# EC-S4
# EC-DS4
<With digital speed controller>

Simple Dust-proof | Straight Motor | Body Width 40 mm | 24v Stepper Motor

## ■ Model Specification Items

EC - [ ] - [ ] - [ ] - [ ] - [ ]

| Series | Type | | Lead | | Stroke | | Power / I/O cable length | Options |
|---|---|---|---|---|---|---|---|---|
| | S4 | Standard | S | 16mm | 50 | 50mm | Refer to "Power / I/O Cable Length" below | Refer to "Options" below |
| | DS4 | Digital speed controller | H | 10mm | ↕ | ↕ | | |
| | | | M | 5mm | 300 | 300mm (Every 50mm) | | |
| | | | L | 2.5mm | | | | |


CE RoHS 10

Horizontal | Vertical | Side | Ceiling

(Note) The photos above are for motor installed on top (MOT).

## ■ Stroke

| Stroke (mm) | EC-S4 | EC-DS4 | Stroke (mm) | EC-S4 | EC-DS4 |
|---|---|---|---|---|---|
| **50** | ○ | ○ | **200** | ○ | ○ |
| **100** | ○ | ○ | **250** | ○ | ○ |
| **150** | ○ | ○ | **300** | ○ | ○ |

## ■ Options

* Please check the Options reference pages to confirm each option.

| Name | Option code | Reference page |
|---|---|---|
| RCON-EC connection specification (Note 1) | **ACR** | 2-373 |
| Brake | **B** | 2-373 |
| Foot bracket | **FT** | 2-377 |
| Specified grease specification | **G1/G5** | 2-381 |
| Motor mounting direction changed (bottom) (Note 2) | **MOB** | 2-381 |
| Motor mounting direction changed (left) (Note 2) | **MOL** | 2-381 |
| Motor mounting direction changed (right) (Note 2) | **MOR** | 2-381 |
| Motor mounting direction changed (up) (Note 2) | **MOT** | 2-381 |
| Non-motor end specification | **NM** | 2-384 |
| PNP specification | **PN** | 2-384 |
| Slider part roller specification | **SR** | 2-386 |
| split motor and controller power supply specification | **TMD2** | 2-387 |
| Battery-less absolute encoder specification | **WA** | 2-388 |
| Wireless communication specification | **WL** | 2-388 |
| Wireless axis operation specification | **WL2** | 2-388 |

(Note 1) If the RCON-EC connection specification (ACR) is selected, the PNP specification (PN) and split motor and controller power supply specification (TMD2) cannot be selected.
(Note 2) Be sure to enter a code in the "Options" field in "Model Specification Items."

POINT Selection Notes

(1) The actuator specifications display the payload's maximum value, but it will vary depending on the acceleration and speed. Please refer to "Table of Payload by Speed/Acceleration" for more details.
(2) If performing push-motion operations, refer to the "Correlation between Torque and Current Limit" diagram. The torques listed are only reference values.
(3) Pay close attention to the installation orientation.
(4) Reference value of the overhang load length is under 100mm in the Ma, Mb, and Mc directions.
(5) The center of gravity of the attached object should be less than 1/2 of the overhang distance. Even when the overhang distance and load moment are within the allowable range, the operating conditions should be moderated if some abnormal vibration or noise is observed.

## ■ Power / I/O Cable Length

### ■ Standard connector cables

| Cable code | Cable length | User wiring specification (flying leads) | RCON-EC connection specification (Note 4) (with connectors on both ends) |
|---|---|---|---|
| | | CB-EC-PWBIO□□□-RB supplied | CB-REC-PWBIO□□□-RB supplied |
| **0** | No cable | ○(Note 3) | ○ |
| **1 ~ 3** | 1 ~ 3m | ○ | ○ |
| **4 ~ 5** | 4~ 5m | ○ | ○ |
| **6 ~ 7** | 6 ~ 7m | ○ | ○ |
| **8 ~ 10** | 8 ~ 10m | ○ | ○ |

(Note 3) Only terminal block connector is supplied. Please refer to P. 2-394 for details.
(Note 4) If RCON-EC connection specification (ACR) is selected as an option.
(Note) The robot cable is standard.

