

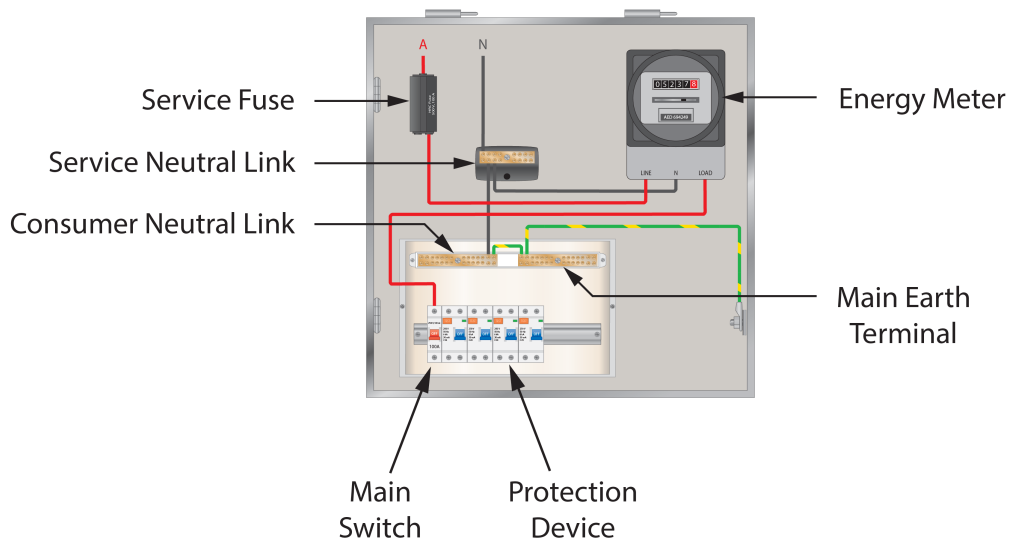
View



Switchboard Layout

The following diagram shows the typical layout of wiring and equipment in a single phase main switchboard with single tariff whole current metering. This type of switchboard would typically be found in a single domestic installation.

***Exact wiring and equipment arrangements may vary slightly based on local Service and Installation Rules (SIR).**



Things to note about the switchboard arrangement include:

- The service fuse is connected upstream and in series with the installation equipment.
- The energy meter is connected in series parallel with the installation.
- A neutral conductor (typically 4 mm²) connects to the neutral side of the voltage coil in the energy meter.
- The main switch is connected downstream from the energy meter.
- The metallic switchboard enclosure is bonded to the main earth terminal.

This learning activity consists of 2 parts designed to develop your understanding of single phase, single tariff main switchboard layouts.



Topic 10.2 Learning Activity

In this skills practice, you are required to design and draw a single phase, single tariff main switchboard layout. You will be able to undertake this skills practice at your desk, and you will need to have a copy of your local Service and Installation Rules (SIR) available for reference.



Topic 10.2 Skills Practice



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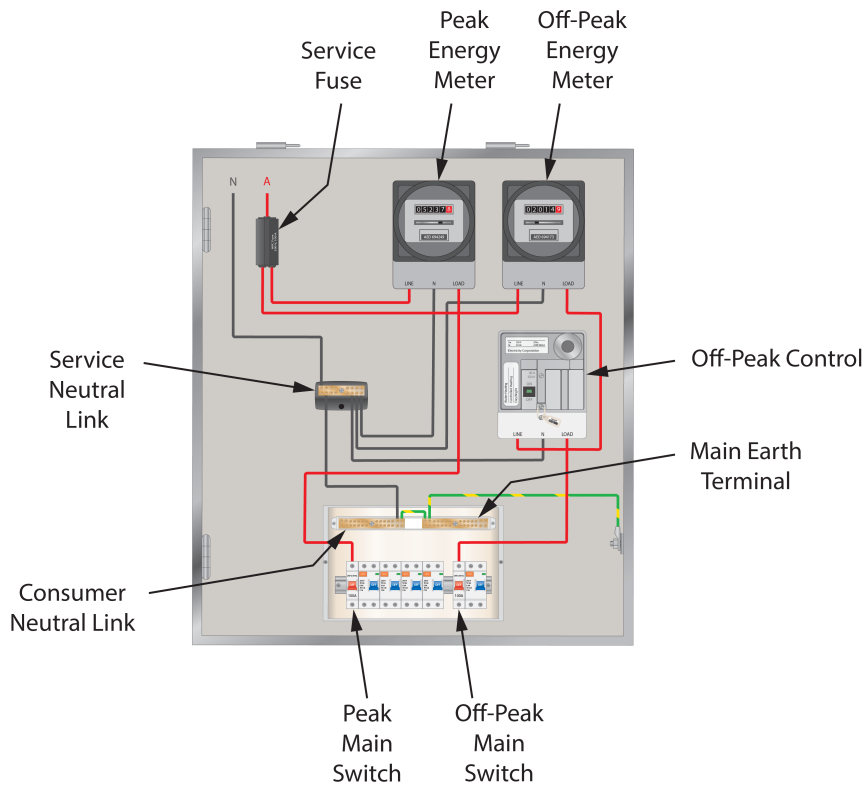


