

TOPIC 2D: WIRING SYSTEM





WHAT YOU SHOULD KNOW

3.3 Apply consumer circuit in electrical installation

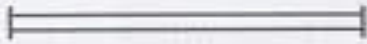


3.3 APPLY CONSUMER CIRCUIT IN ELECTRICAL INSTALLATION

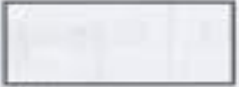
- Cables or lines entering the building are directly connected to a connecting board (service base).
- On this board there is a service fuse and a neutral line.
- These two tools belong to TNB and are its responsibility.
- After the service base, the electricity supply will be connected to the kilowatt hour meter (Watt hour meter).

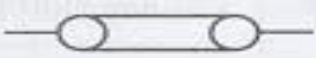
SYMBOL (SIMBOL)

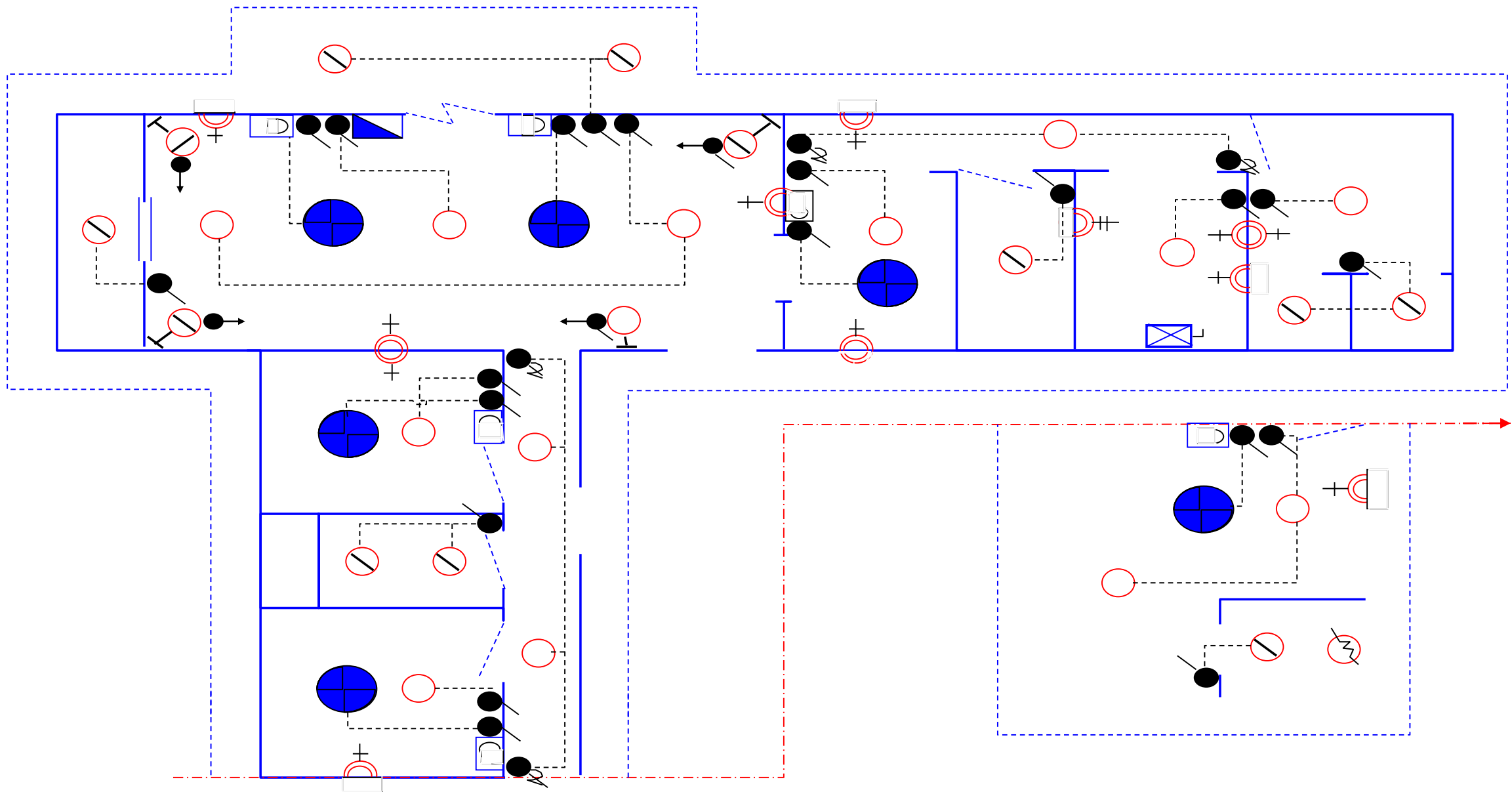


Bil.	Butiran	Simbol piawai
1.	Lampu pendarfluor	
2.	Lampu pendarfluor kembar	
3.	Lampu pendarfluor dinding	
4.	Lampu pendarfluor kembar dinding	
5.	Lampu pendarfluor bulat	
6.	Lampu filamen	
7.	Lampu glob	
8.	Lampu glob dinding	
9.	Lampu dinding	
10.	Lampu dinding kembar	

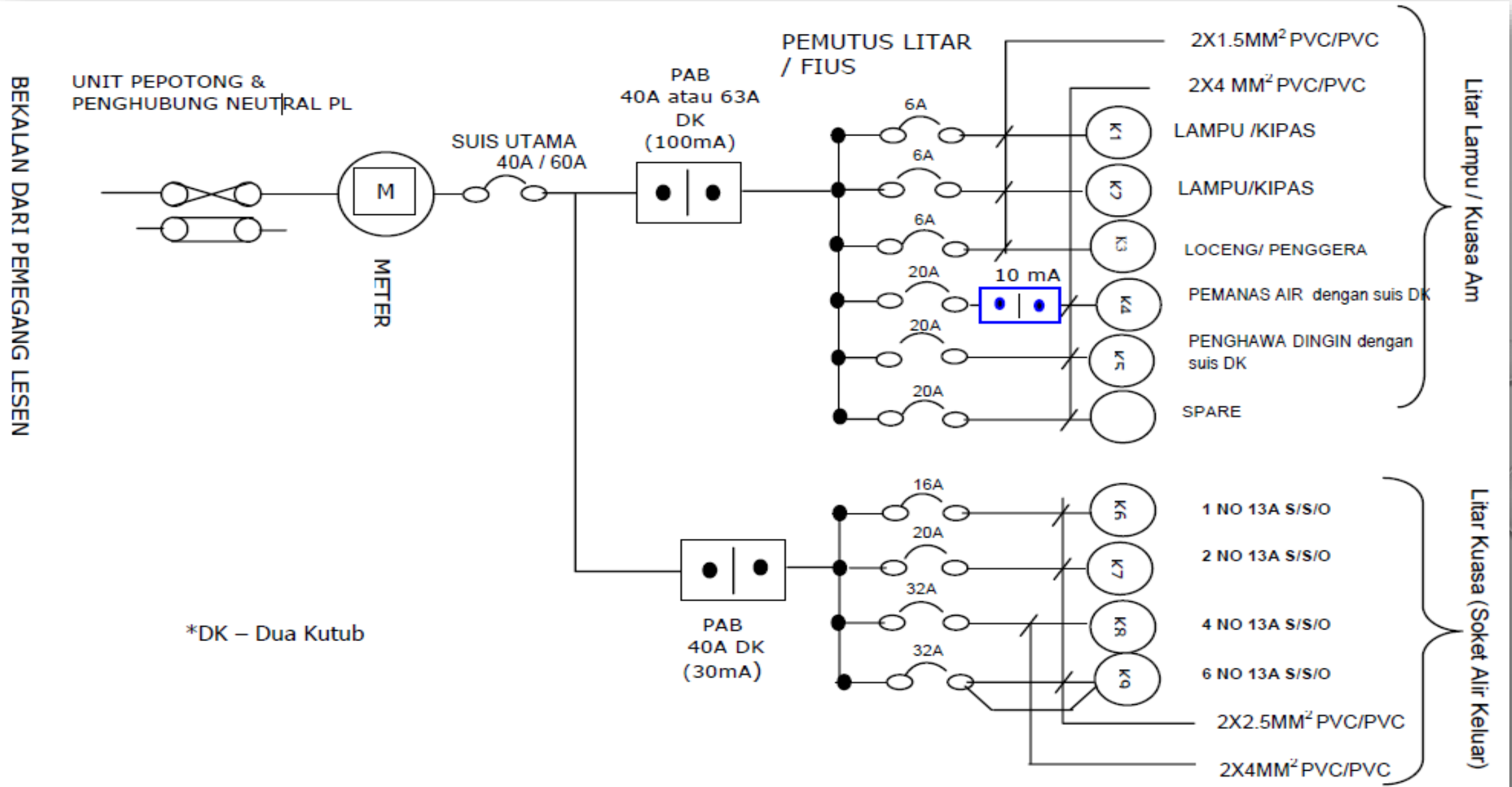
Bil.	Butiran	Simbol piawai
11.	Lampu candelier	
12.	Lampu sorot	
13.	Suis satu hala 5 ampere	
14.	Suis dua hala 5 ampere	
15.	Suis perantaraan 5 ampere	
16.	Suis tarik 5 ampere	
17.	Suis pemalap lampu 5 ampere	
18.	Soket keluar 3 pin 5 ampere	
19.	Soket keluar 3 pin 13 ampere	
20.	Soket keluar 3 pin 15 ampere	

Bil.	Butiran	Simbol piawai
21.	Soket talian telefon	
22.	Soket antena TV	
23.	Loceng elektrik	
24.	Papan fuis agihan	
25.	Kipas siling	
26.	Kipas ekzos	
27.	Kipas dinding	
28.	Alatur kipas	
29.	Unit kawalan pemanas	
30.	Poin pemanas air	
31.	Unit penyaman udara	

Bil.	Butiran	Simbol piawai
32.	Unit kawalan pemasak	
33.	Pemutus litar	
34.	Pemutus litar kenit	
35.	Pemutus litar arus baki	
36.	Fius	
37.	Suis berfius	
38.	Penyambung neutral	
39.	Meter kilowatt jam	
40.	Bumi	
41.	Perangkap kilat	
42.	Peti penyambung	



SINGLE PHASE CONSUMER ELECTRICAL WIRING DIAGRAM



SEQUENCE CONTROL CIRCUIT cont...

a) CUTOUT (UNIT PEMOTONG)

- The cutting unit consists of two main accessories, namely the service fuse and the neutral link.
- It is the place of connection of electricity supply from the supplier to the consumer.
- A service fuse was the first live conductor used to limit current and protect a consumer's main circuit.
- It is also the absolute right of the supplier (TNB), must be sealed and cannot be modified by the consumer.
- The most commonly used service fuse sizes are 30A, 60A and 100A of the HRC or Cartridge type.



