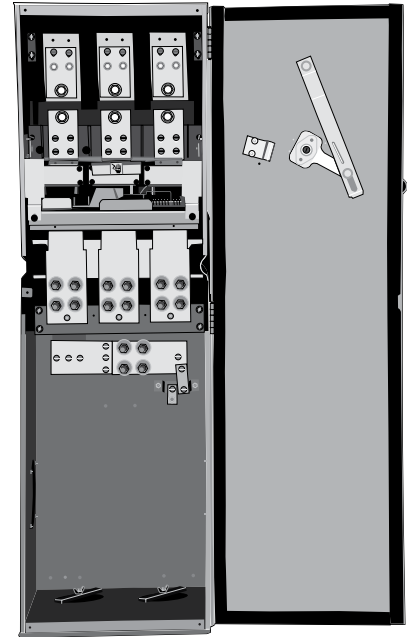
NEMA II stud pattern bolts are standard on every unit enabling compression or mechanical lug use. Each module features a removable ground trough to facilitate pulling the grounding conductor through the pull section. Multiple ground lugs are included with every device.



Standard Switch modules

(Type WS) are designed for line-side and load-side applications ranging from 400 to 1200 amps at 240 VAC max. For modules at 800 amps and below, NEMA II stud pattern bolts are factory installed enabling a wide variety of compression and mechanical lug options.

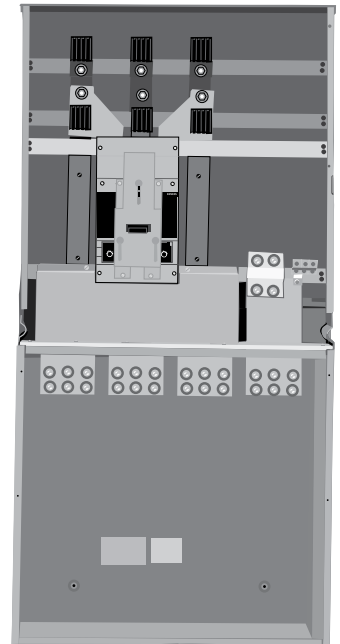
400-800 amp modules have the exclusive invertibility feature, allowing the user to simply rotate the enclosure to accommodate top-feed or bottom-feed. A wide variety of lug options for AL and CU wire are available to help minimize cost and customize the module to your specifications. Class T fuse provisions are standard.



EUSERC-Compliant Switch-Pullbox Combination Modules (type WES)

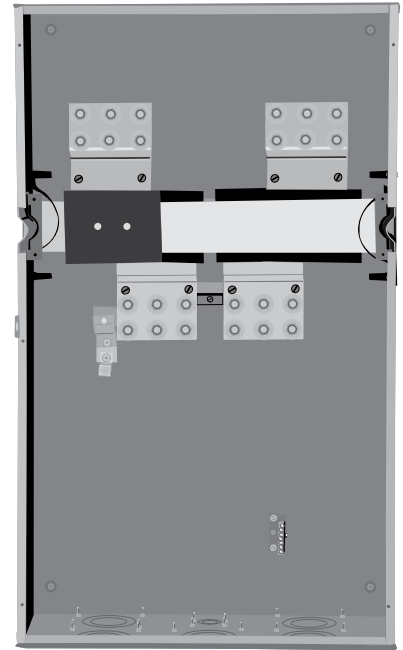
are designed for 240 VAC max., line-side, bottom-feed applications, up to 1200 amps, for those areas that subscribe to the EUSERC standard or require compression lugs.

NEMA II stud pattern bolts are standard on every unit enabling compression or mechanical lug use. Each module features a removable ground trough to facilitate pulling the grounding conductor through the pull section. Multiple ground lugs are included with every device. Class T fuse provisions are standard.

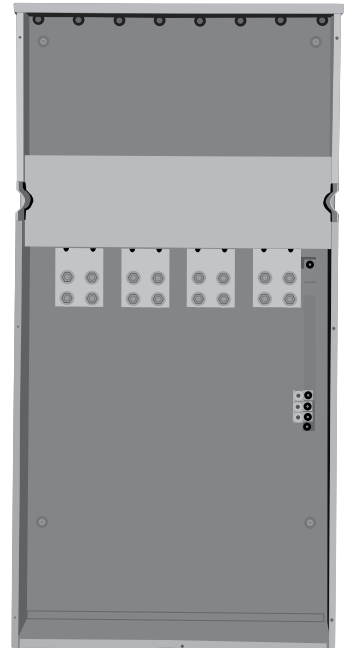


Standard Tap Box Modules (Type WTB) are designed for line-side, main-lug-only or load-side, remote-feed applications ranging from 400 to 1600 amps at 240 VAC.

