



Build it



Electrical

Miniature circuit breakers, isolators & earth leakage units:
Part 1





Hi I'm Bra Build it

This week Clint is talking about electrical isolators & earth leakage units, explaining the basic applications & mounting options.

Remember to use the correct load rated device for your application, ensuring the cable & equipment's protection at all times.



Note !

For the purpose of this presentation, we will be focusing on the miniature circuit breakers (MCBs), isolators & earth leakage units that are more commonly used in the modern day domestic/residential distribution board installations, however these devices are also used in commercial & industrial distribution boards & control panels.

Lets Talk device mounting options



Lets help you understand how the MCBs, isolators & E/L units are secured in an electrical DB or panel.

Commonly used mounting options

Electrical distribution board suited for DIN mount devices



DIN rail

Electrical distribution board suited for SAMITE/MINI rail mount devices



SAMITE/MINI rail

Important



When selecting electrical equipment for a DB or panel installation, you will need to ensure that you select a device that has a mounting base compatible with the mounting rail in the DB or panel where the device is to be installed.



Note!

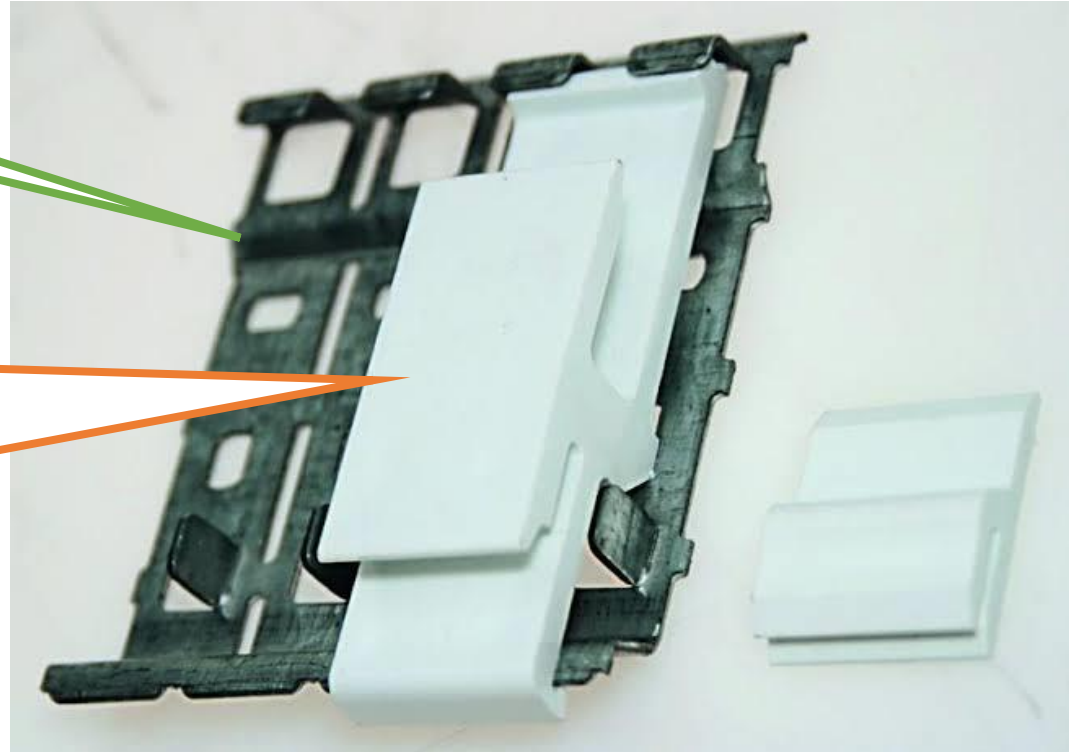
Sales staff need to be aware that when supplying a MCB intended to fit into an existing DB installation, although the din MCB may be a cheaper option, a din MCB is not always suitable for use in a mini rail DB & likewise the other way around.

It's always advisable to supply the customer with a MCB that matches the mounting rail currently installed in the customer's DB.

Rail mount adaptor clip

Samite/mini rail

Din mount adaptor clip used to convert a smite/mini rail DB to accommodate a din rail device. IE: Isolator, E/L or MCB.



Lets Talk Isolators



Lets help you understand
isolators & where they fit
into an electrical
installation.

What is an isolator?

Isolators are a type of switching device used to break the flow of current in a circuit. Isolators are **manually** operated switches and come in various shapes and sizes but all operate on the same principle.

An important factor to consider when choosing a switch is its rating. Reputable manufacturers will always indicate the operating voltage and current rating on the switch. Switches in a residential building would include isolators in the distribution board.

Isolator function

**Important
switch
rating
information**



**2-Pole
isolator**

A **2-pole** isolator is generally installed as a main switch in a single phase DB installation, breaking the phase & neutral conductors simultaneously when switched on or off.



**3-Pole
isolator**

A **3-pole** isolator is generally installed as a main switch in a 3 phase DB installation, breaking all the phase conductors simultaneously when switched on or off.

