

# TA23

series



## Product Segments

- **Care Motion**
- **Industrial Motion**

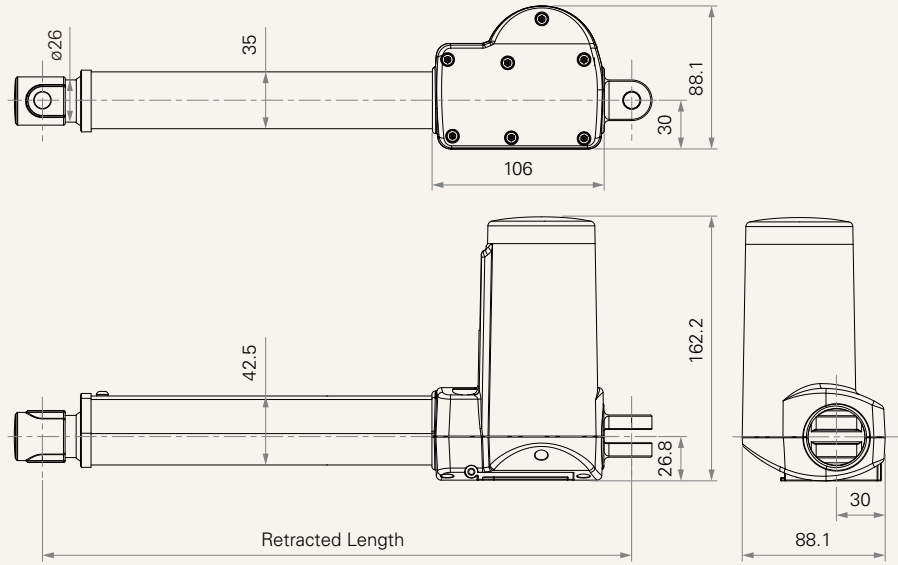
TiMOTION's TA23 series is a compact linear actuator primarily used for medical applications that require high force and high speed. This linear actuator also has the ability to save installation space by mounting the control box to the actuator. The TA23 linear actuator is available with IP rating up to IP66W. It also has Hall sensors for position feedback. The TA23 also has manual release option which can be used for patient hoist applications.

### 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, IEC60601-1-2, EMC |
| Stroke                                 | 25~1000mm                                |
| Output signals                         | Hall sensors                             |
| Options                                | Manual release (for patient hoist)       |
| Voltage                                | 12/24/36V DC; 24V DC (PTC)               |
| Color                                  | Black, grey                              |
| Operational temperature range          | +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 |
| <b>Motor Speed (2600RPM, Duty Cycle 10%)</b> |          |      |                        |                     |                  |                      |                  |
| <b>C</b>                                     | 5000     | 4000 | 5000                   | 0.8                 | 3.5              | 8.0                  | 4.1              |
| <b>D</b>                                     | 6000     | 4000 | 6000                   | 0.8                 | 3.5              | 6.0                  | 3.1              |
| <b>E</b>                                     | 3500     | 3500 | 3500                   | 0.8                 | 3.1              | 10.7                 | 5.6              |
| <b>F</b>                                     | 2500     | 2500 | 2500                   | 0.8                 | 3.2              | 15.9                 | 8.3              |
| <b>G</b>                                     | 2000     | 2000 | 2000                   | 0.8                 | 2.8              | 21.4                 | 12.1             |
| <b>H</b>                                     | 1000     | 1000 | 1000                   | 0.8                 | 2.1              | 32.1                 | 19.1             |
| <b>J</b>                                     | 3500     | 3500 | 3500                   | 0.8                 | 3.6              | 11.9                 | 6.0              |
| <b>K</b>                                     | 8000     | 4000 | 8000                   | 0.8                 | 4.2              | 5.4                  | 2.6              |
| <b>Motor Speed (3400RPM, Duty Cycle 10%)</b> |          |      |                        |                     |                  |                      |                  |
| <b>L</b>                                     | 6000     | 4000 | 6000                   | 1.0                 | 4.2              | 7.3                  | 4.1              |
| <b>M</b>                                     | 3500     | 3500 | 3500                   | 1                   | 3.8              | 13.1                 | 7.5              |
| <b>N</b>                                     | 2500     | 2500 | 2500                   | 1.0                 | 4.1              | 19.4                 | 11.1             |
| <b>O</b>                                     | 2000     | 2000 | 2000                   | 1.0                 | 4.0              | 26.1                 | 14.9             |
| <b>P</b>                                     | 1000     | 1000 | 1000                   | 1.0                 | 3.0              | 39.0                 | 23.4             |
| <b>Q</b>                                     | 3500     | 3500 | 3500                   | 1.0                 | 4.6              | 14.5                 | 7.9              |
| <b>R</b>                                     | 8000     | 4000 | 8000                   | 1.0                 | 5.2              | 6.6                  | 3.4              |
| <b>T</b>                                     | 5000     | 4000 | 5000                   | 1.0                 | 4.2              | 9.8                  | 5.4              |
| <b>Motor Speed (3800RPM, Duty Cycle 10%)</b> |          |      |                        |                     |                  |                      |                  |
| <b>X</b>                                     | 6000     | 4000 | 6000                   | 1.2                 | 4.4              | 8.6                  | 5.0              |
| <b>Y</b>                                     | 8000     | 4000 | 8000                   | 1.2                 | 5.5              | 7.7                  | 4.3              |
| <b>B</b>                                     | 10000    | 4000 | 10000                  | 1.2                 | 5.3              | 5.7                  | 3.2              |
| <b>U</b>                                     | 5000     | 4000 | 5000                   | 1.2                 | 4.7              | 11.3                 | 6.6              |
| <b>W</b>                                     | 2500     | 2500 | 2500                   | 1.2                 | 4.6              | 23.0                 | 13.4             |
| <b>Z</b>                                     | 3500     | 3500 | 3500                   | 1.2                 | 5.3              | 16.8                 | 9.8              |

