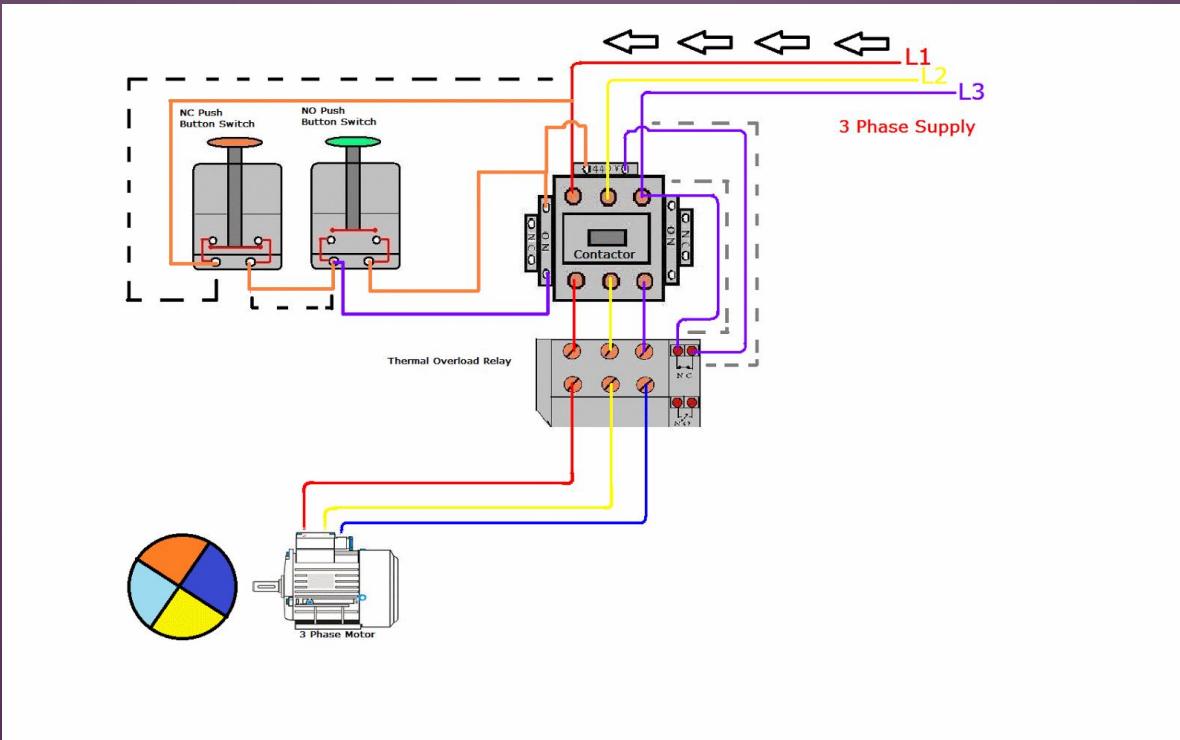


ELECTROMECHANICAL SYSTEM

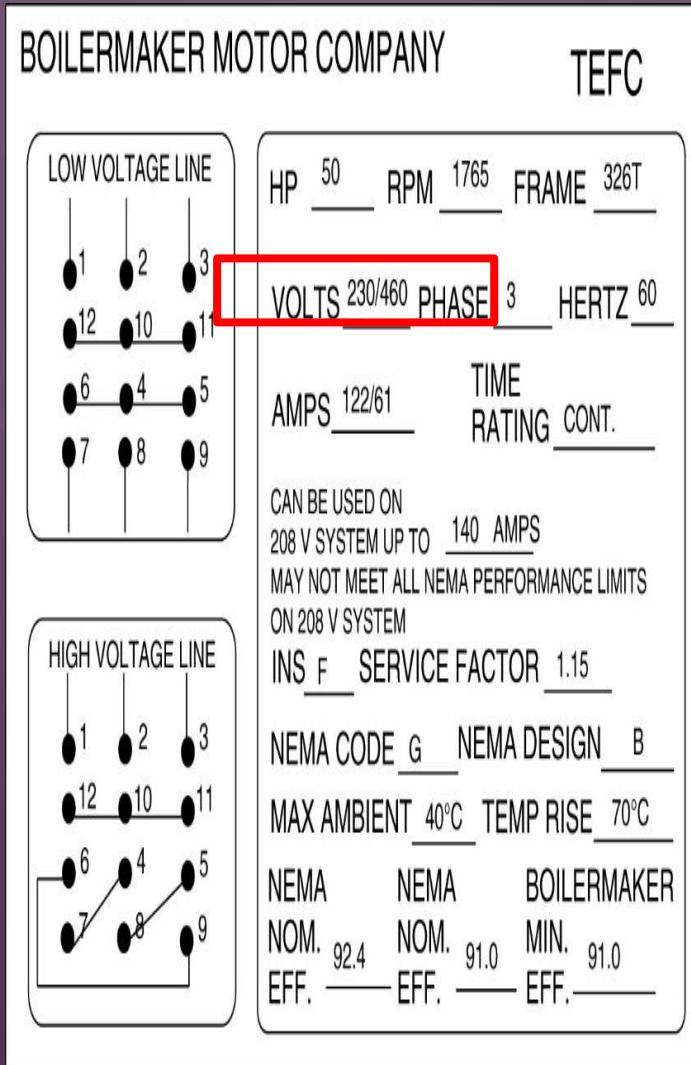
CHAPTER 9: DUAL VOLTAGE MOTOR CONNECTIONS

MOTOR CONTROL

A MOTOR CONTROL CIRCUIT CAN BE DEFINED AS A MEANS OF SUPPLYING POWER TO AND REMOVING POWER FROM A MOTOR.

