# MA2T
## series



## Product Segments

## • Industrial Motion

TiMOTION's MA2T series electric linear actuator was specifically designed for applications that face harsh working environments and require heavy-duty and durability. Example applications suitable for the MA2T: Agricultural equipment such as seed spreader, harvesters, grain handlers, combines, tractors…etc. Commercial and industrial applications include commercial lawn mowers, scrubbers and sweepers, material handling equipment, and livestock ventilation systems.

Furthermore, the MA2T is a T-Smart (note 1) version actuator that can work with the PGMA (note 2) to achieve the following functionality:
- Set up the actuator's stroke and speed
- Multiple signal feedbacks support
- Monitor real-time actuator status
- Up to 8 actuator synchronization
- Built-in safety mechanism
- Customized service for BUS required applications (note 3)

**Note 1:** TiMOTION develops T-Smart functionality. With T-Smart, the actuator has a built-in circuit board with a microprocessor that can operate the actuator without a control box.

**Note 2:** PGMA is a software program developed by TiMOTION. Users can install this programmer into the laptop and adjust the actuator parameters directly.
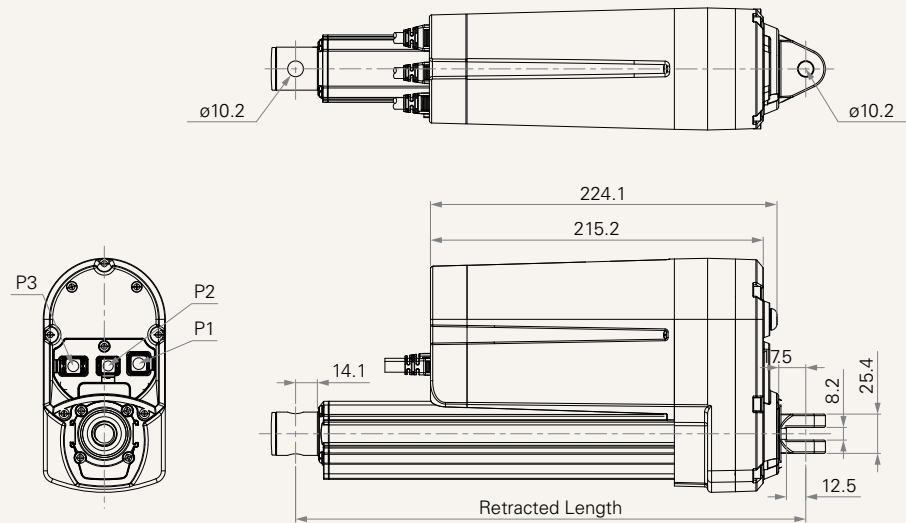
**Note 3:** Please contact your local sales department for further assistance.

### General Features

| | |
|---|---|
| Max. load | 8,000N (push/pull) |
| Max. speed at max. load | 5.4mm/s |
| Max. speed at no load | 52.5mm/s |
| Retracted length | ≥ Stroke + 131mm |
| IP rating | IP69K |
| Stroke | 25~1000mm |
| Options | Hall sensors, manual drive, Reed sensor on the outer tube, T-Smart |
| Voltage | 12/24 V DC |
| Operational temperature range | -40°C~+85°C |
| Operational temperature range at full performance | +5°C~+45°C |

## Drawing

Standard Dimensions
(mm)

ø10.2                                                                    ø10.2

P3        P2
          P1

224.1
215.2

14.1          7.5
              8.2    25.4
              12.5

Retracted Length

## 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, Duty Cycle 25%)** | | | | | | | |
| 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 |
| **Motor Speed (5200RPM, Duty Cycle 10%)** | | | | | | | |
| K | 8000 | 8000 | 10400 | 2.0 | 6.2 | 6.6 | 5.4 |

## 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 under ambient temperature 20°C. 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 a stable 24V DC power supply.