### Note

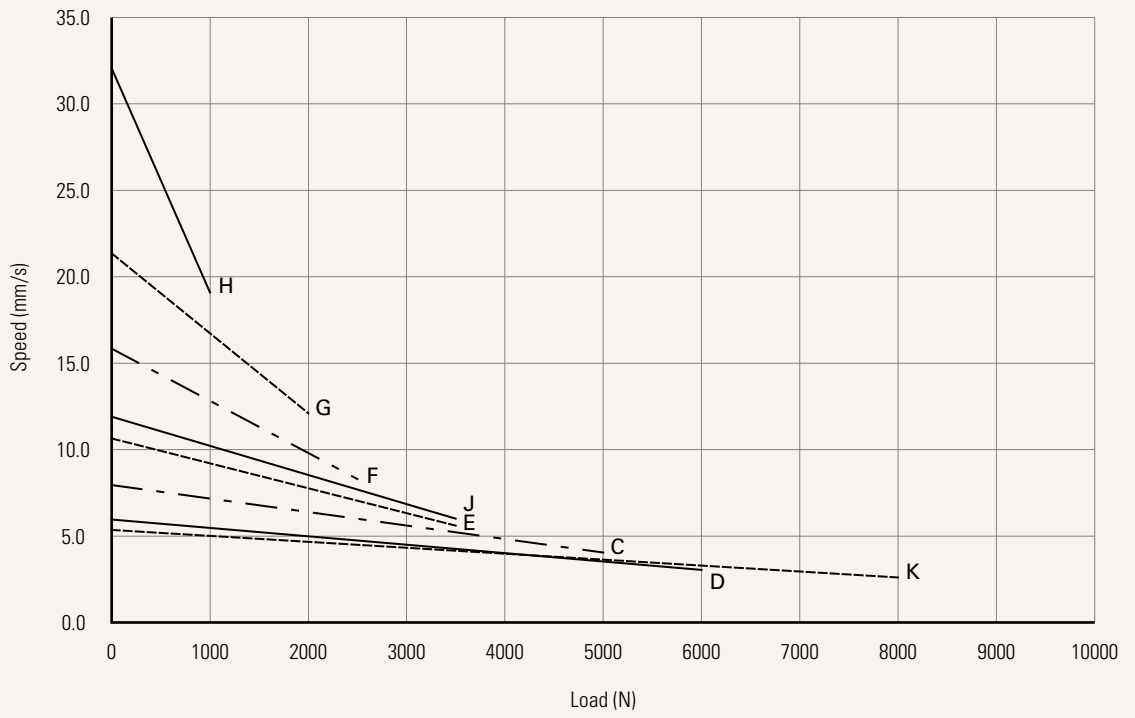
- 1 Please refer to the approved drawing for the final authentic value.
- 2 The current & speed in table are tested with 24V DC motor. With a 12V DC motor, the current is approximately twice the current measured in 24V DC; speed will be similar for both voltages.
- 3 This self-locking force level is reached only when a short circuit is applied on the terminals of the motor. All the TiMOTION control boxes have this feature built-in.
- 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>K, R, Y, B</b> | ≥ 8000   | 450             |
| <b>D, L, X</b>    | = 6000   | 600             |
| <b>Others</b>     | < 6000   | 1000            |

