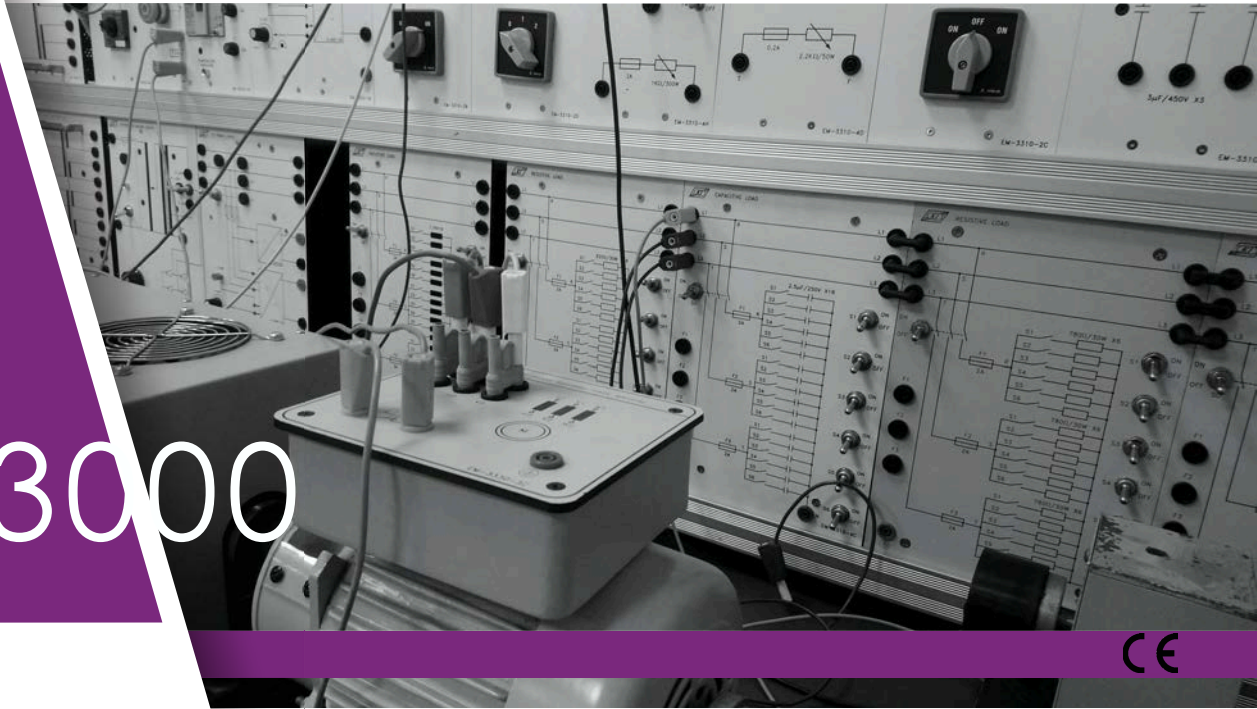


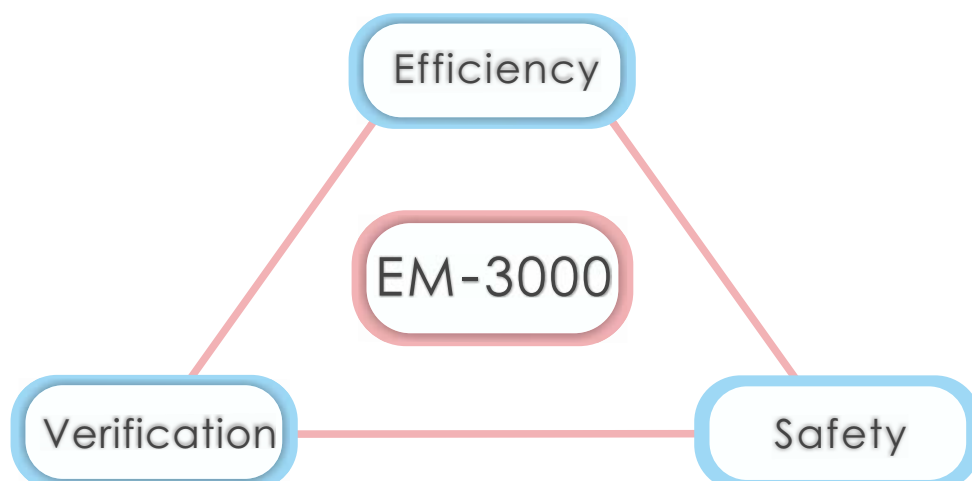
Electrical Machines System

EM-3000



The electrical machines system helps students distinguish the similarities and differences among various electrical machineries.

Circuit models are clearly printed on all kinds of electrical machineries, giving students a comprehensive view of how electrical machineries operate. Moreover, it also enhances students' ability for further application and control.



