Customizable,
High Quality, Heavy Duty,
Industrial-Grade Actuators

INDUSTRIAL MOTION

TiMOTION ELECTRONIC LINEAR ACTUATORS – MOTION TECHNOLOGY THAT HELPS PROVIDE A CLEANER, BETTER FUTURE

Many industrial applications require heavy-duty automation on a large scale — especially for agricultural, construction, mining, ventilation, and process control machinery, among others. The technology is out there, and it's only getting better. Equipment manufacturers are increasingly turning to electric linear actuators as a cost-efficient and reliable alternative to previous industry standards, such as hydraulic and pneumatic motion systems. TiMOTION's Industrial Motion product line is shown within this catalog, as well as additional information about what we offer and the full benefits of our linear actuator technology.

Features and Benefits of TiMOTION Actuation Systems for Industrial Applications

- Five year mechanical warranty
- Aluminum and steel construction
- Acme and ball screw drive
- Customization
- Clutch or internal limit switches
- Multiple feedback options
- Easy installation
- Excellent engineering support
- IP69K protection available
- Heavy duty construction
- Low maintenance
- Wide speed range

JP
series

TiMOTION's JP series family is designed with inline actuator appearance. All the products in the JP series are ideally suitable for high or low load required industrial applications where up to IP69K dust and liquid ingress protection is necessary. JP series allows for use in limited spaces without sacrificing power.

JP3 - Page 12

Maximum load
2,000N in push

Maximum load
500N in pull

Maximum speed at full load
19mm/s

IP rating
Up to IP69K

Minimum installation dimension
≥ Stroke + 217mm

JP4 - Page 18

Maximum load
4,500N in push

Maximum load
3,000N in pull

Maximum speed at full load
24mm/s

IP rating
Up to IP69K

Minimum installation dimension
≥ Stroke + 289mm

MA
series

TiMOTION's MA series family is specially designed for harsh working environments, requiring a durable, long life solution. All of our MA series actuators are ideal for the heavy-duty machinery, industrial equipment and off road vehicles. In addition, they all comply with IP69K protection that will withstand high temperature, high pressure water jets, and the ingress of dust and other solid contaminants.

MA1 - Page 24

Maximum load
4,500N in push and pull

Maximum speed at full load
48mm/s
(Ball screw, DC motor, with 2500N)

IP rating
IP69K

Minimum installation dimension
≥ Stroke + 160mm (without POT)

MA2 - Page 34

Maximum load
6,000N in push and pull

Maximum speed at full load
43mm/s

IP rating
Up to IP69K

Minimum installation dimension
≥ Stroke + 131mm

MA5 - Page 42

Maximum load
3,500N in push

Maximum load
2,000N in pull

Maximum speed at full load
45mm/s

IP rating
Up to IP69K

Minimum installation dimension
≥ 238 or 250mm
(upon the front attachment)

TA series

TiMOTION's TA series family is the well-developed product line for industrial market segment. All the products in the TA series have a compact design, and can meet the demands of high force, high speed, and low noise requirements. The TA series is recommended for use in small spaces where force or capability cannot be sacrificed.

TA2 - Page 50

Maximum load
1,000N in pull and push

Maximum speed at full load
51mm/s

IP rating
Up to IP66D

Minimum installation dimension
≥ Stroke + 105mm
(without output signals)

TA2P - Page 58

Maximum load
3,500N in push

Maximum load
2,000N in pull

Maximum speed at full load
45mm/s

IP rating
Up to IP66D

Minimum installation dimension
≥ Stroke + 108mm
(with Hall sensor(s) or without output signals)

TA16 - Page 67

Maximum load
3,500N in push and pull

Maximum speed at full load
13.5mm/s

IP rating
Up to IP66

Minimum installation dimension
≥ Stroke + 112mm

TA21 - Page 76

Maximum load
10,000N in pull

Maximum load
6,000N in pull

Maximum speed at full load
16.2mm/s

Minimum installation dimension
≥ 67mm

TGM
series

TiMOTION's TGM (Gear Motor) series is primarily designed for height adjustable table applications. The TGM products allow for fast, smooth and quiet adjustment of built-in spindles through the use of external limit switches. Shafting allows for the mechanical synchronization of dual spindles.

TGM1 - Page 81

Maximum speed at full load
144RPM (±5%) after gear reduction

Maximum rated torque
7.7Nm

TGM2 - Page 87

Maximum speed at full load
49RPM (±5%) after gear reduction

Maximum rated torque
24.4Nm

TGM3 - Page 93

Maximum speed at full load
121RPM (±5%) after gear reduction

Maximum rated torque
4.6Nm

TGM4 - Page 99

Maximum speed at full load
98RPM (±5%) after gear reduction

Maximum rated torque
6Nm

TGM7 - Page 105

Maximum speed at full load
156RPM (±5%) after gear reduction

Maximum rated torque
7.2Nm

TL series

TiMOTION's TL (column) series is made up of two or three extruded aluminum tubes of rectangular shape that give the system great stability and a high stroke with reduced retracted length. Our electric lifting columns are perfect for industrial applications such as height adjustable workstations, screen and lifting tables.

TL3 - Page 111

Maximum load
4,000N in push

Maximum speed at full load
24mm/s

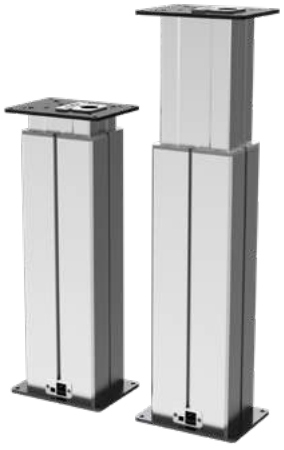
Minimum installation dimension
≥ Stroke/2 + 150mm

TL18 - Page 121

Maximum load
4,500N in push

Maximum speed at full load
28mm/s

Minimum installation dimension
≥ Stroke + 147mm



TL18AC - Page 127

Maximum load
4,500N in push

Maximum speed at full load
28mm/s

Minimum installation dimension
≥ Stroke + 183mm

JP3 series

TiMOTION's JP3 series inline linear actuator was designed for low load industrial applications where up to IP69K dust and liquid ingress protection is necessary. It is best suited for applications with visual or compact installation dimension requirements. Hall sensors are optional for the JP3 which allow for synchronization and position feedback.

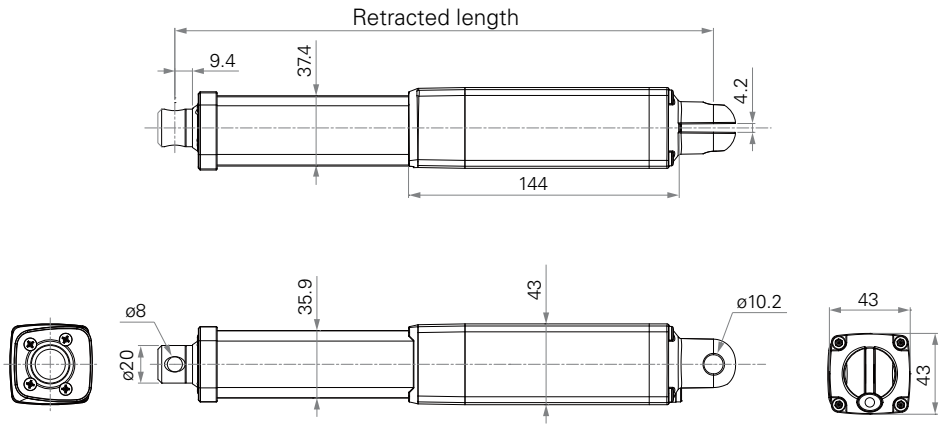
Load and Speed

	CODE	Load (N)		Self Locking Force (N)	Typical Current (A)		Typical Speed (mm/s)	
		Push	Pull		No Load 24V DC	With Load 24V DC	No Load 24V DC	With Load 24V DC
Motor Speed (5600RPM)	B	2000	2000	2000	1.0	3.0	7.0	3.5
	C	1500	1500	1500	1.0	3.0	10.0	6.5
	D	1000	1000	1000	1.0	3.0	14.5	8.5
	E	500	500	500	1.0	3.0	23.5	19.0

NOTE

1 Please refer to the approved drawing for the final authentic value.
2 This self-locking force level is reached only when a short circuit is applied on the terminals of the motor. All the TiMOTION control boxes have this feature built-in.
3 The current & speed in table are tested with 24V DC motor. With a 12V DC motor, the current is approximately twice the current measured in 24V DC; speed will be similar for both voltages.
4 The current & speed in table are tested when the actuator is extending under push load.
5 The current & speed in table and diagram are tested with a stable 24V DC power supply.

Standard Dimension (mm)



General Features

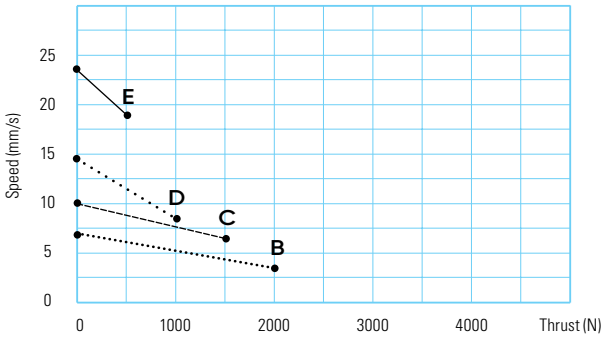
Maximum load	2,000N in push
Maximum load	500N in pull
Maximum speed at full load	19mm/s (with 500N in a push or pull condition)
Stroke	20~1000mm
Minimum installation dimension	≥ Stroke + 217mm
IP rating	Up to IP69K
Color	Black or grey
Certificate	UL73
Operational temperature range	-5°C~+65°C
Operational temperature range at full performance	+5°C~+45°C
Storage temperature range	-40°C~+70°C

An inline actuator designed for small spaces

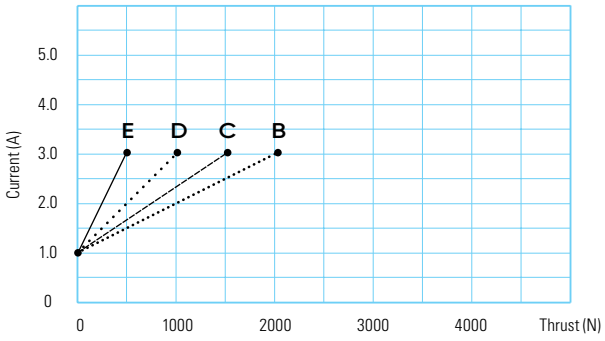
Performance Data

Motor Speed 5600RPM, Duty Cycle 10%

Speed vs. Thrust



Current vs. Thrust



JP3 Ordering Key

JP3

Version: 20181015-D

Voltage	1 = 12V DC 2 = 24V DC	5 = 24V DC, PTC 6 = 12V DC, PTC	
Load and Speed	See page 12		
Stroke (mm)			
Restracted Lengh (mm)	See page 16		
Rear Attachment (mm) See page 17	1 = Aluminum casting, U clevis, slot 4.2, depth 18, hole 10.2		
Front Attachment (mm) See page 17	1 = Aluminum casting, no slot, hole 6.4 2 = Aluminum casting, no slot, hole 8 3 = Aluminum CNC, U clevis, slot 6, depth 13, hole 10 4 = Aluminum CNC, U clevis, slot 6, depth 13, hole 6.4 5 = Aluminum CNC, U clevis, slot 6, depth 13, hole 8 6 = Aluminum casting, hole 10		
Direction of Rear Attachment (Counterclockwise)	1 = 0° See page 17		
Color	1 = Black	2 = Grey (Pantone428C)	
IP Rating	1 = Without 2 = IP54 3 = IP66	5 = IP66W 6 = IP66D 7 = IP68	8 = IP69K
Special Functions for Spindle Sub-Assembly	0 = Without (standard)		
Functions for Limit Switches See page 16	1 = Two switches at full retracted / extended positions to cut current 2 = Two switches at full retracted / extended positions to cut current + 3rd LS to send signal 3 = Two switches at full retracted / extended positions to send signal 4 = Two switches at full retracted / extended positions to send signal + 3rd LS to send signal		
Output Signals	0 = Without	2 = Hall sensor*2	
Connector See page 17	1 = DIN 6P, 90° plug	2 = Tinned leads	
Cable Length (mm)	0 = Straight, 100	1 = Straight, 500	3 = Straight, 1000

JP3
Ordering Key Appendix

Retracted Length (mm)

1. Calculate A+B+C = Y
2. Retracted length needs to ≥ Stroke+Y

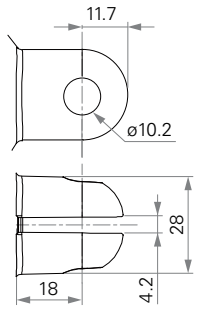
A. Front Attachment	Code			
	1, 2		+217	
	3, 4, 5		+230	
B. Stroke (mm)	20~150	-	551~600	+40
	151~200	-	601~650	+45
	201~250	+ 5	651~700	+50
	251~300	+10	701~750	+55
	301~350	+15	751~800	+60
	351~400	+20	801~850	+65
	401~450	+25	851~900	+70
	451~500	+30	901~950	+75
	501~550	+35	951~1000	+80
C. Output Signals	Code			
	0		-	
	1, 2		+13	

Functions for Limit Switches

Wire Definitions

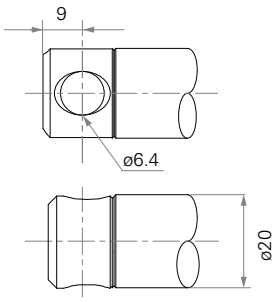
		CODE			
	Pin	**1**	**2**	**3**	**4**
Green	1	Extend (VDC+)	Extend (VDC+)	Extend (VDC+)	Extend (VDC+)
Red	2	N/A	N/A	Common	Common
White	3	N/A	Middle switch pinB	Upper limit switch	Upper limit switch
Black	4	N/A	Middle switch pinA	N/A	Medium limit switch
Yellow	5	Retract (VDC+)	Retract (VDC+)	Retract (VDC+)	Retract (VDC+)
Blue	6	N/A	N/A	Lower limit switch	Lower limit switch

Rear Attachment
(mm)

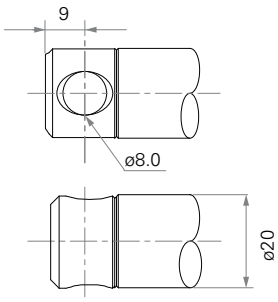


1 = Aluminum casting, U clevis, slot 4.2, depth 18, hole 10.2

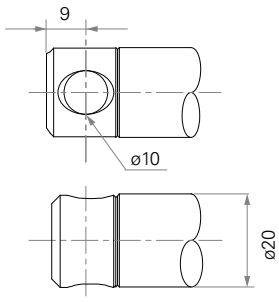
Front Attachment
(mm)



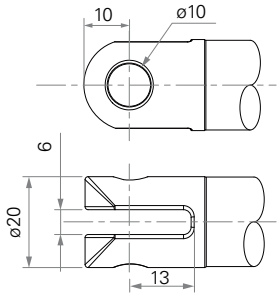
1 = Aluminum casting, no slot, hole 6.4



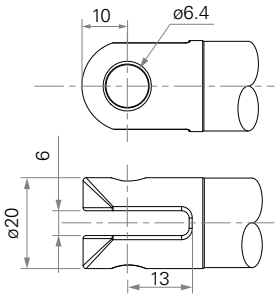
2 = Aluminum casting, no slot, hole 8



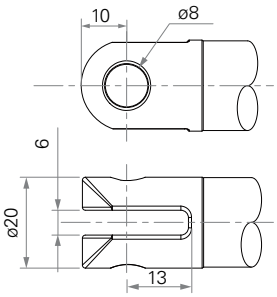
6 = Aluminum casting, hole 10



3 = Aluminum CNC, U clevis, slot 6.0, depth 13, hole 10

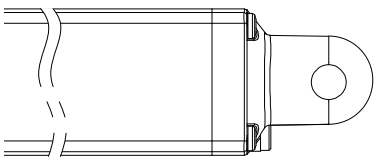


4 = Aluminum CNC, U clevis, slot 6, depth 13, hole 6.4



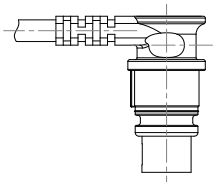
5 = Aluminum CNC, U clevis, slot 6, depth 13, hole 8

Direction of Rear Attachment
Counterclockwise

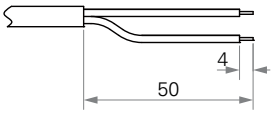


1 = 0°

Connector

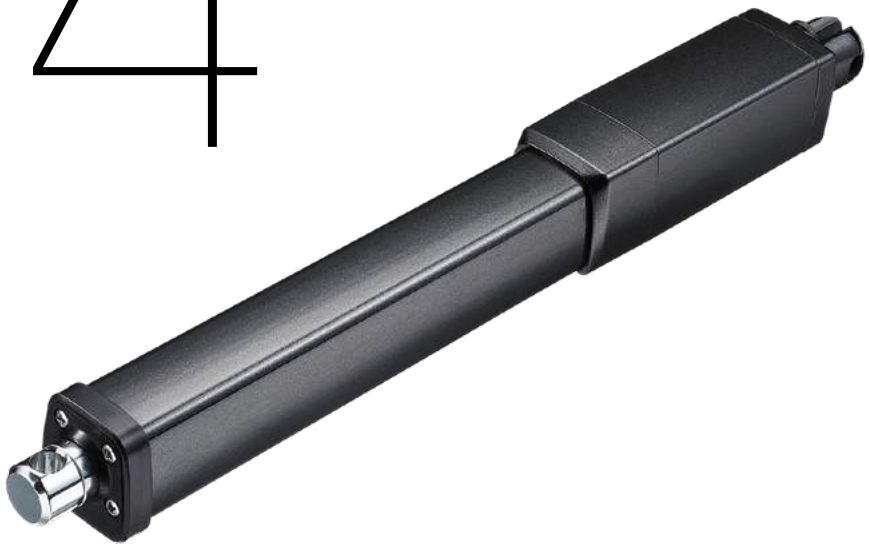


1 = DIN 6P, 90° plug



2 = Tinned leads

JP4 series



TiMOTION's JP4 series inline linear actuator is most similar to the JP3, but was designed for industrial applications that require higher load and speed. Its IP69K protection ensures it will withstand high temperature, high pressure water jets, and the ingress of dust and other solid contaminants. For synchronization and position feedback, the JP4 can be equipped with Hall sensors.

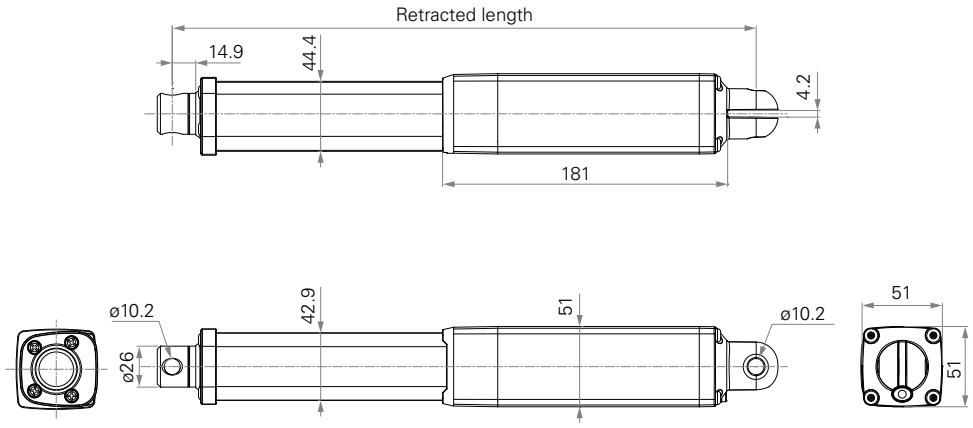
Load and Speed

	CODE	Load (N)		Self Locking Force (N)	Typical Current (A)		Typical Speed (mm/s)	
		Push	Pull		No Load 24V DC	With Load 24V DC	No Load 24V DC	With Load 24V DC
Motor Speed (3800RPM)	B	4500	3000	4500	1.1	4.0	4.4	2.5
	C	3500	3000	3500	1.1	4.0	6.5	4.0
	D	2500	2500	2500	1.1	4.0	9.2	5.6
	E	1500	1500	1500	1.1	3.0	12.0	9.5
	F	1000	1000	1000	1.1	3.0	18.0	14.0
	G	500	500	500	1.1	3.0	27.5	24.0

NOTE

1 With a 12V motor, the current is approximately twice the current measured in 24V; speed will be similar for both voltages.
2 This self-locking force level is reached only when a short circuit is applied on the terminals of the motor. All the TiMOTION control boxes have this feature built-in.
3 Please refer to the approved drawing for the final authentic value.

Standard Dimension (mm)



General Features

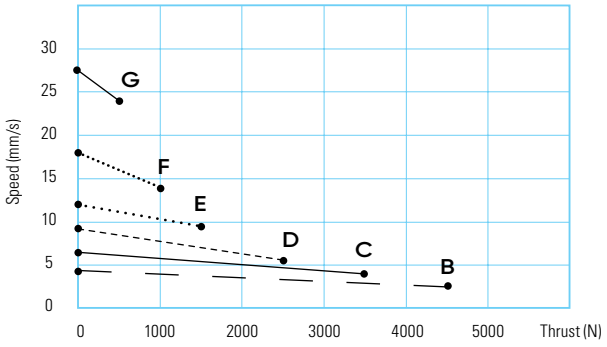
Maximum load	4,500N in push
Maximum load	3,000N in pull
Maximum speed at full load	24mm/s (with 500N in a push or pull condition)
Minimum installation dimension	≥ Stroke + 289mm
Stroke	20~1000mm
IP rating	Up to IP69K
Color	Black or grey
Operational temperature range	-5°C~+65°C
Operational temperature range at full performance	+5°C~+45°C
Storage temperature range	-40°C~+70°C
Certificate	UL73

An inline actuator designed for small spaces

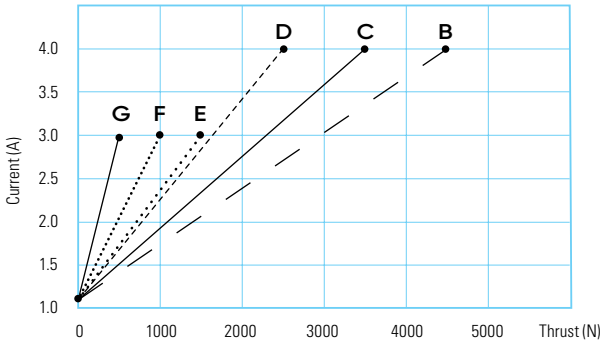
Performance Data

Motor Speed 3800RPM, Duty Cycle 10%

Speed vs. Thrust



Current vs. Thrust



JP4 Ordering Key

JP4

Version: 20171204-C

Voltage	1 = 12V DC 2 = 24V DC	5 = 24V DC, PTC 6 = 12V DC, PTC	
Load and Speed	See page 18		
Stroke (mm)			
Restracted Lengh (mm)	See page 22		
Rear Attachment (mm) See page 23	1 = Aluminum casting, U clevis, slot 4.2, depth 18, hole 10.2		
Front Attachment (mm) See page 23	1 = Aluminum CNC, no slot, hole 13		
Direction of Rear Attachment (Counterclockwise)	1 = 0° See page 23		
Color	1 = Black	2 = Grey (Pantone428C)	
IP Rating	1 = Without 2 = IP54 3 = IP66	5 = IP66W 6 = IP66D 7 = IP68	8 = IP69K
Special Functions for Spindle Sub-Assembly	0 = Without (standard)		
Functions for Limit Switches See page 22	1 = Two switches at full retracted / extended positions to cut current 2 = Two switches at full retracted / extended positions to cut current + 3rd LS to send signal 3 = Two switches at full retracted / extended positions to send signal 4 = Two switches at full retracted / extended positions to send signal + 3rd LS to send signal		
Output Signals	0 = Without	1 = Hall sensor*1	2 = Hall sensor*2
Connector See page 23	1 = DIN 6P, 90° plug	2 = Tinned leads	
Cable Length (mm)	0 = Straight, 100	1 = Straight, 500	3 = Straight, 1000

JP4
Ordering Key Appendix

Retracted Length (mm)

1. Calculate A+B=Y
2. Retracted length needs to ≥ Stroke+Y

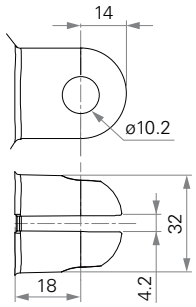
A. **Rear Attachment**	Code			
	1		+289	
B. **Stroke (mm)**	20~150	-	551~600	+80
	151~200	-	601~650	+90
	201~250	+10	651~700	+100
	251~300	+20	701~750	+110
	301~350	+30	751~800	+120
	351~400	+40	801~850	+130
	401~450	+50	851~900	+140
	451~500	+60	901~950	+150
	501~550	+70	951~1000	+160

Functions for Limit Switches

Wire Definitions

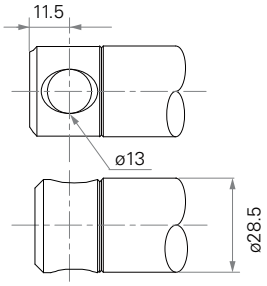
		CODE			
	Pin	**1**	**2**	**3**	**4**
Green	1	Extend (VDC+)	Extend (VDC+)	Extend (VDC+)	Extend (VDC+)
Red	2	N/A	N/A	Common	Common
White	3	N/A	Middle switch pinB	Upper limit switch	Upper limit switch
Black	4	N/A	Middle switch pinA	N/A	Medium limit switch
Yellow	5	Retract (VDC+)	Retract (VDC+)	Retract (VDC+)	Retract (VDC+)
Blue	6	N/A	N/A	Lower limit switch	Lower limit switch

Rear Attachment
(mm)



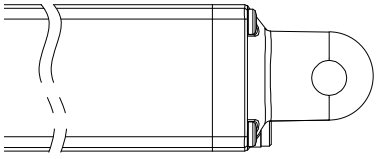
1 = Aluminum casting, U clevis, slot 4.2, depth 18, hole 10.2

Front Attachment
(mm)



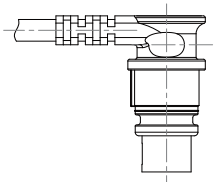
1 = #45 Steel CNC, no slot, hole 13

Direction of Rear Attachment
Counterclockwise

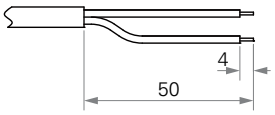


1 = 0°

Connector



1 = DIN 6P, 90° plug



2 = Tinned leads

MA1 series

TiMOTION's MA1 series linear actuator is the proven choice for applications requiring a durable, long life solution. Specifically designed for harsh working environments, the MA1 linear actuator is ideal for use in heavy-duty machinery, industrial equipment and off road vehicles. This linear actuator has been certified for applications requiring IP69K compliance. Available options for the MA1 linear actuator include AC or DC power, ball or acme spindles, mechanical or electrical braking and a load limiting clutch or limit switches.

Load and Speed

	CODE	Load (N)		Typical Current (A)				Typical Speed (mm/s)				Overload Clutch Range (N)
				No Load		With Load		No Load		With Load		
		Push	Pull	12V DC	24V DC	12V DC	24V DC	12V DC	24V DC	12V DC	24V DC	
ACME Screw, DC Motor	B	1500	1500	10.0	5.0	15.4	7.7	29.5	29.5	27.0	27.0	1800~3300
	C	2500	2500	5.0	2.5	14.0	7.0	15.8	15.8	14.3	14.3	3000~5500
Ball Screw, DC Motor	A	2500	2500	7.0	3.5	30.0	12.5	58.5	58.5	36.5	48.0	3000~5500
	B	3500	3500	5.0	2.5	18.0	9.0	29.8	29.8	25.5	25.5	4200~7700
	C	4500	4500	4.0	2.0	13.0	6.5	16.0	16.0	14.0	14.0	5400~9900

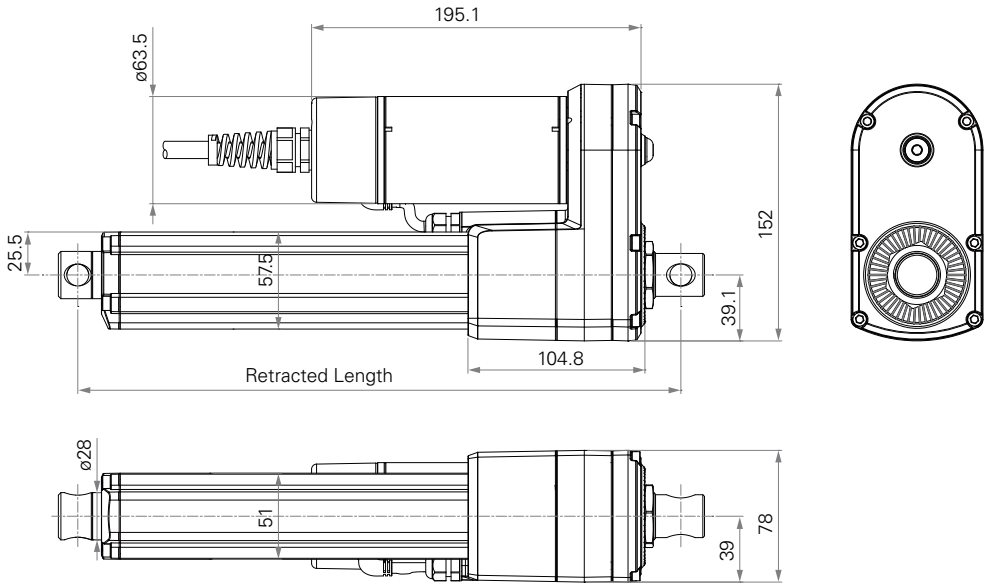
	CODE	Load (N)		Typical Current (A)				Typical Speed (mm/s)				Overload Clutch Range (N)
				No Load		With Load		No Load		With Load		
		Push	Pull	110V AC	220V AC	110VA C	220V AC	110V AC	220V AC	110V AC	220V AC	
ACME Screw, AC Motor	B	1500	1500	1.9	0.9	2.0	1.0	26.1	22.5	23.0	21.0	1800~3300
	C	2500	2500	1.9	0.9	2.0	1.0	14.1	12.0	12.8	11.2	3000~5500
Ball Screw, AC Motor	A	2500	2500	2.0	0.9	2.5	1.3	53.0	46.0	38.5	40.0	3000~5500
	B	3500	3500	1.9	0.9	2.1	1.1	27.0	23.5	22.5	21.5	4200~7700
	C	4500	4500	1.9	0.9	2.0	1.0	14.5	12.0	13.0	11.5	5400~9900

NOTE

1 With a 12V motor, the current is approximately twice the current measured in 24V. With a 36V motor, the current is approximately two-thirds the current measured in 24V; speed will be similar for both voltages.

