DD - 1000

1KW DC Drives kit

Overview

1KW DC Drives kit are used to control all aspects of the electrical machines. The trainer introduces trainees to electrical drives to allow studying their operation and applications. The trainer adopts the modular design to install electrical machines modules to a sturdy metal frame to allow trainees to connect modules to each other using safety cables. The trainer is supplied with a software to measure the machines parameters and display the measured values.



Specifications

- The 1KW DC Drives kit facilitates building a true-to-life learning environment that mirrors real-life work of study and industry relevant skills including how to operate, install and tune major types of DC systems.
- Many applications can be explained through this trainer such as control of speed acceleration ramp time and deceleration ramp time, difference between tacho-generator feedback and armature voltage feedback in various applications
- As well as the drive can compensate the torque through IR potentiometer.
- The trainer allows trainees to operate, control and test the drivers.
- The 1KW DC Drives kit can work with the 1KW Machines **(not inculded)** easily,

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also it`s designed as modular that can fit perfectly on the Machine & Drive Lab Supply Unit **(not inculded)**, the kit contain many modules that can be used together to execute different experiments

- **DC Single-Quadrant Drive Module:**
  - » Features:
    - Switch selectable Tach or Armature Voltage feedback
    - Adjustable IR Compensation for improved AVF
    - Speed or Torque Control
    - Selectable dual voltage AC Supply
    - 150% Overload with stall Protection
    - User Adjustable:
      - » Max, Min Motor Speed
      - » Up, Down Ramp
      - » Stability
      - » Imax
      - » IR Comp
      - » AVF/Tach Switch
      - » Speed Range Switch
      - » AC Voltage Selector
      - » Signal Level Compensator
  - » Technical data
    - AC Supply Range: 100V to 130V / 200V to 264V
    - Typical Armature Voltage: 90V / 180V
    - Max. Continuous Armature Current 12.2A
    - Nominal Power 0.75kW (1HP) / 1.8kW (2.0HP)
- **DC Two/Four Quadrant Drive Module**
  - » Features:
    - Dual Loop Proportional and integral control action
    - 0.1% Tacho-Generator or 2% Armature voltage feedback speed regulation
    - Overload Protection with extra 50% peak Torque for 30 secs prior to stall trip operation
    - Over-speed and Over-Torque Limits
    - Inverse time Overload
    - 50% stall Threshold
    - Precision reference
    - Dual Set Point
    - Adjustable presets:
      - » Max speed: 25v – 400v full scale feedback
      - » Min speed 0 to 30% of max speed
      - » Up and Down ramp (Acceleration) 1-30 secs
      - » Independent up/down ramp adjustment for forward and reverse direction
      - » Stability
      - » IR Compensation
      - » Multi option current limit
  - » Technical data
    - AC Supply Range: 100 to 130V OR 200 to 264V
    - Typical Armature Voltage: 90V OR 180V
    - Maximum Continuous Armature Current: 16A
    - Nominal Power: 1.1kW (1.5HP) OR 2.2kW (3.0HP)
- **DC PWM Drive Module:**
  - » Features:
    - PWM (Pulse Width Modulation) Technology with low noise
    - Speed Regulation ration 1:100 (Open-Loop)
    - High Starting torque
    - Double Closed loops PI regulation
    - Current setting, current limiting protection, over-current warning, output stop
    - Setting function of soft starting (0.3-10 seconds adjustable)
    - Torque compensation adjustment
    - The maximum output limit function
    - Short-circuit protection
    - Self-inspection alarm output function
    - Standard signal interface
    - Function of enabling block control
  - » Technical data:
    - Input Voltage: AC 110V/220V +/- 10%
    - Output Voltage: DC 0 ~ 110V/220V
    - Rated output current: DC 8A
    - Rated excitation Voltage/Current: DC 220V(110V) / 3A
    - The output accuracy: <1%

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- **Line Fuse Module**
  - » 3 x DIN-Rail Mounted Fuses Holders with 38*10 Fuses 10A
- **Isolating Transformer Module**
  - » 220/220V, 1.5 kVA
- **Load Torque Controller Module**
  - » input voltage: 220VAC
  - » Input signal : potentiometer 10k ohm
  - » output: dc PWM with swithching frequancy 3khz
- **Eddy Current Brake**
  - » Nominal shaft speed: 1500rpm
  - » Rated braking power: 1000W
  - » Nominal Input voltage: 0- 12 VDC
- **DC Shunt/Separately Excited Machine**
  - » Nominal shaft speed: 3000rpm
  - » Rated output power: 1000W
  - » Rated armature voltage: 220VDC
  - » Rated field voltage: 220VDC

Learning Objectives

- Installment and tuning DC drive motors.
- Investigation of methods of reversing the rotation of a DC motor.
- Studying the function of voltage feedback in a DC full-range drive.
- Studying the construction and operation of a power bridge circuit in a DC SCR drive
- Calibration of a DC PWM drive
- Calibration of a 2-quadrant operation
- Calibration of a 4-quadrant operation

Scope of Delivery

- 1KW DC Drives kit (DD - 1000)
- Hard copy user manual

Required for Operation

- Machine & Drive Lab Supply Unit (ML-100)
- Laboratory PC

Options

- Digital content (BI-01)

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