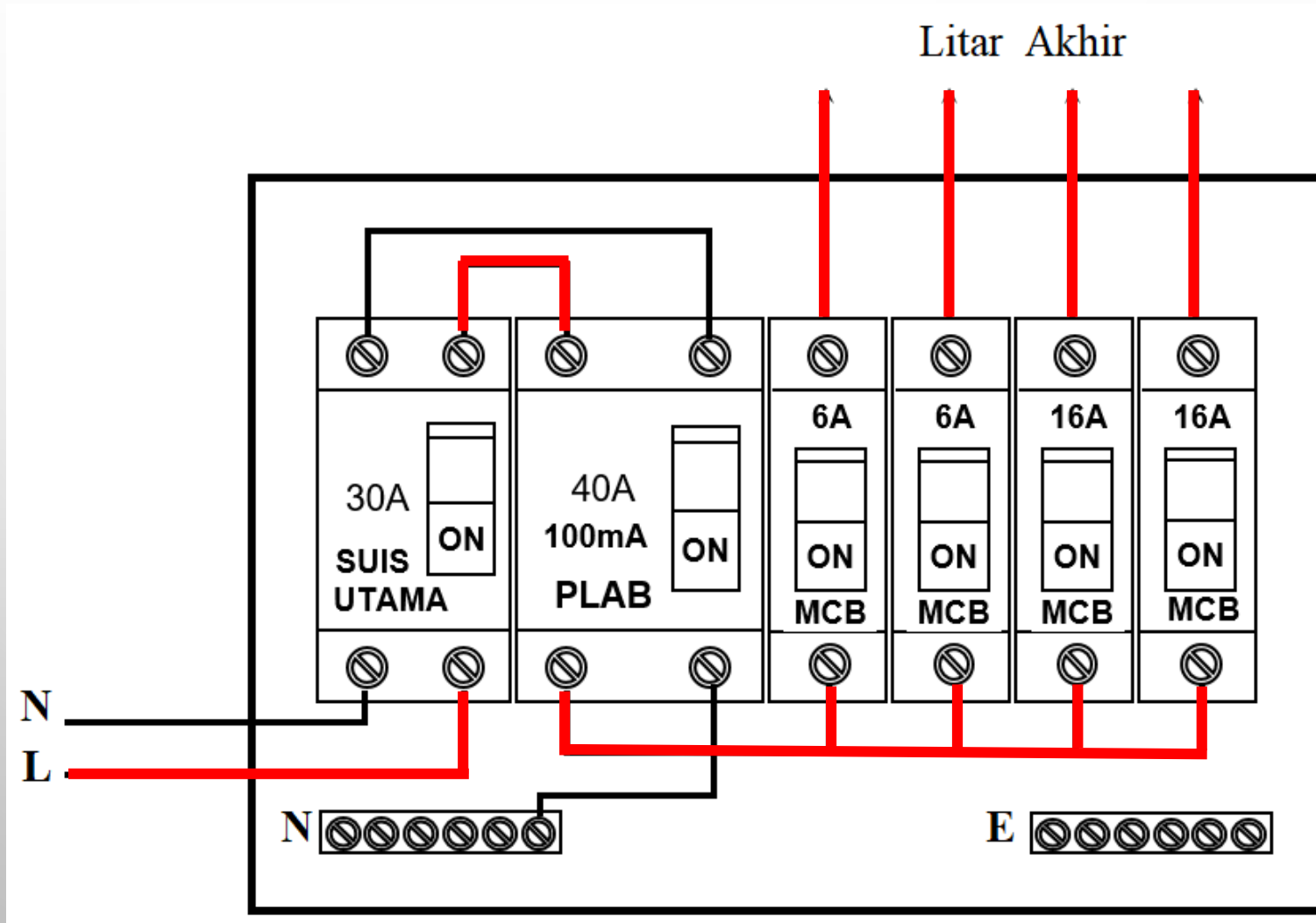
SEQUENCE CONTROL CIRCUIT cont..

b) KILOWATT HOUR METER (JANGKA KILOWATT JAM)

The term kilowatt hour is used to measure the amount of energy consumed by a consumer in a given period of time. Its basic construction consists of a current coil and a voltage coil. KWJ terms are available for 1 phase 2 wire and 3 phase 4 wire installations.



DISTRIBUTION BOARD (KOTAK FIUS AGIHAN)



SEQUENCE CONTROL CIRCUIT cont..

c) Main switch

The main switch is a mechanical device that can manually open and close a circuit. It is very important in an electrical wiring installation because it is used to ensure there is no danger in the event of overcurrent or a short circuit. There are two common types of main switches that are typically used :

- i. **Fuse switch** – an accessory used in single-phase domestic installations that combines a switch and a fuse. The fuse is fixed in place and does not move together with the switch link.
- ii. **Switch fuse** – an accessory commonly used in industrial installations or in three-phase systems. It consists of both a fuse and a switch. The fuse link is mounted together with the fuse and moves simultaneously with it. Switch fuses are available in sizes of 30A, 60A, 100A, 150A, 300A, and 400A



SEQUENCE CONTROL CIRCUIT cont..

d) RESIDUAL CURRENT CIRCUIT BREAKER (RCCB)

RCCB is a control used to control earth leakage circuits. It is turned on manually and will disconnect the circuit automatically in the event of a current leakage to earth



e) DISTRIBUTION FUSE BOX

Distribution fuse box is a fuse assembly or small circuit breaker (MCB) arranged in various sizes for the distribution of electrical energy to the final circuit to the load. It is usually made of wood, PVC and metal.



(ELECTRIC WATER HEATER)

i. Water heater (instantaneous type)

will heat the water immediately when the water tap is opened. This type of heater only requires a 2 -pole switch because the manufacturer has equipped the earth leakage breaker protection on the heater unit.

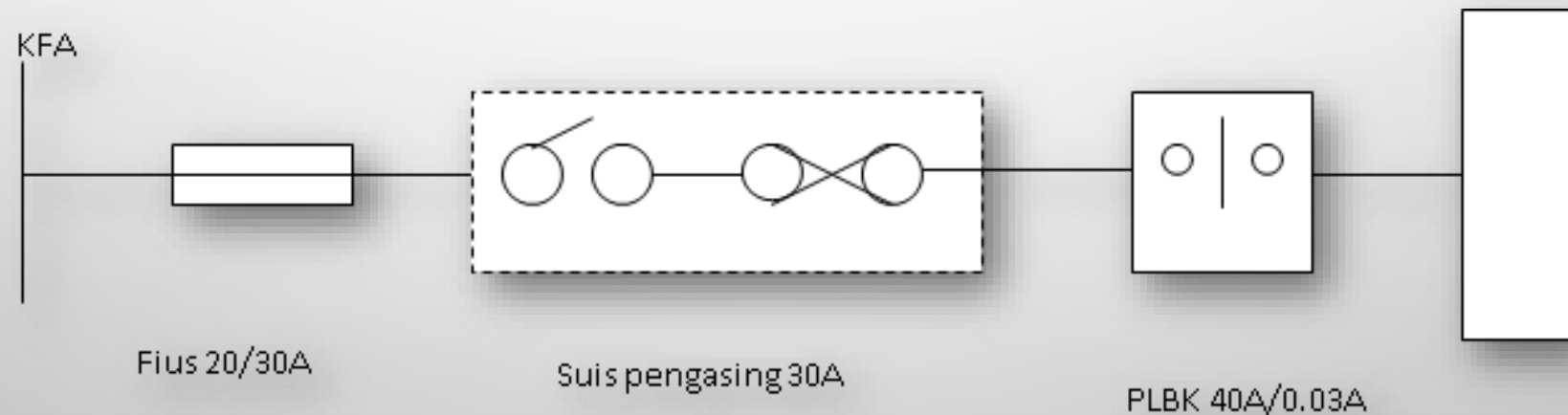
ii. Water heater controlled by thermostat.

will heat the water using a heating rod and controlled by a thermostat. When the water has heated the thermostat acts to cut off the supply. This type of heater requires the installation of an isolator and an earth leakage circuit breaker separately from the main circuit earth leakage circuit breaker (PLBK)

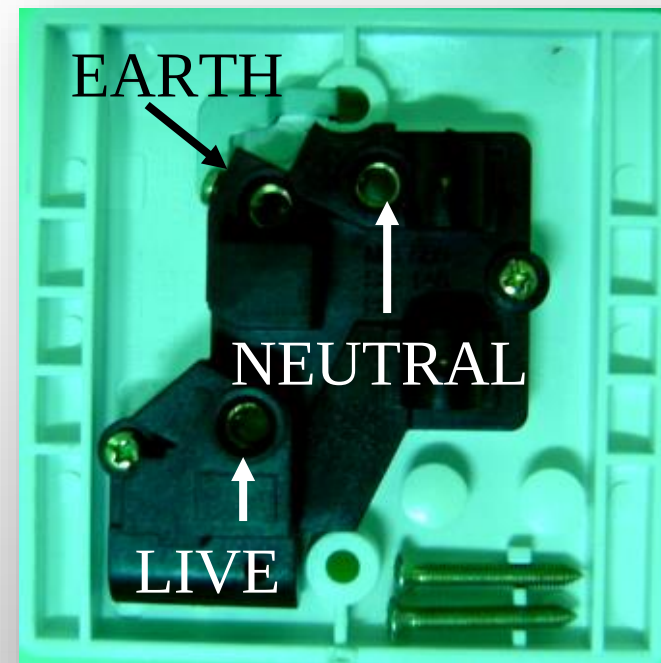


WATER HEATER CIRCUIT

MS IEC regulation 60364 stipulates that water heaters in excess of 3KW must be permanently connected to a 20A/30A fuse in the distribution fuse box together with an isolator switch and an earth leakage circuit breaker having a tripping rate of 10mA - 30mA. Water heaters less than 3KW can be connected directly to a 13A or 15A outlet socket



Suis Socket Outlet



1. Radial Connection

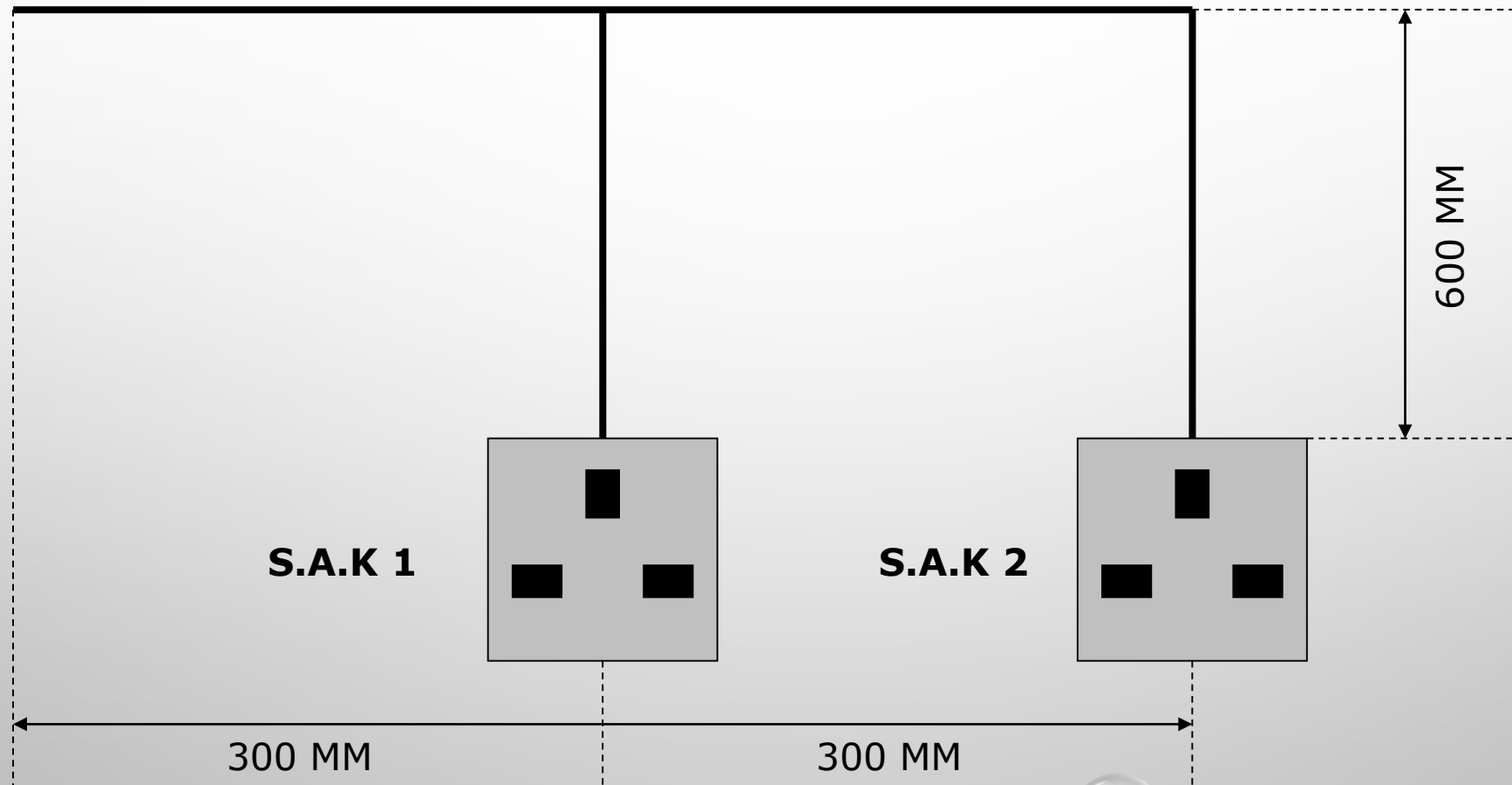
A final subcircuit of the radial type is a common wiring circuit in which the live, neutral, and earth cables are taken from the consumer distribution board through a single MCB rated at 16A or 20A. At the end of the wiring, it is connected to an socket outlet.

