ElectroCraft
powering innovation

SM02EN

ElectroCraft Stepper Motor Products

ElectroCraft
powering innovation

For over 60 years, ElectroCraft has been helping engineers translate innovative ideas into reality—one reliable motor at a time. As a global specialist in custom motor and motion technology, we provide the engineering capabilities and worldwide resources you need to succeed.

Which Stepper Motor?

ElectroCraft TorquePower™

Size: Nema 23, 34 & 42

Torque: up to 2100 oz-in or 1482 Ncm

Features:

- Conventional stepper
- Environmentally sealed
- Imperial sizes
- Housed motor reduces radiated magnetic flux
- High step accuracy

ElectroCraft TorquePower™ Plus

Size: Nema 11, 17, 23 & 34

Torque: up to 1190 oz-in or 840 Ncm

Features:

- High torque stepper
- Highest performing
- Metric and imperial sizes
- High step accuracy

Custom Stepper Motors For Precise Movement

Medical Diagnostic Imaging Equipment

Situation: A medical diagnostic imaging machine manufacturer kept experiencing stepper motor failures in its imaging machines, and customers of their higher-priced units were complaining about reliability.

Solution: ElectroCraft built a fully customized, compact and ultra-rugged stepper that would fit more securely into the imager. The new motor included a custom-designed housing, shaped to fit into the machine itself.

Results: By working with ElectroCraft's engineering team to integrate in the new system, the company cut their anticipated time to market by one quarter. In addition, the new motor integration prompted a successful product marketing launch and helped the manufacturer gain significant market share.

1

A fully-customized, ultra-rugged stepper became the heart of a new, market-leading line of medical diagnostic image machines.

Industrial Surveillance Equipment

Situation: A manufacturer of outdoor pan-and-tilt surveillance cameras experienced a problem with their newly-designed system. The stock stepper motors they had integrated into their design kept breaking at the shaft, and their motor vendor could not remedy the issue.

Solution: ElectroCraft created a stepper with a larger, more rugged shaft that could be retrofit into the customer's products already in the field. The custom stepper motors were built into the newer models to maintain long-term product durability.

Results: Over 1000 surveillance systems have shipped with the custom stepper motor system installed. Since the stepper switch, not one stepper motor shaft failure has been reported.

2

Custom rock-solid steppers gave surveillance cameras the added security of long life.

Typical applications for TorquePower stepper motors:

- Custom OEM applications **(Our Specialty)**
- Packaging
- Semiconductor handling and testing
- Antenna positioning
- Laboratory equipment
- Rapid prototyping machines
- Medical equipment
- Dispensing

TP23 : ElectroCraft TorquePower™ | Stepper Motor

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

Forceful. Extra-sturdy.

This 1.8° size 23 hybrid DC stepping motor is built with an extra-sturdy casing for when you need small, powerful torque with a little more durability. The motor is totally enclosed with permanently lubricated ball bearings. The bi-directional size 23 has a step angle accuracy of ±3%.

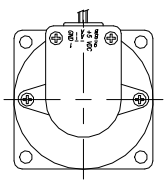
To build your own motor, choose the:

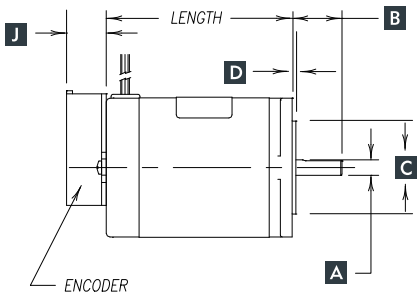
1 - Frame Size (Imperial)	2 - Torque (Stack Length)	3 - Winding	4 - Features (See page 20)

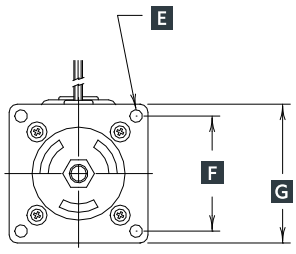
TP	23	—	150	A 30 (Bipolar, Current (Amps x 10)) / V 60 (Unipolar, Voltage (Volts x 10))	—	1	1	0	0	—	X
Product Name	Frame Size		Holding Torque (oz-in) Bipolar			Step Angle	Front Shaft	Rear Shaft	Lead Option		Encoder

Step 1: TP23 Frame Size Drawing Key

Model	Length	A Front Shaft Diameter	B Front Shaft Length	C Pilot Diameter	D Pilot Length	E Mount Hole Callout	F Mount Hole Spacing	G Flange External Dimension	H Rear Shaft Diameter	I Rear Shaft Length	J Encoder Length
TP23–48	1.60 in±.03	Ø 0.2500 / 0.2495 in	0.81 in±.03	Ø 1.502 / 1.498 in	0.06 in Ref	(4) 0.205±.010 Through	1.86 in Ref	2.25 in Ref	Ø 0.2500 / 0.2495 in	0.75 in±.04	0.68 in Max
TP23–72	2.00 in±.03										
TP23–150	3.00 in±.03										
TP23–210	4.00 in±.03								(not shown)	(not shown)	

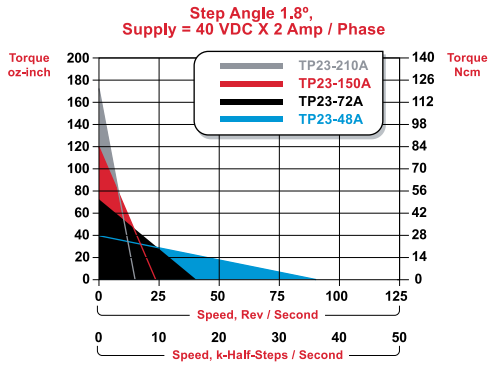




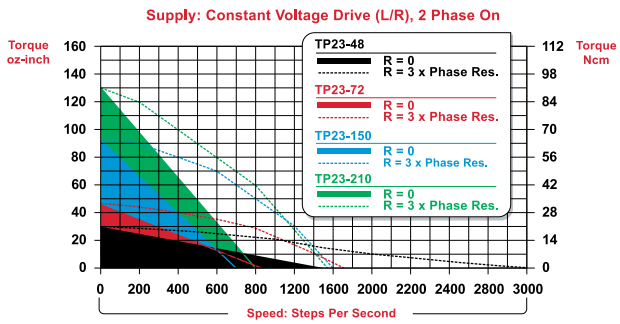


Step 2: TP23 Torque and Mechanical Data

TP23 Bipolar



TP23 Unipolar



Stack Size Models	48A	48V	72A	72V	150A	150V	210A	210V
Holding Torque Bipolar oz-in (Ncm)	48.0 (33.89)	48.0 (33.89)	72.0 (50.84)	72.0 (50.84)	150.0 (105.92)	150.0 (105.92)	210.0 (148.28)	210.0 (148.28)
Holding Torque Unipolar oz-in (Ncm)	N/A	38.5 (27.2)	N/A	57.5 (40.66)	N/A	120.0 (84.7)	N/A	168.0 (118.6)
Weight oz (Kg)	14.0 (0.4)	14.0 (0.4)	19.0 (0.5)	19.0 (0.5)	32.0 (0.9)	32.0 (0.9)	47.0 (1.3)	47.0 (1.3)
Step Angle (°/step)	1.8°	1.8°	1.8°	1.8°	1.8°	1.8°	1.8°	1.8°
Number Leads	4	6	4	6	4	6	4	6

Step 3: Available Windings

Bipolar

Imperial	48A10	48A20	48A30	48A40	72A10	72A20	72A30	72A40	150A10	150A20	150A30	150A40	210A20	210A30	210A40
Current Bipolar (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

Unipolar

Imperial	48V40	48V60	48V120	48V240	72V51	72V60	72V120	72V240	150V54	150V60	150V120	150V240	210V34	210V60	210V120	210V240
Voltage Unipolar (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	24.0
Current Unipolar (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	0.4
Current Bipolar (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	0.3

*Data represents Unipolar windings configured as Bipolar

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TP34 : ElectroCraft TorquePower™ | Stepper Motor

Size: Nema 34, 1.8°
Holding Torque: up to 620 oz-in or 438 Ncm
Speed: up to 34 RPS

Forceful. Extra-sturdy.

