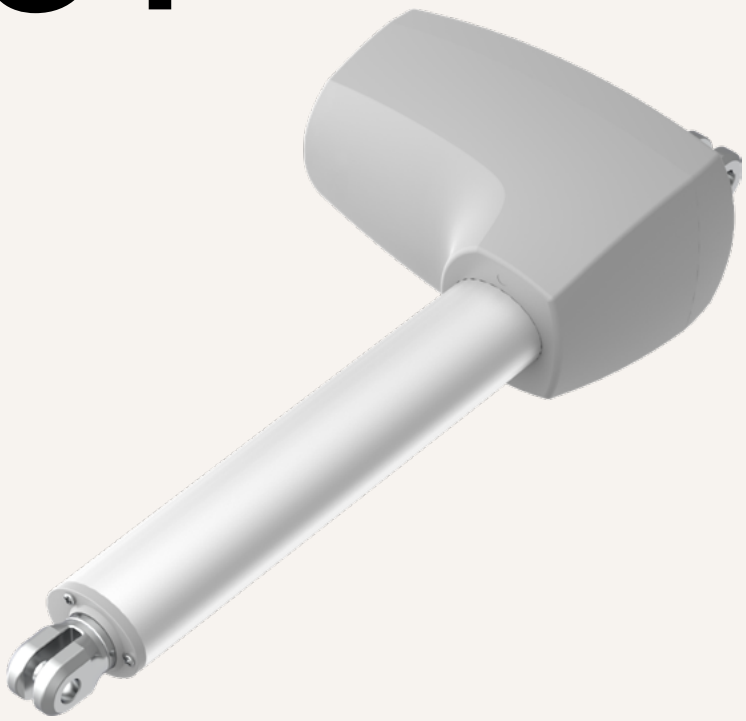
# TA51

series



Product Segments

- **Care Motion**

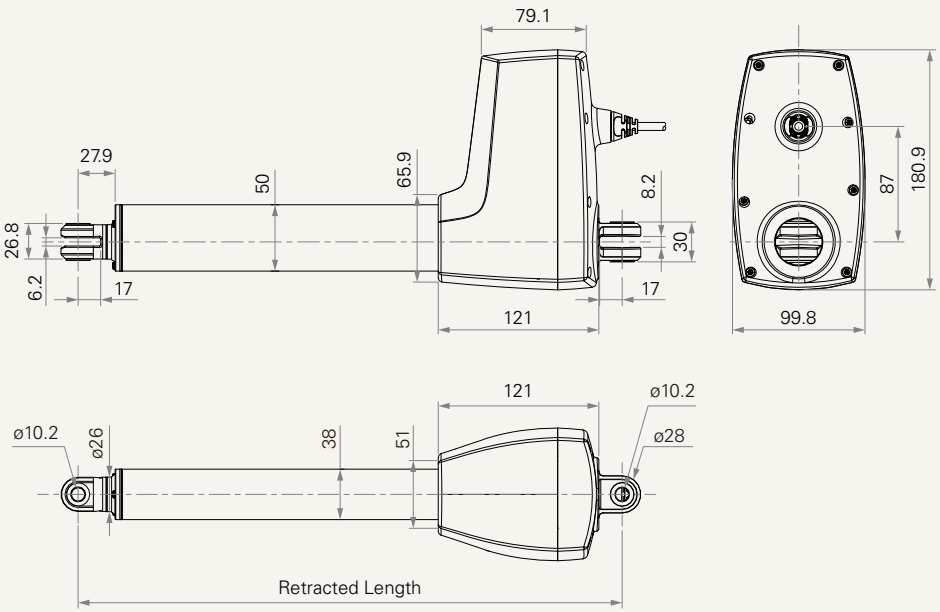
The TA51 is a high-performance medical electric linear actuator engineered for strength and reliability. With a powerful lifting capacity of up to 10,000N and an IP rating of up to IP66W, it is built to withstand demanding medical environments. Designed for versatility, the TA51 is ideal for operating beds and high-load patient lifting systems, delivering the precision and durability essential for critical medical applications.

