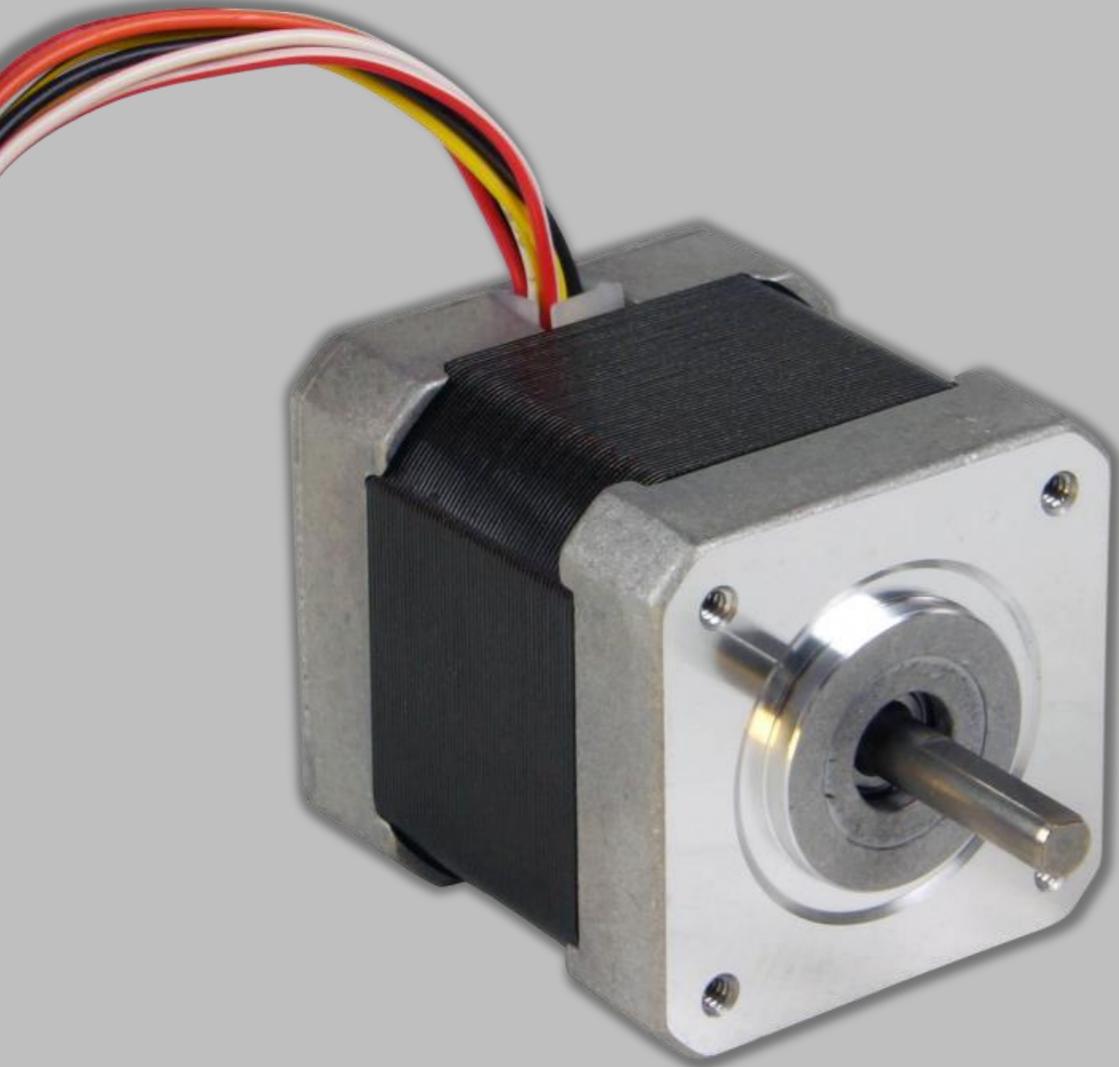


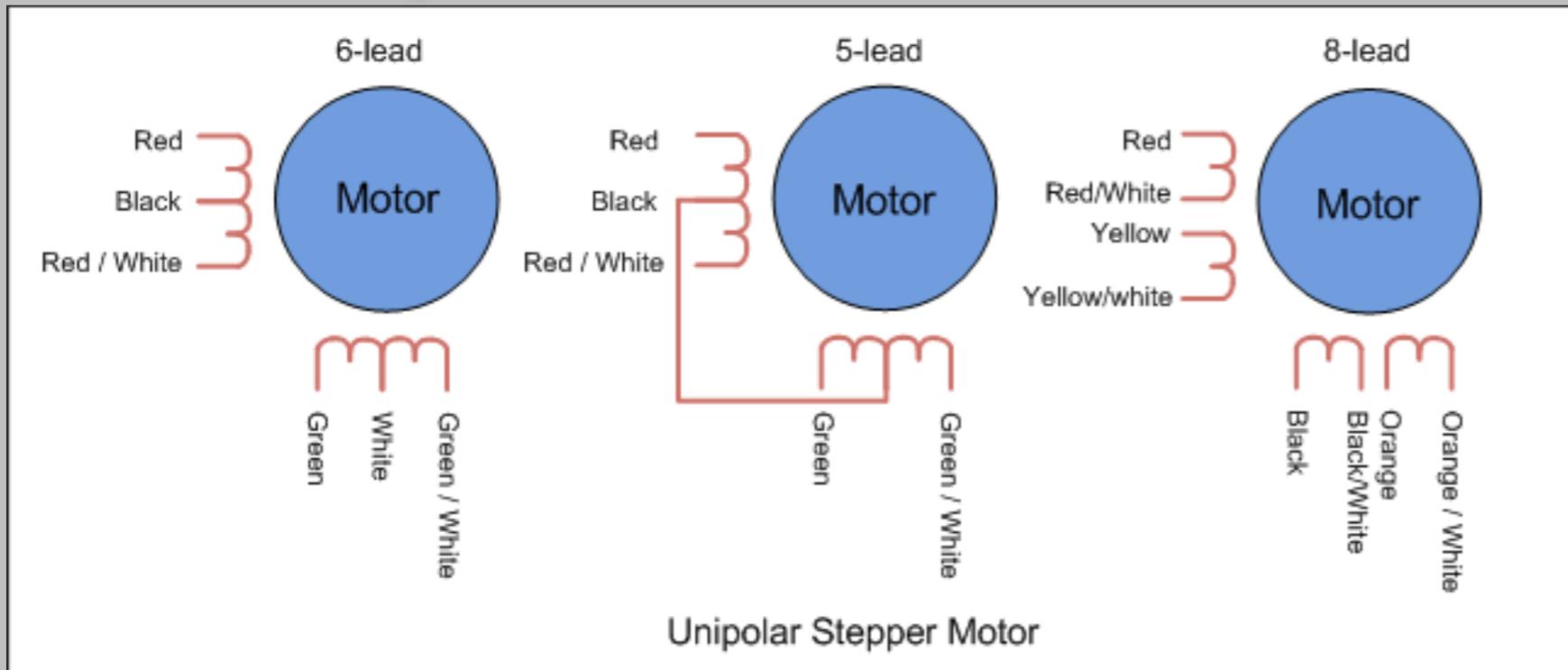
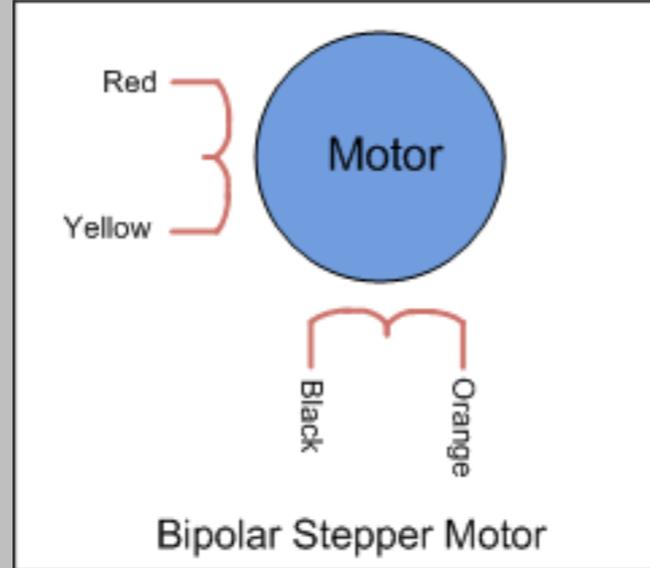
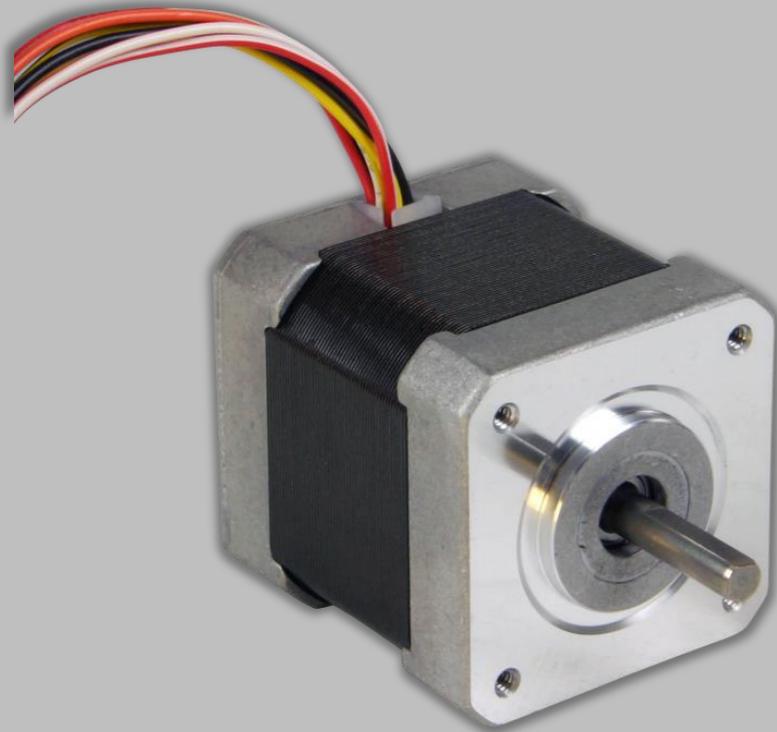
# Motor de passo de 4, 5, 6 e 8 fios