NEMA II stud pattern bolts are factory installed enabling a wide variety of compression and mechanical lug options. All modules in this family feature the exclusive invertibility feature - allowing the user to simply rotate the enclosure to accommodate top or bottom feed. A wide variety of lug options for AL and CU wire are available to help minimize cost and customize the module to your specifications.

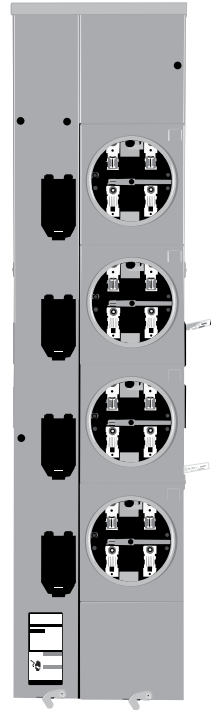


EUSERC-Compliant Tapbox-Pullbox Combination Modules (type WET) are designed for 240 VAC max., line-side, bottom-feed applications, up to 1200 amps, for those areas that subscribe to the EUSERC standard, require compression lugs, or require more wired bending space than a standard tapbox. NEMA II stud pattern bolts are standard on every unit enabling compression or mechanical lug use.



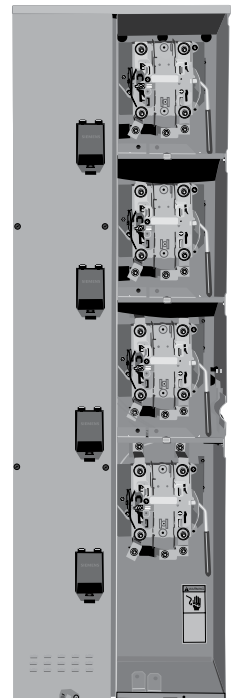
Residential Meter Stacks (type WMM) are available in 125 amp and 225 amp per position modules. Two through six position 125 amp and 225 amp stacks are available in ring and ringless (with or without horn bypasses) versions.

Modules with three-phase through bus have the QuickPhase feature. 225 amp modules use the new QS type breaker which eliminates multiple bends in tenant service conductors and allows 125 amp conversion without the need for costly labor-intensive conversion kits.



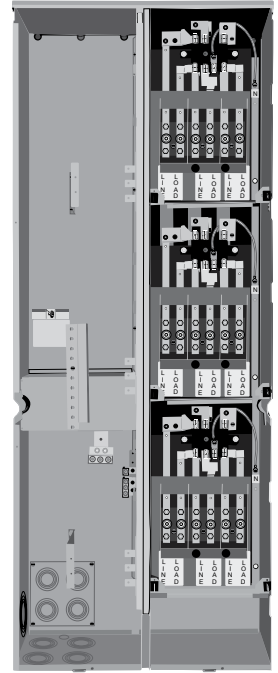
Commercial Meter Stacks (type WML) are available with 240 VAC max., single-phase and three-phase tenant main provisions. 100 amp three-phase tenant main stacks are available up to four positions. 225 amp single-phase and three-phase tenant main stacks are available up to four positions. 320 amp three-phase tenant main stacks are available up to two positions.

WML stacks use the Landis & Gyr type HQ lever bypass. Stacks with single-phase 225 amp provisions can be converted to 125 amp without the need for costly labor-intensive conversion kits.



EUSERC-Compliant Commercial Meter Stacks with Test Block Bypass with Test Block Bypass (type WMT) are available

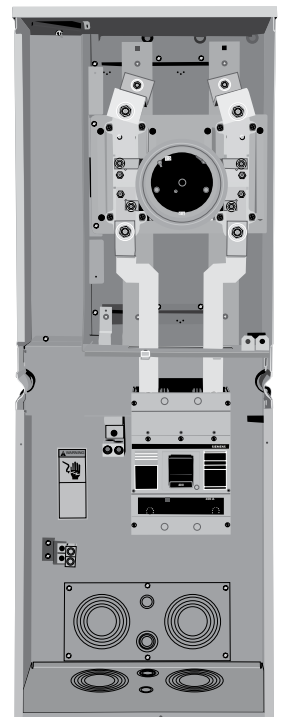
with single-phase and three-phase tenant main provisions. 225 amp single-phase and three-phase tenant main stacks are available up to three positions. Stacks with single-phase, 225 amp provisions can be converted to 125 amp without the need for costly labor-intensive conversion kits.



