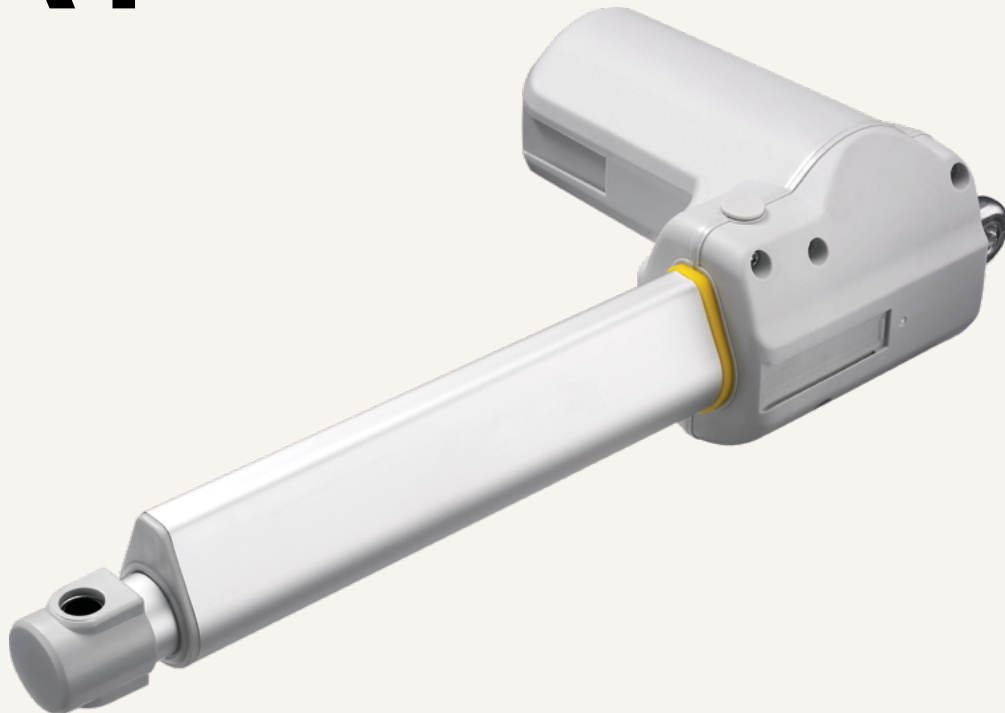


TA1

series



Product Segments

- **Care Motion**
- **Comfort Motion**
- **Ergo Motion**

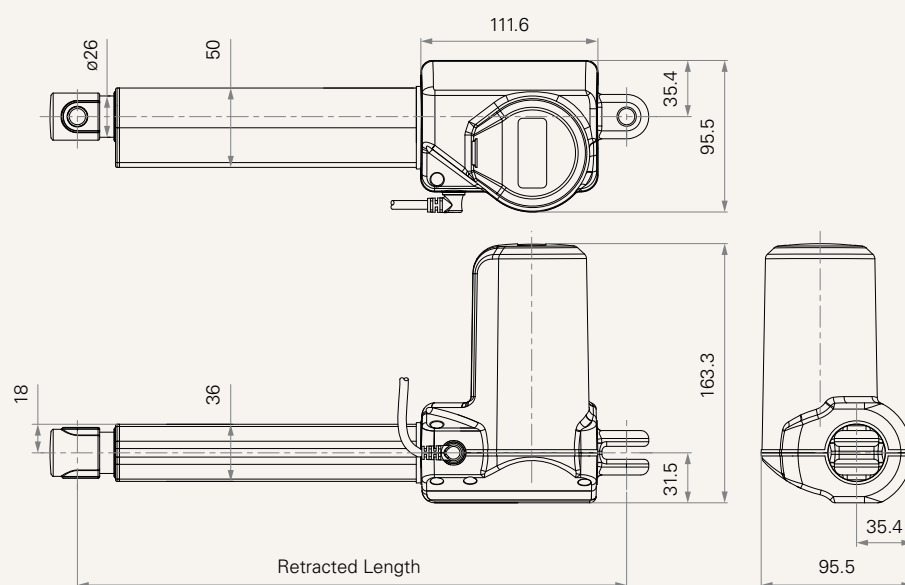
The TA1 series linear actuator is TiMOTION's flagship model suited for healthcare applications. Industry certifications for the TA1 include IEC60601-1. In addition, the TA1 linear actuator supports IP rating up to IP66W. Other options include a manual or quick release system and Hall or Reed feedback sensors.

General Features

Max. load	10,000N (push) 4,000N (pull)
Max. speed at max. load	3.2mm/s
Max. speed at no load	39mm/s
Retracted length	≥ Stroke + 163mm
IP rating	IP66W
Certificate	IEC60601-1, ES60601-1, EN60601-1-2, EMC
Stroke	25~1000mm
Options	Safety nut, quick release, Reed, Hall sensors
Voltage	12/24/36V DC; 24V DC (PTC)
Color	Black or grey
Operational temperature range	+5°C~+45°C

Drawing

Standard Dimensions
(mm)



