# TA16
## series



TiMOTION

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## Product Segments

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

TiMOTION's TA16 series linear actuator is similar to the TA2 linear actuator, but is specifically designed for low-noise applications where a compact linear actuator is needed. It is available with optional IP66 protection and Hall sensors for position feedback. Certificates for the TA16 include IEC60601-1, ES60601-1, IEC60601-1-2, UL962, and EMC.

### General Features

| | |
|---|---|
| Max. load | 4,500N (push) ; 2,500N (pull) |
| Max. speed at max. load | 4.9mm/s |
| Max. speed at no load | 56.5mm/s |
| Retracted length | ≥ Stroke + 112mm |
| IP rating | IP66M |
| Certificate | IEC60601-1, ES60601-1, IEC60601-1-2, UL962, EMC |
| Stroke | 20~600mm |
| Output Signals | Pot., NPN Hall sensors |
| Options | Motor brake |
| Voltage | 12/24/36/48V DC; 12/24/48V DC (PTC) |
| Color | Silver |
| Operational temperature range at full performance | +5°C~+45°C |

With very low noise, small size for easy installation
Suitable for patient hoist application

## Drawing

Dimensions
without Output Signal
or with Hall Sensors
(mm)
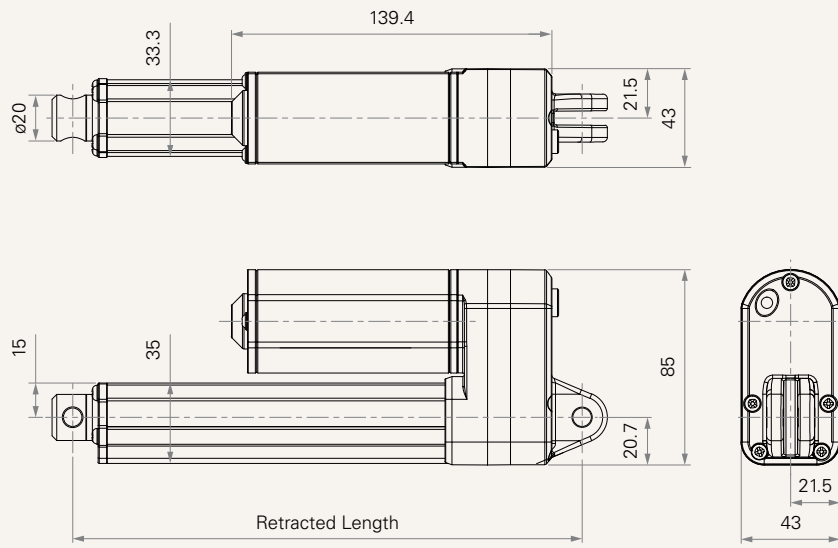
Dimensions with POT
(mm)
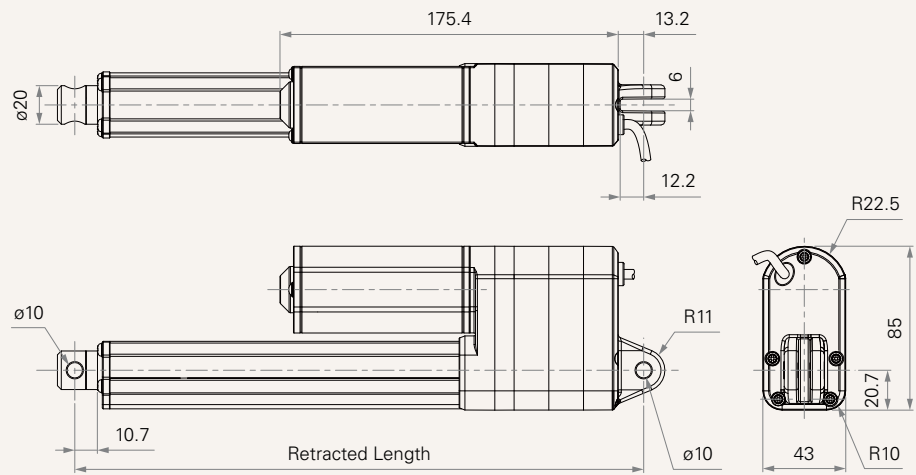
## Load and Speed