Por Fernando Koyanagi



# Motores mais comuns





Em [www.fernandok.com](http://www.fernandok.com)

Download arquivo **PDF** dos diagramas

 Inscreva-se

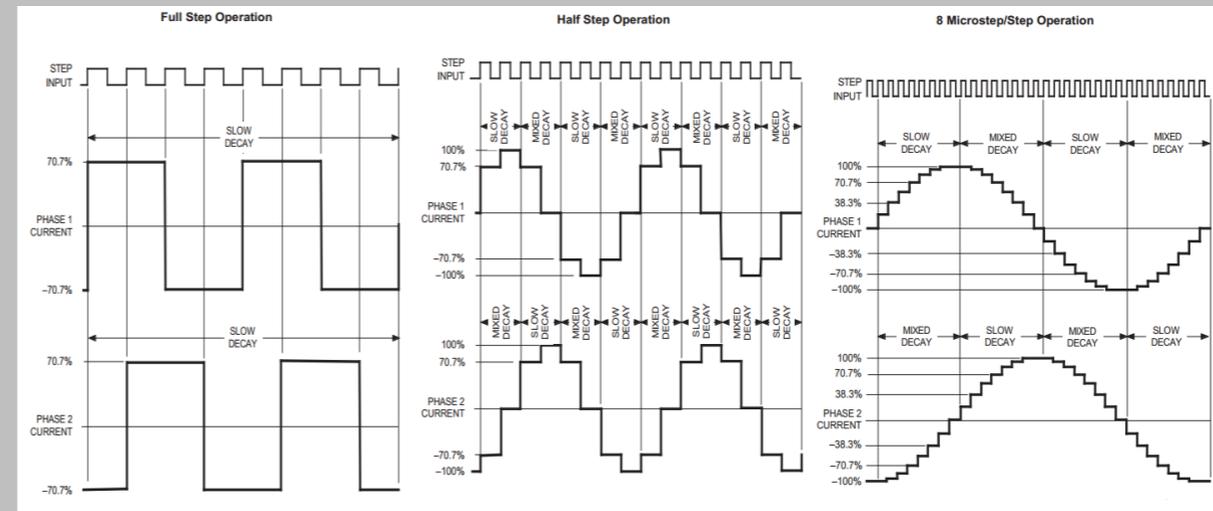
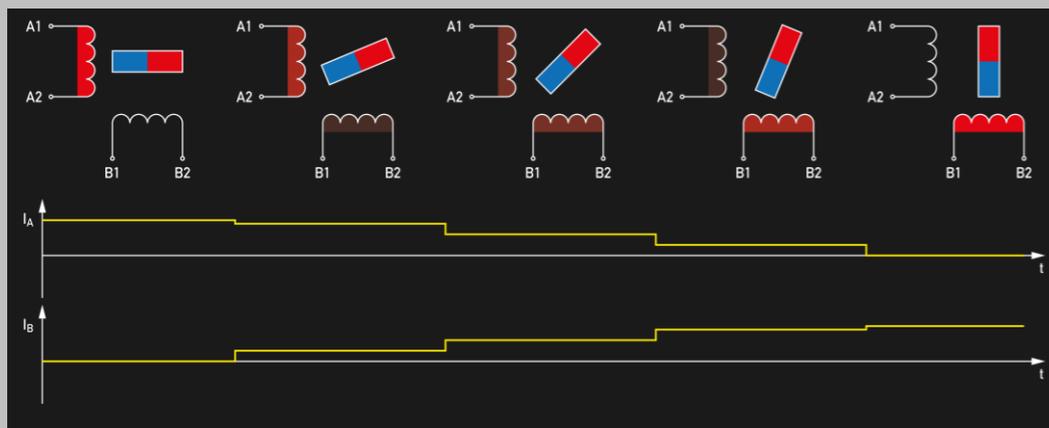