Load and Speed

CODE	Load (N)		Self Locking Force (N)	Typical Current (A)		Typical Speed (mm/s)	
	Push	Pull		No Load 32V DC	With Load 24V DC	No Load 32V DC	With Load 24V DC
Motor Speed (2600RPM, Duty Cycle 10%)							
C	5000	4000	5000	0.8	3.5	8.0	4.1
D	6000	4000	6000	0.8	3.5	6.0	3.1
F	2500	2500	2500	0.8	3.2	15.9	8.3
G	2000	2000	2000	0.8	2.8	21.4	12.1
H	1000	1000	1000	0.8	2.1	32.1	19.1
J	3500	3500	3500	0.8	3.6	11.9	6.0
K	8000	4000	8000	0.8	4.2	5.4	2.6
Motor Speed (3400RPM, Duty Cycle 10%)							
L	6000	4000	6000	1.0	4.2	7.3	4.1
N	2500	2500	2500	1.0	4.1	19.4	11.1
O	2000	2000	2000	1.0	4.0	26.1	14.9
P	1000	1000	1000	1.0	3.0	39.0	23.4
Q	3500	3500	3500	1.0	4.6	14.5	7.9
R	8000	4000	8000	1.0	5.2	6.6	3.4
T	5000	4000	5000	1.0	4.2	9.8	5.4
Motor Speed (3800RPM, Duty Cycle 10%)							
Y	8000	4000	8000	1.2	5.5	7.7	4.3
B	10000	4000	10000	1.2	5.3	5.7	3.2
U	5000	4000	5000	1.2	4.7	11.3	6.6
W	2500	2500	2500	1.2	4.6	23.0	13.4
Z	3500	3500	3500	1.2	5.3	16.8	9.8

Note

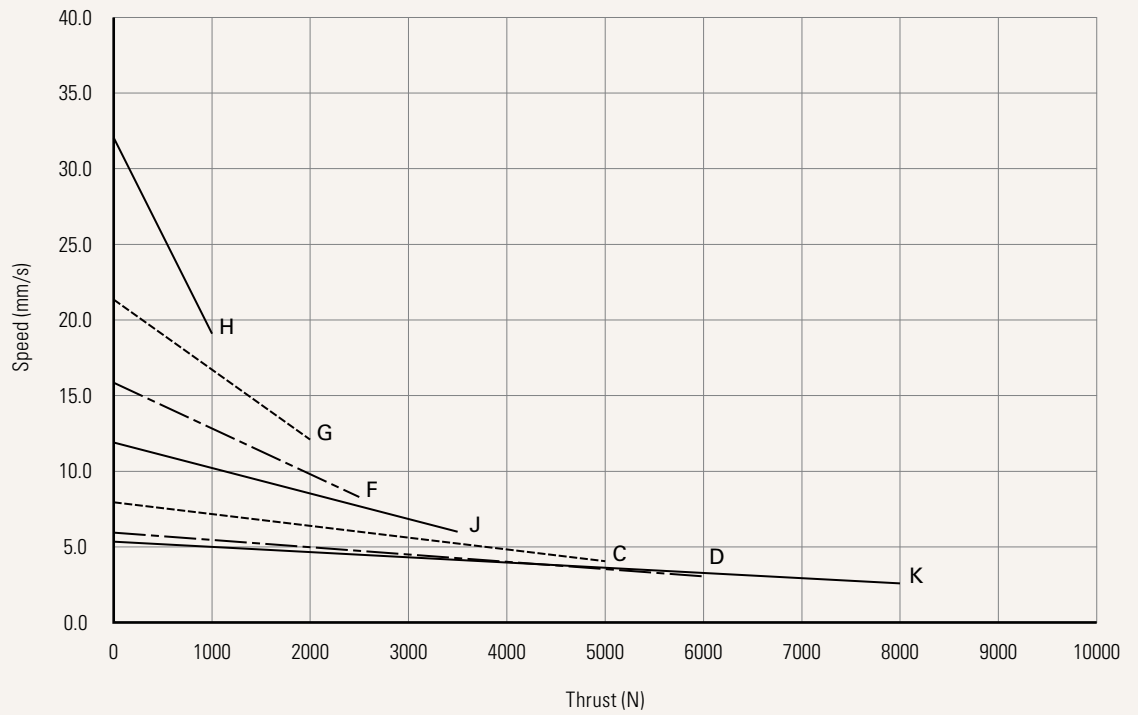
- 1 Please refer to the approved drawing for the final authentic value.
- 2 This self-locking force level is reached only when a short circuit is applied on the terminals of the motor. All the TiMOTION control boxes have this feature built-in.
- 3 The current & speed in table are tested with 24V DC motor. With a 12V DC motor, the current is approximately twice the current measured in 24V DC. With a 36V DC motor, the current is approximately two-thirds the current measured in 24V DC. Speed will be similar for all the 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 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)
- 6 Standard stroke: Min. $\geq 25\text{mm}$, Max. please refer to below table.

CODE	Load (N)	Max Stroke (mm)
K, R, Y, B	≥ 8000	450
D, L	≈ 6000	600
Others	< 6000	1000