K-Base is a bolt-in meter socket designed and provided exclusively by Landis & Gyr. Utility acceptance varies so (check for approval prior to selection. **Commercial**

Meter Stacks with K-Base Meter Sockets with K-Base Meter Sockets (type WMK) are available with 240 VAC max. single-phase and three-phase tenant main provisions.

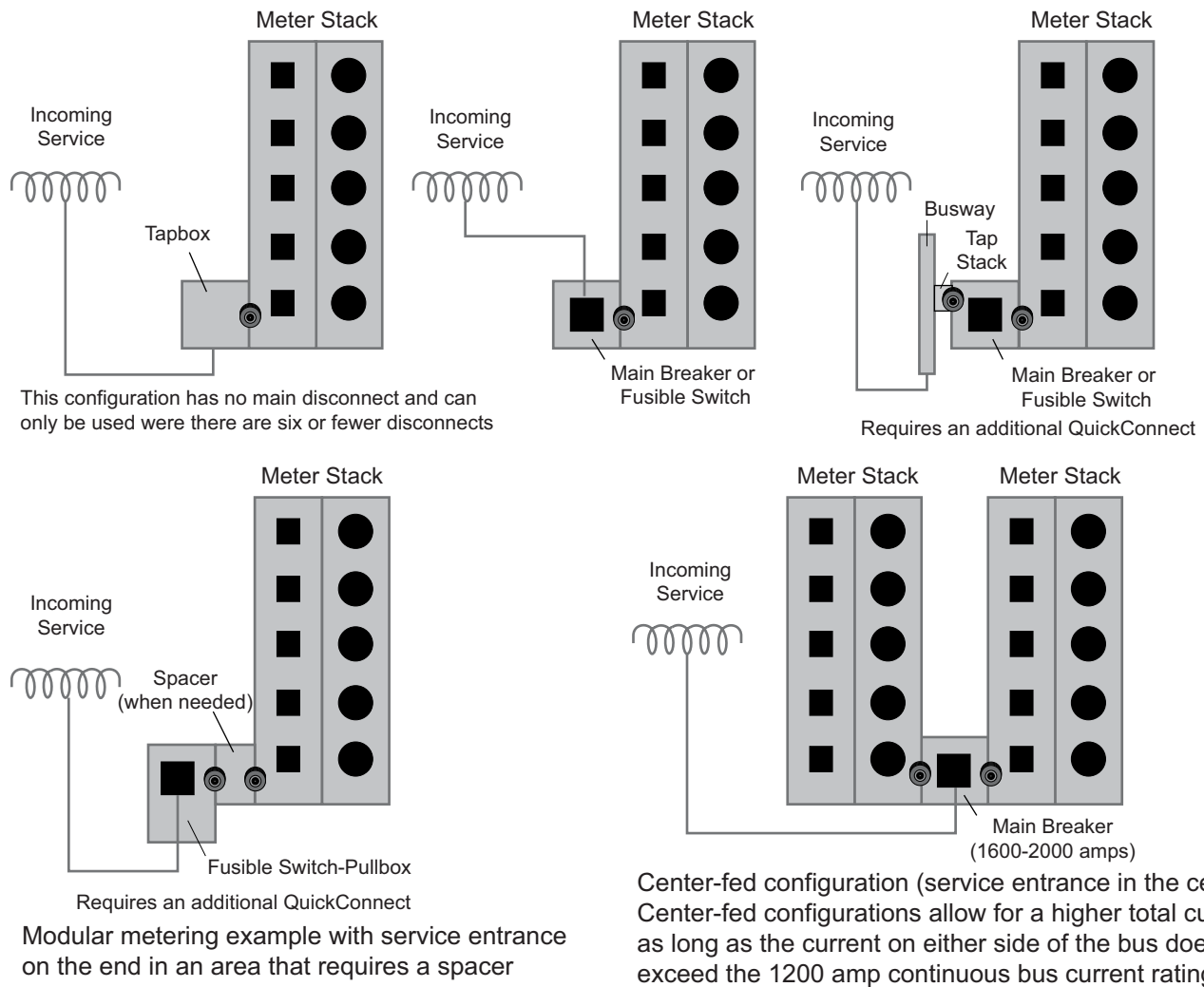
Three-phase in, single-phase out stacks use the K5 meter socket. Three-phase in-out stacks use the K7 meter socket. Both types of sockets are available in one position 400 and 600 amp configurations. K7 modules are also available with two positions at 400 amps per position.