### ■ Four-way connector cables

| Cable code | Cable length | User wiring specification (flying leads) | RCON-EC connection specification (Note 5) (with connectors on both ends) |
|---|---|---|---|
| | | CB-EC2-PWBIO□□□-RB supplied | CB-REC2-PWBIO□□□-RB supplied |
| **S1 ~S3** | 1 ~ 3m | ○ | ○ |
| **S4 ~ S5** | 4~ 5m | ○ | ○ |
| **S6 ~ S7** | 6 ~ 7m | ○ | ○ |
| **S8 ~ S10** | 8 ~ 10m | ○ | ○ |

(Note 5) If RCON-EC connection specification (ACR) is selected as an option.
(Note) The robot cable is standard.

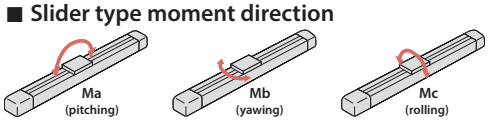
## Main Specifications

| Item | | | Description | | | |
|---|---|---|---|---|---|---|
| Lead | | Ball screw lead (mm) | 16 | 10 | 5 | 2.5 |
| Horizontal | Payload | Max. payload (kg) (energy-saving disabled) | 7 | 12 | 15 | 18 |
| | | Max. payload (kg) (energy-saving enabled) | 4 | 10 | 12 | 14 |
| | Speed / acceleration/ deceleration | Max. speed (mm/s) | 800 | 700 | 350 | 175 |
| | | Min. speed (mm/s) | 40 | 30 | 7 | 4 |
| | | Rated acceleration/deceleration (G) | 0.3 | 0.3 | 0.3 | 0.3 |
| | | Max. acceleration/deceleration (G) | 1 | 1 | 0.5 | 0.3 |
| Vertical | Payload | Max. payload (kg) (energy-saving disabled) | 1.5 | 2.5 | 5 | 6.5 |
| | | Max. payload (kg) (energy-saving enabled) | 1 | 2 | 4.5 | 6.5 |
| | Speed / acceleration/ deceleration | Max. speed (mm/s) | 800 | 700 | 350 | 150 |
| | | Min. speed (mm/s) | 40 | 30 | 7 | 4 |
| | | Rated acceleration/deceleration (G) | 0.3 | 0.3 | 0.3 | 0.3 |
| | | Max. acceleration/deceleration (G) | 0.5 | 0.5 | 0.5 | 0.3 |
| Push | | Max. push force (N) | 41 | 66 | 132 | 263 |
| | | Max. push speed (mm/s) | 40 | 30 | 20 | 20 |
| Brake | | Brake specification | Non-excitation actuating solenoid brake | | | |
| | | Brake holding force (kgf) | 1.5 | 2.5 | 5 | 6.5 |
| Stroke | | Min. stroke (mm) | 50 | 50 | 50 | 50 |
| | | Max. stroke (mm) | 300 | 300 | 300 | 300 |
| | | Stroke pitch (mm) | 50 | 50 | 50 | 50 |

| Item | Description |
|---|---|
| Driving system | Ball screw ϕ8mm, rolled C10 |
| Positioning repeatability | ±0.05mm |
| Lost motion | - (two-point positioning function; cannot be represented) |
| Base | Dedicated aluminum extruded material (A6063SS-T5 equivalent), black alumite treatment |
| Linear guide | Linear motion infinite circulating type |
| Static allowable moment | Ma: 13.0N·m |
| | Mb: 18.6N·m |
| | Mc: 25.3N·m |
| Dynamic allowable moment (Note 6) | Ma: 5.0N·m |
| | Mb: 7.1N·m |
| | Mc: 9.7N·m |
| Ambient operating temperature, humidity | 0 ~ 40°C, 85%RH or less (Non-condensing) |
| Degree of protection | IP20 |
| Vibration/shock resistance | 4.9m/s² |
| Overseas standards | CE marking, RoHS directive |
| Motor type | Stepper motor (□35) |
| Encoder type | Incremental/battery-less absolute |
| Number of encoder pulses | 800 pulse/rev |

(Note 6) Based on the standard rated operation life of 5,000km. Operation life varies according to operating and mounting conditions.