This 1.8° size 34 hybrid DC stepping motor is built with an extra-sturdy casing for when you need medium-sized, powerful torque with a little more durability. The motor is totally enclosed with permanently lubricated ball bearings. The bi-directional size 34 has a step angle accuracy of ±3%.

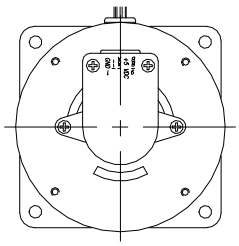
To build your own motor, choose the:

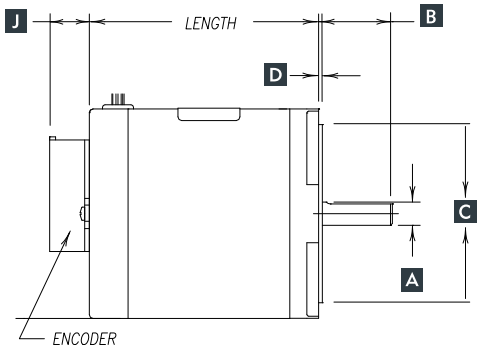
1 - Frame Size (Imperial)
2 - Torque (Stack Length)
3 - Winding
4 - Features (See page 20)

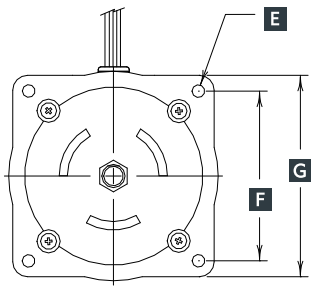
TP	34	—	420	A 30 (Bipolar, Current (Amps x 10)) / V 60 (Unipolar, Voltage (Volts x 10))	—	1	1	0	0	—	X
Product Name	Frame Size		Holding Torque (oz-in) Bipolar			Step Angle	Front Shaft	Rear Shaft	Lead Option		Encoder

Step 1: TP34 Frame Size Drawing Key

Model	Length	A Front Shaft Diameter	B Front Shaft Length	C Pilot Diameter	D Pilot Length	E Mount Hole Callout	F Mount Hole Spacing	G Flange External Dimension	H Rear Shaft Diameter	I Rear Shaft Length	J Encoder Length
TP34–235	2.45 in±.03	Ø 0.3750 / 0.3745 in	1.19 in±0.03	Ø 2.877 / 2.873 in	0.06 in Ref	(4) 0.22±0.10 Through	2.74 in Ref	3.25 in Ref	Ø 0.3750 / 0.3745 in	1.19 in±0.04	0.68 in Max
TP34–420	3.70 in±.03										
TP34–620	5.08 in±.03								(not shown)	(not shown)	

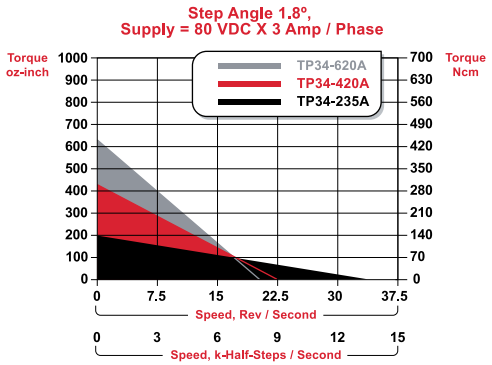




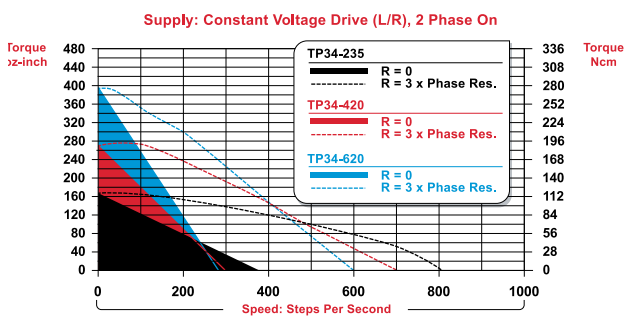


Step 2: TP34 Torque and Mechanical Data

TP34 Bipolar



TP34 Unipolar



Stack Size Models	235A	235V	420A	420V	620A	620V
Holding Torque Bipolar oz-in (Ncm)	235.0 (165.93)	235.0 (165.93)	420.0 (296.56)	420.0 (296.56)	620.0 (437.78)	620.0 (437.78)
Holding Torque Unipolar oz-in (Ncm)	N/A	188.0 (133)	N/A	336.0 (237)	N/A	496.0 (350)
Weight oz (Kg)	48.0 (1.4)	48.0 (1.4)	80.0 (2.3)	80.0 (2.3)	121.0 (3.4)	121.0 (3.4)
Step Angle (°/step)	1.8°	1.8°	1.8°	1.8°	1.8°	1.8°
Number Leads	4	6	4	6	4	6

Step 3: Available Windings

Bipolar

Imperial	235A20	235A30	235A40	235A60	420A20	420A30	420A40	420A60	620A20	620A30	620A40	620A60
Current Bipolar (A/Phase)	2.0	3.0	4.0	6.0	2.0	3.0	4.0	6.0	2.0	3.0	4.0	6.0

Unipolar

Imperial	235V26	235V53	235V120	235V240	420V25	420V30	420V60	420V120	420V240	620V22	620V43	620V120	620V240
Voltage Unipolar (V/Phase)	2.6	5.3	12.0	24.0	2.5	3.0	6.0	12.0	24.0	2.2	4.3	12.0	24.0
Current Unipolar (A/Phase)	3.1	1.6	0.7	0.3	4.6	4.0	2.0	1.0	0.6	7.1	3.6	1.2	0.6
Current Bipolar (A/Phase)*	2.2	1.1	0.5	0.2	3.2	2.8	1.4	0.7	0.4	5.0	2.5	0.8	0.4

*Data represents Unipolar windings configured as Bipolar

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TP42 : ElectroCraft TorquePower™ | Stepper Motor

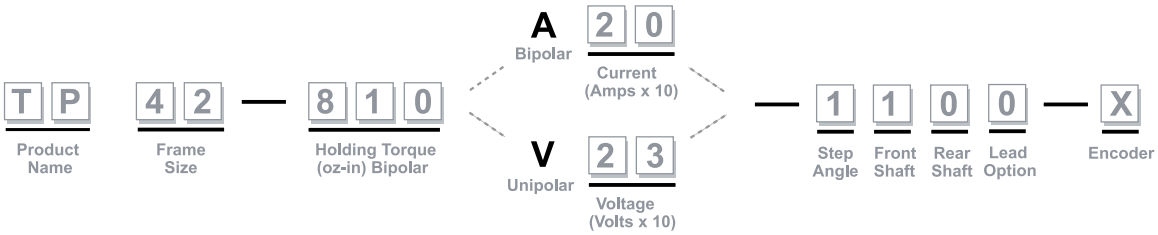
Size: Nema 42, 1.8°
Holding Torque: up to 2100 oz-in or 1480 Ncm
Speed: up to 24 RPS

Protected. Force.