**General Features**

| | |
|---|---|
| Max. load | 10,000N (push); 6,000N (pull) |
| Max. speed at max. load | 5.7mm/s |
| Max. speed at no load | 14.7mm/s |
| Retracted length | ≥ Stroke + 190mm |
| IP rating | IP66W |
| Certificate | IEC60601-1, ES60601-1, IEC60601-1-2 |
| Stroke | 25~450mm |
| Output signals | Hall sensors, POT |
| Options | Manual release (for patient hoist) |
| Voltage | 24V DC; 24V DC (PTC) |
| Color | Black or grey |
| Operational temperature range at full performance | +5°C~+45°C |
| Suitable for patient hoist application | |

## 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 (4300RPM, Long motor)** | | | | | | | |
| **B** | 6000 | 6000 | 6000 | 2 | 7.1 | 14.7 | 8.9 |
| **C** | 8000 | 6000 | 8000 | 1.8 | 8.6 | 13.2 | 7.6 |
| **D** | 10000 | 6000 | 10000 | 1.5 | 8.6 | 9.8 | 5.7 |
| **Motor Speed (3800RPM, Long motor)** | | | | | | | |
| **F** | 6000 | 6000 | 6000 | 1.8 | 6.4 | 13.4 | 7.8 |
| **G** | 8000 | 6000 | 8000 | 1.6 | 7.8 | 12.0 | 6.5 |
| **H** | 10000 | 6000 | 10000 | 1.3 | 7.8 | 9.0 | 4.8 |

## 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)

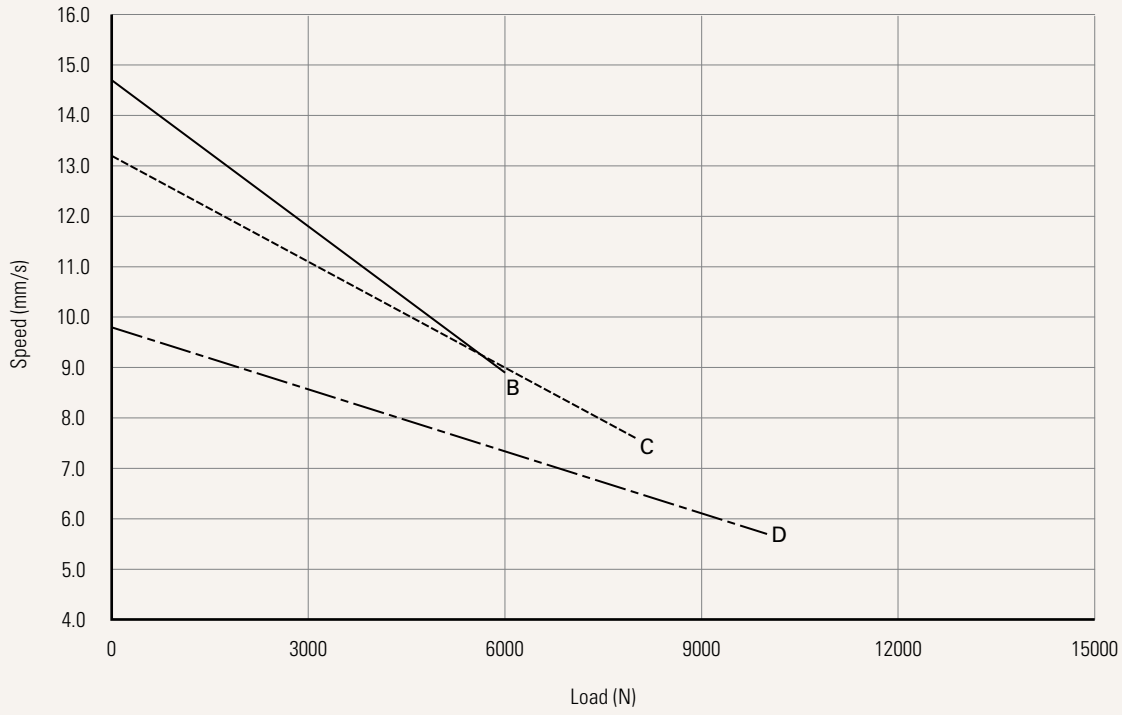
6 Standard stroke: Min. ≥ 25mm, Max. please refer to below table.

