










**PROGRAMME: ICP
CENTRE: POINT FORTIN
COURSE: ELECTRICAL INSTALLATION LEVEL # 1
INSTRUCTOR: MASLYN VERNE MENDEZ**

<i>Function</i>	<i>UK (New Code as per IEC)</i>	<i>UK (Old Code)</i>
Three Phase Line (L1)		
Three Phase Line (L2)		
Three Phase Line (L3)		
Neutral (N)		
Protective Earth or Ground (PE)		
Single Phase Line		

**TOPIC: CABLES, CONDUCTORS, INSULATORS, COLOUR
CODE, AND VOLTAGE SUPPLY**

(Home Improvement, 2023)



LESSON OBJECTIVES

At the end of this lesson, the students will be able to:

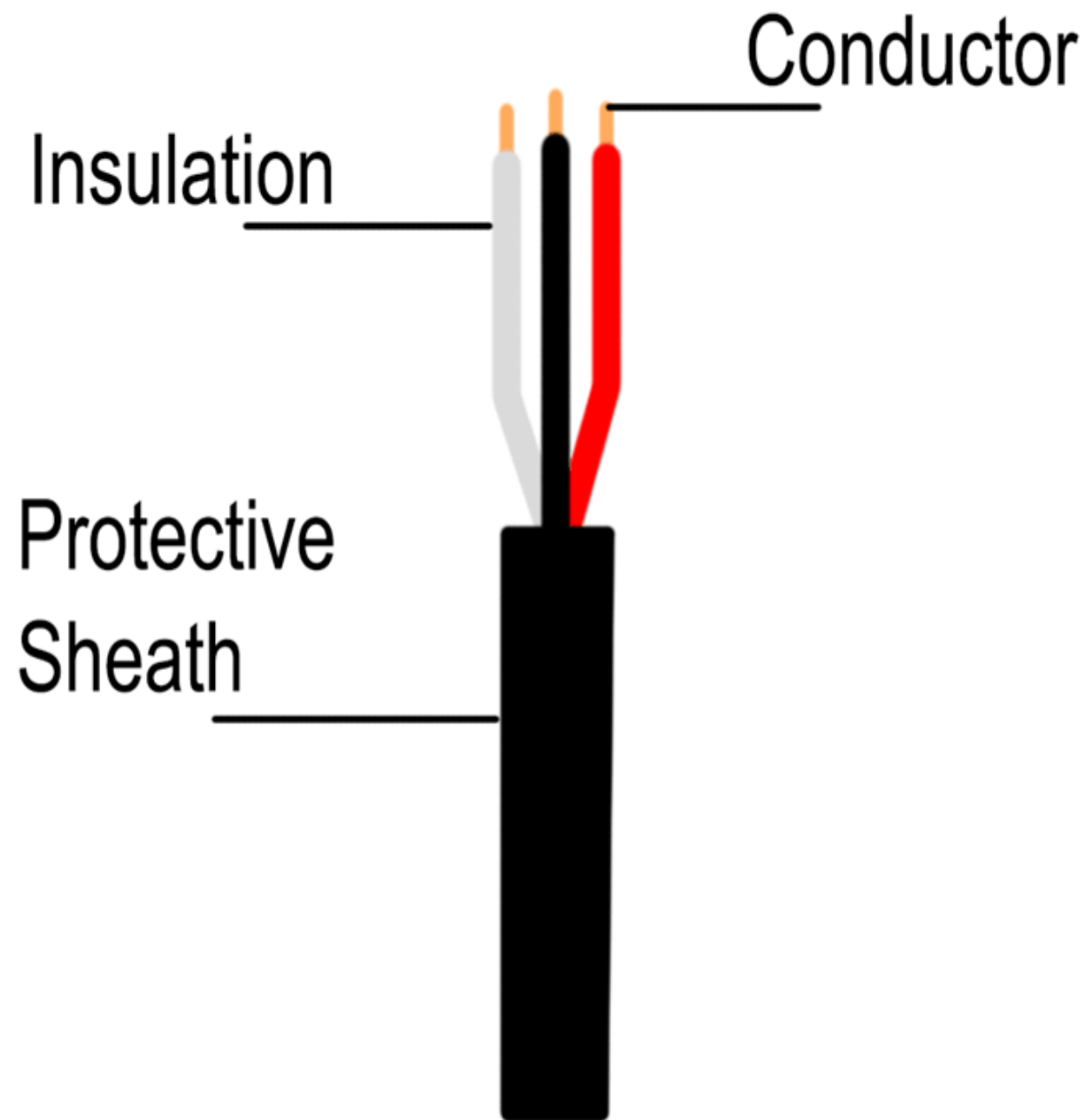
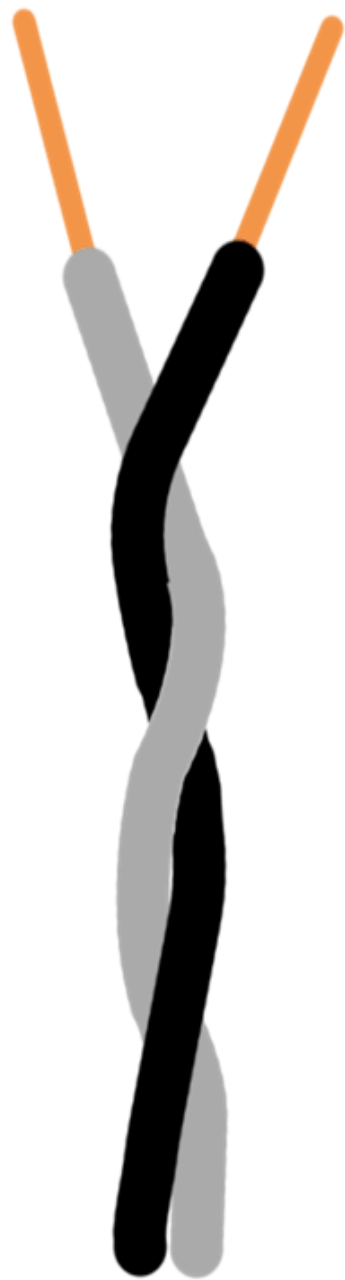
- **Describe what a cable is.**
- **Identify the difference between a conductor and an insulator for a cable.**
- **List different types of cables.**
- **Identify different sizes of cables.**
- **Recall the colour code for cables.**
- **Identify the voltage supply used by the different cable colours.**
- **Remove the insulation from the cable using the appropriate tools.**