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

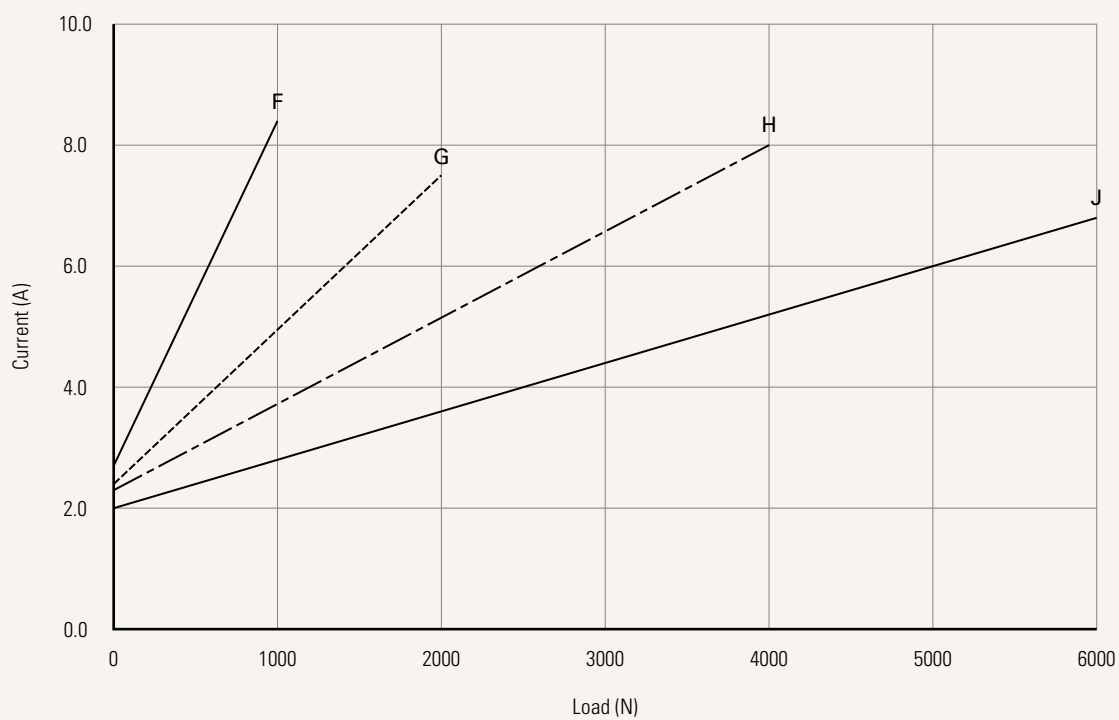| CODE | Load (N) | Max Stroke (mm) |
|------|----------|-----------------|
| K | ≥ 8000 | 200 |
| H, J | ≥ 4000 | 600 |
| G | = 2000 | 800 |
| F | = 1000 | 1000 |

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**Performance Data (24V DC Motor)**
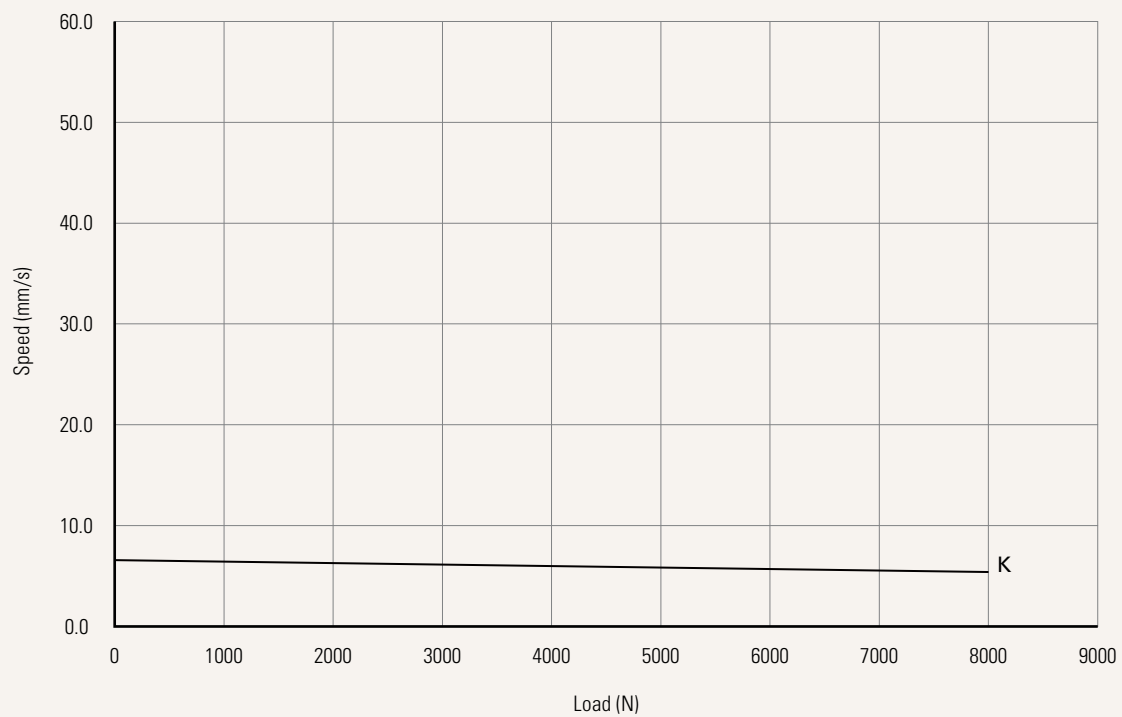
Motor Speed (5200RPM, Duty Cycle 25%)