| CODE | Load (N) | Max Stroke (mm) |
|---|---|---|
| **B / F** | 6000 | 350 |
| **C / G** | 8000 | 300 |
| **D / H** | 10000 | 450 |

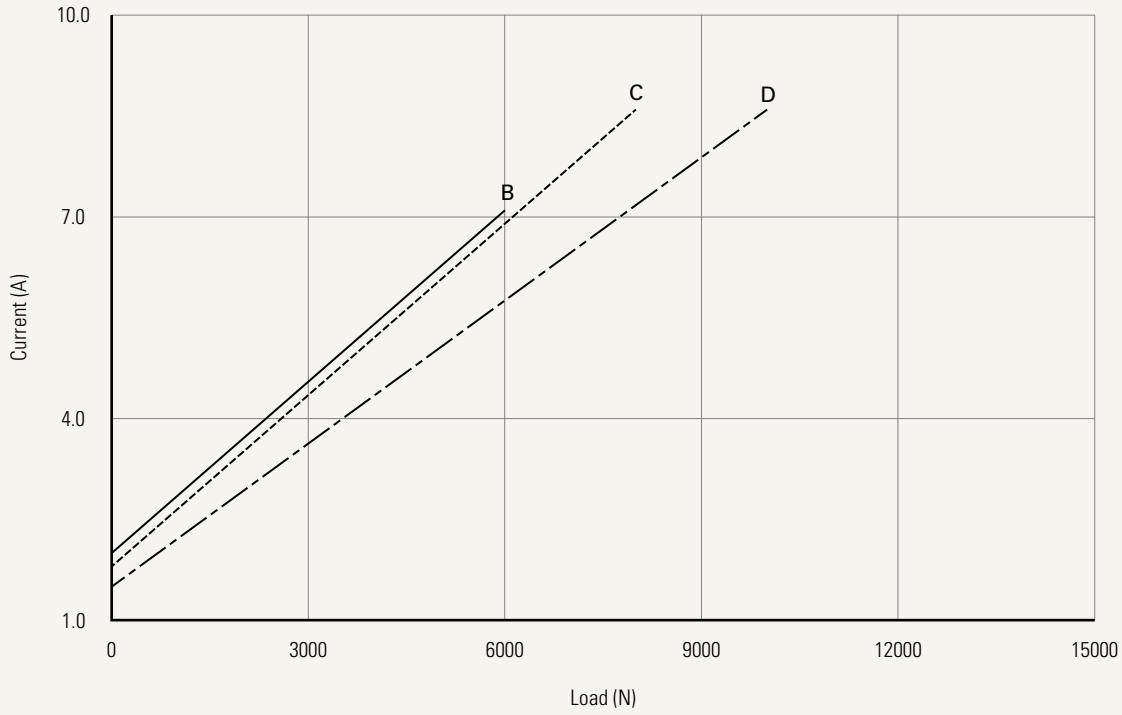
**Performance Data (24V DC Motor)**

Motor Speed (4300RPM, Long motor)