# Pergunta & Resposta

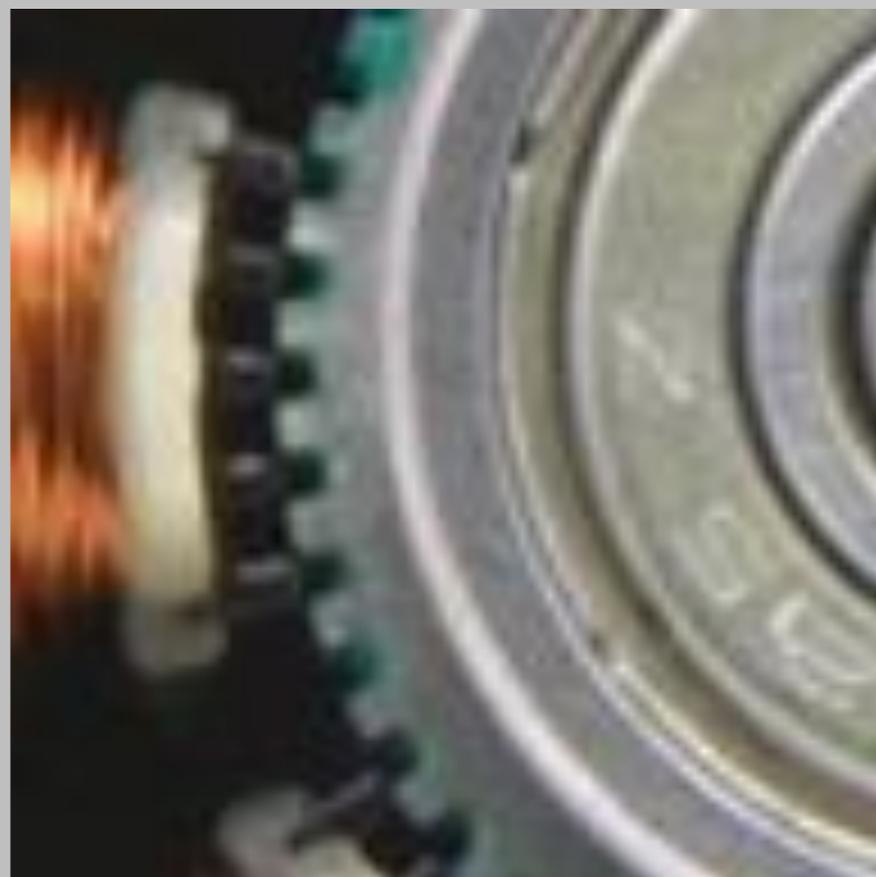
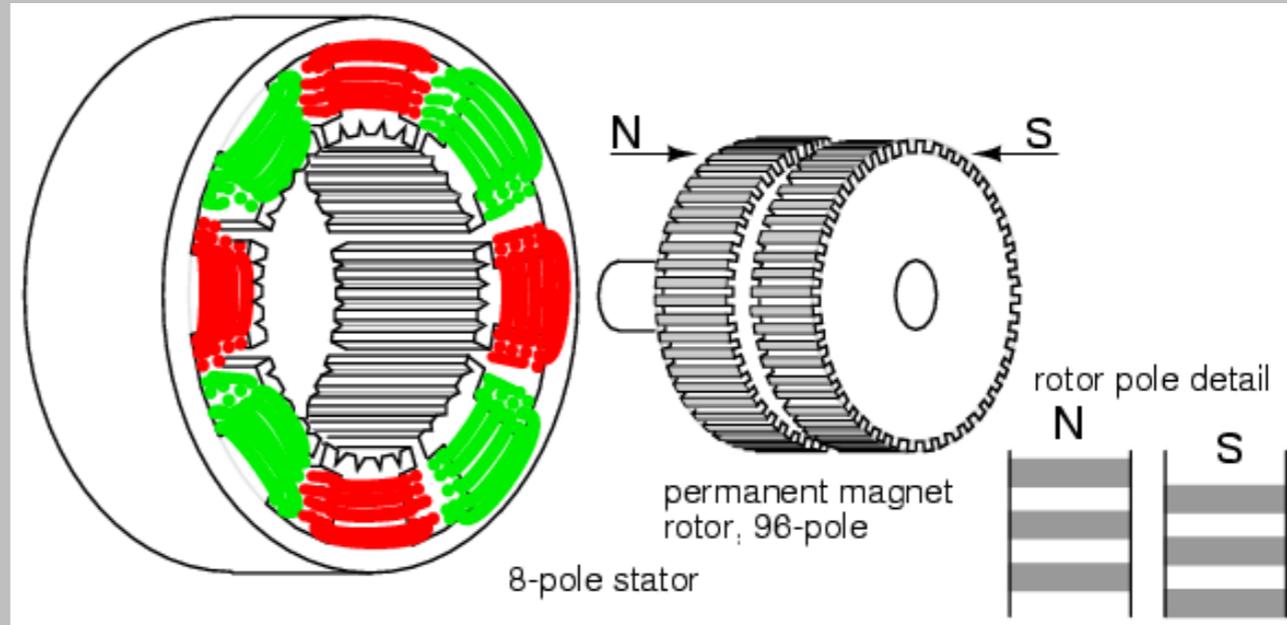
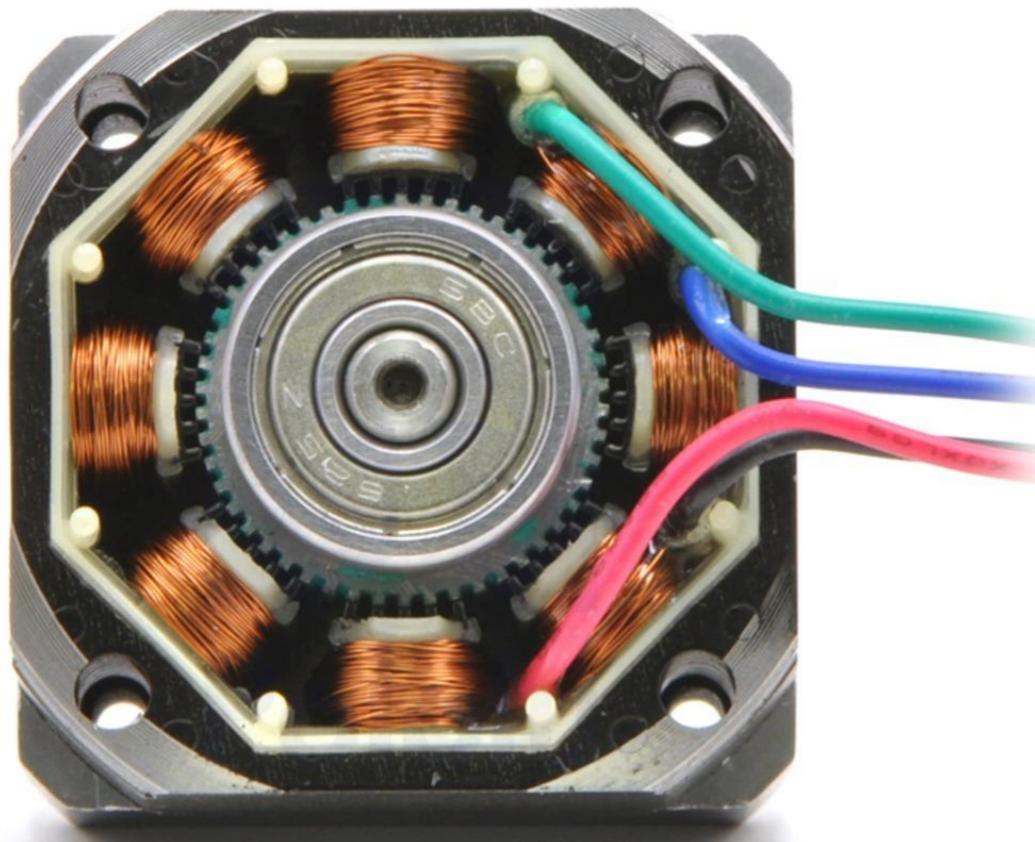


natan bittencourt

Não entendi muito bem a questão da resolução do motor de passo. Ela tem a ver com a quantidade de bobinas dentro do motor? Pois eu posso variar a quantidade de passos dentro de uma rotação completa apenas variando a intensidade da corrente elétrica nas bobinas....