Peraturan-peraturan IEE bagi litar Soket Alur Keluar.

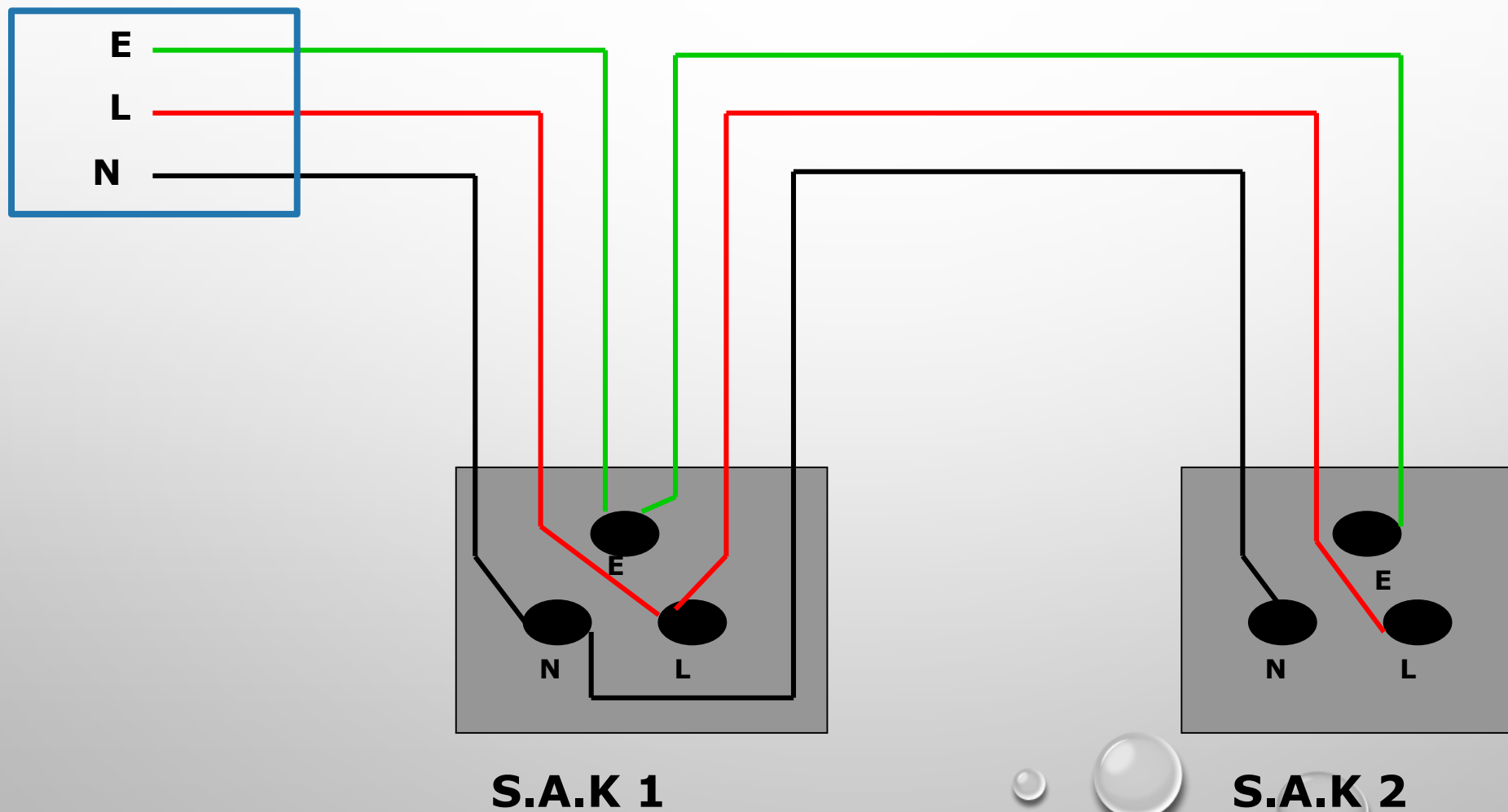
Litar Jejari

- ✓ Peraturan IEE ke 16 menetapkan bilangan soket alir keluar bergantung kepada keluasan lantai bilik, saiz pengalir, dan kadaran perlindungan.
- ✓ Litar ini mestilah dikawal oleh alat perlindungan sama ada fius atau MCB
- ✓ Kabel yang digunakan ialah kabel jenis tembaga bersalut PVC dan saiz kabel mestilah tidak kurang daripada 2.5mm^2 .

GAMBAR JAWAB



2-WIRE AND 3-WIRE CABLES



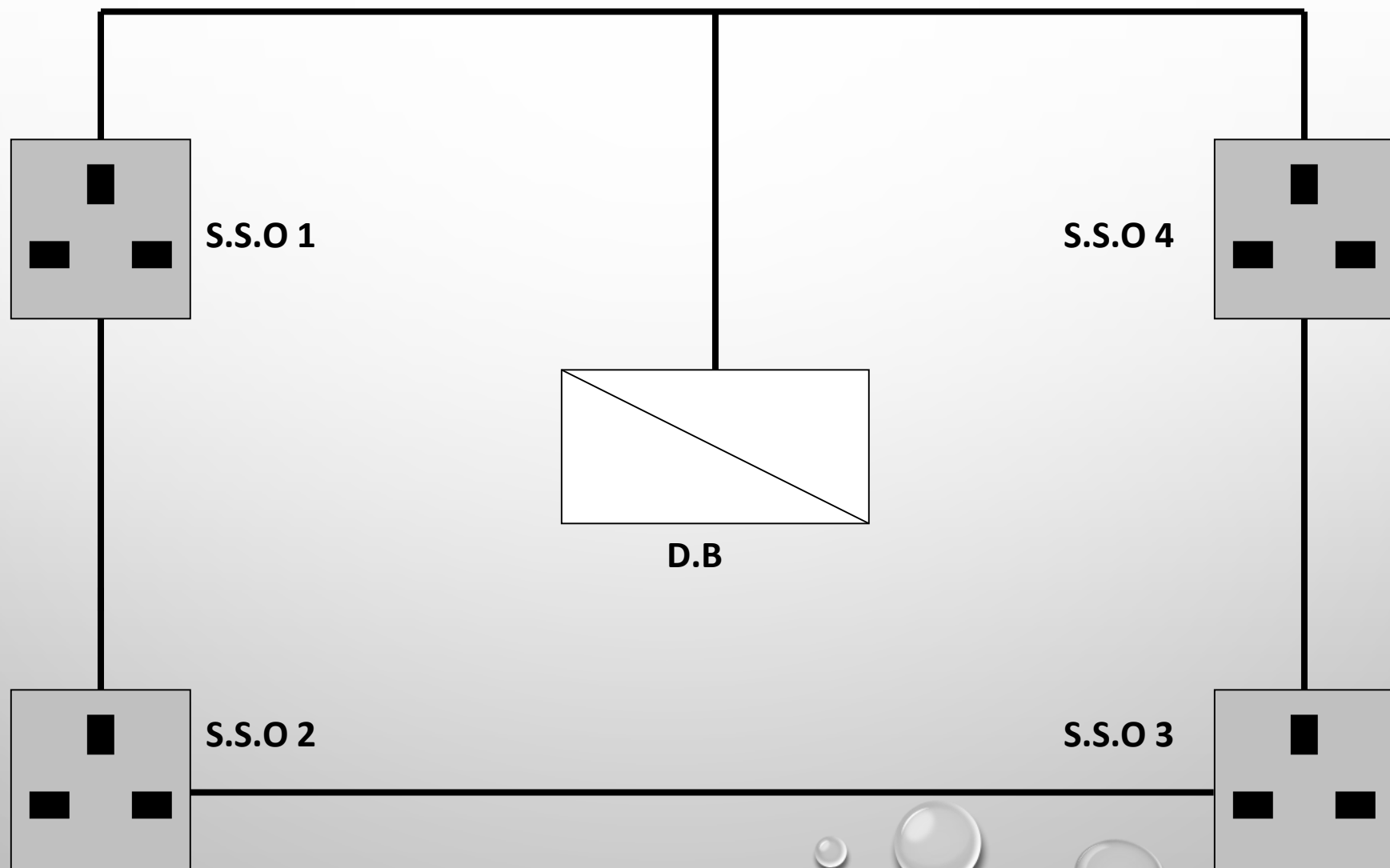
2. Ring Connection

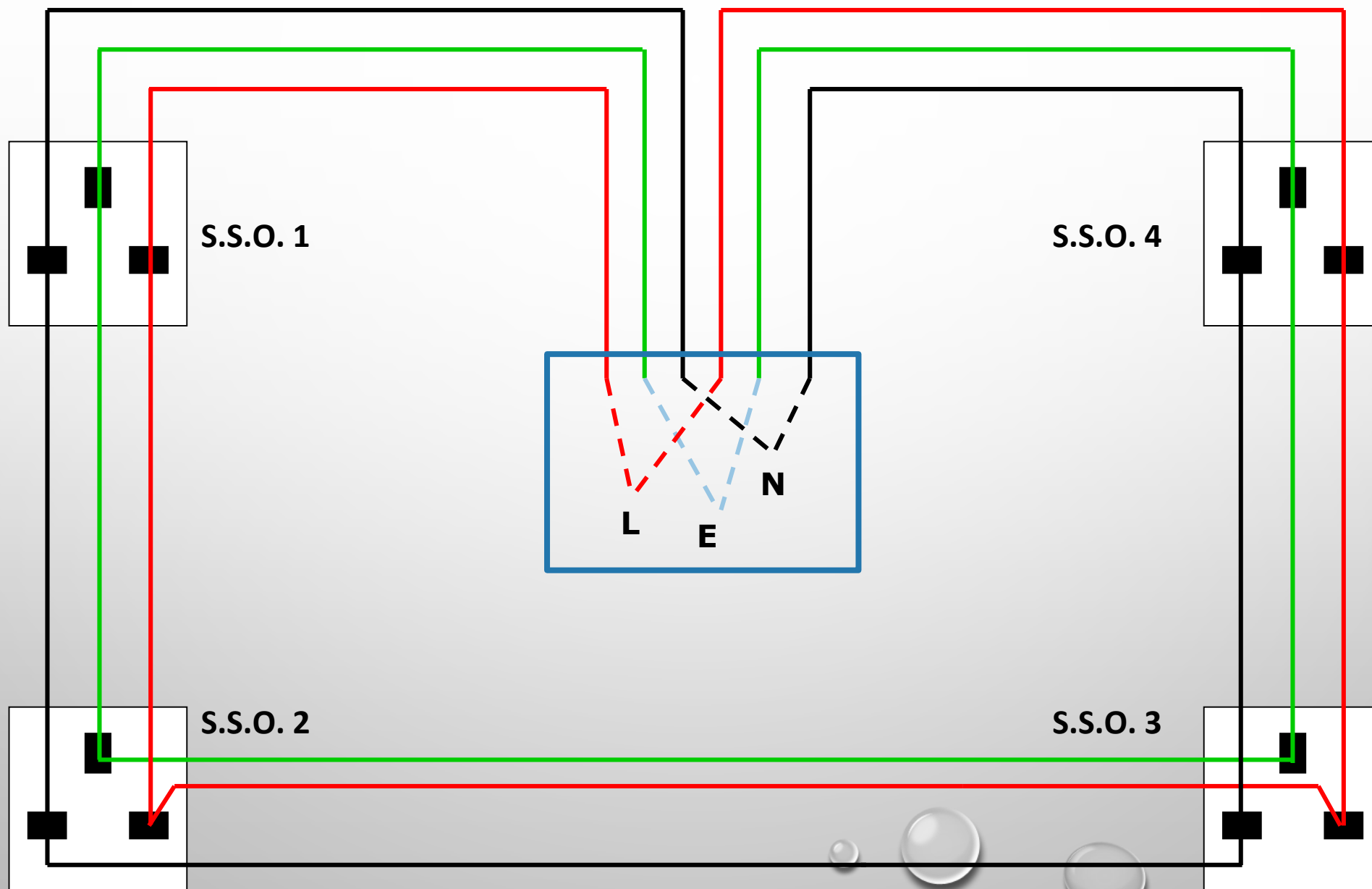
The installation of a ring circuit must begin from a single MCB in the consumer distribution board, with its ends connected to each termination point at the outlet sockets, and then returning to the same MCB