● What are Electrical Machines ?

Electrical Machines Field

Transformer

Changing one voltage into another voltage.

Motor

Changing electrical energy into kinetic energy.

Elevator, Escalators, Lathe.....



In the system, use Brake Unit and Brake Controller to emulate the mechanical loads.

Generator

Changing kinetic energy into electrical energy.

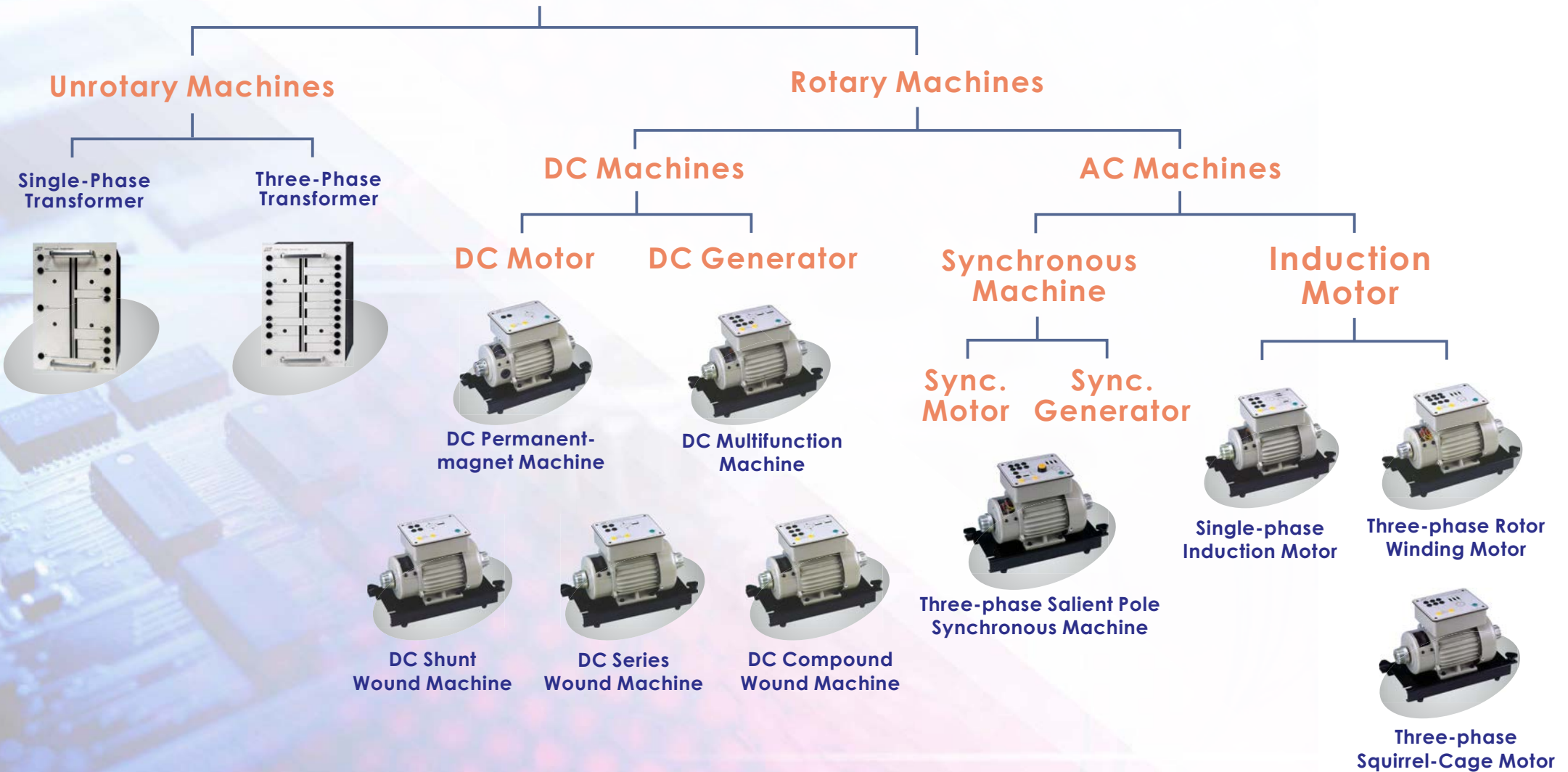
Wind energy, Nuclear energy, Hydroelectric power.....



In the system, use DC Permanent-magnet Machine as prime mover.