2 Current and speed: Tested average value when extending in push direction.

Standard Dimension (mm)



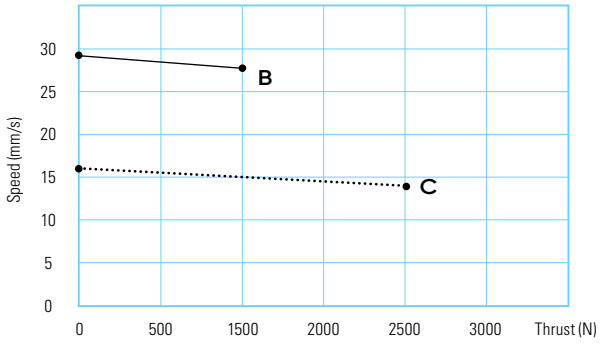
General Features

Spindle	ACME or Ball screw
Maximum load	4,500N in push and pull
Maximum speed at full load	48mm/s (Ball screw, DC motor, with 2500N)
Stroke	20~1000mm (ACME screw) 50~800mm (Ball screw)
Minimum installation dimension	≥ Stroke + 160mm (without POT)
IP rating	IP69K
Operational temperature range	-30°C~+65°C
Operational temperature range at full performance	+5°C~+45°C
Options	Overload clutch, Hall sensor(s), POT, manual crank function
Mechanical or electromagnetic brake	
Higher duty cycle (25%), corrosion proof	

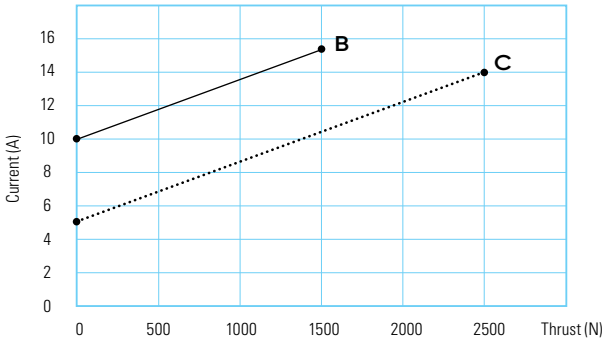
Performance Data

ACME Screw 12V DC Motor, Duty Cycle 25%

Speed vs. Thrust

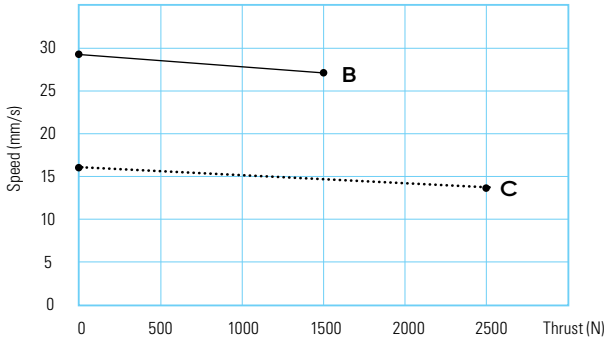


Current vs. Thrust

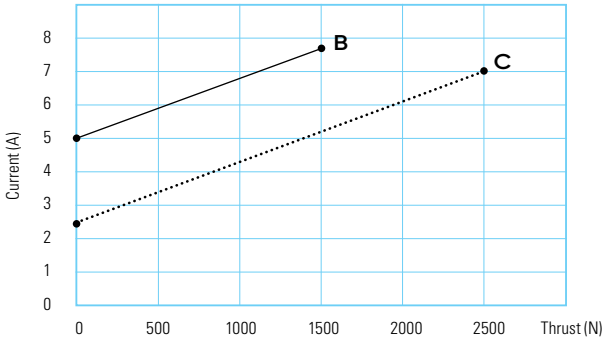


ACME Screw 24V DC Motor, Duty Cycle 25%

Speed vs. Thrust



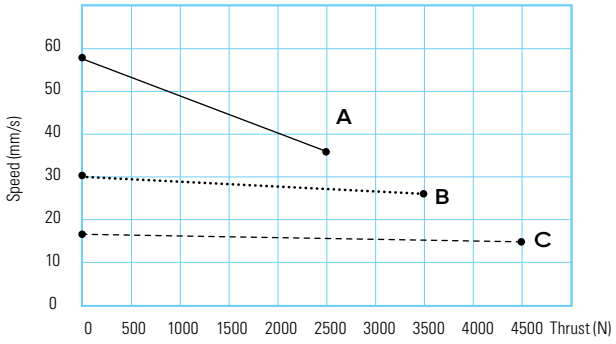
Current vs. Thrust



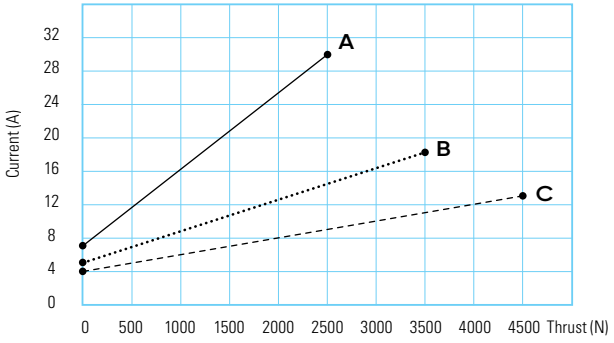
Performance Data

Ball Screw 12V DC Motor, Duty Cycle 25%

Speed vs. Thrust

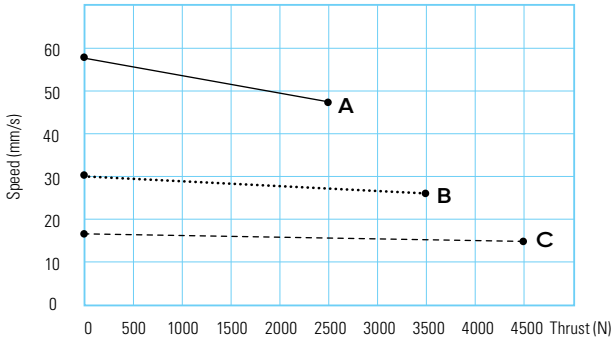


Current vs. Thrust

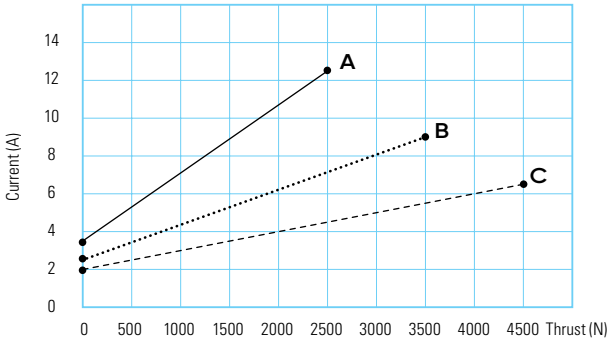


Ball Screw 24V DC Motor, Duty Cycle 25%

Speed vs. Thrust



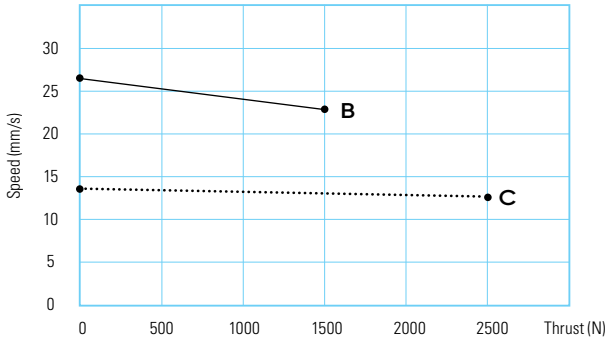
Current vs. Thrust



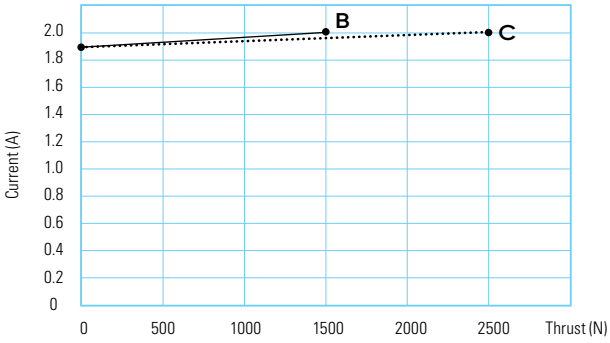
Performance Data

ACME Screw 110V AC Motor, Duty Cycle 25%

Speed vs. Thrust

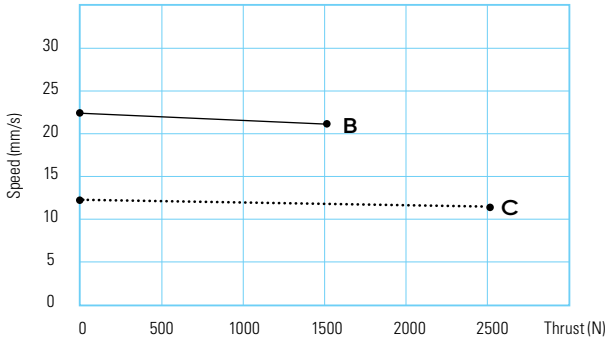


Current vs. Thrust

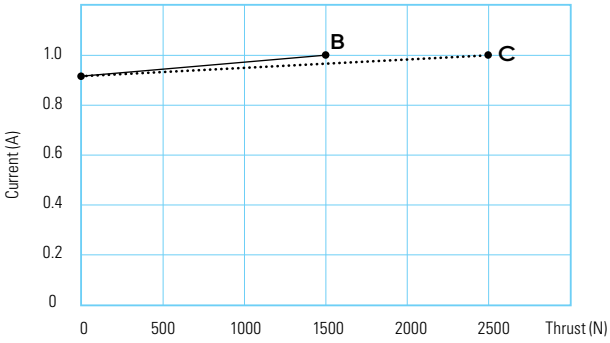


ACME Screw 220V AC Motor, Duty Cycle 25%

Speed vs. Thrust



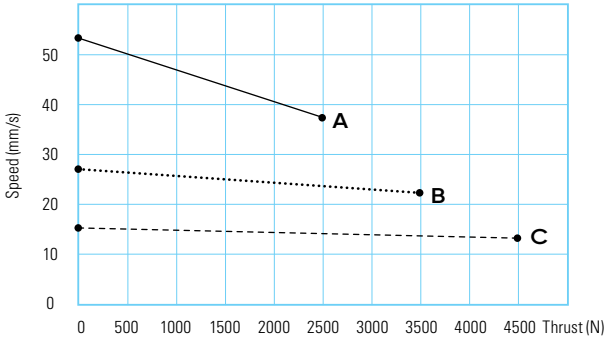
Current vs. Thrust



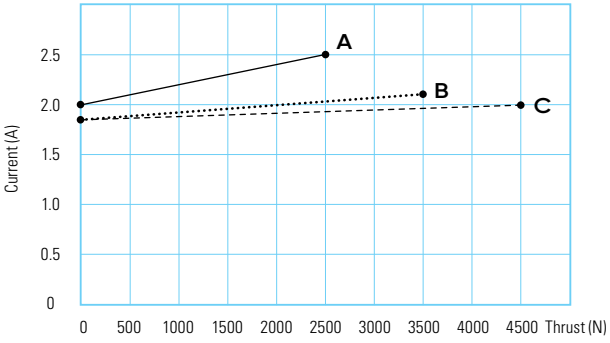
Performance Data

Ball Screw 110V AC Motor, Duty Cycle 25%

Speed vs. Thrust

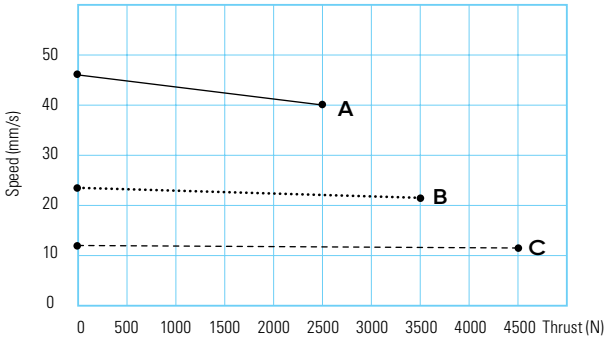


Current vs. Thrust

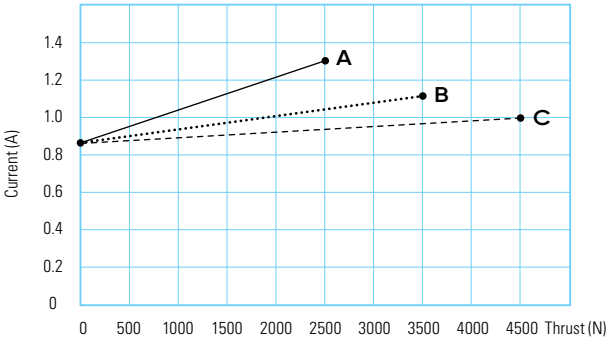


Ball Screw 220V AC Motor, Duty Cycle 25%

Speed vs. Thrust



Current vs. Thrust



MA1 Ordering Key

MA1

Version: 20180831-C

Spindle Type	A = ACME screw	B = Ball screw	
Voltage	1 = 12V DC 2 = 24V DC	3 = 36V DC 4 = 110V AC 60Hz	5 = 220V AC 50Hz
Load and Speed	See page 24		
Stroke (mm)			
Restracted Lengh (mm)	See page 31		
Rear Attachment (mm) See page 33	1 = #45 Steel CNC, without slot, hole 13		
Front Attachment (mm) See page 33	1 = #45 Steel CNC, without slot, hole 13		
Direction of Rear Attachment (Counterclockwise)	1 = 90° (Standard) See page 33	2 = 0°	
Functions for Limit Switches See page 32	0 = Without (Needs to choose overload clutch) 1 = Two switches at full retracted / extended positions to cut current 2 = Two switches at full retracted / extended positions to send signal		
Overload Clutch	0 = Without	1 = With (Standard)	
Mechanical Brake See page 33	0 = Without	1 = With (Ball screw's standard option)	
Electromagnetic Brake See page 33	0 = Without (Standard)	1 = With	
IP Rating	6 = IP66D	8 = IP69K	
Manual Drive	0 = Without	1 = With	
Output Signals See page 31	0 = Without	1 = POT	5 = Hall sensor*2
Connector	1 = Tinned leads		
Cable Length (mm)	1 = Straight, 500		

MA1
Ordering Key Appendix

Retracted Length (mm)

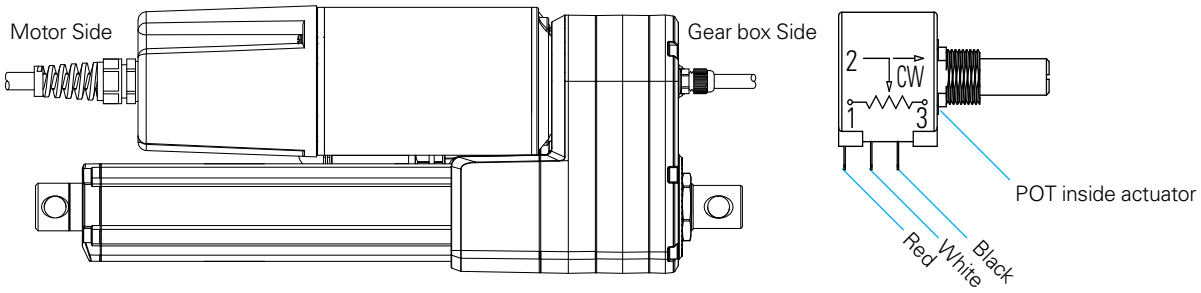
1. Calculate A+B+C = Y
2. Retracted length needs to ≥ Stroke+Y

A. Type		ACME Screw DC Motor	Ball Screw DC Motor	ACME Screw AC Motor	Ball Screw AC Motor
		+160	+201	+160	+201
B. Mechanical Brake	Code	Type			
		ACME Screw DC Motor	Ball Screw DC Motor	ACME Screw AC Motor	Ball Screw AC Motor
	0	-	-	-	-
	1	+35	-	+35	-
C. Output Signals	Code	Type			
		ACME Screw DC Motor	Ball Screw DC Motor	ACME Screw AC Motor	Ball Screw AC Motor
	0	-	-	-	-
	1	+36	+40	+36	+40
	5	-	-	+36	+40

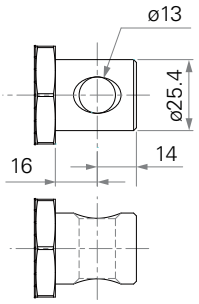
Functions for Limit Switches

Wire Definitions

				Output signal code			
			AWG	**0** Without	**1** POT	**4** 1 Hall	**5** 2 Hall
DC motor	Motor side	Black	26	-	-	GND	GND
		Blue	26	-	-		S2
		White	26	-	-	S1	S1
		Red	26	-	-	+5V	+5V
		Red	14	Stretch+	Stretch+	Stretch+	Stretch+
		Black	14	Retract+	Retract+	Retract+	Retract+
	Gear box side	Red	26	-	Pin 1	-	-
		White	26	-	Pin 2	-	-
		Black	26	-	Pin 3	-	-
AC motor	Motor side	Black	18	Retract+	Retract+	Retract+	Retract+
		Grey	18	Stretch+	Stretch+	Stretch+	Stretch+
		Brown	18	PCBA+	PCBA+	PCBA+	PCBA+
		Blue	18	Neutral	Neutral	Neutral	Neutral
		Green/Yellow	18	GND	GND	GND	GND
	Gear box side	Red	20	-	Pin1	+5V	+5V
		White	20	-	Pin2	S1	S1
		Blue	20	-	-	-	S2
		Black	20	-	Pin3	GND	GND

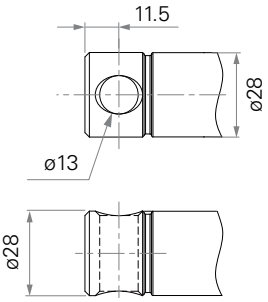


Rear Attachment (mm)



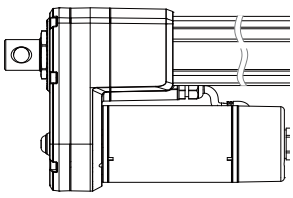
1 = #45 Steel CNC, without slot, hole 13

Front Attachment (mm)

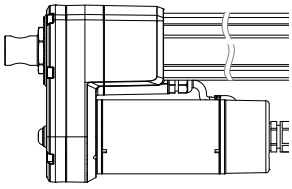


1 = #45 Steel CNC, without slot, hole 13

Direction of Rear Attachment Counterclockwise

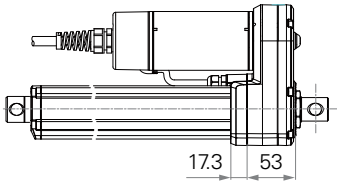


1 = 90°

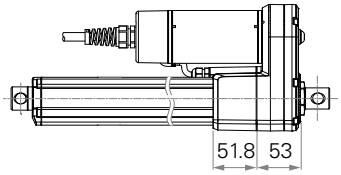


2 = 0°

Mechanical Brake (mm)

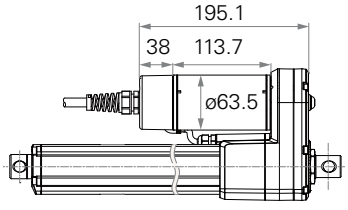


0 = Without

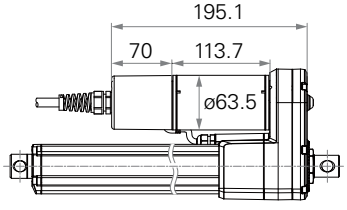


1 = With
(Ball Screw's standard option)

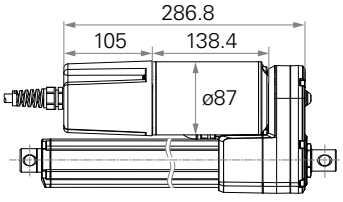
Electromagnetic Brake (mm)



0 = Without (DC)



1 = With (DC)



0 = Without (AC)

MA2 series

TiMOTION's MA2 series linear actuator was specifically designed for applications which face harsh working environments and require ruggedness and durability. Its IP69K protection ensures it will withstand high temperature, high pressure water jets, and the ingress of dust and other solid contaminants. The MA2 also has optional Reed switches along the outer tube which allow users to adjust the stroke length. For improved control and accuracy of motion, the MA2 can be customized with many different feedback options depending on your application requirements. Example applications suitable for the MA2: Agricultural equipment such as spreaders, harvesters, grain handlers, combines and tractors.

Load and Speed

	CODE	Load (N)		Self Locking Force (N)	Typical Current (A)		Typical Speed (mm/s)	
		Push	Pull		No Load 24V DC	With Load 24V DC	No Load 24V DC	With Load 24V DC
Motor Speed (5200RPM)	F	1000	1000	1300	2.7	8.4	52.5	43.0
	G	2000	2000	2600	2.4	7.5	25.5	22.3
	H	4000	4000	5200	2.3	8.0	13.2	11.1
	J	6000	6000	7800	2.0	6.8	6.6	6.1

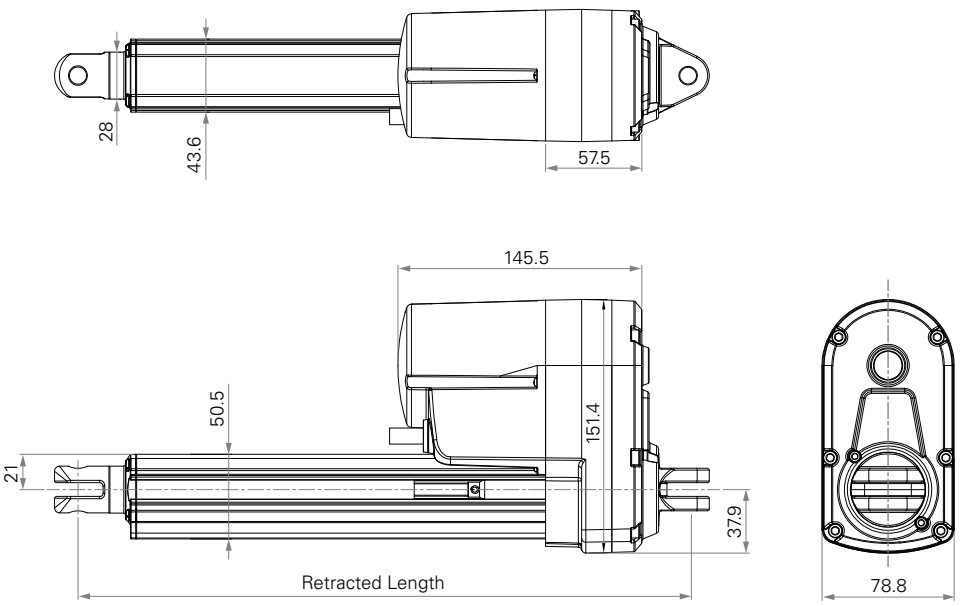
NOTE

1 With a 12V motor, the current is approximately twice the current measured in 24V. With a 36V motor, the current is approximately two-thirds the current measured in 24V; speed will be similar for both voltages.

2 This self-locking force level is reached only when a short circuit is applied on the terminals of the motor. All the TiMotion control boxes have this feature built-in.