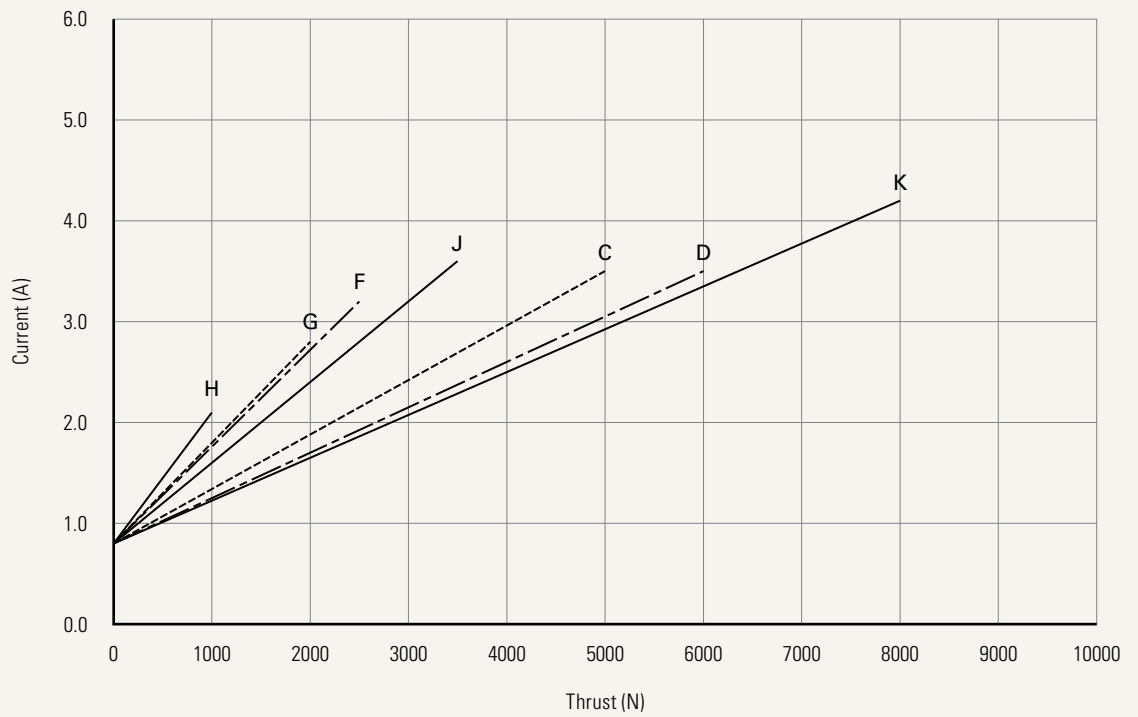
Performance Data (24V DC Motor)

Motor Speed (2600RPM, Duty Cycle 10%)