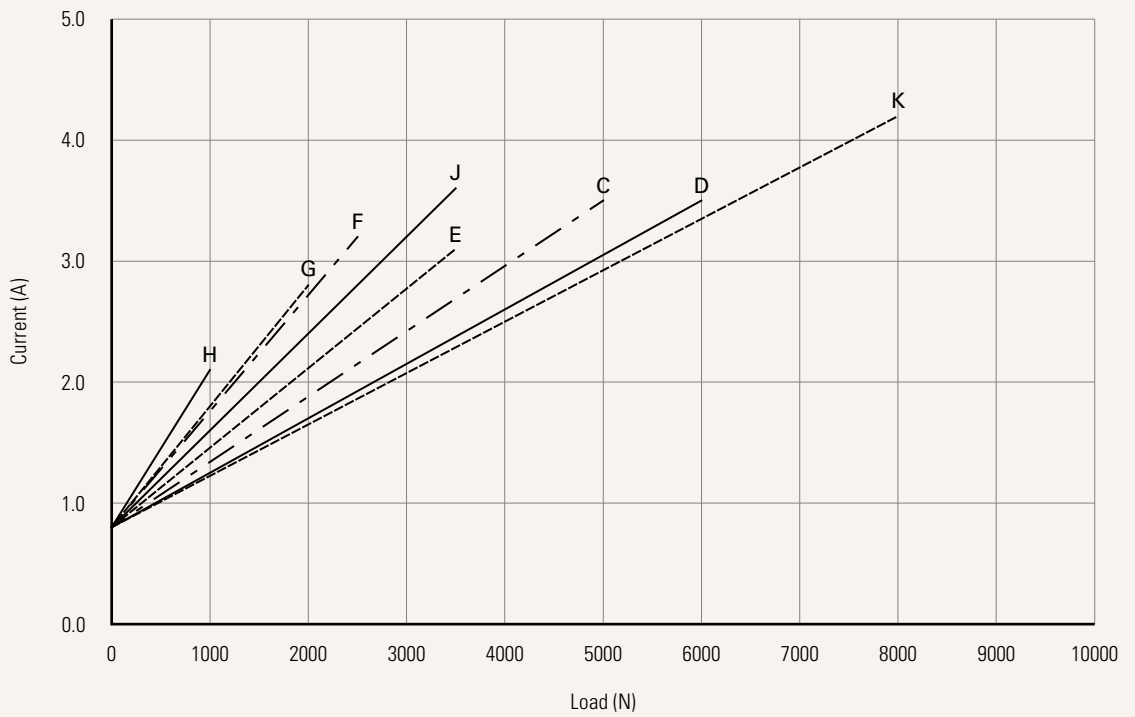
**Performance Data (24V DC Motor)**

Motor Speed (2600RPM, Duty Cycle 10%)