| 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 (3800RPM, Duty Cycle 10%)** | | | | | | | |
| **A** | 2500 | 2500 | 2500 | 1.7 | 2.4 | 5.2 | 3.0 |
| **B** | 2000 | 2000 | 2000 | 1.7 | 2.4 | 8.3 | 4.7 |
| **C** | 1500 | 1500 | 1500 | 1.7 | 2.2 | 10.8 | 7.0 |
| **D** | 1000 | 1000 | 1000 | 1.7 | 2.4 | 17.1 | 10.0 |
| **E** | 500 | 500 | 500 | 1.7 | 2.8 | 56.5 | 28.0 |
| **Motor Speed (5200RPM, Duty Cycle 10%)** | | | | | | | |
| **G** | 3500 | 2500 | 3500 | 2.0 | 4.7 | 11.0 | 6.2 |
| **J** | 2000 | 2000 | 2000 | 2.0 | 3.7 | 15.8 | 9.5 |
| **K** | 1500 | 1500 | 1500 | 2.0 | 3.7 | 21.5 | 14.2 |
| **L** | 4500 | 2500 | 4500 | 2.0 | 5.0 | 9.5 | 4.9 |

## Note

**1** #G_When pull load > 2500N, please discuss with engineer.

**2** Please refer to the approved drawing for the final authentic value.

**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. The self-locking force is a minimum value and can be actually higher.

**4** 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. With a 48V DC motor, the current is approximately half the current measured in 24V DC. Speed will be similar for all the voltages.

**5** The current & speed in table is tested when the actuator is extending under push load

**6** 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)

**7** Without load, noise level ≤ 56dBA (by TiMOTION test standard, ambient noise level ≤ 36dBA).

**8** Standard stroke: Please refer to the table below.

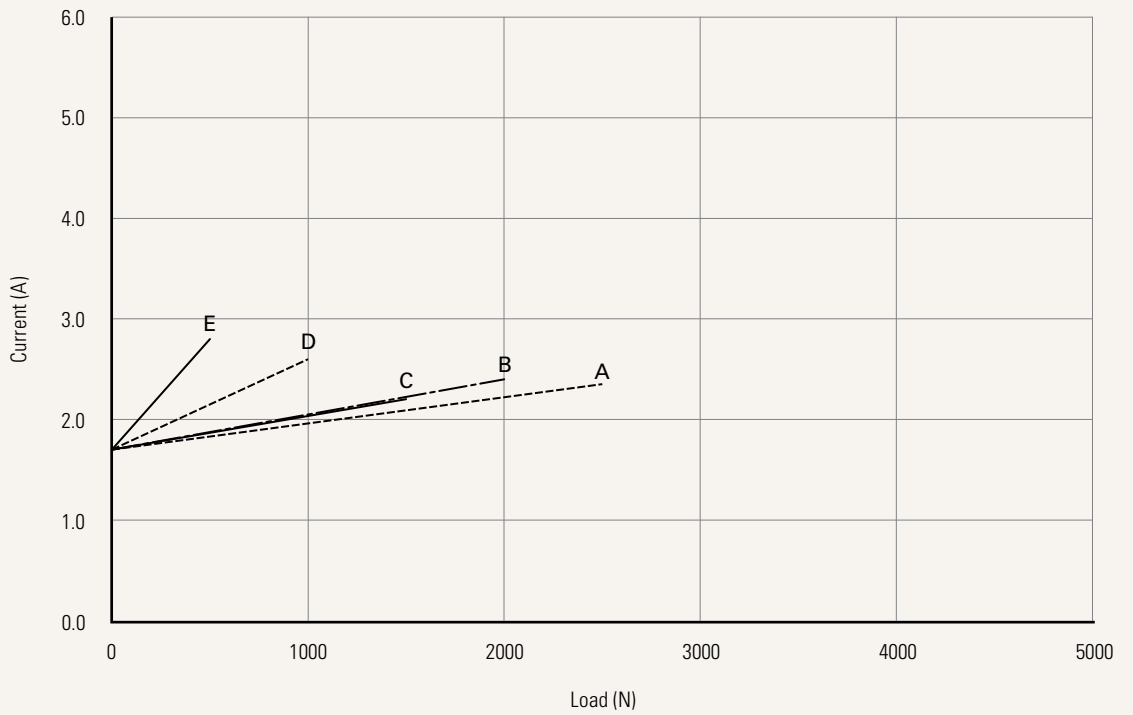| CODE | Load (N) | Min Stroke (mm) | Max Stroke (mm) |
|---|---|---|---|
| **E** | ≤ 500 | 38 | 600 |
| **D** | ≤ 1000 | 20 | 600 |
| **C, K** | ≤ 1500 | 20 | 500 |
| **B, J** | ≤ 2000 | 20 | 450 |
| **A** | ≤ 2500 | 20 | 400 |
| **G** | ≤ 3500 | 20 | 300 |
| **L** | ≤ 4500 | 20 | 300 |