Switchboard Layout



The following diagram shows the typical layout of wiring and equipment in a single phase, multiple tariff main switchboard with whole current induction type meters. This type of switchboard would typically be found in a single domestic installation.

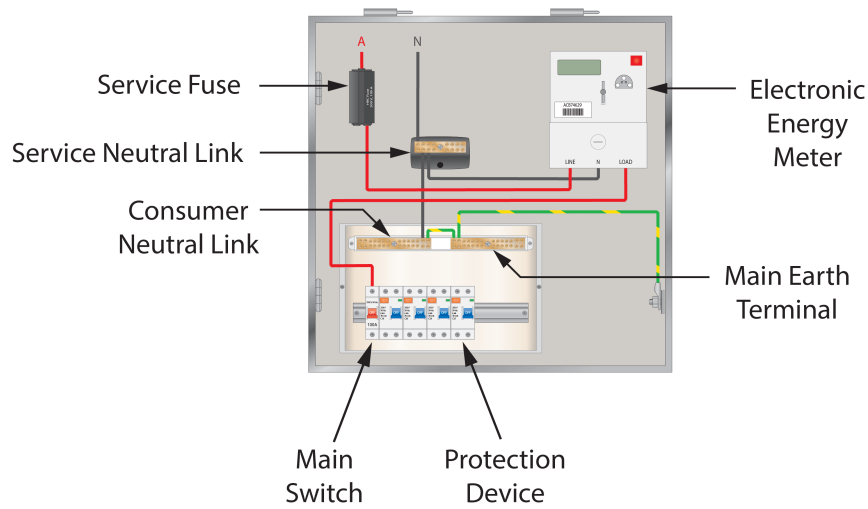
***Exact wiring and equipment arrangements may vary slightly based on local Service and Installation Rules (SIR).**



Things to note about the switchboard arrangement include:

- The off-peak energy meter is connected in series with the controlled load relay.
- The installation has two main switches.

The following diagram shows an alternative method of achieving multiple tariff metering in a single phase installation. In this case, the installation is provided with a TOU capable electronic energy meter.



Things to note about the switchboard arrangement include:

- The energy meter automatically applies different tariffs based on the time of day/night.
- The installation has only one main switch.

This learning activity consists of 4 parts designed to develop your understanding of single phase, multiple tariff main switchboard layouts.



[Topic 10.3 Learning Activity](#)

In this skills practice, you are required to design and draw a single phase, multiple tariff main switchboard layout. You will be able to undertake this skills practice at your desk, and you will need to have a copy of your local Service and Installation Rules (SIR) available for reference.