3 Please refer to the approved drawing for the final authentic value.

Standard Dimension (mm)



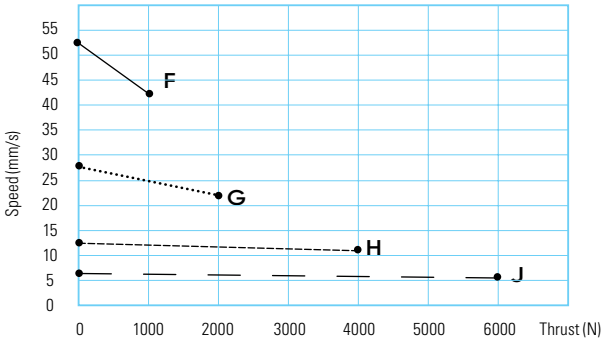
General Features

Maximum load	6,000N in push and pull
Maximum speed at full load	43mm/s (with 1000N in a push or pull condition)
Stroke	25~1000mm
Minimum installation dimension	≥ Stroke + 131mm
IP rating	Up to IP69K
Operational temperature range	-30°C~+65°C
Operational temperature range at full performance	+5°C~+45°C
Options	Hall sensor(s), POT

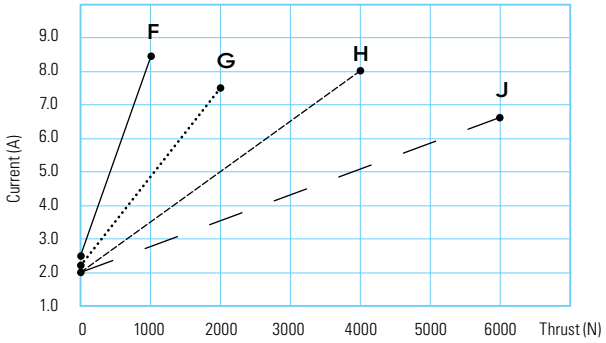
Performance Data

Motor Speed 5200RPM, Duty Cycle 25%

Speed vs. Thrust



Current vs. Thrust



MA2 Ordering Key

MA2

Version: 20171221-C

Voltage	1 = 12V DC	3 = 36V DC	6 = 12V DC, thermal control
	2 = 24V DC	5 = 24V DC, thermal control	7 = 36V DC, thermal control
Load and Speed	See page 34		
Stroke (mm)			
Restracted Lengh (mm)	See page 38		
Rear Attachment (mm) See page 40	1 = Aluminum casting, clevis U, slot 8.2, depth 12.5, hole 10.2 2 = Aluminum casting, clevis U, slot 8.2, depth 15, hole 10.2 3 = Aluminum casting, clevis U, slot 8.2, depth 15, hole 12.8 4 = Aluminum casting, clevis U, slot 8.2, depth 15, hole 12.2		
Front Attachment (mm) See page 40	1 = Iron inner tube with punched hole, without slot, hole 10.2 2 = Iron inner tube with punched hole, without slot, hole 12.2 3 = Iron inner tube with punched hole, without slot, hole 12.8 4 = Aluminum casting, clevis U, slot 8.2, depth 15, hole 10.2 5 = Aluminum casting, clevis U, slot 8.2, depth 15.0, hole 12.2 6 = Aluminum casting, clevis U, slot 8.2, depth 15, hole 12.8 K = Rod end bearing, hole 12.8		
Direction of Rear Attachment (Counterclockwise)	1 = 90° See page 41	2 = 0°	
Functions for Limit Switches See page 39	1 = Two switches at full retracted / extended positions to cut current 2 = Two switches at full retracted / extended positions to cut current + third one in between to send signal 6 = Two switches at full retracted/extended positions to cut current + send signal		
Reed Sensor on the Outer Tube	0 = Without	1 = One Reed sensor	2 = Two Reed sensors
Output Signals See page 38	0 = Without 1 = POT	4 = Hall sensor*1 5 = Hall sensor*2	
Connector See page 41	2 = Tinned leads		
Cable Length (mm)	1 = Straight, 500 2 = Straight, 1000	3 = Straight, 1500 4 = Straight, 2000	
IP Rating	1 = Without 2 = IP54	3 = IP66 6 = IP66D	8 = IP69K
Manual Drive	0 = Without	1 = With	
T-Smart	0 = Without		

MA2
Ordering Key Appendix

Retracted Length (mm)

1. Calculate A+B+C = Y
2. Retracted length needs to ≥ Stroke+Y

A. Attachment	Front Attachment Code	Rear Attachment Code		
		1	2, 3, 4	
	1, 2, 3	+131	+134	
	4, 5, 6	+161	+164	
	K	+178	+181	
B. Stroke (mm)	25~150	-	551~600	+80
	151~200	-	601~650	+90
	201~250	+10	651~700	+100
	251~300	+20	701~750	+110
	301~350	+30	751~800	+120
	351~400	+40	801~850	+130
	401~450	+50	851~900	+140
	451~500	+60	901~950	+150
	501~550	+70	951~1000	+160
C. Output Signals	Code			
	0, 4, 5, 6, 7		-	
	1		+20	

Functions for Limit Switches

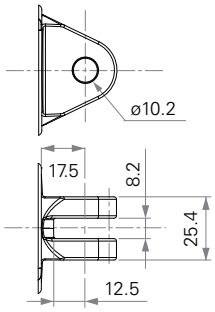
Wire Definitions

		CODE		
	Pin	**1**	**2**	**6**
Green	1	Extend (VDC+)	Extend (VDC+)	Extend (VDC+)
Red	2	N/A	N/A	N/A
White	3	N/A	Middle switch pinB	Upper limit switch
Black	4	N/A	Middle switch pinA	Lower limit switch
Yellow	5	Retract (VDC+)	Retract (VDC+)	Retract (VDC+)
Blue	6	N/A	N/A	N/A

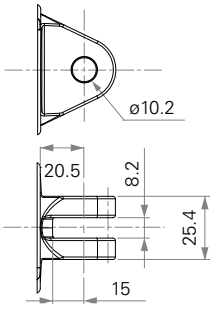
NOTE

1 See ordering key - functions for limit switches.

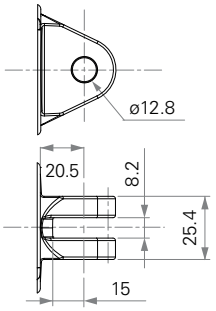
Rear Attachment
(mm)



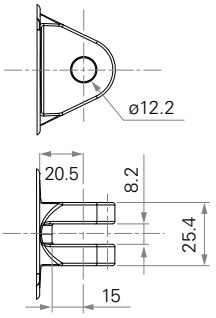
1 = Aluminum casting, clevis U, slot 8.2, depth 12.5, hole 10.2



2 = Aluminum casting, clevis U, slot 8.2, depth 15, hole 10.2

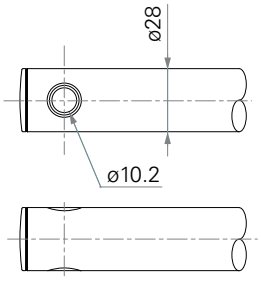


3 = Aluminum casting, clevis U, slot 8.2, depth 15, hole 12.8

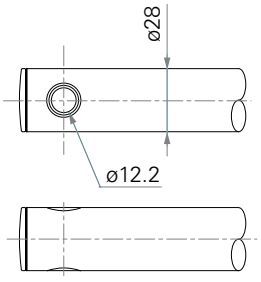


4 = Aluminum casting, clevis U, slot 8.2, depth 15, hole 12.2

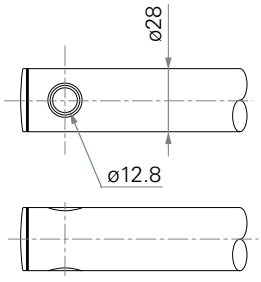
Front Attachment
(mm)



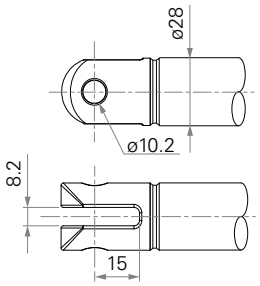
1 = Iron inner tube with punched hole, without slot, hole 10.2



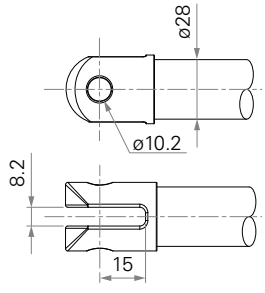
2 = Iron inner tube with punched hole, without slot, hole 12.2



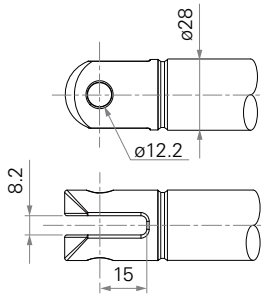
3 = Iron inner tube with punched hole, without slot, hole 12.8



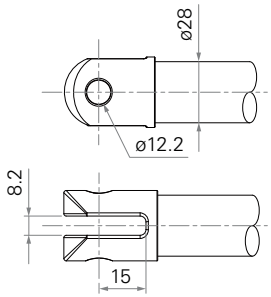
4 = Aluminum casting, clevis U, slot 8.2, depth 15, hole 10.2
(IP: IP66D, IP69K)



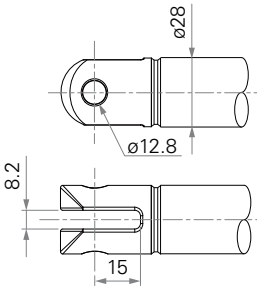
4 = Aluminum casting, clevis U, slot 8.2, depth 15, hole 10.2
(IP: Without, IP54)



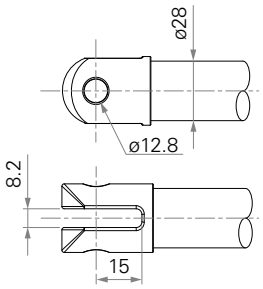
5 = Aluminum casting, clevis U, slot 8.2, depth 15, hole 12.2
(IP: IP66D, IP69K)

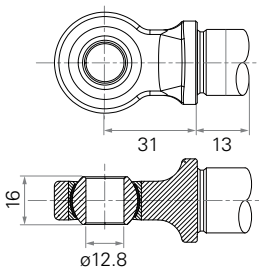


5 = Aluminum casting, clevis U, slot 8.2, depth 15, hole 12.2
(IP: Without, IP54)



6 =Aluminum casting, clevis U, slot 8.2, depth 15, hole 12.8
(IP: IP66D, IP69K)

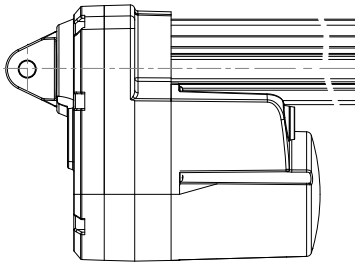




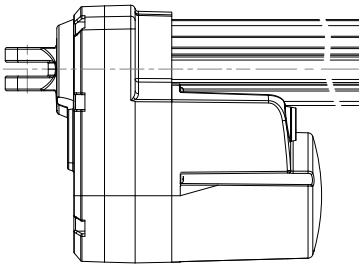
6 = Aluminum casting, clevis U, slot 8.2, depth 15, hole 12.8 (IP: Without, IP54)

K = Rod end bearing, hole 12.8

Direction of Rear Attachment
Counterclockwise

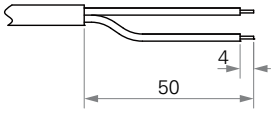


1 = 90°



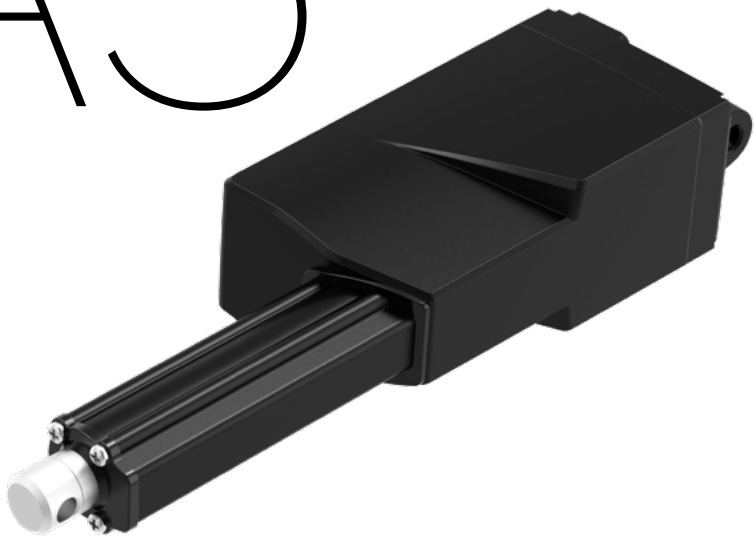
2 = 0°

Connector



2 = Tinned leads

MA5 series



TiMOTION's MA5 series linear actuator was specifically designed for applications which face harsh working environments and require ruggedness and durability. Its IP69K protection ensures it will withstand high temperature, high pressure water jets, and the ingress of dust and other solid contaminants. The MA5 can be customized with many different feedback options depending on your application requirements and can be equipped with grease nipple to increase the protection and life. Example applications suitable for the MA5: Agricultural equipment such as spreaders, harvesters, grain handlers.

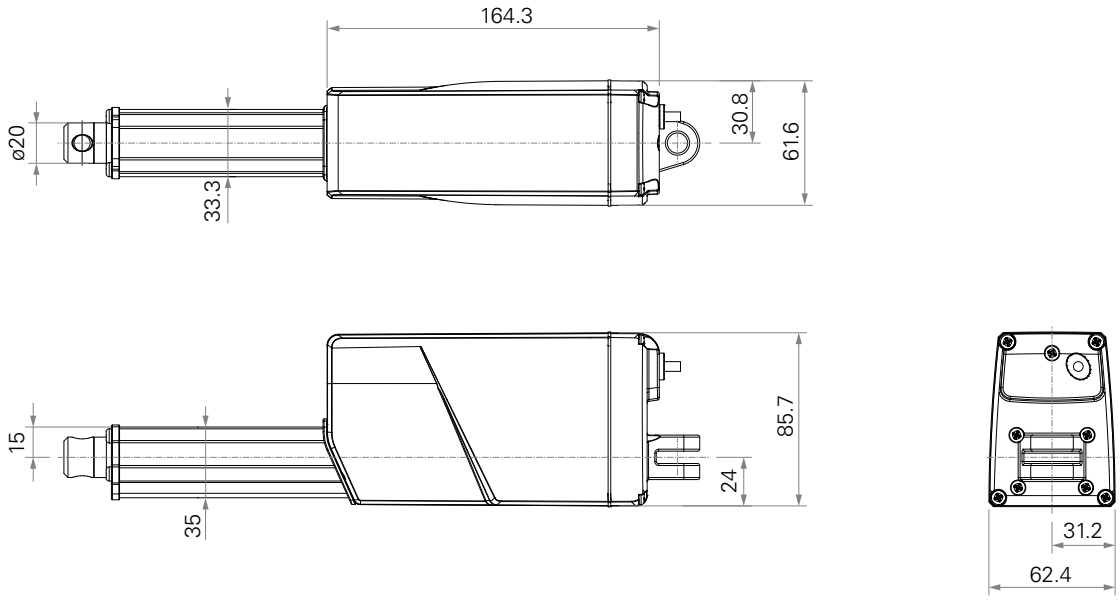
Load and Speed

	CODE	Load (N)		Self Locking Force (N)	Typical Current (A)		Typical Speed (mm/s)	
		Push	Pull		No Load 24V DC	With Load 24V DC	No Load 24V DC	With Load 24V DC
Motor Speed (5200RPM)	A	250	250	250	1.2	2.3	43.0	36.0
	B	500	500	500	1.1	2.3	25.8	23.0
	C	1000	1000	1000	1.1	2.3	14.0	11.8
	D	1500	1500	1500	1.0	2.2	9.0	8.0
	E	2000	2000	2000	1.0	2.2	7.1	6.2
	W	500	500	500	1.3	5.0	54.0	35.0
Motor Speed (6600RPM)	F	250	250	250	1.6	2.8	56.5	45.0
	G	500	500	500	1.5	2.8	32.5	28.5
	H	1000	1000	1000	1.5	2.8	16.5	14.3
	K	1500	1500	1500	1.3	2.8	11.1	10.0
	L	2000	2000	2000	1.3	2.8	8.8	7.7
Motor Speed (3800RPM)	S	3500	2000	3500	0.9	2.8	3.2	2.4
Motor Speed (2200RPM)	T	2000	2000	2000	0.3	1.2	3.2	2.4

NOTE

1 With a 12V motor, the current is approximately twice the current measured in 24V. With a 36V motor, the current is approximately two-thirds the current measured in 24V; speed will be similar for both voltages.
2 This self-locking force level is reached only when a short circuit is applied on the terminals of the motor. All the TiMotion control boxes have this feature built-in.
3 Please refer to the approved drawing for the final authentic value.

Standard Dimension (mm)



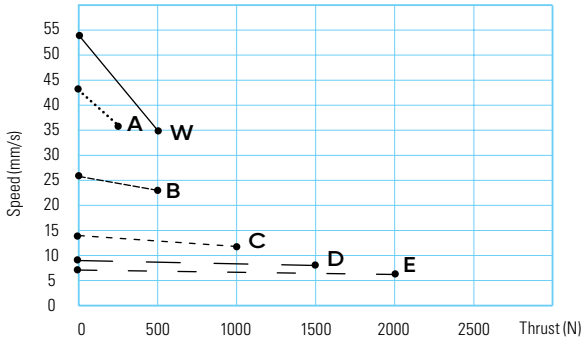
General Features

Maximum load	3,500N in push
Maximum load	2,000N in pull
Maximum speed at full load	45mm/s (with 250N in a push or pull condition)
Stroke	20~1000mm
Minimum installation dimension	≥ 238 or 250mm (upon the front attachment)
IP rating	Up to IP69K
Operational temperature range	-25˚C ~ +65˚C
Operational temperature range at full performance	+5°C~+45°C
Options	Hall sensor(s), POT, grease chamber

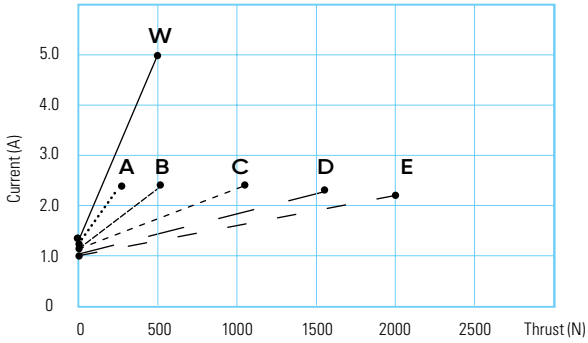
Performance Data

Motor Speed 5200RPM, Duty Cycle 25%

Speed vs. Thrust

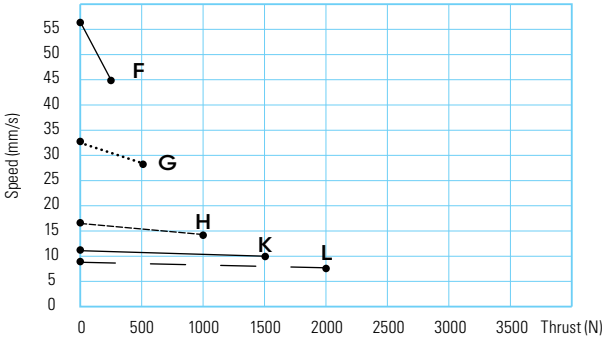


Current vs. Thrust

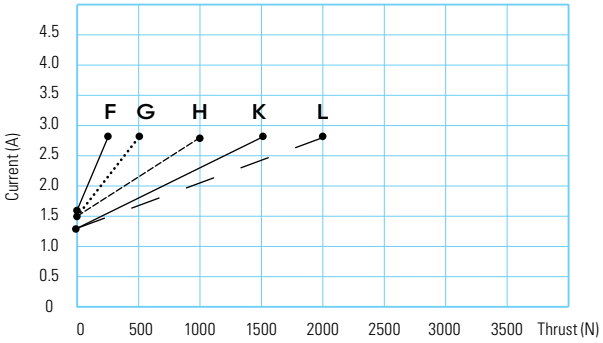


Motor Speed 6600RPM, Duty Cycle 25%

Speed vs. Thrust



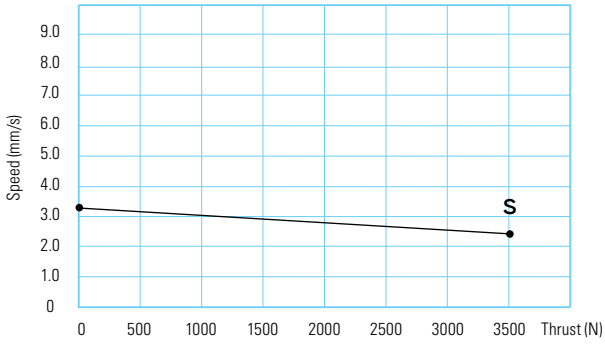
Current vs. Thrust



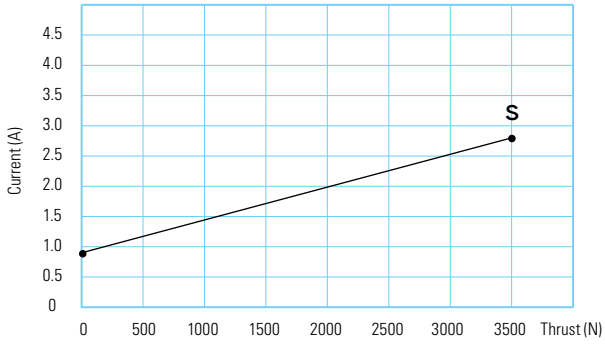
Performance Data

Motor Speed 3800RPM, Duty Cycle 25%

Speed vs. Thrust

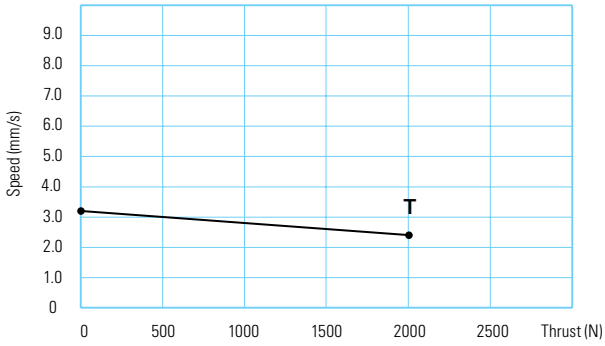


Current vs. Thrust

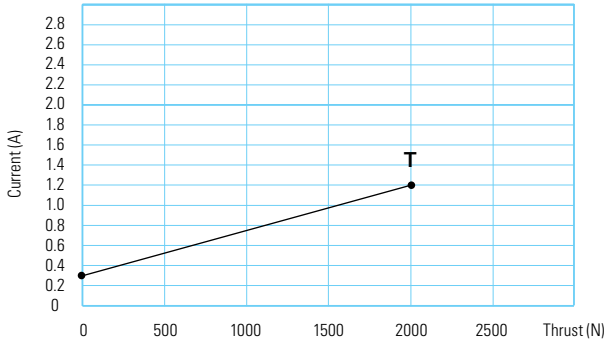


Motor Speed 2200RPM, Duty Cycle 25%

Speed vs. Thrust



Current vs. Thrust



MA5 Ordering Key

MA5

Version: 20181015-B

Voltage	1 = 12V DC 2 = 24V DC	5 = 24VDC, PTC 6 = 12VDC, PTC	
Load and Speed	See page 42		
Stroke (mm)			
Restracted Lengh (mm)	See page 47		
Rear Attachment (mm) See page 49	4 = Aluminum casting, U clevis, slot 6, width 10.5, hole 6.4, one piece casting with gear box 5 = Aluminum casting, U clevis, slot 6, width 10.5, hole 8, one piece casting with gear box 6 = Aluminum casting, U clevis, slot 6, width 10.5, hole 10.1, one piece casting with gear box		
Front Attachment (mm) See page 49	1 = Aluminum casting, hole 6.4 2 = Aluminum casting, hole 8 3 = Aluminum CNC, U clevis, slot 6, depth 16.0, hole 10 4 = Aluminum CNC, U clevis, slot 6, depth 16.0, hole 6.4 5 = Aluminum CNC, U clevis, slot 6, depth 16.0, hole 8		
Direction of Rear Attachment (Counterclockwise)	2 = 0° See page 49		
Functions for Limit Switches See page 48	1 = Two switches at full retracted / extended positions to cut current 2 = Two switches at full retracted / extended positions to cut current + third one in between to send signal 3 = Two switches at full retracted / extended positions to send signal 4 = Two switches at full retracted / extended positions to send signal + third one in between to send signal		
Output Signals See page 47	0 = Without 1 = POT	4 = Hall sensor*1 5 = Hall sensor*2	
Connector See page 49	1 = DIN 6P, 90° plug	2 = Tinned leads	
Cable Length (mm)	1 = Straight, 300	2 = Straight, 600	3 = Straight, 1000
IP Rating	6 = IP66D	9 = IP69K	
Grease Chamber	0 = Without 1 = With, grease chamber*1	2 = With, grease chamber*2	

MA5
Ordering Key Appendix

Retracted Length (mm)

1. Calculate A+B+C = Y
2. Retracted length needs to ≥ Stroke+Y
3. Front attachment #1, #2, min retracted length ≥ 238
   Front attachment #3, #4, #5, min retracted length ≥ 250

A. Front Attachment

Code	
1, 2	+112
3, 4, 5	+124

B. Stroke (mm)

	Load (N)	
	<3500	=3500
0~150	-	+5
151~200	+2	+7
201~250	+2	+7
251~300	+2	+7
301~350	+12	+17
351~400	+22	+27
401~450	+32	+37
451~500	+42	+47
501~550	+52	+57
551~600	+62	+67
601~650	+72	+77
651~700	+82	+87
701~750	+92	+97
751~800	+102	+107
801~850	+112	+117
851~900	+122	+127
901~950	+132	+137
951~1000	+142	+147

C. Output Signals

Code	
0, 4, 5	-
1	+30

D. Grease Chamber	Code	
	0	-
	1, 2	+10

Functions for Limit Switches

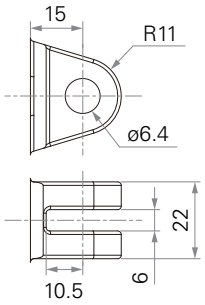
Wire Definitions

			CODE			
		Pin	**1**	**2**	**3**	**4**
	Green	1	Extend (VDC+)	Extend (VDC+)	Extend (VDC+)	Extend (VDC+)
	Red	2	N/A	N/A	Common	Common
	White	3	N/A	Middle switch pinB	Upper limit switch	Upper limit switch
	Black	4	N/A	Middle switch pinA	N/A	Medium limit switch
	Yellow	5	Retract (VDC+)	Retract (VDC+)	Retract (VDC+)	Retract (VDC+)
	Blue	6	N/A	N/A	Lower limit switch	Lower limit switch

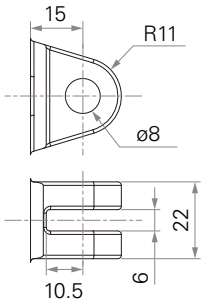
NOTE

1 See ordering key - functions for limit switches.

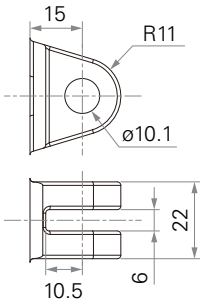
Rear Attachment
(mm)



4 = Aluminum casting, U clevis, slot 6, width 10.5, hole 6.4, one piece casting with gear box

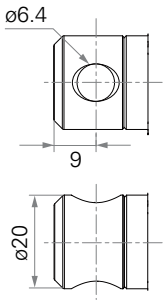


5 = Aluminum casting, U clevis, slot 6, width 10.5, hole 8, one piece casting with gear box

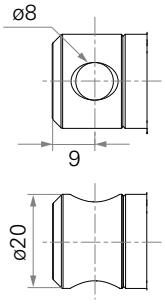


6 = Aluminum casting, U clevis, slot 6, width 10.5, hole 10.1, one piece casting with gear box

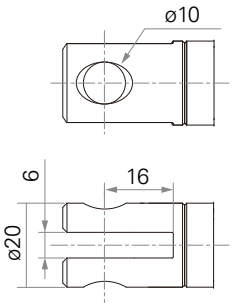
Front Attachment
(mm)



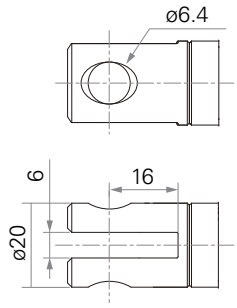
1 = Aluminum casting, hole 6.4



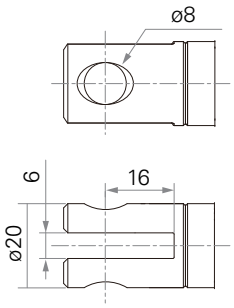
2 = Aluminum casting, hole 8



3 = Aluminum CNC, U clevis, slot 6, depth 16, hole 10

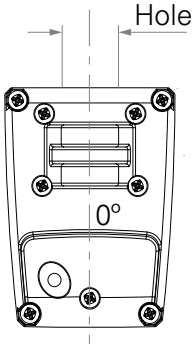


4 = Aluminum CNC, U clevis, slot 6, depth 16, hole 6.4



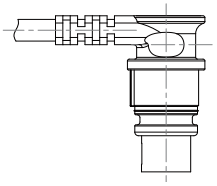
5 = Aluminum CNC, U clevis, slot 6, depth 16, hole 8

Direction of Rear Attachment
Counterclockwise

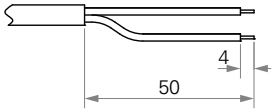


2 = 0°

Connector



1 = DIN 6P, 90° plug



2 = Tinned leads

TA2 series

TiMOTION's TA2 series linear actuator is compact, robust and capable of performing well in certain outdoor environments. This linear actuator is perfect for use in small spaces where force or capability cannot be sacrificed. Options include feedback sensors, signal sending limit switches and 90 degree clevis mounting. Industry certifications for the TA2 linear actuator include UL73, EMC.

Load and Speed

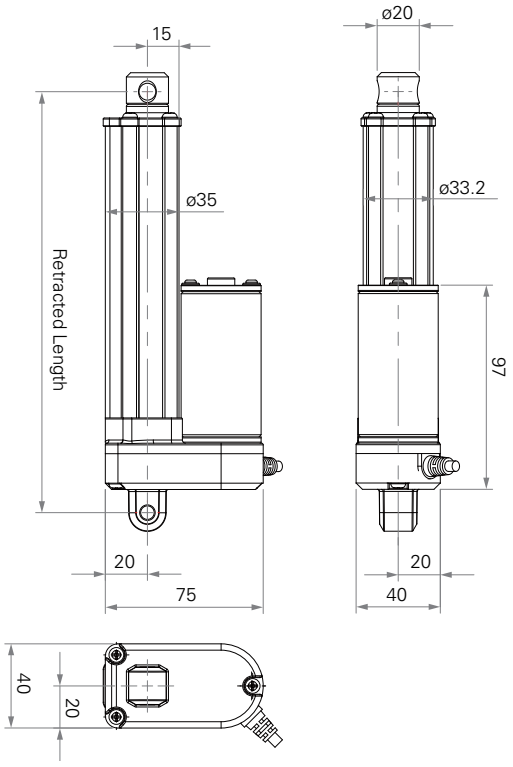
	CODE	Load (N)		Self Locking Force (N)	Typical Current (A)		Typical Speed (mm/s)	
		Push	Pull		No Load 24V DC	With Load 24V DC	No Load 24V DC	With Load 24V DC
Motor Speed (4200RPM)	A	120	120	120	0.8	1.2	44.0	32.0
	B	240	240	240	0.7	1.2	22.0	16.5
	C	500	500	500	0.6	1.0	11.0	8.5
	D	750	750	750	0.6	1.0	7.5	6.2
	E	1000	1000	1000	0.6	1.0	5.6	4.6
Motor Speed (6000RPM)	F	120	120	120	1.0	1.8	67.5	51.0
	G	240	240	240	0.9	1.8	33.5	26.5
	H	500	500	500	0.8	1.5	17.0	14.0
	K	750	750	750	0.8	1.5	11.0	10.0
	L	1000	1000	1000	0.8	1.5	9.0	7.6

NOTE

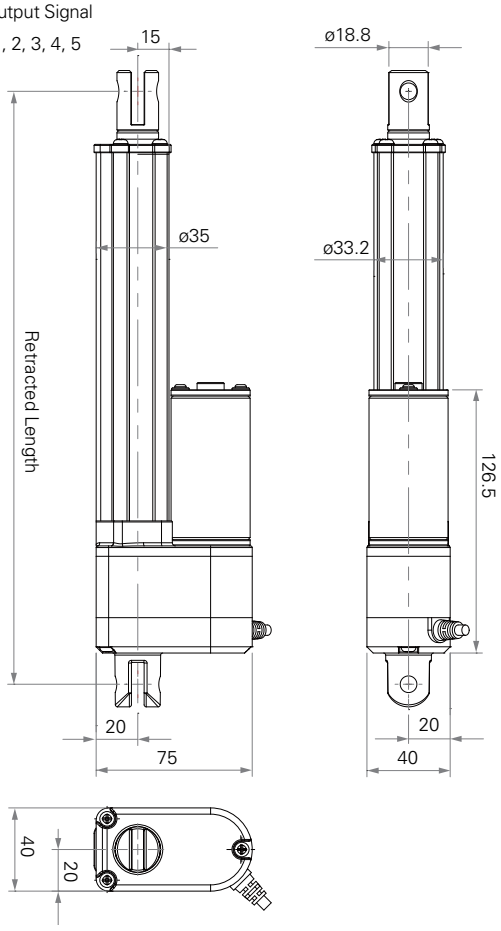
1 Motor 12V current is around 2 times in 24V; Motor 36V current is around 2/3 in 24V; Motor 48V current is around 1/2 in 24V; speed is around the same.
2 Above self lock performance needs working with Timotion control system in push direction.
3 Please refer to the approved drawing for the final authentic value.