## Speed vs. Load
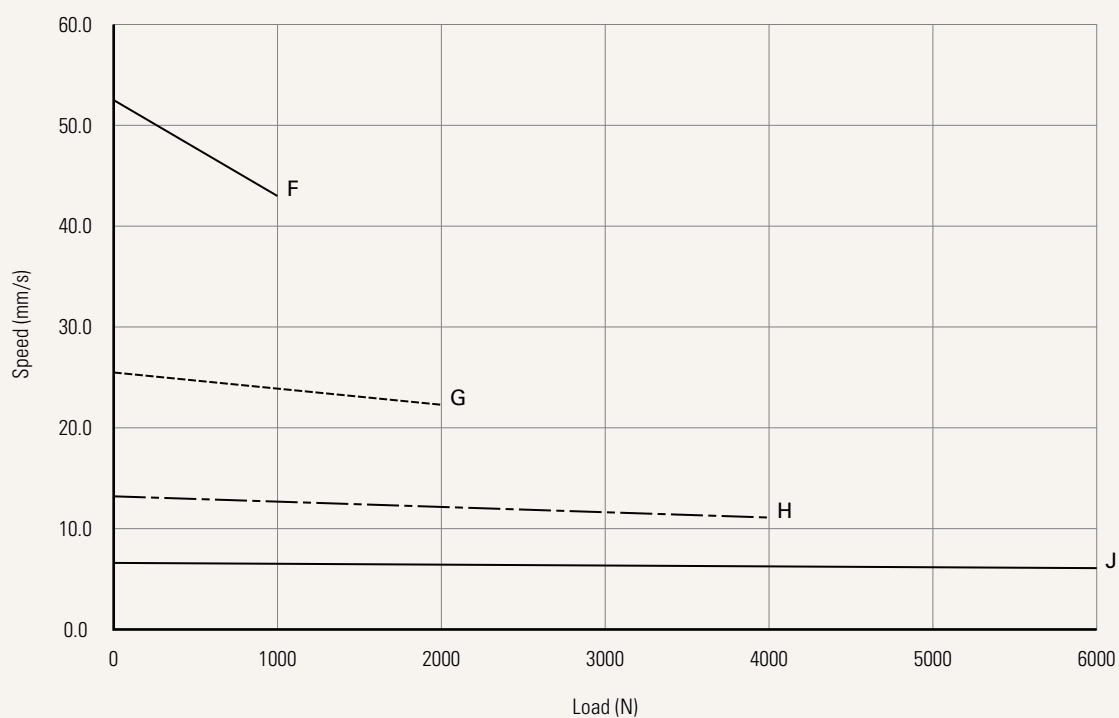


## Current vs. Load

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

Motor Speed (5200RPM, Duty Cycle 10%)