Speed vs. Load



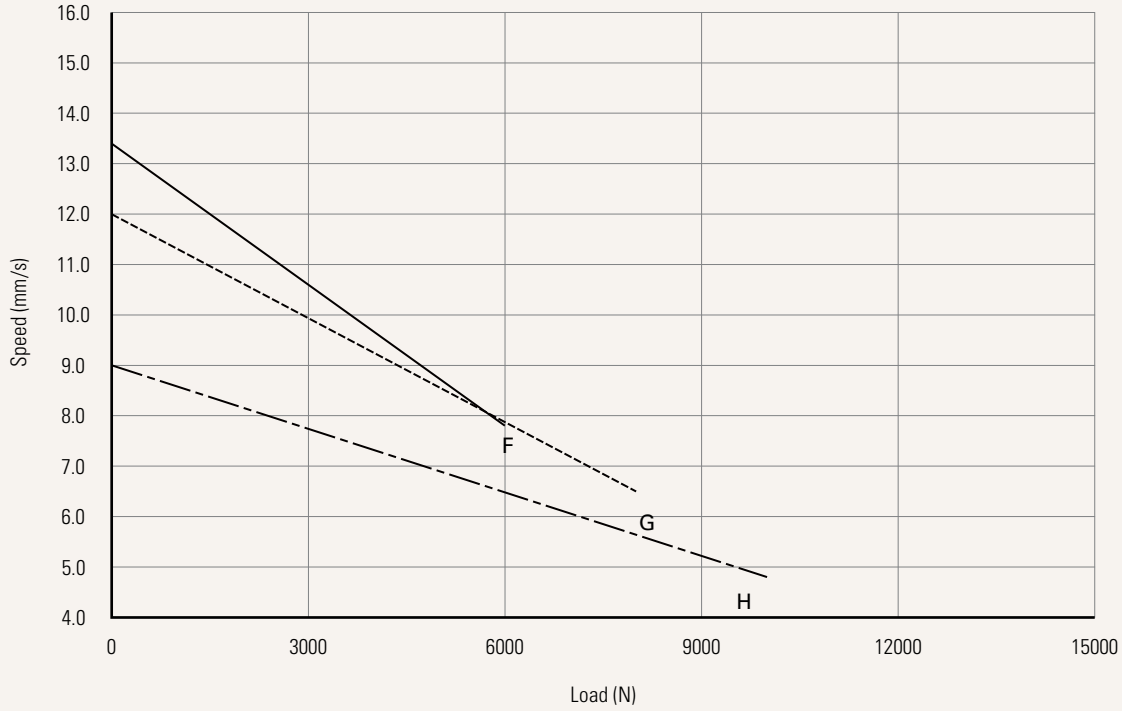

Current vs. Load



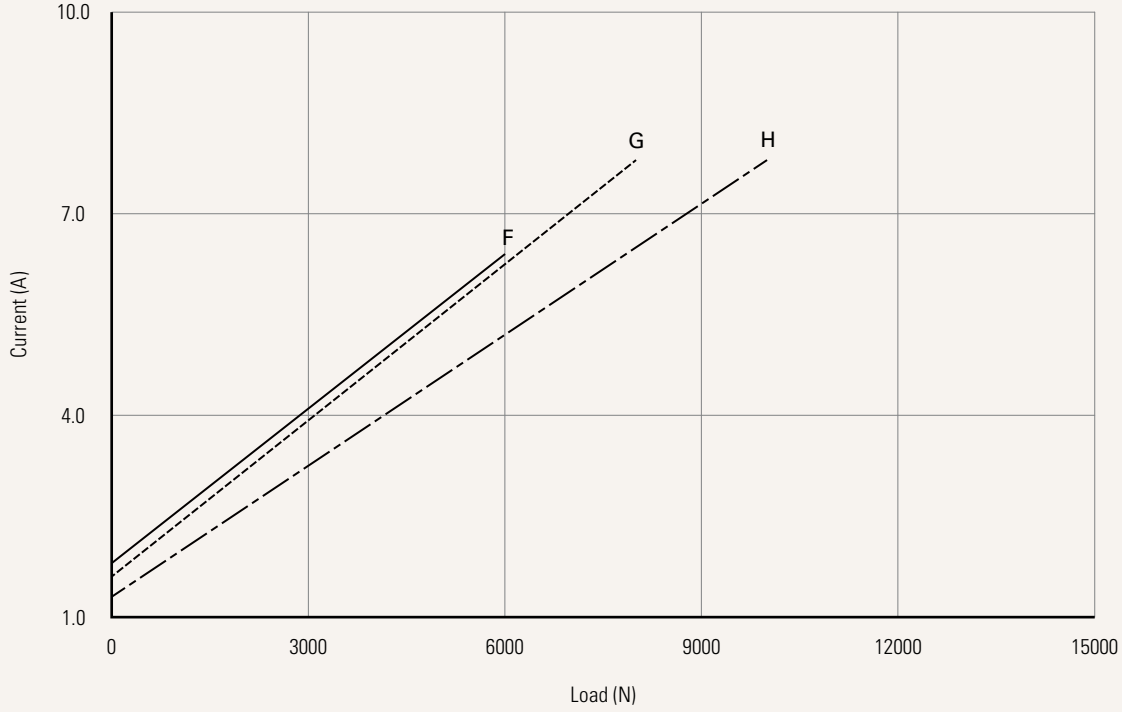
**Performance Data (24V DC Motor)**

Motor Speed (3800RPM, Long motor)

Speed vs. Load




Current vs. Load



# **TA51** Ordering Key

TiMOTION

TA51

Version: 20250730-F

| | | | | |
|---|---|---|---|---|
| **Voltage** | 2 = 24V DC | 5 = 24V DC, PTC | | |
| **Load and Speed** | See page 2 | | | |
| **Stroke (mm)** | See page 2 | | | |
| **Retracted Length (mm)** | See page 7 | | | |
| **Rear Attachment (mm)** See page 8 | 7 = Aluminum casting, clevis U, slot 8.2, depth 17.0, hole 12.2<br>C = Aluminum casting, clevis U, slot 8.2, depth 17.0, hole 10.2, with plastic T-bushing | | | |
| **Front Attachment (mm)** See page 8-9 | 1 = Inner tube with punched hole + plastic cap, no slot, hole 10.2, with plastic bushing<br>2 = Inner tube with punched hole + plastic cap, no slot, hole 12.2<br>5 = Inner tube with punched hole, no slot, hole 10.2, with plastic bushing<br>6 = Inner tube with punched hole, no slot, hole 12.2<br>7 = Aluminum casting, clevis U, slot 6.2, depth 17.0, hole 10.2<br>8 = Aluminum casting, clevis U, slot 6.2, depth 17.0, hole 12.2 | 9 = Aluminum casting, clevis U, slot 6.2, depth 17.0, hole 10.2, with plastic T-bushing<br>J = Aluminum casting, no slot, hole 10.2, for dental chair<br>N = Iron CNC, clevis U, slot 6.2, depth 17.0, hole 10.0<br>O = Iron CNC, clevis U, slot 6.2, depth 17.0, hole 12.0<br>P = Iron CNC, clevis U, slot 8.2, depth 17.0, hole 10.0<br>Q = Iron CNC, clevis U, slot 8.2, depth 17.0, hole 12.0 | | |