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**Performance Data (24V DC Motor)**
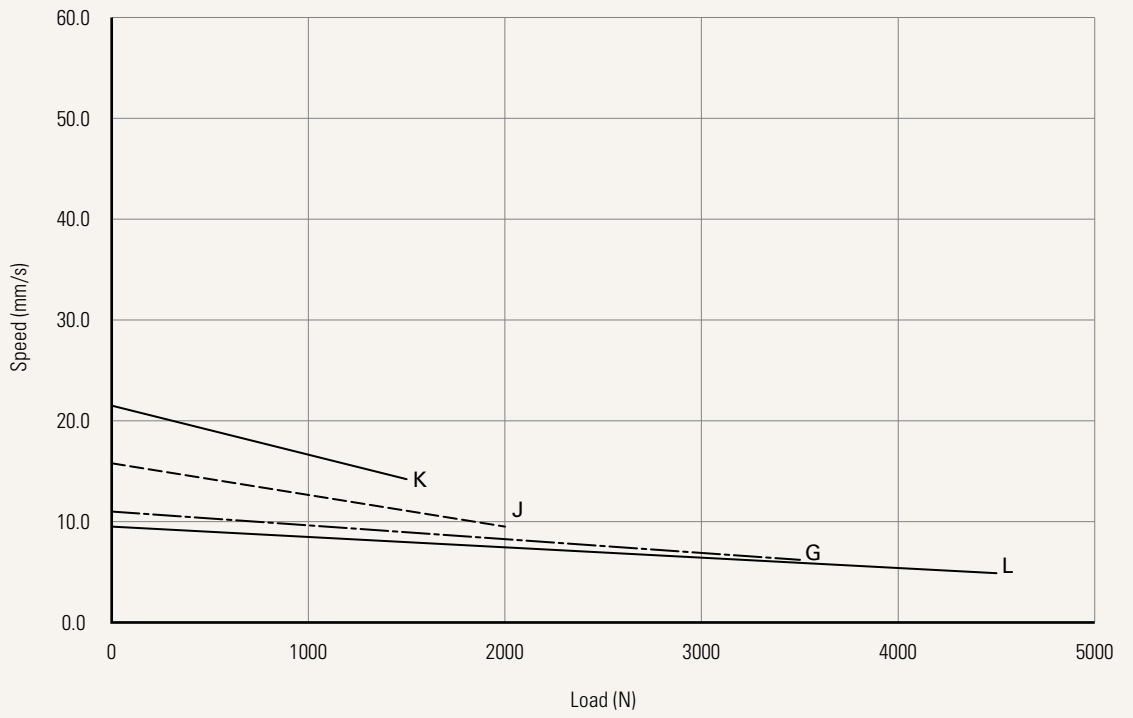
Motor Speed (3800RPM, Duty Cycle 10%)
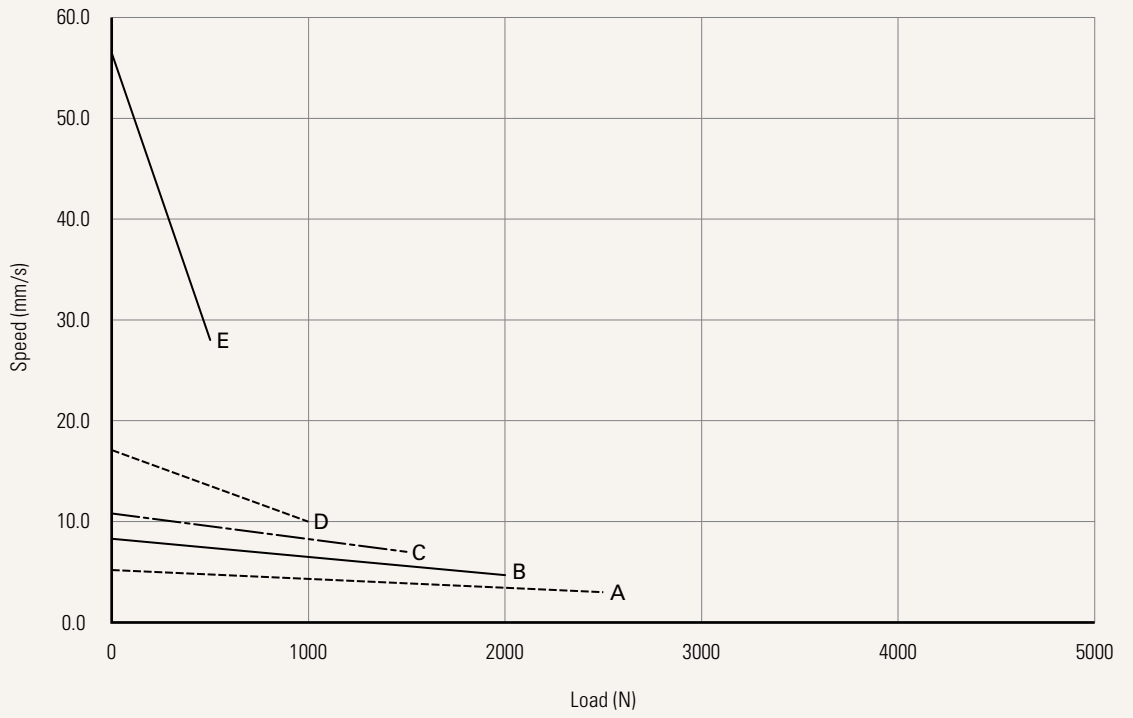
### Speed vs. Load