Speed vs. Load



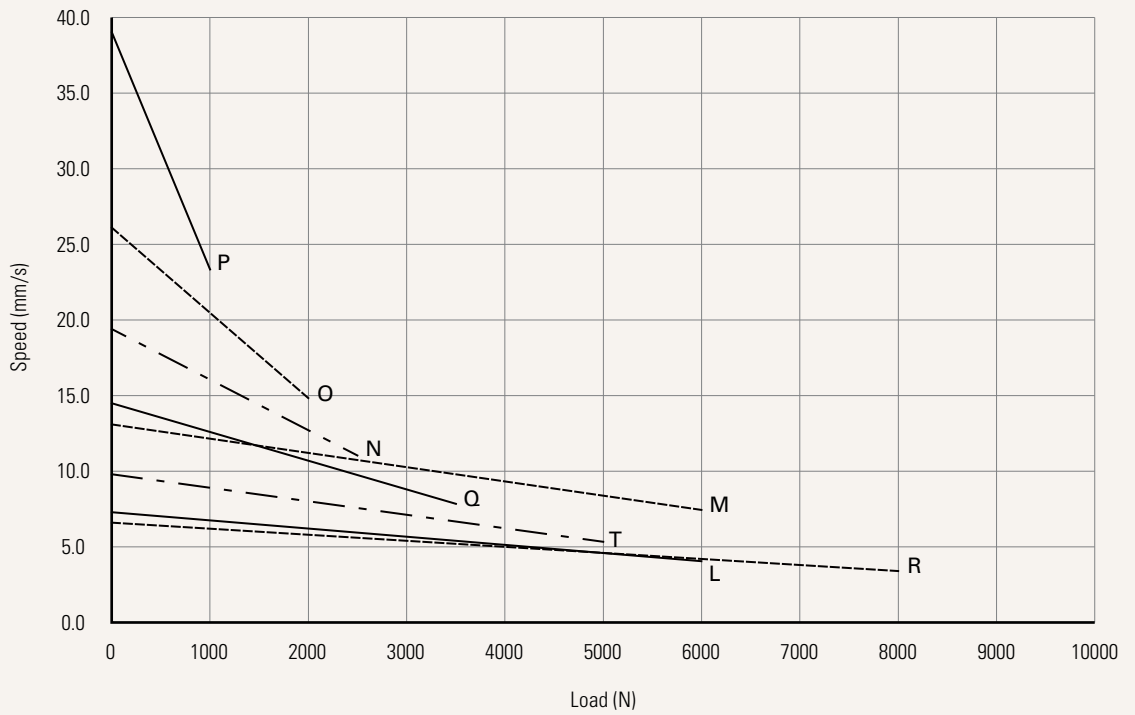
Current vs. Load



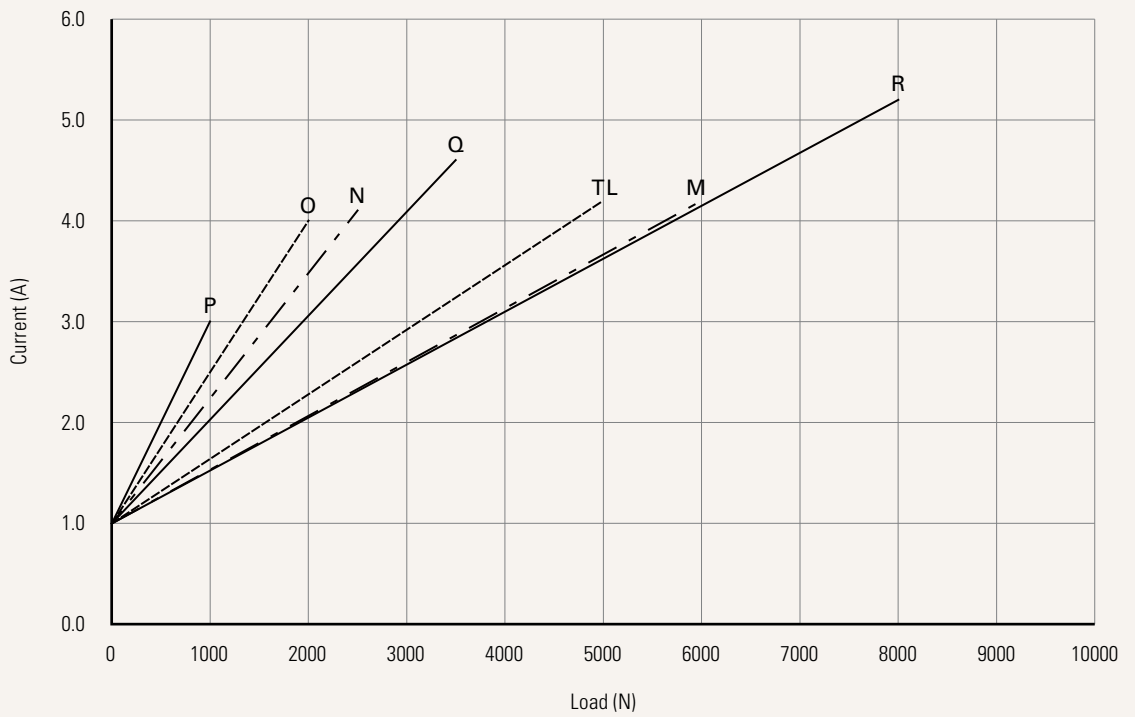
**Performance Data (24V DC Motor)**

Motor Speed (3400RPM, Duty Cycle 10%)

