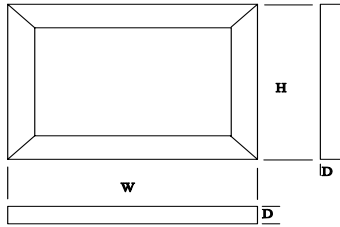


ELECTRICAL MACHINERY EXPERIMENTS

Model: EM-102750A

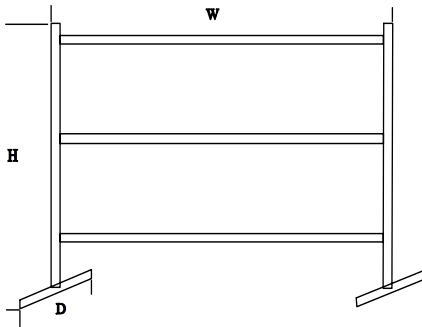


III. MODULE BOARD

1. Size: 13.5"/.34M (W) x 9.6"/.24M (D) x 2"/.05M (H) approx.
2. Board frame: PS plastic extrusion, 0.118"/3mm thick.
3. Dimensions shown below.

I. FEATURES

1. This device includes some basic experiment units and can be expanded to the advanced one. Modular design makes it easy to use and maintain.
2. Each experiment unit consists of several module boards. All Input and output signals, control flows and wirings are shown on the module boards.
3. Circuit diagrams, or block diagrams, are silkscreen-printed on the module board.
4. All the test points and connection terminals are brought out



- on the front for easy access and measurement,
5. Connection terminals are standard .16"/4mm diameter jacks.
6. Main panel frame (stand) is molded, specially treated and painted for long-lasting and beautification.

II. MAIN PANEL FRAME (STAND)

1. Size: 31"(W) x 34.6"(H) x 15.7"(D)
2. Material: Stainless steel and square steel tubing.
3. Demonstration panel structure: Module boards can be slid in and out of the holding slots. It is designed to allow the instructors conveniently demonstrate the circuits and let the students practice on the panel easily.



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EXPERIMENTS INCLUDED

A. Transformer Experiments

1. Winding Ratio & Polarity Tests
2. Open-Circuit & Short-Circuit Tests
3. Load Test
4. Temperature Rise Test
5. Transformer in Parallel Connection
6. Transformer Three-phase Connections
7. Phase Transformations
8. Three-Phase Transformer Open-Circuit Test
9. Three-Phase Transformer Short-Circuit Test
10. Three-Phase Transformer Load Test

B. AC Motor Experiments

1. Three-Phase Induction Motor No-Load Test
2. Three-Phase Induction Motor Blocking Test
3. Three-Phase Induction Motor Load Test
4. Three-Phase Induction Motor Speed Control
5. Characteristic Test of Single-Phase Induction Motor

C. Sync Motor and Generator Experiments

1. Introduction to three-phase Synchronous generator
2. Three-Phase, Synchronous Generator No-Load and Short-

circuit Tests

3. Three-Phase, Synchronous Generator Load Test
4. Three-Phase, Synchronous Generator Parallel Connection Operation Test
5. Synchronous Motor Phase Adjustment Test

D. DC Motor And Generator Experiments

1. Introduction to DC Motor
2. DC Generator No-Load Characteristic Test
3. DC Separately Excited Generator Load Characteristic Test
4. DC Shunt Generator Load-Characteristic Test
5. DC Series Generator Load-Characteristic Test
6. DC Compound Generator Load-Characteristic Test
7. DC Generator Parallel Connection Operation Test
8. DC Motor Speed Control
9. DC Separately Excited Motor Load Characteristic Test
10. DC Shunt Motor Load-Characteristic Test
11. DC Series Motor Load-Characteristic Test
12. DC Compound Motor Load-Characteristic Test

◆ COMPONENT SPECIFICATION

I. POWER SECTION

1. PRIMARY(EM-N1601) x 1

- ① 3 ϕ AUTO TRANSFORMERS (220V, 10A).
- ② 1 ϕ AUTO TRANSFORMERS (220V, 5A).
- ③ NFB (10A, 220V).
- ④ RECEPTACLE, 1 ϕ , 110V.
- ⑤ OUTPUT TERMINALS, 3 ϕ .
- ⑥ OUTPUT TERMINALS, 1 ϕ .
- ⑦ PL, 3 ϕ .
- ⑧ PL, 1 ϕ .
- ⑨ 620Wx400Dx285H (mm)
- ⑩ 33Kg