Power Mod Configuration

Utilities have varying requirements for equipment height, cover types, and bypass types. Therefore, utility acceptance should be obtained prior to installation of any modules.

The following illustration shows a few configuration examples. Other configurations are also possible. For simplicity, only one or two meter stacks are shown for each configuration, but additional meter sacks can be added as long as the cross bus and main device specifications are not exceeded.



The service feed for a modular metering configuration can be on the end of the configuration or in the middle.

Configurations are limited by the continuous current ratings for the main device and the cross bus. All cross buses are aluminum with a 1200 amp continuous current rating. For center-feed applications, the total current in the main device may exceed 1200 amps, if the main device is rated accordingly, but the cross bus current on either side of the main device cannot exceed 1200 amps.

Pullboxes have provisions for field-installed lugs for incoming and outgoing conductors. These modules should be used for underground service feeds when inspecting authorities require the service to be split. Pullboxes do not have a horizontal cross bus. If a cross bus is needed, a tapbox (type WTB or WET) should be used.

A spacer is commonly required between a meter stack and the main disconnect module (or tapbox) for a EUSERC installation. A spacer can also be used to extend the length of the lineup when needed.

200 to 1200 amp standard breaker modules accept combination feed, allowing service conductors to enter the top or bottom of the enclosure. 1600 to 2000 amp standard breaker modules have dedicated top or bottom feed. 400 to 800 amp switch modules are invertible for top or bottom feed. 1200 amp switches are bottom-feed-only. All standard tapboxes are invertible for top or bottom feed. Invertible units come with two sets of two QuickBolts on both sides of the unit. The QuickBolts on the left side can be removed by taking off two mounting screws on each QuickBolt assembly.

A standard tapbox (type WTB) or circuit breaker module (type WB) may be used as a service-entrance module or a load-side feed for remote equipment. An additional QuickConnect must be ordered when these devices are installed on the load side to feed remote equipment.

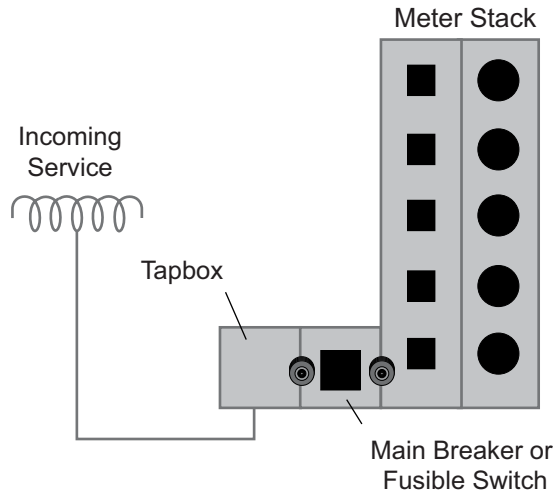
Tapboxes provide a direct connection to the cross bus and do not provide any overcurrent protection. A tapbox should never be used to feed a main device module (types WS, WB, WES, or WEB) as this would bypass the overcurrent protection.

All meter stack horizontal bussing must match the output (three-phase or single-phase) of the main disconnect module.