If you need a corrosion-resistant motor with powerful force, this 1.8° size 42 hybrid DC stepping motorcould be for you. It is totally enclosed with permanently lubricated ball bearings. The bi-directional size 42 has holding torque up to 2100 oz-in with a step angle accuracy of ±3% non-cumulative.

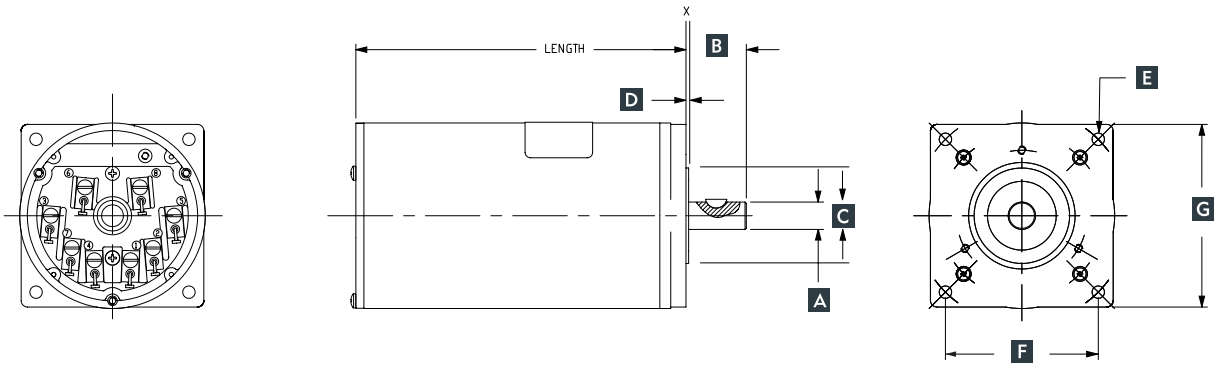
To build your own motor, choose the:

1 - Frame Size (Imperial)
2 - Torque (Stack Length)
3 - Winding
4 - Features (See page 20)

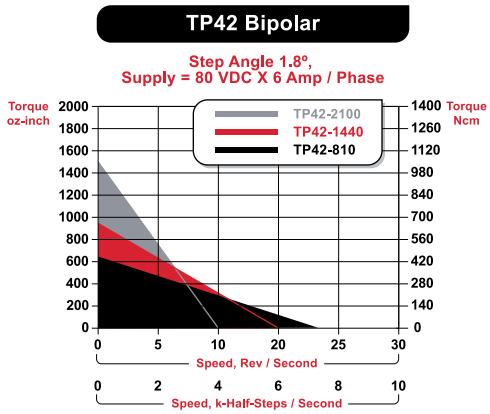


Step 1: TP42 Frame Size Drawing Key

Model	Length	A Front Shaft Diameter	B Front Shaft Length	C Pilot Diameter	D Pilot Length	E Mount Hole Callout	F Mount Hole Spacing	G Flange External Dimension	H Rear Shaft Diameter	I Rear Shaft Length	J Encoder Length
TP42–810	5.39 in±0.04	Ø 0.6250 / 0.6245 in	1.38 in±0.03	Ø 2.188 / 2.184 in	0.06 in Ref	(4) 0.28 in±0.10 Through	3.50 in Ref	4.19 in Ref	Ø .5000 / .4995 in	1.25 in±0.04	TBD
TP42–1440	7.56 in±0.04								(not shown)	(not shown)	(not shown)
TP42–2100	9.90 in±0.04										



Step 2: TP42 Torque and Mechanical Data



Stack Size Models	810A	810V	1440A	1440V	2100A	2100V
Holding Torque Bipolar oz-in (Ncm)	810.0 (571.94)	810.0 (571.94)	1440.0 (1016.78)	1440.0 (1016.78)	2100.0 (1482.81)	2100.0 (1482.81)
Holding Torque Unipolar oz-in (Ncm)	N/A	650.0 (458.96)	N/A	1150.0 (812.01)	N/A	1650.0 (1165.07)
Weight oz (Kg)	216.0 (6.1)	216.0 (6.1)	320.0 (9.1)	320.0 (9.1)	424.0 (12.0)	424.0 (12.0)
Step Angle (°/step)	1.8°	1.8°	1.8°	1.8°	1.8°	1.8°
Number Connections	4	6	4	6	4	6

Step 3: Available Windings

Bipolar

Imperial	810A20	810A30	810A50	1440A20	1440A30	1440A50	2100A20	2100A30	2100A50
Current Bipolar (A/Phase Series)	2.0	3.0	5.0	2.0	3.0	5.0	2.0	3.0	5.0

Unipolar

Imperial	810V23	810V41	810V79	810V98	1440V37	1440V46	1440V58	1440V74	2100V24	2100V32	2100V39	2100V45
Voltage Unipolar (V/Phase)	2.3	4.1	7.9	9.8	3.7	4.6	5.8	7.4	2.4	3.2	3.9	4.5
Current Unipolar (A/Phase)	6.1	3.5	1.8	1.4	6.1	4.7	3.8	3.1	10.4	8.4	6.8	5.2
Current Bipolar (A/Phase Series)*	4.3	2.5	1.3	1.0	4.3	3.4	2.7	2.2	7.3	6.0	4.8	3.7

*Data represents Unipolar windings configured as Bipolar

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TPP11M : ElectroCraft TorquePower™ Plus | Stepper Motor

Size: Nema 11, 1.8°
Holding Torque: up to 18 oz-in or 13 Ncm
Speed: up to 140 RPS

Quiet. Durable.

This extremely quiet hybrid stepping motor is made with ball bearings. Only available in metric configuration, sizes in metric units and has a holding torque up to 18 oz-in with a step angle accuracy of ±5%.