2. SECONDARY (EM-N1602) x 1

- ① WATT METER, INCLUDING PT & CT (30W~1920w).
- ② 1 ϕ AUTO TRANSFORMER (110V, 10A).
- ③ 620Wx400Dx285H (mm)
- ④ 25Kg

II. TRANSFORMERS SECTION

1. MULTI-FUNCTION TRANSFORMER(EM-T1842) x 3

- ① 1KVA
- ② PRIMARY: 220V, 4.5A, 60Hz; TAPS AT 50% & 86.6%.
- ③ SECONDARY: 220V, 4.5A, 60Hz; TAPS AT 50% & 86.6%.
- ④ 180Wx200Dx175H (mm)
- ⑤ 11.5Kg

2. 3 ϕ TRANSFORMER (EM-T1843) (Optional)

- ① 1KVA.
- ② PRIMARY: 3 ϕ 220V, 2.6A, 60Hz
- ③ SECONDARY: 3 ϕ 110VX2, 2.6A, 60Hz
- ④ 200Wx200Dx175H (mm)
- ⑤ 13Kg

III. MOTOR/GENERATOR SECTION

1. MULTIFUNCTION DC MOTOR/GENERATOR (EM-M1203) x 1

- ① CAN BE CONNECTED AS SHUNT, COMPOUND, SERIES DC MOTOR AND GENERATOR.
- ② VOLTAGE RATING: 260V.
- ③ CURRENT RATING: 2.5A.
- ④ HORSE POWER: 1/2 HP, (3/4 AND 1 HP OPTIONAL)
- ⑤ 1800 RPM.
- ⑥ 330Wx220Dx240H (mm)
- ⑦ 28Kg
- ⑧ Aluminum Alloy Molded L-shape Stand.

2. PM DC MOTOR/GENERATOR (EM-M1205) x 1

- ① VOLTAGE RATING: 190V.
- ② CURRENT RATING: 3.7A.
- ③ HORSE POWER: 3/4 HP
- ④ 1800 RPM.
- ⑤ 350Wx220Dx240H (mm)
- ⑥ 15Kg
- ⑦ Aluminum Alloy Molded L-shape Stand.

3. 3 ϕ SQUIRREL-CAGE INDUCTION MOTOR (EM-M1226) x 1

- ① VOLTAGE RATING: 220V.
- ② CURRENT RATING: 1.9A.
- ③ HORSE POWER: 1/2 HP, (3/4 HP AND 1 HP OPTIONAL)
- ④ 1720 RPM.
- ⑤ 280Wx220Dx240H (mm)
- ⑥ 14Kg
- ⑦ Aluminum Alloy Molded L-shape Stand.

4. 3 ϕ WOUND-ROTOR INDUCTION MOTOR (EM-M1201) (Optional)

- ① VOLTAGE RATING: 220V.
- ② CURRENT RATING: 2.5A.
- ③ HORSE POWER: 1/2 HP, (3/4 HP AND 1 HP OPTIONAL)
- ④ 1720 RPM.
- ⑤ 400Wx220Dx240H (mm)
- ⑥ 24Kg
- ⑦ Aluminum Alloy Molded L-shape Stand.

5. 1 ϕ INDUCTION MOTOR (EM-M1202) x 1

- ① VOLTAGE RATING: 220V.



- ② CURRENT RATING: 5A/10A.
- ③ HORSE POWER: 1/2 HP, (3/4 HP AND 1 HP OPTIONAL)
- ④ 1720 RPM.
- ⑤ 320Wx220Dx240H (mm)
- ⑥ 20Kg
- ⑦ Aluminum Alloy Molded L-shape Stand.

6. 3 ϕ SYNCHRONOUS MOTOR/GENERATOR (EM-1230) x 1

- ① ALSO CAN BE USED AS MOTOR THAT DRIVES THE DC GENERATOR.
- ② VOLTAGE RATING: 220V.
- ③ CURRENT RATING: 2.5A.
- ④ HORSE POWER: 1 HP.
- ⑤ 1800 RPM.
- ⑥ 400Wx220Dx240H (mm)
- ⑦ 24Kg
- ⑧ Aluminum Alloy Molded L-shape Stand.