### Current vs. Load

## Performance Data (24V DC Motor)

Motor Speed (5200RPM, Duty Cycle 10%)

### Speed vs. Load



### Current vs. Load

# TA16 Ordering Key

| **Voltage** | 1 = 12V DC | 3 = 36V DC | 5 = 24V DC, PTC | 8 = 48V DC, PTC |
| --- | --- | --- | --- | --- |
| | 2 = 24V DC | 4 = 48V DC | 6 = 12V DC, PTC | |

| **Load and Speed** | See page 3 | | | |
| --- | --- | --- | --- | --- |

| **Stroke (mm)** | See page 3 | | | |
| --- | --- | --- | --- | --- |

| **Retracted Length (mm)** | See page 7 | | | |
| --- | --- | --- | --- | --- |

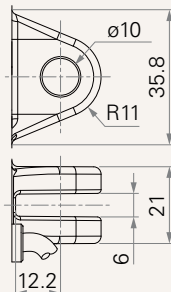| **Rear Attachment (mm)** <br> See page 8 | 1 = Aluminum, U clevis, width 6.0, depth 12.2, hole 6.4, one piece casting with gearbox |
| --- | --- |
| | 2 = Aluminum, U clevis, width 6.0, depth 12.2, hole 8.0, one piece casting with gearbox |
| | 3 = Aluminum, U clevis, width 6.0, depth 12.2, hole 10.0, one piece casting with gearbox |
| | B = Aluminum, U clevis, width 6.0, depth 12.2, hole 10.2, one piece casting with gearbox, with plastic T-bushing (black), for weather resistant application |

| **Front Attachment (mm)** <br> See page 8 | 1 = Aluminum, slotless, hole 6.4 | 6 = Aluminum, U clevis, width 6.0, depth 13.0, hole 10.0 |
| --- | --- | --- |
| | 2 = Aluminum, slotless, hole 8.0 | B = Aluminum, slotless, hole 10.2, with plastic T-bushing (black), for weather resistant application |
| | 3 = Aluminum, slotless, hole 10.0 | C = Steel, U clevis, width 6.0, depth 13.0, hole 10.2, with plastic T-bushing (black), for weather resistant application |
| | 4 = Aluminum, U clevis, width 6.0, depth 13.0, hole 6.4 | |
| | 5 = Aluminum, U clevis, width 6.0, depth 13.0, hole 8.0 | |

| **Direction of Rear Attachment (Counterclockwise)** <br> See page 9 | 1 = 90° | 2 = 0° |
| --- | --- | --- |

| **IP Rating** | 1 = Without | 3 = IP66 | 6 = IP66M |
| --- | --- | --- | --- |
| | 2 = IP54 | 5 = IP66W | |

| **Function of Limit Switches** <br> See page 9 | 1 = Two micro switches cut off the actuator at end of stroke |
| --- | --- |
| | 2 = Two micro switches cut off the actuator at end of stroke + third one in between sends signal |
| | 3 = Two micro switches send signal at end of stroke |
| | 4 = Two micro switches send signal at end of stroke + third one in middle sends signal |