Standard Dimension (mm)

Without Output Signal



Output Signal #1, 2, 3, 4, 5



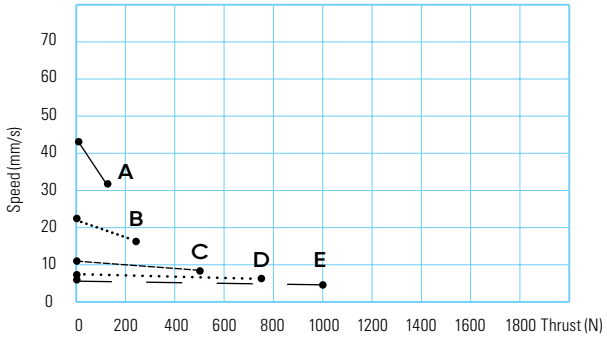
General Features

Maximum load	1,000N in push and pull
Maximum speed at full load	51mm/s (with 120N in a push or pull condition)
Stroke	20~1000mm
Minimum installation dimension	≥ Stroke + 105mm (without output signals)
Operational temperature range	Load < 500N: +5˚C~+45˚C Load ≥ 500N: -25˚C~+65˚C
Operational temperature range at full performance	+5°C~+45°C
IP rating	Up to IP66D
Options	POT, Reed, Hall sensor(s)
Compact size for limited space	

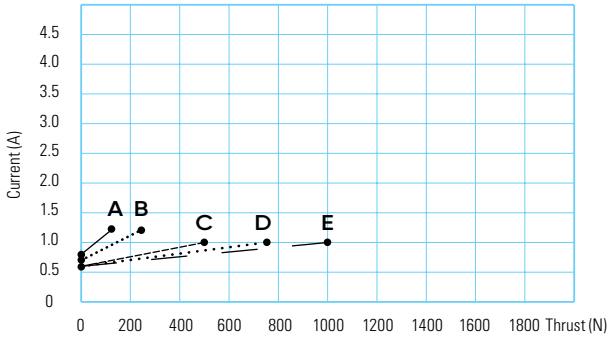
Performance Data

Motor Speed 4200RPM, Duty Cycle 25%

Speed vs. Thrust

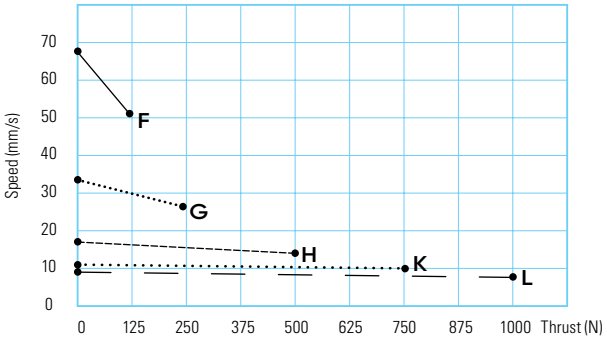


Current vs. Thrust

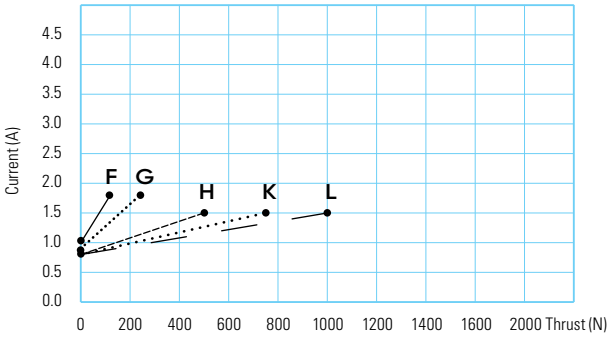


Motor Speed 6000RPM, Duty Cycle 25%

Speed vs. Thrust



Current vs. Thrust



TA2 Ordering Key

TA2

Version: 20180517-O

Voltage	1 = 12V DC 2 = 24V DC 3 = 36V DC	4 = 48V DC 5 = 24V DC, PTC 6 = 12V DC, PTC	7 = 36V DC, PTC 8 = 48V DC, PTC
Load and Speed	See page 50		
Stroke (mm)			
Restracted Lengh (mm)	See page 54		
Rear Attachment (mm) See page 56	1 = Aluminum casting, without slot, hole 6.4, one piece casting with gear box 2 = Aluminum casting, without slot, hole 8, one piece casting with gear box 3 = Aluminum casting, without slot, hole 10, one piece casting with gear box 4 = Aluminum casting, clevis U, slot 6, depth 10.5, hole 6.4, one piece casting with gear box 5 = Aluminum casting, clevis U, slot 6, depth 10.5, hole 8, one piece casting with gear box 6 = Aluminum casting, clevis U, slot 6, depth 10.5, hole 10, one piece casting with gear box		
Front Attachment (mm) See page 56	1 = Aluminum casting, without slot, hole 6.4 2 = Aluminum casting, without slot, hole 8 3 = Aluminum CNC, U clevis, slot 6, depth 16, hole 10 4 = Aluminum CNC, U clevis, slot 6, depth 16, hole 6.4 5 = Aluminum CNC, U clevis, slot 6, depth 16, hole 8 6 = Aluminum casting, hole 10		
Direction of Rear Attachment (Counterclockwise)	1 = 90° See page 57	2 = 0°	
Functions for Limit Switches See page 55	1 = Two switches at full retracted / extended positions to cut current 2 = Two switches at full retracted / extended positions to cut current + 3rd one in between to send signal 3 = Two switches at full retracted / extended positions to send signal 4 = Two switches at full retracted / extended positions to send signal + 3rd one in between to send signal		
Output Signals	0 = Without 1 = POT	3 = Reed sensor 4 = Hall sensor*1	5 = Hall sensor*2
Connector See page 57	1 = DIN 6P, 90° plug	2 = Tinned leads	
Cable Length (mm)	1 = Straight, 300 2 = Straight, 600	3 = Straight, 1000 B~H = For direct cut system, please contact TiMOTION before making an order	
IP Rating	1 = Without 2 = IP54	3 = IP66 6 = IP66D	

TA2
Ordering Key Appendix

Retracted Length (mm)

1. Calculate A+B+C = Y
2. Retracted length needs to ≥ Stroke+Y

A. Attachment	Front Attachment Code	Rear Attachment Code	
		1,2,3	4,5,6
	1, 2, 6	+105	+109
	3, 4, 5	+115	+119

B. Stroke (mm)				
	20~150	-	551~600	+62
	151~200	+2	601~650	+72
	201~250	+2	651~700	+82
	251~300	+2	701~750	+92
	301~350	+12	751~800	+102
	351~400	+22	801~850	+112
	401~450	+32	851~900	+122
	451~500	+42	901~950	+132
	501~550	+52	951~1000	+142

C. Output Signals	Code	
	0	-
	1, 3, 4, 5	+30

Functions for Limit Switches

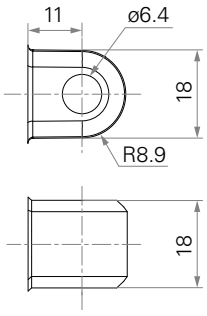
Wire Definitions

		CODE			
	Pin	1	2	3	4
Green	1	Extend (VDC+)	Extend (VDC+)	Extend (VDC+)	Extend (VDC+)
Red	2	N/A	N/A	Common	Common
White	3	N/A	Middle switch pinB	Upper limit switch	Upper limit switch
Black	4	N/A	Middle switch pinA	N/A	Medium limit switch
Yellow	5	Retract (VDC+)	Retract (VDC+)	Retract (VDC+)	Retract (VDC+)
Blue	6	N/A	N/A	Lower limit switch	Lower limit switch

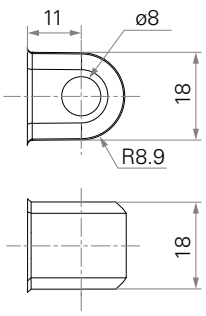
NOTE

1 See ordering key - functions for limit switches.

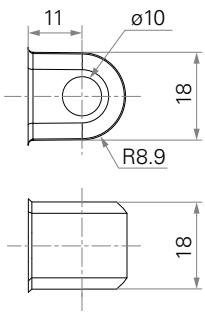
Rear Attachment (Below is the illustration of 90° rear attachment) (mm)



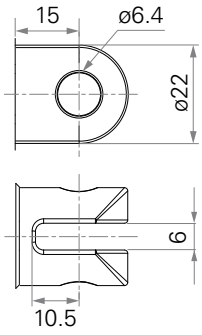
1 = Aluminum casting, without slot, hole 6.4, one piece casting with gear box



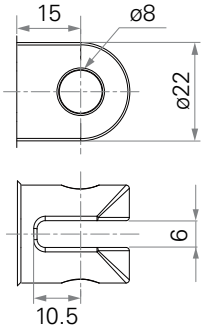
2 = Aluminum casting, without slot, hole 8, one piece casting with gear box



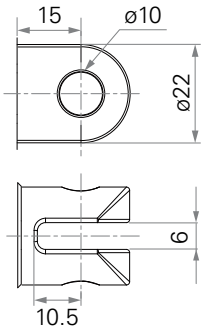
3 = Aluminum casting, without slot, hole 10, one piece casting with gear box



4 = Aluminum casting, clevis U, slot 6, depth 10.5, hole 6.4, one piece casting with gear box

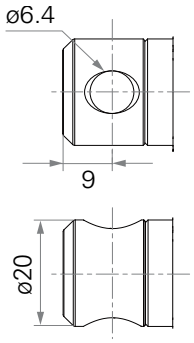


5 = Aluminum casting, clevis U, slot 6, depth 10.5, hole 8, one piece casting with gear box

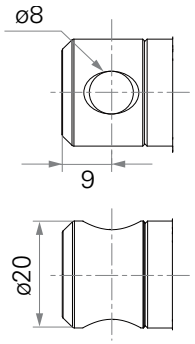


6 = Aluminum casting, clevis U, slot 6, depth 10.5, hole 10, one piece casting with gear box

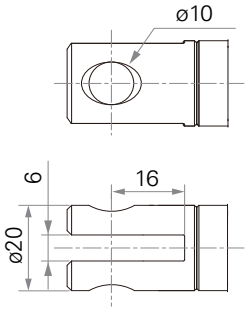
Front Attachment (mm)



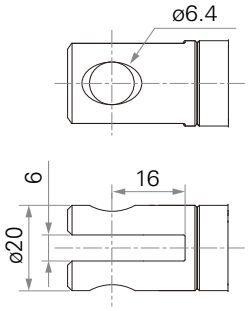
1 = Aluminum casting, without slot, hole 6.4



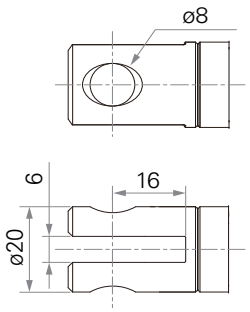
2 = Aluminum casting, without slot, hole 8



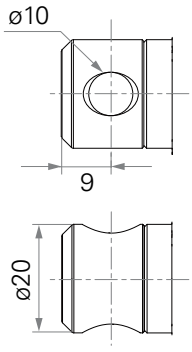
3 = Aluminum CNC, U clevis, slot 6, depth 16.0, hole 10



4 = Aluminum CNC, U clevis, slot 6, depth 16, hole 6.4

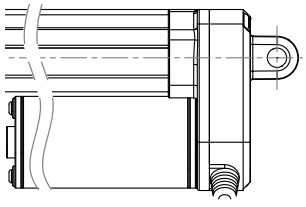


5 = Aluminum CNC, U clevis, slot 6, depth 16, hole 8

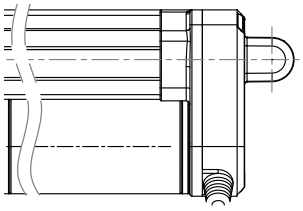


6 = Aluminum casting, without slot, hole 10

Direction of Rear Attachment
Counterclockwise

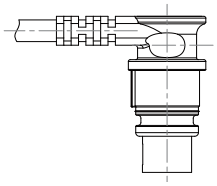


1 = 90°

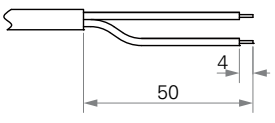


2 = 0°

Connector



1 = DIN 6P, 90° plug



2 = Tinned leads

TA2P series

Both the TA2 and the TA2P are compact, robust, and capable of performing well in certain outdoor environments. A more powerful motor makes the TA2P capable of handling load ratings up to 3500N (787 pounds) while retaining its compact size. In addition to the high power motor, the TA2P linear actuator is available with multiple choices for feedback sensors. Industry certification for the TA2P linear actuator includes UL73.

Load and Speed

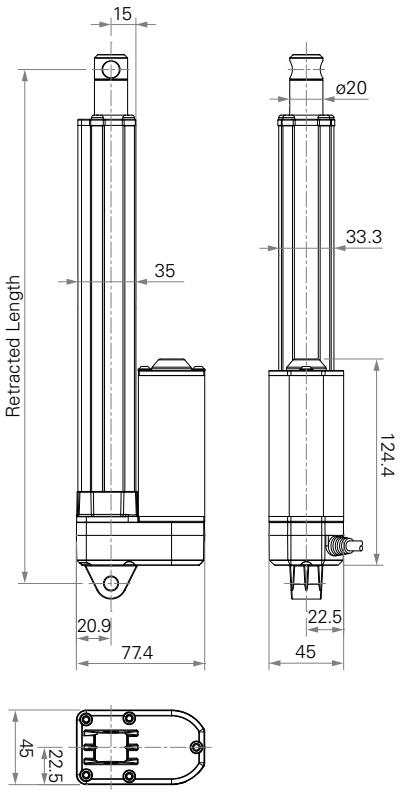
	CODE	Load (N)		Self Locking Force (N)	Typical Current (A)		Typical Speed (mm/s)	
		Push	Pull		No Load 24V DC	With Load 24V DC	No Load 24V DC	With Load 24V DC
Motor Speed (5200RPM)	A	250	250	250	1.2	2.3	43.0	36.0
	B	500	500	500	1.1	2.3	25.8	23.0
	C	1000	1000	1000	1.1	2.3	14.0	11.8
	D	1500	1500	1500	1.0	2.2	9.0	8.0
	E	2000	2000	2000	1.0	2.2	7.1	6.2
Motor Speed (6600RPM)	F	250	250	250	1.6	2.8	56.5	45.0
	G	500	500	500	1.5	2.8	32.5	28.5
	H	1000	1000	1000	1.5	2.8	16.5	14.3
	K	1500	1500	1500	1.3	2.8	11.1	10.0
	L	2000	2000	2000	1.3	2.8	8.8	7.7
Motor Speed (3800RPM)	S	3500	2000	3500	0.9	2.8	3.2	2.4
Motor Speed (2200RPM)	T	2000	2000	2000	0.3	1.2	3.2	2.4

NOTE

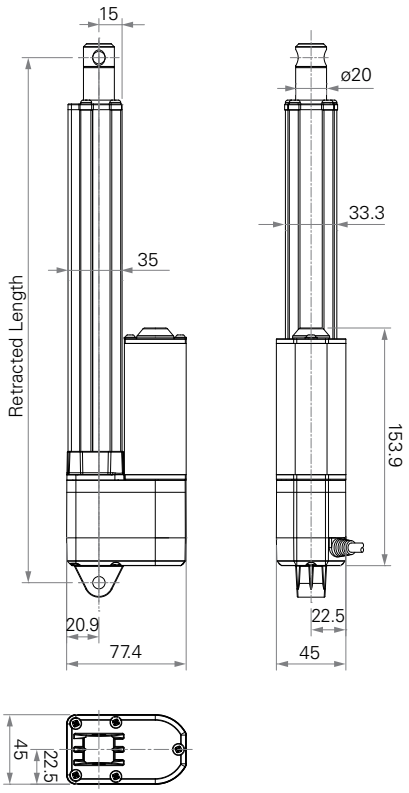
1 Motor 12V current is around 2 times in 24V; Motor 36V current is around 2/3 in 24V; Motor 48V current is around 1/2 in 24V; speed is around the same.
2 Above self lock performance needs working with Timotion control system in push direction.
3 Please refer to the approved drawing for the final authentic value.

Standard Dimension (mm)

Without
Output Signal



Output Signal
#1, 2, 3, 4, 5



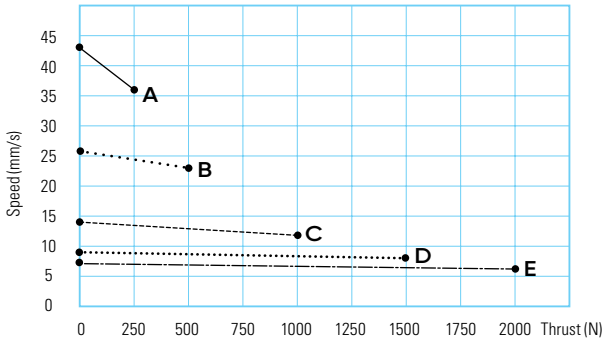
General Features

Maximum load	3,500N in push
Maximum load	2,000N in pull
Maximum speed at full load	45mm/s (with 250N in a push or pull condition)
Stroke	20~1000mm
Minimum installation dimension	≥ Stroke + 108mm (with Hall sensor(s) or without output signals)
IP rating	Up to IP66D
Operational temperature range	-25˚C ~ +65˚C
Operational temperature range at full performance	+5˚C ~ +45˚C
Options	POT, Optical, or Hall / Reed sensor(s)

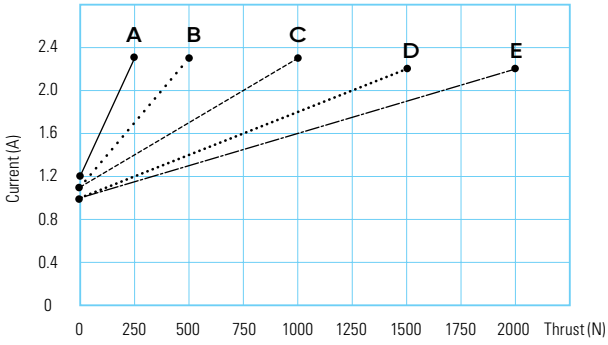
Performance Data

Motor Speed 5200RPM, Duty Cycle 25%

Speed vs. Thrust

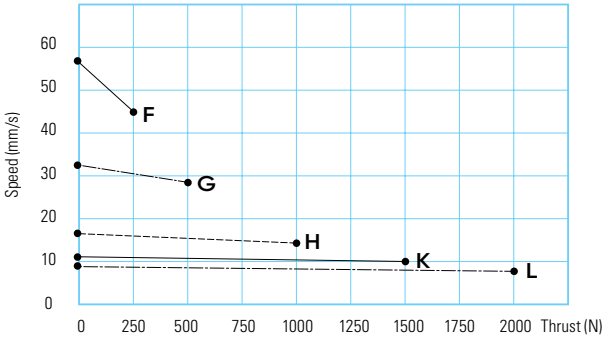


Current vs. Thrust

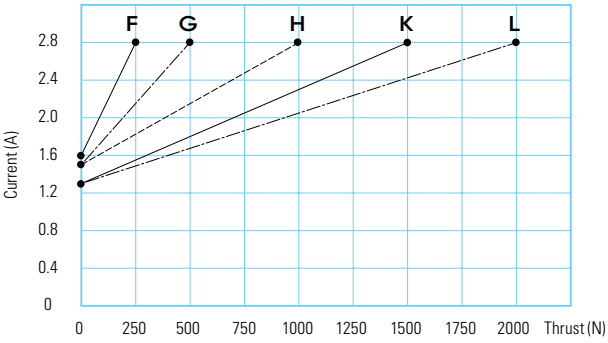


Motor Speed 6600RPM, Duty Cycle 25%

Speed vs. Thrust



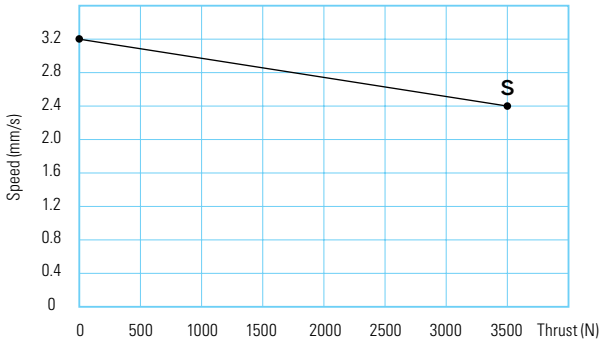
Current vs. Thrust



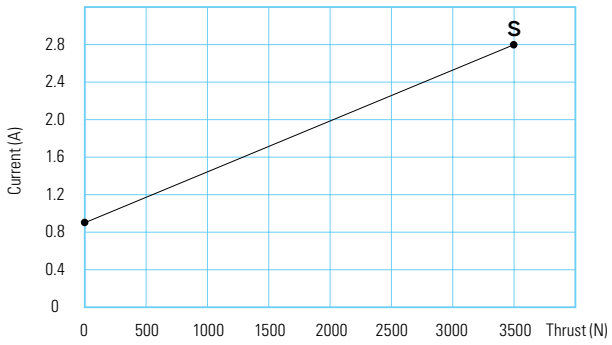
Performance Data

Motor Speed 3800RPM, Duty Cycle 25%

Speed vs. Thrust

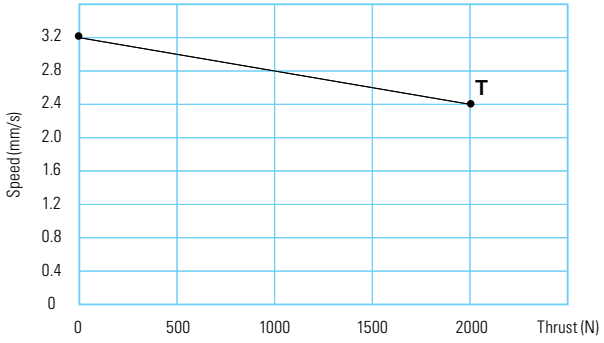


Current vs. Thrust

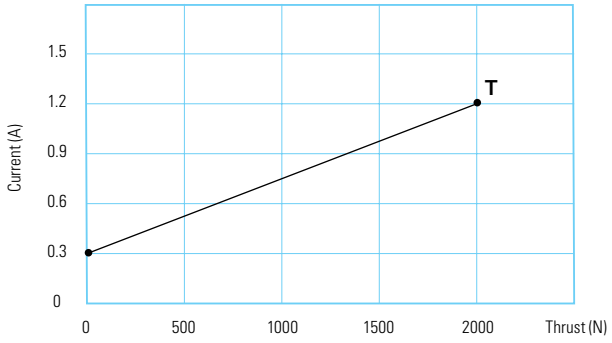


Motor Speed 2200RPM, Duty Cycle 25%

Speed vs. Thrust



Current vs. Thrust



TA2P Ordering Key

TA2P

Version: 20171127-M

Voltage	1 = 12V DC 2 = 24V DC	3 = 36V DC 5 = 24V DC, PTC	6 = 12V DC, PTC
Load and Speed	See page 58		
Stroke (mm)			
Restracted Lengh (mm)	See page 63		
Rear Attachment (mm) See page 65	1 = Aluminum casting, hole 6.4, one piece casting with gear box 2 = Aluminum casting, hole 8, one piece casting with gear box 3 = Aluminum casting, hole 10, one piece casting with gear box 4 = Aluminum casting, U clevis, slot 6, depth 10.5, hole 6.4, one piece casting with gear box 5 = Aluminum casting, U clevis, slot 6, depth 10.5, hole 8, one piece casting with gear box 6 = Aluminum casting, U clevis, slot 6, depth 10.5, hole 10, one piece casting with gear box		
Front Attachment (mm) See page 65	1 = Aluminum casting, no slot, hole 6.4 2 = Aluminum casting, no slot, hole 8 3 = Aluminum CNC, U clevis, slot 6, depth 16, hole 10 4 = Aluminum CNC, U clevis, slot 6, depth 16, hole 6.4 5 = Aluminum CNC, U clevis, slot 6, depth 16, hole 8		
Direction of Rear Attachment (Counterclockwise) See page 66	1 = 90°	2 = 0°	
Functions for Limit Switches See page 64	1 = Two switches at full retracted / extended positions to cut current 2 = Two switches at full retracted / extended positions to cut current+3rd one in between to send signal 3 = Two switches at full retracted / extended positions to send signal 4 = Two switches at full retracted / extended positions to send signal+3rd one in between to send signal		
Output Signals See page 63	0 = Without 1 = POT	2 = Optical 3 = Reed sensor	4 = Hall sensor*1 5 = Hall sensor*2
Connector See page 66	1 = DIN 6P, 90° plug	2 = Tinned leads	
Cable Length (mm)	1 = Straight, 300 2 = Straight, 600	3 = Straight, 1000 B~H = For direct cut system, please contact TiMOTION before making an order	
IP Rating	1 = Without 2 = IP54	3 = IP66 6 = IP66D	

TA2P
Ordering Key Appendix

Retracted Length (mm)

1. Calculate A+B+C = Y
2. Retracted length needs to ≥ Stroke+Y

A. Attachment

Front Attachment Code	Rear Attachment Code	
	1,2,3	4,5,6
1, 2	+108	+112
3, 4, 5	+120	+124

B. Stroke (mm)

	Load (N)	Load (N)
	<3500	=3500
0~150	-	+5
151~200	+2	+7
201~250	+2	+7
251~300	+2	+7
301~350	+12	+17
351~400	+22	+27
401~450	+32	+37
451~500	+42	+47
501~550	+52	+57
551~600	+62	+67
601~650	+72	+77
651~700	+82	+87
701~750	+92	+97
751~800	+102	+107
801~850	+112	+117
851~900	+122	+127
901~950	+132	+137
951~1000	+142	+147

C. Output Signals

Code	
0, 4, 5	-
1, 2, 3	+30

Functions for Limit Switches

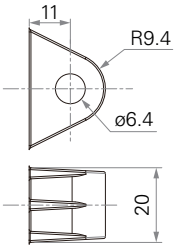
Wire Definitions

		CODE			
	Pin	**1**	**2**	**3**	**4**
Green	1	Extend (VDC+)	Extend (VDC+)	Extend (VDC+)	Extend (VDC+)
Red	2	N/A	N/A	Common	Common
White	3	N/A	Middle switch pinB	Upper limit switch	Upper limit switch
Black	4	N/A	Middle switch pinA	N/A	Medium limit switch
Yellow	5	Retract (VDC+)	Retract (VDC+)	Retract (VDC+)	Retract (VDC+)
Blue	6	N/A	N/A	Lower limit switch	Lower limit switch

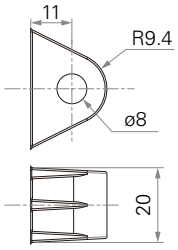
NOTE

1 See ordering key - functions for limit switches.

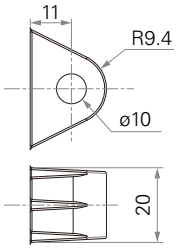
Rear Attachment
(mm)



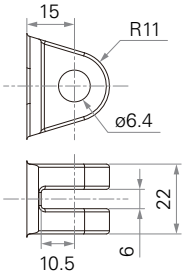
1 = Aluminum casting, hole 6.4, one piece casting with gear box



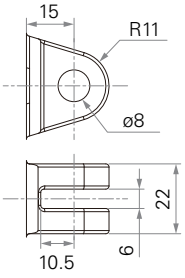
2 = luminum casting, hole 8, one piece casting with gear box



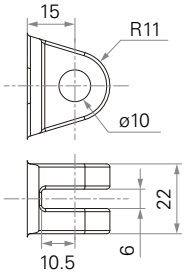
3 = Aluminum casting, hole 10, one piece casting with gear box



4 = Aluminum casting, clevis U, slot 6, depth 10.5, hole 6.4, one piece casting with gear box

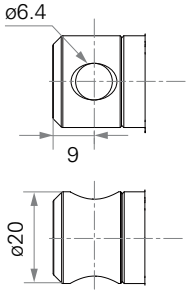


5 = Aluminum casting, clevis U, slot 6, depth 10.5, hole 8, one piece casting with gear box

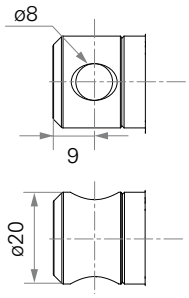


6 = Aluminum casting, clevis U, slot 6, depth 10.5, hole 10, one piece casting with gear box

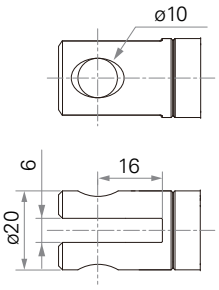
Front Attachment
(mm)



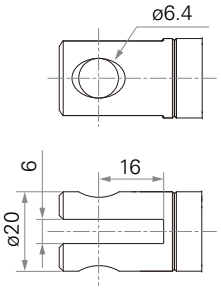
1 = Aluminum casting, no slot, hole 6.4



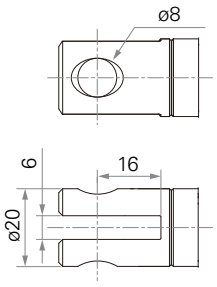
2 =Aluminum casting, no slot, hole 8



3 = Aluminum CNC, U clevis, slot 6, depth 16, hole 10

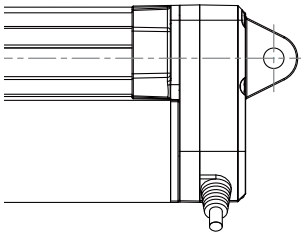


4 = Aluminum CNC, U clevis, slot 6, depth 16, hole 6.4

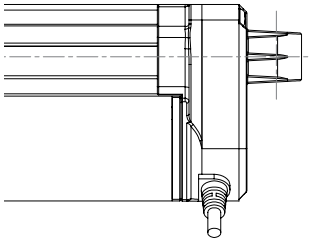


5 = Aluminum CNC, U clevis,
slot 6, depth 16, hole 8

Direction of Rear Attachment
Counterclockwise

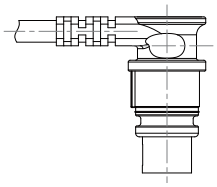


1 = 90°

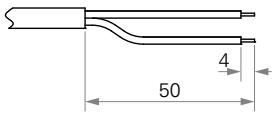


2 = 0°

Connector



1 = DIN 6P, 90° plug



2 = Tinned leads

TA16 series

TiMOTION's TA16 series linear actuator is similar to the TA2 linear actuator, but is specifically designed for low-noise industrial applications where a compact linear actuator is needed. It is available with optional IP66 protection and Hall sensors for position feedback.