Important note!

When selecting an isolator for an installation, careful consideration of the switch rating should be taken, due to the fact that an **isolator is not equipped with over current protection!** The over current protection should be taken care of by a circuit breaker or fuse that has been correctly installed up circuit from the isolator in that installation.

Failing to install an isolator with a current rating (measured in Amps) equal to or larger than the rating of the circuit breaker or fuse protecting that circuit, may cause the isolator to overheat and fail with the excessive current drain! This may lead to very dangerous circumstances!

Where should a DB isolator be situated?

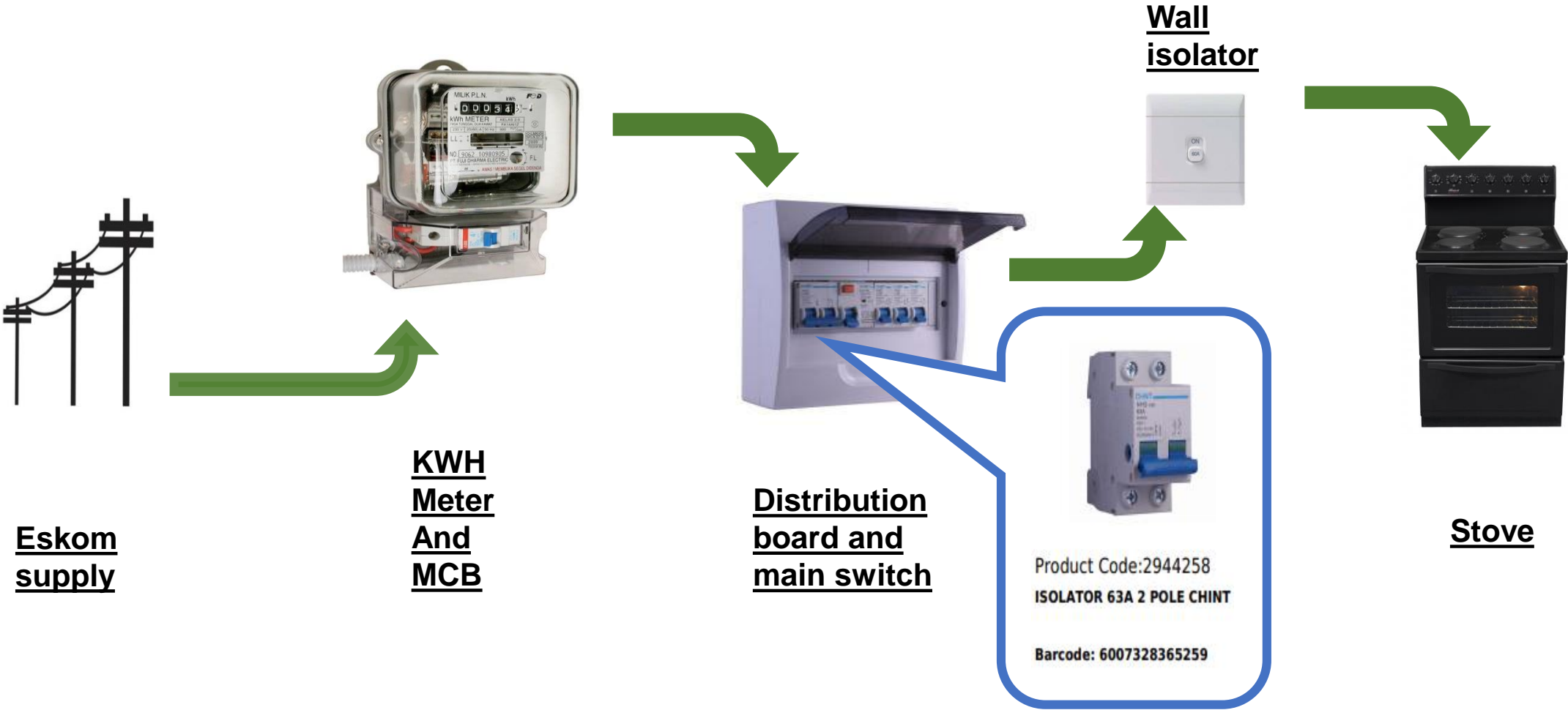
A DB isolator should be mounted in the distribution board, or may be mounted in a separate enclosure alongside the DB.

In the case of the main or first distribution board of an installation, the isolator needs to be labelled as a 'main switch'.

In the case of a sub-distribution board, be labelled as 'sub-main switch' or 'main switch' if the DB is labelled 'sub-board'.

Note: In accordance with the SANS 10142 code for wiring, if the main DB is mounted above the regulation height, a main isolator must be installed and labelled at a height that is accessible to the operator. This is so that the electrical installation may be isolated (turned off) in the case of an emergency.

Example



Lets Talk Earth Leakage Units



Lets help you understand earth leakage units & where they fit into an electrical installation.

What is an earth leakage unit?