| **Special Function of Spindle Set** | 0 = Without (Standard) | 2 = Standard push only |
| --- | --- | --- |
| | 1 = Safety nut | 3 = Standard push only + safety nut |

| **Output Signal** | 0 = Without | N = NPN Hall sensor * 2 |
| --- | --- | --- |
| | 1 = Pot. | |

| **Connector** <br> See page 9-10 | 1 = DIN 6P, 90° plug | C = Y cable (For direct cut system, water proof, anti pull) | G = Audio plug |
| --- | --- | --- | --- |
| | 2 = Tinned leads | E = Molex 8P, plug | |
| | 4 = Big 01P, plug | F = DIN 6P, 180° plug | |

| **Cable Length (mm)** | 0 = Straight, 100 | 3 = Straight, 1000 | 6 = Straight, 2000 | B~H = For direct cut system <br> See page 9 |
| --- | --- | --- | --- | --- |
| | 1 = Straight, 500 | 4 = Straight, 1250 | 7 = Curly, 200 | |
| | 2 = Straight, 750 | 5 = Straight, 1500 | 8 = Curly, 400 | |

| **Brake** | 0 = Without | 1 = Motor brake |
| --- | --- | --- |

| **Load Type** | T = Push | P = Pull |
| --- | --- | --- |

| **Color** | 0 = Silver grey |
| --- | --- |
| | 3 = Glittering black, for weather resistant application |

# **TA16** Ordering Key Appendix

**Retracted Length (mm)**

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

**A. Rear / Front Attach.**

| Front Attach. | Rear Attach. |
|---|---|
| | 1, 2, 3, B |
| **1, 2, 3** | +112 |
| **B** | +115 |
| **4, 5, 6, C** | +122 |

**B. Load V.S. Stroke**

| Stroke (mm) | Load & Speed Type | |
|---|---|---|
| | A, B, C, D, E, J, K | G, L |
| **20~150** | - | +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. Load V.S. Spindle Functions**

| Spindle Functions | Load & Speed Type | |
|---|---|---|
| | A, B, C, D, E, J, K | G, L |
| **0** | - | - |
| **1** | +10 | +5 |
| **2** | +2 | +2 |
| **3** | +12 | +7 |

**D. Output Signals**

| | |
|---|---|
| **0, 4, 5** | - |
| **1** | +36 |

**E. IP Rating**

| | |
|---|---|
| **1, 2, 3, 5** | - |
| **6** | +5 |

## Rear Attachment (mm)

1 = Aluminum, U clevis, width 6.0, depth 12.2, hole 6.4, one piece casting with gearbox
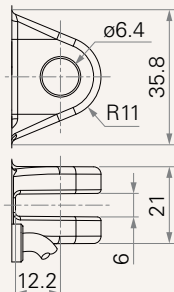
2 = Aluminum, U clevis, width 6.0, depth 12.2, hole 8.0, one piece casting with gearbox
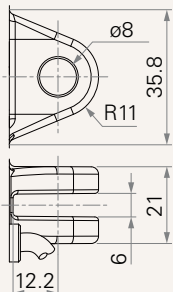
3 = Aluminum, U clevis, width 6.0, depth 12.2, hole 10.0, one piece casting with gearbox

B = Aluminum, U clevis, width 6.0, depth 12.2, hole 10.2, one piece casting with gearbox, with plastic T-bushing (black), for weather resistant application
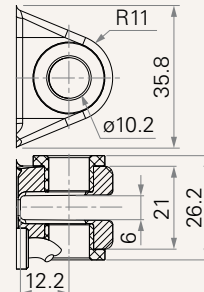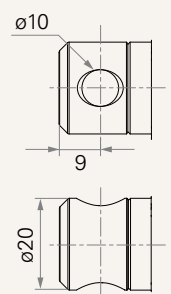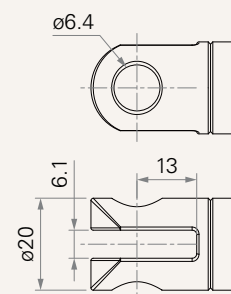
## Front Attachment (mm)