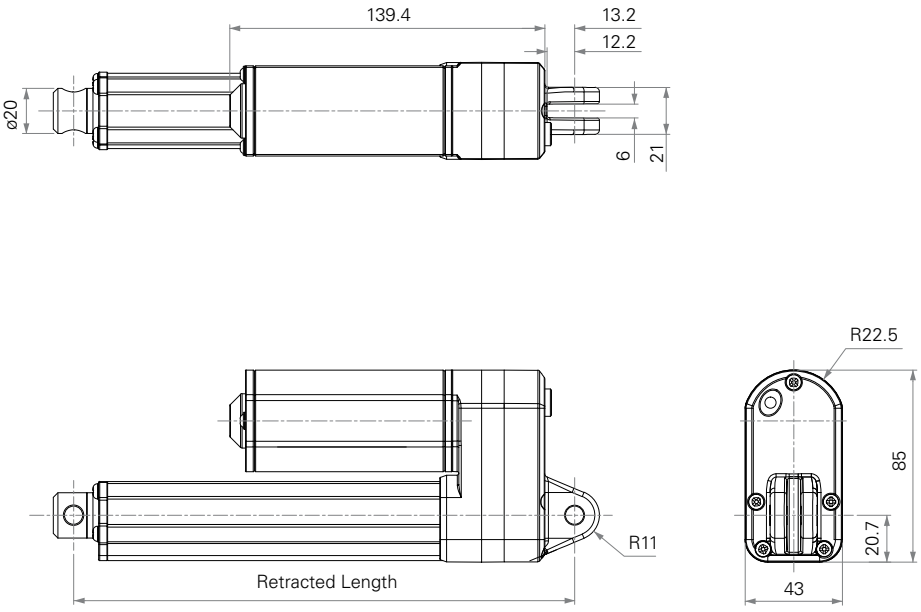
Load and Speed

	CODE	Load (N)		Self Locking Force (N)	Typical Current (A)		Typical Speed (mm/s)	
		Push	Pull		No Load 24V DC	With Load 24V DC	No Load 24V DC	With Load 24V DC
Motor Speed (3800RPM)	A	2500	2500	2500	1.2	2.8	5.2	3.0
	B	2000	2000	2000	1.2	2.8	8.3	4.7
	C	1500	1500	1500	1.2	2.8	11.9	7.0
	D	1000	1000	1000	1.2	2.8	17.7	10.3
Motor Speed (5600RPM)	G	3500	3500	3500	1.5	4.7	12.0	6.5
	J	2000	2000	2000	1.5	3.2	17.0	10.5
	K	1500	1500	1500	1.5	3.5	23.5	13.5

NOTE

1. With a 12V motor, the current is approximately twice the current measured in 24V; speed will be similar for both voltages.
2. This self-locking force level is reached only when a short circuit is applied on the terminals of the motor. All the TiMOTION control boxes have this feature built-in.
3. Current and speed: Tested average value when extending in push direction.
4. Please refer to the approved drawing for the final authentic value.

Standard Dimension (mm)



General Features

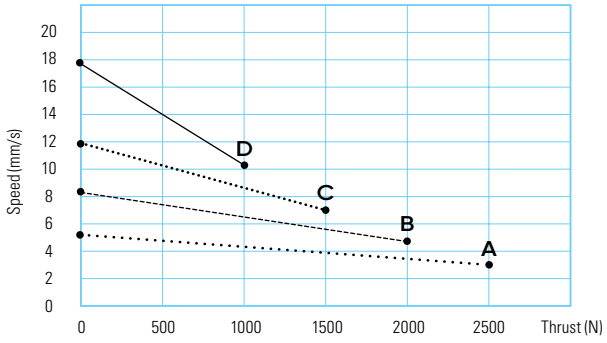
Maximum load	3,500N in push and pull
Maximum speed at full load	13.5 mm/s (with 1500N in a push or pull condition)
Stroke	20~600mm
Minimum installation dimension	≥ Stroke + 112mm
IP rating	Up to IP66
Operational temperature range	+5°C~+45°C
Options	POT, Hall sensor(s)

With very low noise, small size for easy installation

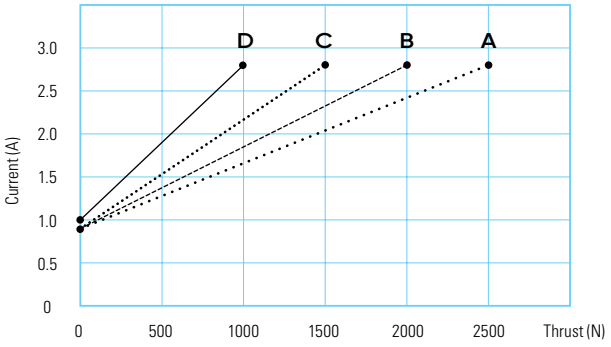
Performance Data

Motor Speed 3800RPM, Duty Cycle 10%

Speed vs. Thrust

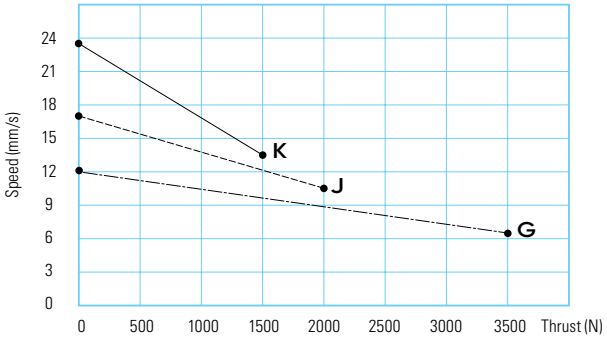


Current vs. Thrust

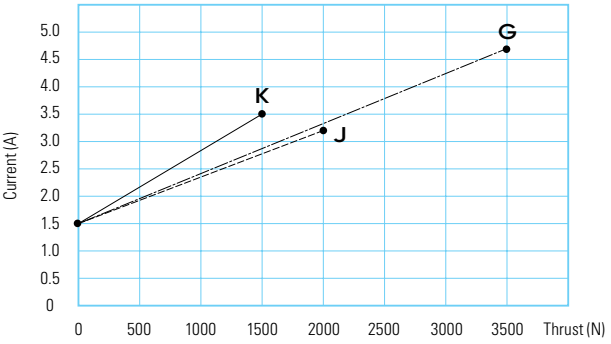


Motor Speed 5600RPM, Duty Cycle 10%

Speed vs. Thrust



Current vs. Thrust



TA16 Ordering Key

TA16

Version: 20181219-J

Voltage	1 = 12V DC 2 = 24V DC	3 = 36V DC 4 = 48V DC	
Load and Speed	See page 67		
Stroke (mm)			
Restracted Lengh (mm)	See page 71		
Rear Attachment (mm) See page 73	1 = Aluminum casting, U clevis, width 6, depth 12.2, hole 6.4, one piece casting with gear box 2 = Aluminum casting, U clevis, width 6, depth 12.2, hole 8, one piece casting with gear box 3 = Aluminum casting, U clevis, width 6, depth 12.2, hole 10, one piece casting with gear box		
Front Attachment (mm) See page 73	1 = Aluminum casting, no slot, hole 6.4 2 = Aluminum casting, no slot, hole 8 3 = Aluminum casting, no slot, hole 10 4 = Aluminum casting, U clevis, width 6, depth 13, hole 6.4 5 = Aluminum casting, U clevis, width 6, depth 13, hole 8 6 = Aluminum casting, U clevis, width 6, depth 13, hole 10		
Direction of Rear Attachment (Counterclockwise)	1 = 90° See page 74	2 = 0°	
IP Rating	1 = Without	2 = IP54	3 = IP66
Functions for Limit Switches See page 72	1 = Two switches at full retracted/extended positions to cut current 2 = Two switches at full retracted/extended positions to cut current + 3rd LS to send signal 3 = Two switches at full retracted/extended positions to send signal 4 = Two switches at full retracted/extended positions to send signal + 3rd LS to send signal		
Special Functions for Spindle Sub-Assembly	0 = Without (Standard) 1 = Safety nut	2 = Standard push only 3 = Standard push only + safety nut	
Output Signals See page 71	0 = Without 1 = POT	4 = Hall sensor*1 5 = Hall sensor*2	
Connector See page 74	1 = DIN 6P, 90° plug 2 = Tinned leads 4 = Big 01P, plug	C = Y cable (For direct cut system, water proof, anti pull)	E = Molex 8P, plug F = DIN 6P, 180° plug G = Audio plug
Cable Length (mm)	0 = Straight, 100 1 = Straight, 500 2 = Straight, 750 3 = Straight, 1000	4 = Straight, 1250 5 = Straight, 1500 6 = Straight, 200 7 = Curly, 20	8 = Curly, 400 B~H = For direct cut system, please contact TiMOTION before making an order

TA16
Ordering Key Appendix

Retracted Length (mm)

1. Calculate A+B+C+D = Y
2. Retracted length needs to ≥ Stroke+Y

A. Attachment	Front Attachment Code	Rear Attachment Code
		1, 2, 3
	1, 2, 3	+112
	4, 5, 6	+122

B. Stroke (mm)	Load (N)	
	<3500	=3500
~150	-	+13
151~200	+8	+21
201~250	+8	+21
251~300	+13	+26
301~350	+13	+26
351~400	+18	+31
401~450	+23	+36
451~500	+28	+41
501~550	+33	+46
551~600	+38	+51

C. Spindle Functions	Load (N)		
	A, B	G	C, D, J, K
0	-	-	-
1	+10	+5	+10
2	+2	+2	+2
3	+12	+7	+12

D. Output Signals	CODE	
	0, 4, 5	-
	1	+36

Functions for Limit Switches

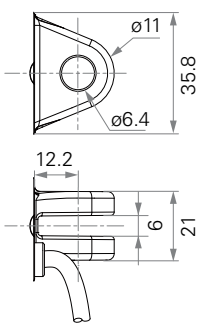
Wire Definitions

		CODE			
	Pin	**1**	**2**	**3**	**4**
Green	1	Extend (VDC+)	Extend (VDC+)	Extend (VDC+)	Extend (VDC+)
Red	2	N/A	N/A	Common	Common
White	3	N/A	Middle switch pinB	Upper limit switch	Upper limit switch
Black	4	N/A	Middle switch pinA	N/A	Medium limit switch
Yellow	5	Retract (VDC+)	Retract (VDC+)	Retract (VDC+)	Retract (VDC+)
Blue	6	N/A	N/A	Lower limit switch	Lower limit switch

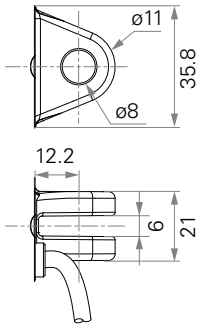
NOTE

1 See ordering key - functions for limit switches.

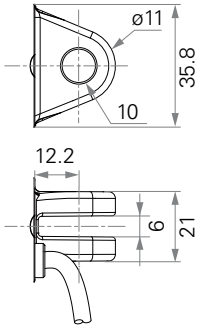
Rear Attachment
(mm)



1 = Aluminum casting, U clevis, width 6, depth 12.2, hole 6.4, one piece casting with gear box

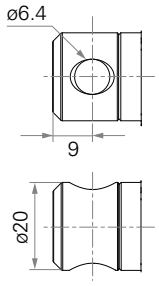


2 = Aluminum casting, U clevis, width 6, depth 12.2, hole 8, one piece casting with gear box

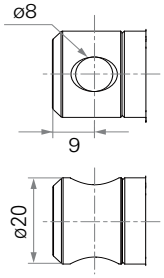


3 = Aluminum casting, U clevis, width 6, depth 12.2, hole 10, one piece casting with gear box

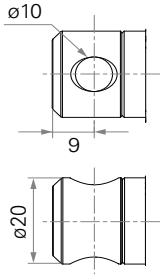
Front Attachment
(mm)



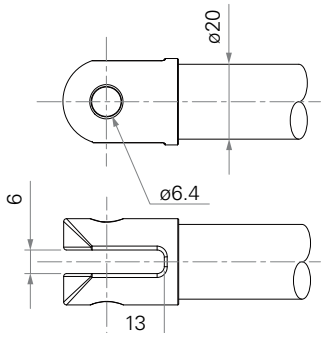
1 = Aluminum casting, no slot, hole 6.4



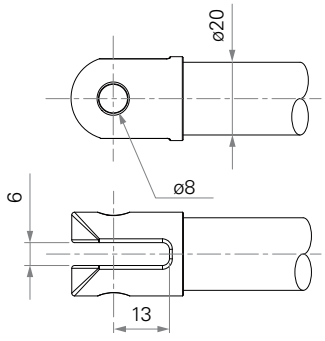
2 = Aluminum casting, no slot, hole 8



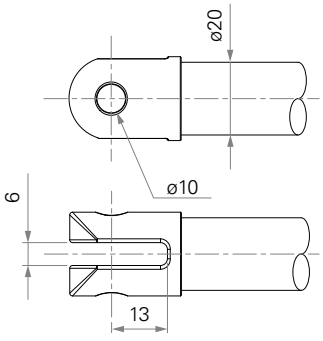
3 = Aluminum casting, no slot, hole 10



4 = Aluminum casting, U clevis, width 6, depth 13, hole 6.4

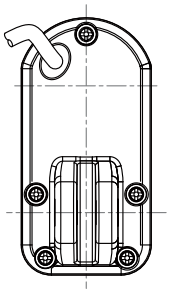


5 = Aluminum casting, U clevis, width 6, depth 13, hole 8

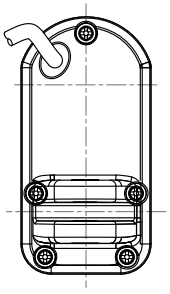


6 = Aluminum casting, U clevis, width 6, depth 13, hole 10

Direction of Rear Attachment
Counterclockwise

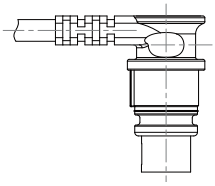


1 = 90°

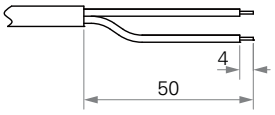


2 = 0°

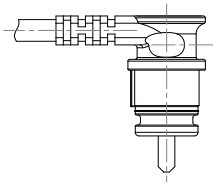
Connector



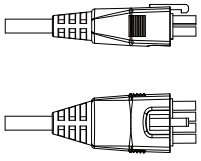
1 = DIN 6P, 90° plug



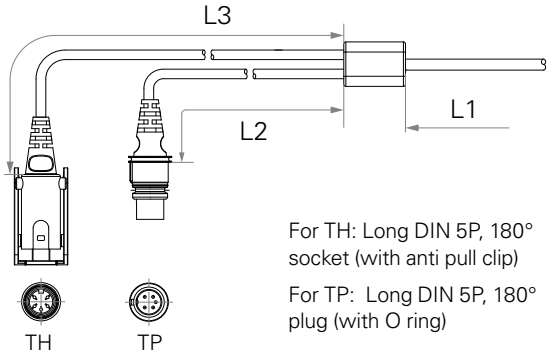
2 = Tinned leads



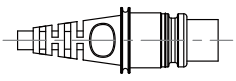
4 = Big 01P, plug



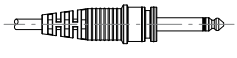
E = Molex 8P, plug



C = Y cable, for direct cut system



F = DIN 6P, 180° plug



G = Audio plug

TA21 series

TiMOTION's TA21 electric linear actuator was designed for use in height adjustable industrial workstations. Customers have a high degree of design flexibility with this actuator as it does not include a standard outer tube. This allows manufacturers to decide on the exact aesthetic and ingress specifications for their electric lifting column and overall application.

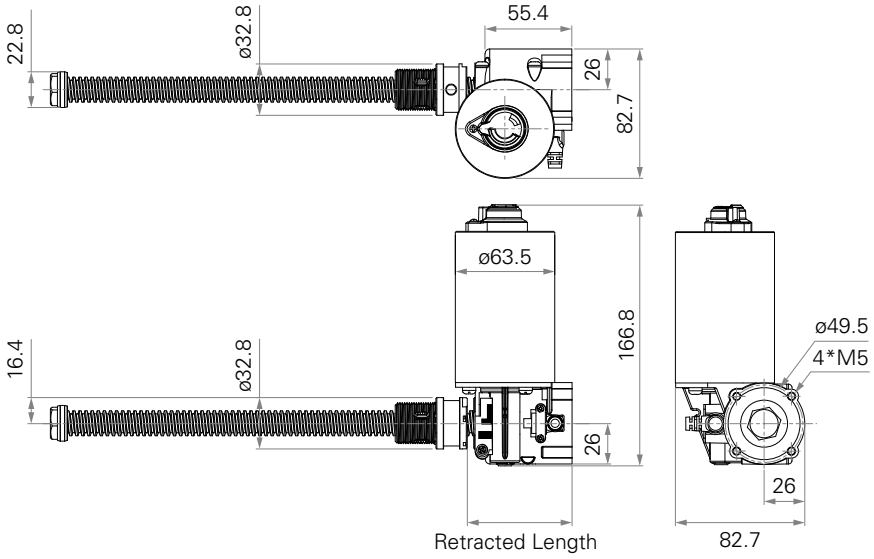
Load and Speed

	CODE	Load (N)		Self Locking Force (N)	Typical Current (A)		Typical Speed (mm/s)	
		Push	Pull		No Load 24V DC	With Load 24V DC	No Load 24V DC	With Load 24V DC
Motor Speed (3800RPM)	A	10000	6000	10000	2.0	15.0	12.1	6.3
	C	7000	6000	6000	2.0	9.0	12.3	8.3
	D	4000	4000	3000	2.0	9.5	24.7	16.2

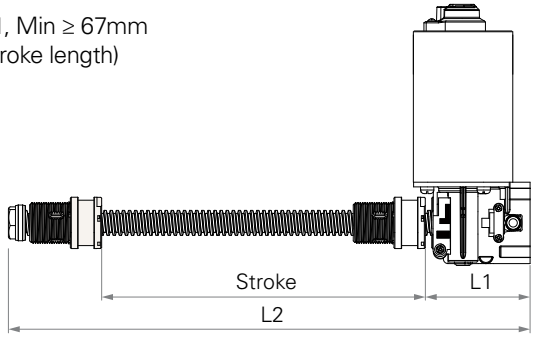
NOTE

1 This self-locking force level is reached only when a short circuit is applied on the terminals of the motor. All the TiMOTION control boxes have this feature built-in.
2 Operational temperature range: +5°C~+45°C.
3 The current & speed in table and diagram are tested with TiMOTION control boxes, and there will be around 10% tolerance depending on different models of the control box. (Under no load condition, the voltage is around 32V DC. At rated load, the voltage output will be around 24V DC)

Standard Dimension (mm)



Retracted length L1, Min ≥ 67mm
(NO need to add stroke length)



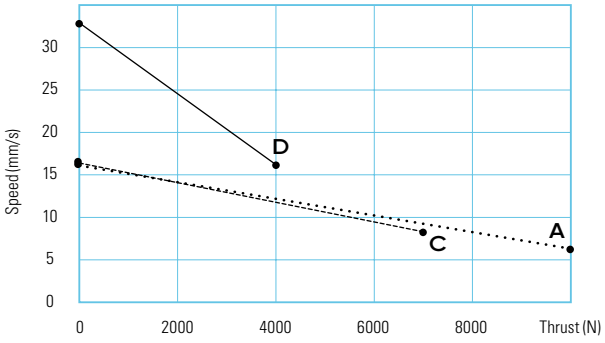
General Features

Maximum load	10,000N in push
Maximum load	6,000N in pull
Maximum speed at full load	16.2mm/s (with 4000N in a push or pull condition)
Stroke	25~400mm
Minimum installation dimension	≥ 67mm
Color	Black or grey
Options	Safety nut, Hall/Reed sensor(s)

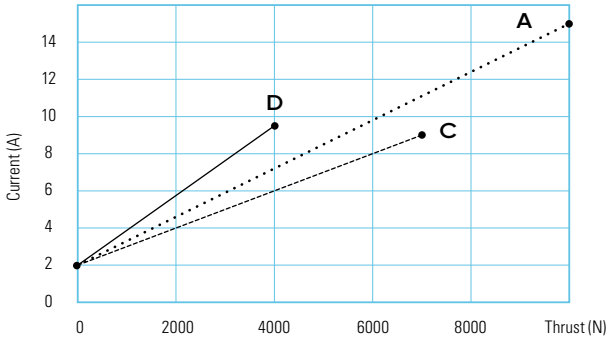
Performance Data

Motor Speed 3800RPM, Duty Cycle 10%

Speed vs. Thrust



Current vs. Thrust



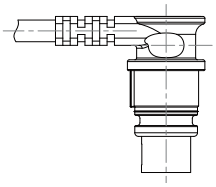
TA21 Ordering Key

TA21

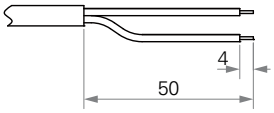
Version: 20181102-C

Voltage	2 = 24V DC		
Load and Speed	See page 76		
Stroke (mm)			
Restracted Lengh (mm)	See page 77		
Motor Cable Color	1 = Black	2 = Grey (Pantone 428C)	
Special Functions for Spindle Sub-Assembly	1 = Safety nut		
Signal Output	0 = Without	2 = Hall sensor*2	3 = Reed sensor
Connector See page 80	1 = DIN 6P, 90° plug	2 = Tinned leads	F = DIN 6P, 180° plug
Cable Length (mm)	1= Straight, 500 2= Straight, 750 3= Straight, 1000	4= Straight, 1250 5= Straight, 1500 6= Straight, 2000	7= Curly, 200 8= Curly, 400

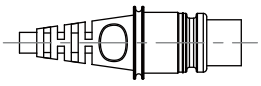
Connector



1 = DIN 6P, 90° plug



2 = Tinned leads



F = DIN 6P, 180° plug

TGM1

series

TiMOTION's TGM1 series gear motor was designed primarily for industrial applications like height adjustable workstations and tables, but can be used in many other applications. This economical product allows for fast, smooth and quiet adjustment of built-in spindles through the use of external limit switches. Shafting allows for the mechanical synchronization of dual spindles.

Load and Speed

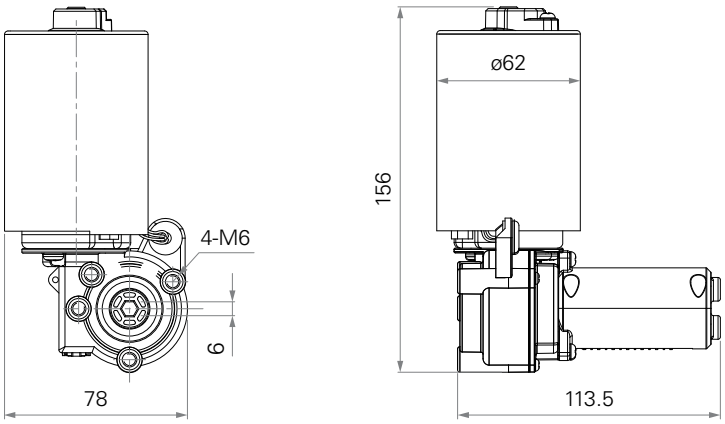
	CODE	Torque Load (Nm)	Self Locking Force (Nm)	Typical Current (A)		Typical Speed (RPM±5%)		Hall Sensor Output		
				No Load 24V DC	With Load 24V DC	No Load 24V DC	With Load 24V DC	Magnet Poles	Period (ms)	
									No Load 24V DC	With Load 24V DC
Motor Speed (3800RPM)	A	7.6	4.4	1.0	5.0	132	72	2	10.9 - 12.3	14.6 - 16.4
	D	3.8	1.9	1.0	5.0	264	144			
Motor Speed (3400RPM)	B	7.7	4.4	1.0	4.0	112	64	4	6.6 - 7.1	8.8 - 9.5
	E	3.9	1.9	1.0	4.0	224	128			
Motor Speed (2600RPM)	C	6.8	4.4	1.0	3.0	88	51	4	8.3 - 9.4	11.1 - 12.5
	F	3.4	1.9	1.0	3.0	175	102			

NOTE

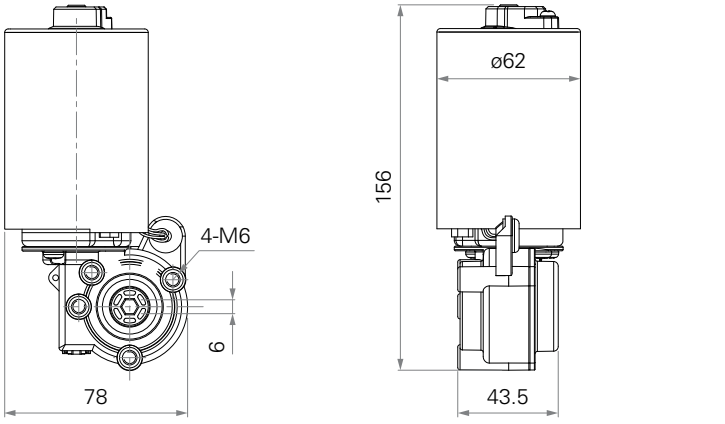
1 Please refer to the approved drawing for the final authentic value.
2 The current & speed in table and diagram are tested with TiMOTION control boxes, and there will be around 10% tolerance depending on different models of the control box. (Under no load condition, the voltage is around 32V DC. At rated load, the voltage output will be around 24V DC)

Standard Dimension (mm)

Without TES2



With TES2



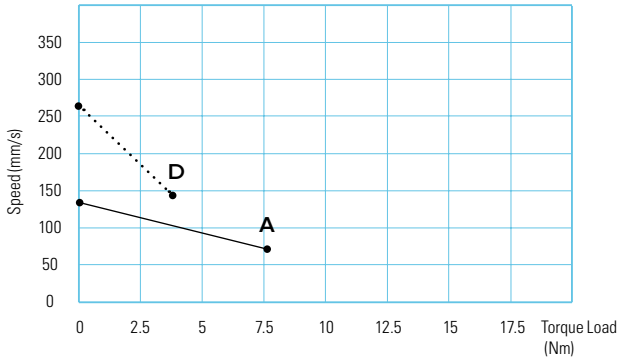
General Features

Voltage of motor	24V DC or 24V DC (PTC)
Maximum speed at full load	144RPM (±5%) after gear reduction
Maximum rated torque	7.7Nm
Certificate	UL (motor only)
Operational temperature range at full performance	+5°C~+45°C
Options	Hall sensors
Hexagon hole for the shaft by 6mm diameter	
Low noise	

