

First Course on Power Systems

Module 8: Synchronous Generators

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Reference Textbook:
First Course on Power Systems by Ned Mohan,
www.mnpere.com

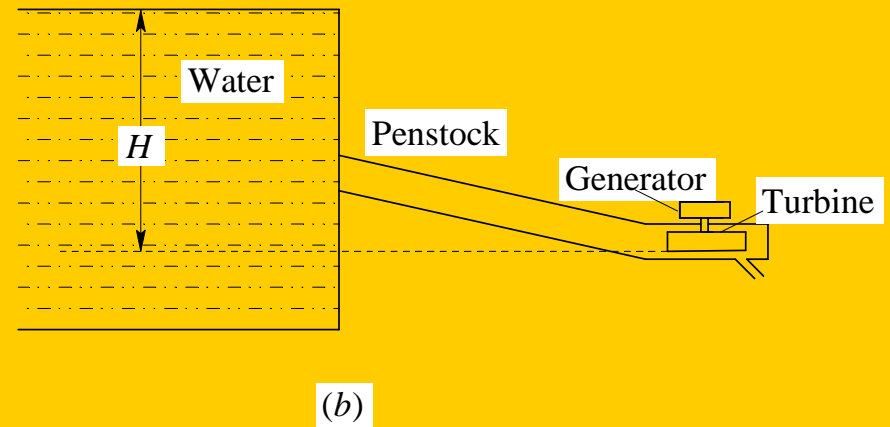
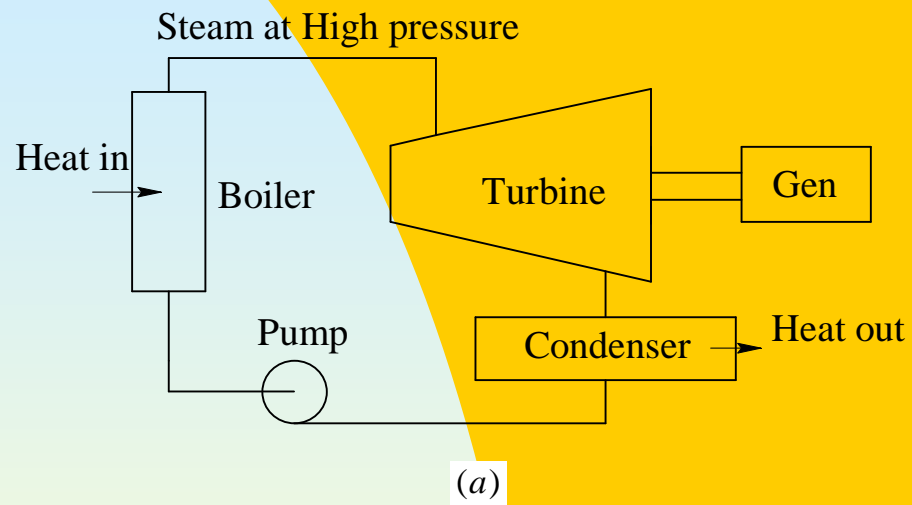
Module 8: Synchronous Generators

Chapter 9	SYNCHRONOUS GENERATORS	9-1
9-1	INTRODUCTION	9-1
9-2	STRUCTURE	9-2
9-3	INDUCED-EMF IN THE STATOR WINDINGS	9-4
9-4	POWER OUTPUT, STABILITY AND THE LOSS OF SYNCHRONISM	9-9
9-5	FIELD EXCITATION CONTROL TO ADJUST REACTIVE POWER	9-11
9-6	FIELD EXCITERS FOR AUTOMATIC VOLTAGE REGULATION (AVR)	9-12
9-7	SYNCHRONOUS, TRANSIENT AND SUB-TRANSIENT REACTANCES	9-13
	REFERENCES	9-15
	PROBLEMS	9-15