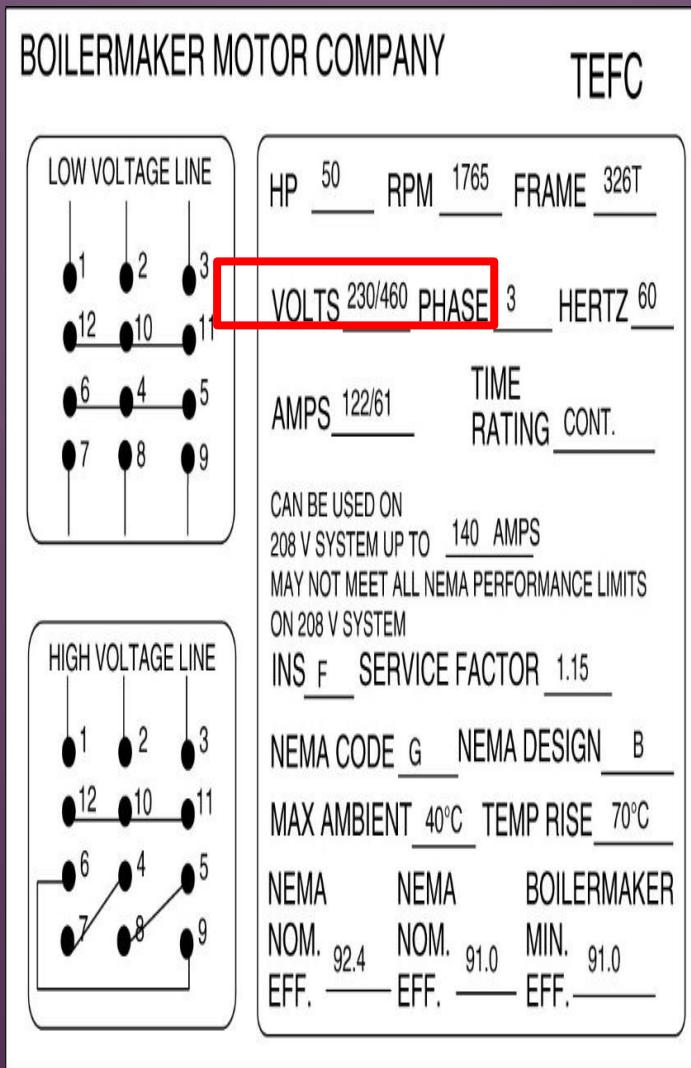


DUAL VOLTAGE MOTORS



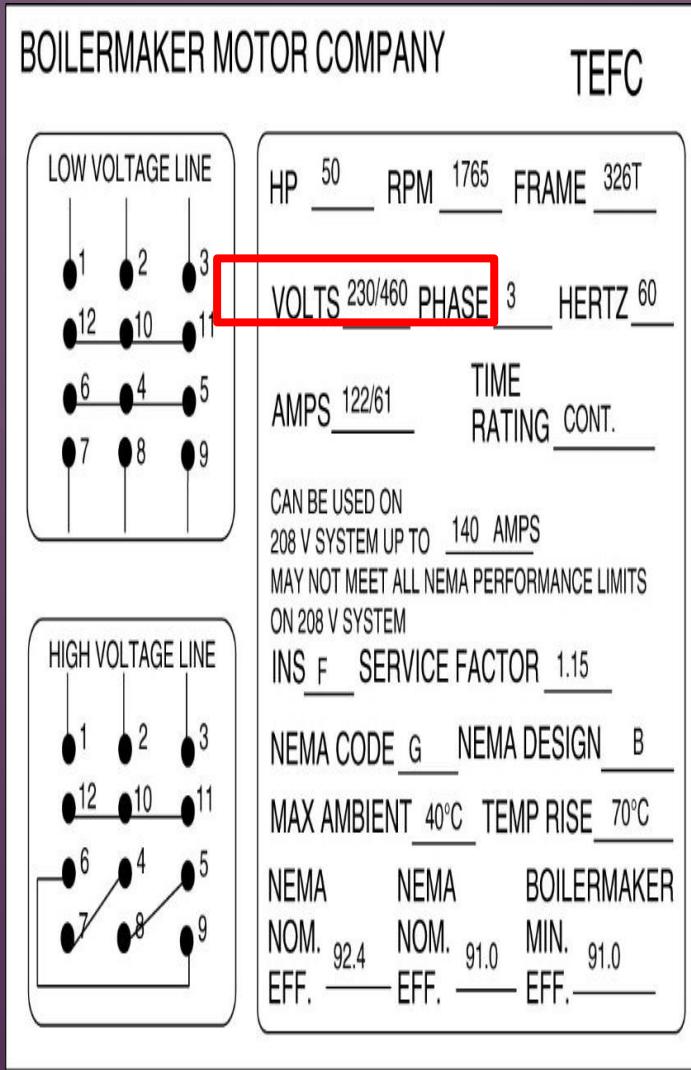
- If we take a look at electric motor name plate, we can see the several important information and specification about electric motor.
- Particularly the 2 types of voltages indicated on the template. It might be 230V and 460V, or 220V and 380V.