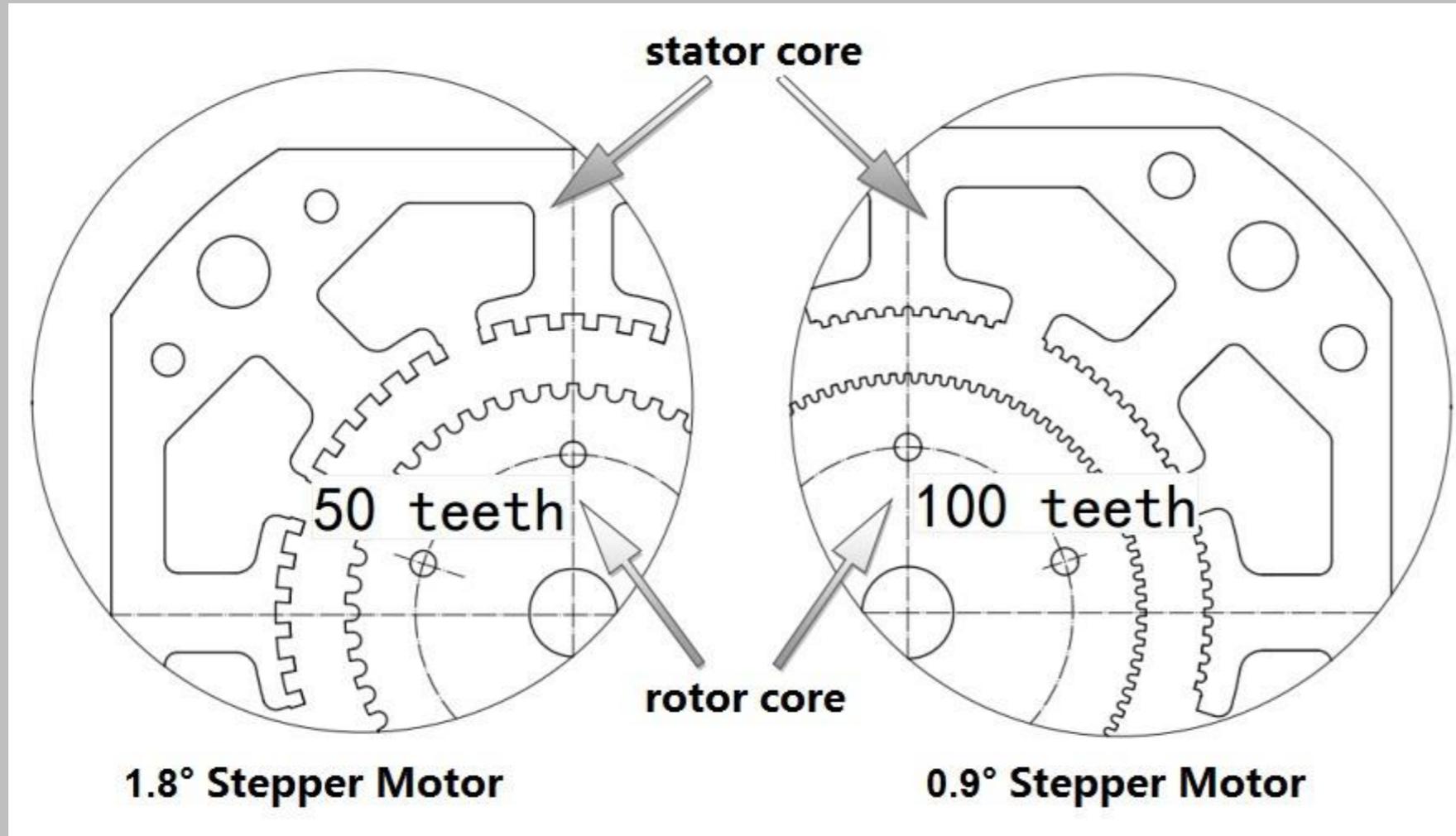


# Motor Bipolar



## Número de dentes

<https://www.moonsindustries.com/series/nema-14-high-precision-hybrid-stepper-motors-b020401>