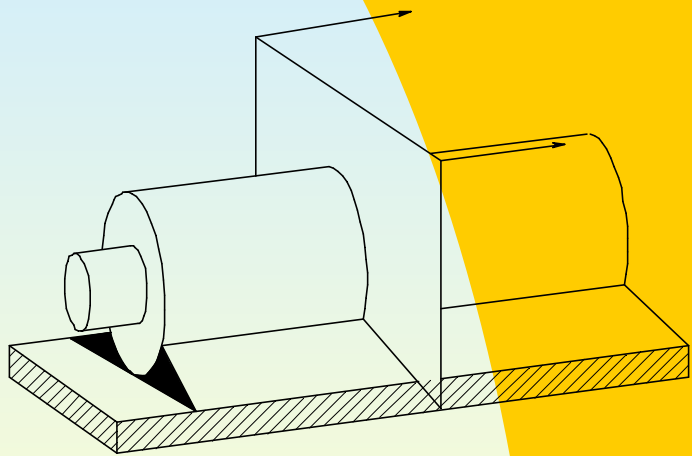
Synchronous Generators

- Very Important Apparatus in Power Systems
- Supply Reactive Power

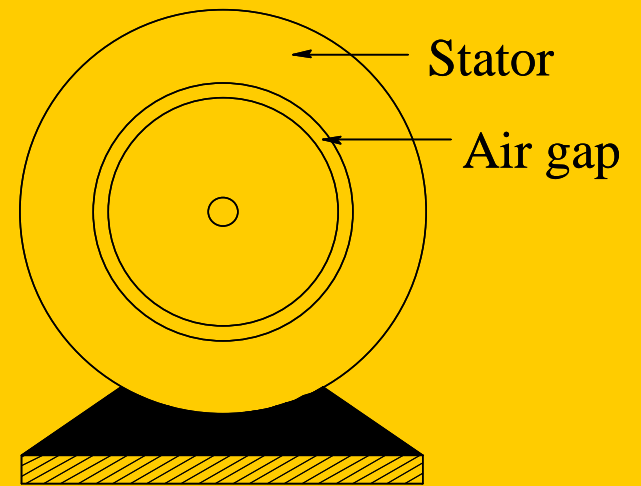
Use of Synchronous Generators



Cross-section of Synchronous Generators

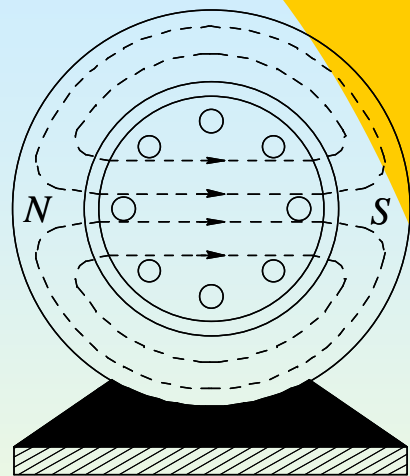


(a)

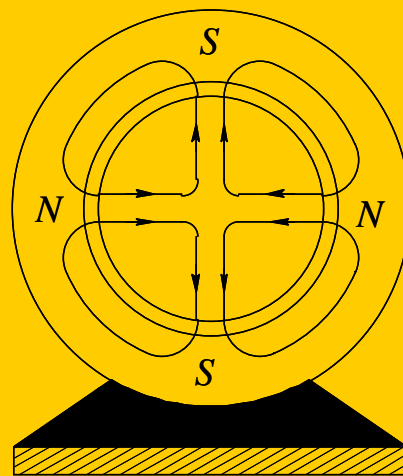


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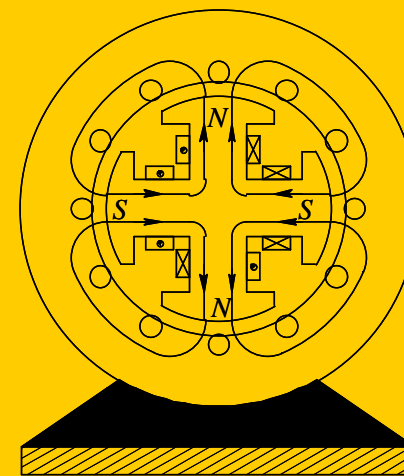
Synchronous Generator Structure