| **Direction of Rear Attachment (Counterclockwise)** See page 9 | 1 = 0° | 3 = 90° | | |
| **Color** | 1 = Black | 2 = Pantone 428C | | |
| **IP Rating** | 1 = Without | 2 = IP54 | 3 = IP66 | 5 = IP66W |
| **Special Function for Spindle Sub-assembly** | 0 = Without<br>1 = Safety nut<br>2 = Standard push only | | 3 = Standard push only + safety nut<br>4 = Electrical anti-pinch<br>5 = Electrical anti-pinch + safety nut | |
| **Function for Limit Switches** See page 9 | 1 = Two switches at full retracted / extended positions to cut current | | | |
| **Output Signal** | 0 = Without<br>1 = Hall sensor * 1 | | 2 = Hall sensor * 2<br>3 = POT | |
| **Connector** See page 10 | 0 = Without, for socket on gear box (Molex 8P)<br>1 = DIN 6P, 90° plug<br>2 = Tinned leads | | F = DIN 6P, 180° plug<br>Q = Molex 6P, 90° plug, without anti-clip<br>R = Molex 6P, 180° plug | |
| **Cable Length (mm)** | 0 = Without, for socket on gear box (Molex 8P)<br>1 = Straight, 500<br>3 = Straight, 1000<br>5 = Straight, 1500 | | 6 = Straight, 2000<br>7 = Curly, 200<br>8 = Curly, 400 | |
| **Brake** | 0 = Without<br>8 = Double Spindle brake (4.5N*2) | | 9 = Spindle brake (4.5N) + Motor brake<br>M = Motor brake | |