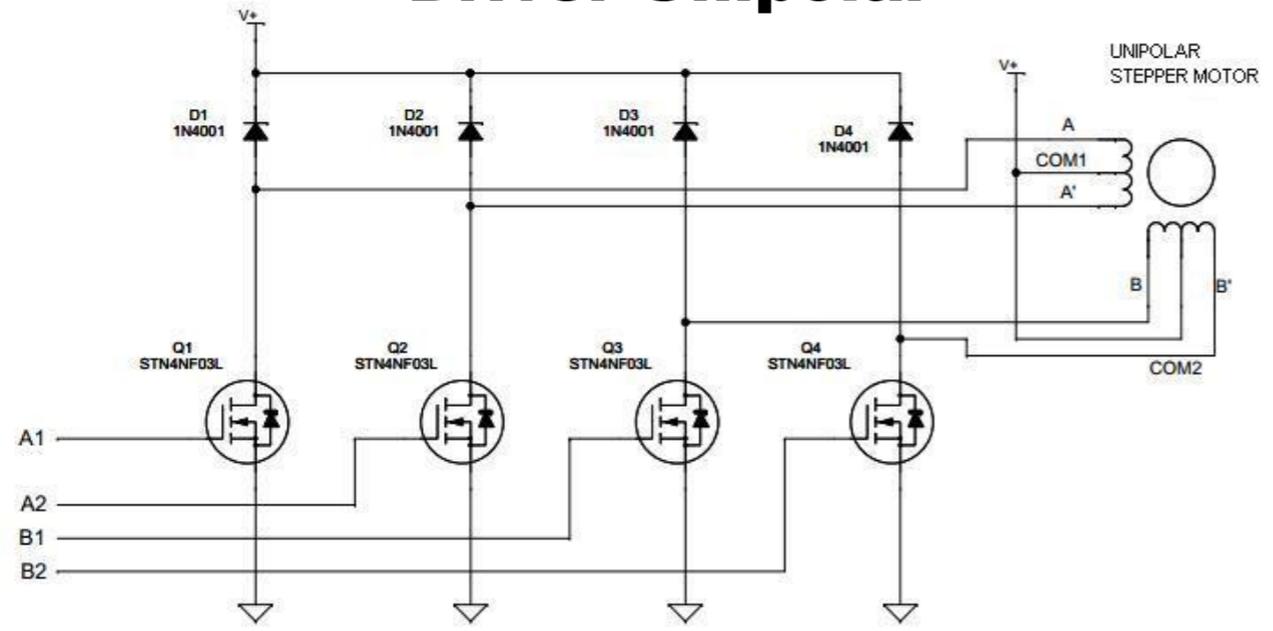


**Motor de passo de alta precisão NEMA 14**

### **Evitar regiões de Ressonância**

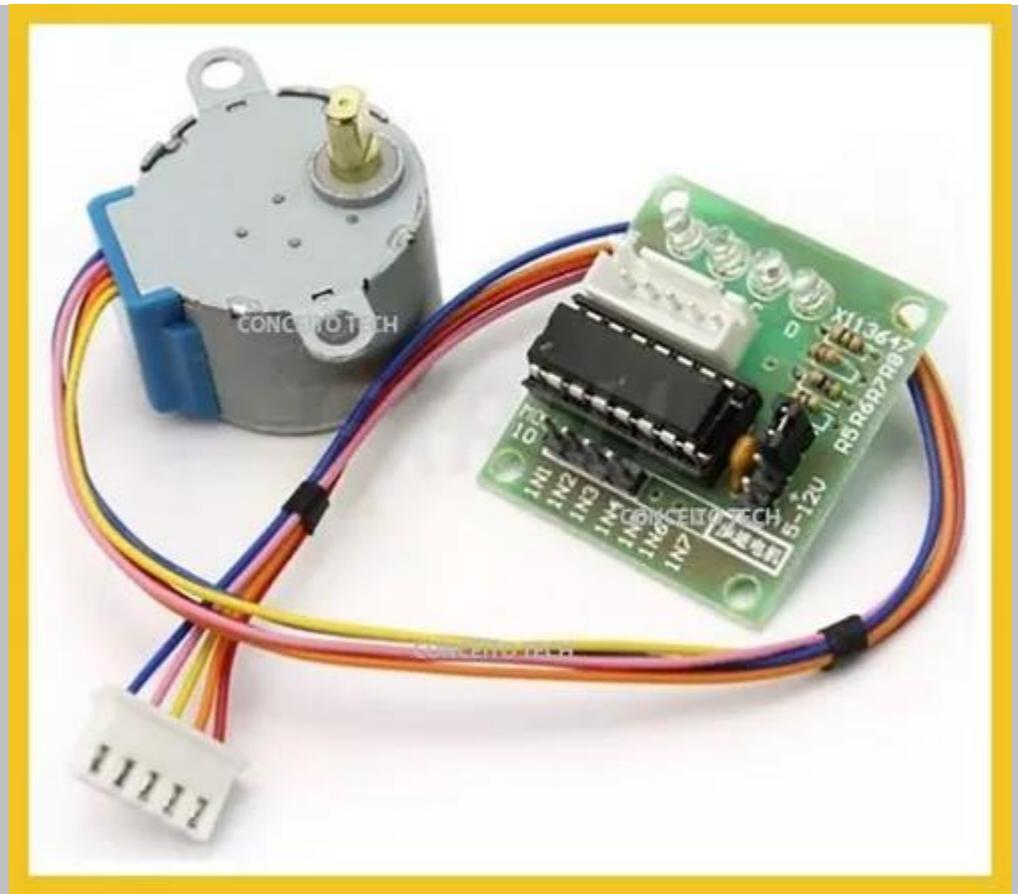
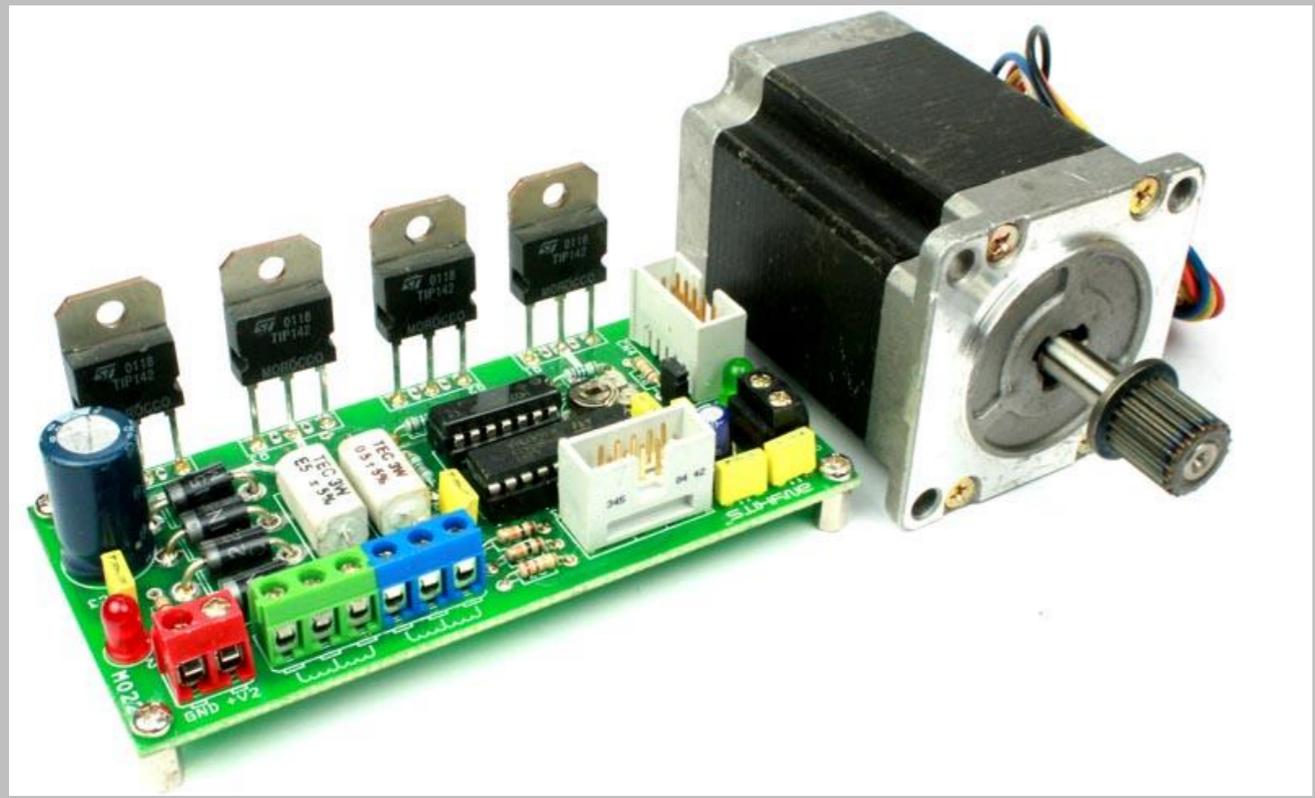
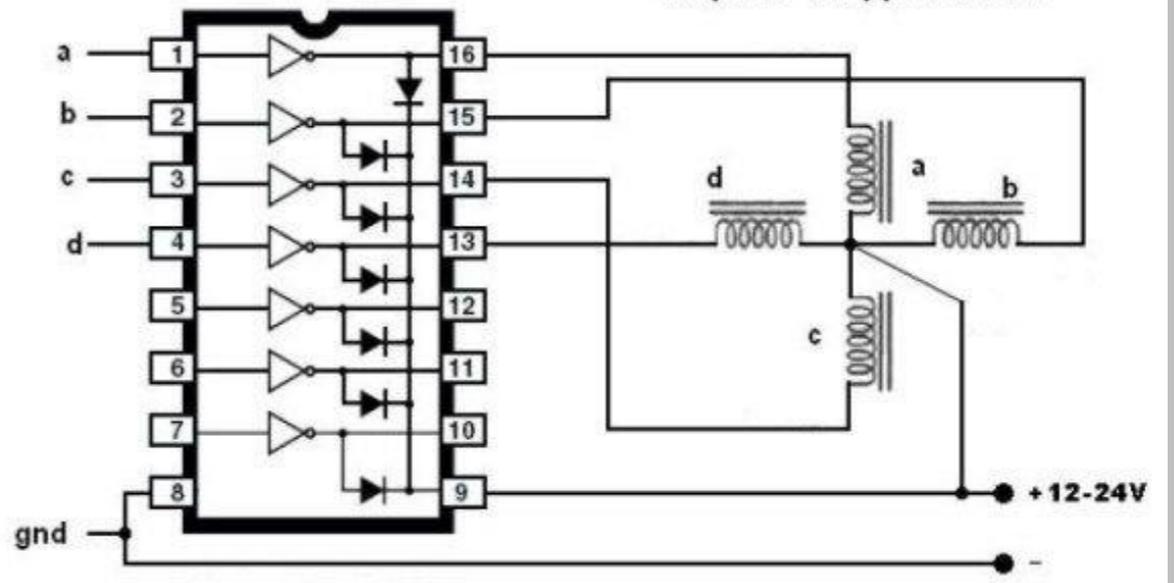
Em comparação com o motor passo a passo de  $1,8^\circ$ , quando o motor de passo  $0,9^\circ$  é utilizado, a frequência de funcionamento do motor pode ser duplicada e pode ser configurada para que a frequência de funcionamento do motor não caia dentro da faixa de vibração, evitando vibrações. Como resultado, o motor passo a passo de  $0,9^\circ$  corre mais suavemente e obtém menor ruído.