Speed vs. Thrust



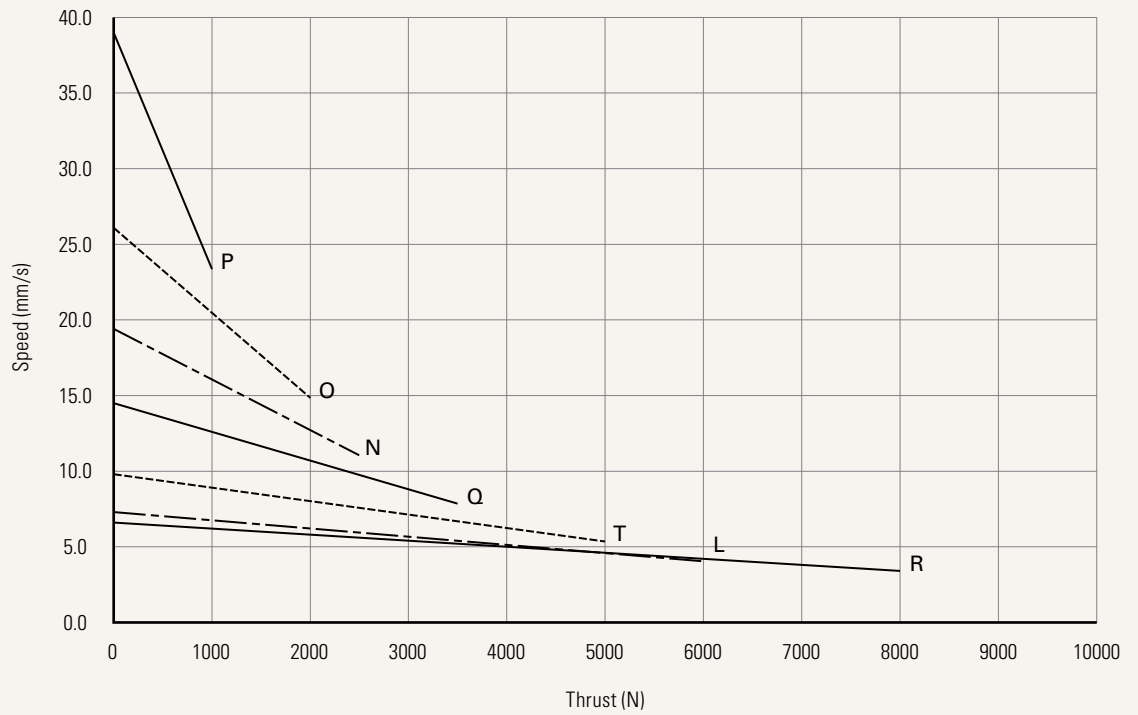
Current vs. Thrust



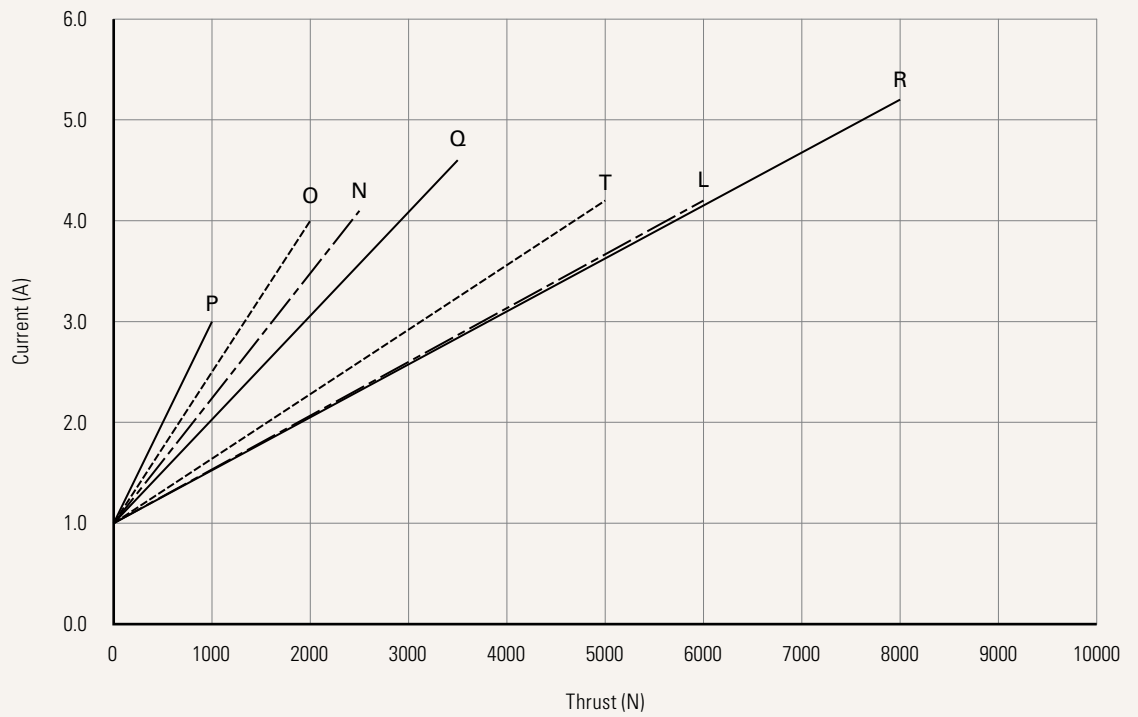
Performance Data (24V DC Motor)

Motor Speed (3400RPM, Duty Cycle 10%)