# **TA51** Patient Hoist Ordering Key

TA51

Version: 20250730-F

| | | | | |
|---|---|---|---|---|
| **Voltage** | 2 = 24V DC | 5 = 24V DC, PTC | | |
| **Load and Speed** | See page 2 | | | |
| **Stroke (mm)** | See page 2 | | | |
| **Retracted Length (mm)** | See page 7 | | | |
| **Rear Attachment (mm)** See page 8 | C = Aluminum casting, clevis U, slot 8.2, depth 17.0, hole 10.2, T bushing | | | |
| **Front Attachment (mm)** See page 8-9 | F = Aluminum casting, clevis U, slot 8.2, depth 19.0, hole 10.2, T bushing, for Manual Release<br>I = Aluminum casting, U clevis, slot 8.2, depth 39.0, hole 10.2, with plastic T-bushing, for manual release<br>G = Aluminum casting, U clevis, slot 8.2, depth 19.0, hole 10.2, with plastic T-bushing, Without press down for manual release | | | |
| **Direction of Rear Attachment (Counterclockwise)** See page 9 | 1 = 0° | 3 = 90° | | |
| **Color** | 2 = Pantone 428C | | | |
| **IP Rating** | 2 = IP54 | 3 = IP66 | 5 = IP66W | |
| **Special Function for Spindle Sub-assembly** | 6 = Mechanical push only + safety nut<br>7 = Mechanical push only + Electrical anti-pinch + safety nut | | | |
| **Function for Limit Switches** See page 9 | 1 = Two switches at full retracted / extended positions to cut current | | | |
| **Output Signal** | 0 = Without | 1 = Hall sensor * 1 | 2 = Hall sensor * 2 | |
| **Connector** See page 10 | Q = Molex 6P, 90° plug | R = Molex 6P, 180° plug | | |
| **Cable Length (mm)** | 1 = Straight, 500 | 3 = Straight, 1000 | 5 = Straight, 1500 | 6 = Straight, 2000 |
| **Brake** | 8 = Double Spindle brake (4.5N * 2) | | | |
| **Load Type** | T = Push | | | |

# **TA51** Ordering Key Appendix

## Retracted Length (mm)

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

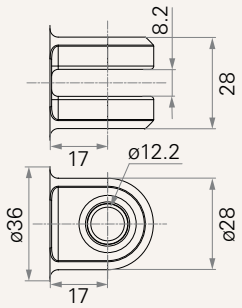
| **A.** | |
|---|---|
| **Front Attach.** | General |
| **1, 2, 5, 6** | +190 |
| **7, 8, 9** | +202 |
| **J** | +193 |

| **B. Load & Stroke** | | | |
|---|---|---|---|
| **Stroke (mm)** | Load (N) General | | |
| | = 6000 | = 8000 | = 10000 |
| **25~150** | - | - | +5 |
| **151~200** | - | +5 | +10 |
| **201~250** | +5 | +10 | +15 |
| **251~300** | +10 | +15 | +20 |
| **301~350** | +15 | +20 | +25 |
| **351~400** | +20 | +25 | +30 |
| **401~450** | +25 | +30 | +35 |
| **451~500** | +30 | +35 | +40 |
| **501~550** | +35 | +40 | +45 |
| **551~600** | +40 | +45 | +50 |
| **601~650** | +45 | +50 | +55 |
| **651~700** | +50 | +55 | x |
| **701~750** | +55 | +60 | x |
| **751~800** | +60 | +65 | x |
| **801~850** | +65 | x | x |
| **851~900** | +70 | x | x |