(a)

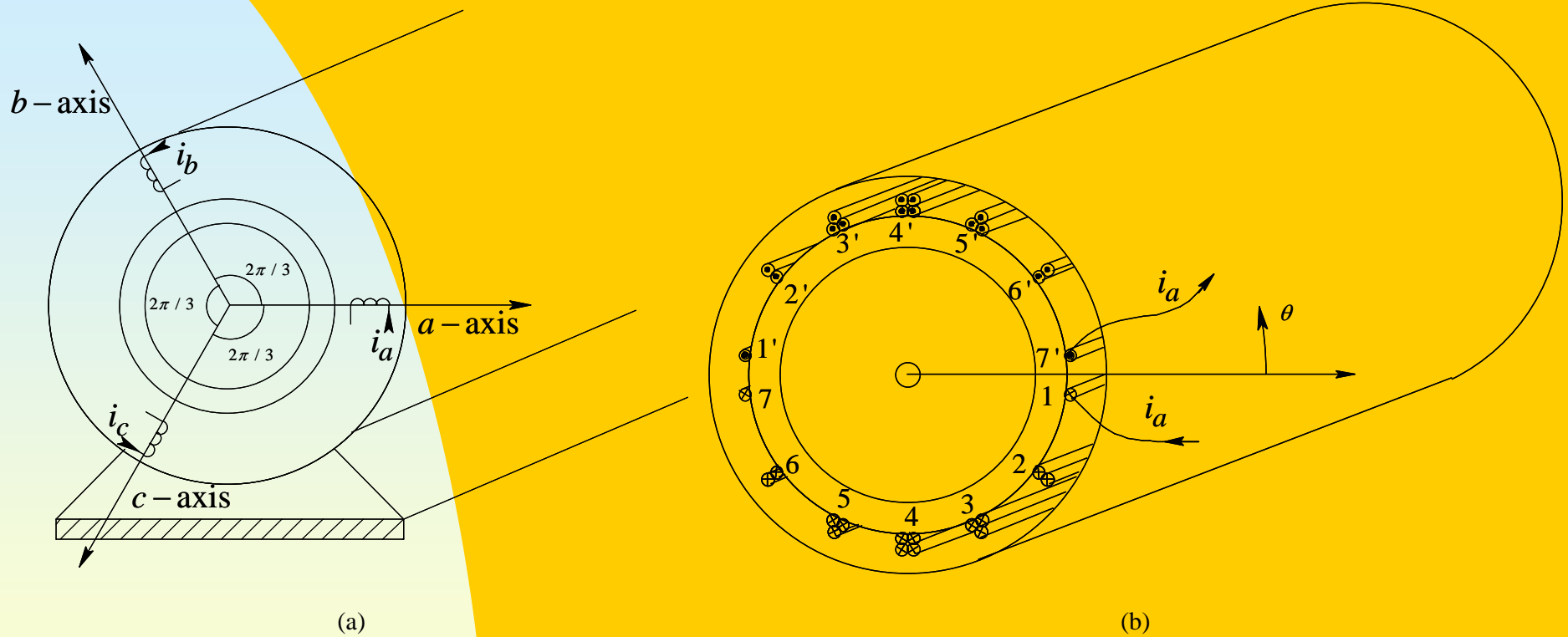


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