DUAL VOLTAGE MOTORS



- The reason why motor manufacturers design ***dual voltage motor*** is to make the motor available for any country used because every country have a different voltage value such as 200 VAC, 600 VAC and 415 VAC.
- It is also for marketing strategy to increase their profit margin.

DUAL VOLTAGE MOTORS



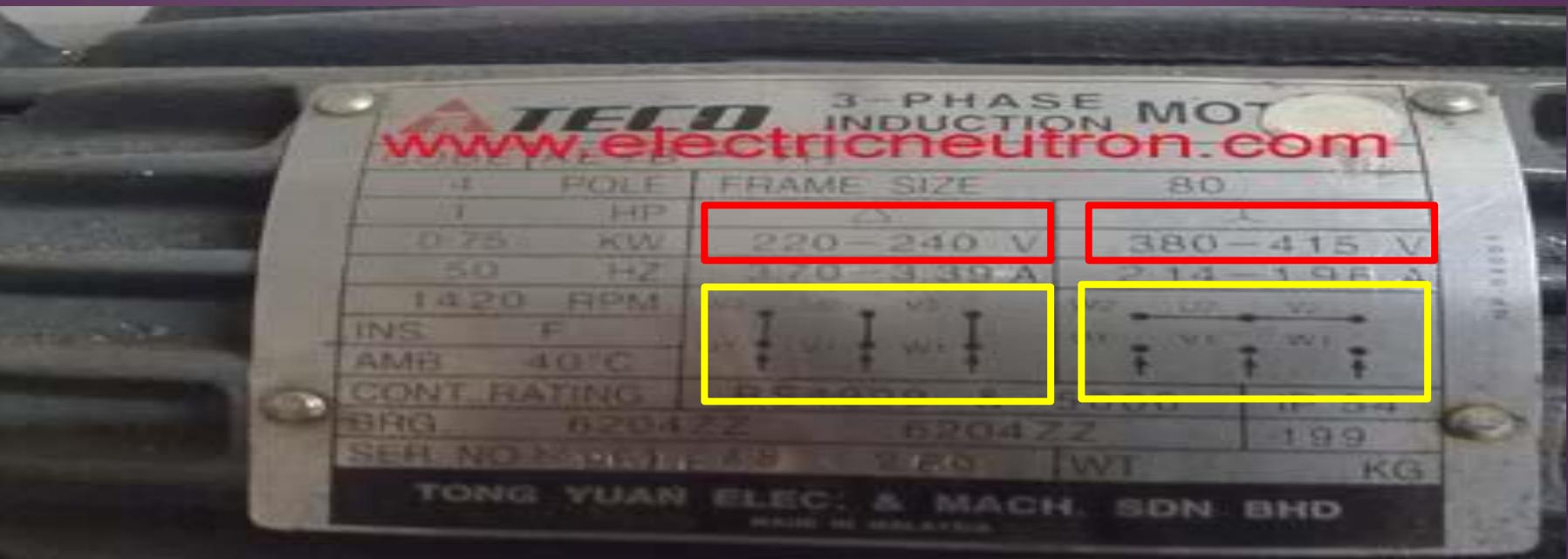
- It is like a simple thing and not so important BUT if we make a mistake about electric motor voltage power supply, it can cause winding damage and burn out.
- That is why I would like to share about this information to avoid serious damage for electric motor.

WHAT IS DUAL VOLTAGE FOR ELECTRIC MOTOR?

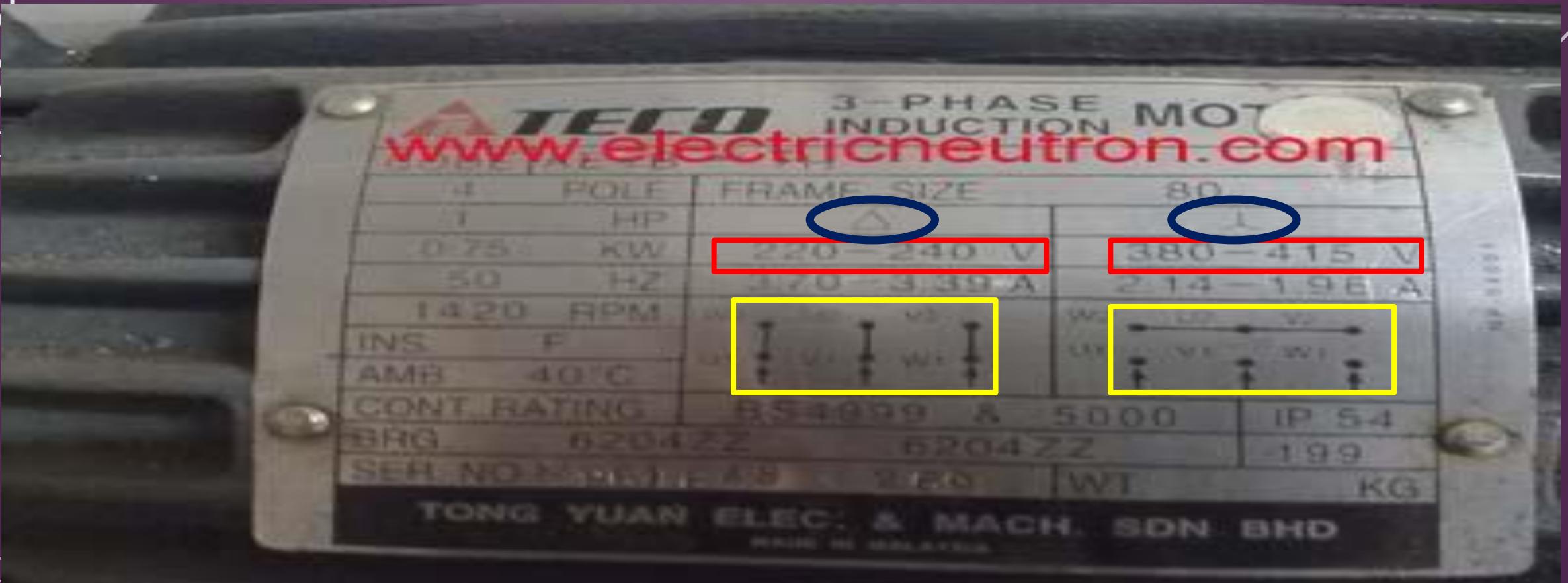
- Below figure is an electric motor name plate that has dual voltages. If we observe further, it has two motor terminal connections for two power supply voltages .

