AMRON

MOTOR / GENERATOR TRAINER MG-400

Investigate the Behaviour & Performance of Various AC & DC Machines

Excellent Features of the MG-400 System

- Ø High quality genuine industrial parts
- Ø Robust & durable
- Ø Major components all powder-coated
- Ø Easy installation & assembly
- Ø Comprehensive metering & control functions
- Ø 12 high quality mimic panels
- Ø Full range of AC & DC machines
- Ø Detailed experiment manual & diagrams
- Ø Maximum safety with minimum supervision
- Ø Competitively priced

Product Information

The MG-400 is a self-contained, fully integrated system, which needs only be mounted on a suitable bench or table and connected to a 3 phase supply.

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12 Major Experiments Possible with the MG-400

- 3 phase squirrel cage motor & eddy current brake
- 3 phase slipring (wound rotor) induction motor & eddy current brake
- Single phase capacitor start induction motor & eddy current brake
- Single phase capacitor run induction motor & eddy current brake
- Universal motor & eddy current brake
- DC shunt motor & eddy current brake
- DC compound & eddy current brake
- DC series motor & eddy current brake
- 3 phase induction motor & DC shunt generator
- 3 phase induction motor & DC compound generator
- 3 phase induction motor & DC series generator
- DC shunt motor & 3 phase synchronous generator (alternator)

The MG-400 enables the student to examine the characteristics and performance of the specific combination selected from the machines provided. The student can calculate and/or measure the following parameters:

- Speed
- Torque
- Driving and/or output voltage
- Driving and/or output current
- Efficiency
- Power factor
- Full speed control of the drive motor
- Full excitation control of the generator/alternator
- Load control of the generator/alternator
- 4 voltmeters (72mm)
- 4 ammeters (72mm)
- Digital RPM meter (4 digit of 14mm height)
- Digital torque meter (4 digits of 14mm height)
- Variable load to stall provided by eddy current brake
- Industrially rated motors
- Machines size is frame 80
- Machine power is 0.375KW
- Individual didactic mimic panels provided for all experiments showing diagrammatic representation of wiring & placement of metering. These panels are placed by the student over the jack-field matrix on the front of the console. The connections to be made are indicated by bold lines.
- All relevant measuring points brought out on didactic front fascia
- RPM sensed from machine-to-machine coupling
- Self-contained, needing no tools to assemble
- Complete with all machines, leads & detailed experiment manuals

Schedule of Experiments

1) 3 PHASE INDUCTION MOTOR & BRAKE

a. To show how the speed, driving current, power factor & efficiency phase squirrel cage induction motor are related to the torque produced by the motor
b. Demonstrate a change in direction of rotation of the motor
c. Show that the driving current to the motor can be reduced at start-up by connecting the stator windings in “star” formation

2) 3 PHASE SLIPRING MOTOR & BRAKE

a. To show how the speed, driving current, power factor & efficiency of a 3 phase slipring motor are related to the torque produced by the motor
b. To demonstrate the effects of resistance in the rotor circuit
c. To demonstrate a change in direction of rotation of the motor

3) SINGLE PHASE CAPACITOR START INDUCTION MOTOR & BRAKE

a. To show how the speed, driving current, power factor & efficiency of a single phase capacitor start induction motor are related to the torque produced by the motor
b. To demonstrate how the direction of rotation can be changed

4) SINGLE PHASE CAPACITOR RUN INDUCTION MOTOR & BRAKE

a. To show how the speed, driving current, power factor & efficiency of a single phase capacitor run induction are related to the torque produced by the motor
b. To compare the starting torque of a capacitor start motor to that of a capacitor run (permanent split capacitor) motor

5) UNIVERSAL MOTOR & BRAKE

a. To show how the speed, driving current & efficiency of a universal motor are related to the torque produced by the motor when connected to an AC power supply
b. To show how the speed, driving current & efficiency of a universal motor are related to the torque produced by the motor when connected to a DC power supply
c. To control the speed of a universal motor when using an external resistor in series

6) DC SHUNT MOTOR & BRAKE

a. To show how the speed, driving current & efficiency of a DC shunt motor are related to the torque produced by the motor
b. To show how the motor speed is affected by a change in shunt field excitation

7) DC COMPOUND MOTOR & BRAKE

a. To show how the speed,driving current & efficiency of a DC compound motor are related to the torque produced by the motor

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8) DC SERIES MOTOR & BRAKE

a. To show how the speed, driving current & efficiency of a DC series motor are related to the torque produced by the motor
b. To demonstrate regulation of start current, speed control & reversal of a series motor

9) 3 PHASE INDUCTION MOTOR & DC SHUNT GENERATOR

a. To demonstrate the open circuit characteristics of a DC shunt motor
b. To show how the output voltage of a DC shunt generator is related to load current
c. To show how the output voltage of a DC shunt generator is related to load current when the field is separately excited

10) 3 PHASE INDUCTION MOTOR & DC COMPOUND GENERATOR

a. To show how the output voltage of a self-excited DC compound motor is related to the load current
b. To show how the output voltage of an externally DC compound generator is related to the load current

11) 3 PHASE INDUCTION MOTOR & DC SERIES GENERATOR

a. To show how the voltage output of a DC series generator is related to the load current

12) DC SHUNT MOTOR & 3 PHASE SYNCHRONOUS GENERATOR (ALTERNATOR)

a. To demonstrate the operation of a synchronous generator

Specification

CONTROL CONSOLE

- Ø Durable metal cabinet
- Ø Precision motor mounting facility & motor connecting sockets
- Ø Mains isolator, overload protection, no volt control & thermal overcurrent sensing
- Ø 4 x voltmeters; 4 x ammeters
- Ø 5 Amp variac with variable AC/DC output & thermal trip
- Ø 2 Amp variac with AC/DC output & thermal trip
- Ø Tachometer & sensor block (0-5000 RPM)
- Ø Electronic load control (AC & DC generator experiments)
- Ø High power variable DC supply (energizing eddy current brake & wound rotor motor)
- Ø Switchable resistors (shunt field control of DC machines)
- Ø Fixed resistors (starting & speed control)
- Ø Switchable resistor bank (start control for slipring motor)
- Ø 12 x experiment mimic panels

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ELECTRICAL MACHINE (Rated at approx.400watt)

- Ø 3 phase induction motor: frame 72; 220/380V;2970 RPM (50Hz); cos 0.8
- Ø 3 phase slipring motor: frame 80; 2 pole; 220/380V
- Ø Single phase induction motor: capacitor start/capacitor run with centrifugal switch; frame 80; 220V; 3.8A;2860 RPM (50Hz) cos 0.72
- Ø Universal AC/DC motor: frame 80; 2 pole; 180V; 4A; 720W (As a DC generator: 60V at 0.5A)
- Ø DC series motor compound wound: frame 80; 2 pole; 180v at 4A DC generator,60v at 0.5A
- Ø 3 phase synchronous machine (alternator)
- Ø Eddy current brake: frame 80

ACCESSORIES

- Ø 4mm high quality stackable banana plug connecting leads
- Ø Detailed experiment manual featuring 24 experiments
- Ø Detailed manual of circuit diagrams & connections

Manufacturer : AMRON

Tel : (033) 3868309
Fax : (033) 3868556
E MAIL:amron@pixie.co.za

P.O.BOX 2435
Pietermaritzburg
3201

Distributor :