# Driver Unipolar



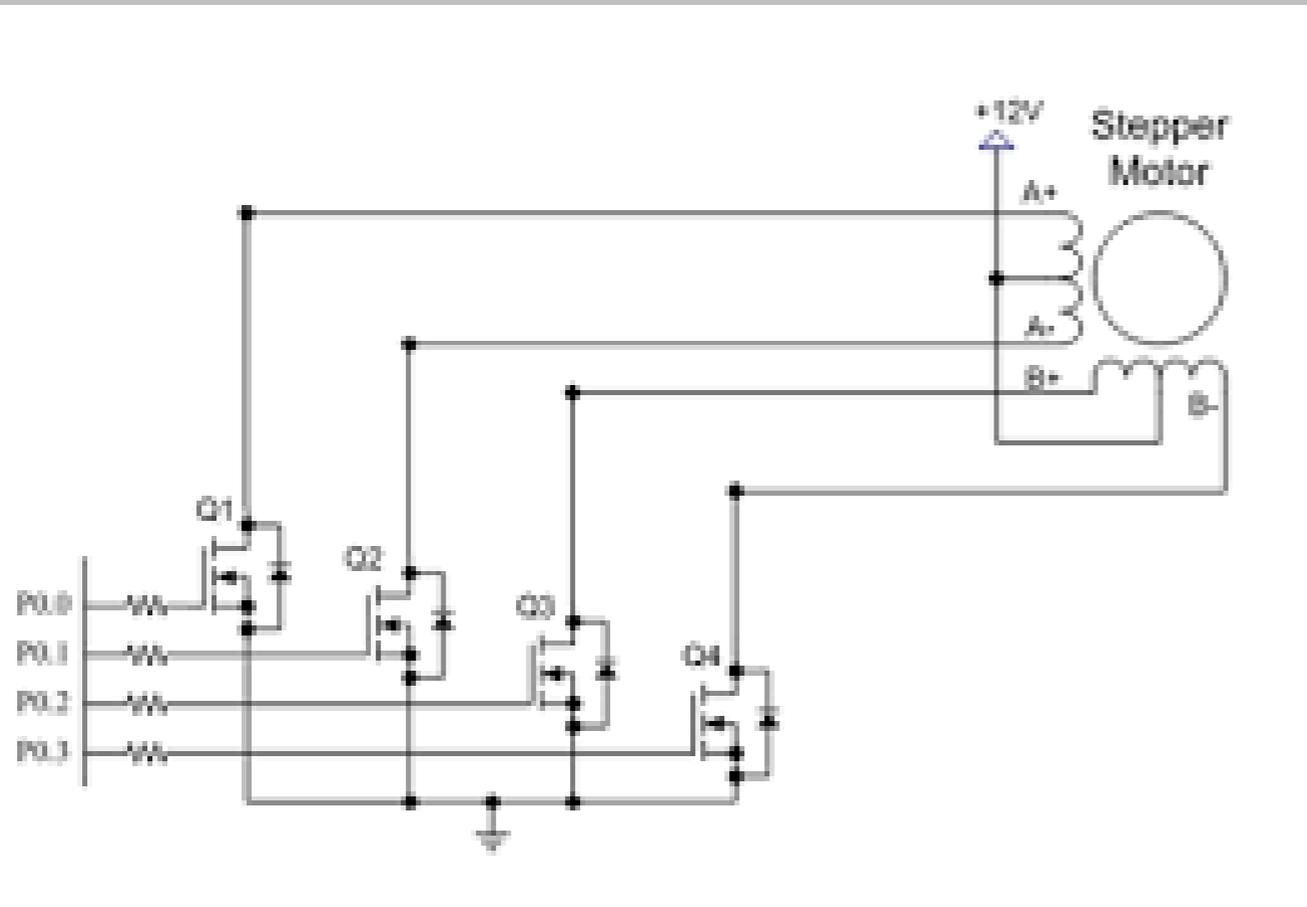
## ULN2003

## Unipolar Stepper Motor



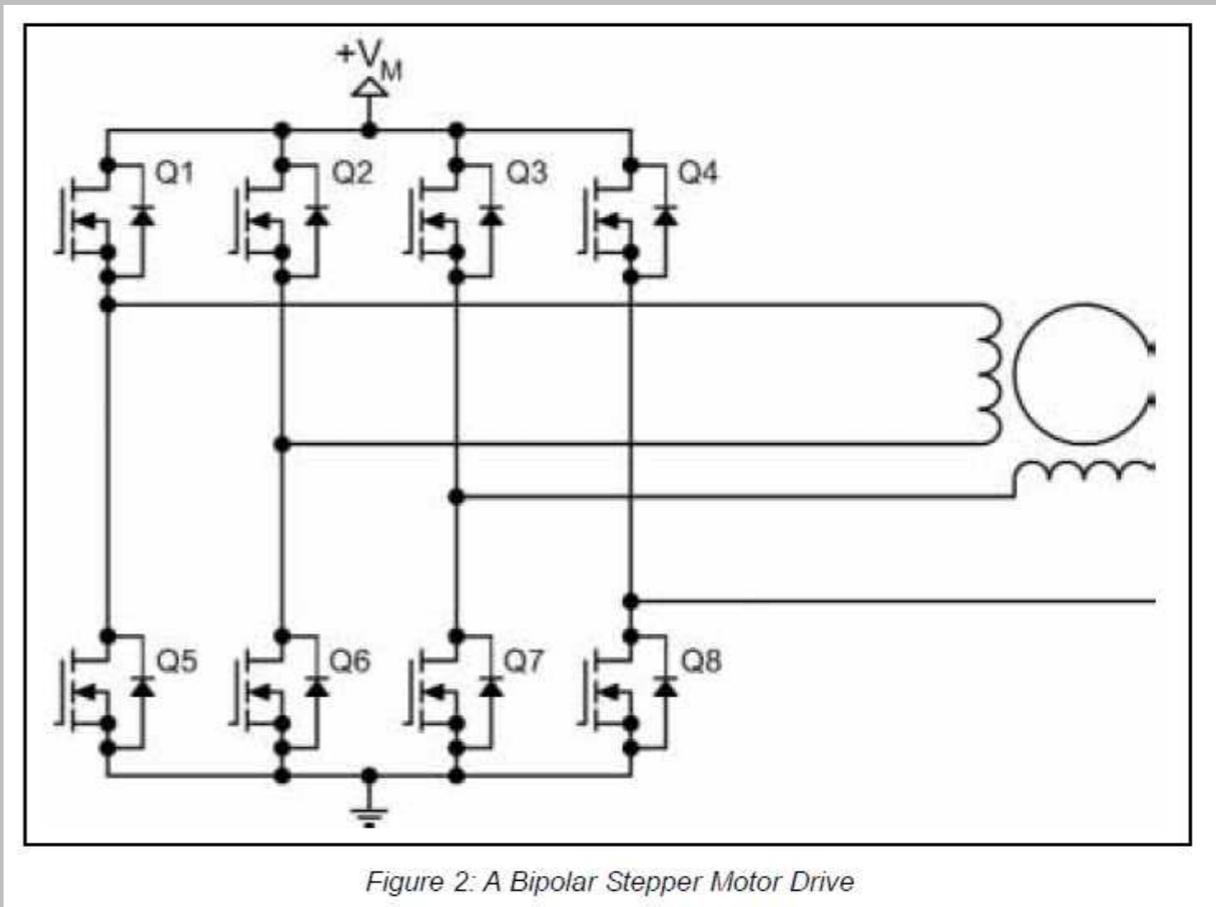
## Driver Unipolar

**Ex: ULN2003 ULN2803**



## Driver Bipolar

**Ex A4988 drv8825 TB6600**

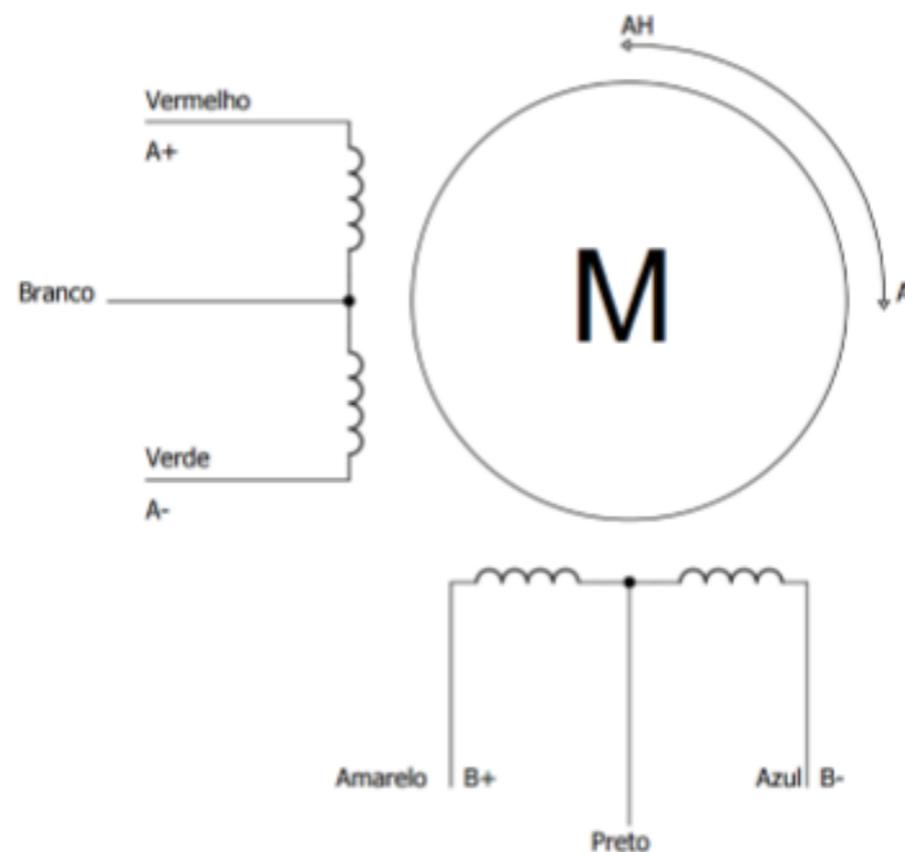
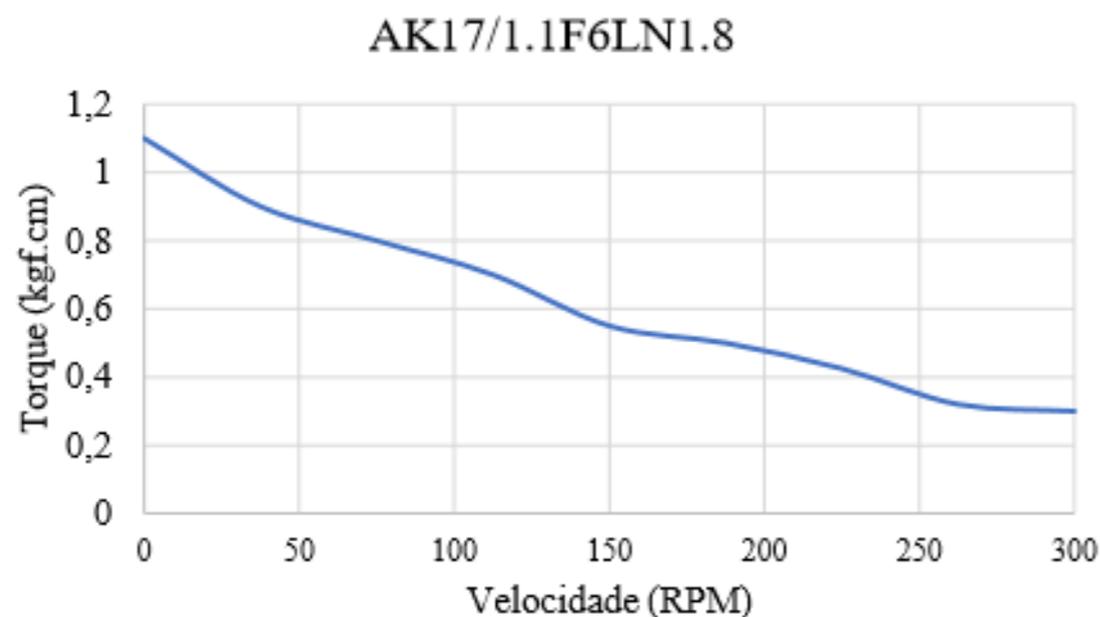


Representação de saída com transistor

## TABELA DE SELEÇÃO

NEMA	MODELO	CONEXÃO		HOLDING TORQUE (kgf.cm)	CORRENTE (A/fase)	TENSÃO (V/fase)	RESISTÊNCIA ( $\Omega$ /fase)	INDUTÂNCIA (mH/fase)	PESO (kg)
17	AK17/1.1F6LN1.8	Bipolar	Série	1,1	0,07	0,017	140	148	0,22
		Unipolar		0,77	0,1	0,012	37	37	

## INFORMAÇÕES TÉCNICAS

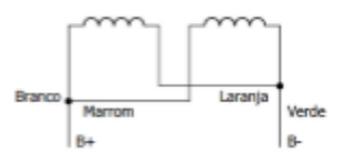
