



**KILIMANJARO INTERNATIONAL INSTITUTE FOR TELECOMMUNICATIONS,
ELECTRONICS AND COMPUTERS
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Course: Variable Speed Drives (VSDs)

Course Description:

Variable speed control can be accomplished, for example, using a frequency converter as the energy control component, a two-speed motor as the motor component and gears, belts or hydraulic coupling between shafts as the transmission components. In some situations, reversing direction of motion is necessary. There are several advantages of using Variable Speed drives:

Less maintenance costs, more productivity, energy saving, Higher quality or control precision and etc.

Duration: 5 days

Dates: 4- 8th May 2020

Venue: KIITEC, Arusha, along Nelson Mandela Road (Moshono, Suye)

Tuition Fees: Tanzania shillings **500,000.00** per participant, inclusive of tea/coffee and lunch

Prerequisites: Knowledge of electrical schematics, motors and motor controls is recommended

Target group: Engineers/technicians in the fields of mining, building automation, manufacturing, and electrical/mechanical design

Delivery Method: Instructor led, group-paced, classroom-delivery learning model with structured hands-on activities/labs

Performance-Based Objectives:

Upon successful completion of this course, participants will be able to:

- Explain the operating principles of AC and DC motors
- Identify classifications of motor braking techniques and describe operation of each type.
- Apply safe working practices when working with variable speed drives.
- Demonstrate an understanding of the principles of operation of a range of inverter drive systems.
- Correctly configure, operate and monitor drive systems
- Identify and correct configuration errors.
- Design VSD control system for a particular application e.g. rolling door, using PLC.
- Differentiate between drive faults, motor faults and power faults
- Implement soft starting and speed variation& setting in AC Motor.
- Identify classifications of motor braking techniques and describe operation of each type.
- Correctly configure, operate and monitor drive systems
- Identify and correct configuration errors.
- Design VSD control system for a particular application e.g. rolling door, using PLC.
- Differentiate between drive faults, motor faults and power faults
- Implement soft starting and speed variation& setting in AC Motor.

Course Content

Module 1: Electric Motors

DC Motors

Brushless Motors: AC motors, Asynchronous & Synchronous Motors

Three Phase Asynchronous Motor

Slip ring rotor asynchronous motor

Module 2: Asynchronous Motor Starting

Conventional Starters

Asynchronous Motor Braking

Electronic Soft Starter

Three Phase Soft Starter Braking Methods

Module 3: Variable Speed Drive Structure

Main objectives of VSD

Basic Principles

Speed Drive Structure

Power Part Structure

Rectifier

Single Phase Inverter

Three Phase Inverter

Speed Drive Assessment

Module 4: Application

Typical application

Motor Characteristics

Configuration and Human Machine Interface (HMI)

Choice of the drive

Installation wiring

Troubleshooting, fault identification, repair & maintenance

PLC and VSD interfacing