IV. STARTERS

1. 3 ϕ SYNCHRONOUS MOTOR STARTER MODULE (IW-3738) x 1

- ① MANUAL STATER.
- ② 343Wx24.3Dx48H (mm)
- ③ 1.5Kg

V. METERS

1. DIGITAL MULTIMETERS MODULE (ES-5704) x 3

- ① MULTIMETER, MODEL 6E
- ② MULTIMETER, MODEL 7S
- ③ 343Wx24.3Dx48H (mm)
- ④ 1.6Kg
- ⑤ PS Injection Molding Frame.

2. WATT METER MODULE (ES-5813) x 1

- ① RANGE: 12W, 24W, 48W.
- ② VOLTAGE: 120V, 240V.
- ③ CURRENT: 0.1A X 2.
- ④ 343Wx24.3Dx110H (mm)
- ⑤ 2.6Kg
- ⑥ PS Injection Molding Frame.

3. 3 ϕ POWER FACTOR METER MODULE (ES-5706) x 1

- ① RANGE: - 0.5 TO + 0.5.
- ② VOLTAGE: 240V.
- ③ CURRENT: 5A.
- ④ 343Wx24.3Dx110H (mm)
- ⑤ 2.1Kg
- ⑥ PS Injection Molding Frame.

4. DIGITAL RPM METER MODULE (CJ-813) x 1

- ① 4-DIGIT DISPLAY.
- ② RANGE: 0 TO 9999 RPM
- ③ OUTPUT: +/-12V (2A), AND +5V (2A).
- ④ 343Wx24.3Dx110H (mm)
- ⑤ 3.5Kg
- ⑥ PS Injection Molding Frame.

VI. LOADS

1. WATER RHEOSTAT (EM-N1835) x 1

- ① POWER RATING: 240W.
- ② VOLTAGE RATING: 240V.
- ③ CURRENT RATING: 10A.
- ④ 455Wx335Dx235H (mm)
- ⑤ 2.6Kg
- ⑥ PS Injection Molding Frame.

- ④ PS Injection Molding Frame.

2. DC MOTOR 4-POINT STATER MODULE (EM-5799) (Optional)

- ① MANUAL STATER.
- ② 343Wx24.3Dx48H (mm)
- ③ 5.5Kg
- ④ PS Injection Molding Frame.

3. WOUND-ROTOR INDUCTION MOTOR STARTER MODULE (EM-5798) (Optional)

- ① MANUAL STARTER.
- ② 343Wx24.3Dx48H (mm)
- ③ 2.1Kg
- ④ PS Injection Molding Frame.

4. RECTIFIER MODULE (EM-N1402) x 1

- ① 1 ϕ RECTIFIER, 2 PIECES.
- ② 3 ϕ RECTIFIER, 2 PIECES.
- ③ VOLTAGE RATING: 250V.
- ④ CURRENT RATING: 25A.
- ⑤ 343Wx24.3Dx48H (mm)
- ⑥ 1.5Kg
- ⑦ PS Injection Molding Frame.

2. RLC LOAD BOX (EM-N1836, 1837, 1838) x 1

- ① RESISTANCE (EM-N1836)
 - a. 1K Ω (70w), 15 pieces.
 - b. Size: 410mm(W) x 300mm(D) x 320mm(H)
- ② INDUCTANCE (EM-N1837)
 - a. 0.3A (250V), 15 pieces.
 - b. Size: 410mm(W) x 300mm(D) x 320mm(H)
- ③ CAPACITANCE (EM-N1837)
 - a. 3.3 μ f (250V), 15 pieces.
 - b. Size: 410mm(W) x 300mm(D) x 320mm(H)

VII. OTHER

1. VARIABLE POWER RESISTOR (EM-N1833) x 1

- ① POWER RATING: 500W.
- ② RESISTANCE: 500 Ω .
- ③ 410Wx190Dx200H (mm)
- ④ 4.4Kg

2. VARIABLE POWER RESISTOR (EM-N1833) x 1

- ① POWER RATING: 500W.
- ② RESISTANCE: 10 Ω .
- ③ 410Wx190Dx200H (mm)
- ④ 4.4Kg

3. PLATFORM x 1

- ① CAST IRON.
- ② USED AS THE BASE FOR COUPLING MACHINERIES.
- ③ 695Wx220Dx53H (mm)
- ④ 23Kg
- ⑤ PS Injection Molding Frame.

4. SYNCHRONOUS LAMP MODULE (ES-5708) x 1

- ① SYNCHRONOUS LAMPS, 3 PIECES.
- ② WHITE BULBS.
- ③ 343Wx24.3Dx110H (mm)
- ④ 2.3Kg
- ⑤ PS Injection Molding Frame.