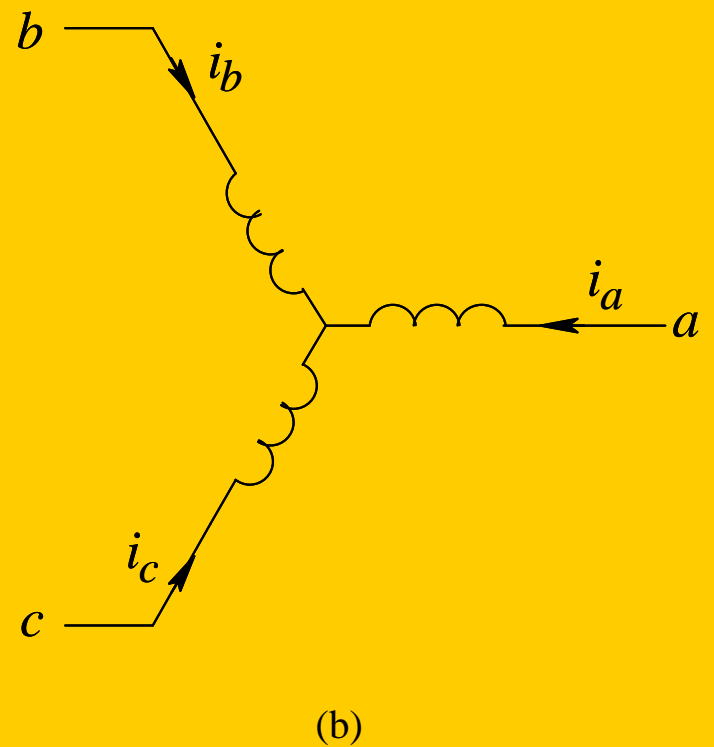
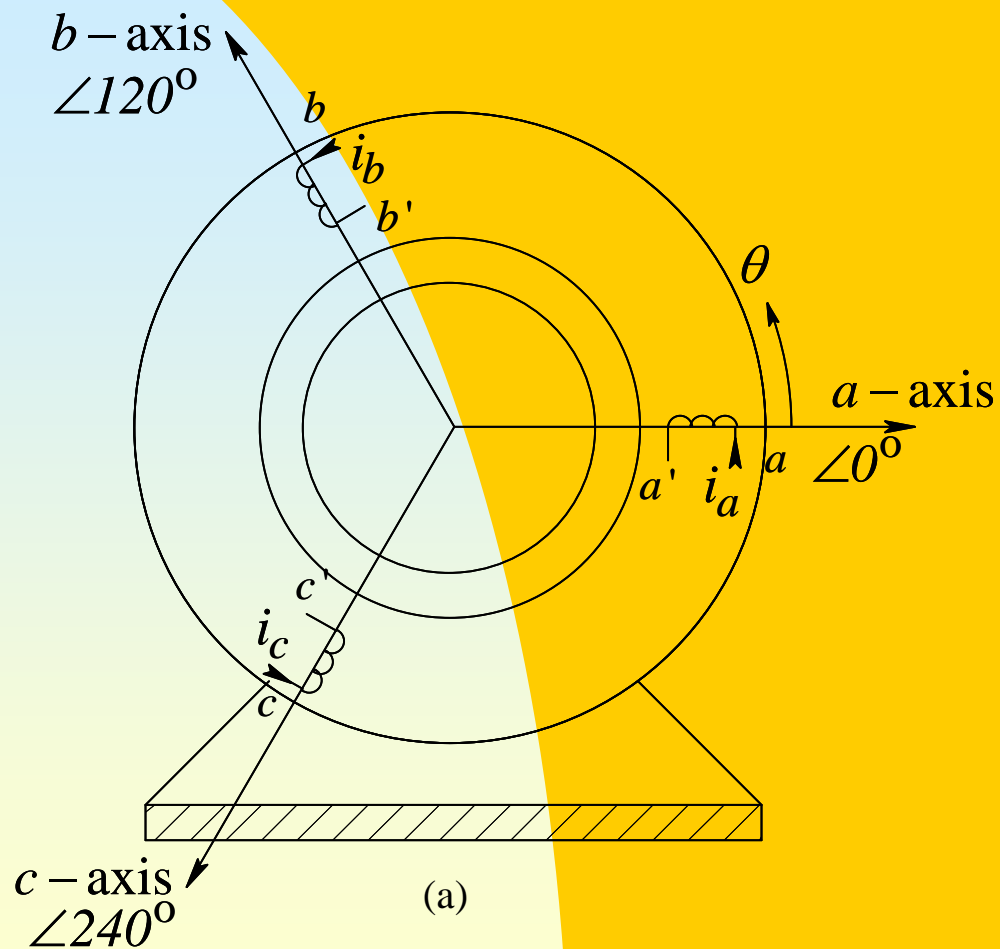