## Speed vs. Load



## Current vs. Load

# **MA2T** Ordering Key

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## MA2T

Version: 20210728-D

| | | |
|---|---|---|
| **Voltage** | 1 = 12V DC | 2 = 24V DC |

| | |
|---|---|
| **Load and Speed** | See page 2 |

| | |
|---|---|
| **Stroke (mm)** | See page 2 |

| | |
|---|---|
| **Retracted Length (mm)** | See page 6 |

| | |
|---|---|
| **Rear Attachment (mm)**<br>See page 6 | 1 = Aluminum casting, clevis U, slot 8.2, depth 12.5, hole 10.2 |
| | 2 = Aluminum casting, clevis U, slot 8.2, depth 15.0, hole 10.2 |
| | 3 = Aluminum casting, clevis U, slot 8.2, depth 15.0, hole 12.8 |
| | 4 = Aluminum casting, clevis U, slot 8.2, depth 15.0, hole 12.2 |

| | |
|---|---|
| **Front Attachment (mm)**<br>See page 7 | 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 15.0, 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 15.0, hole 12.8 |
| | K = Rod end bearing, hole 12.8 |

| | | |
|---|---|---|
| **Direction of Rear Attachment (Counterclockwise)**<br>See page 7 | 1 = 0° | 2 = 90° |

| | |
|---|---|
| **Functions for Limit switches** | T = T-smart Limit Switch dedicated option |

| | | |
|---|---|---|
| **Reed Sensor on The Outer Tube** | 0 = Without | 2 = Reed sensor * 1 to actuator P2 |
| | 1 = Reed sensor * 2 to control box, tinned lead | |

| | |
|---|---|
| **Output Signal**<br>See page 8 | D = Embedded Hall sensor*2 to T-smart; configurable on PGMA with signal output type |

| | | |
|---|---|---|
| **Output Cable** | 3 = 3 sockets with extension cable | T= Direct cable out, 1+1 type |

| | |
|---|---|
| **Connector**<br>See page 8 | 1 = Tinned lead |

| | | | |
|---|---|---|---|
| **Cable Length (mm)** | 1 = 500 | 3 = 1500 | 5 = 3000 |
| | 2 = 1000 | 4 = 2000 | 6 = 5000 |

| | | | | |
|---|---|---|---|---|
| **IP Rating** | 2 = IP54 | 3 = IP66 | 6 = IP66D | 8 = IP69K |

| | |
|---|---|
| **Manual Drive** | 1 = With |

| | |
|---|---|
| **T-Smart** | T = T-smart advanced |

| | |
|---|---|
| **Bus Interface Board** | C = CAN bus |
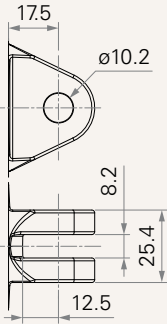
## Retracted Length (mm)

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

**A.**
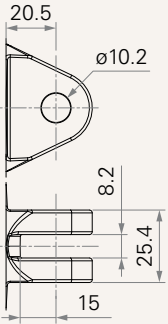
| Front Attach. | Rear Attach. | |
| --- | --- | --- |
| | 1 | 2, 3, 4 |
| 1, 2, 3 | +131 | +134 |
| 4, 5, 6 | +161 | +164 |
| K | +178 | +181 |

**B. Stroke (mm)**

| | |
| --- | --- |
| 25~150 | - |
| 151~200 | - |
| 201~250 | +10 |
| 251~300 | +20 |
| 301~350 | +30 |
| 351~400 | +40 |
| 401~450 | +50 |
| 451~500 | +60 |
| 501~550 | +70 |
| 551~600 | +80 |
| 601~650 | +90 |
| 651~700 | +100 |
| 701~750 | +110 |
| 751~800 | +120 |
| 801~850 | +130 |
| 851~900 | +140 |
| 901~950 | +150 |
| 951~1000 | +160 |

## Rear Attachment (mm)
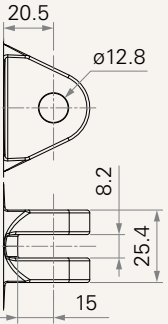
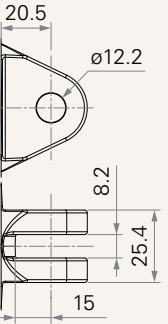1 = Aluminum casting, clevis U, slot 8.2, depth 12.5, hole 10.2