Speed vs. Thrust



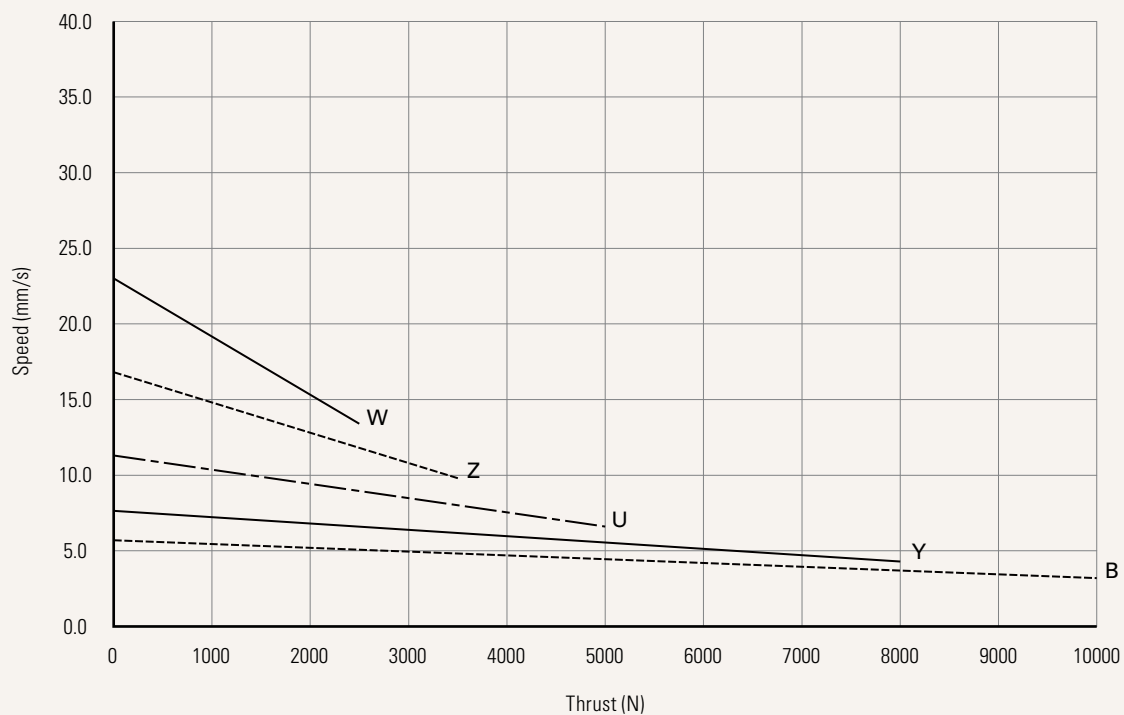
Current vs. Thrust



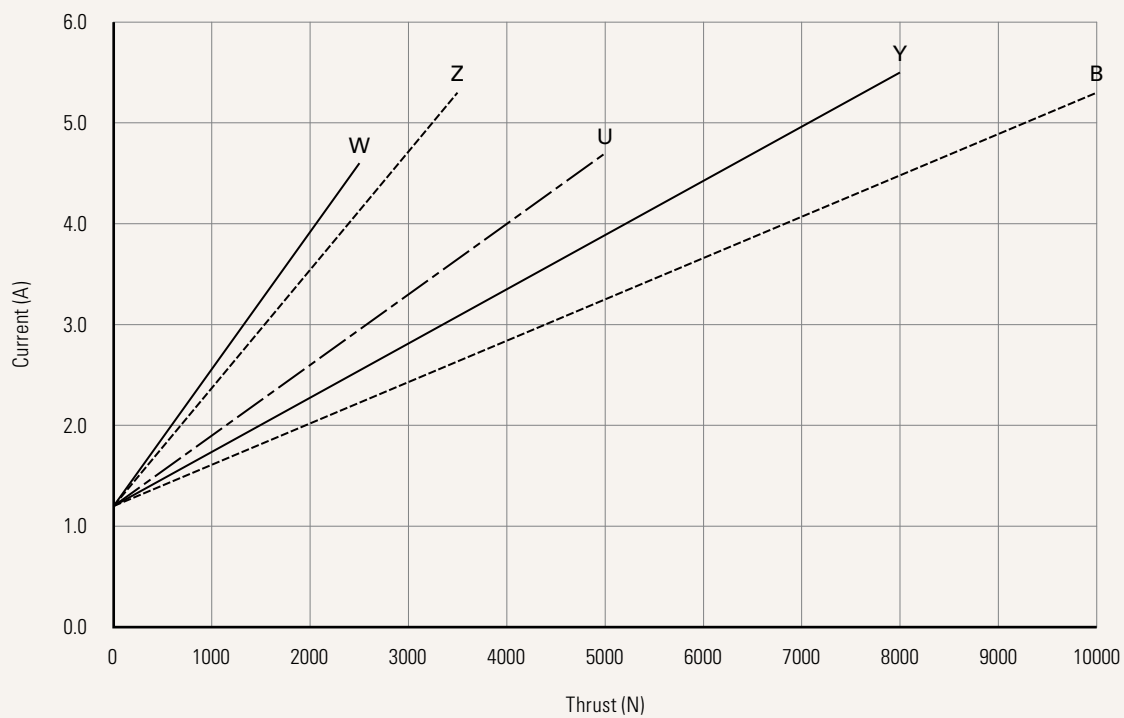
Performance Data (24V DC Motor)

Motor Speed (3800RPM, Duty Cycle 10%)

Speed vs. Thrust



Current vs. Thrust



Voltage	1 = 12V DC	2 = 24V DC	3 = 36V DC	5 = 24V DC, PTC
Load and Speed	See page 3			
Stroke (mm)	See page 3			
Retracted Length (mm)	See page 8			
Rear Attachment (mm) See page 9	0 = Plastic, U clevis, slot 8.2, depth 15.5, hole 10.2, for load push < 4000N & pull < 2500N 1 = Plastic, U clevis, slot 8.2, depth 15.5, hole 12.2, for load push < 4000N & pull < 2500N 2 = Aluminum casting, U clevis, slot 8.2, depth 15.5, hole 10.2 3 = Aluminum casting, U clevis, slot 8.2, depth 15.5, hole 12.2 4 = Aluminum casting, U clevis, slot 10.2, depth 15.5, hole 10.2 5 = Aluminum casting, U clevis, slot 10.2, depth 15.5, hole 12.2 C = Aluminum casting, U clevis, slot 8.2, depth 15.5, hole 10.2, with plastic T-busing H = Aluminum casting, without slot, hole 10.2, for hand crank I = Aluminum CNC, slot 8.2, depth 15.5, hole 10, for small backlash J = Aluminum CNC, slot 8.2, depth 15.5, hole 12, for small backlash K = Plastic, U clevis, slot 8.2, depth 12.5, hole 10.2, for load push < 4000N & pull < 2500N, for spindle set hall sensors L = Plastic, U clevis, slot 8.2, depth 12.5, hole 12.2, for load push < 4000N & pull < 2500N, for spindle set hall sensors			
Front Attachment (mm) See page 10	1 = Punched hole on inner tube + plastic cap, without slot, hole 10.2, with plastic bushing 2 = Punched hole on inner tube + plastic cap, without slot, hole 12.2 3 = Plastic, U clevis, slot 8.2, depth 20.2, hole 10.2, for load push < 4000N & pull < 2500N 4 = Plastic, U clevis, slot 8.2, depth 20.2, hole 12.2, for load push < 4000N & pull < 2500N 5 = Punched hole on inner tube, without slot, hole 10.2, with plastic bushing 6 = Punched hole on inner tube, without slot, hole 12.2 7 = Aluminum casting, U clevis, slot 6.2, depth 17.0, hole 10.2 8 = Aluminum casting, U clevis, slot 6.2, depth 17.0, hole 12.2 9 = Aluminum casting, U clevis, slot 6.2, depth 17.0, hole 10.2, with plastic T-bushing J = Aluminum casting, without slot, hole 10.2, for dental chair K = Aluminum CNC, without slot, hole 10, for small backlash L = Aluminum CNC, without slot, hole 12, for small backlash			
Direction of Rear Attachment (Counterclockwise) See page 11	1 = 0°	2 = 45°	3 = 90°	4 = 135°
Color	1 = Black	2 = Pantone 428C		
IP Rating	1 = Without	2 = IP54	3 = IP66	4 = Without housings 5 = IP66W
Emergency Release Function	0 = Without 1 = Quick release - for cable (Cable excluded)		2 = Quick release - for handle	
Special Functions for Spindle Sub-Assembly	0 = Without (Standard) 1 = Safety nut		2 = Standard push only 3 = Standard push only + safety nut	
Functions for Limit Switches See page 11	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 5 = Two switches at full retracted / extended positions to send signal (For TC1, TC8, TC10, TC14; compatible with hall sensors)	
Output Signal	0 = Without 2 = Hall sensor * 2		3 = Reed Sensor H = Spindle set Hall sensors * 2	
Connector See page 12	1 = DIN 6P, 90° plug 2 = Tinned leads 4 = Big 01P, plug C = Y cable (for direct cut system, water proof, anti pull)	J = Extension cable, not preset on motor cover (cable legth 120mm) R = Extension cable, preset on motor cover(cable legth 75mm) E = Molex 8P, plug	F = DIN 6P, 180° plug, for TEC extension cable standard option G = Audio plug M = DIN 4P, plug for dental chair (40510-143, standard)	N = DIN 4P, plug for dental chair (40510-040) P = Molex 8P, 90° plug, without anti-clip
Cable Length (mm)	0 = Straight, 100 1 = Straight, 500 2 = Straight, 750 3 = Straight, 1000 4 = Straight, 1250	5 = Straight, 1500 6 = Straight, 2000 7 = Curly, 200 8 = Curly, 400	B-H = For direct cut system. See page 12 J = For socket attached on motor, not preset attached on motor cover,120. See page 12 R = For socket attached on motor, preset attached on motor cover,75. See page 12	