[Topic 10.3 Skills Practice](#)



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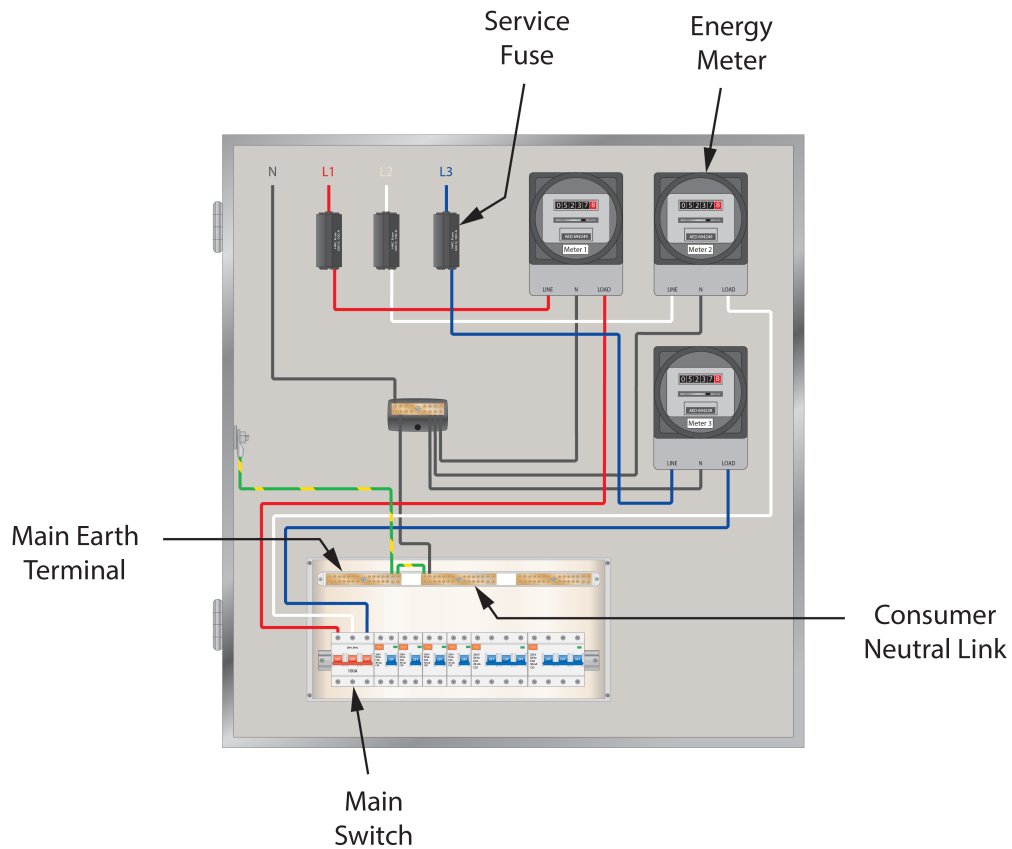
View



Switchboard Layout

The following diagram shows the typical layout of wiring and equipment in a three phase, single tariff main switchboard with whole current metering. This type of switchboard would typically be found in commercial or large single domestic installations.