17.5  ø10.2  8.2  25.4  12.5

2 = Aluminum casting, clevis U, slot 8.2, depth 15.0, hole 10.2

20.5  ø10.2  8.2  25.4  15

3 = Aluminum casting, clevis U, slot 8.2, depth 15.0, hole 12.8

20.5  ø12.8  8.2  25.4  15

4 = Aluminum casting, clevis U, slot 8.2, depth 15.0, hole 12.2

20.5  ø12.2  8.2  25.4  15

## Front Attachment (mm)

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

ø28
ø10.2

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

ø28
ø12.2

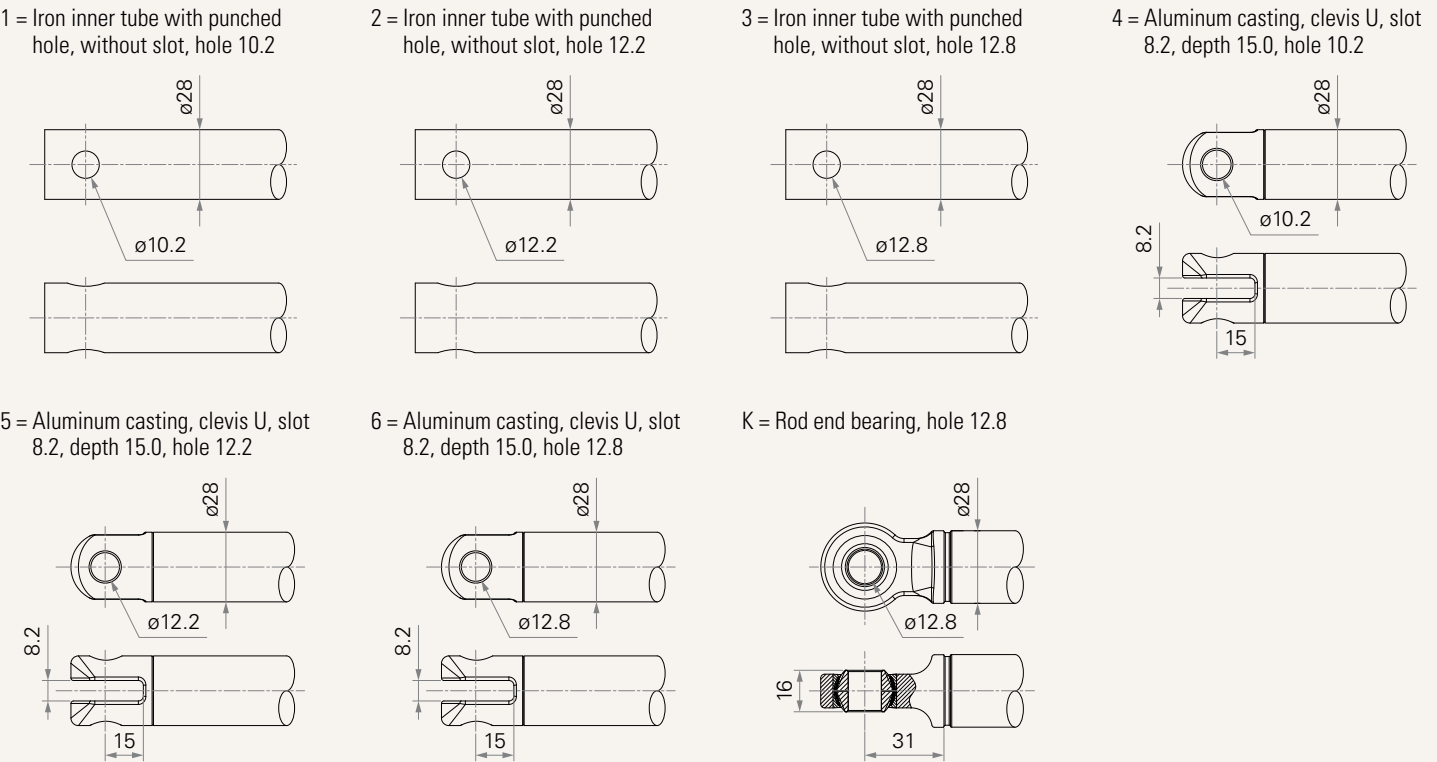3 = Iron inner tube with punched hole, without slot, hole 12.8