WHAT IS A CABLE

Definition of Cables

A cable is defined in the I.E.E. Regulations as: "A length of insulated single conductor (solid or stranded), or of two or more such conductors, each provided with its own insulation, which are laid up together. The insulated conductor or conductors may or may not be provided with an overall covering for mechanical protection." A cable consists of two basic parts: (a) the conductor; and (b) the insulator.





TOOLS USED TO REMOVE THE CABLE INSULATION

Tools used to remove cable insulation are:

- Wire stripper
- Utility knives
- Pliers
- Measuring tape
- Marking tool [pencil, markers]

CONDUCTOR VERSUS INSULATOR

CONDUCTOR

- A conductor is a material or object that allows electric charge, heat, or sound to pass through it easily, with metals like copper and aluminum being the most common examples.

INSULATOR

An insulator is a material that offers a high resistivity to the flow of current, meaning electrons are tightly bound and cannot move freely. Common examples include rubber, glass, plastics, and ceramics.

CONDUCTOR VERSUS INSULATOR

CONDUCTOR



INSULATOR



THE PURPOSE OF CABLE COLOUR CODES

- Cable colour codes are used to identify the function of each wire in electrical, data, and control systems. They help distinguish between live (phase), neutral, and ground wires, as well as signal or control lines.
- Using standardized colors prevents wiring errors, reduces the risk of electric shock, and simplifies troubleshooting and maintenance in residential, commercial, and industrial installations.

NEW ELECTRICAL COLOUR CODE

in Trinidad & Tobago

The Amendment 1 (2007) of the Trinidad and Tobago Electrical Wiring Code: Part 1: Low Voltage Installations (TTS 171: Part 1: 2002) on colour coding of fixed wiring in electrical installations may be used from 1st July 2007. The amendment is mandatory as from 1st January 2008.

Amendment 1 (2007) specifies the new colour code for the identification of conductors in electrical installations in Trinidad and Tobago.

Full details of this Amendment can be downloaded free of charge from www.ttbs.org.tt and www.ttconnect.gov.tt.

The new colour code is summarized below.

Single-phase installations

- The fixed installation colours of red and black are replaced by the new colours of **brown** and **blue**.
- For 2-core cables, identify the neutral as **grey**.
- **Caution:** Black is now a live conductor.
- The ground conductor shall be identified by either green or green with yellow stripes.

Old (Existing) Colours

Cannot be used after 31st December 2007



Twin Flat (ECC)

Triple Flat (ECC)

New Colours

Can be used from 1st July 2007

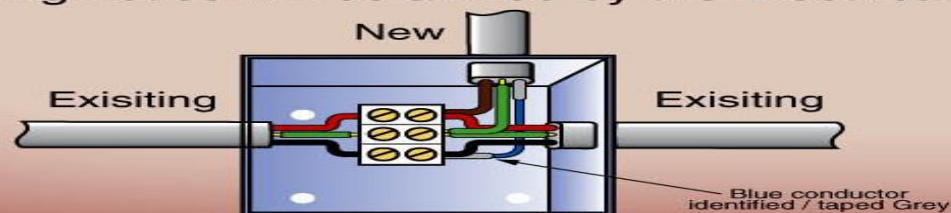


Extensions or alterations to existing single phase installations

Alterations or additions to a single phase installation do not require marking at the interface between old and new cables providing that the conductors are correctly identified according to the requirements of Amendment 1 (2007) of TTS 171 : Part 1 : 2002.

