

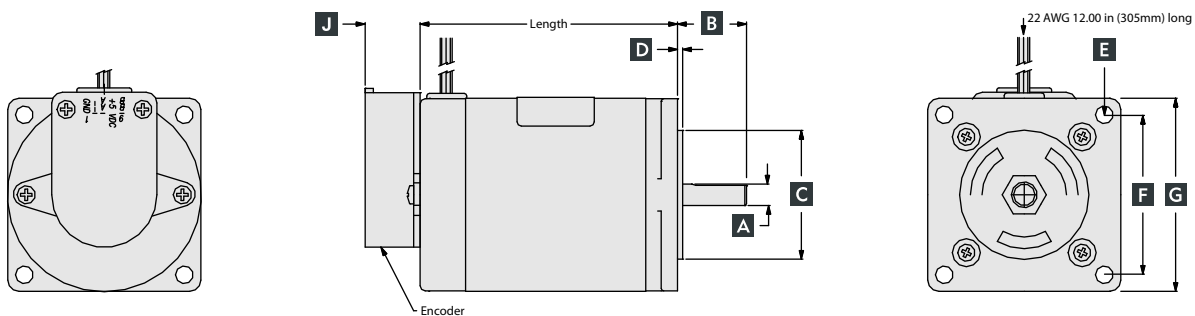
### Forceful. Extra-sturdy.

This size 23 hybrid DC stepping motor is built with an extra-sturdy housing. The motor is totally enclosed with permanently lubricated ball bearings. This bi-directional size 23 has a step angle accuracy of  $\pm 3\%$ .



TP23 STEPPER MOTOR	
Size	Nema 23, 1.8°
Holding Torque	up to 210 oz-in or 148 Ncm
Speed	up to 85 RPS

Bipolar Model	Unipolar Model	MAX Length	A	B	C	D	E	F	G	H	I	J
			Front Shaft Diameter	Front Shaft Length	Pilot Diameter	Pilot Length (Ref)	Mount Hole Callout (Ref)	Mount Hole Spacing (Ref)	Flange External Dimension (Ref)	Rear Shaft Diameter	Rear Shaft Length	Encoder Length (max)
TP23-48	TP23-38	1.60 in $\pm 0.03$	0.2500 in 0.2495 in	0.81 in $\pm 0.03$	1.502 in 1.498 in	0.06 in	(4) 0.205 in $\pm 0.010$ Through	1.86 in	2.25 in	0.2500 in 0.2495 in	0.75 in $\pm 0.040$	0.70 in
TP23-72	TP23-57	2.00 in $\pm 0.03$										
TP23-150	TP23-120	3.00 in $\pm 0.03$										
TP23-210	TP23-168	4.00 in $\pm 0.03$										



### TP23 Model Number

1 - Frame Size  
(Imperial)

2 - Torque  
(Stack Length)

3 - Winding

4 - Features

**T P**  
Product Name

**2 3**  
Frame Size

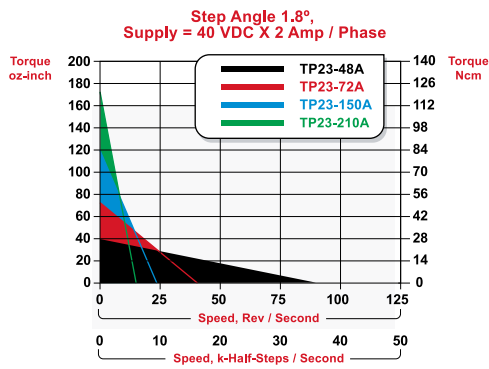
**- 1 5 0**  
Holding Torque  
(oz-in) Bipolar

**A** **3 0**  
Bipolar  
Current  
(Amps x 10)

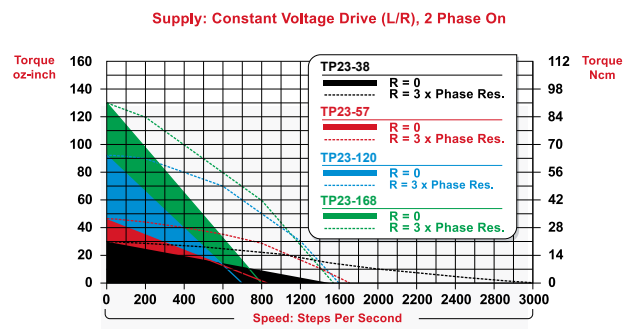
**V** **6 0**  
Unipolar  
Voltage  
(Volts x 10)