Retracted Length (mm)

1. Calculate $A+B+C+D+E = Y$
2. Retracted length needs to $\geq \text{Stroke}+Y$

A.				
Front Attach.	Rear Attach.			
	0, 1, 2, 3, 4, 5, C	H	I, J	K, L
1, 2, 5, 6	+163	+171	-	+166
3, 4	+185	+193	-	+188
7, 8, 9	+175	+183	-	+178
J	+166	+174	-	+169
K, L	-	-	+174	-

B.				
Stroke (mm)	Load (N)			
	< 6000	= 6000	= 8000	= 10000
25~150	-	-	-	+6
151~200	-	-	+5	+11
201~250	-	+5	+10	+16
251~300	-	+10	+15	+21
301~350	+5	+15	+20	+26
351~400	+10	+20	+25	+31
401~450	+15	+25	+30	+36
451~500	+20	+30	x	x
501~550	+25	+35	x	x
551~600	+30	+40	x	x
601~650	+35	x	x	x
651~700	+40	x	x	x
701~750	+45	x	x	x
751~800	+50	x	x	x
801~850	+55	x	x	x
851~900	+60	x	x	x
901~950	+65	x	x	x
951~1000	+70	x	x	x

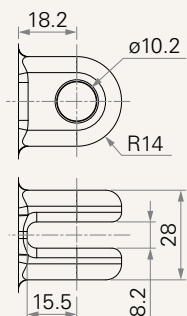
C.				
Emergency Release	Load (N)			
	< 6000	= 6000	= 8000	= 10000
0	-	-	-	-
1, 2	+24	+24	+24	+24

D.				
Spindle Functions	Load (N)			
	< 6000	= 6000	= 8000	= 10000
0	-	-	-	-
1	-	-	-	-
2, 3	-	+3	+3	+3

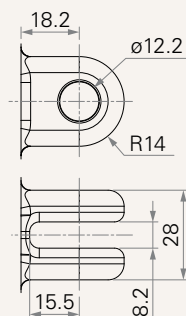
E.				
Spindle Functions	Emergency Release			
	0		1, 2	
0, 1	-		-	
2, 3	-		+3	

Rear Attachment (mm)

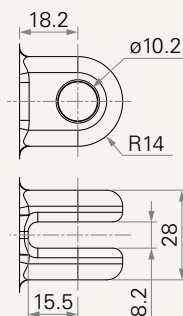
0 = Plastic, U clevis, slot 8.2, depth 15.5, hole 10.2, for load push < 4000N & pull < 2500N



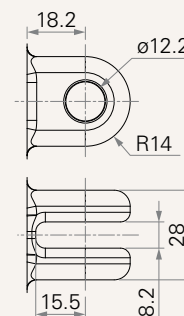
1 = Plastic, U clevis, slot 8.2, depth 15.5, hole 12.2, for load push < 4000N & pull < 2500N



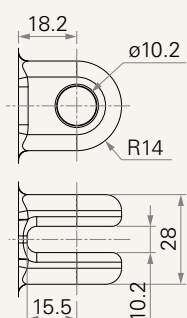
2 = Aluminum casting, U clevis, slot 8.2, depth 15.5, hole 10.2



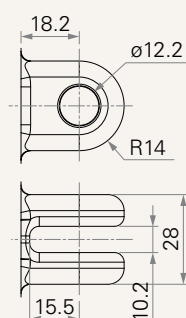
3 = Aluminum casting, U clevis, slot 8.2, depth 15.5, hole 12.2



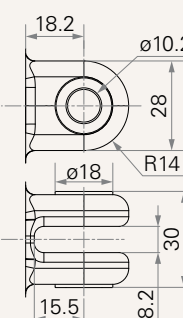
4 = Aluminum casting, U clevis, slot 10.2, depth 15.5, hole 10.2



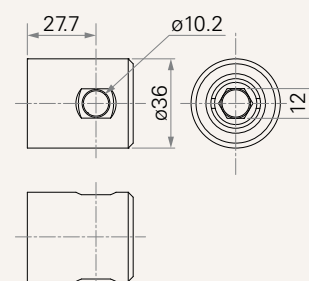
5 = Aluminum casting, U clevis, slot 10.2, depth 15.5, hole 12.2



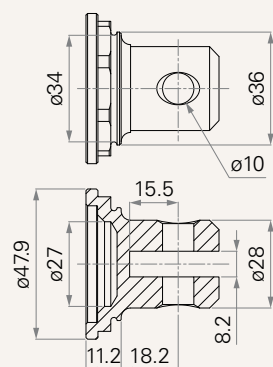
C = Aluminum casting, U clevis, slot 8.2, depth 15.5, hole 10.2, with plastic T-busing



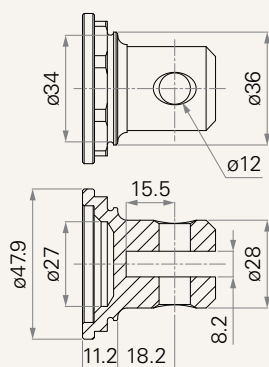
H = Aluminum casting, without slot, hole 10.2, for hand crank