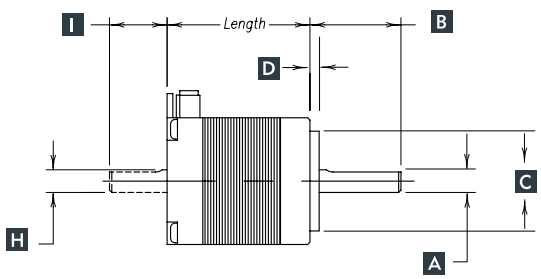
To build your own motor, choose the:

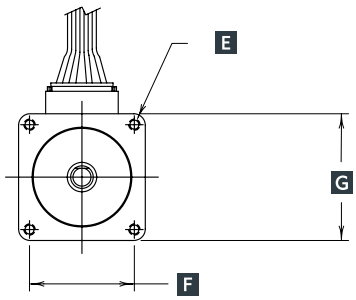
1 - Frame Size (Metric)
2 - Torque (Stack Length)
3 - Winding
4 - Features (See page 20)

TPP	11	M	—	10	—	A Bipolar 10 (Current (Amps x 10)) / V Unipolar 14 (Voltage (Volts x 10))	—	1	1	0	0	—	X
Product Name	Frame Size	Metric		Holding Torque (Ncm) Bipolar				Step Angle	Front Shaft	Rear Shaft	Lead Option		Encoder

Step 1: TPP11M Frame Size Drawing Key

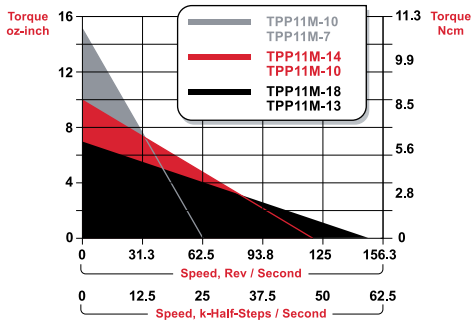
Model	Length	A	B	C	D	E	F	G	H	I	J
		Front Shaft Diameter	Front Shaft Length	Pilot Diameter	Pilot Length	Mount Hole Callout	Mount Hole Spacing	Flange External Dimension	Rear Shaft Diameter	Rear Shaft Length	Encoder Length
TPP11M–7	31.5 mm ±.08	Ø .4999 / .4986 mm	20.0 mm±0.8	Ø 22.00 / 21.07 mm	2.0mm Ref	(4) M3 x 0.5-6H 3.5 mm Deep min	23.0 mm Ref	28.0 mm Ref	Ø .4999 / .4986 mm	12.7 mm±.08	N/A
TPP11M–10	39.6 mm ±.08										
TPP11M–13	49.3 mm ±.08										



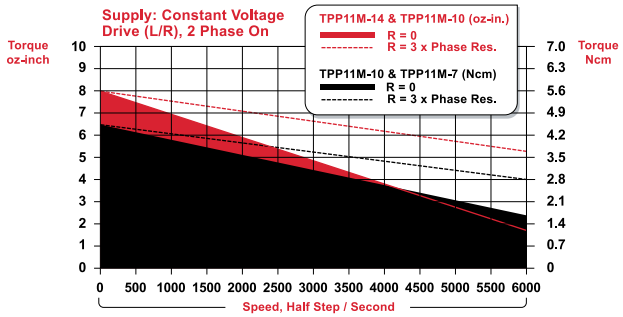


Step 2: TPP11M Torque and Mechanical Data

TPP11M Bipolar



TPP11M Unipolar



Stack Size Models	TPP11M - 10A	TPP11M - 10V	TPP11M - 14A	TPP11M - 14V	TPP11M - 18A	TPP11M - 18V
Holding Torque Bipolar oz-in (Ncm)	9.5 (6.71)	9.5 (6.71)	13.7 (9.67)	13.7 (9.67)	18 (12.71)	18 (12.71)
Holding Torque Unipolar oz-in (Ncm)	N/A	6.6 (4.7)	N/A	9.6 (6.8)	N/A	13.0 (9.2)
Weight oz (Kg)	4.0 (0.1)	4.0 (0.1)	5.1 (0.1)	5.1 (0.1)	7.1 (0.2)	7.0 (0.2)
Step Angle (°/step)	1.8°	1.8°	1.8°	1.8°	1.8°	1.8°
Number Leads	4	6	4	6	4	6

Step 3: Available Windings

Bipolar

Imperial	10A05	10A10	10A15	14A05	14A10	14A15	18A05	18A10	18A15
Metric	7A05	7A10	7A15	10A05	10A10	10A15	13A05	13A10	13A15
Current Bipolar (A/Phase)	0.5	1.0	1.5	0.5	1.0	1.5	0.5	1.0	1.5

Unipolar

Imperial	10V14	10V27	14V17	14V33	18V22	18V43
Metric	7V14	7V27	10V17	10V33	13V22	13V43
Voltage Unipolar (V/Phase)	1.4	2.7	1.7	3.3	2.2	4.4
Current Unipolar (A/Phase)	1.8	0.9	1.8	0.9	1.8	0.9
Current Bipolar (A/Phase)*	1.3	0.7	1.3	0.7	1.3	0.7

*Data represents Unipolar windings configured as Bipolar

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TPP17 : ElectroCraft TorquePower™ Plus | Stepper Motor

TPP17M : ElectroCraft TorquePower™ Plus (metric)

Size: Nema 17, 1.8°
Holding Torque: up to 58 oz-in or 41 Ncm
Speed: up to 80 RPS

Precise. Compact.

This 1.8° size 17 hybrid DC stepping motor has permanently lubricated ball bearings. The bi-directional size 17 has holding torque up to 58 oz-in with a step angle accuracy of ±5%.

To build your own motor, choose the:

1 - Frame Size (Metric or Imperial)	2 - Torque (Stack Length)	3 - Winding	4 - Features (see page 20)

a. **TPP17** — **29** — **A** (Bipolar) **10** — **1100** — **X**

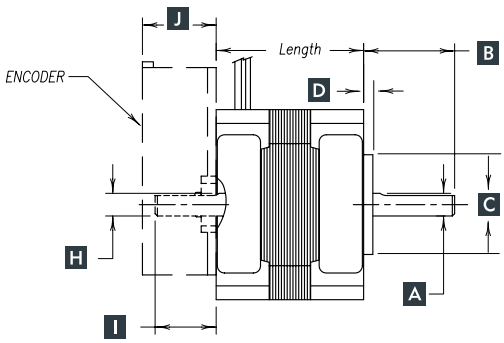
- TPP: Product Name
- 17: Frame Size
- 29: Holding Torque (oz-in) Bipolar
- A: Bipolar
- 10: Current (Amps x 10)
- 1: Step Angle
- 1: Rear Shaft
- 0: Rear Shaft
- 0: Lead Option
- X: Encoder

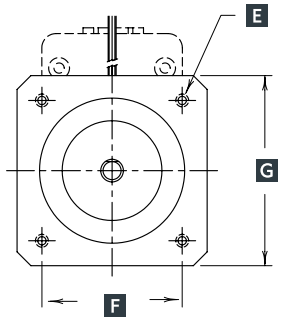
b. **TPP17M** — **20** — **V** (Unipolar) **40** — **1100** — **X**

- TPP: Product Name
- 17: Frame Size
- M: Optional Metric
- 20: Holding Torque (Ncm) Bipolar
- V: Unipolar
- 40: Voltage (Volts x 10)
- 1: Step Angle
- 1: Rear Shaft
- 0: Rear Shaft
- 0: Lead Option
- X: Encoder