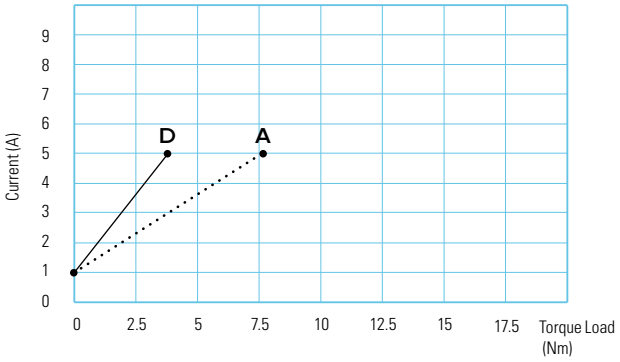
Performance Data

Motor Speed 24V DC 3800RPM

Speed vs. Torque Load

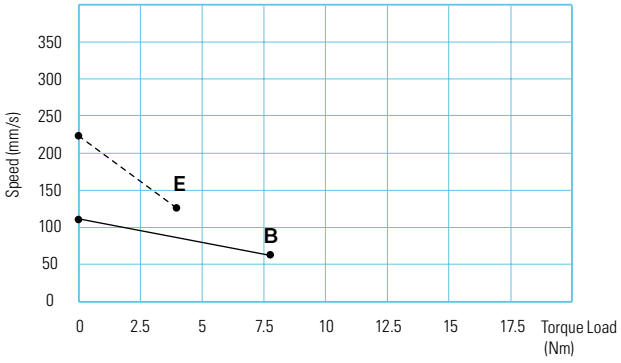


Current vs. Torque Load

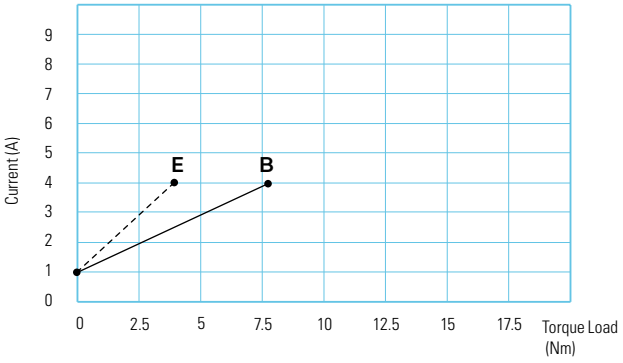


Motor Speed 24V DC 3400RPM

Speed vs. Torque Load

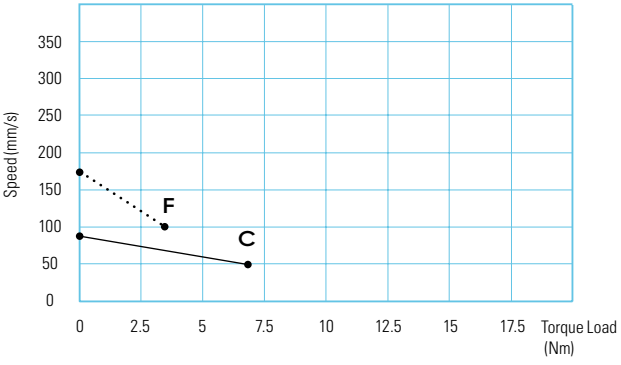


Current vs. Torque Load

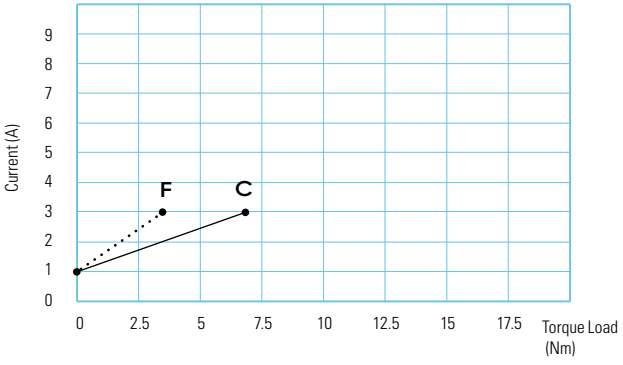


Motor Speed 24V DC 2600RPM

Speed vs. Torque Load



Current vs. Torque Load



TGM1 Ordering Key

TGM1

Version: 20181122-J

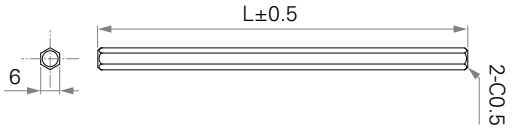
Voltage	2 = 24V DC	5 = 24V DC, PTC		
Load and Speed	See page 81			
Output Signal	0 = Without	2 = Hall sensor*2		
Brake	0 = Without	1 = Motor brake		
Plug See page 86	0 = Tinned leads	1 = DIN 6P, 90°	2 = Molex 8P	
Cable Length (mm)	0 = Straight, 1000 1 = Straight, 1500	2 = Straight, 2000 3 = Curly, 1000		
External Limit Switches (TES2)	00 = Without	XX = Number of output rotations (between13~17 & 25~35 rotations, factory preset)		

TGM1
Ordering Key Appendix

Combination of TGM & TBS

TBS	Input Torque	TGM				
		TGM1	TGM2	TGM3	TGM4	TGM7
TBS1	#1	V	V	V	V	-
TBS2	#1	-	-	-	-	V
TBS3	#1	-	-	-	-	V
TBS4	#1	V	V	V	V	-
TBS5	#1	V	V	V	V	-
TBS9	#1	V	V	V	V	-
TBS10	#1	V	V	V	V	-

Hexagonal Drive Shaft

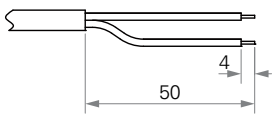


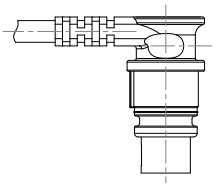
CODE	L (mm)
32709-0101-175-1	175
32709-0101-200-1	200
32709-0101-270-1	270
32709-0101-375-1	375
32709-0101-470-1	470
32709-0101-570-1	570

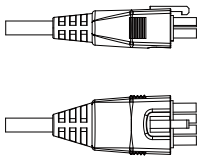
NOTE

1 The combinations of TGM and TBS are marked as “v” on the above table.
2 When choosing the combination of TBS2 / 3 and TGM7, the hexagonal drive shaft is not required.
3 When choosing the combination of TBS1 / 4 / 5 / 9 / 10 and TGM1 / 3 / 4, the extra order of hexagonal drive shaft is needed.
4 Please refer to the table below for the serial numbers and the dimensions of the component.

Plug







0 = Tinned leads

1 = DIN 6P, 90°

2 = Molex 8P

TGM2

series

The TGM2 series is TiMOTION's most powerful gear motor. It was designed primarily for industrial applications like height adjustable workstations and tables, but can be used in many other applications. This economical product allows for fast, smooth and quiet adjustment of built-in spindles through the use of external limit switches. Shafting allows for the mechanical synchronization of dual spindles.

Load and Speed

	CODE	Torque Load (Nm)	Self Locking Force (Nm)	Typical Current (A)		Typical Speed (RPM±5%)		Hall Sensor Output		
				No Load 24V DC	With Load 24V DC	No Load 24V DC	With Load 24V DC	Magnet Poles	Period (ms)	
									No Load 24V DC	With Load 24V DC
Motor Speed (3800RPM)	A	24.2	11	1.5	8.5	108	49	2	11.0 - 12.3	24.8 - 27.5
Motor Speed (2200RPM)	B	16.9	11	1.0	4.0	60	31	2	19.1 - 22.5	39.4 - 43.6

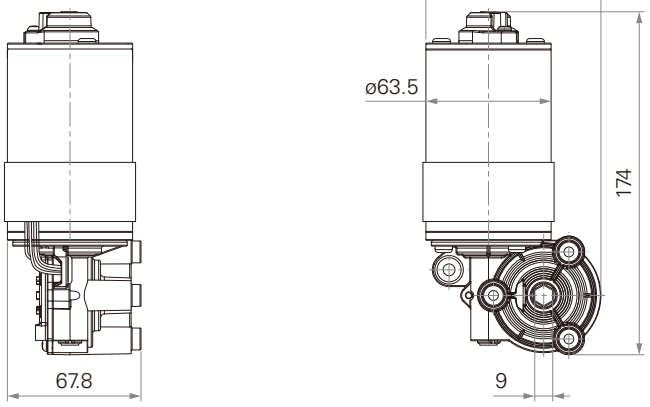
NOTE

1 Please refer to the approved drawing for the final authentic value.

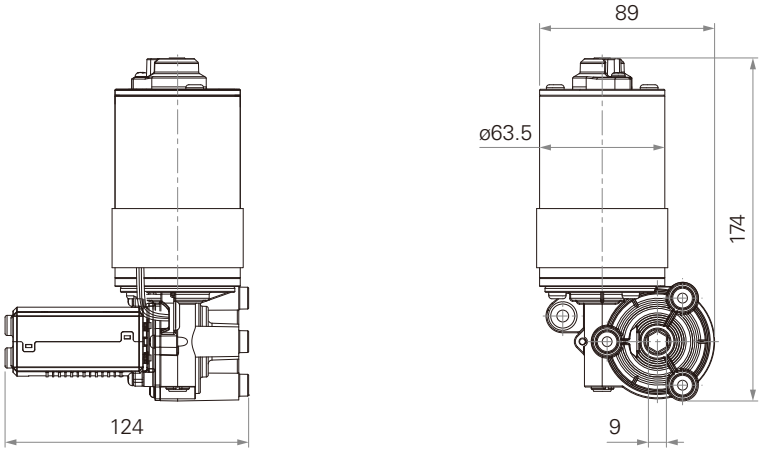
2 The current & speed in table and diagram are tested with TiMOTION control boxes, and there will be around 10% tolerance depending on different models of the control box. (Under no load condition, the voltage is around 32V DC. At rated load, the voltage output will be around 24V DC)

Standard Dimension (mm)

Without TES2



With TES2



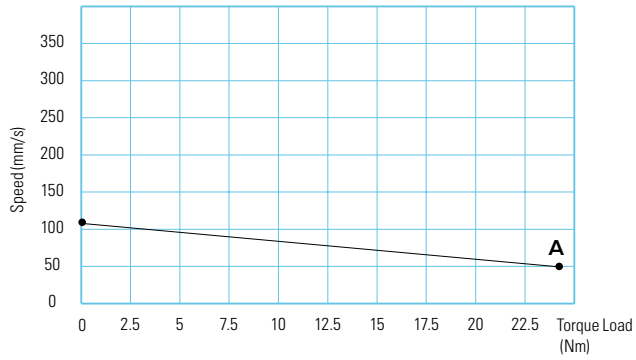
General Features

Voltage of motor	24V DC, thermal protector
Maximum speed at full load	49RPM (±5%) after gear reduction
Maximum rated torque	24.4Nm
Operational temperature range at full performance	+5°C~+45°C
Options	Hall sensors
Hexagon hole for the shaft by 9mm diameter	
Low noise	

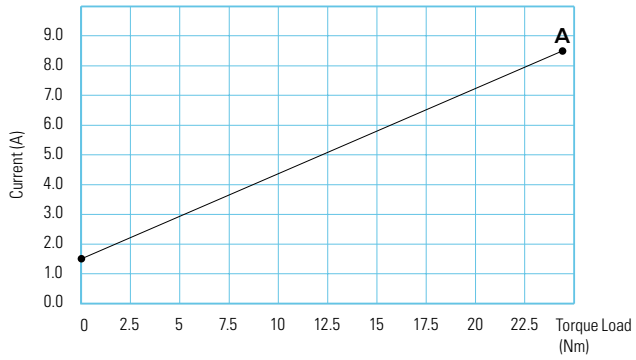
Performance Data

Motor Speed 24V DC 3800RPM

Speed vs. Torque Load

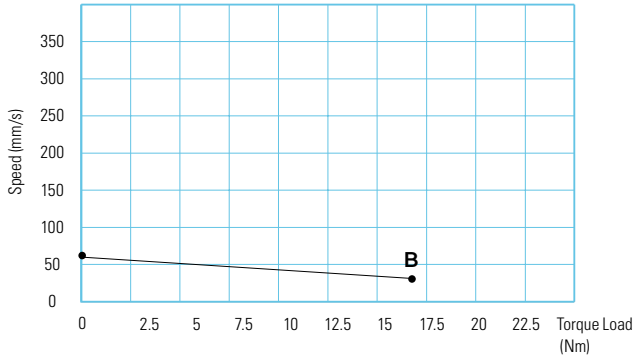


Current vs. Torque Load

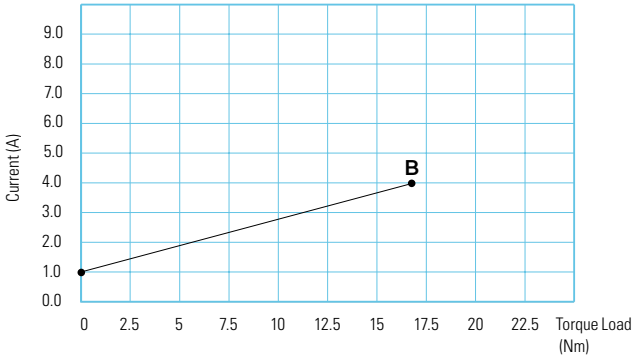


Motor Speed 24V DC 2200RPM

Speed vs. Torque Load



Current vs. Torque Load



TGM2 Ordering Key

TGM2

Version: 20181122-J

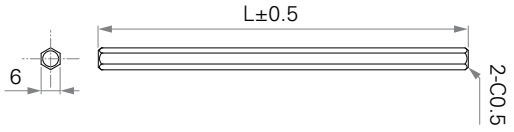
Voltage	5 = 24V DC, thermal protector			
Load and Speed	See page 87			
Output Signals	0 = Without	2 = Hall sensor*2		
Brake	0 = Without	1 = Motor brake		
Plug See page 92	0 = Tinned leads	1 = DIN 6P, 90°	2 = Molex 8P	
Cable Length (mm)	0 = Straight, 1000 1 = Straight, 1500	2 = Straight, 2000 3 = Curly, 1000		
Output Torgue	1 = Drive shaft hole (Inner hexagon 9mm) 2 = One side drive shaft (Ø12mm, knurling) 3 = Two sides drive shaft (Ø12mm, knurling)	4 = Two sides drive shaft (Ø12mm, with Ø4.8 latch hole) 5 = Drive shaft hole (inner hexagon 6mm)		
External Limit Switches (TES2)	00 = Without	XX = Number of output rotations (Between13~17 & 25~35 rotations, factory preset)		

TGM2
Ordering Key Appendix

Combination of TGM & TBS

TBS	Input Torque	TGM				
		TGM1	TGM2	TGM3	TGM4	TGM7
TBS1	#1	V	V	V	V	-
TBS2	#1	-	-	-	-	V
TBS3	#1	-	-	-	-	V
TBS4	#1	V	V	V	V	-
TBS5	#1	V	V	V	V	-
TBS9	#1	V	V	V	V	-
TBS10	#1	V	V	V	V	-

Hexagonal Drive Shaft

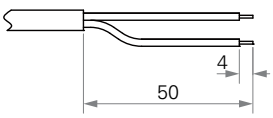


CODE	L (mm)
32709-0101-175-1	175
32709-0101-200-1	200
32709-0101-270-1	270
32709-0101-375-1	375
32709-0101-470-1	470
32709-0101-570-1	570

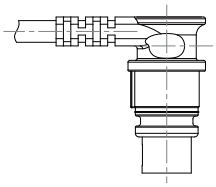
NOTE

1 The combinations of TGM and TBS are marked as “v” on the above table.
2 When choosing the combination of TBS2 / 3 and TGM7, the hexagonal drive shaft is not required.
3 When choosing the combination of TBS1 / 4 / 5 / 9 / 10 and TGM1 / 3 / 4, the extra order of hexagonal drive shaft is needed.
4 Please refer to the table below for the serial numbers and the dimensions of the component.

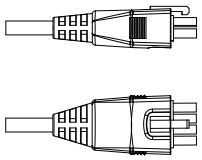
Plug



0 = Tinned leads

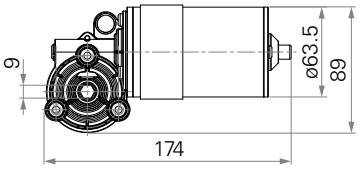


1 = DIN 6P, 90°

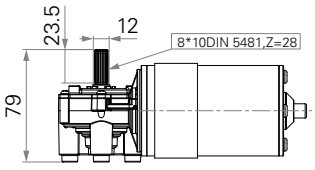


2 = Molex 8P

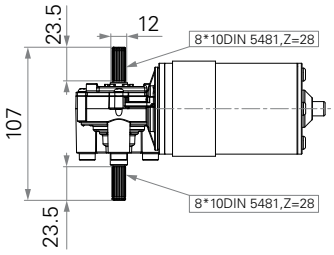
Output Torque



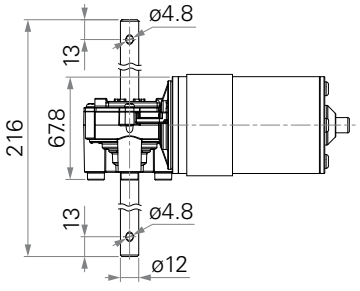
1 = Drive shaft hole (inner hexagon 9mm)



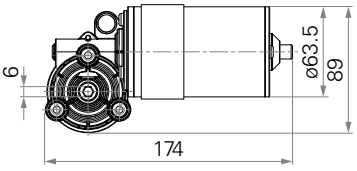
2 = One side drive shaft (Ø12mm, knurling)



3 = Two sides drive shaft (Ø12mm, knurling)



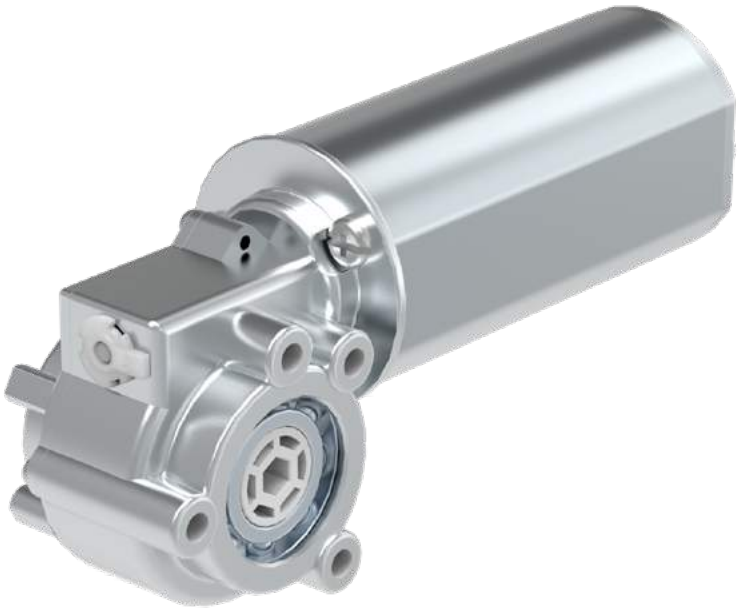
4 = Two sides drive shaft (Ø12mm, with Ø4.8mm latch hole)



5 = Drive shaft hole (inner hexagon 6mm)

TGM3

series



The TGM3 series is TiMOTION's compact size gear motor. It was designed primarily for industrial applications like height adjustable workstations and tables, but can be used in many other applications. This economical product allows for fast, smooth and quiet adjustment of built-in spindles through the use of external limit switches. Shafting allows for the mechanical synchronization of dual spindles.

Load and Speed

	CODE	Torque Load (Nm)	Self Locking Force (Nm)	Typical Current (A)		Typical Speed (RPM±5%)		Hall Sensor Output		
				No Load 24V DC	With Load 24V DC	No Load 24V DC	With Load 24V DC	Magnet Poles	Period (ms)	
									No Load 24V DC	With Load 24V DC
Motor Speed (3800RPM)	A	4.6	1.7	1.0	3.2	130	61	2	11.1 - 12.2	24.1 - 26.7
	C	2.3	0.2	1.0	3.2	259	121			
Motor Speed (2200RPM)	B	3.7	1.7	0.5	1.6	75	26	2	18.3 - 22.0	56.2 - 62.2
	D	1.8	0.2	0.5	1.6	151	52			

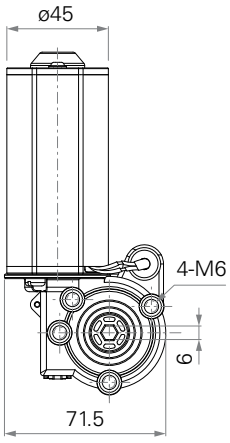
NOTE

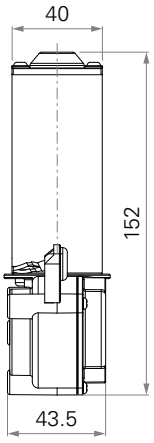
1 Please refer to the approved drawing for the final authentic value.

2 The current & speed in table and diagram are tested with TiMOTION control boxes, and there will be around 10% tolerance depending on different \ models of the control box. (Under no load condition, the voltage is around 32V DC. At rated load, the voltage output will be around 24V DC)

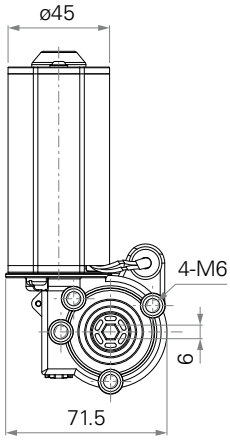
Standard Dimension (mm)

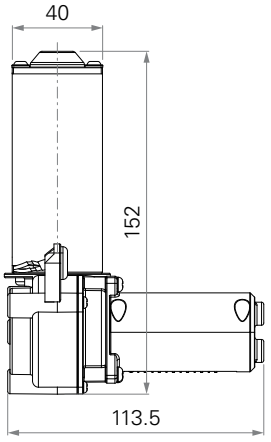
Without TES2





With TES2





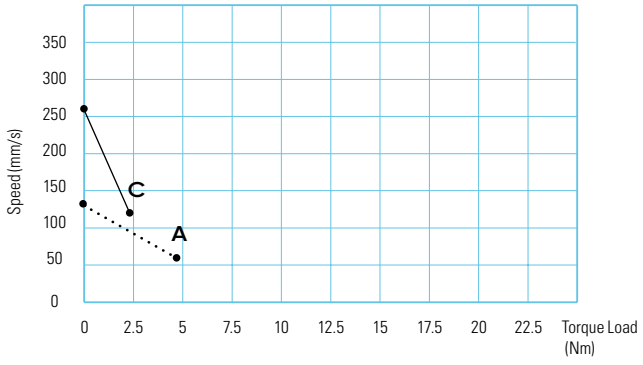
General Features

Voltage of motor	24V DC
Maximum speed	121RPM (±5%) after gear reduction
Maximum rated torque	4.6Nm
Operational temperature range at full performance	+5°C~+45°C
Options	Hall sensors
Hexagon hole for the shaft by 6mm diameter	
Low noise	

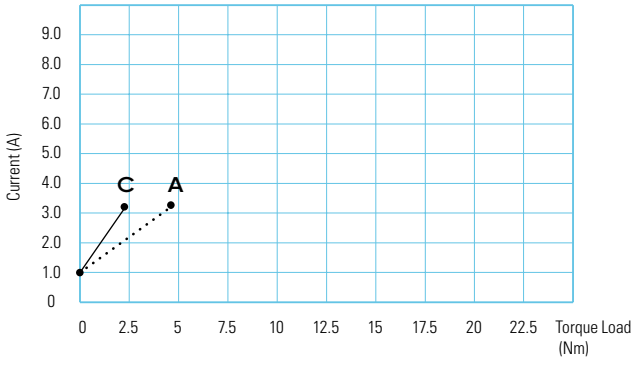
Performance Data

Motor Speed 24V DC 3800RPM

Speed vs. Torque Load

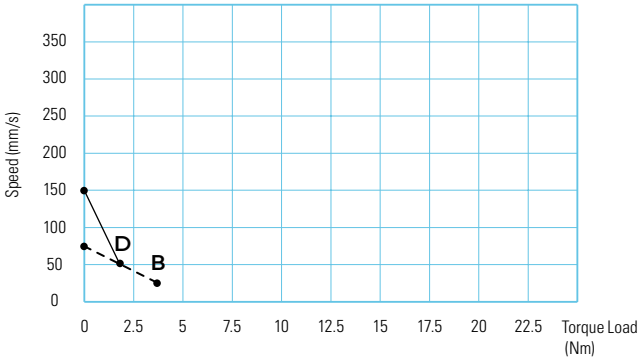


Current vs. Torque Load

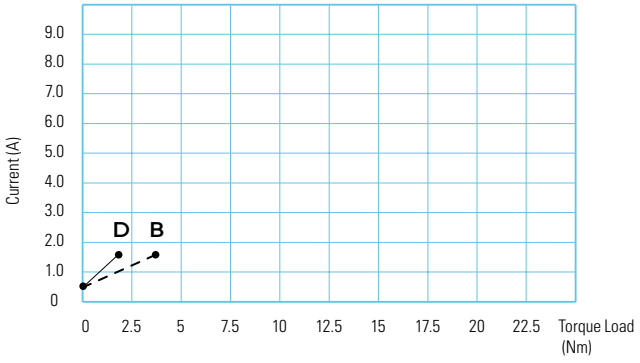


Motor Speed 24V DC 2200RPM

Speed vs. Torque Load



Current vs. Torque Load



TGM3 Ordering Key

TGM3

Version: 20181122-J

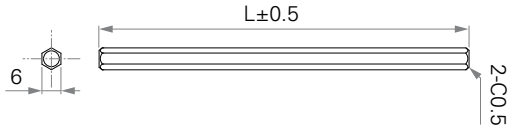
Voltage	2 = 24V DC			
Load and Speed	See page 93			
Output Signals	0 = Without	2 = Hall sensor*2		
Brake	0 = Without			
Plug See page 98	0 = Tinned leads	1 = DIN 6P, 90°	2 = Molex 8P	
Cable Length (mm)	0 = Straight, 1000 1 = Straight, 1500	2 = Straight, 2000 3 = Curly, 1000		
Bracket	0 = Without			
External Limit Switches (TES2)	0 = Without	1 = With		
TES2 Number of Output Rotation	00 = Without	XX = Number of output rotations (between13~17 & 25~35 rotations, factory preset)		

TGM3
Ordering Key Appendix

Combination of TGM & TBS

TBS	Input Torque	TGM				
		TGM1	TGM2	TGM3	TGM4	TGM7
TBS1	#1	V	V	V	V	-
TBS2	#1	-	-	-	-	V
TBS3	#1	-	-	-	-	V
TBS4	#1	V	V	V	V	-
TBS5	#1	V	V	V	V	-
TBS9	#1	V	V	V	V	-
TBS10	#1	V	V	V	V	-

Hexagonal Drive Shaft

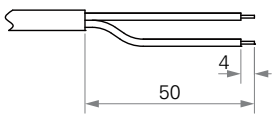


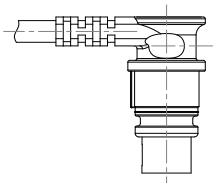
CODE	L (mm)
32709-0101-175-1	175
32709-0101-200-1	200
32709-0101-270-1	270
32709-0101-375-1	375
32709-0101-470-1	470
32709-0101-570-1	570

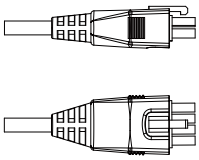
NOTE

1 The combinations of TGM and TBS are marked as “v” on the above table.
2 When choosing the combination of TBS2 / 3 and TGM7, the hexagonal drive shaft is not required.
3 When choosing the combination of TBS1 / 4 / 5 / 9 / 10 and TGM1 / 3 / 4, the extra order of hexagonal drive shaft is needed.
4 Please refer to the table below for the serial numbers and the dimensions of the component.

Plug







0 = Tinned leads

1 = DIN 6P, 90°

2 = Molex 8P

TGM4

series

The TGM7 series is TiMOTION's compact size gear motor. It was designed primarily for high adjustable tables, but can be used in many other applications. This economical product allows for fast, smooth and quiet adjustment of built-in spindles through the use of external limit switches. Shafting allows for the mechanical synchronization of dual spindles.

Load and Speed

	CODE	Torque Load (Nm)	Self Locking Force (Nm)	Typical Current (A)		Typical Speed (RPM±5%)		Hall Sensor Output		
				No Load 24V DC	With Load 24V DC	No Load 24V DC	With Load 24V DC	Magnet Poles	Period (ms)	
									No Load 24V DC	With Load 24V DC
Motor Speed (3800RPM)	A	3.9	2.4	1.0	3.2	155	73	2	11.1 - 12.2	24.2 - 26.7
Motor Speed (2200RPM)	B	3.1	2.4	0.8	1.6	92	31	2	18.4 - 20.9	56.2 - 62.2
Motor Speed (5600RPM)	E	6	1.8	1.0	6.0	219	98	2	7.9 - 8.5	17.9 - 19.7

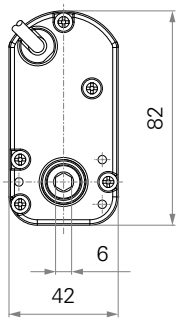
NOTE

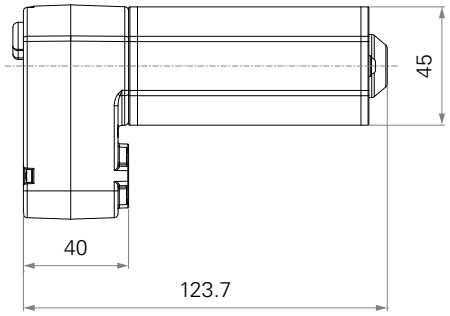
1 Please refer to the approved drawing for the final authentic value.