ø28
ø12.8

4 = Aluminum casting, clevis U, slot 8.2, depth 15.0, hole 10.2

ø28
ø10.2
8.2
15

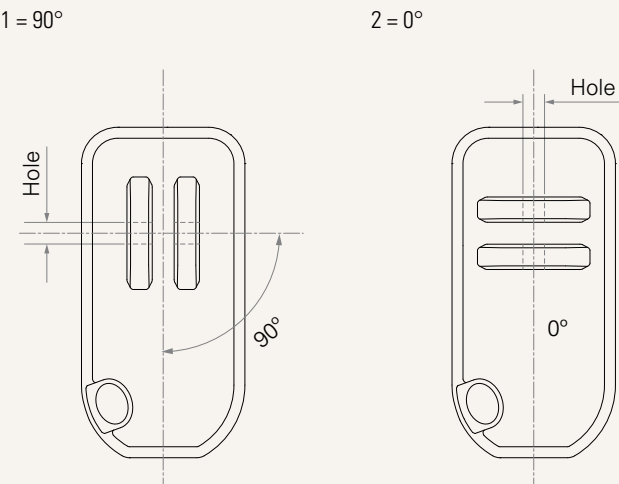5 = Aluminum casting, clevis U, slot 8.2, depth 15.0, hole 12.2

ø28
ø12.2
8.2
15

6 = Aluminum casting, clevis U, slot 8.2, depth 15.0, hole 12.8

ø28
ø12.8
8.2
15

K = Rod end bearing, hole 12.8

ø28
ø12.8
16
31

## Direction of Rear Attachment (Counterclockwise)

1 = 90°

Hole
90°

2 = 0°

Hole
0°

# MA2T Ordering Key Appendix

## Wire Definition

**DC Moter**

| P1 | Wire Color | 🔴 Red | ⚫ Black | | | | | |
|---|---|---|---|---|---|---|---|---|
| | AWG | 14 | 14 | | | | | |
| | T-Smart | VDC + | VDC- | | | | | |
| **P2** | Wire Color | 🔴 Red | ⚪ White | 🔵 Blue | ⚫ Black | 🟤 Brown | ⚪ Gray | |
| | AWG | 20 | 20 | 20 | 20 | 20 | 20 | |
| | T-Smart | UART-+5V DC | UART-TX | UART-RX | UART-GND | reed input 1 | reed input 2 | Hall 2 / PWM   Signal GND |
| **P3** | Wire Color | 🟤 Brown | ⚪ Gray | 🟠 Orange | 🟡 Yellow | ⚪ White | 🔵 Blue | 🔴 Red    ⚫ Black |
| | AWG | 20 | 20 | 20 | 20 | 20 | 20 | 20     20 |
| | T-Smart | Ctrl EXT | Ctrl RET | EOS-extended | EOS-retracted | S1/POT/CAN+ | S2/PWM/CAN- | VDC +    Common |
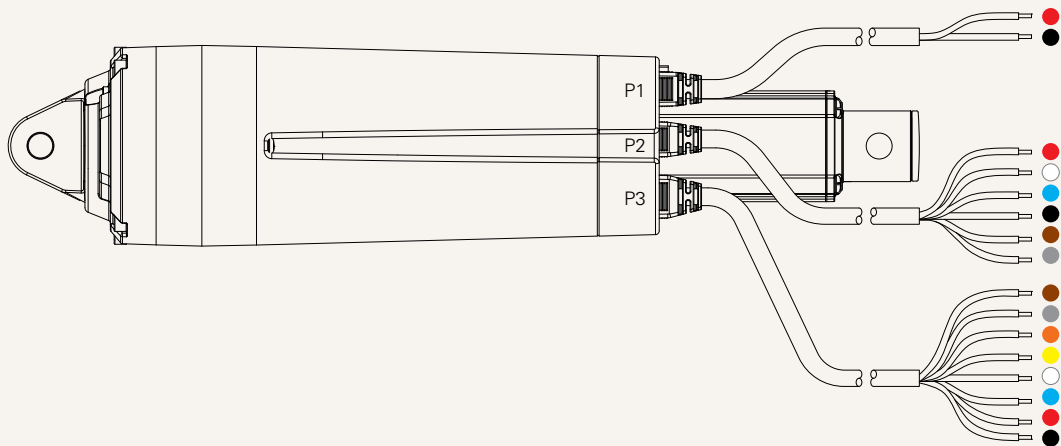


\* The signal wires depend on the chosen options.

## Connector

1 = Tinned lead
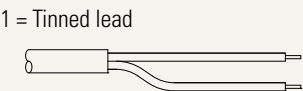


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