A warning notice will be affixed by the Electrical Inspectorate Division.

(Yumpu.com, n.d.)



NEW ELECTRICAL COLOUR CODE in Trinidad & Tobago

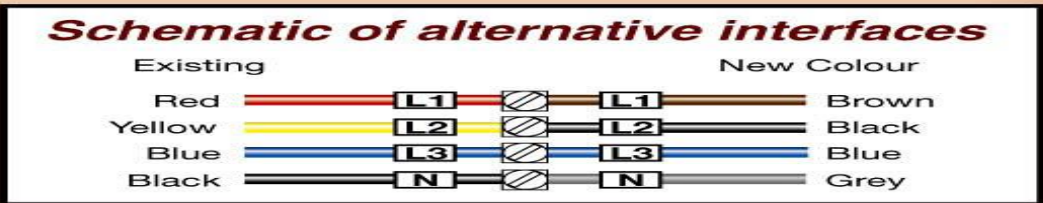
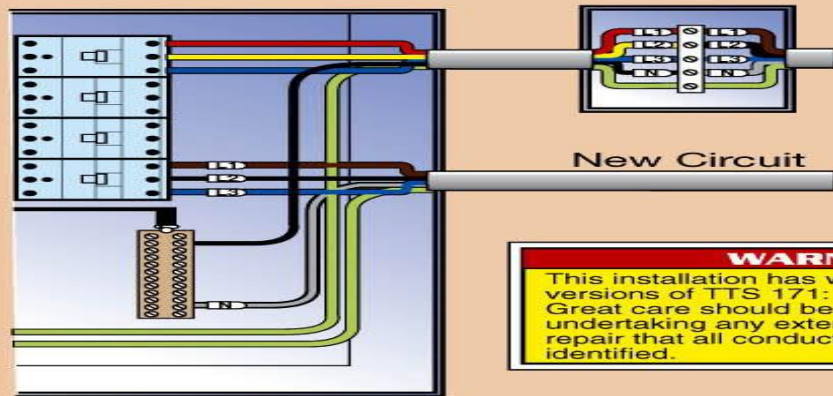
Three-phase installations

- For three-phase systems, the new phase colours are **brown, black and blue**, with a **grey** as neutral, which replaces the old phase colours of red, yellow and blue with a black neutral, as stated in Amendment 1 (2007).
- The ground conductor shall be identified by either green or green with yellow stripes.



Extensions or alterations to existing three phase installations

- Alterations or additions to a three phase installation do not require marking at the interface between old and new cables providing that the conductors are correctly identified according to the requirements of Amendment 1 (2007) of TTS 171 : Part 1 : 2002.
- A notice will be affixed by the Electrical Inspectorate Division.



WARNING
This installation has wiring colours to two versions of TTS 171: PART I : 2002. Great care should be taken before undertaking any extension, alteration or repair that all conductors are correctly identified.

CAUTION
BLACK IS NOW A LIVE CONDUCTOR

Implementation of Amendment 1 (2007)

- Electrical installations presently being conducted in Trinidad and Tobago and up to the 31st December 2007 shall comply with the new colour code or with the old colour code, but not both.
- Work commencing from January 1st 2008 will be required to comply with the new colour code specified in Amendment 1 (2007) and must not use the old colours.

Diagrams are for illustration purposes only

(Yumpu.com, n.d.)

SINGLE PHASE VERSUS THREE PHASE VOLTAGE SUPPLY

SINGLE PHASE SUPPLY

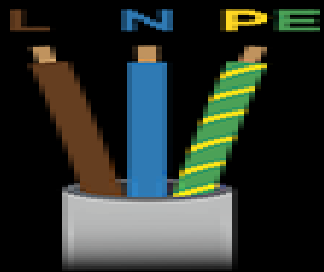
- Single-phase power commonly operates at residential voltages such as 120V or 230V, depending on the region.

THREE PHASE SUPPLY

- Three-phase power is available in various higher voltage configurations above 240V.