2 The current & speed in table and diagram are tested with TiMOTION control boxes, and there will be around 10% tolerance depending on different models of the control box. (Under no load condition, the voltage is around 32V DC. At rated load, the voltage output will be around 24V DC)

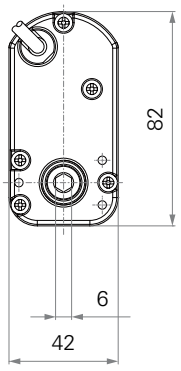
Standard Dimension (mm)

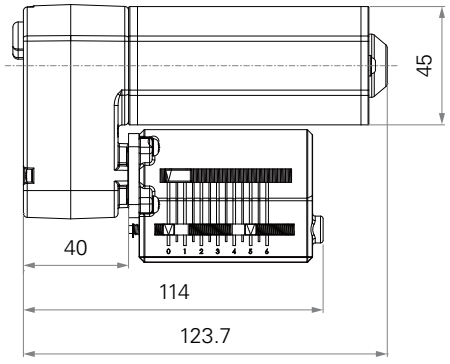
Without TES2





With TES2





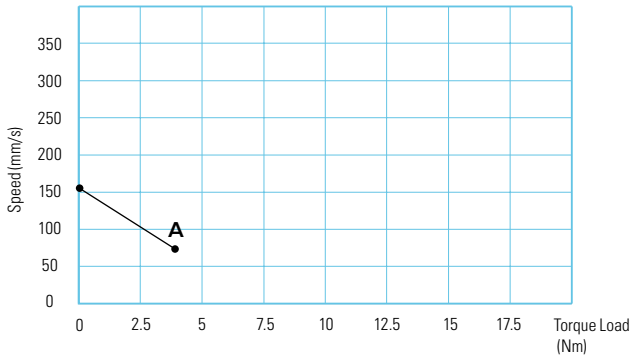
General Features

Voltage of motor	24V DC
Maximum speed at full load	98RPM (±5%) after gear reduction
Maximum rated torque	6Nm
Operational temperature range at full performance	+5°C~+45°C
Options	Hall sensors
Low noise	

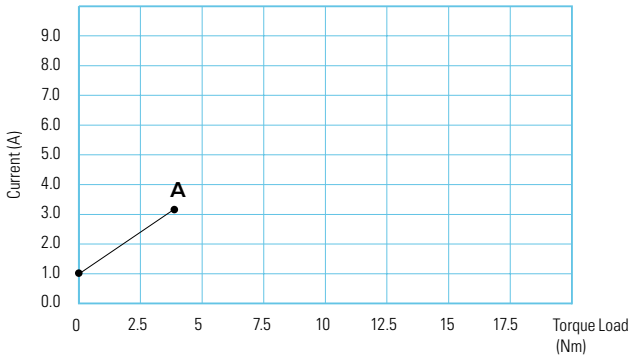
Performance Data

Motor Speed 24V DC 3800RPM

Speed vs. Torque Load

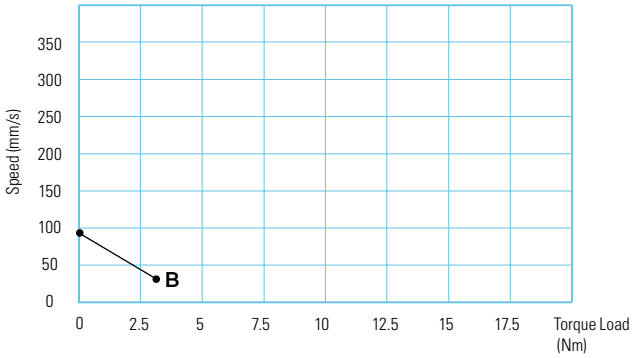


Current vs. Torque Load

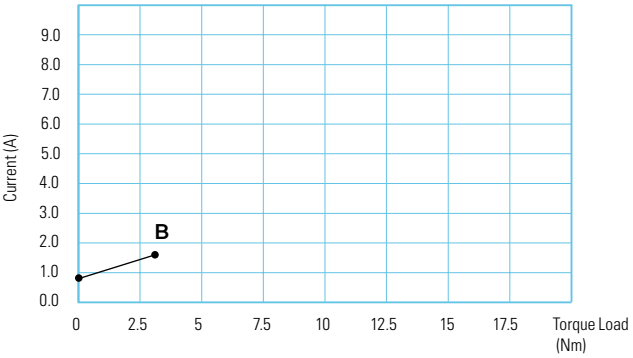


Motor Speed 24V DC 2200RPM

Speed vs. Torque Load

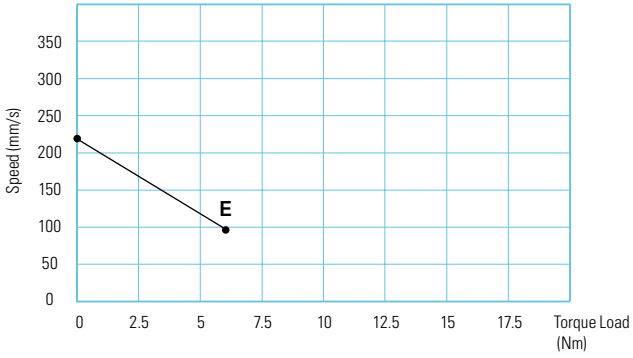


Current vs. Torque Load

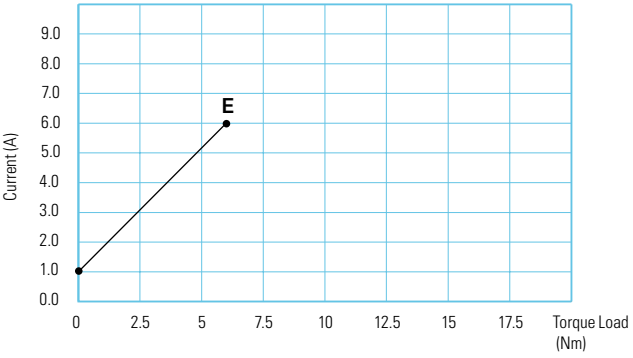


Motor Speed 24V DC 5600RPM

Speed vs. Torque Load



Current vs. Torque Load



TGM4 Ordering Key

TGM4

Version: 20181122-K

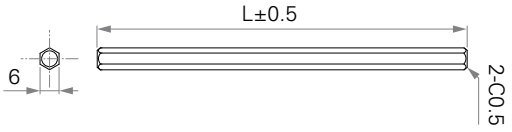
Voltage	2 = 24V DC			
Load and Speed	See page 99			
Output Signals	0 = Without	2 = Hall sensors*2		
Brake	0 = Without	1 = Motor brake		
Plug See page 104	0 = Tinned leads	1 = DIN 6P, 90°	2 = Molex 8P	
Cable Length (mm)	0 = Straight, 1000 1 = Straight, 1500	2 = Straight, 2000 3 = Curly, 1000		
External Limit Switches (TES2)	00 = Without	XX = Number of output rotations (between13~17 & 25~35 rotations, factory preset)		

TGM4
Ordering Key Appendix

Combination of TGM & TBS

TBS	Input Torque	TGM				
		TGM1	TGM2	TGM3	TGM4	TGM7
TBS1	#1	V	V	V	V	-
TBS2	#1	-	-	-	-	V
TBS3	#1	-	-	-	-	V
TBS4	#1	V	V	V	V	-
TBS5	#1	V	V	V	V	-
TBS9	#1	V	V	V	V	-
TBS10	#1	V	V	V	V	-

Hexagonal Drive Shaft

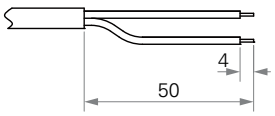


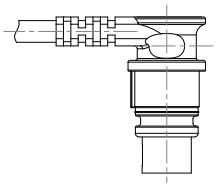
CODE	L (mm)
32709-0101-175-1	175
32709-0101-200-1	200
32709-0101-270-1	270
32709-0101-375-1	375
32709-0101-470-1	470
32709-0101-570-1	570

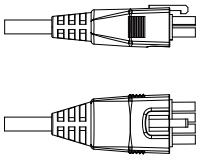
NOTE

1 The combinations of TGM and TBS are marked as “v” on the above table.
2 When choosing the combination of TBS2 / 3 and TGM7, the hexagonal drive shaft is not required.
3 When choosing the combination of TBS1 / 4 / 5 / 9 / 10 and TGM1 / 3 / 4, the extra order of hexagonal drive shaft is needed.
4 Please refer to the table below for the serial numbers and the dimensions of the component.

Plug







0 = Tinned leads

1 = DIN 6P, 90°

2 = Molex 8P

TGM7

series

The TGM7 series is TiMOTION's compact size gear motor. It was designed primarily for high adjustable tables, but can be used in many other applications. This economical product allows for fast, smooth and quiet adjustment of built-in spindles through the use of external limit switches. Shafting allows for the mechanical synchronization of dual spindles.

Load and Speed

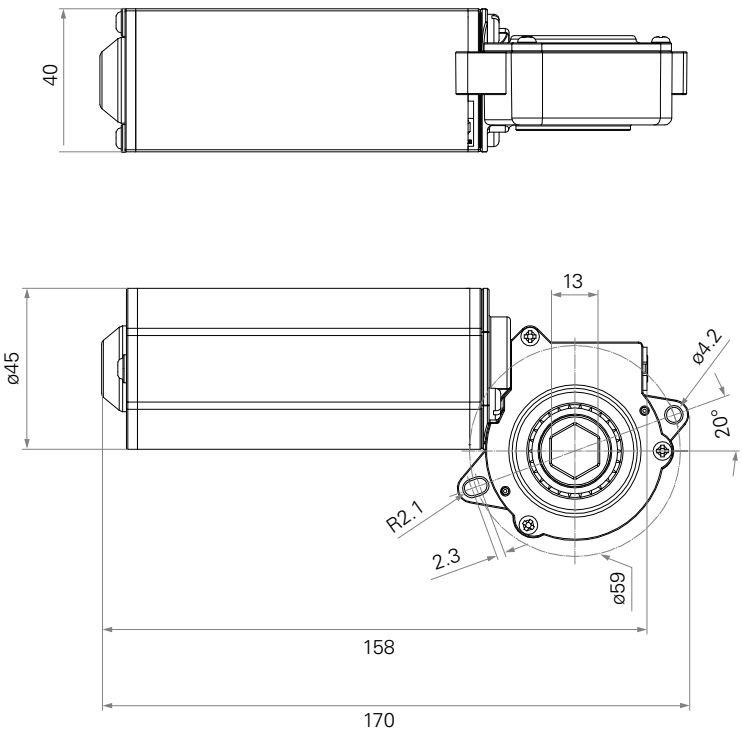
	CODE	Torque Load (Nm)	Self Locking Force (Nm)	Typical Current (A)		Typical Speed (RPM±5%)		Hall Sensor Output		
				No Load 24V DC	With Load 24V DC	No Load 24V DC	With Load 24V DC	Magnet Poles	Period (ms)	
									No Load 24V DC	With Load 24V DC
Motor Speed (5200RPM)	C	7.2	2.9	1.0	6.0	178	78	2	7.9 - 8.5	17.9 - 19.7
	D	3.6	0.7	1.0	6.0	355	156			

NOTE

1 Please refer to the approved drawing for the final authentic value.

2 The current & speed in table and diagram are tested with TiMOTION control boxes, and there will be around 10% tolerance depending on different models of the control box. (Under no load condition, the voltage is around 32V DC. At rated load, the voltage output will be around 24V DC)

Standard Dimension (mm)



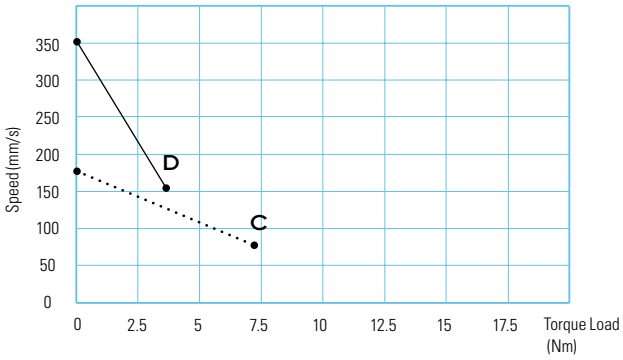
General Features

Voltage of motor	24V DC
Maximum speed at full load	156RPM (±5%) after gear reduction
Maximum rated torque	7.2Nm
Operational temperature range at full performance	+5°C~+45°C
Options	Hall sensors
Low noise	

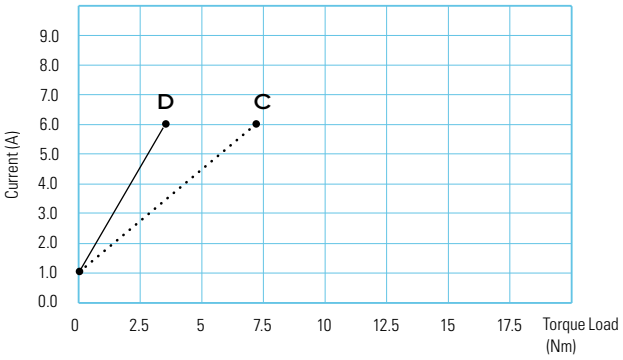
Performance Data

Motor Speed 24V DC 5200RPM

Speed vs. Torque Load



Current vs. Torque Load



TGM7 Ordering Key

TGM7

Version: 20181122-E

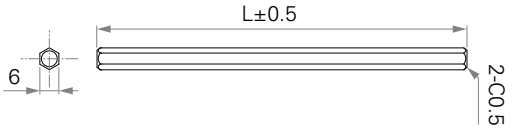
Voltage	2 = 24V DC			
Load and Speed	See page 105			
Output Signal	0 = Without	2 = Hall sensors*2		
Brake	0 = Without	1 = Motor brake		
Plug See page 110	0 = Tinned leads	1 = DIN 6P, 90°	2 = Molex 8P	
Cable Length (mm)	0 = Straight, 1000 1 = Straight, 1500	2 = Straight, 2000 3 = Curly, 1000		

TGM7
Ordering Key Appendix

Combination of TGM & TBS

TBS	Input Torque	TGM				
		TGM1	TGM2	TGM3	TGM4	TGM7
TBS1	#1	V	V	V	V	-
TBS2	#1	-	-	-	-	V
TBS3	#1	-	-	-	-	V
TBS4	#1	V	V	V	V	-
TBS5	#1	V	V	V	V	-
TBS9	#1	V	V	V	V	-
TBS10	#1	V	V	V	V	-

Hexagonal Drive Shaft

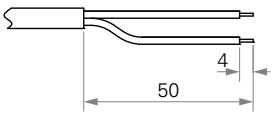


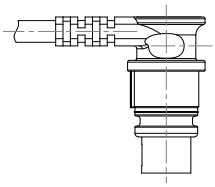
CODE	L (mm)
32709-0101-175-1	175
32709-0101-200-1	200
32709-0101-270-1	270
32709-0101-375-1	375
32709-0101-470-1	470
32709-0101-570-1	570

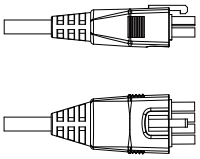
NOTE

1 The combinations of TGM and TBS are marked as “v” on the above table.
2 When choosing the combination of TBS2 / 3 and TGM7, the hexagonal drive shaft is not required.
3 When choosing the combination of TBS1 / 4 / 5 / 9 / 10 and TGM1 / 3 / 4, the extra order of hexagonal drive shaft is needed.
4 Please refer to the table below for the serial numbers and the dimensions of the component.

Plug







0 = Tinned leads

1 = DIN 6P, 90°

2 = Molex 8P

TL3 series

The TL3 columns from TiMOTION are made up of three extruded aluminum tubes of rectangular shape that give the system great stability and a high stroke with reduced retracted length. This electric lifting column allows for an easy integration into many height adjustable applications.

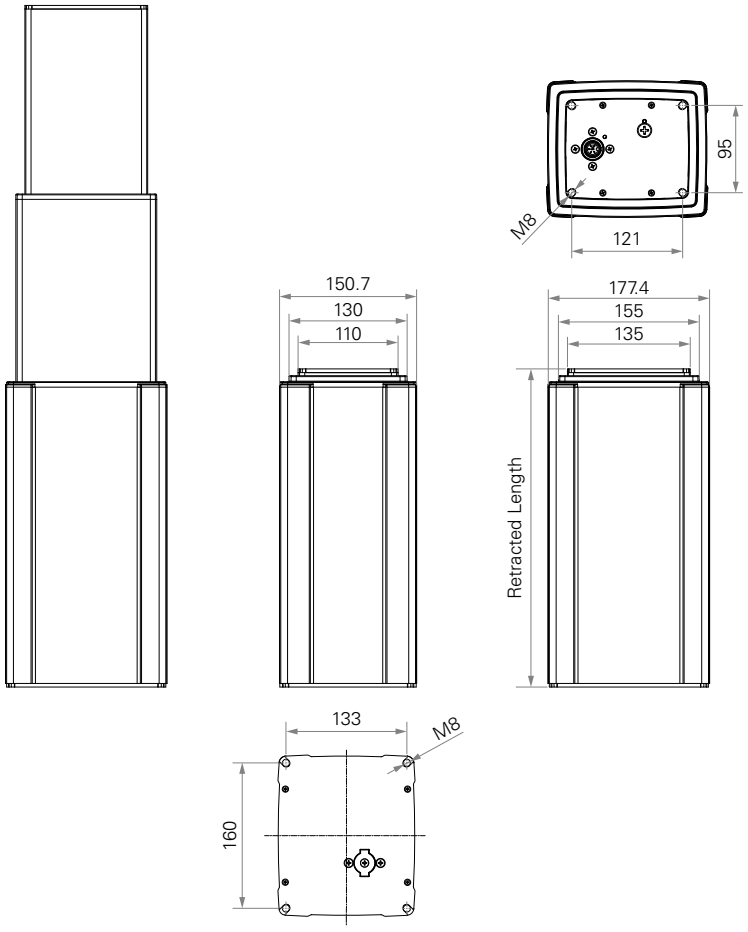
Load and Speed

	CODE	Load (N)	Self Locking Force (N)	Typical Current (A)		Typical Speed (mm/s)	
		Push		No Load 24V DC	With Load 24V DC	No Load 24V DC	With Load 24V DC
Motor Speed (2200RPM)	B	4000	4000	2.5	6.3	14.5	7.6
	C	2000	2000	2.5	4.3	22.0	13.0
	D	1000	1000	2.5	3.8	39.0	24.0
Motor Speed (2800RPM)	E	4000	4000	3.5	7.5	18.5	9.4
	F	2000	2000	3.5	6.3	35.0	20.0
Motor Speed (3400RPM)	G	4000	4000	4.0	10.8	28.0	13.7

NOTE

1 With a 12V motor, the current is approximately twice the current measured in 24V; speed will be similar for both voltages.
2 Please refer to the approved drawing for the final authentic value.

Standard Dimension (mm)



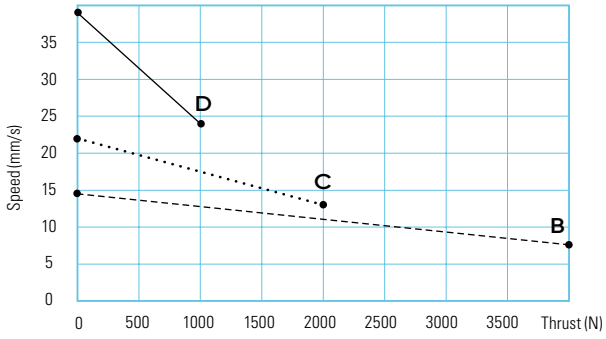
General Features

Maximum load	4,000N in push
Maximum dynamic bending moment	1,000Nm
Maximum static bending moment	2,000Nm
Maximum speed at full load	24mm/s (with 1,000N in a push condition)
Minimum installation dimension	≥ Stroke/2 + 150mm
Dimension of cross section	177.4x150.7 mm
Stroke	250~1200mm
Operational temperature range	+5°C~+45°C
Options	POT, Hall sensor(s)

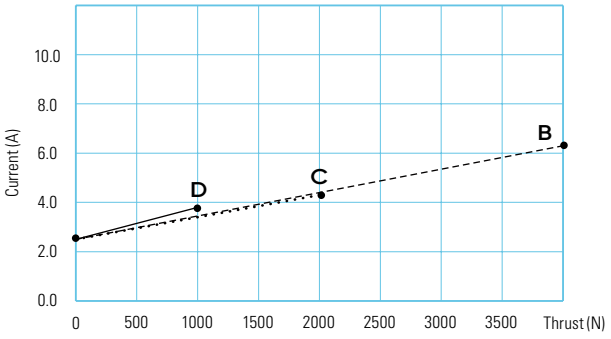
Performance Data

Motor Speed 24V DC 2200RPM, Duty Cycle 10%

Speed vs. Thrust

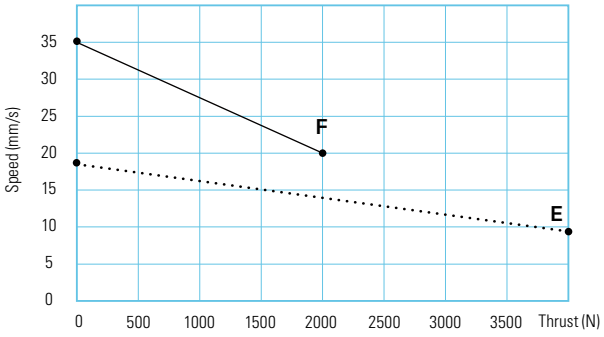


Current vs. Thrust

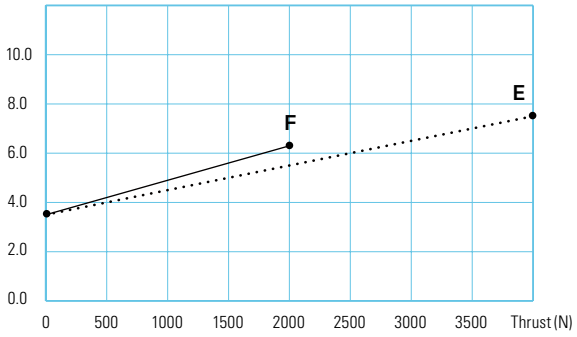


Motor Speed 24V DC 2800RPM, Duty Cycle 10%

Speed vs. Thrust

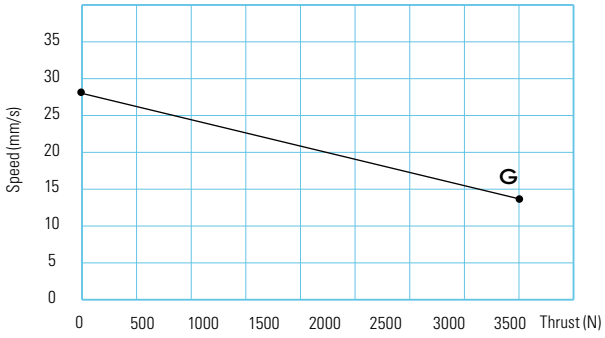


Current vs. Thrust

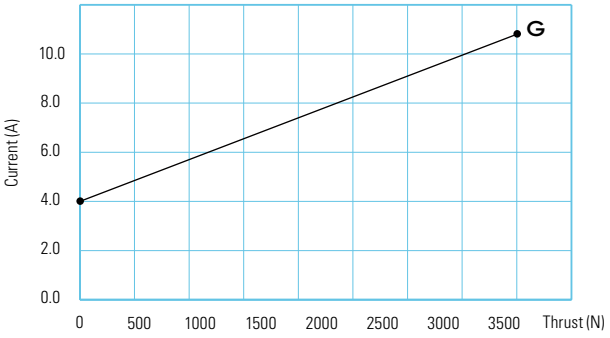


Motor Speed 24V DC 3400RPM, Duty Cycle 10%

Speed vs. Thrust



Current vs. Thrust



TL3 Top End Socket Ordering Key

TL3

Version: 20180801-O

Voltage	1 = 12V DC	5 = 24V DC, thermal protector	
Load and Speed	See page 111		
Stroke (mm)	250-1200		
Restracted Lengh (mm)	See page 117		
Cable Exit See page 117	1 = Top end socket		
Special Functions for Spindle Sub-Assembly	0 = Without (standard)	1 = Safety nut	
Functions for Limit Switches See page 118	1 = Two switches at full retracted / extended positions to cut current 3 = Two switches at full retracted / extended positions to send signal		
IP Rating	1 = Without	2 = IPX4	3 = IPX6
Output Signals	0 = Without	2 = Hall sensor*2	3 = POT
Connector See page 119	1 = DIN 6P, socket		
Cable Length (mm)	0 = Without (the corresponding extension cable TEC needs to be ordered seperately)		
Color	1 = Black	2 = Matte silver	
Tubes Direction See page 120	0 = Thinner on top	1 = Wider on top	
Grounding Function	0 = Without	1 = With	

NOTE

1 The TL18AC is designed especially for push applications, not suitable for pull applications.

TL3 **Side Cable** Ordering Key

TL3

Version: 20180801-O

Voltage	1 = 12V DC	5 = 24V DC, thermal protector		
Load and Speed	See page 111			
Stroke (mm)	250-1200			
Restracted Lengh (mm)	See page 117			
Cable Exit See page 117	2 = Bottom side cable	3 = Top side cable		
Special Functions for Spindle Sub-Assembly	0 = Without (standard)	1 = Safety nut		
Functions for Limit Switches See page 118	1 = Two switches at full retracted/ extended positions to cut current 3 = Two switches at full retracted/ extended positions to send signal			
IP Rating	1 = Without	2 = IPX4	3 = IPX6	
Output Signals	0 = Without	2 = Hall sensor*2	3 = POT	
Connector See page 119	1 = DIN 6P, 90° plug	2 = Tinned leads	F = DIN 6P, 180° socket	
Cable Length (mm)	1 = Straight, 500 2 = Straight, 750 3 = Straight, 1000	4 = Straight, 1250 5 = Straight, 1500 6 = Straight, 1750	7 = Straight, 2000	
Color	1 = Black (Black cable set) 2 = Silver (428C color cable set) 3 = Silver (Black cable set)			
Tubes Direction See page 120	0 = Thinner on top	1 = Wider on top		
Grounding Function	0 = Without	1 = With		

NOTE

1 The TL18AC is designed especially for push applications, not suitable for pull applications.

TL3 **Direct Cut** Ordering Key

TL3

Version: 20180801-O

Voltage	5 = 24V DC, thermal protector	
Load and Speed	See page 111	
Stroke (mm)	250-1200	
Restracted Lengh (mm)	See page 117	
Cable Exit See page 117	B = Top side- for TH; Bottom side- for TP C = Bottom side - Y cable, for TH + TP D = Top side - for the 2nd column; bottom side - for TH & TP; direct cut operation with 2 columns E = Top side - for the 2nd column & TH; bottom side - for TP; direct cut operation with 2 columns	
Special Functions for Spindle Sub-Assembly	0 = Without (standard)	1 = Safety nut
Functions for Limit Switches See page 118	1 = Two switches at full retracted/extended positions to cut current	
IP Rating	1 = Without	2 = IPX4 3 = IPX6
Output Signals	0 = Without	
Connector See page 119	C = Direct cut, water proof, anti-pull	

Cable Length (mm)	B = Cable exit #B, L2=L3=100
	C = Cable exit #C, L1=L2=L3=100
		D = Cable exit #D, L2=L3=L4=100
		E = Cable exit #E, L2=L3=L4=100

Color	1 = Black (Black cable set) 2 = Silver (428C color cable set) 3 = Silver (Black cable set)	
Tubes Direction See page 120	0 = Thinner on top	1 = Wider on top
Grounding Function	0 = Without	1 = With

NOTE

1 The TL18AC is designed especially for push applications, not suitable for pull applications.

TL3
Ordering Key Appendix

Retracted Length (mm)

1. Minimum retracted length needs to≥ A+B+C

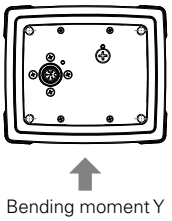
A. Retracted Length (mm)	Load (N)		
	1000	2000	4000
	Stroke/ 2+150 or Stroke/ 2+220*		

*The minimum retracted length generated by the formula-Stroke/2+150 applies to the minimum bending moment rating. Please refer to the left column of the "Dynamic bending moment chart".