Step 1: TPP17 & TPP17M Frame Size Drawing Key

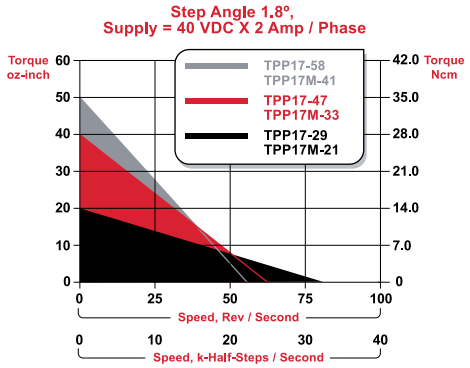
Model	Length	A Front Shaft Diameter	B Front Shaft Length	C Pilot Diameter	D Pilot Length	E Mount Hole Callout	F Mount Hole Spacing	G Flange External Dimension	H Rear Shaft Diameter	I Rear Shaft Length	J Encoder Length
TPP17–29	1.28 in±0.03	Ø .1968 / .1963 in	0.79 in±0.03	Ø 0.8660 / 0.8648 in	0.08 in Ref	(4) 4-40 UNC-2B 0.17 in Deep Min	1.22 in Ref	1.65 in Ref	Ø .1968 / .1963 in	.53 in±.04	0.68 in Max
TPP17–47	1.52 in±0.03										
TPP17–58	1.85 in±0.03										
TPP17M–21	32.5 mm±0.8	Ø 4.999 / 4.986 mm	20.0 mm ±0.8	Ø 22.00 / 21.07 mm	2.0 mm Ref	(4) M3 x 0.5-6H 4.3 mm Deep Min	30.9 mm Ref	41.9 mm Ref	Ø 4.999 / 4.986 mm	13.5 mm±1.0	17 mm Max
TPP17M–33	38.6 mm±0.8										
TPP17M–41	47.0 mm±0.8										



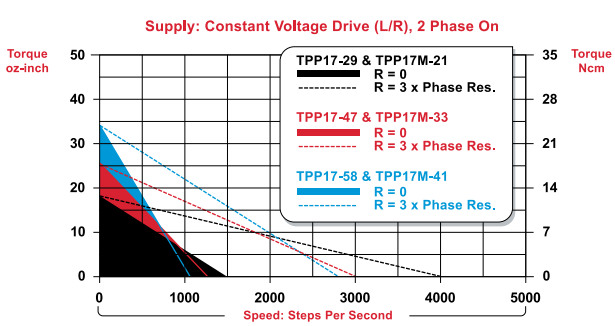


Step 2: TPP17 & TPP17M Torque and Mechanical Data

TPP17 & TPP17M Bipolar



TPP17 & TPP17M Unipolar



Stack Size Models	29A	29V	47A	47V	58A	58V
Holding Torque Bipolar oz-in (Ncm)	29.0 (20.5)	29.0 (20.5)	47.0 (33.2)	47.0 (33.2)	58.0 (41.0)	58.0 (41.0)
Holding Torque Unipolar oz-in (Ncm)	N/A	22.2 (15.7)	N/A	36.1 (25.5)	N/A	44.4 (31.4)
Weight oz (Kg)	7.0 (0.2)	7.0 (0.2)	9.0 (0.3)	9.0 (0.3)	11.8 (0.3)	11.8 (0.3)
Step Angle (°/step)	1.8°	1.8°	1.8°	1.8°	1.8°	1.8°
Number Leads	4	6	4	6	4	6

Step 3: Available Windings

Bipolar

Imperial	29A10	29A15	29A20	47A10	47A15	47A20	58A10	58A15	58A20
Metric	21A10	21A15	21A20	33A10	33A15	33A20	41A10	41A15	41A20
Current Bipolar (A/Phase)	1.0	1.5	2.0	1.0	1.5	2.0	1.0	1.5	2.0

Unipolar

Imperial	29V40	29V60	29V96	29V120	47V40	47V60	47V120	47V240	58V40	58V60	58V120	58V240
Metric	21V40	21V60	21V96	21V120	33V40	33V60	33V120	33V240	41V40	41V60	41V120	41V240
Voltage Unipolar (V/Phase)	4.0	6.0	9.6	12.0	4.0	6.0	12.0	24.0	4.0	6.0	12.0	24.0
Current Unipolar (A/Phase)	1.0	0.6	0.4	0.3	1.2	0.8	0.4	0.2	1.2	0.8	0.4	0.2
Current Bipolar (A/Phase)*	0.7	0.4	0.3	0.2	0.9	0.6	0.3	0.1	0.9	0.6	0.3	0.1

*Data represents Unipolar windings configured as Bipolar

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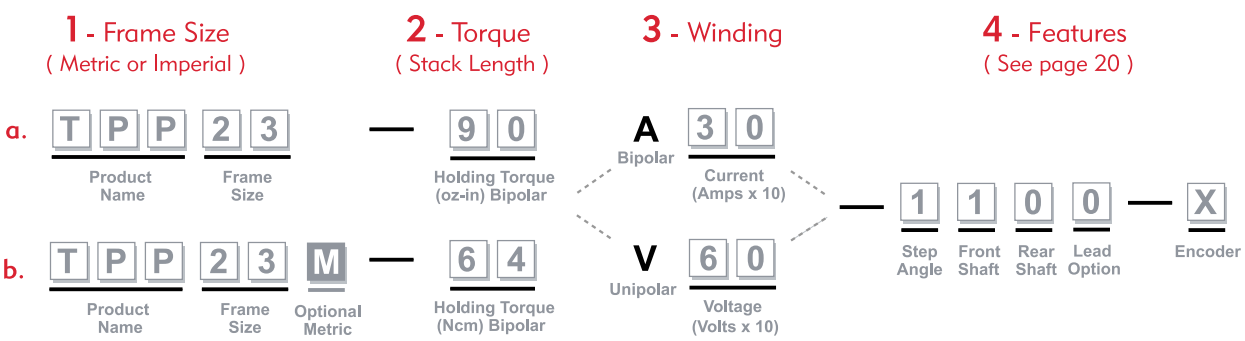
TPP23 : ElectroCraft TorquePower™ Plus | Stepper Motor
TPP23M : ElectroCraft TorquePower™ Plus (metric)

Size: Nema 23, 1.8°
Holding Torque: up to 240 oz-in or 169 Ncm
Speed: up to 90 RPS

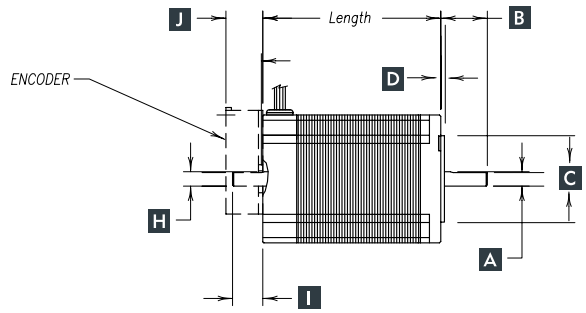
Powerful. Precise.

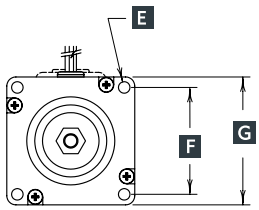
This 1.8° degree size 23 hybrid DC stepping motor has permanently lubricated ball bearings. The bi-directional size 23 has holding torque up to 240 oz-in with a step angle accuracy of ±3%.