1 = Aluminum, slotless, hole 6.4
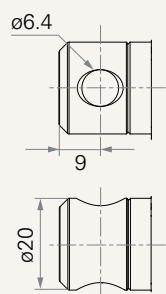
2 = Aluminum, slotless, hole 8.0
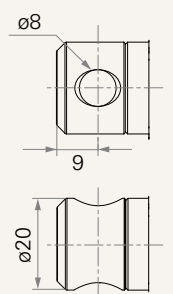
3 = Aluminum, slotless, hole 10.0

4 = Aluminum, U clevis, width 6.0, depth 13.0, hole 6.4

5 = Aluminum, U clevis, width 6.0, depth 13.0, hole 8.0
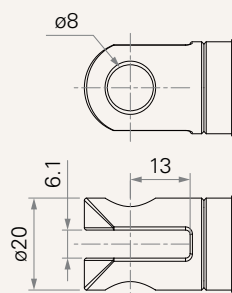
6 = Aluminum, U clevis, width 6.0, depth 13.0, hole 10.0
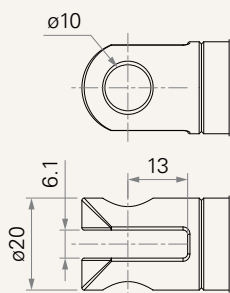
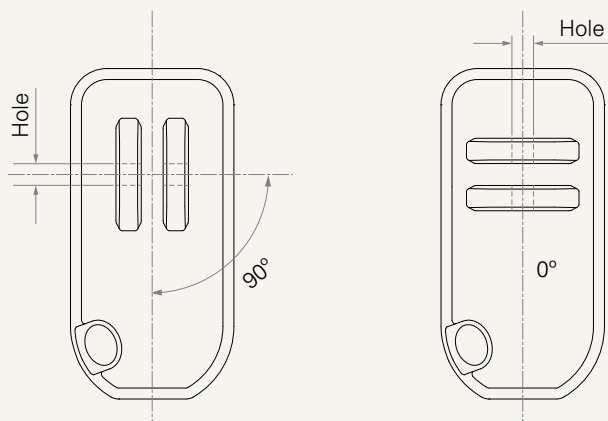B = Aluminum, slotless, hole 10.2, with plastic T-bushing (black), for weather resistant application
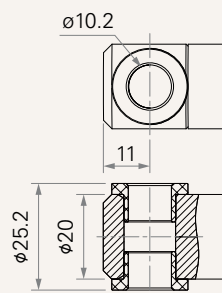
C = Steel, U clevis, width 6.0, depth 13.0, hole 10.2, with plastic T-bushing (black), for weather resistant application
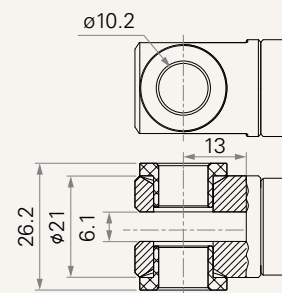
## **Direction of Rear Attachment (Counterclockwise)**

1 = 90°                                    2 = 0°
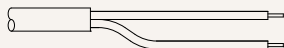


## **Function of Limit Switches**

### **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 |

## **Connector**
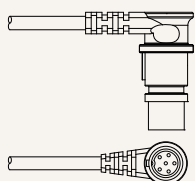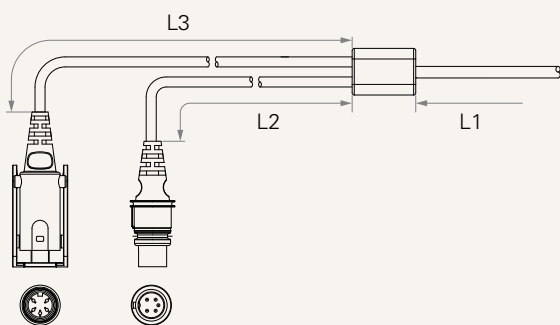
1 = DIN 6P, 90° plug          2 = Tinned leads          4 = Big 01P, plug
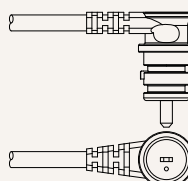


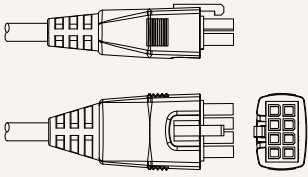C = Y cable (For direct cut system, water proof, anti pull)



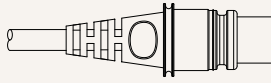### **Cable Length for Direct Cut System (mm)**

| 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 |

## Connector

E = Molex 8P, plug

F = DIN 6P, 180° plug

G = Audio plug