### ■ Slider type moment direction




## Table of Payload by Speed/Acceleration

### ■ Energy-saving setting disabled (The unit for payload is kg. If blank, operation is not possible.)

**Lead 16**

| Orientation | Horizontal | | | | Vertical | |
|---|---|---|---|---|---|---|
| Speed (mm/s) | Acceleration (G) | | | | | |
| | 0.3 | 0.5 | 0.7 | 1 | 0.3 | 0.5 |
| 0 | 7 | 6 | 6 | 5 | 1.5 | 1.25 |
| 140 | 7 | 6 | 6 | 5 | 1.5 | 1.25 |
| 280 | 7 | 6 | 6 | 5 | 1.5 | 1.25 |
| 420 | 7 | 6 | 6 | 5 | 1.5 | 1.25 |
| 560 | 7 | 6 | 5.5 | 5 | 1.5 | 1.25 |
| 700 | 6 | 5 | 4.5 | 4 | 1.5 | 1.25 |
| 800 | | 4 | 3.5 | 3 | | 1 |

**Lead 10**

| Orientation | Horizontal | | | | Vertical | |
|---|---|---|---|---|---|---|
| Speed (mm/s) | Acceleration (G) | | | | | |
| | 0.3 | 0.5 | 0.7 | 1 | 0.3 | 0.5 |
| 0 | 12 | 11 | 10 | 10 | 2.5 | 2 |
| 175 | 12 | 11 | 10 | 10 | 2.5 | 2 |
| 350 | 12 | 11 | 10 | 9 | 2.5 | 2 |
| 435 | 12 | 11 | 9 | 8 | 2.5 | 2 |
| 525 | 11 | 9 | 7 | 6 | 2 | 2 |
| 600 | 10 | 7 | 5 | 4.5 | 2 | 1.5 |
| 700 | | 4 | 2.5 | 2.5 | | 1 |

**Lead 5**

| Orientation | Horizontal | | Vertical | |
|---|---|---|---|---|
| Speed (mm/s) | Acceleration (G) | | | |
| | 0.3 | 0.5 | 0.3 | 0.5 |
| 0 | 15 | 14 | 5 | 4.5 |
| 85 | 15 | 14 | 5 | 4.5 |
| 130 | 15 | 14 | 5 | 4.5 |
| 215 | 15 | 14 | 5 | 4.5 |
| 260 | 15 | 14 | 5 | 4.5 |
| 300 | 15 | 14 | 4.5 | 4 |
| 350 | 13 | 12 | 4 | 3.5 |

**Lead 2.5**

| Orientation | Horizontal | Vertical |
|---|---|---|
| Speed (mm/s) | Acceleration (G) | |
| | 0.3 | 0.3 |
| 0 | 18 | 6.5 |
| 40 | 18 | 6.5 |
| 85 | 18 | 6.5 |
| 105 | 18 | 6.5 |
| 135 | 18 | 6.5 |
| 150 | 18 | 6 |
| 175 | 18 | |

### ■ Energy-saving setting enabled (The unit for payload is kg. If blank, operation is not possible.)

**Lead 16**

| Orientation | Horizontal | | Vertical |
|---|---|---|---|
| Speed (mm/s) | Acceleration (G) | | |
| | 0.3 | 0.7 | 0.3 |
| 0 | 4 | 3.5 | 1 |
| 140 | 4 | 3.5 | 1 |
| 280 | 4 | 3.5 | 1 |
| 420 | 4 | 3.5 | 1 |
| 560 | 4 | 3 | 1 |
| 700 | 3 | 2 | |
| 800 | | 1 | |