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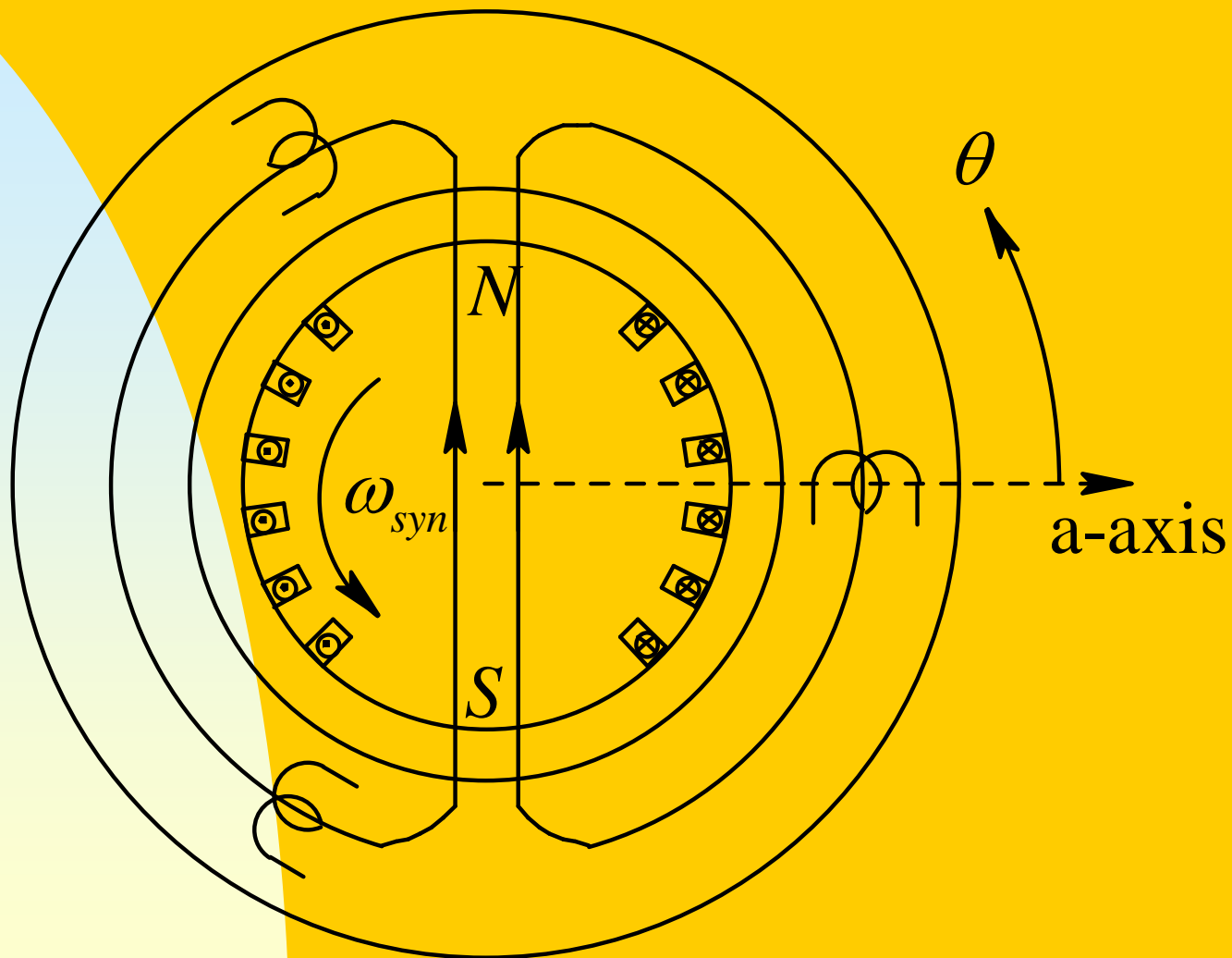
Sinusoidally-Distributed Windings