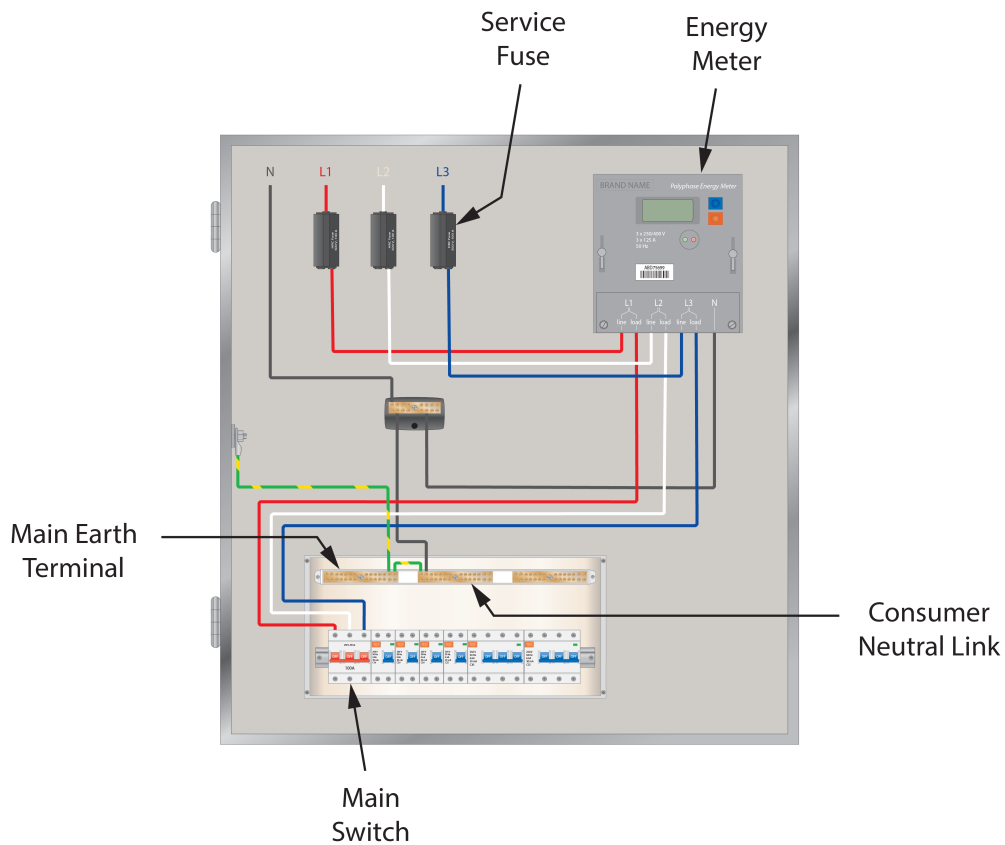
***Exact wiring and equipment arrangements may vary slightly based on local Service and Installation Rules (SIR).**



Things to note about the switchboard arrangement include:

- Each phase is protected by an individual service fuse.
- Each phase is metered by an individual induction type energy meter.
- The installation has one three pole main switch.

The following diagram shows the metering of a three phase installation using a polyphase meter.



Things to note about the switchboard arrangement include:

- All three phases are metered by a single polyphase energy meter.

This learning activity consists of 2 parts designed to develop your understanding of three phase, single tariff main switchboard layouts.



Topic 10.4 Learning Activity

In this skills practice, you are required to design and draw a three phase, single tariff main switchboard layout. You will be able to undertake this skills practice at your desk, and you will need to have a copy of your local Service and Installation Rules (SIR) available for reference.



Topic 10.4 Skills Practice



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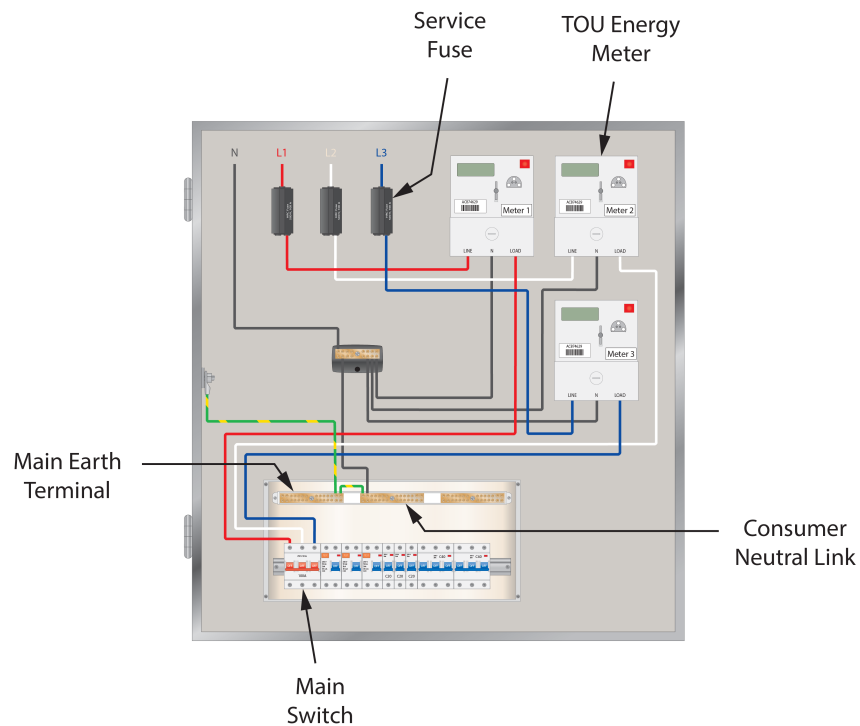
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View

Switchboard Layout

The following diagram shows the typical layout of wiring and equipment in a three phase, multiple tariff main switchboard with whole current metering. This type of switchboard would typically be found in commercial installations.