Litar Gelang Jenis A1

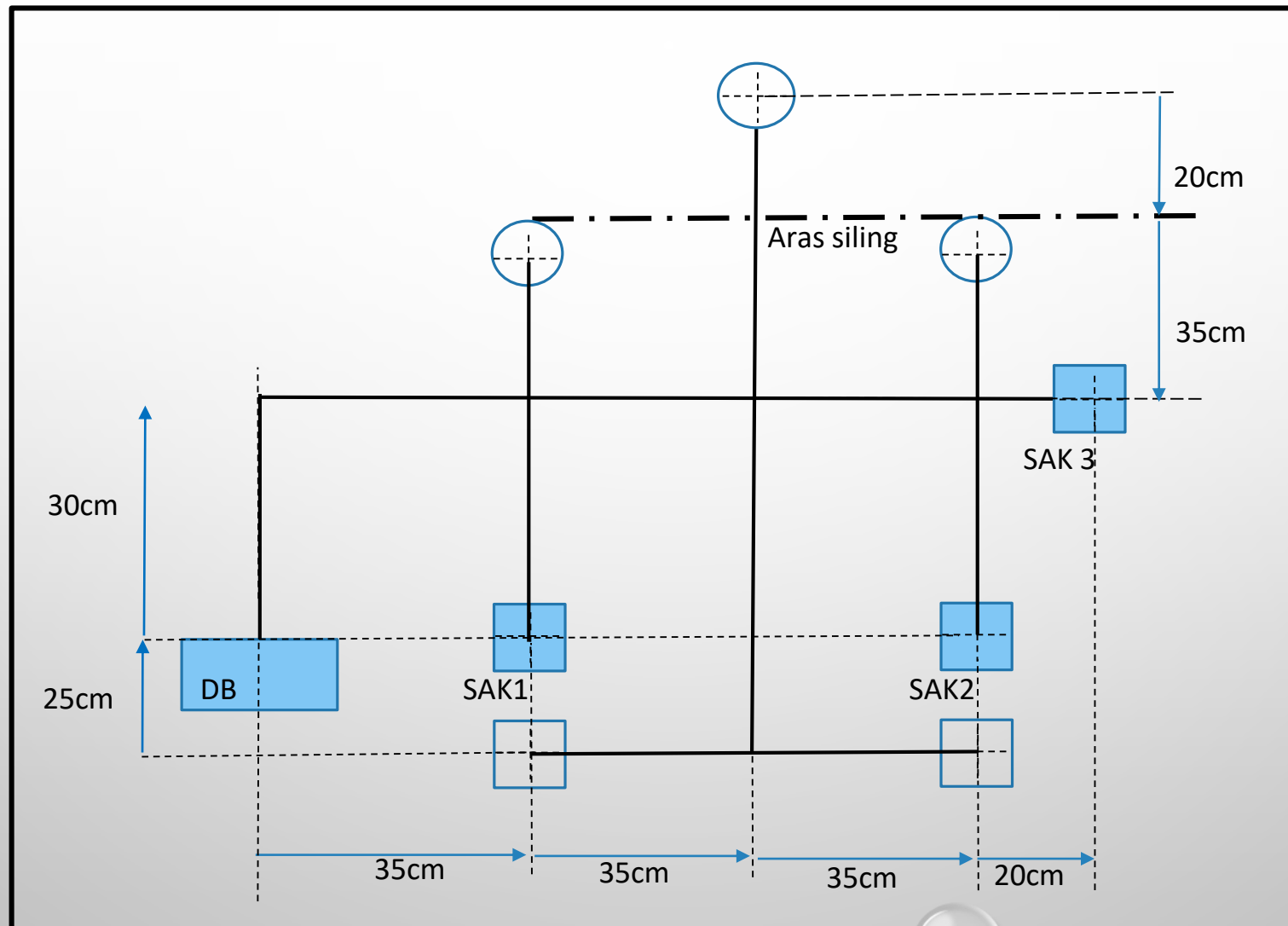
- ✓ Peraturan IEE telah menetapkan Litar Gelang hanya boleh di pasang pada kawasan yang tidak melebihi 100 meter persegi.
- ✓ Jumlah bilangan soket yang boleh di pasang pada satu Litar Gelang tidak terhad.
- ✓ Walau bagaimanapun jumlah arus yang digunakan mestilah tidak melebihi kadaran arus fuis yang mengawal litar berkenaan.
- ✓ Jumlah 'spur' atau sulur bagi satu Litar Gelang tidak melebihi bilangan soket.
- ✓ Kadaran alat perlindungan arus lebih ialah 30 Amp. / 32 Amp.
- ✓ Saiz kabel yang digunakan mestilah tidak kurang daripada 2.5mm².
- ✓ Konduktor litar membentuk suatu gelang berterusan bermula dari punca bekalan (litar akhir) ke beberapa poin soket alir keluar dan balik semula ke punca bekalan.