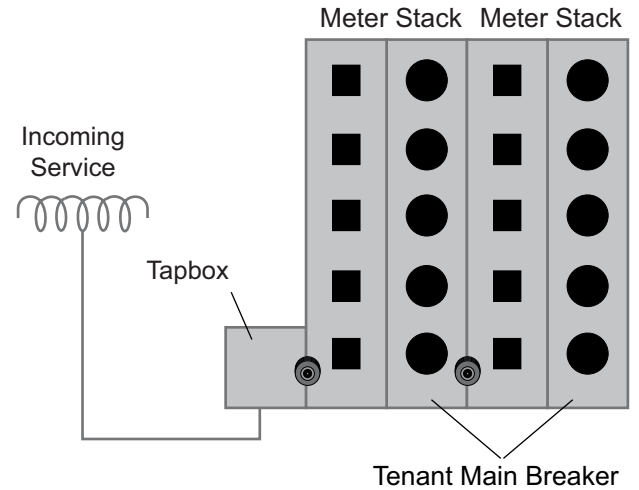
Each meter stack comes with a QuickConnect and a mounting rail. A QuickConnect is needed for each cross bus connection.

Order a circuit breaker tenant main for each meter position. Circuit breakers must match the meter socket (single-phase or three-phase). Refer to the Speedfax catalog for circuit breaker series rating information.

Examples of Improper Configurations



A tapbox directly connects the incoming service to the cross bus, bypassing the main circuit protection device



Six-disconnect rule violation - no main circuit protection device and more than six tenant main breakers

Review 4

1. Uni-Pak Metering is a self-contained system with two to _____ meter compartments.
2. The standard Uni-Pak metering design features angled breakers for easier wiring and can have a _____ bypass. Uni-Pak metering with _____ bypass does not have angled breakers.
3. The Power Mod QuickSystem incorporates the following five labor saving features: _____, _____, _____, _____, and _____.
4. Power Mod modular metering has aluminum cross bus with a _____ amp continuous current rating. The cross bus for one module is connected to the cross bus of the next module by a _____.
4. Each 225 amp meter socket in a Power Mod residential meter stack (type WMM) has a provision for a 2-pole _____ circuit breaker; however, a 2-pole 125 amp _____ circuit breaker can be installed without a conversion kit or filler plate.
5. A Power Mod _____ module cannot be used to feed circuit breaker or fusible switch modules because the cross bus current would pass straight through to the meter stacks, bypassing the circuit protection device.

Review Answers

Review 1

1) Self-contained, transformer-rated; 2) quad; 3) single-phase, three-phase; 4) side-wire; 5) bypass.

Review 2

1) 200; 2) 320, 200; 3) six, two, three; 4) 20, 80; 5) extended-range metering.

Review 3

1) meter main, EUSERC meter main, meter load center combination, and EUSERC meter load center combination; 2) EUSERC; 3) meter main; 4) meter load center combination; 5) six; 6) feed-thru; 7) over-under combination service, side-by-side, over-under overhead service; 8) side-by-side between-the-studs, over-under between-the-studs, side-by-side full load center, and side-by-side 400 amp.

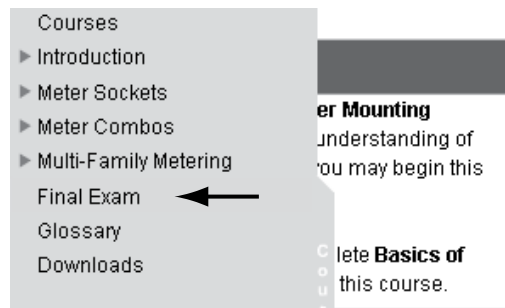
Review 4

1) six; 2) horn, lever; 3) QuickConnect, QuickTorque, QuickBolt, Quick Roll, QuickPhase; 4) 1200, QuickConnect; 5) QS, QP; 6) tapbox.

Final Exam

You can test your knowledge by taking the final exam for this course online at <http://www.usa.siemens.com/step>. This web page provides links to a variety of our quickSTEP online courses. To complete the final exam for this course, click on the **Basics of Meter Mounting Equipment** link.

Next, move your mouse over to the left so that the navigation bar pops out, and select the **Final Exam** link. The final exam page will appear. Before taking the final exam, it is recommended that you delete the temporary files on your computer. For most versions of **Internet Explorer**, you can do this by selecting **Internet Options** from the **Tools** menu and then clicking on the **Delete Files** button. If you do not perform this step, you may see a score of 0% after you submit your exam for grading.



After you complete the final exam, click on the **Grade the Exam** button at the bottom of the page. Your score on the exam will be displayed along with the questions that you missed.

If you score 70% or better on the exam, you will be given two options for displaying and printing a certificate of completion. The **Print Certificate** option allows you to display and print the certificate without saving your score in our database and the **Save Score** option allows you to save your score and display and print your certificate.