Speed vs. Load



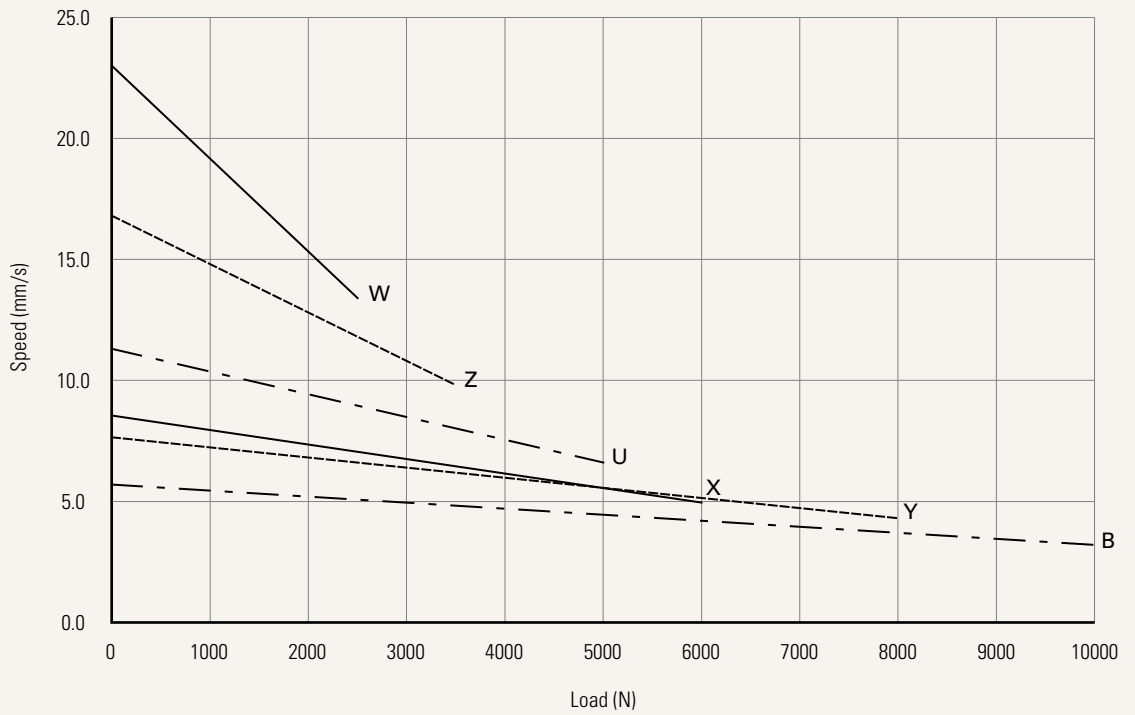
Current vs. Load



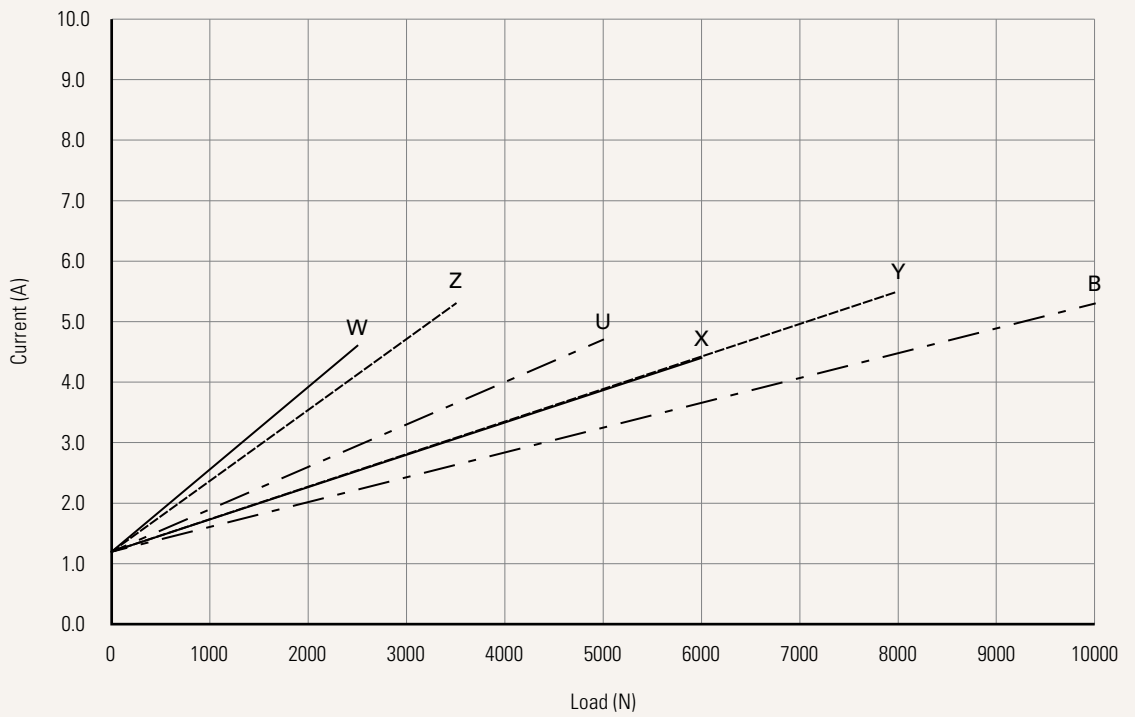
**Performance Data (24V DC Motor)**

Motor Speed (3800RPM, Duty Cycle 10%)

Speed vs. Load



Current vs. Load



|   |  |  |  |                 |
|---|--|--|--|-----------------|
| <b>Voltage</b>  | 1 = 12V DC   | 2 = 24V DC   | 3 = 36V DC   | 5 = 24V DC, PTC |
| <b>Load and Speed</b>   | <a href="#">See page 3</a>   |  |  |                 |
| <b>Stroke (mm)</b>  | <a href="#">See page 3</a>   |  |  |                 |
| <b>Retracted Length (mm)</b>  | <a href="#">See page 9</a>   |  |  |                 |
| <b>Rear Attachment (mm)</b><br><a href="#">See page 10</a>                            | 2 = Aluminum casting, U clevis, slot 8.2, depth 17.0, hole 10.2<br>3 = Aluminum casting, U clevis, slot 8.2, depth 17.0, hole 12.2<br>C = Aluminum casting, U clevis, slot 8.2, depth 17.0, hole 10.2, with plastic T-bushing  |  |  |                 |
| <b>Front Attachment (mm)</b><br><a href="#">See page 10</a>                           | 1 = Punched hole on inner tube + plastic cap, without slot, hole 10.2, with plastic bushing<br>2 = Punched hole on inner tube + plastic cap, without slot, hole 12.2<br>3 = Plastic, U clevis, slot 8.2, depth 20.0, hole 10.2 (for load push < 4000N & pull < 2500N)<br>4 = Plastic, U clevis, slot 8.2, depth 20.0, hole 12.2 (for load push < 4000N & pull < 2500N) |  | 5 = Punched hole on inner tube, without slot, hole 10.2, with plastic bushing<br>6 = Punched hole on inner tube, without slot, hole 12.2<br>7 = Aluminum casting, U clevis, slot 6.2, depth 17.0, hole 10.2<br>8 = Aluminum casting, U clevis, slot 6.2, depth 17.0, hole 12.2<br>9 = Aluminum casting, U clevis, slot 6.2, depth 17.0, hole 10.2, with plastic T-bushing<br>J = Aluminum casting, without slot, hole 10.2, for dental chair |                 |
| <b>Direction of Rear Attachment (Counterclockwise)</b><br><a href="#">See page 11</a> | 1 = 0°   | 3 = 90°  |  |                 |
| <b>Color</b>  | 1 = Black  | 2 = Pantone 428C                                       |  |                 |
| <b>IP Rating</b>  | 1 = Without  | 2 = IP54   | 3 = IP66   | 5 = IP66W       |
| <b>Special Functions for Spindle Sub-Assembly</b>                                     | 0 = Without (Standard)<br>1 = Safety nut   |  | 2 = Standard push only<br>3 = Standard push only + safety nut  |                 |
| <b>Functions for Limit Switches</b><br><a href="#">See page 11</a>                    | 1 = Two switches at full retracted / extended positions to cut current<br>2 = Two switches at full retracted / extended positions to cut current + third one in between to send signal<br>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<br>5 = Two switches at full retracted/extended positions to send signal (Operate with control box: TC8, TC10, TC14, TC21; compatible with hall sensors)   |                 |
| <b>Output Signals</b>   | 0 = Without  | 2 = Hall sensor * 2                                    |  |                 |
| <b>Connector</b><br><a href="#">See page 12</a>                                       | 1 = DIN 6P, 90° plug<br>2 = Tinned leads<br>4 = Big 01P, plug<br>C = Y cable (for direct cut system, water proof, anti pull)<br>D = Extension cable, not preset on motor cover (cable length 120mm)<br>R = Extension cable, preset on motor cover (cable length 50mm)  |  | E = Molex 8P, plug<br>F = DIN 6P, 180° plug<br>G = Audio plug<br>M = DIN 4P, dental chair plug (40510-143, standard)<br>N = DIN 4P, dental chair plug (40510-040)<br>P = Molex 8P, 90° plug, without anti-clip<br>Q = Molex 6P, 90° plug<br>S = Molex 6P, 180° plug  |                 |
| <b>Cable Length (mm)</b>  | 0 = Straight, 100<br>1 = Straight, 500<br>3 = Straight, 1000<br>5 = Straight, 1500   | 6 = Straight, 2000<br>7 = Curly, 200<br>8 = Curly, 400 | B-H = For direct cut system. <a href="#">See page 12</a><br>J = For socket attached on motor, not preset attached on motor cover. <a href="#">See page 12</a><br>R = For socket attached on motor, preset attached on motor cover. <a href="#">See page 12</a>   |                 |