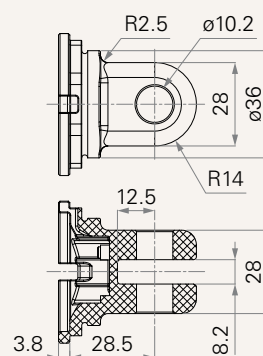
I = Aluminum CNC, slot 8.2, depth 15.5, hole 10, for small backlash



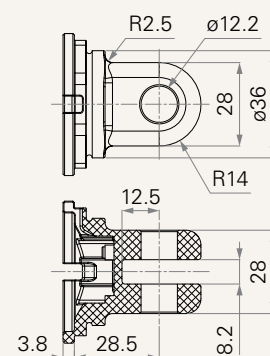
J = Aluminum CNC, slot 8.2, depth 15.5, hole 12, for small backlash



K = Plastic, U clevis, slot 8.2, depth 12.5, hole 10.2, for load push < 4000N & pull < 2500N, for spindle set hall sensors

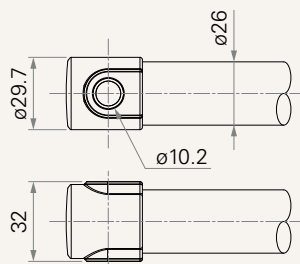


L = Plastic, U clevis, slot 8.2, depth 12.5, hole 12.2, for load push < 4000N & pull < 2500N, for spindle set hall sensors

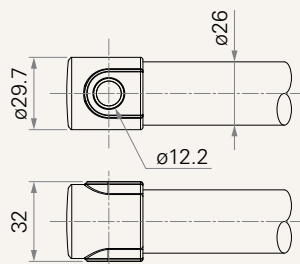


Front Attachment (mm)

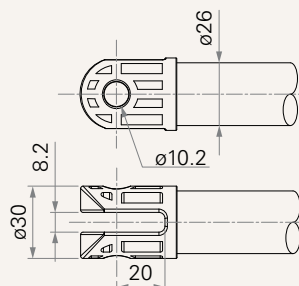
1 = Punched hole on inner tube + plastic cap, without slot, hole 10.2, with plastic bushing



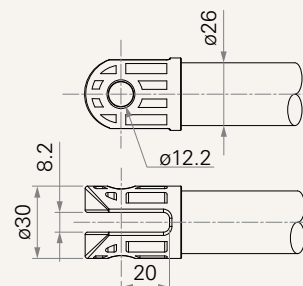
2 = Punched hole on inner tube + plastic cap, without slot, hole 12.2



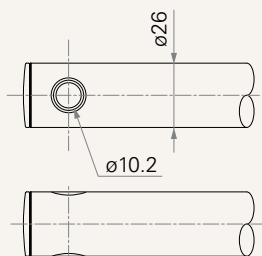
3 = Plastic, U clevis, slot 8.2, depth 20.2, hole 10.2, for load push < 4000N & pull < 2500N



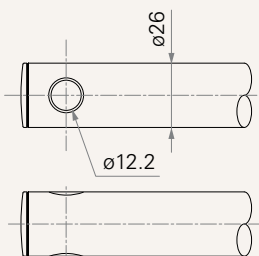
4 = Plastic, U clevis, slot 8.2, depth 20.2, hole 12.2, for load push < 4000N & pull < 2500N



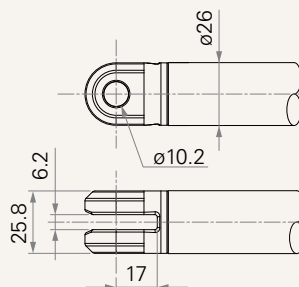
5 = Punched hole on inner tube, without slot, hole 10.2, with plastic bushing



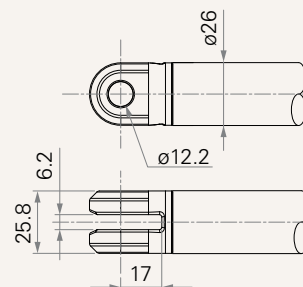
6 = Punched hole on inner tube, without slot, hole 12.2



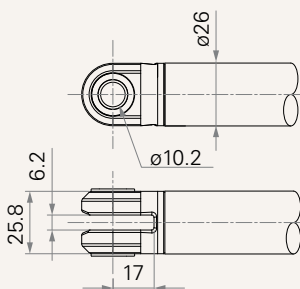
7 = Aluminum casting, U clevis, slot 6.2, depth 17.0, hole 10.2



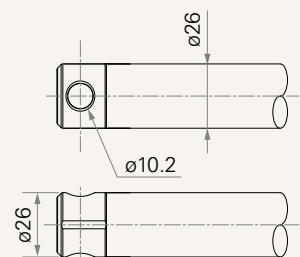
8 = Aluminum casting, U clevis, slot 6.2, depth 17.0, hole 12.2



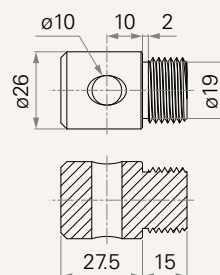
9 = Aluminum casting, U clevis, slot 6.2, depth 17.0, hole 10.2, with plastic T-bushing



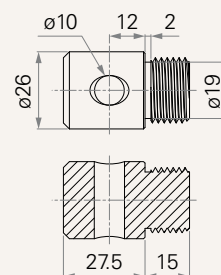
J = Aluminum casting, without slot, hole 10.2, for dental chair