Single Line Diagram

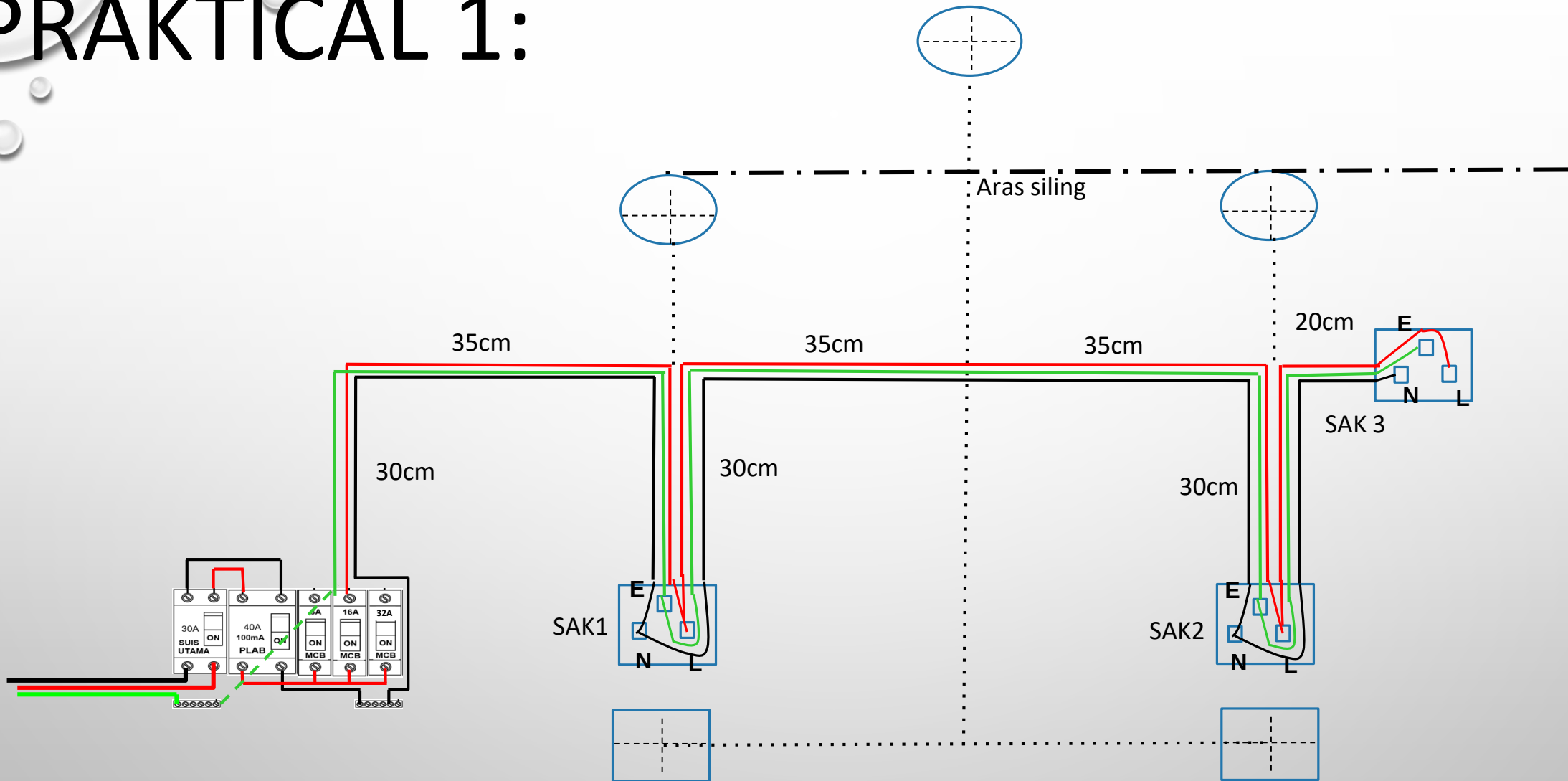


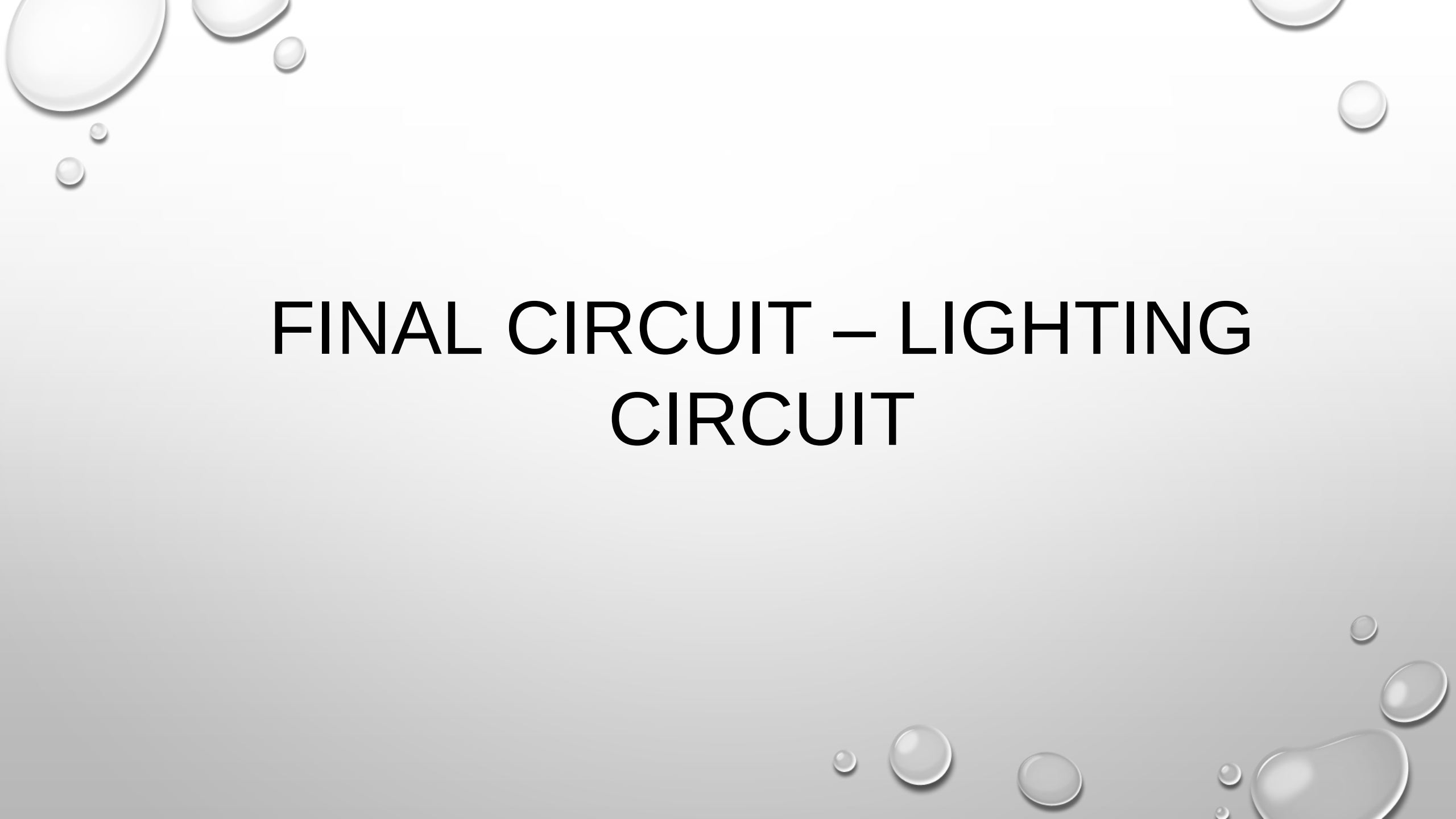


PRACTICAL 1 : AMPERE POWER CIRCUIT (RADIAL) (SAK 1, SAK 2, SAK 3)



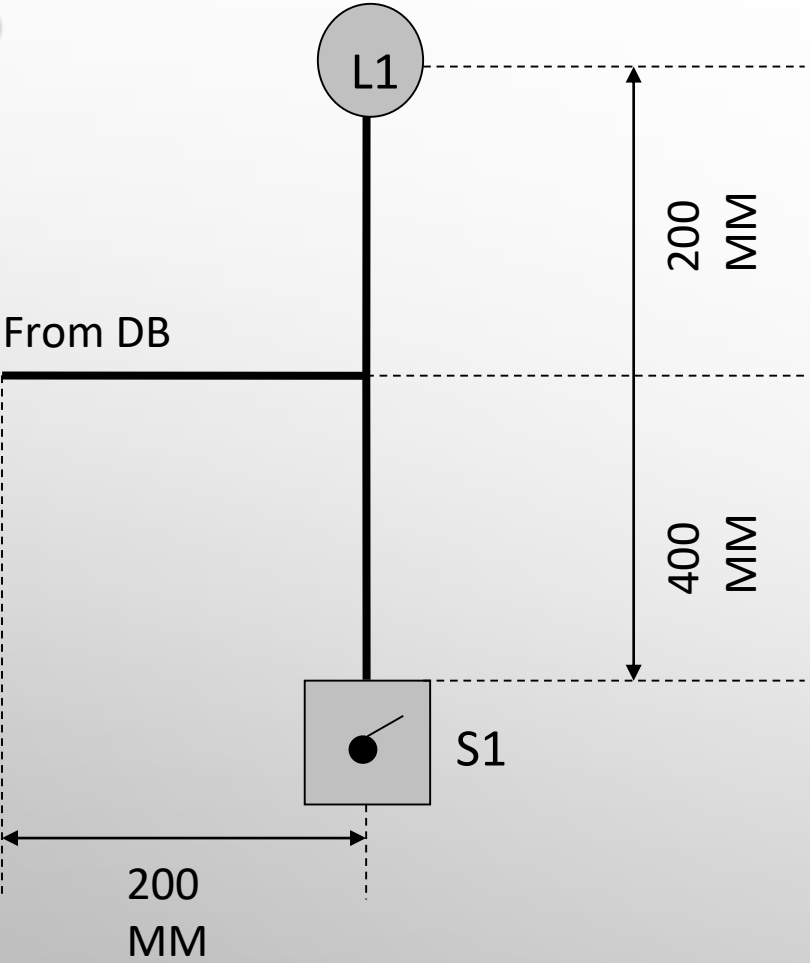
PRAKTICAL 1:



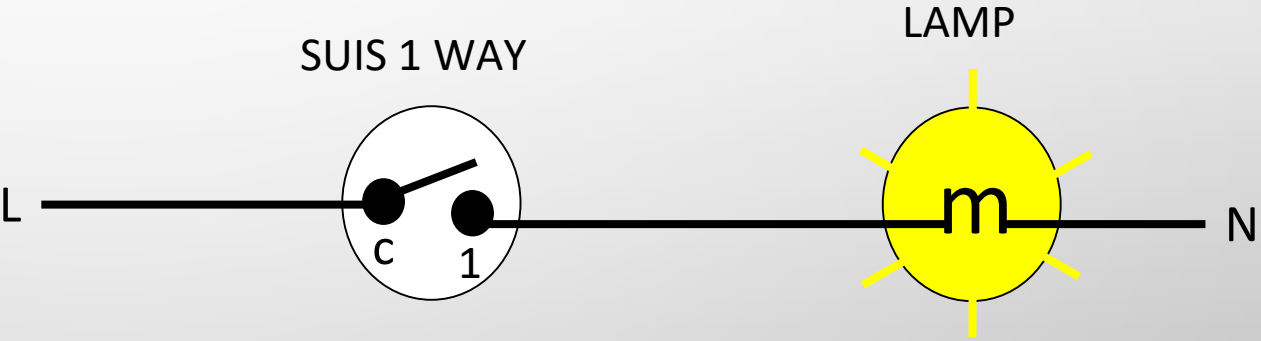
The image features a light gray gradient background. In the top-left and bottom-right corners, there are clusters of realistic, three-dimensional water droplets of various sizes. The droplets have highlights and shadows, giving them a wet, glossy appearance. Centered on the page is the text "FINAL CIRCUIT – LIGHTING CIRCUIT" in a bold, black, sans-serif font, arranged in two lines.