# TA23 Patient Hoist Ordering Key

TA23

Version: 20241212-T

|  |  |                        |                         |
|--|--|------------------------|-------------------------|
| <b>Voltage</b>   | 2 = 24V DC   | 5 = 24V DC, PTC        |                         |
| <b>Load and Speed</b>                                  | X = 6000N  | Y = 8000N              |                         |
| <b>Stroke (mm)</b>                                     | <a href="#">See page 3</a>   |                        |                         |
| <b>Retracted Length (mm)</b>                           | <a href="#">See page 9</a>   |                        |                         |
| <b>Rear Attachment (mm)</b>                            | C = Aluminum casting, U clevis, slot 8.2, depth 17.0, hole 10.2, with T-bushing  |                        |                         |
|  | <a href="#">See page 10</a>  |                        |                         |
| <b>Front Attachment (mm)</b>                           | F = Aluminum casting, U clevis, slot 8.2, depth 19.0, hole 10.2, with T-bushing, manual release                                |                        |                         |
|  | I = Aluminum casting, U clevis, slot 8.2, depth 39.0, hole 10.2, with plastic 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 |                        |                         |
|  | <a href="#">See page 10-11</a>   |                        |                         |
| <b>Direction of Rear Attachment (Counterclockwise)</b> | 1 = 0°   |                        |                         |
|  | <a href="#">See page 11</a>  |                        |                         |
| <b>Color</b>   | 1 = Black  | 2 = Pantone 428C       |                         |
| <b>IP Rating</b>                                       | 2 = IP54   | 3 = IP66               |                         |
| <b>Special Functions for Spindle Sub-Assembly</b>      | 6 = Mechanical push only + safety nut  |                        |                         |
| <b>Functions for Limit Switches</b>                    | 1 = Two switches at full retracted / extended positions to cut current   |                        |                         |
|  | <a href="#">See page 11</a>  |                        |                         |
| <b>Output Signals</b>                                  | 0 = Without  |                        |                         |
| <b>Connector</b>                                       | 1 = DIN 6P, 90° plug   | G = Audio plug         | R = Molex 6P, 180° plug |
|  | F = DIN 6P, 180° plug  | Q = Molex 6P, 90° plug |                         |
|  | <a href="#">See page 12</a>  |                        |                         |
| <b>Cable Length (mm)</b>                               | 1 = Straight, 500  | 3 = Straight, 1000     |                         |



## Retracted Length (mm)

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

**A.**

| Front Attach.            | Rear Attach. |                   |
|--------------------------|--------------|-------------------|
|                          | General      | For Patient Hoist |
| 1, 2, 5, 6               | +163         | -                 |
| 3, 4                     | +188         | -                 |
| 7, 8, 9                  | +178         | -                 |
| J                        | +166         | -                 |
| F, G (For Patient Hoist) | -            | +250              |
| I (For Patient Hoist)    | -            | +270              |

**B.**

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

**C. Load < 6000 (N)**

| Front Attach.            | Spindle Function |      |
|--------------------------|------------------|------|
|                          | 0, 1             | 2, 3 |
| 1, 2, 5, 6               | -                | +5   |
| 3, 4                     | -                | +5   |
| 7, 8, 9                  | -                | +5   |
| J                        | -                | +5   |
| F, G (For Patient Hoist) | -                | -    |
| I (For Patient Hoist)    | -                | -    |

**C. Load = 6000 / 8000 (N)**

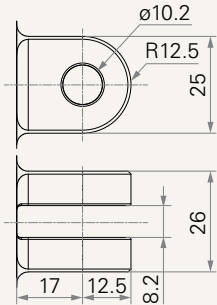
| Front Attach.            | Spindle Function |      |
|--------------------------|------------------|------|
|                          | 0, 1             | 2, 3 |
| 1, 2, 5, 6               | -                | +8   |
| 3, 4                     | -                | -    |
| 7, 8, 9                  | -                | +8   |
| J                        | -                | +8   |
| F, G (For Patient Hoist) | -                | -    |
| I (For Patient Hoist)    | -                | -    |