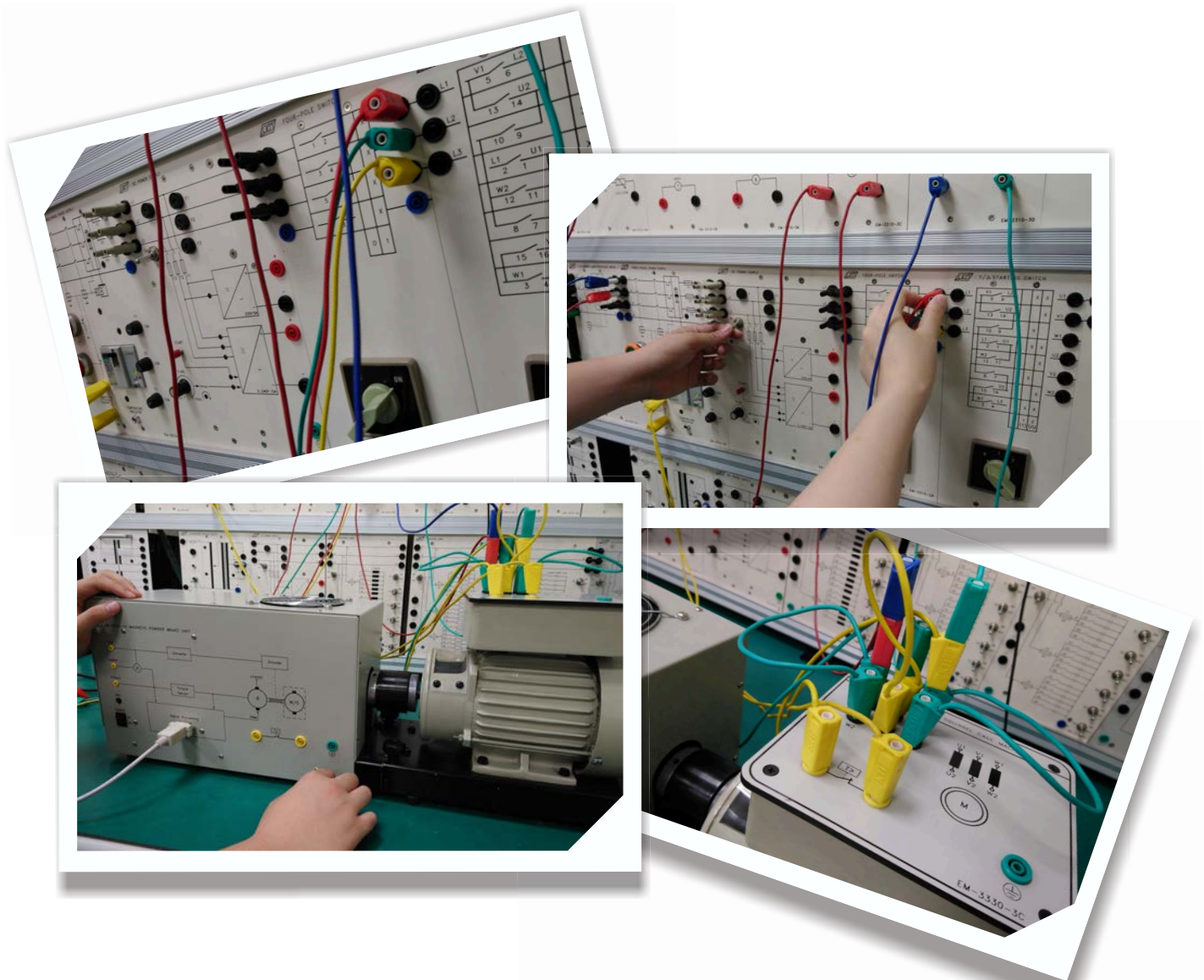
● Hardware Overview

Electrical Machines



● Features

1. Modular design provides flexible experimental requirement
2. Each Module panel height compatible with DIN A4 standard
3. Using 4 mm safety sockets and plugs
4. Each DC/AC power supply equipped with overload protection
5. Rotary machine and brake with overheating protection
6. Adopting digitized and microprocessor-based measuring instrument to provide high-accuracy measurement
7. Brake with constant speed / constant torque function, easy to operate
8. Drawing complete T/N curve
9. Connecting to PC, measuring and drawing characteristic curve available
10. 300W-grade designed equipment suitable for learning the theory and characteristics of electrical machines
11. Stand-alone machine design equipped with two shaft ends and aluminum alloy base for coupling to other machines
12. Training panel uses 5 mm isolation bakelite, printed component symbol, value and function, easy to connect
13. Fully protected system safe to connect various kinds of machines
14. Providing powerful computer measuring software for saving graphic file, drawing and printing characteristic curves
15. For the sake of safety, the system normally operates at three-phase 220V. Different line voltages can be adjusted by system transformer.



Overview of Equipment Required

▲ : DC Multifunction machine can be used as shunt, series, compound wound machine for motor and generator operation.