FINAL CIRCUIT – LIGHTING CIRCUIT

1.0 SWITCH ONE WAY ONE GENG - LIGHT POINT
(S1 CONTROL L1)

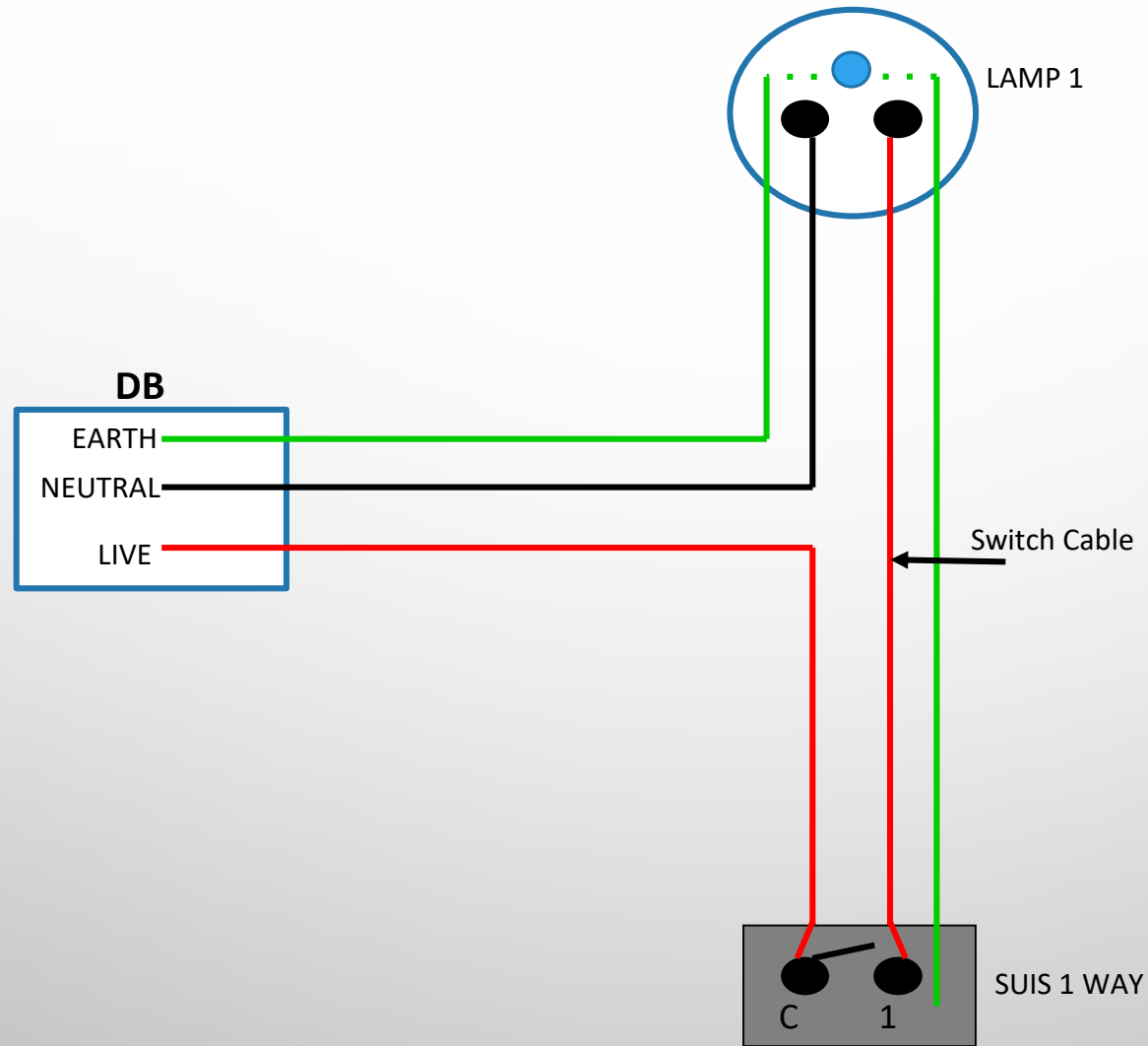


Block Diagram



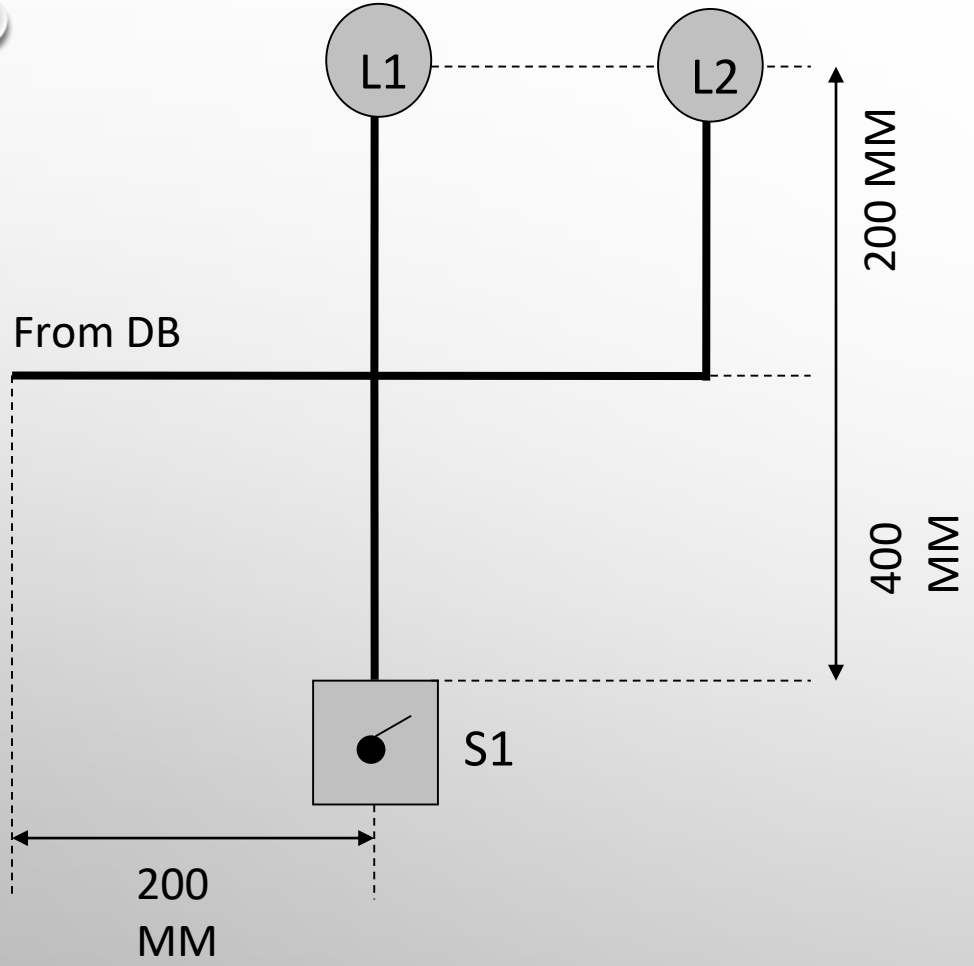
Circuit Diagram

SWITCH ONE WAY ONE GENG - LIGHT POINT (S1 CONTROL L1)

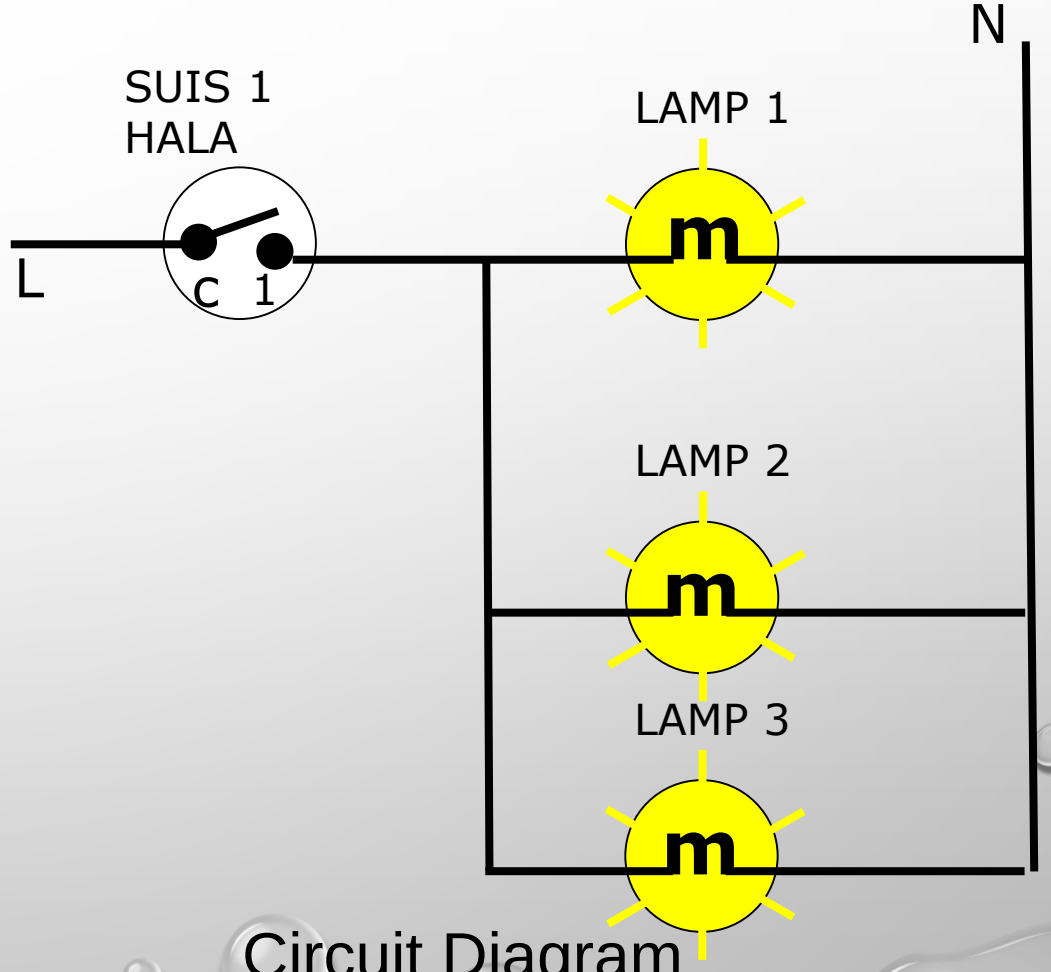


Wiring Diagram

SWITCH ONE WAY ONE GENG - LIGHT POINT
(S1 CONTROL L1 & L2)