**C. Load = 10000 (N)**

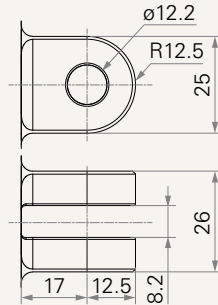
| Front Attach.            | Spindle Function |      |
|--------------------------|------------------|------|
|                          | 0, 1             | 2, 3 |
| 1, 2, 5, 6               | -                | +24  |
| 3, 4                     | -                | -    |
| 7, 8, 9                  | -                | +16  |
| J                        | -                | +16  |
| F, G (For Patient Hoist) | -                | -    |
| I (For Patient Hoist)    | -                | -    |

## Rear Attachment (mm)

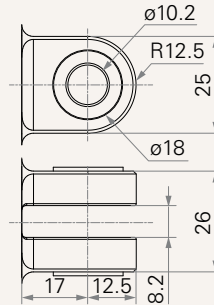
2 = Aluminum casting, U clevis, slot 8.2, depth 17.0, hole 10.2



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

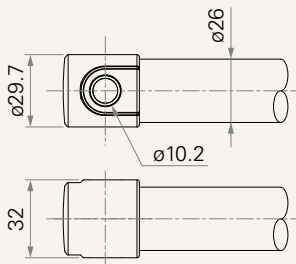


C = Aluminum casting, U clevis, slot 8.2, depth 17.0, hole 10.2, with plastic T-bushing

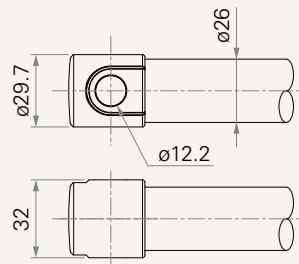


## Front Attachment (mm)

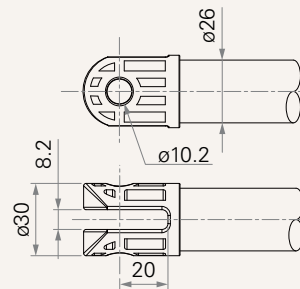
1 = Punched hole on inner tube + plastic cap, without slot, hole 10.2, with plastic bushing



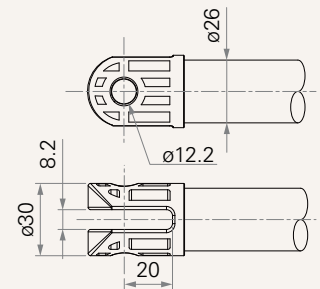
2 = Punched hole on inner tube + plastic cap, without slot, hole 12.2



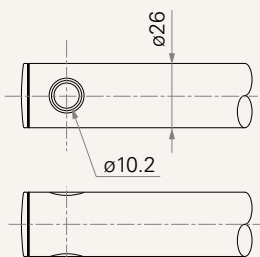
3 = Plastic, U clevis, slot 8.2, depth 20.0, hole 10.2 (for load push < 4000N & pull < 2500N)



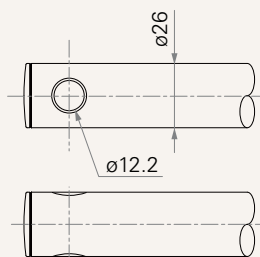
4 = Plastic, U clevis, slot 8.2, depth 20.0, hole 12.2 (for load push < 4000N & pull < 2500N)



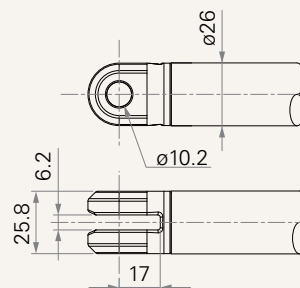
5 = Punched hole on inner tube, without slot, hole 10.2, with plastic bushing



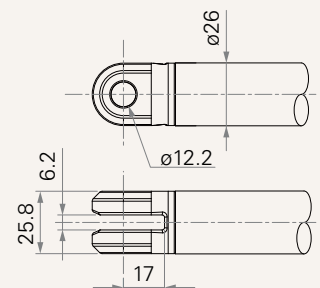
6 = Punched hole on inner tube, without slot, hole 12.2



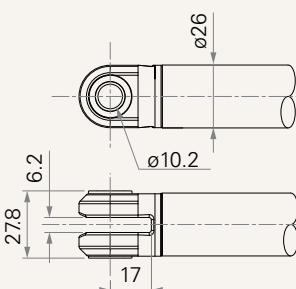
7 = Aluminum casting, U clevis, slot 6.2, depth 17.0, hole 10.2



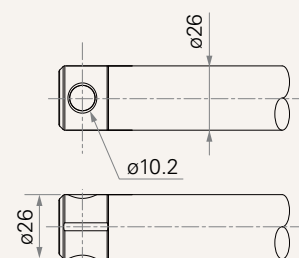
8 = Aluminum casting, U clevis, slot 6.2, depth 17.0, hole 12.2