B. Cable Exit	Code	Top end socke	Bottom side cable	Top side Cable	Direct Cut
	1, 2	-	-	-	-
	3	-	-	+15	-
	B, D, E	-	-	-	+35
	C	-	-	-	-

C. When with POT (When without POT, C=0)	Cable Exit	Top end socket	Bottom side cable	Top side cable
		1	2	3
		+40	+40	+40

Dynamic bending moment (Nm)- X direction	Stroke (mm)	Retracted Length (mm)	
		S/2+150	S/2+220
	100-300	700	1000
	301-500	500	800
	501-700	300	500
	701-1200	200	200



NOTE

1 Bending moment Y direction= X*0.8
2 Static bending moment= dynamic*2

Functions for Limit Switches

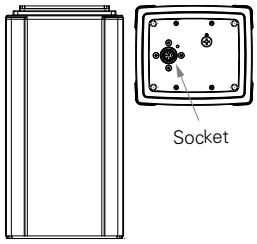
Wire Definitions

		CODE	
	Pin	**1**	**3**
Green	1	Extend (VDC+)	Extend (VDC+)
Red	2	N/A	Common
White	3	N/A	Upper limit switch
Black	4	N/A	N/A
Yellow	5	Retract (VDC+)	Retract (VDC+)
Blue	6	N/A	Lower limit switch

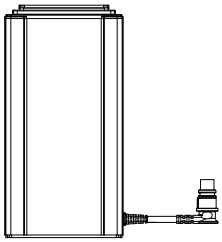
NOTE

1 See ordering key - functions for limit switches.

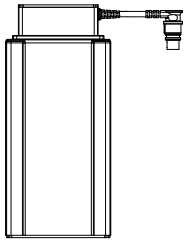
Cable Exit



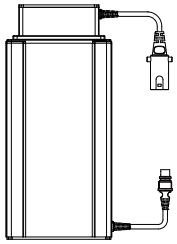
1 = Top end socket



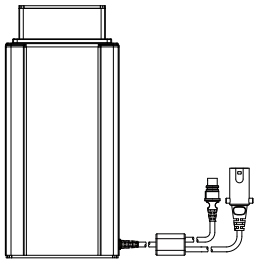
2 = Bottom side cable



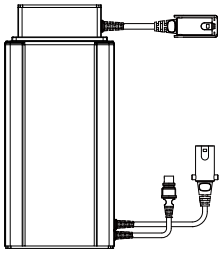
3 = Top side cable



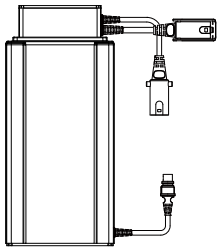
B = Top side- for TH; Bottom side- for TP



C = Bottom side- Y cable, for TH + TP

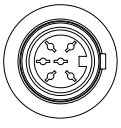


D = Top side- for the 2nd column; Bottom side- for TH & TP

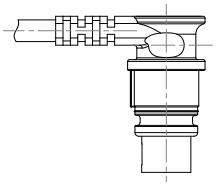


E = Top side- for the 2nd column & TH; Bottom side- for TP

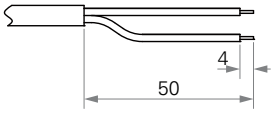
Connector



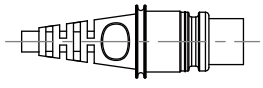
1 = DIN 6P, socket (Top end socket)



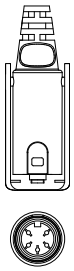
1 = DIN 6P, 90° plug



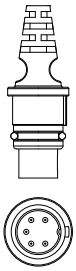
2 = Tinned leads



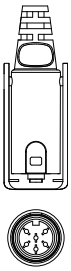
F = DIN 6P, 180° plug



C = Directcut, water proof, anti-pull.
For TH: long DIN 5P
(Pin array 240°),180° socket
(with anti-pull clip)

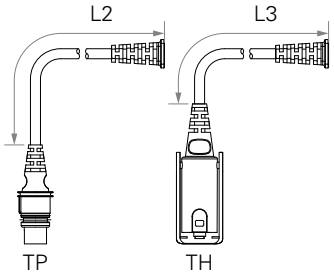


C = Directcut, water proof, anti-pull.
For TP: long DIN 5P
(Pin array 240°),180° plug
(with O-ring)

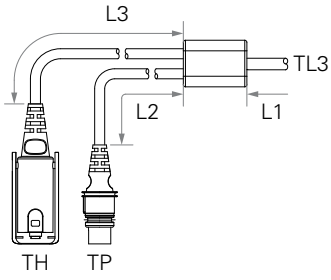


C = Directcut, water proof, anti-pull.
For Columm 2: long DIN 6P
(Pin array 240°),180° socket
(with anti-pull clip)

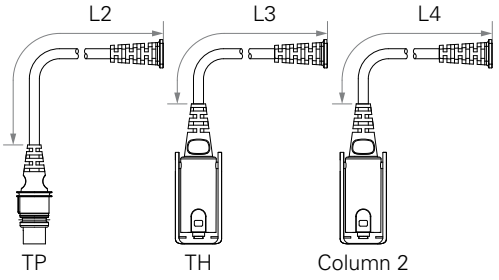
Cable Length
(mm)



B = Cable exit #B, L2 = L3 = 100

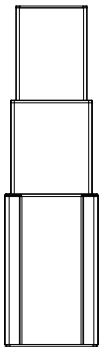


C = Cable exit #C, L1 = L2 = L3 = 100

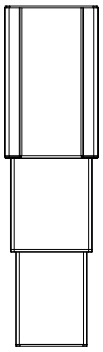


D, E = Cable exit #D, #E, L2 = L3 = L4 = 100

Tubes Direction



0 = Thinner on top



1 = Wider on top

TL18 series

TiMOTION's TL18 series electric lifting columns are designed for industrial applications like electric height adjustable workstations and screen or lifting tables. The TL18 features an extruded aluminum rectangular appearance. Our high capacity, yet economical, TL18 provides stable vertical lifting. This streamlines the engineering design process and replaces the older style, unsafe lifting mechanisms which have many moving stages and pinch points.

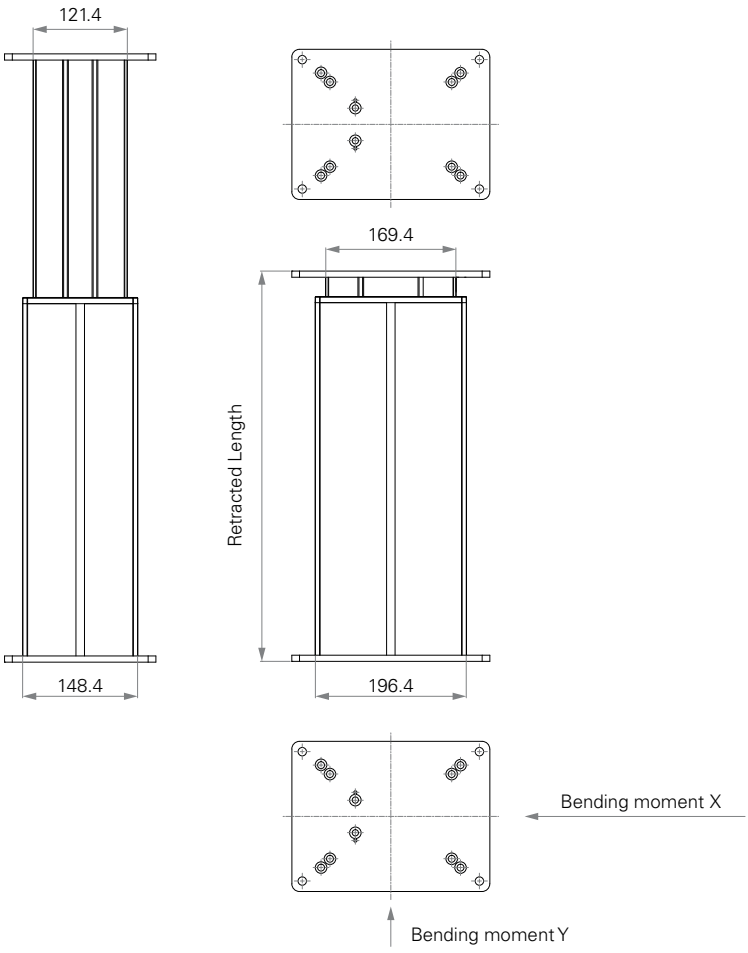
Load and Speed

	CODE	Load (N)	Bending Moment-X Direction (Nm)		Self Locking Force (N)	Typical Current (A)		Typical Speed (mm/s)	
		Push	Dynamic	Static		No Load 24V DC	With Load 24V DC	No Load 24V DC	With Load 24V DC
Motor Speed (3800RPM)	U	4500	250	500	4500	2.5	4.9	11.4	6.6
	Z	3000	250	500	3000	2.5	5.5	17.1	9.5
	W	2000	250	500	2000	2.5	4.8	22.9	13.1
	S	1500	250	500	1500	2.5	4.7	30.0	18.9
	V	500	250	500	500	2.5	4.0	45.0	28.0

NOTE

1. With a 12V motor, the current is approximately twice the current measured in 24V; speed will be similar for both voltages.
2. Self locking force: Tested average value when working with TiMOTION control system.
3. Y direction= X*0.8
4. Please refer to the approved drawing for the final authentic value.

Standard Dimension (mm)



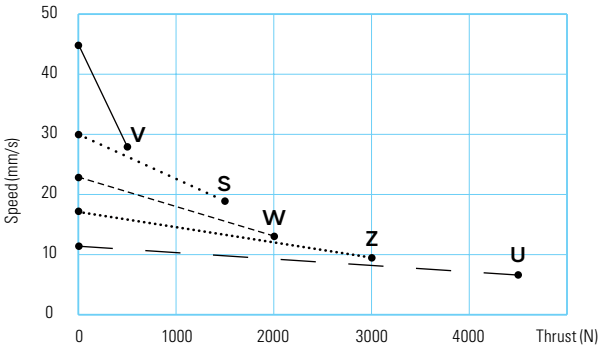
General Features

Maximum load	4,500N in push
Maximum dynamic bending moment	250Nm
Maximum static bending moment	500Nm
Maximum speed at full load	28mm/s (with 500N in a push condition)
Minimum installation dimension	≥ Stroke + 147mm
Stroke	100~700mm
Operational temperature range	+5°C~+45°C
Options	Hall sensor(s), cable exit from top/bottom side, direct cut system

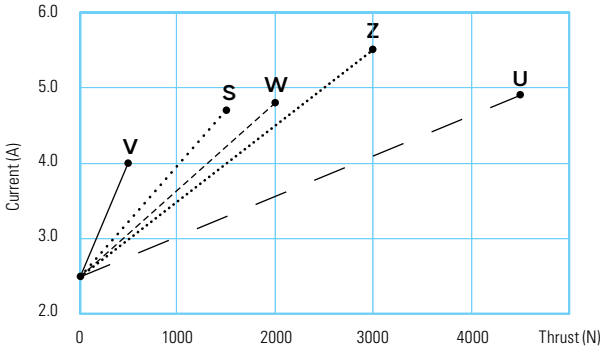
Performance Data

Motor Speed 24V DC 3800RPM

Speed vs. Thrust



Current vs. Thrust



TL18 Ordering Key

TL18

Version: 20180328-G

Voltage	1 = 12V DC	2 = 24V DC	
Load and Speed	See page 121		
Stroke (mm)	100~700		
Restracted Lengh (mm)	See page 125		
Cable Exit See page 126	2 = Bottom side cable	3 = Top side cable	
Special Functions for Spindle Sub-Assembly	0 = Without (standard)	1 = Safty nut	
Functions for Limit Switches See page 125	1 = Two switches at full retracted / extended positions to cut current 3 = Two switches at full retracted / extended positions to send signal		
Color	1 = Black	2 = Matte silver	
IP Rating	1 = Without		
Output Signals	0 = Without	2 = Hall sensor*2	
Top Plate	1 = Small plate	2 = Big plate	
Bottom Plate	1 = Small plate	2 = Big plate	
Connector See page 126	1 = DIN 6P, 90° plug	C = Y cable, for direct cut system	E = Molex 8P, plug
Cable Length (mm)	1 = Straight, 500 2 = Straight, 750 3 = Straight, 1000	4 = Straight, 1250 5 = Straight, 1500 6 = Straight, 1750	7 = Straight, 2000 B = For direct cut system, See page 126

NOTE

1 The TL18 is designed especially for push applications, not suitable for pull applications.

TL18
Ordering Key Appendix

Retracted Length (mm)

1. Retracted length needs to ≥ Stroke+A

A. Plate	Top Plate	Bottom Plate	
		1	2
	1	+147	+151
	2	+151	+155

Functions for Limit Switches

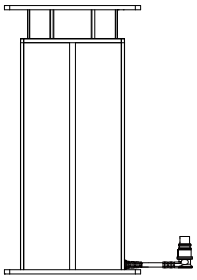
Wire Definitions

		CODE	
	Pin	**1**	**3**
Green	1	Extend (VDC+)	Extend (VDC+)
Red	2	N/A	Common
White	3	N/A	Upper limit switch
Black	4	N/A	N/A
Yellow	5	Retract (VDC+)	Retract (VDC+)
Blue	6	N/A	Lower limit switch

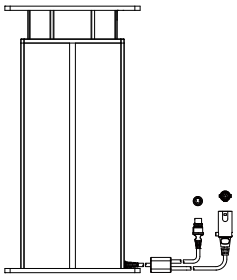
NOTE

1 See ordering key - functions for limit switches.

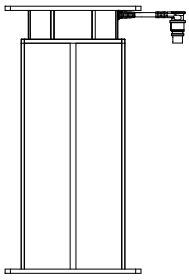
Cable Exit



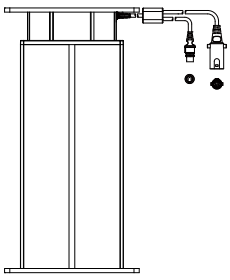
2 =Bottom side cable



2 = Bottom side cable
Y cable, for TH + TP

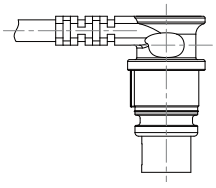


3 = Top side cable

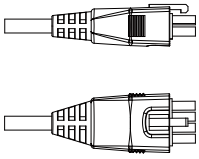


3 = Top side cable
Y cable, for TH + TP

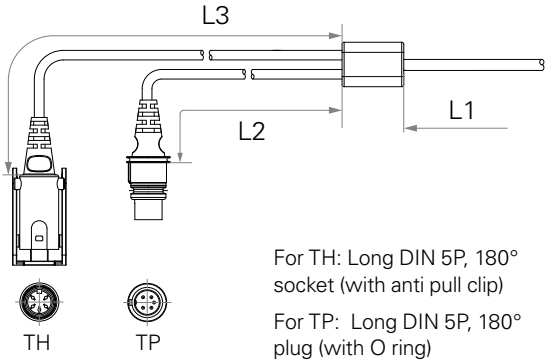
Connector



1 = DIN 6P, 90° plug



E = Molex 8P, plug

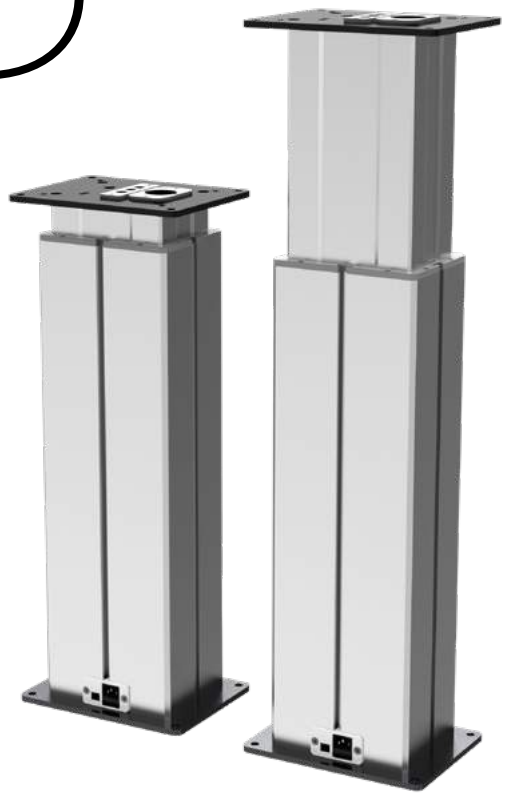


For TH: Long DIN 5P, 180° socket (with anti pull clip)

For TP: Long DIN 5P, 180° plug (with O ring)

C = Y cable, for direct cut system

TL18 AC series



TiMOTION's TL18AC electric lifting column is designed for industrial applications such as height adjustable workstations, screen and lifting tables. The TL18AC features an extruded aluminum rectangular appearance. It is equipped with AC plug to connect the computers, TV or other device directly.

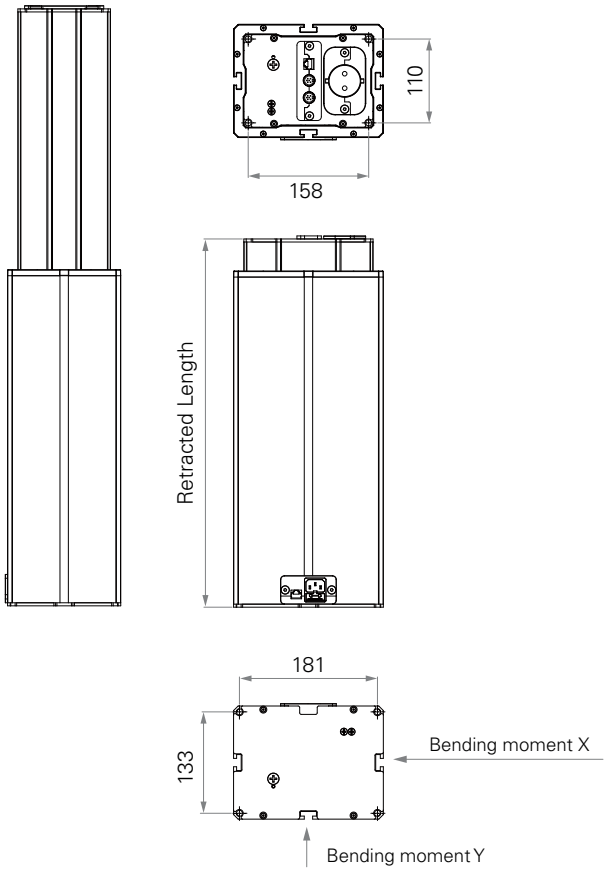
Load and Speed

	CODE	Load (N)	Bending Moment-X Direction (Nm)		Self Locking Force (N)	Typical Current (A)		Typical Speed (mm/s)	
		Push	Dynamic	Static		No Load 24V DC	With Load 24V DC	No Load 24V DC	With Load 24V DC
Motor Speed (3800RPM)	U	4500	250	500	4500	2.5	4.9	11.4	6.6
	Z	3000	250	500	3000	2.5	5.5	17.1	9.5
	W	2000	250	500	2000	2.5	4.8	22.9	13.1
	S	1500	250	500	1500	2.5	4.7	30.0	18.9
	V	500	250	500	500	2.5	4.0	45.0	28.0

NOTE

1 Parameters above are from tested average, please refer to approval drawing for final value.
2 With a 12V motor, the current is approximately twice the current measured in 24V; speed will be similar for both voltages.
3 Y direction= X*0.8
3 Please refer to the approved drawing for the final authentic value.

Standard Dimension (mm)



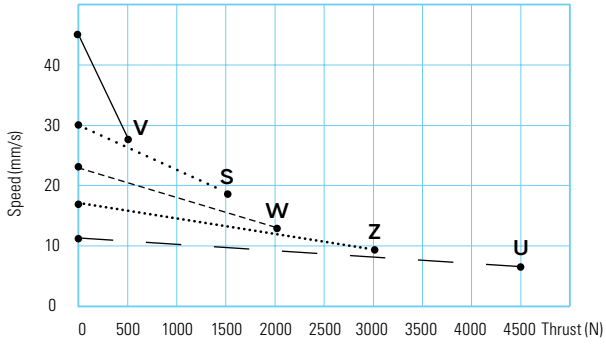
General Features

Maximum load	4,500N in push
Maximum dynamic bending moment	250Nm
Maximum static bending moment	500Nm
Maximum speed at full load	28mm/s (with 500N in a push condition)
Minimum installation dimension	≥ Stroke + 183mm
Stroke	200~700mm
Operational temperature range	+5°C~+45°C
Options	AC cable exit from top end, top side; Ethernet socket

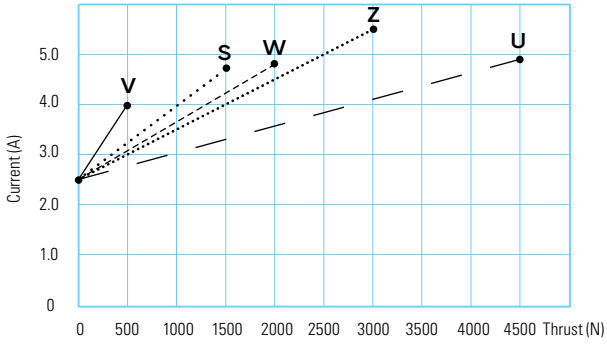
Performance Data

Motor Speed 3800RPM

Speed vs. Thrust



Current vs. Thrust



TL18AC Ordering Key

TL18AC

Version: 20180120-B

Voltage	U = 100-240VAC, SMPS			
Load and Speed	See page 127			
Stroke (mm)	200~700			
Restracted Lengh (mm)	See page 131			
Special Functions for Spindle Sub-Assembly	0 = Without (standard)	1 = Safety nut		
Color	1 = Black	2 = Matte silver		
Tubes & Sockets Position	See page 132			
Top Plate	1 = Small plate	2 = Big plate		
Bottom Plate	1 = Small plate	2 = Big plate		
AC Input Plug & Output Socket	5 = EU	6 = US	8 = UK	
AC Cable Length (mm)	5 = Straight, 1500			
AC Output Socket	0 = Without	1 = With		
Direct Cut	K = 1 motor direct cut system	L = 1+1 motor direct cut system		
Internet Socket	0 = Without	1 = With		

NOTE

1 The TL18AC is designed especially for push applications, not suitable for pull applications.

TL18AC
Ordering Key Appendix

Retracted Length (mm)

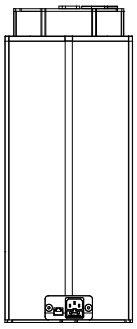
1. Calculate A+B=Y

2. Retracted length needs to ≥ Stroke+Y

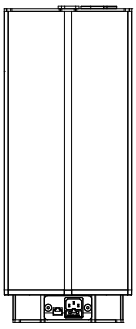
A. Top Plate		Small	Big
		1	2
	1	+8	+12
	2	+12	+16

B. AC Output Socket		Top End	Top Side
		B, C	D, E
	Without 0	+175	+209
	With 1	+175	+229

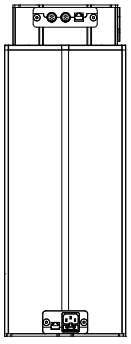
Tube & Socket Position



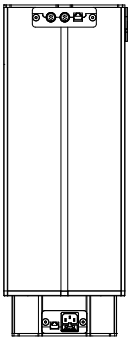
B =Tube: Thinner on top
Sockets: Top end



C = Tube: Thicker on top
Sockets: Top end

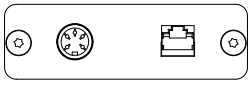


D = Tube: Thinner on top
Sockets: Top side

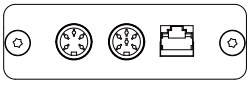


E = Tube: Thicker on top
Sockets: Top side

Direct Cut

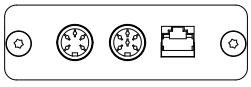


K = 1 Motor direct cut. Control socket - Without motor socket. Top end or top side - AC output & control socket

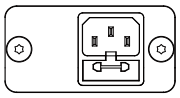


L = 1+1 motor direct cut. Control socket - With motor socket. Top end or top side - AC output & control socket

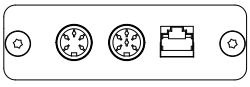
Ethernet Socket



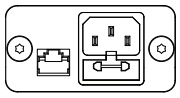
0 = Without Ethernet socket
Top end or top side- AC output & control socket



Bottom side - AC input

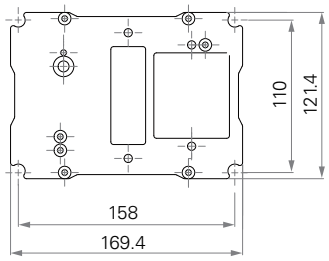


1 = With Ethernet socket
Top end or top side- AC output & control socket

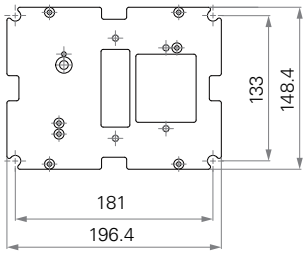


Bottom side - AC input

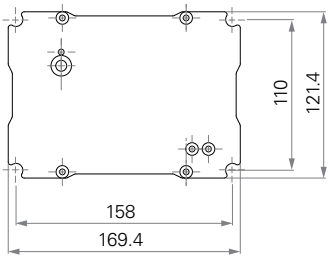
Top Plate Small



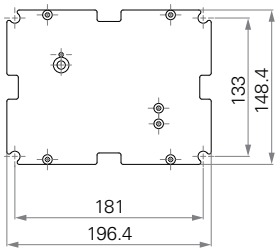
1 = Small plate - B



1 = Small plate - C

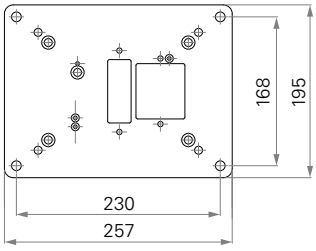


1 = Small plate - D

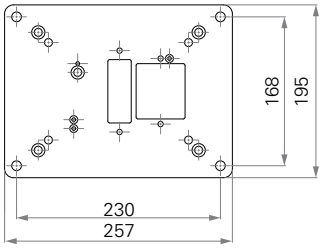


1 = Small plate - E

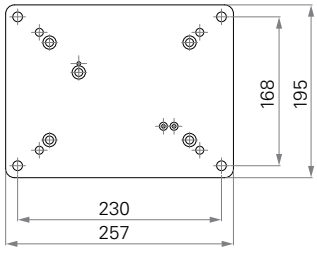
Top Plate Big



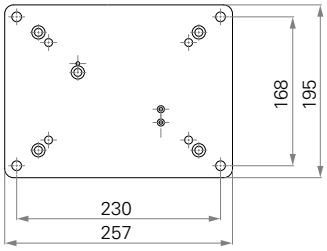
2 = Big plate - B



2 = Big plate - C

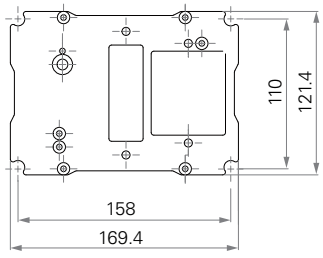


2 = Big plate - D

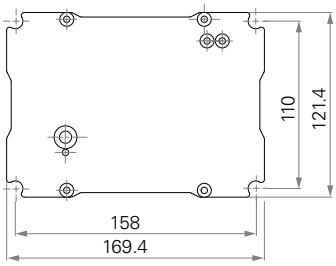


2 = Big plate - E

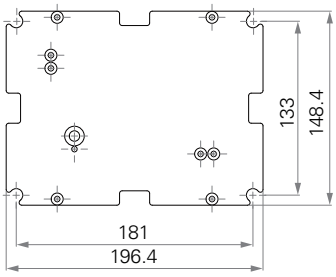
Bottom Plate Small



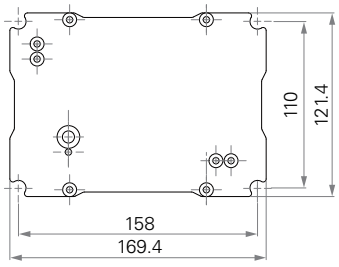
1 = Small plate - B



1 = Small plate - C

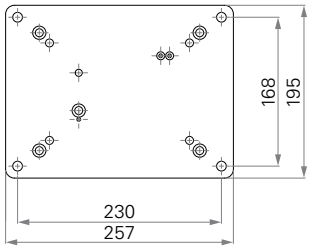


1 = Small plate - D

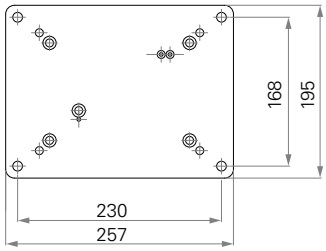


1 = Small plate - E

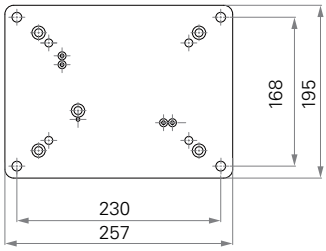
Bottom Plate Big



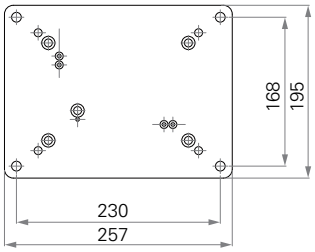
2 = Big plate - B



2 = Big plate - C



2 = Big plate - D



2 = Big plate - E

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FSC

Every Day is Earth Day

TiMOTION uses FSC certified paper in order to help care for our forests, as well as the people and wildlife who call them home.

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