**Lead 10**

| Orientation | Horizontal | | Vertical |
|---|---|---|---|
| Speed (mm/s) | Acceleration (G) | | |
| | 0.3 | 0.7 | 0.3 |
| 0 | 10 | 8 | 2 |
| 175 | 10 | 8 | 2 |
| 350 | 9 | 6 | 2 |
| 435 | 7 | 5 | 1.5 |
| 525 | 5 | 2.5 | 1 |

**Lead 5**

| Orientation | Horizontal | Vertical |
|---|---|---|
| Speed (mm/s) | Acceleration (G) | |
| | 0.3 | 0.3 |
| 0 | 12 | 4.5 |
| 85 | 12 | 4.5 |
| 130 | 12 | 4 |
| 215 | 10 | 4 |
| 260 | 9 | 2.5 |

**Lead 2.5**

| Orientation | Horizontal | Vertical |
|---|---|---|
| Speed (mm/s) | Acceleration (G) | |
| | 0.3 | 0.3 |
| 0 | 14 | 6.5 |
| 40 | 14 | 6.5 |
| 85 | 14 | 6.5 |
| 105 | 14 | 6.5 |
| 135 | 14 | 5 |

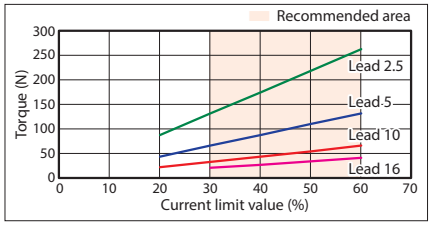
## Stroke and Max Speed

| Lead (mm) | Energy-saving setting | 50 ~ 200 (Every 50mm) | 250 (mm) | 300 (mm) |
|---|---|---|---|---|
| 16 | Disabled | 800 | 760 | 540 |
| | Enabled | 800 <560> | 760 <560> | 540 |
| 10 | Disabled | 700 | 470 | 320 |
| | Enabled | 525 | 470 | 320 |
| 5 | Disabled | 350 | 240 | 160 |
| | Enabled | 260 | 240 | 160 |
| 2.5 | Disabled | 175 <150> | 120 | 85 |
| | Enabled | 135 | 120 | 85 |

(Unit: mm/s)

(Note) Values in brackets < > are for vertical use.