* : Additionally recommended

** : Alternative of Digital RPM Meter(EM-3310-3G)

() : Alternative of Digital Power Analysis Meter(EM-3310-3H)

	Transformer Tests	DC Permanent-magnet Motor Tests	DC Shunt Wound Motor Tests	DC Separately-excited Generator Tests	DC Shunt Wound Generator Tests	DC Series Wound Motor Tests	DC Series Wound Generator Tests	DC Compound Wound Motor Tests	DC Compound Wound Generator Tests	Single-Phase Induction Motor Tests	Three-Phases Squirrel-Cage Induction Motor Tests	Three-Phases Rotor Winding Motor Tests	Three-Phases Synchronous Motor (Salient-Pole) Tests	Three-Phases Synchronous Generator (Salient-Pole) Tests	Total
1. EM-3330-1A DC Permanent-magnet Machine		1		1	1		1		1					1	1
2. EM-3330-1B DC Multifunction Machine			▲1	▲1	▲1	▲1	▲1	▲1	▲1						▲1
3. EM-3330-1C Single-phase Induction Motor										1					1
4. EM-3330-1D DC Shunt Wound Machine			1	1	1										1
5. EM-3330-1E DC Series Wound Machine						1	1								1
6. EM-3330-1F DC Compound Wound Machine								1	1						1
7. EM-3330-3A Three-phase Salient Pole Synchronous Machine													1	1	1
8. EM-3330-3B Three-phase Rotor Winding Motor												1			1
9. EM-3330-3C Three-phase Squirrel Cage Motor											1				1
10. EM-3320-1C Magnetic Powder Brake Unit		1	1	**1	**1	1	**1	1	**1	1	1	1	1	**1	1
11. EM-3320-1N Brake Controller		1	1	**1	**1	1	**1	1	**1	1	1	1	1	**1	1
12. EM-3310-1A DC Power Supply Module		1	1	1	1	1	1	1	1						1
13. EM-3310-1C Synchronous Machine Exciter Module													1	1	1
14. EM-3310-1D AC/DC Power Supply	1			1							1	1			1
15. EM-3310-1E Three-phase Power Supply Module	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16. EM-3310-2A 3-P Current Limit Protection Switch Module	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
17. EM-3310-2B Four-pole Switch Module											1	1	1		1
18. EM-3310-2C Reversing Switch Module											1	1	1		1
19. EM-3310-2D Y/Δ Starting Switch Module											1				1
20. EM-3310-4A DC Machine Starter						1									1
21. EM-3310-4B DC Motor Field Regulator			1					1							1
22. EM-3310-4D DC Generator Field Regulator					1				1						1
23. EM-3310-4E Winding Machine Starter												1			1
24. EM-3310-4F Reactive Compensator											1				1
25. EM-3310-4H DC Generator Load Resistor				1	1		1		1						1
26. EM-3310-4R Resistive Load	1													1	1
27. EM-3310-4C Capacitive Load	1													1	1
28. EM-3310-4L Inductive Load	1													1	1
29. EM-3310-5B Fuse Set	1										1	1			1
30. EM-3310-3A Digital DCA Meter		1	2	3	3	2	2	2	3				1	2	3
31. EM-3310-3B Digital DCV Meter		1	1	3	2	1	3	1	2				1	2	3
32. EM-3310-3C Digital ACA Meter	2									(1)	(1)	(1)	(1)	(1)	2
33. EM-3310-3D Digital ACV Meter	3									(1)	(1)	(1)	(1)	(1)	3
34. EM-3310-3E Digital Three-phase Watt Meter										(1)	(1)	(1)	(1)	(1)	(1)
35. EM-3310-3F Digital Power Factor Meter										(1)	(1)	(1)	(1)	(1)	(1)
36. EM-3310-3G Digital RPM Meter				1	1		1		1					1	1
37. EM-3310-3H Digital Power Analysis Meter										1	1	1	1	1	1
38. EM-3340-1A Single-Phase Transformer	1														1
39. EM-3340-3A Three-Phase Transformer	1														1
40. EM-3340-3B System Transformer	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
41. EM-3380-1A Laboratory Table	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
42. EM-3380-2A Experimental Frame (two-layers) EM-3380-2B Experimental Frame (three-layers)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
43. EM-3390-1A Connecting Lead Holder	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
44. EM-3390-2A Coupling		1	1	2	2	1	2	1	2	1	1	1	1	2	2
45. EM-3390-2B Coupling Guard		1	1	2	2	1	2	1	2	1	1	1	1	2	2
46. EM-3390-2C Shaft End Guard		1	1	1	1	1	1	1	1	1	1	1	1	1	1
47. EM-3390-3A Connecting Leads Set	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
48. EM-3390-4A Safety Bridging Plugs Set	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
49. Experiment Manual	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1