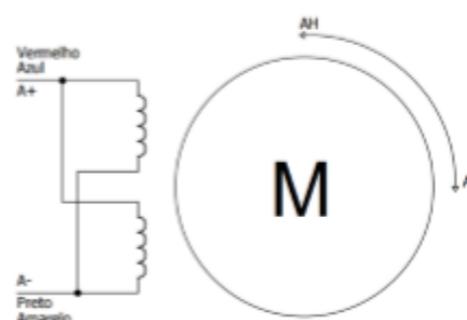
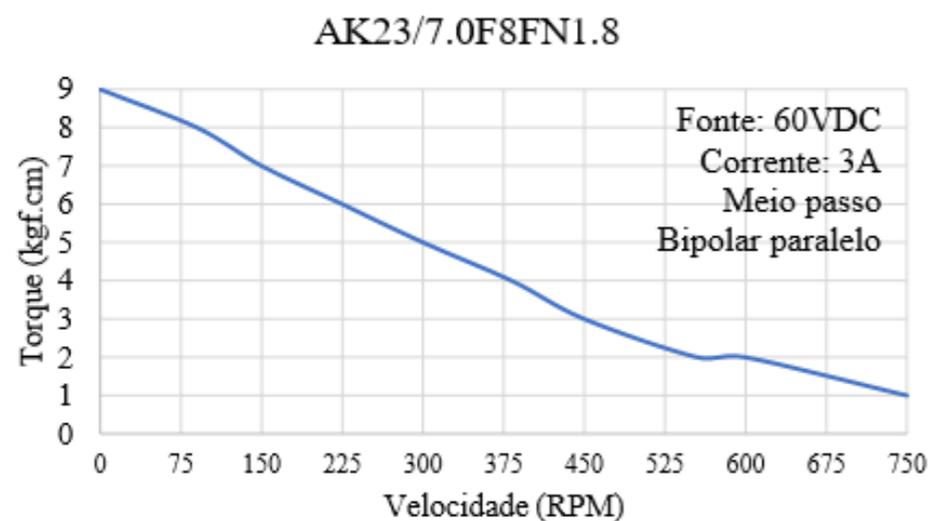


Ligação bipolar série ou unipolar

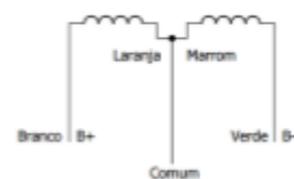
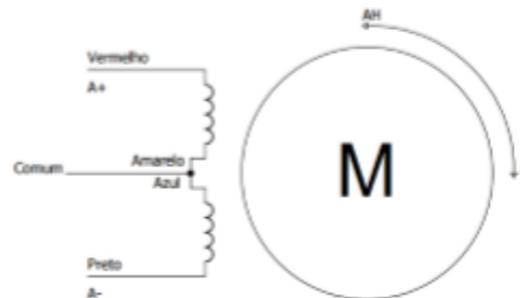
## TABELA DE SELEÇÃO

NEMA	MODELO	CONEXÃO		HOLDING TORQUE (kgf.cm)	CORRENTE (A/fase)	TENSÃO (V/fase)	RESISTÊNCIA ( $\Omega$ /fase)	INDUTÂNCIA (mH/fase)	PESO (kg)
23	AK23/7.0F8FN1.8	Bipolar	Série	7	1	5	2,4	9,2	0,6
			Paralelo		2	2,5	0,6	2,3	
		Unipolar	4,9	1,4	3,5	1,2	2,3		

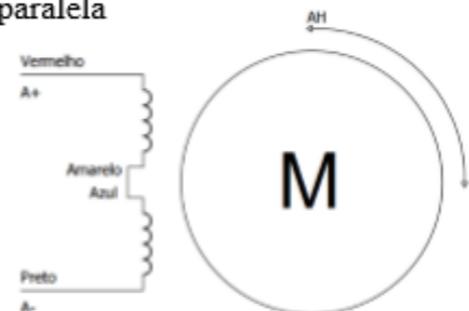
## INFORMAÇÕES TÉCNICAS



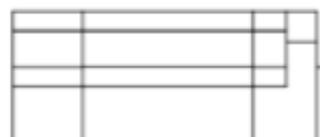
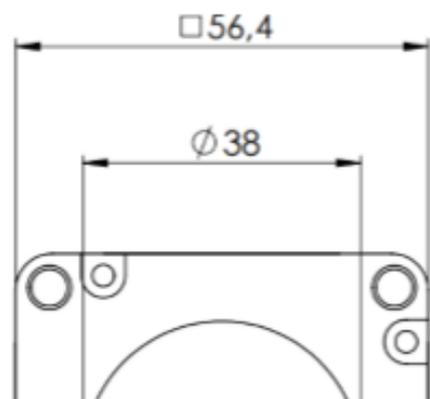
Ligação paralela