Step 1: TPP23 & TPP23M Frame Size Drawing Key

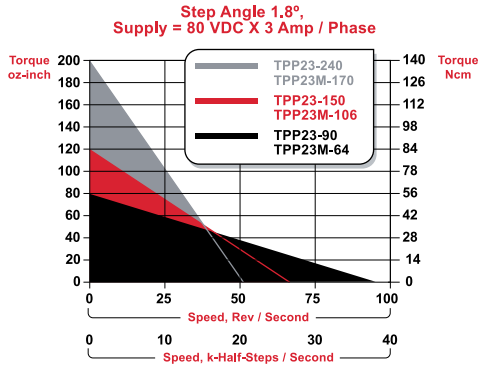
Model	Length	A Front Shaft Diameter	B Front Shaft Length	C Pilot Diameter	D Pilot Length	E Mount Hole Callout	F Mount Hole Spacing	G Flange External Dimension	H Rear Shaft Diameter	I Rear Shaft Length	J Encoder Length
TPP23–90	1.75 in±0.03	Ø .2500 / .2495 in	0.81 in±.03	Ø 1.502 / 1.498 in	0.06 in Ref	(4) 0.205 ±0.10 Through	1.86 in Ref	2.22 in Ref	Ø .2500 / .2495 in	0.53 in ±0.04	0.68 in Max
TPP23–150	2.21 in±0.03										
TPP23–240	3.09 in±0.03										
TPP23M–64	44.5 mm±0.8	Ø 7.988 / 7.976 mm	20.5 mm±0.8	Ø 38.15 / 38.05 mm	1.5 mm Ref	(4) 5.08 mm ±0.25 Through	47.1 mm Ref	56.4 mm Ref	Ø 4.998 / 4.986 mm	16.5 mm ± 1.0	17 mm Max
TPP23M–106	44.5 mm±0.8										
TPP23M–170	44.5 mm±0.8										



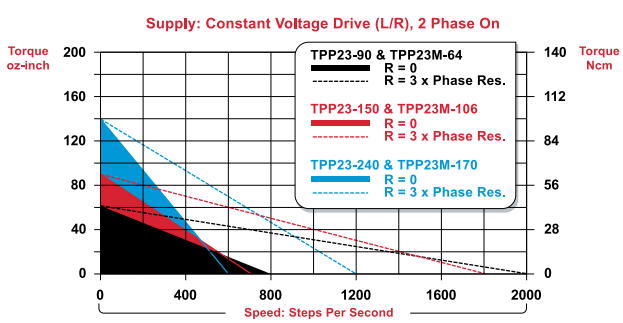


Step 2: TPP23 & TPP23M Torque and Mechanical Data

TPP23 & TPP23M Bipolar



TPP23 & TPP23M Unipolar



Stack Size Models	90A	90V	150A	150V	240A	240V
Holding Torque Bipolar oz-in (Ncm)	90.0 (63.55)	90.0 (63.55)	150.0 (105.92)	150.0 (105.92)	240.0 (169.46)	240.0 (169.46)
Holding Torque Unipolar oz-in (Ncm)	N/A	72.0 (50.8)	N/A	120.0 (84.7)	N/A	168.0 (118.66)
Weight oz (Kg)	17.0 (0.5)	17.0 (0.5)	24.0 (0.7)	24.0(0.7)	37.0 (1.0)	37.0 (1.0)
Step Angle (°/step)	0.9°	1.8°	1.8°	1.8°	1.8°	1.8°
Number Leads	4	6	4	6	4	6

Step 3: Available Windings

Bipolar

Imperial	90A10	90A20	90A30	150A10	150A20	150A30	240A10	240A20	240A30
Metric	64A10	64A20	64A30	106A10	106A20	106A30	170A10	170A20	170A30
Current Bipolar (A/Phase)	1.0	2.0	3.0	1.0	2.0	3.0	1.0	2.0	3.0

Unipolar

Imperial	90V18	90V30	90V60	90V120	150V23	150V38	150V60	150V76	150V154	240V28	240V45	240V60	240V92	240V179
Metric	64V18	64V30	64V60	64V120	106V23	106V38	106V60	106V76	106V154	170V28	170V45	170V60	170V92	170V179
Voltage Unipolar (V/Phase)	1.8	3.0	6.0	11.9	2.3	3.8	6.0	7.6	15.4	2.8	4.5	6.0	9.2	17.9
Current Unipolar (A/Phase)	3.0	2.0	1.0	0.5	3.0	2.0	1.3	1.0	0.5	3.0	2.0	1.5	1.0	0.5
Current Bipolar (A/Phase)*	2.1	1.4	0.7	0.4	2.1	1.4	0.9	0.7	0.4	2.1	1.4	1.1	0.7	0.4

*Data represents Unipolar windings configured as Bipolar

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TPP34 : ElectroCraft TorquePower™ Plus | Stepper Motor
TPP34M : ElectroCraft TorquePower™ Plus (metric)

Size: Nema 34, 1.8°
Holding Torque: up to 1190 oz-in or 840 Ncm
Speed: up to 35 RPS

Compact. Force.

This bi-directional, 1.8° size 34 hybrid DC stepping motor provides a lot of torque in a relatively small size. The TPP34 has holding torque up to 1190 oz-in with a step angle accuracy of ±3%.

To build your own motor, choose the:

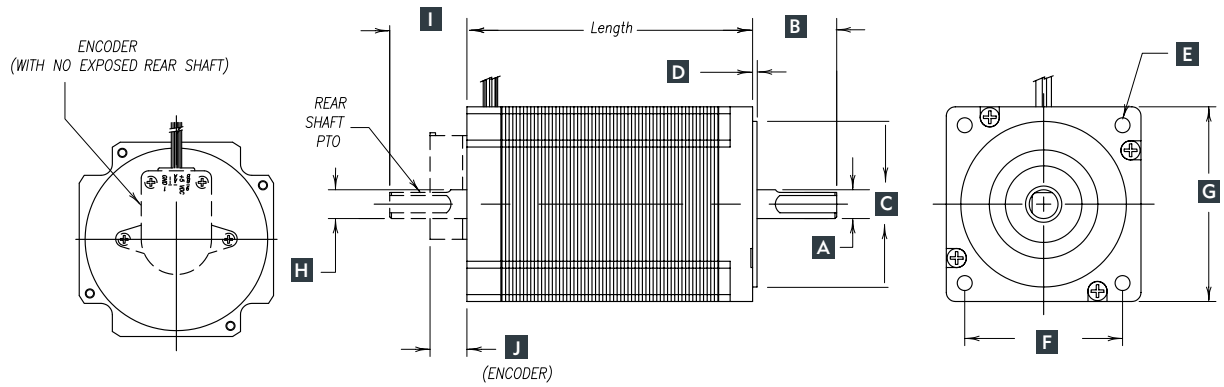
1 - Frame Size (Metric or Imperial)
2 - Torque (Stack Length)
3 - Winding
4 - Features (see page 20)

a. T P P 3 4 — 3 9 6 — A 3 0 — 1 1 0 0 — X
Product Name | Frame Size | Holding Torque (oz-in) Bipolar | Bipolar | Current (Amps x 10) | Step Angle | Front Shaft | Rear Shaft | Lead Option | Encoder

b. T P P 3 4 M — 2 8 0 — V 3 0 — 1 1 0 0 — X
Product Name | Frame Size | Optional Metric | Holding Torque (Ncm) Bipolar | Unipolar | Voltage (Volts x 10) | Step Angle | Front Shaft | Rear Shaft | Lead Option | Encoder