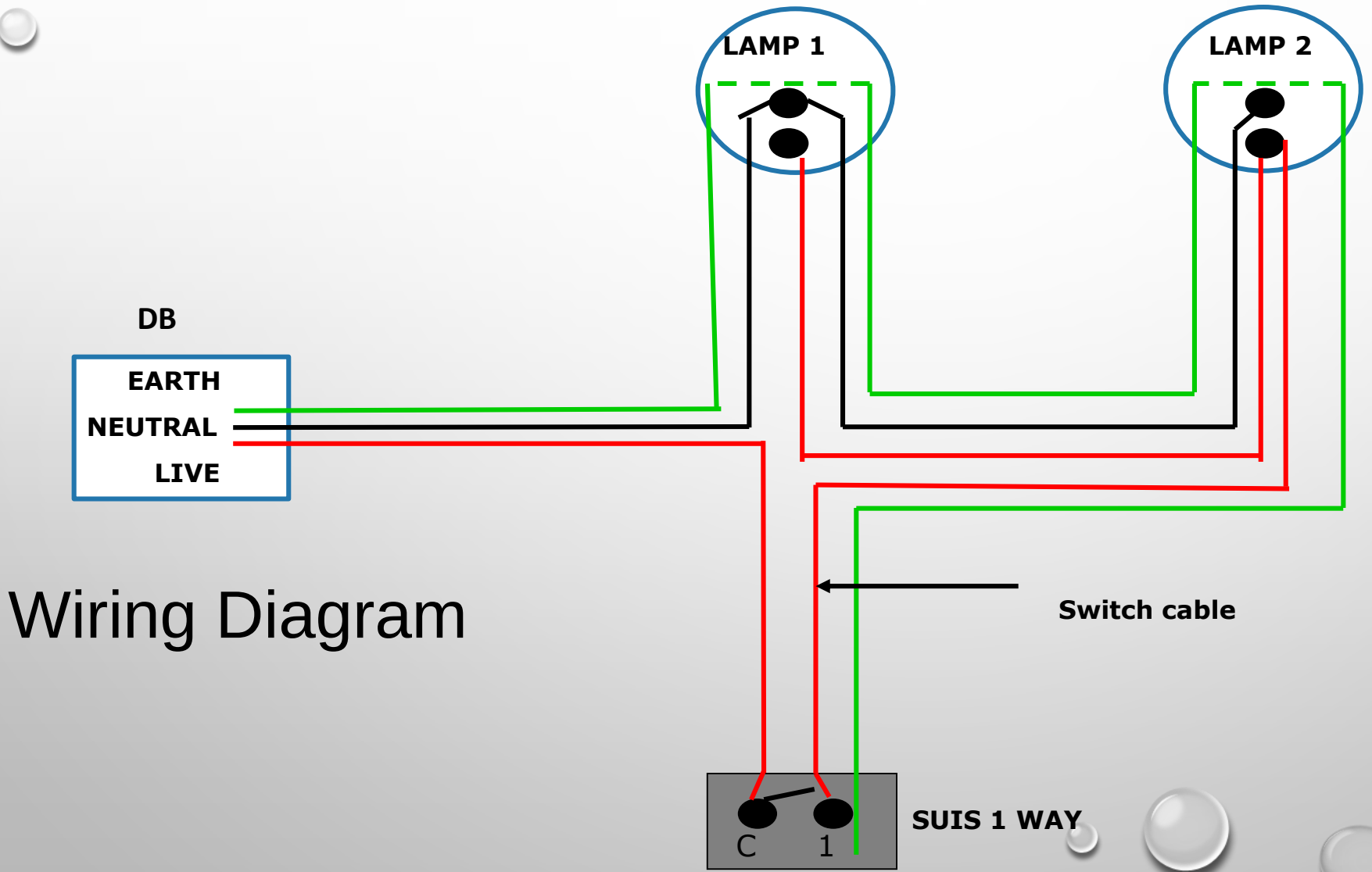


Block Diagram



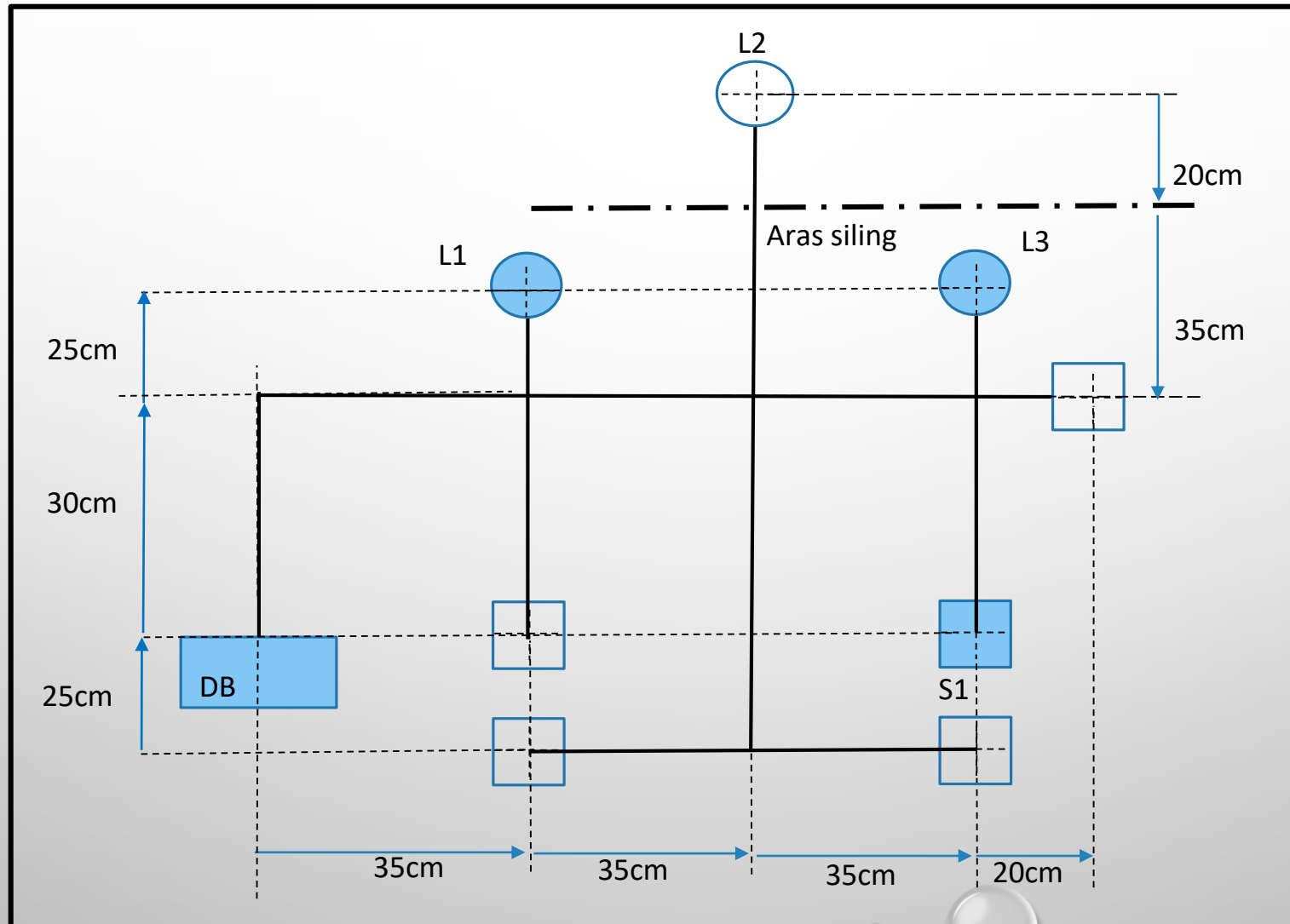
Circuit Diagram

SWITCH ONE WAY ONE GENG - LIGHT POINT
(S1 CONTROL L1 & L2)

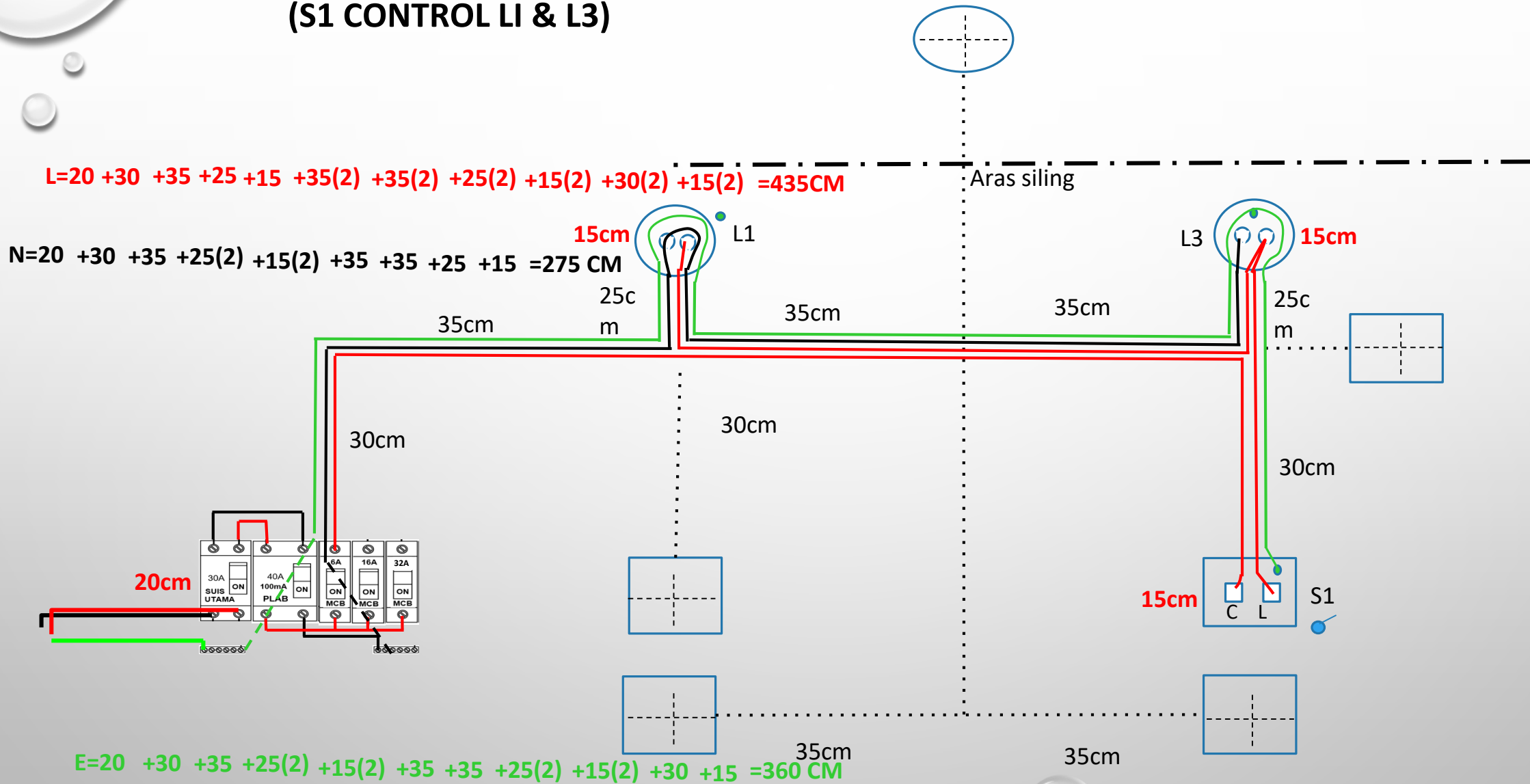


Wiring Diagram

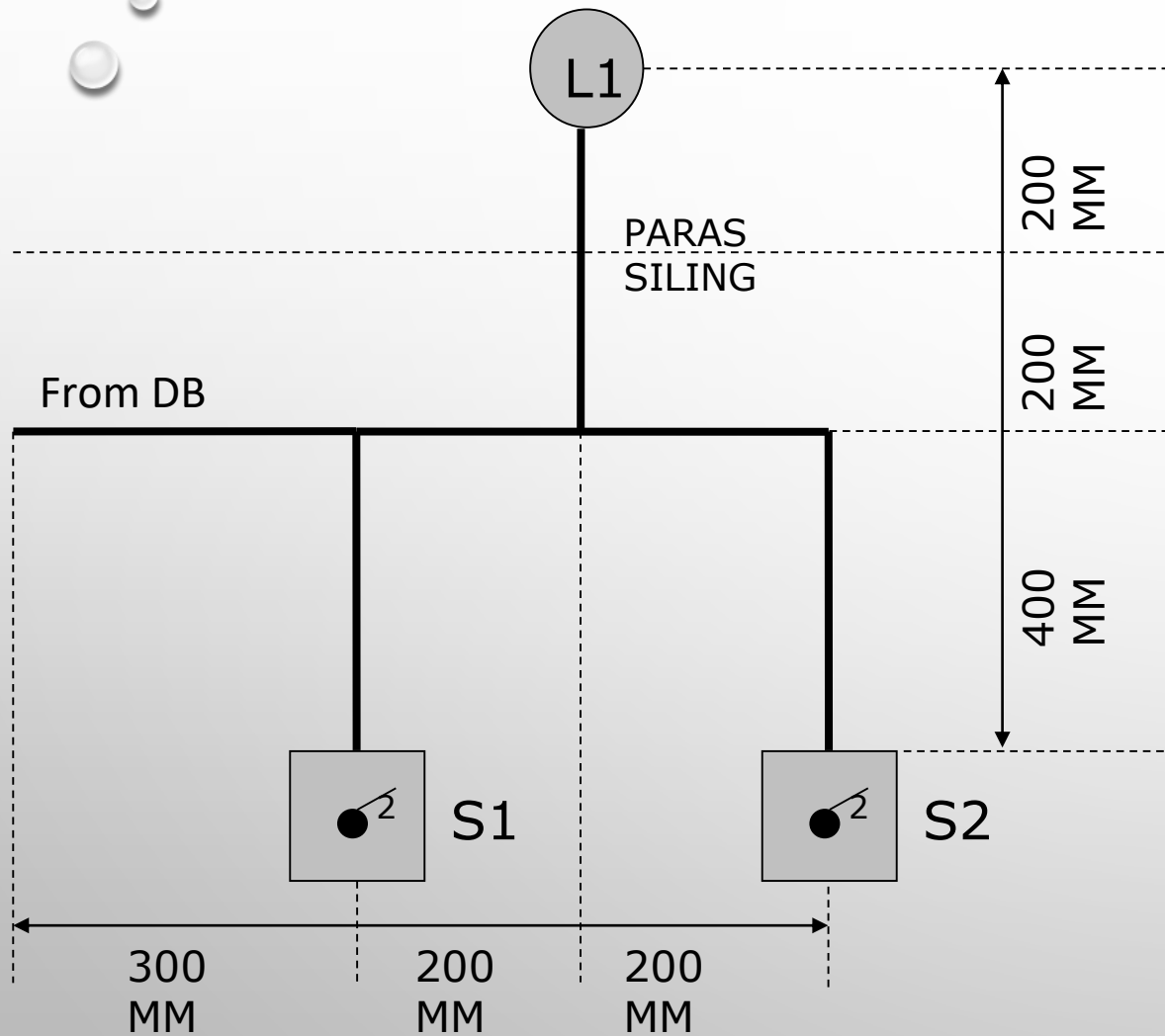
PRACTICAL 2 : SWITCH ONE WAY ONE GENG
SWITCH LIGHT POINT
(S1 CONTROL L1 & L3)



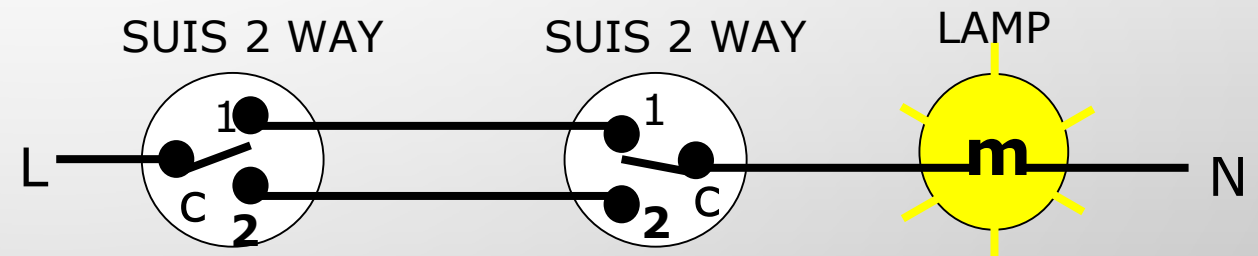
PRAKTICAL 2 :SWITCH ONE WAY ONE GENG LIGHT POINT (S1 CONTROL LI & L3)