DELTA : 220 ~ 240 VAC – 3 PHASE

STAR : 380 ~ 415 VAC – 3 PHASE



WHAT IS DUAL VOLTAGE FOR ELECTRIC MOTOR?

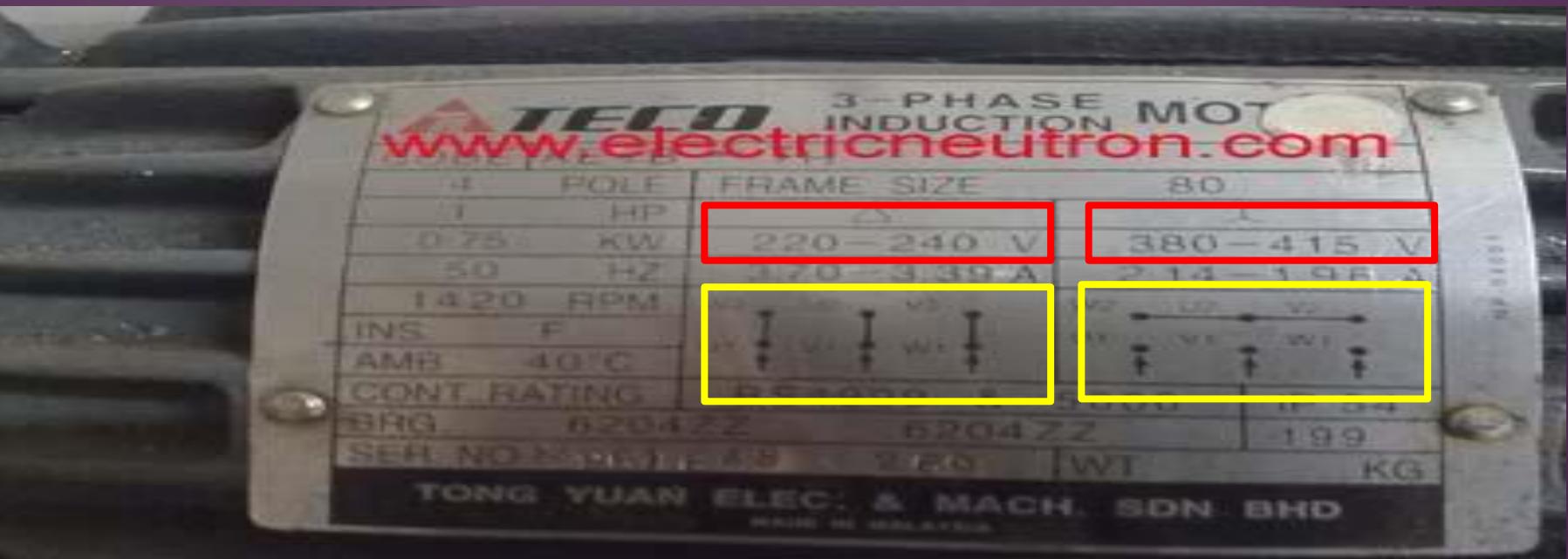


- And if we observe further, above the voltages are the symbols of “*delta*” and “*wye*”. Which indicates the origin of the two motor terminal connections for two power supply voltages .

WHAT IS DUAL VOLTAGE FOR ELECTRIC MOTOR?

From this information, the conclusions are:

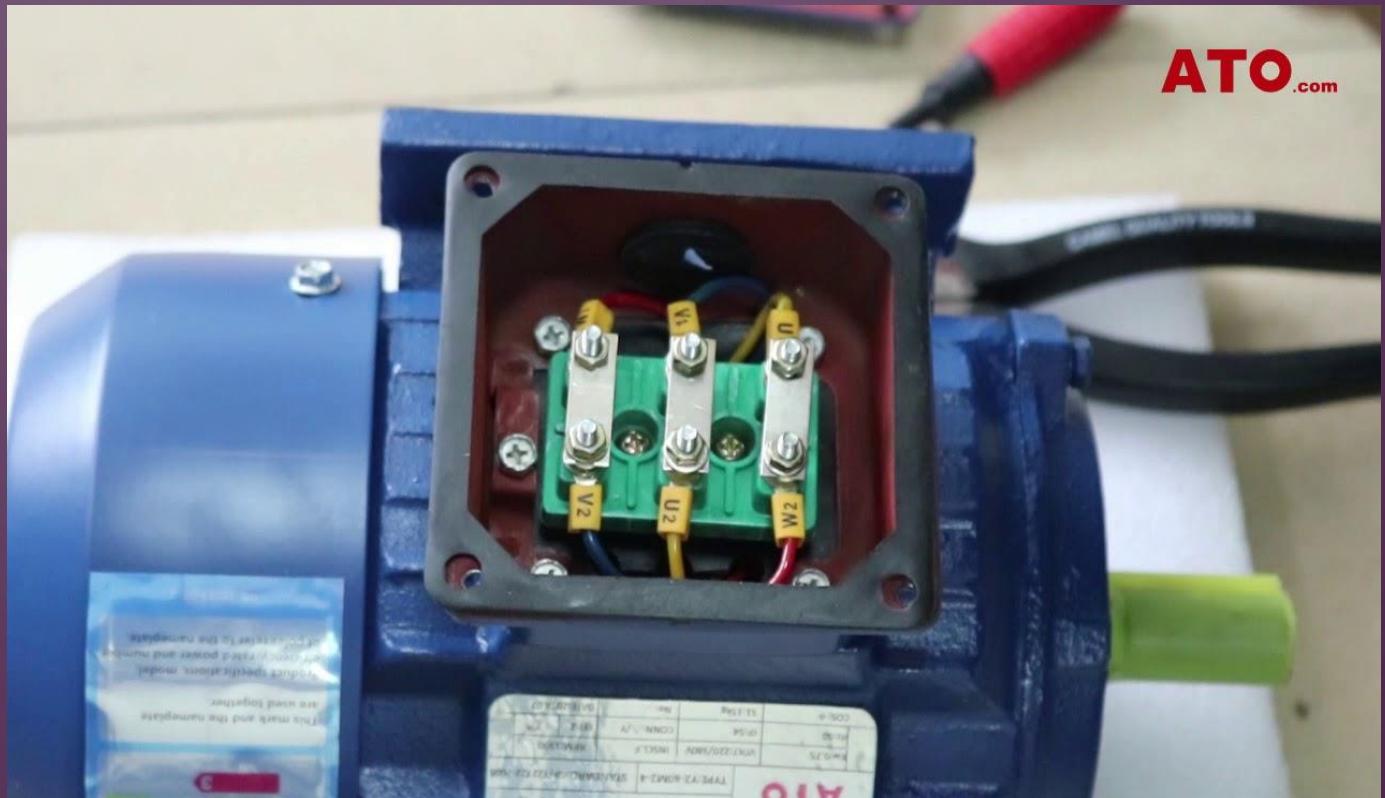
- If our power supply is a 220 Volt, 3 phase, we should connect the power supply in DELTA.
- If your power supply is 415 volt, 3 phase, we should externally be connected the power supply for electric motor in STAR or WYE.



DUAL VOLTAGE FOR ELECTRIC MOTOR LEADS

Inside the Terminal box of an electrical motor there are 4 types of Leads:

1. 3 Leads out
2. 4 Leads out
3. 9 Leads out
4. 12 Leads out



MOTOR CONNECTION DIAGRAMS

For better understanding of how to use the motor connection leads please watch the video bellow.

1. Paano basahin ang 6 leads 3 phase motor terminal connections

<https://www.youtube.com/watch?v=x3Eo22Kqx9g&list=PLyM1fvECOtBVMwi2gv8vCKLDZavbxNIXM&index=3>

2. Paano basahin ang 9 leads 3 phase motor terminal connection

<https://www.youtube.com/watch?v=8bCeb2j0TO4&list=PLyM1fvECOtBVMwi2gv8vCKLDZavbxNIXM&index=4>

MOTOR CONNECTION IN ACTUAL 3 PHASE MOTOR

For better understanding of how to use the motor connection diagrams please watch the video bellow showing an actual example of wye and delta wiring.

[https://drive.google.com/file/d/1bUMdHJqgG0QXZFsxCk0UXQmrFj4TMGT9
/view?usp=sharing](https://drive.google.com/file/d/1bUMdHJqgG0QXZFsxCk0UXQmrFj4TMGT9/view?usp=sharing)