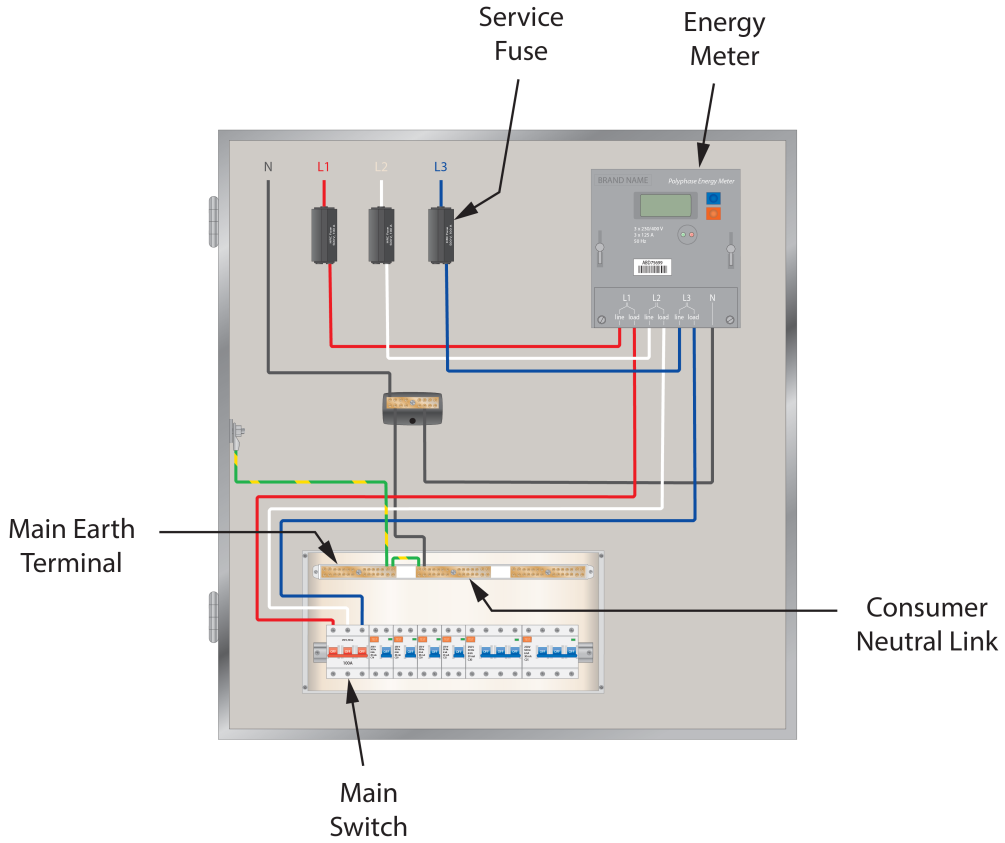
***Exact wiring and equipment arrangements may vary slightly based on local Service and Installation Rules (SIR).**



Things to note about the switchboard arrangement include:

- Each phase is protected by an individual service fuse.
- Each phase is metered by an individual electronic TOU energy meter.
- The installation has one three pole main switch.

Multiple tariff metering of a three phase installation can also be achieved using a single electronic polyphase meter, as shown below.



This learning activity consists of 2 parts designed to develop your understanding of three phase, multiple tariff main switchboard layouts.



Topic 10.5 Learning Activity

In this skills practice, you are required to design and draw a three phase, multiple tariff main switchboard layout. You will be able to undertake this skills practice at your desk, and you will need to have a copy of your local Service and Installation Rules (SIR) available for reference.