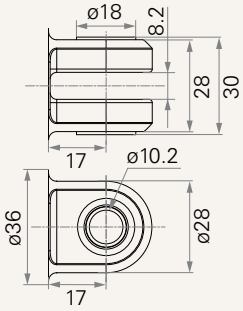
# **TA51** Ordering Key Appendix

## Rear Attachment (mm)

7 = Aluminum casting, clevis U, slot 8.2, depth 17.0, hole 12.2

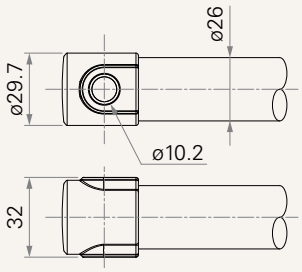



C = Aluminum casting, clevis U, slot 8.2, depth 17.0, hole 10.2, with plastic T-bushing

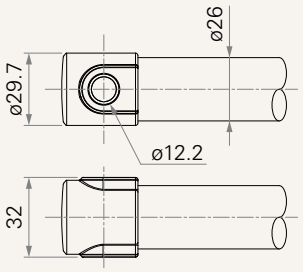



## Front Attachment (mm)

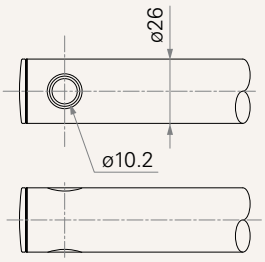
1 = Inner tube with punched hole + plastic cap, no slot, hole 10.2, with plastic bushing



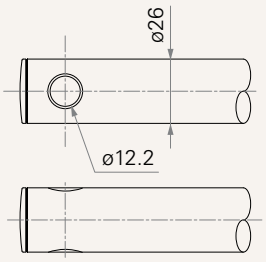

2 = Inner tube with punched hole + plastic cap, no slot, hole 12.2



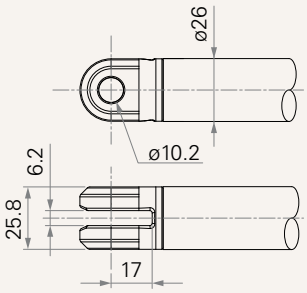

5 = Inner tube with punched hole, no slot, hole 10.2, with plastic bushing



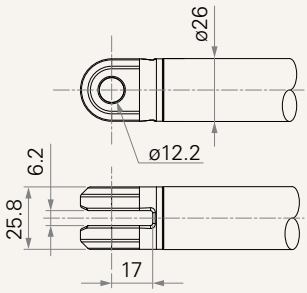

6 = Inner tube with punched hole, no slot, hole 12.2



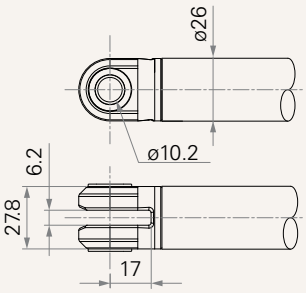

7 = Aluminum casting, clevis U, slot 6.2, depth 17.0, hole 10.2



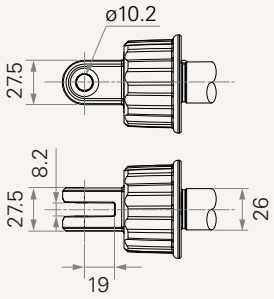

8 = Aluminum casting, clevis U, slot 6.2, depth 17.0, hole 12.2



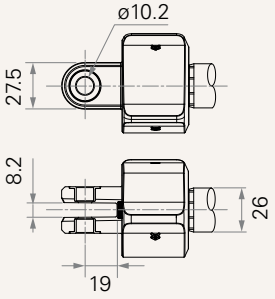

9 = Aluminum casting, clevis U, slot 6.2, depth 17.0, hole 10.2, with plastic T-bushing



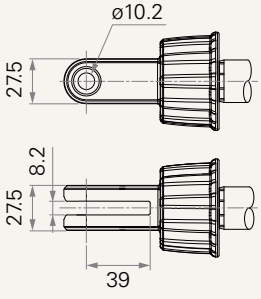

F = Aluminum casting, clevis U, slot 8.2, depth 19.0, hole 10.2, T bushing, for Manual Release