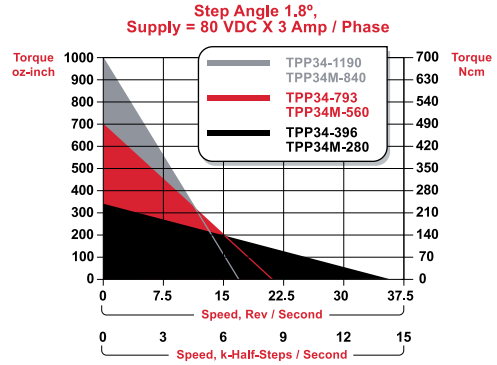
Step 1: TPP34 & TPP34M Frame Size Drawing Key

Model	Length	A Front Shaft Diameter	B Front Shaft Length	C Pilot Diameter	D Pilot Length	E Mount Hole Callout	F Mount Hole Spacing	G Flange External Dimension	H Rear Shaft Diameter	I Rear Shaft Length	J Encoder Length
TPP34–396	2.60 in±0.04	Ø 0.5000 / 0.4995 in	1.46 in±0.04	Ø 2.876 / 2.874 in	0.08 in Ref	(4) 0.260 ±0.10 Through	2.74 in Ref	3.38 in Ref	Ø 0.5000 / 0.4995 in	1.34 in±0.04	0.68 in Max
TPP34–793	3.78 in±0.04										
TPP34–1190	4.96 in±0.04										
TPP34M–280	66.0 mm±1.0	Ø 14.000 / 13.988 mm	37.0 mm±1.0	Ø 73.05 / 73.00 mm	2.0 mm Ref	(4) 6.60 mm ±0.25 Through	69.6 mm Ref	85.8 mm Ref	Ø 14.000 / 13.988 mm	34.0 mm±1.0	17 mm Max
TPP34M–560	96.0 mm±1.0										
TPP34M–840	126.0 mm±1.0										

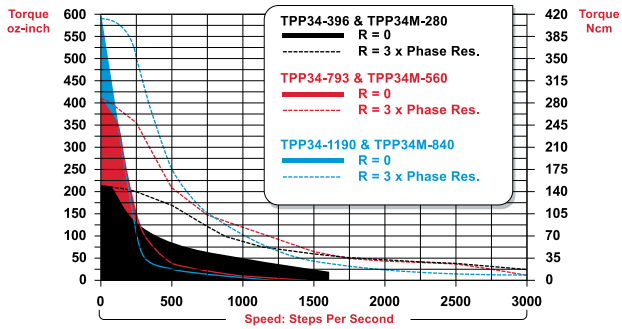


Step 2: TPP34 & TPP34M Torque and Mechanical Data

TPP34 & TPP34M Bipolar



TPP34 & TPP34M Unipolar



Stack Size Models	396A	396V	793A	793V	1190A	1190V
Holding Torque Bipolar oz-in (Ncm)	396.0 (279.62)	396.0 (279.62)	793.0 (559.94)	793.0 (559.94)	1190.0 (840.26)	1190.0 (840.26)
Holding Torque Unipolar oz-in (Ncm)	N/A	305.0 (215)	N/A	610 (430)	N/A	916.0 (650)
Weight oz (Kg)	61.7 (1.7)	61.7 (1.7)	98.8 (2.8)	98.8 (2.8)	138.6 (3.9)	138.6 (3.9)
Step Angle (°/step)	1.8°	1.8°	1.8°	1.8°	1.8°	1.8°
Number Leads	4	6	4	6	4	6

Step 3: Available Windings

Bipolar

Imperial	396A20	396A30	396A50	793A20	793A30	793A50	1190A20	1190A30	1190A50
Metric	280A20	280A30	280A50	560A20	560A30	560A50	840A20	840A30	840A50
Current Bipolar (A/Phase)	2.0	3.0	5.0	2.0	3.0	5.0	2.0	3.0	5.0

Unipolar

Imperial	396V23	396V30	396V50	793V35	T793V47	793V79	1190V39	1190V52	1190V87
Metric	286V23	286V30	286V50	563V35	5693V47	563V79	8490V39	8490V52	8490V87
Voltage Unipolar (V/Phase)	2.3	3.0	5.0	3.5	4.7	7.9	3.9	5.2	8.7
Current Unipolar (A/Phase)	4.5	3.0	2.0	4.5	3.0	2.0	4.5	3.0	2.0
Current Bipolar (A/Phase)*	3.2	2.1	1.4	3.2	2.1	1.4	3.2	2.1	1.4

*Data represents Unipolar windings configured as Bipolar

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SA45 : Electrocraft CompletePower™ | Motion Control

Technology: Bipolar Stepper Drive
Nominal Current: 5A and 10A

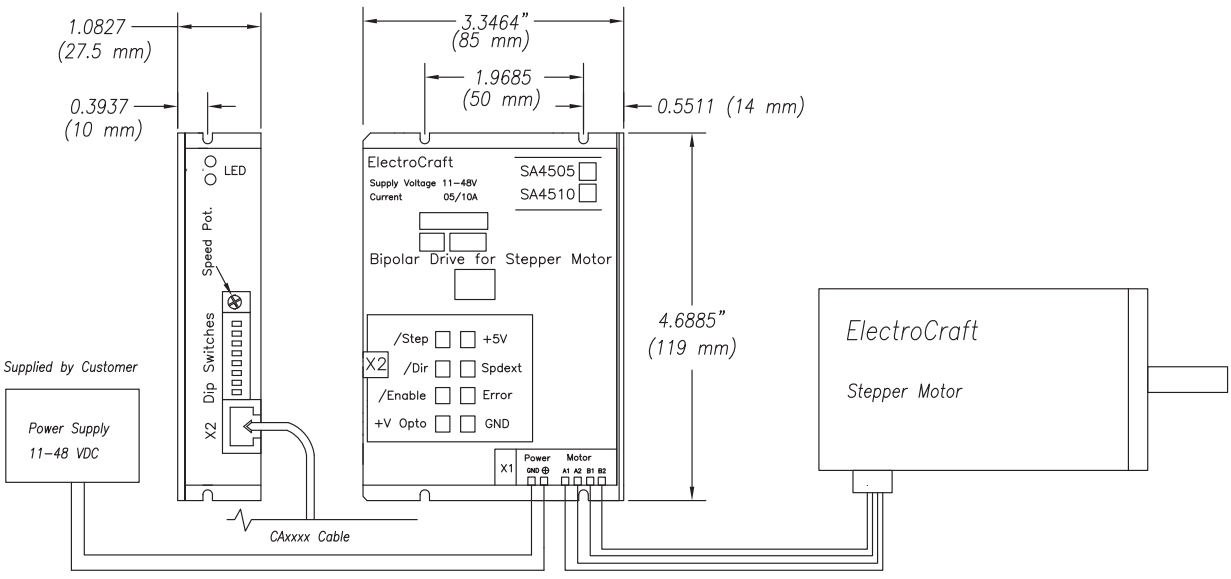
For Stepper Motors. Up to 500W.