MOTOR CONNECTION DIAGRAMS

9 leads

Valid for voltage Code: E

Frames 56 and 143/5

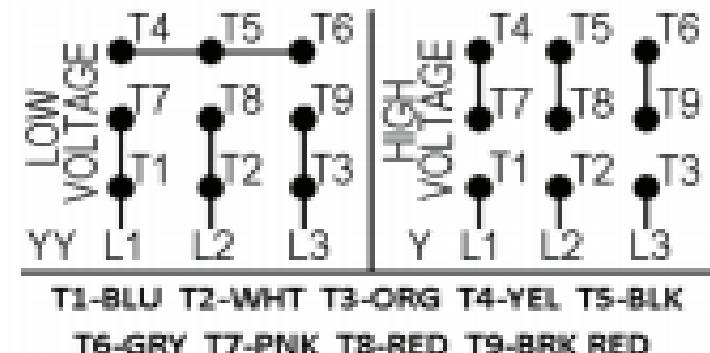
9 leads

Valid for voltage Codes: E

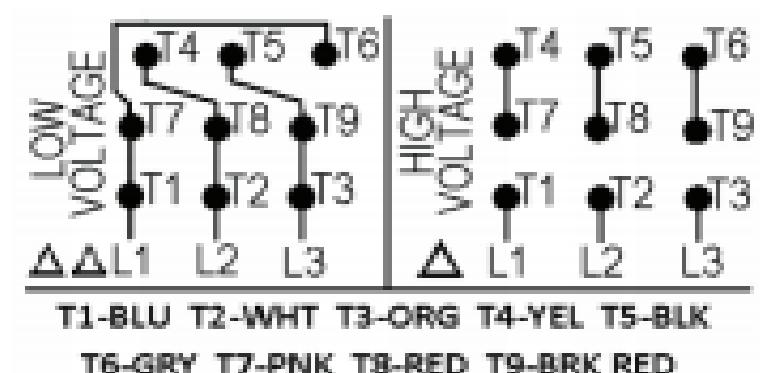
Frames 182/4 and 213/5 for E code

Frames 143/5 through 213/5 for V code

DOL



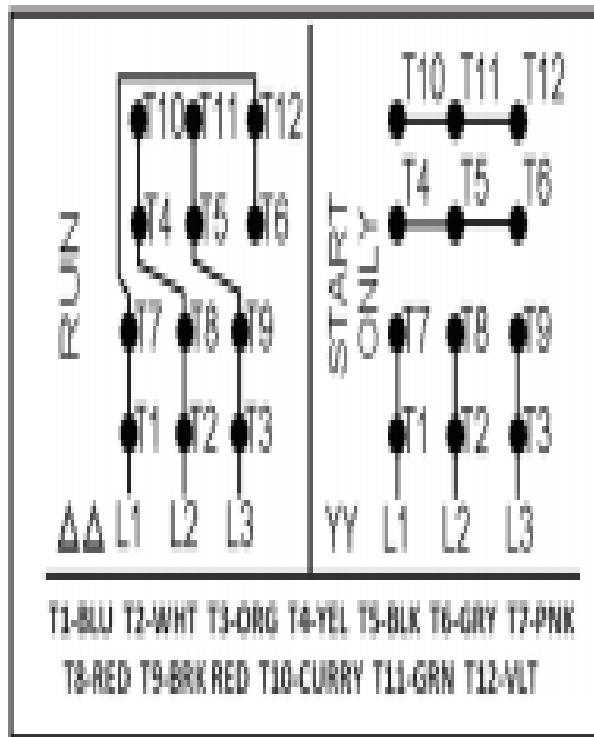
DOL



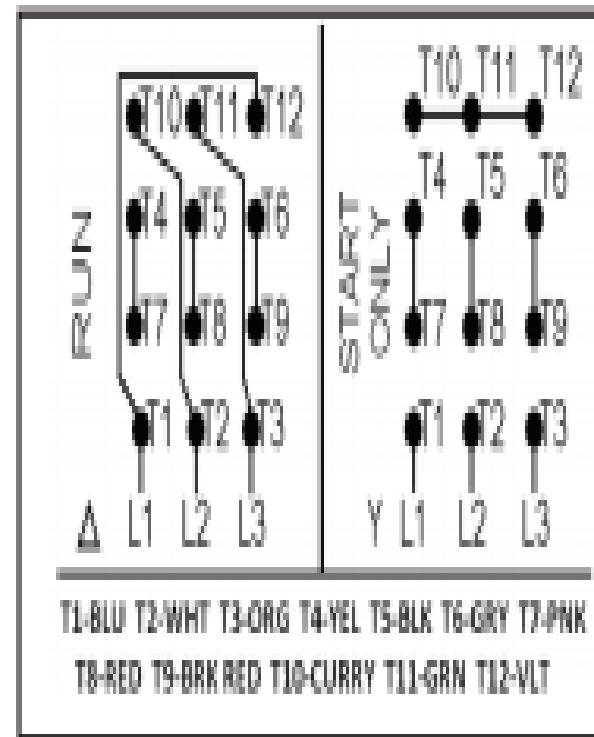
MOTOR CONNECTION DIAGRAMS

12 leads
Valid for voltage Codes: E & V
Frames 254/6 and above for E voltage code
All Frames for V voltage code
Motors are capable of WYE/Delta start
Motors are capable of part-winding start
at the low voltage