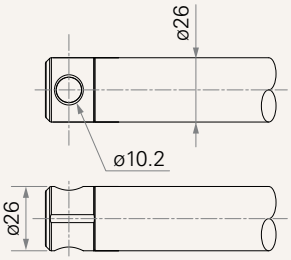

G = Aluminum casting, U clevis, slot 8.2, depth 19.0, hole 10.2, with plastic T-bushing, Without press down for manual release



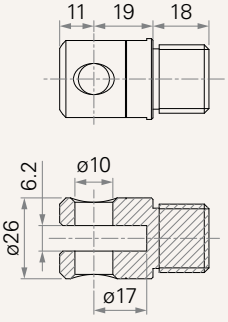

I = Aluminum casting, U clevis, slot 8.2, depth 39.0, hole 10.2, with plastic T-bushing, for manual release




J = Aluminum casting, no slot, hole 10.2, for dental chair



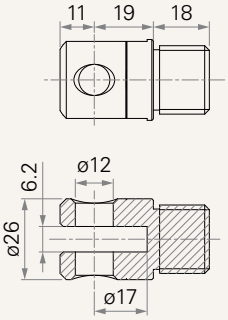

N = Iron CNC, clevis U, slot 6.2, depth 17.0, hole 10.0



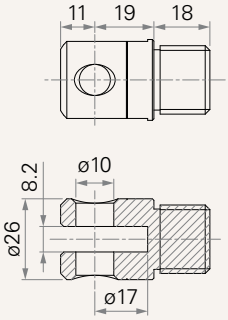
# **TA51** Ordering Key Appendix

## Rear Attachment (mm)

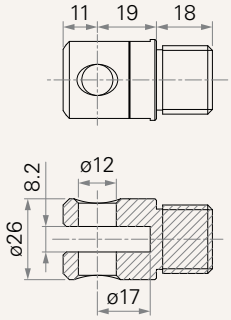
O = Iron CNC, clevis U, slot 6.2, depth 17.0, hole 12.0




P = Iron CNC, clevis U, slot 8.2, depth 17.0, hole 10.0

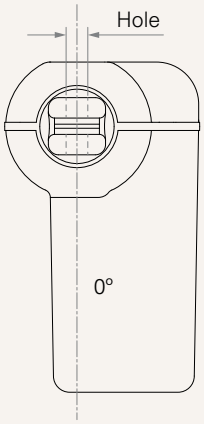



Q = Iron CNC, clevis U, slot 8.2, depth 17.0, hole 12.0

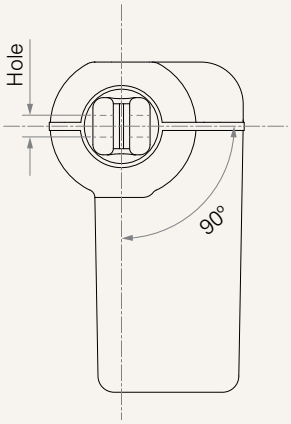



## Direction of Rear Attachment (Counterclockwise)

1 = 0°




3 = 90°




## Functions for Limit Switches

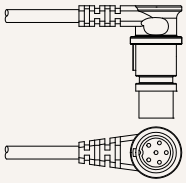
**Wire Definitions**

| **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 |

# **TA51** Ordering Key Appendix

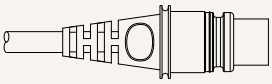
## Connector

1 = DIN 6P, 90° plug

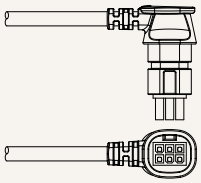


2 = Tinned leads

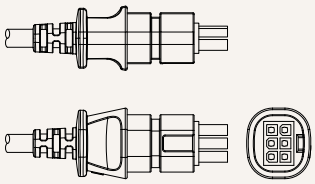
F = DIN 6P, 180° plug



Q = Molex 6P, 90° plug, without anti-clip



R = Molex 6P, 180° plug



## 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.