SINGLE PHASE VERSUS THREE PHASE VOLTAGE SUPPLY CABLES

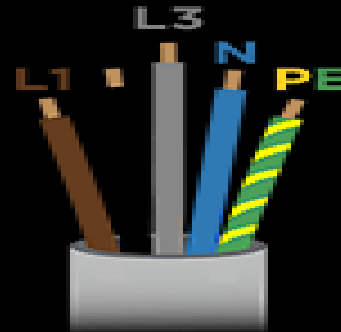
SINGLE PHASE SUPPLY



SINGLE-PHASE

L Line
N Neutral
PE Protective Earth

THREE PHASE SUPPLY



L1 Line 1
L2 Line 2
L3 Line 3
N Neutral
PE Protective Earth

New Wire Colour Code

	Single Phase	Three Phase
Phase Conductor (Line)	 Brown	 Line 1 - Brown  Line 2 - Black  Line 3 - Grey
Neutral Conductor	 Blue	
Protective Conductor (Earth)	 Green and Yellow	

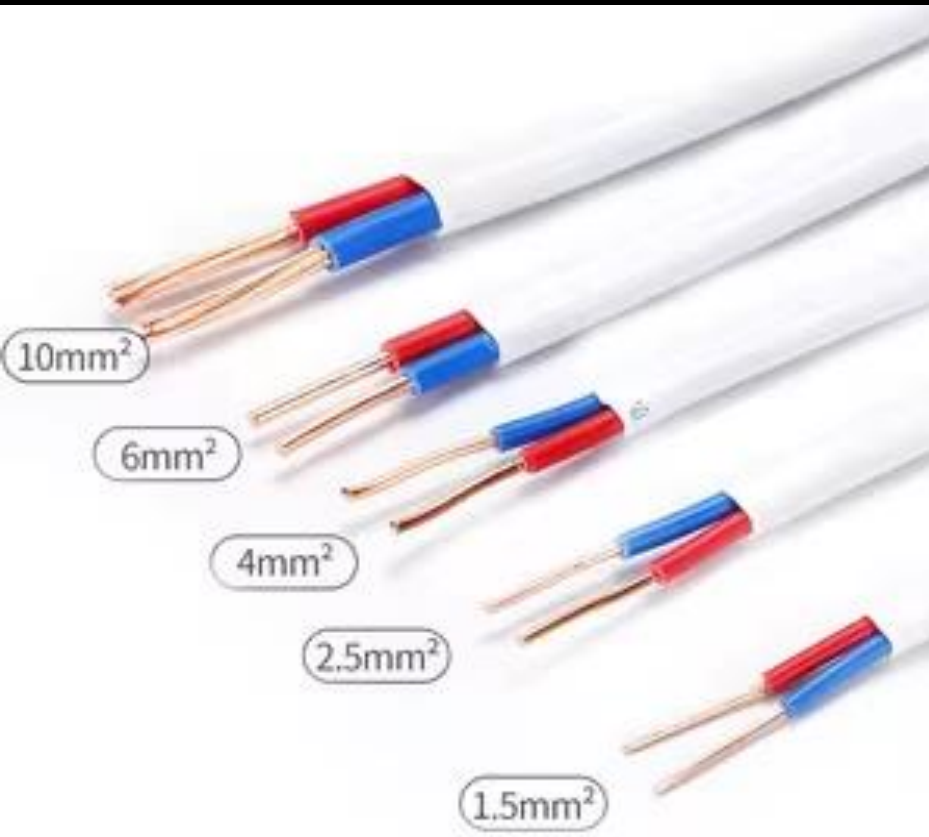
(Repairs.Sg, 2025)

TYPES OF CABLES



CK ELECTRICAL CONSULTANCY, n.d.)

CABLE SIZES



CK ELECTRICAL CONSULTANCY, n.d.)

HOUSE WIRING

1.5mm ²	LED Bulb
2.5mm ²	AC Board
4mm ²	AC Cooler
6mm ²	Cooler
8mm ²	House
	COMPANY

house wiring

Electrical Technical

1.5mm ²	fan
2.5mm ²	iron
4mm ²	AC
6mm ²	House
10mm ²	factory

CABLES COLOURS AND VOLTAGE SUPPLY

ELECTRICAL WIRING COLOR CODES (NEC & IEC) - 1 & 3 PHASE (AC)

www.electricaltechnology.org



PHASE SUPPLY	WIRE & CABLE	NEC - US / CANADA (120, 208 & 240V)	NEC - US / CANADA (277 & 480 V)	IEC- UK & EU	CHINA & RUSSIA ^(Old)	AUS & NZ	JAPAN	INDIA, PAK & SA
3-PHASE	LINE 1 "L1"							
	LINE 2 "L2"							
	LINE 3 "L3"							
COMMON	NEUTRAL "N"							
GROUND / EARTH "PG" or "PE"			Or					
1-PHASE	LINE "L"							
	NEUTRAL "N"						(Technology, 2025)	

ASSIGNMENT QUESTIONS

1. What is a cable?
2. What is an insulator?
3. What is a conductor?
4. List the single-phase colour code.

REFERENCES

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THANK YOU FOR
YOUR LISTENING



ANY QUESTIONS?