WYE - DELTA - LOW VOLTAGE



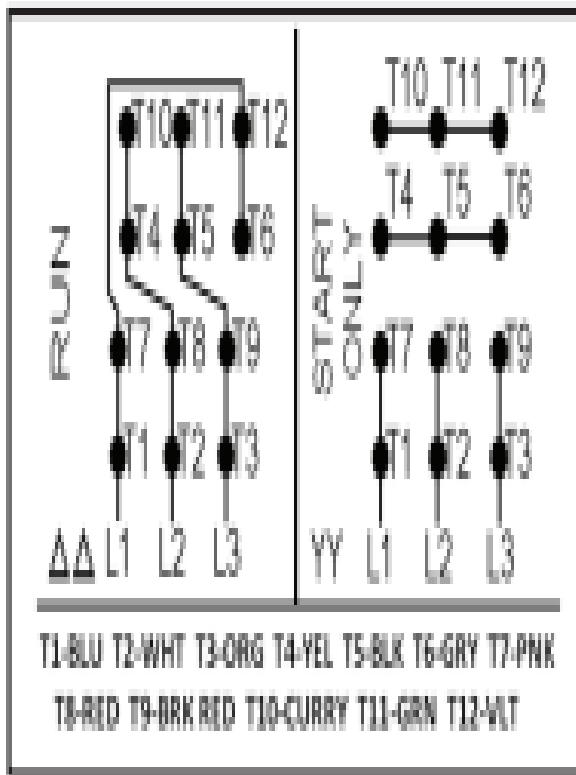
WYE - DELTA - HIGH VOLTAGE



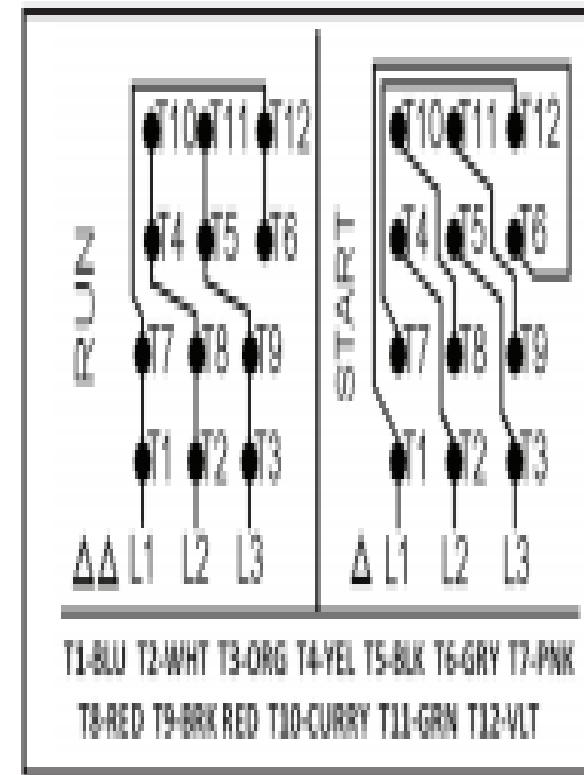
MOTOR CONNECTION DIAGRAMS

- 12 leads
- Valid for voltage Code: G
- Frames 254/6 and above
- Motors are capable of WYE/Delta start
- Motors are capable of part-winding start

WYE - DELTA - LOW VOLTAGE



PART-WINDING



MOTOR CONNECTION DIAGRAMS

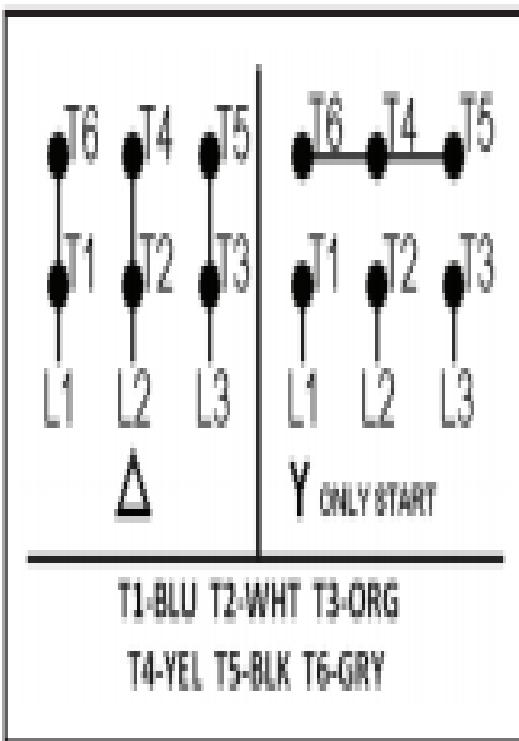
6 leads

Valid for voltage Code: J, H, P, Q, W & Y

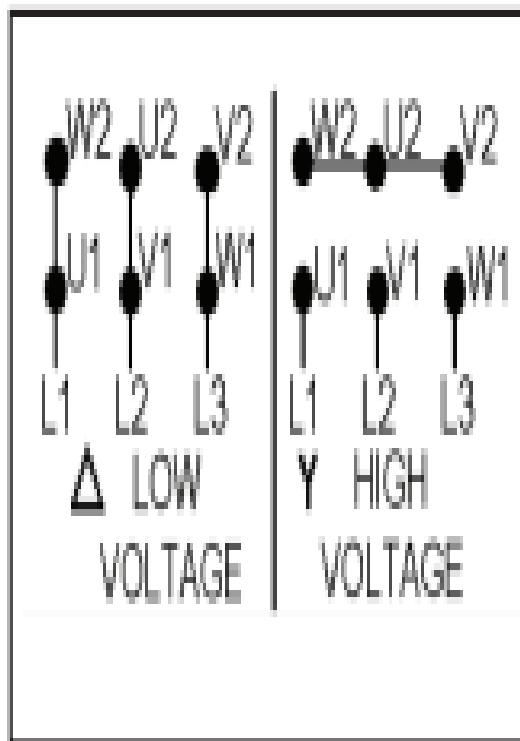
All frames

Q code can also have only 3 leads

WYE - DELTA



WYE - DELTA (METRIC)