Three-Phase Winding Connection in a Wye



Synchronous Generator Rotor Field



Voltage induced in the Stator Phase due to Rotating Rotor Field

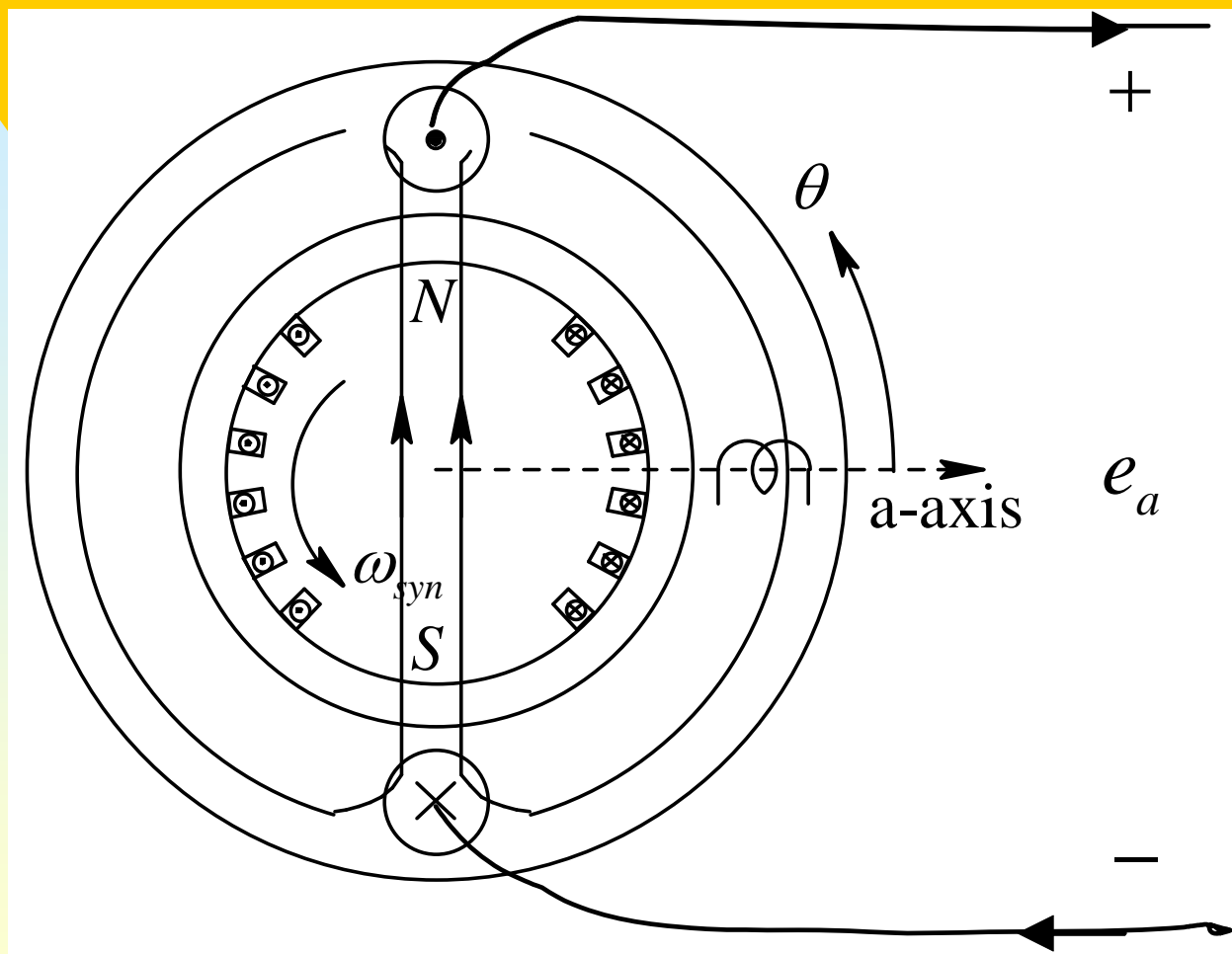


Fig. 9-7 Current direction and voltage polarities; the rotor position shown induces

maximum e_a .