2.0 SWITCH ONE WAY TWO GENG - LIGHT POINT (S1 & S2 CONTROL L1)

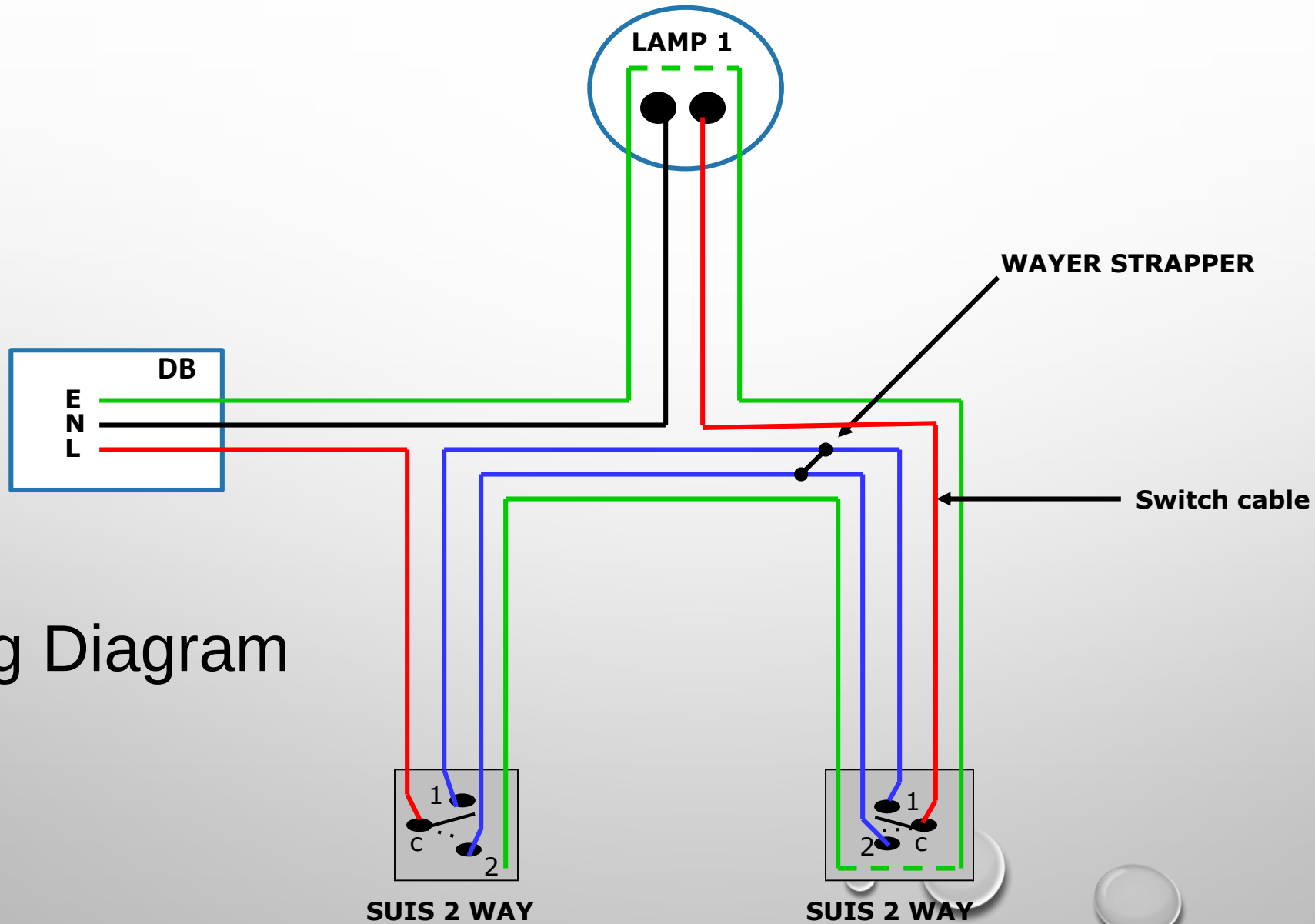


Block Diagram



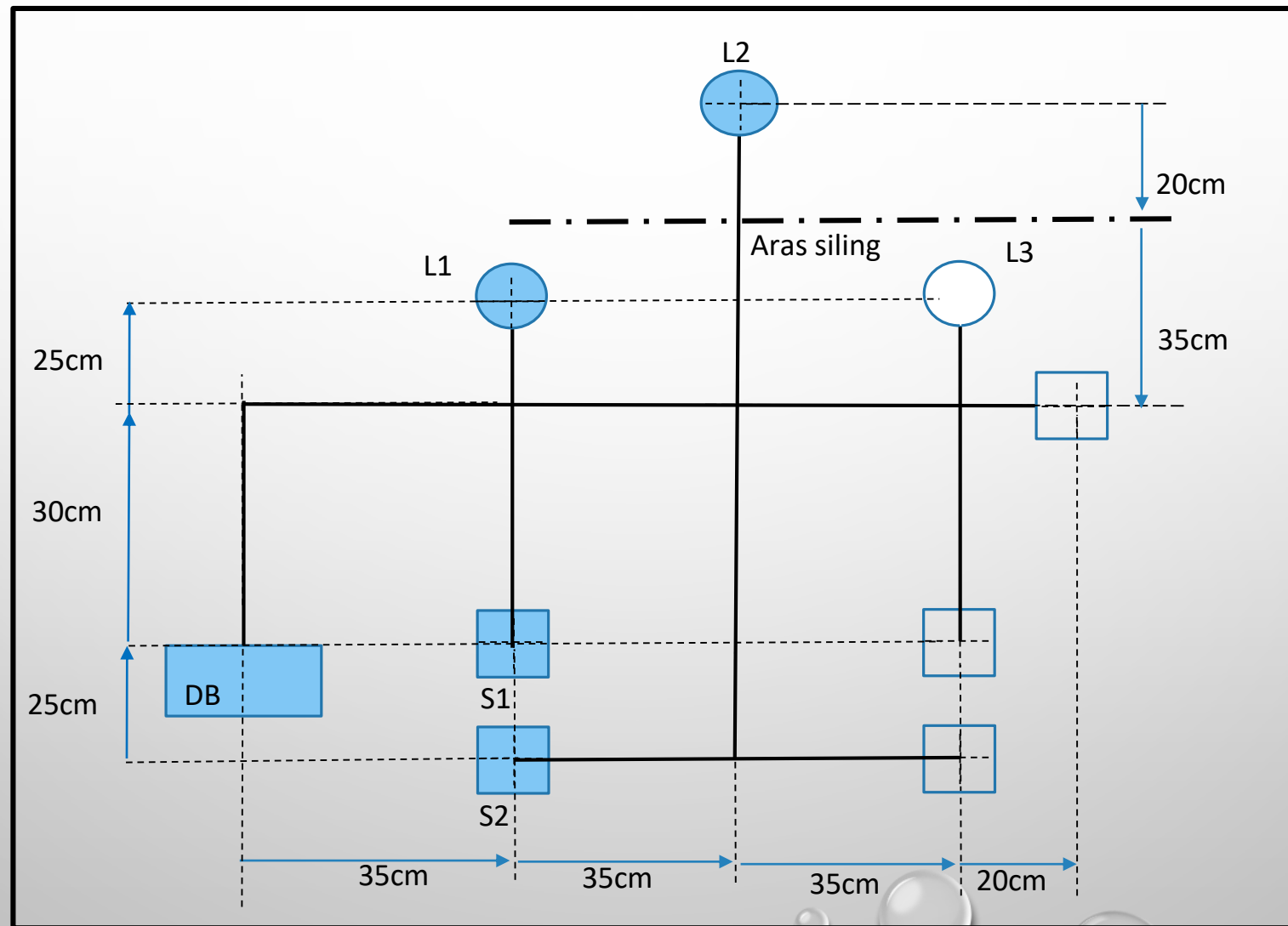
Circuit Diagram

SWITCH ONE WAY TWO GENG - LIGHT POINT (S1 & S2 CONTROL L1)

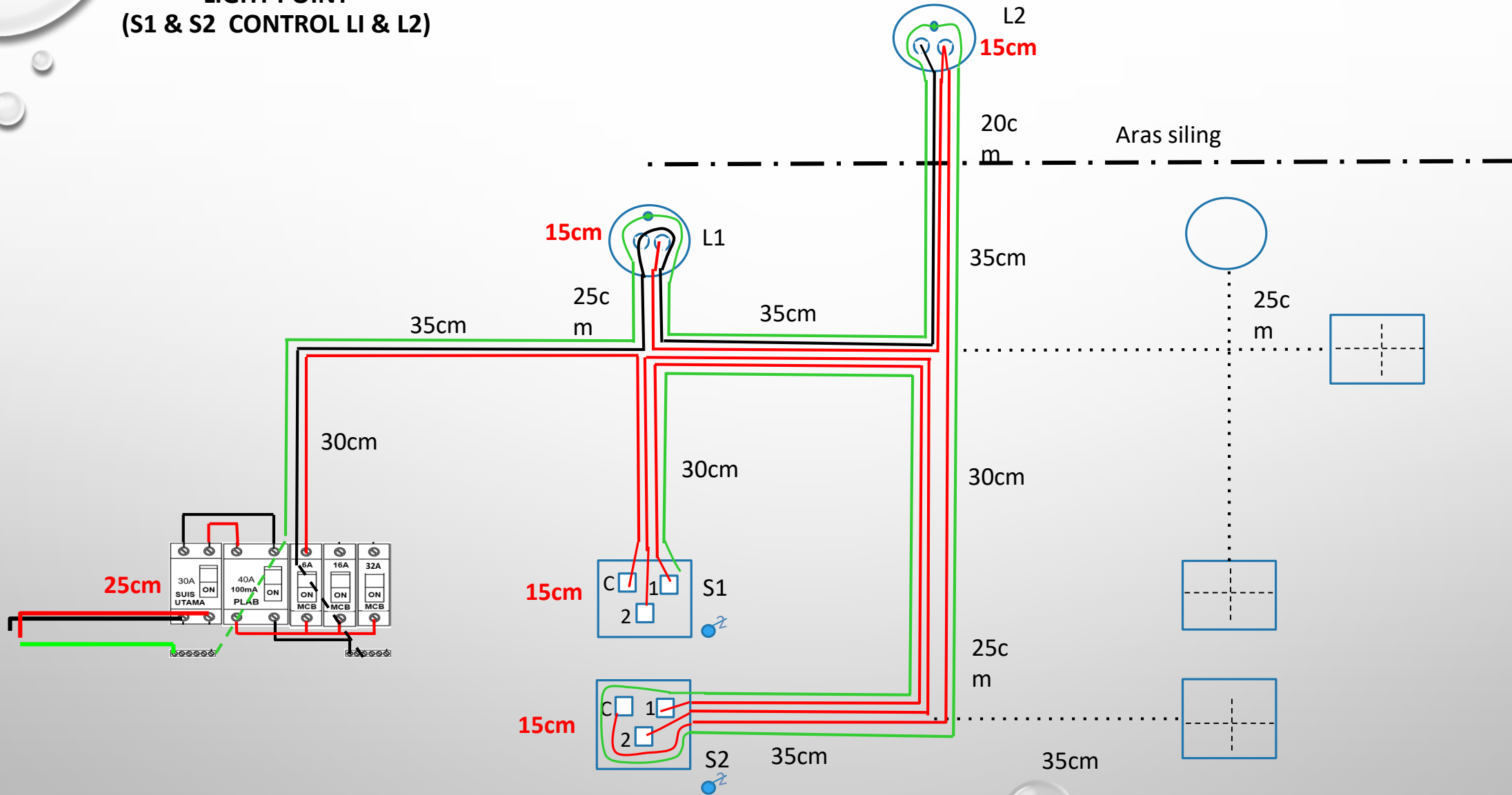


Wiring Diagram

**PRACTICAL 3 :SWITCH TWO WAY ONE GENG
LIGHT POINT
(S1 & S2 CONTROL LI & L2)**



PRAKTICAL 3: SWITCH TWO WAY ONE GENG
LIGHT POINT
(S1 & S2 CONTROL L1 & L2)



FAKTA VS AUTA



PARU-PARU
MANUSIA ADALAH
SAMA BESAR PADA
SEBELAH KANAN
DAN KIRI

FAKTA



**OTAK MANUSIA MEMPUNYAI
KAPASITI MEMORI BERSAMAAN
DENGAN LEBIH DARIPADA
EMPAT TERA BYTE CAKERA
KERAS!**

**OTAK MEMPUNYAI BERAT
KIRA-KIRA 1.3 KG DAN
MENGANDUNGI
SEKITAR 100 BILION NEURON
IATU SEL YANG MEMBAWA
MAKLUMAT**