MOTOR CONNECTION DIAGRAMS

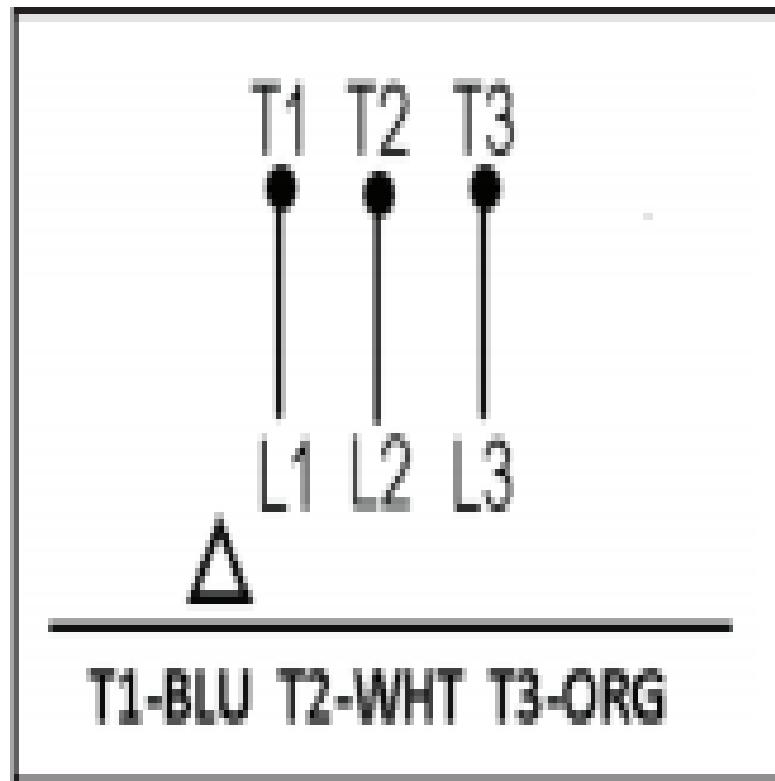
3 leads

Valid for voltage Code: Q

All frames

Q code, non IEEE-841 motors, can also
have 6 leads

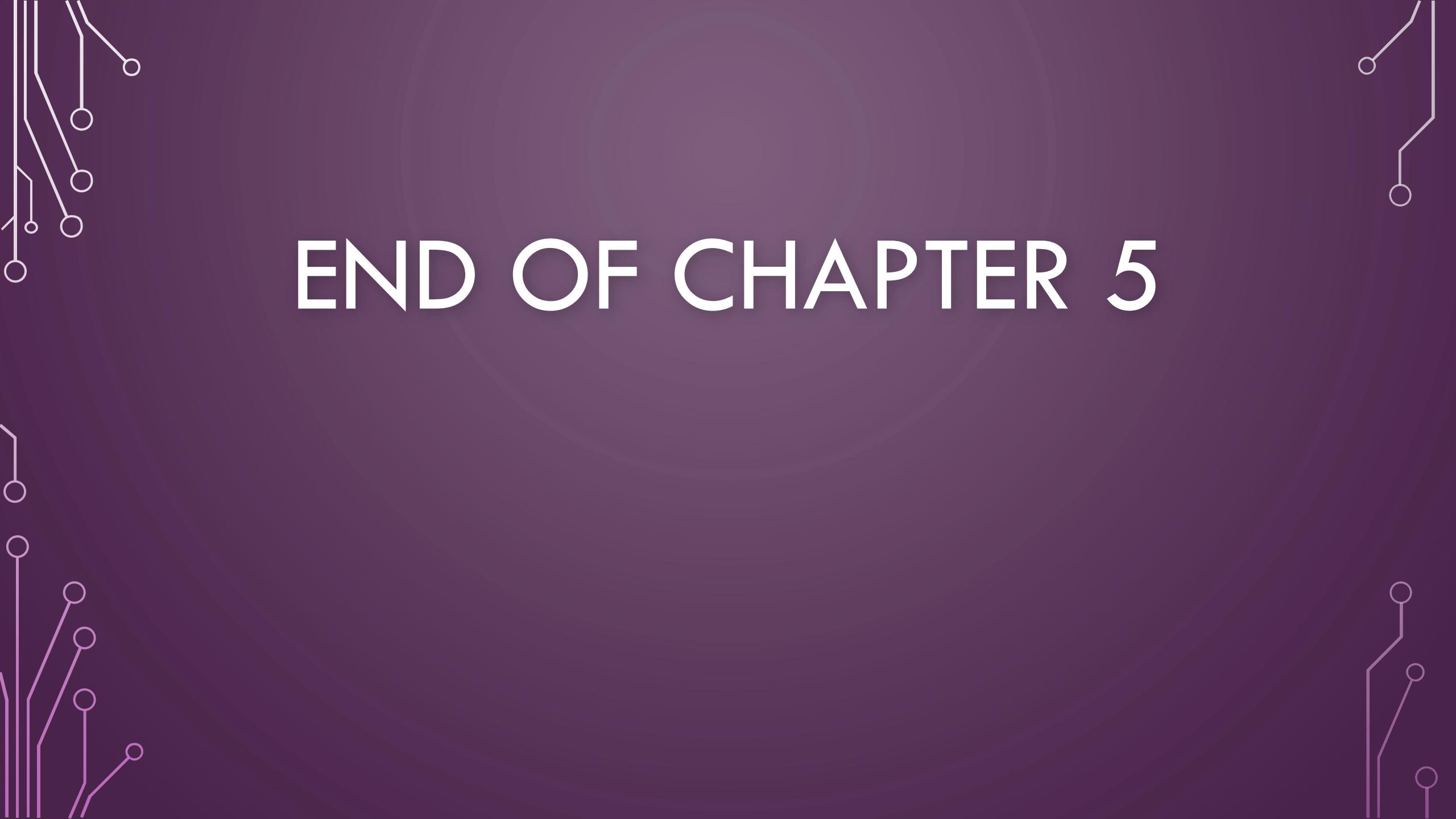
DOL



MOTOR CONNECTION DIAGRAMS

For additional wiring diagrams, bellow is the link for other diagrams concerning motor controls.

http://catalog.wegelectric.com/img/Wiring_Diagrams.pdf



END OF CHAPTER 5