Ligação unipolar

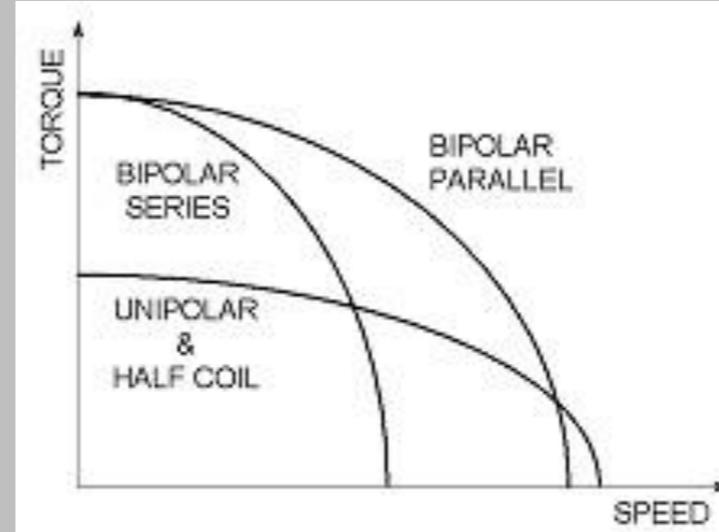
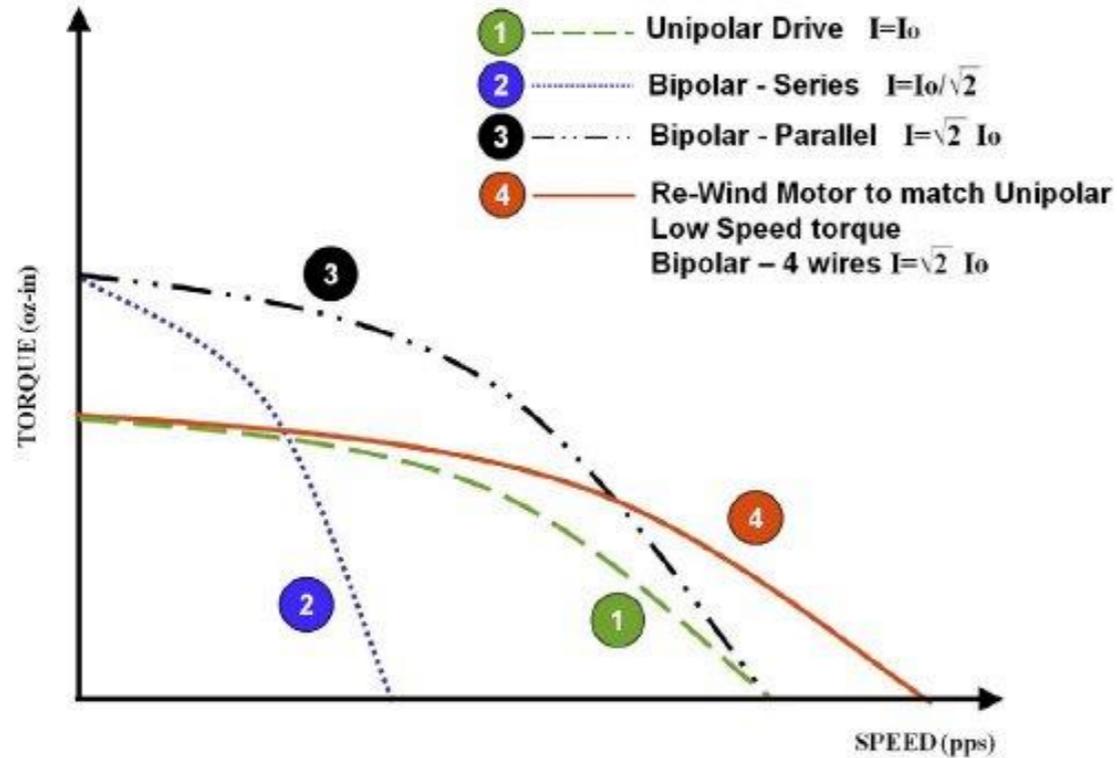


Ligação série

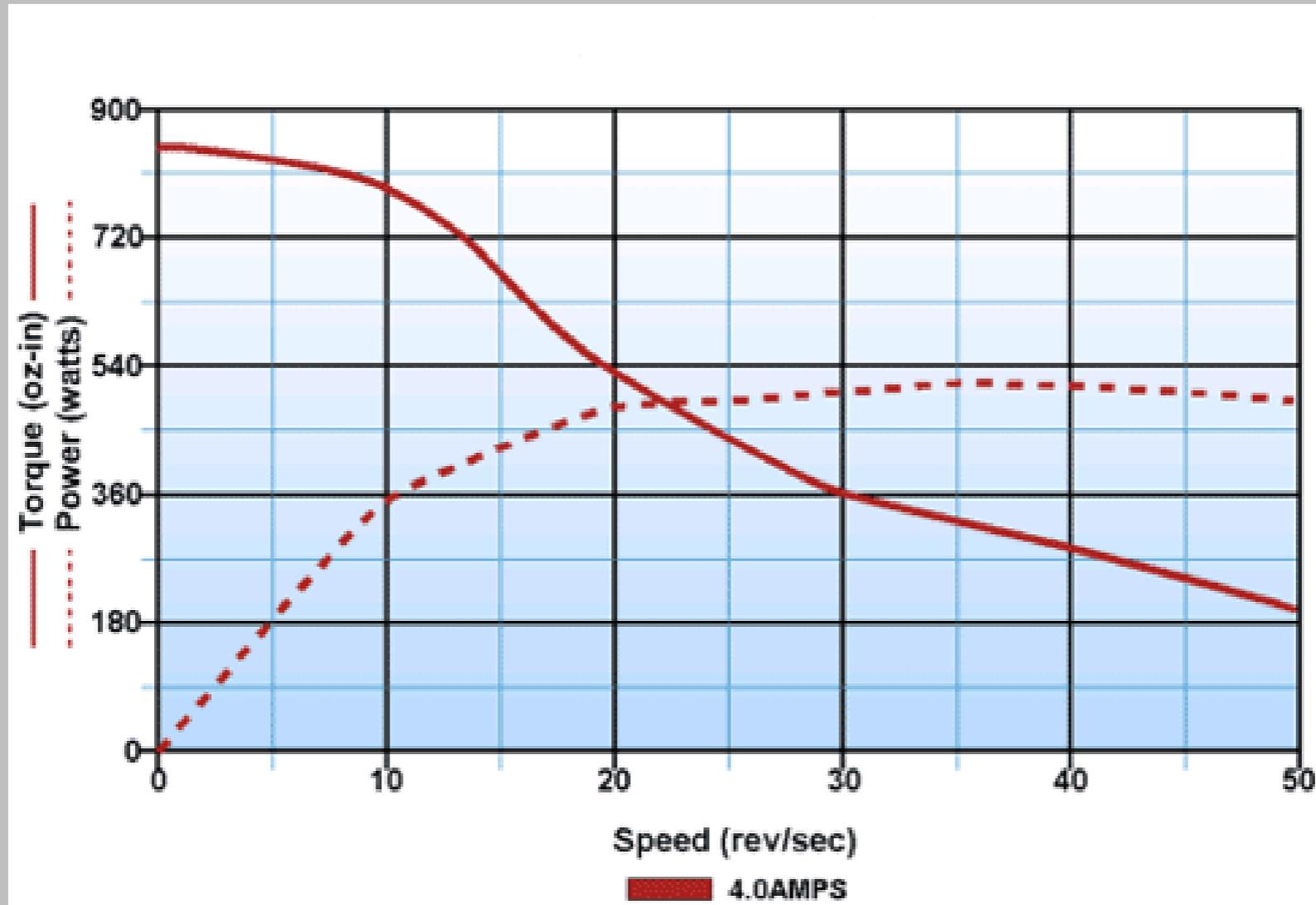


# Torque: Bipolar vs Unipolar

## UNIPOLAR VS. BIPOLAR



# Torque – Potência - Velocidade





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