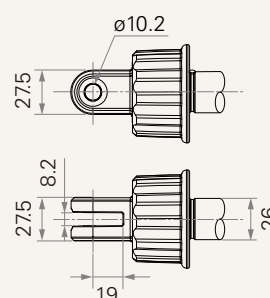
9 = Aluminum casting, U clevis, slot 6.2, depth 17.0, hole 10.2, with plastic T-bushing



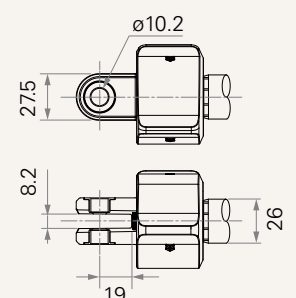
J = Aluminum casting, without slot, hole 10.2, for dental chair



F = Aluminum casting, U clevis, slot 8.2, depth 19.0, hole 10.2, with T-bushing, manual release

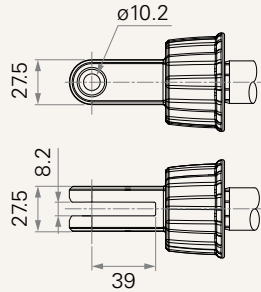


G = Aluminum casting, U clevis, slot 8.2, depth 19.0, hole 10.2, with plastic T-bushing, Without press down for manual release



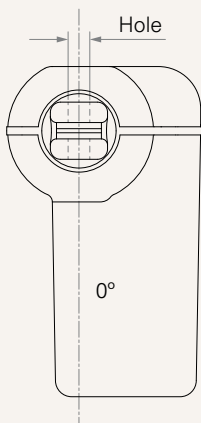
## Front Attachment (mm)

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

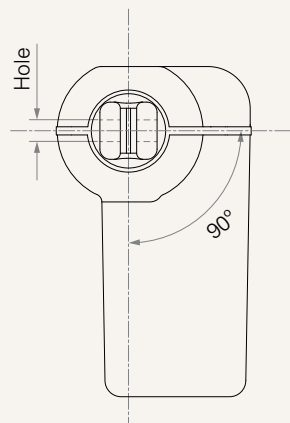


## Direction of Rear Attachment (Counterclockwise)

1 = 0°



3 = 90°



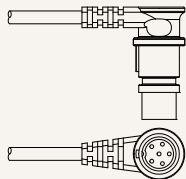
## Functions for Limit Switches

### 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                |
| 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

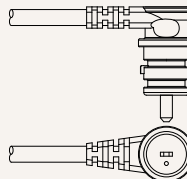
1 = DIN 6P, 90° plug



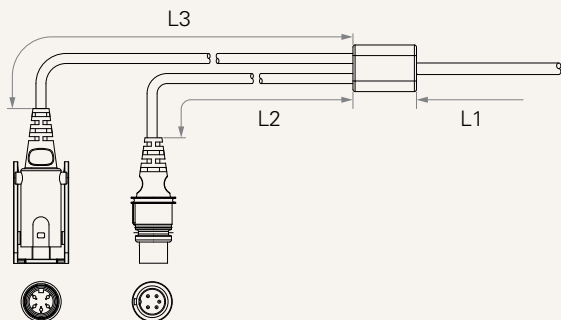
2 = Tinned leads



4 = Big 01P, plug



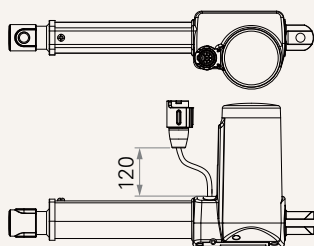
C = Y cable (for direct cut system, water proof, anti pull)



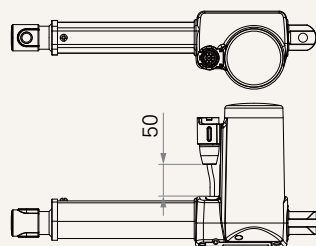
### Cable Length for Direct Cut System (mm)

| 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 |

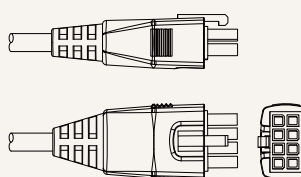
D = Extension cable, not preset on motor cover (cable length 120mm)



R = Extension cable, preset on motor cover (cable length 50mm)



E = Molex 8P, plug



F = DIN 6P, 180° plug



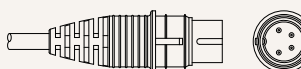
G = Audio plug



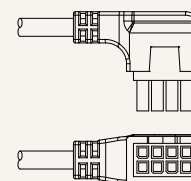
M = DIN 4P, dental chair plug (40510-143, standard)



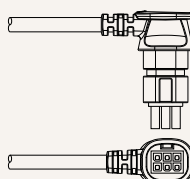
N = DIN 4P, dental chair plug (40510-040)



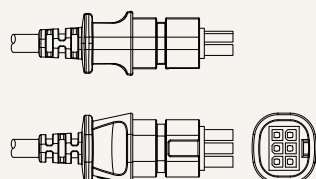
P = Molex 8P, 90° plug, without anti-clip



Q = Molex 6P, 90° plug



S = Molex 6P, 180° plug



## Terms of Use

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