An earth leakage unit (E/L) is a device that can detect small imbalances between the earth conductors and the supply, indicating leakage of electricity down to earth.

When this happens, the E/L switch **automatically** turns off or 'trips' and therefore breaking current flow to the circuit or multiple circuits protected by this unit.

A small test button is provided on the E/L unit and it should be used to test the unit periodically. It is a vital safety feature for any installation and should always be installed.

Earth leakage unit function



2-Pole
Earth leakage

A **2-pole** E/L unit is generally installed in a single phase DB installation, breaking the phase & neutral conductors simultaneously when “tripped” due to an earth fault detection or if manually switched.



4-Pole
Earth leakage

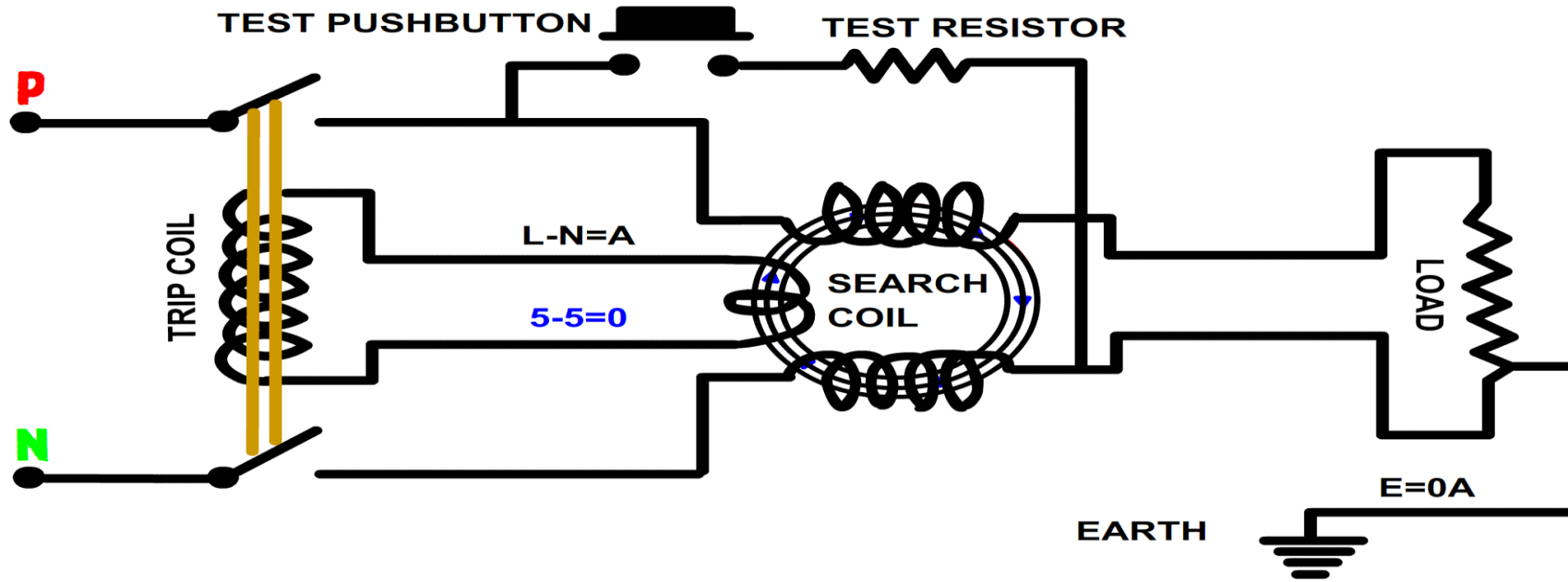
A **4-pole** E/L unit is generally installed in a three phase DB installation, breaking all phase & neutral conductors simultaneously when “tripped” due to an earth fault detection or if manually switched.

Types of E/L Units

There are 2 types of E/L units commonly used in our domestic installations, one with over current protection and the other without over current protection.

When an E/L unit **without** over current protection is used for an installation, a circuit breaker with an over current protection rating that is equivalent to or less than the switch rating of the E/L should be installed. This will need to be installed up circuit from the E/L unit, protecting the E/L unit from a possible over current situation and resultant damages.

Basic operation of an E/L unit



Build it DC range



Product Code:2944240
ISOLATOR 32A 2 POLE CHINT

Barcode: 6007328365242



Product Code:2944258
ISOLATOR 63A 2 POLE CHINT

Barcode: 6007328365259



Product Code:2943945
**EARTH LEAKAGE 63A 2POLE
30MA 6KA CHINT**

Barcode: 6007328365334

Did You Know ?



Did you know that Build it only purchases product from accredited & approved suppliers?

MCBs, Isolators & E/L units purchased through the DC are all SABS approved.

Thank You



Thank you for joining me. I hope you enjoyed the isolators & E/L units part 1 tutorial.

Part 2 tutorial will cover MCBs and how they are used in an electrical installation

Until then, stay safe!