K = Aluminum CNC, without slot, hole 10, for small backlash

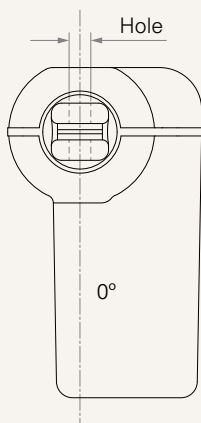


L = Aluminum CNC, without slot, hole 12, for small backlash

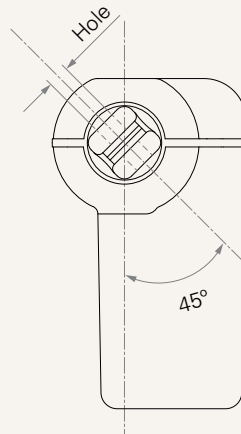


Direction of Rear Attachment (Counterclockwise)

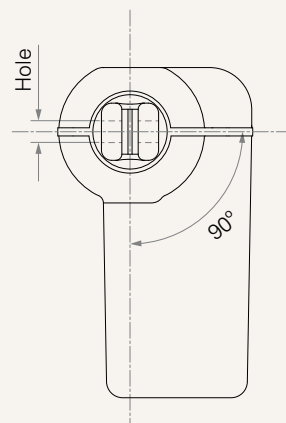
1 = 0°



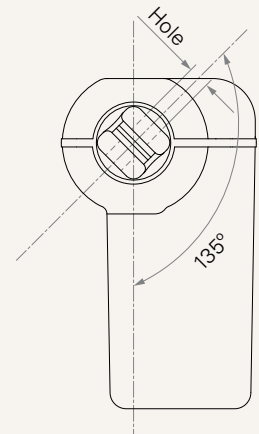
2 = 45°



3 = 90°



4 = 135°



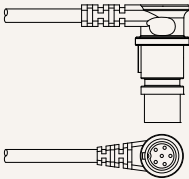
Functions for Limit Switches

Wire Definitions

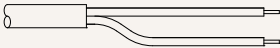
CODE	Pin					
	1 (Green)	2 (Red)	3 (White)	4 (Black)	5 (Yellow)	6 (Blue)
1	extend (VDC+)	N/A	N/A	N/A	retract (VDC+)	N/A
2	extend (VDC+)	N/A	middle switch pin B	middle switch pin A	retract (VDC+)	N/A
3	extend (VDC+)	common	upper limit switch	N/A	retract (VDC+)	lower limit switch
4	extend (VDC+)	common	upper limit switch	medium limit switch	retract (VDC+)	lower limit switch
5	extend (VDC+)	N/A	upper limit switch	common	retract (VDC+)	lower limit switch

Connector

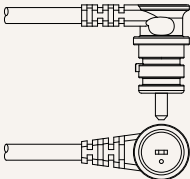
1 = DIN 6P, 90° plug



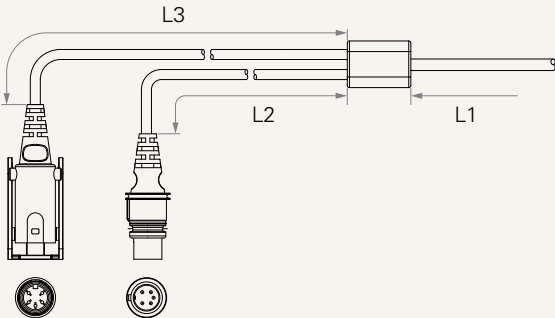
2 = Tinned leads



4 = Big 01P, plug

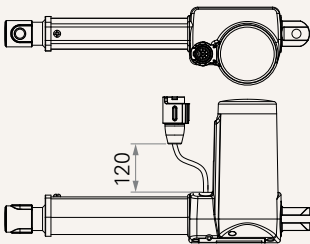


C = Y cable (for direct cut system, water proof, anti pull)

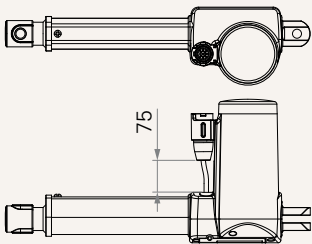


Cable Length for Direct Cut System (mm)			
CODE	L1	L2	L3
B	100	100	100
C	100	1000	400
D	100	2700	500
E	1000	100	100
F	100	600	1000
G	1500	1000	1000
H	100	100	1200

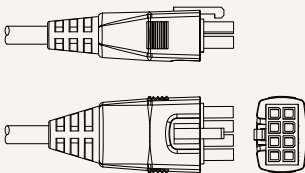
J = Extension cable, not preset on motor cover (cable legth 120mm)



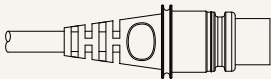
R = Extension cable, preset on motor cover(cable legth 75mm)



E = Molex 8P, plug



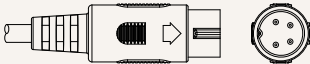
F = DIN 6P, 180° plug, for TEC extension cable standard option



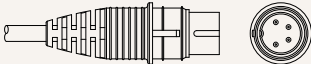
G = Audio plug



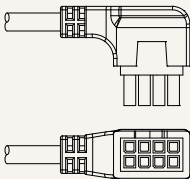
M = DIN 4P, plug for dental chair (40510-143, standard)



N = DIN 4P, plug for dental chair (40510-040)



P = Molex 8P, 90° plug, without anti-clip



Terms of Use

The user is responsible for determining the suitability of TiMOTION products for a specific application. TiMOTION products are subject to change without prior notice.