This bipolar stepper drive provides microstepping to 1/16 built into a fully enclosed rugged aluminum case. It can be DIN-rail mounted or panel mounted for fast integration. The mode of operation is set by simple DIP switches. Features include an internal oscillator that allows operation of the drive at a internal speed set point or with an external analog speed reference that can scale this set point. Both the 5A and 10A versions of this drive can be powered by the same range of voltage supplies. This drive is protected against over-current and overtemperature and incorporates the state of the art dual full bridge MOSFET driver for maximum efficiency. Connectivity is tool-free with RJ45-CAT5 plugs for the control inputs and push-type terminals for power. The optically isolated control circuit can be powered with the internal 5V supply on the drive for TTL step and direction compatibility or supply an auxiliary voltage supply for up to 24V logic step and direction.

Drive Model Example

S	A	4	5	10
Drive Technology	Revision	# Quadrants	Voltage 10x VDC	Nominal Amps

SA45XX Connection and Outline Drawing



SA45 Specifications						
Model Number	Power Supply Voltage (VDC)	Aux Voltage +Vopto (VDC)	Nominal Current (Amps)	Max Power with Heatsink (Watts)	Fixed Off Time of Power Output Stage (µs)	Efficiency (%)
SA4505	11 - 48	5 - 24	5	250	20	95
SA4510	11 - 48	5 - 24	10	500	20	95
Optically Isolated Control Inputs						
Enable				Active Low, Ri = 1 kOhm, 5 mA max., 5V		
Dir				Ri = 1 kOhm, 5 mA max., 5V TTL Compatible		
Step				Ri = 1 kOhm, 5 mA max., 5V TTL Compatible		
Features Selected by Dip Switches						
Microstepping				1/1; 1/2; 1/4; 1/16		
Current				.5 - 5A / 1 - 10A		
Fallback				Current at standstill is reduced to 60%		
Internal Oscillator				1.5 Hz to 1.2 kHz		
Oscillator x 8				12 Hz to 9.6 kHz		
Outputs						
Auxillary Voltage Source				5VDC, 50 mA		
Error				Optical 10 mA		
Display						
LEDs				green = power/red = error		
Potentiometer						
Function of Potentiometer				Speed		
Analog Input						
SpdExt				0-5 V DC, Ri = 100 k0hm		
Mechanical Specifications						
Dimensions (L x W x H in mm)				119 X 85 X 27.5		
Mounting Hole Distance (mm)				112 X 50		
Weight (grams)				220		
Operating / Storage Temperature (°C)				-10 to +45 / - 40 to +85		
Humidity Range Not Condensing (%rel)				20 to 80% rel.		
Mode of Operation						
Mode of Operation				fullstep 1/1		
				halfstep1/2		
				microstep 1/4		
				microstep 1/16		

Motion Control Accessories

CAxxx		CA2005 - Red 50cm CA2010 - Red 100cm CA2020 - Red 200cm CA2030 - Red 300cm CA4005 - Yellow 50cm CA4010 - Yellow 100cm CA4020 - Yellow 200cm CA4030 - Yellow 300cm CA8005 - Gray 50cm CA8010 - Gray 100cm CA8020 - Gray 200cm CA8030 - Gray 300cm
HA3008		Passive heatsink optimized for drives: SA45 EA27 EA47 DA47
HA3018		One fan heatsink optimized for drives: SA45 EA27 EA47 DA47 Fan is 1 x 24VDC, .8W.
HA3028		Two fan heatsink optimized for drives: SA45 EA27 EA47 DA47 Fans are 2 x 24VDC, .8W.
MA0025		Din Rail Mounting Kit for PVC-top-hat rail adapter for units: DA47 EA27 EA47 SA45
MA3050		Din Rail Mounting Kit for WA2509 Break Out Board
WA2509		Break Out Board for DA, EA and SA-Series

To build your own motor, choose the:

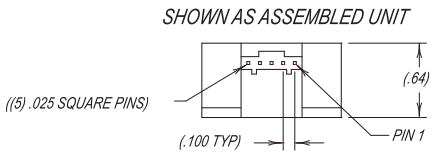
1 - Frame Size (Imperial) **2 - Torque** (Stack Length) **3 - Winding** **4 - Features** (Select Appropriate Code)

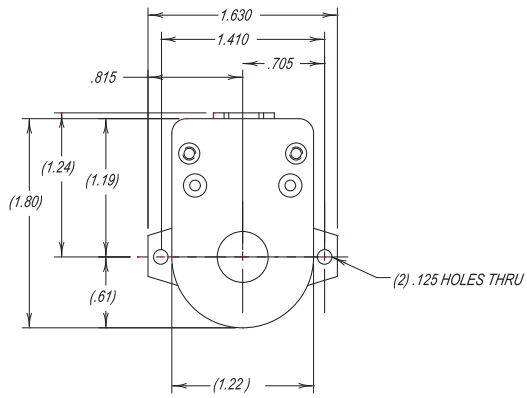
TP	23	—	150	A (Bipolar) 30 (Current (Amps x 10)) / V (Unipolar) 60 (Voltage (Volts x 10))	—	1	1	0	0	—	X
Product Name	Frame Size		Holding Torque (oz-in) Bipolar			Step Angle	Front Shaft	Rear Shaft	Lead Option		Encoder

Step 4: Stepper Motor Features

Step Angles	Front Shaft Modification	Rear Shaft Modification	Lead Option	Encoder Options
1 = 1.8˚	0 = none	0 = none	0 = flying leads	H = 400 PPR
0 = 0.9˚	1 = standard flat	1 = standard shaft	1 = connector	K = 1000 PPR
	2 = key seat			

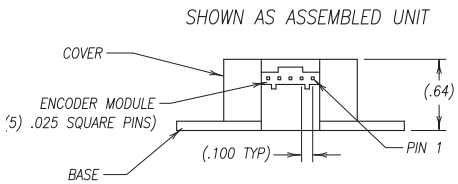
Encoder Specifications for TPP17, TPP23, and TPP34

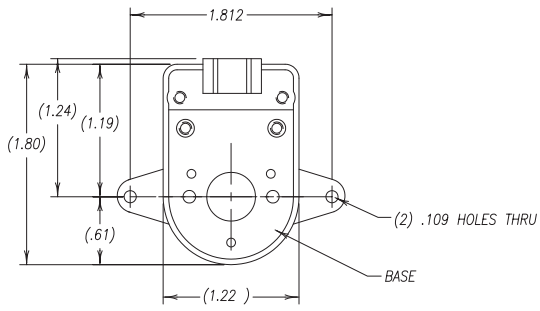




Motor Size	Encoder	Line Count
TPP17	H	400
	K	1000

Pin Number	Parameter	Max Current Draw	Typ Current Draw	Supply Voltage	Mating Connector (Ref)	Contact (Ref)
Pin 1	Ground	85 ma	55 ma	5V	AMP P/N: 104257-4	AMP P/N 104480-4
Pin 2	Index					
Pin 3	Channel A					
Pin 4	+5 VDC					
Pin 5	Channel B					





Motor Size	Encoder	Line Count
TPP23	H	400
	K	1000
TPP34	H	400
	K	1000

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