Topic 10.5 Skills Practice



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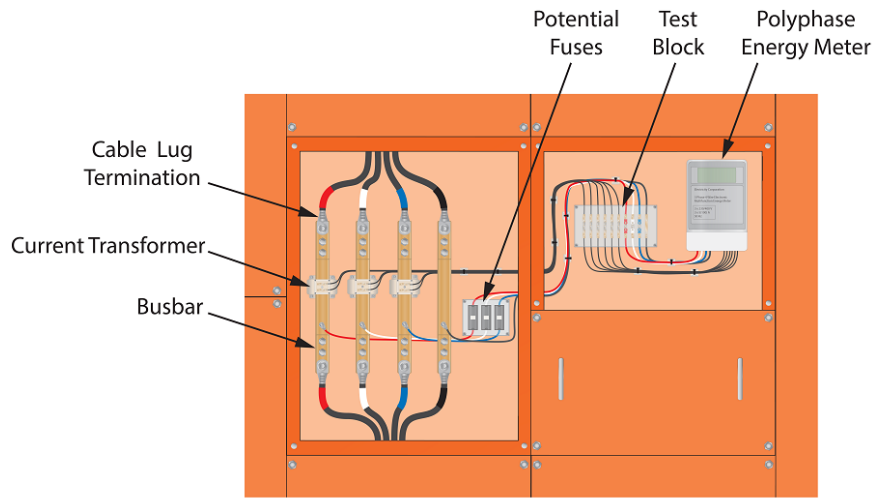


Switchboard Layout



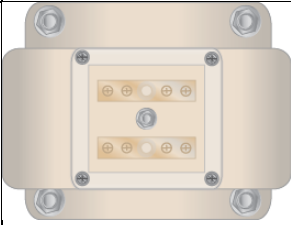
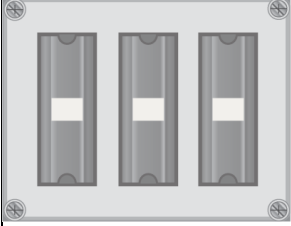
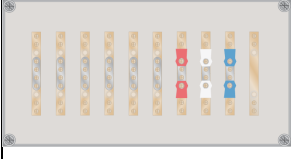
The following diagram shows the typical layout of wiring and equipment in a three phase main switchboard with CT metering. This type of switchboard would typically be found in commercial and industrial installations.

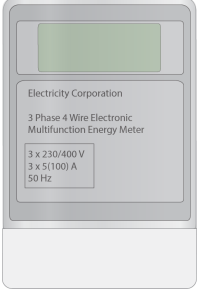
***Exact wiring and equipment arrangements may vary slightly based on local Service and Installation Rules (SIR).**



Current Transformer (CT) Metering

For services greater than 100 A per phase, current transformer (CT) metering is used. The following diagram shows the arrangement of CTs and associated equipment inside the main switchboard of a commercial three phase installation.

CT Metering Equipment		
Components	Illustration	Description
Current Transformer (CT)		<ul style="list-style-type: none"> Measures the load current indirectly by sensing the magnetic field around a conductor. The magnetic field induces an e.m.f. into the CT coil, which causes a current to flow in the CT circuit that is proportional to the load current flowing in the line conductor.
Potential Fuses		<ul style="list-style-type: none"> Potential fuses protect the metering equipment.
Metering Test Block		<ul style="list-style-type: none"> Allows for testing, shorting and disconnecting the CTs from the circuit. Note: for safety, the secondary terminals of a CT must be shorted before the meter is disconnected.

Polyphase Energy Meter		<ul style="list-style-type: none"> • An energy meter is connected to the CT circuit to measure the CT circuit current. • The meter is calibrated to indicate the line current based on the current flowing in the CT circuit.
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This learning activity consists of 2 parts designed to develop your understanding of three phase CT metering arrangements.



[Topic 10.7 Learning Activity](#)

In this skills practice, you are required to design and draw a three phase main switchboard layout incorporating CT metering. You will be able to undertake this skills practice at your desk, and you will need to have a copy of your local Service and Installation Rules (SIR) available for reference.



[Topic 10.7 Skills Practice](#)

Undertaking this topic quiz will help you to confirm your understanding of switchboard equipment, layouts, and Wiring Rules requirements.



[Topic 10 Content Quiz](#)



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