**1 1 0 0** - **X**  
Step Front Rear  
Angle Shaft Shaft  
Termination  
Feedback

## TP23 - Bipolar Performance



## TP23 - Unipolar Performance



## TP23 Mechanical Data

### TP23 Bi-Polar Stack Size

Imperial Models	TP23-48	TP23-72	TP23-150	TP23-210
Holding Torque (oz-in)	48.0	72.0	150.0	210.0
Holding Torque (Ncm)	34	51	106	148
Length (inches)	1.60	2.00	3.00	4.00
Length (cm)	4.1	5.1	7.6	10.2
Width (inches)	2.3	2.3	2.3	2.3
Width (cm)	5.8	5.8	5.8	5.8
Weight (oz)	14.0	19.0	32.0	47.0
Weight (Kg)	0.4	0.5	0.9	1.3
Step Angle (°/step)	1.8	1.8	1.8	1.8
Number Leads	4	4	4	4

### TP23 Uni-Polar Stack Size

Imperial Models	TPE23-38	TP23-57	TP23-120	TP23-168
Holding Torque (oz-in)	38.5	57.5	120.0	168.0
Holding Torque (Ncm)	27	41	85	119
Length (inches)	1.60	2.00	3.00	4.00
Length (cm)	4.1	5.1	7.6	10.2
Width (inches)	2.3	2.3	2.3	2.3
Width (cm)	5.8	5.8	5.8	5.8
Weight (oz)	14.0	19.0	32.0	47.0
Weight (Kg)	0.4	0.5	0.9	1.3
Step Angle (°/step)	1.8	1.8	1.8	1.8
Number Leads	6	6	6	6



## TP23 Winding Data

### TP23 Bi-Polar Windings

Imperial Models	48A10	48A20	48A30	48A40	72A10	72A20	72A30	72A40	150A10	150A20	150A30	150A40	210A20	210A30	210A40
Current (A/Phase)	1.0	2.0	3.0	4.0	1.0	2.0	3.0	4.0	1.0	2.0	3.0	4.0	2.0	3.0	4.0
Voltage (V/Phase)	6.0	3.0	2.0	1.5	5.6	2.8	1.9	1.4	7.6	3.8	2.5	1.9	5.3	3.5	2.7
Resistance (R/Phase)	5.9	1.5	0.7	0.4	5.6	1.4	0.6	0.4	7.6	1.9	0.8	0.5	2.7	1.2	0.7
Inductance (mH)	16.9	4.2	1.9	1.1	25.6	6.4	2.8	1.6	35.2	8.8	3.9	2.2	13.2	5.9	3.3

### TP23 Uni-Polar Windings

Imperial Models	38v40	38V60	38V120	38V240	57V51	57V60	57V120	57V240	120V54	120V60	120V120	120V240	168V34	168V60	168V120
Current Uni-Polar (A/Phase)	1.5	1.2	0.6	0.3	1.0	1.0	0.5	0.3	1.5	1.3	0.7	0.4	2.8	1.8	0.8
Voltage Uni-Polar (V/Phase)	4.0	6.0	12.0	24.0	5.1	6.0	12.0	24.0	5.4	6.0	12.0	24.0	3.4	6.0	12.0
Resistance Uni-Polar (R/Phase)	2.6	5.0	20.0	80.0	5.1	6.2	25.0	96.0	3.5	4.8	18.2	66.0	1.2	3.4	16.0
Inductance Uni-Polar (mH)	3.2	5.4	21.6	81.2	9.7	10.6	41.2	131.4	7.8	11.4	41.2	143.3	2.9	8.4	39.0
Current Bi-Polar (A/Phase)	1.1	0.9	0.4	0.2	0.7	0.7	0.3	0.2	1.1	0.9	0.5	0.3	2.0	1.3	0.5
Voltage Bi-Polar (V/Phase)	5.7	8.5	17.0	34.0	7.2	8.5	17.0	34.0	7.6	8.5	17.0	34.0	4.8	8.5	17.0
Resistance Bi-Polar (R/Phase)	5.2	10.0	40.0	160.0	10.2	12.4	50.0	192.0	7.0	9.6	36.4	132.0	2.4	6.8	32.0
Inductance Bi-Polar (mH)	12.7	21.6	86.4	324.6	38.9	42.4	164.8	525.6	31.2	45.6	164.6	573.6	11.4	33.4	156.0