5. SWITCH MODULE (ES-5713) x 1

- ① SWITCH (250V, 10A), 4 PIECES.
- ② FUSES, 8 PIECES.
- ③ 343Wx24.3Dx48H (mm)
- ④ 1.5Kg



6. THERMOMETER (EM-N1832) x 1

- ① RANGE: 0 TO 150°C.
- ② SIZE: 80mm (Diameter) X 175mm (L).
- ③ 0.15Kg

7. CONNECTION WIRES (EM-N1831) x 1

- ① EXTRUDED BANANA PLUG WIRES.
- ② 4mm IN DIAMETER.
- ③ 20 Cm, 80Cm, 120Cm. 10 PIECES EACH.
- ④ 1Kg

8. MAIN PANEL FRAME (EM-N1830) x 1

- ① 40 X 80 mm, ALUMINUM AND SQUARE STEEL TUBE.
- ② MODULE BOARDS CAN BE SLID IN AND OUT OF THE HOLDING SLOTS. IT IS DESIGNED TO ALLOW THE INSTRUCTORS CONVENIENTLY DEMONSTRATE THE CIRCUITS AND LET THE STUDENTS PRACTICE ON THE PANEL EASILY.
- ③ SIZE: 58.3"/1.48m(W) X 30.7"/.78m(H) X 16"/.41m(D).
- ④ 6Kg

9. TABLE (EM-N1829) (Optional)

- ① WOOD TABLE TOP.
- ② STEEL FRAME.
- ③ SIZE: 70.8"/1.80m(W)x34.4"/.9m(D)x29.5"/.75m(D).
- ④ 40Kg

10. WIRE HANGER (EM-N1828) (Optional)

- ① STEEL.
- ② SIZE: 600mm (DIAMETER) x 1350mm.
- ③ 5Kg

11. DIGITAL DYNAMOMETER (EM-M1262) (Optional)

- ① TORQUE: 0 TO 30Kg-Cm.
- ② SWIRL TYPE.
- ③ DIGITAL DISPLAY FOR TORQUE.
- ④ PHOTO-COUPLING SENSOR, 4-DIGIT RPM DISPLAY.
- ⑤ SIZE: 240mm (W) x 280mm (D) x 360mm (H).
- ⑥ 23Kg
- ⑦ MOLDED STAND

SECTION MOTORS (Optional)

1. DC SHUT MOTOR (EM-M1204S) (Optional)

- ① HORSE POWER: 1/2 HP.
- ② 1/4 SECTIONS.
- ③ TRANSPARENT ACRYLIC COVER.
- ④ SIZE: 430mm (W) x 360mm (D) x 300mm (H).
- ⑤ 30Kg

2. PM TYPE DC MOTOR/GENERATOR (EM-M1205S) (Optional)

- ① HORSE POWER: 3/4 HP.
- ② 1/4 SECTIONS.
- ③ TRANSPARENT ACRYLIC COVER.
- ④ SIZE: 430mm (W) x 360mm (D) x 300mm (H).
- ⑤ 17Kg

3. 3 ϕ SQUIRREL-CAGE INDUCTION MOTOR (EM-M1201S) (Optional)

- ① HORSE POWER: 1/2 HP.
- ② 1/4 SECTIONS.
- ③ TRANSPARENT ACRYLIC COVER.
- ④ SIZE: 430mm (W) x 360mm (D) x 300mm (H).
- ⑤ 26Kg

(EM-M1226S) (Optional)

- ① HORSE POWER: 1/2 HP.
- ② 1/4 SECTIONS.
- ③ TRANSPARENT ACRYLIC COVER.
- ④ SIZE: 430mm (W) x 360mm (D) x 300mm (H).
- ⑤ 16Kg

5. 1 ϕ INDUCTION MOTOR (EM-M1202S) (Optional)

- ① HORSE POWER: 1/2 HP.
- ② 1/4 SECTIONS.
- ③ TRANSPARENT ACRYLIC COVER.
- ④ SIZE: 430mm (W) x 360mm (D) x 300mm (H).
- ⑤ 22Kg

6. 3 ϕ SYNCH. MOTOR/GENERATOR (EM-M1230S) (Optional)

- ① HORSE POWER: 1 HP.
- ② 1/4 SECTIONS.
- ③ TRANSPARENT ACRYLIC COVER.
- ④ SIZE: 430mm (W) x 360mm (D) x 300mm (H).
- ⑤ 26Kg

4. 3 ϕ WOUND-ROTOR INDUCTION MOTO