## Correlation between Torque and Current Limit

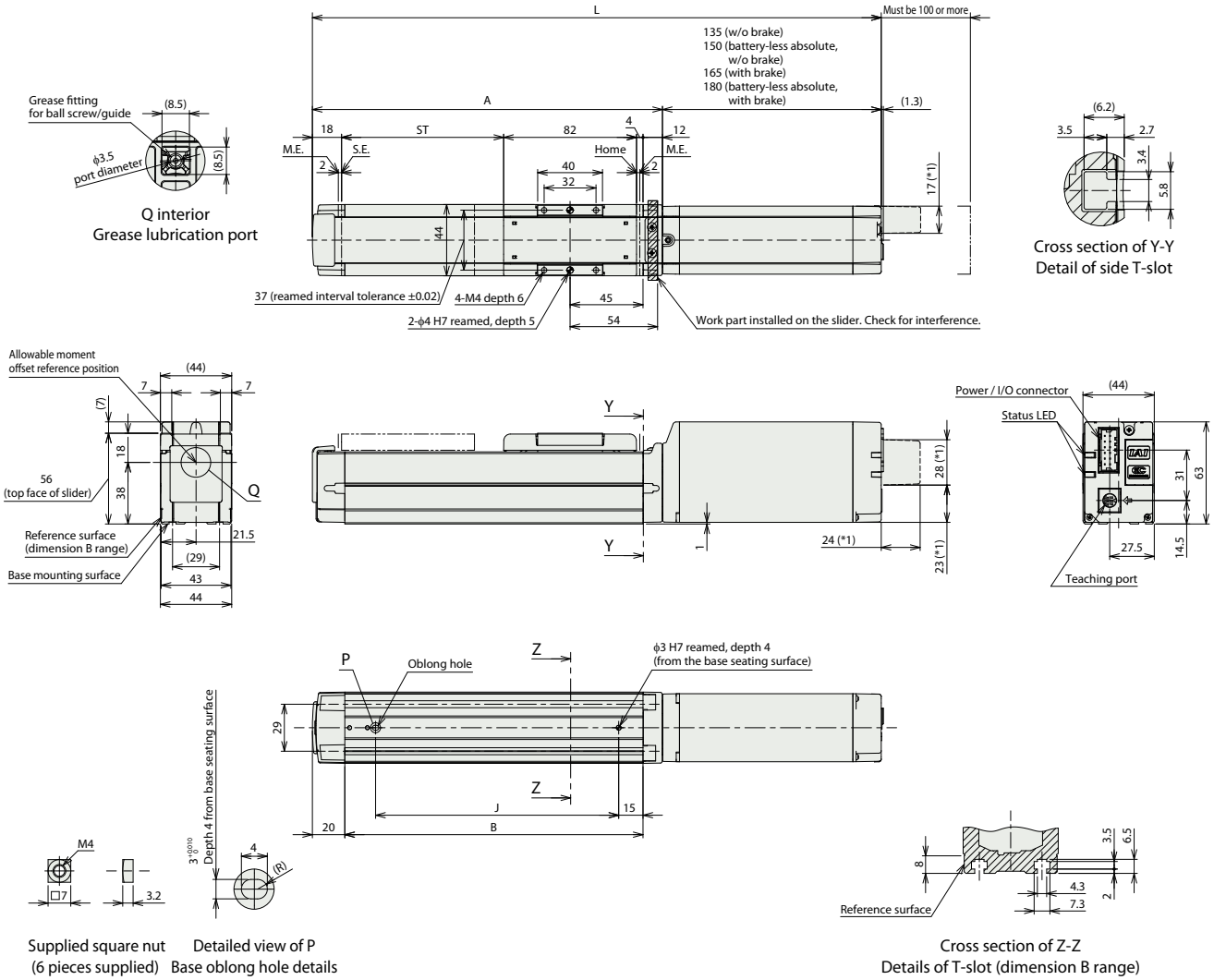


CAD drawings can be downloaded from our website.
www.intelligentactuator.com

## EC-S4

*1 Dimensions when wireless communication specification (option) or wireless axis operation specification (option) is selected.
(Note) When the slider is returning to its home position, be careful of interference from surrounding objects, as it will travel until it reaches the M.E.
(Note) The figures below are for motor installed on top (MOT).

ST: Stroke
M.E: Mechanical end
S.E: Stroke end



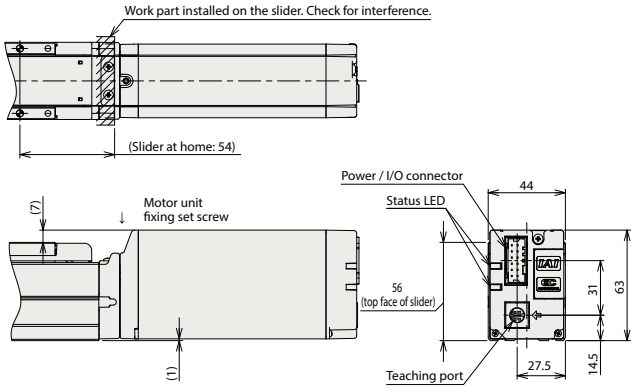

## Dimensions by stroke

| Stroke | | | 50 | 100 | 150 | 200 | 250 | 300 |
|---|---|---|---|---|---|---|---|---|
| L | Incremental | Without brake | 301 | 351 | 401 | 451 | 501 | 551 |
| | | With brake | 331 | 381 | 431 | 481 | 531 | 581 |
| | Battery-less absolute | Without brake | 316 | 366 | 416 | 466 | 516 | 566 |
| | | With brake | 346 | 396 | 446 | 496 | 546 | 596 |
| A | | | 166 | 216 | 266 | 316 | 366 | 416 |
| B | | | 134 | 184 | 234 | 284 | 334 | 384 |
| J | | | 100 | 150 | 200 | 250 | 300 | 350 |

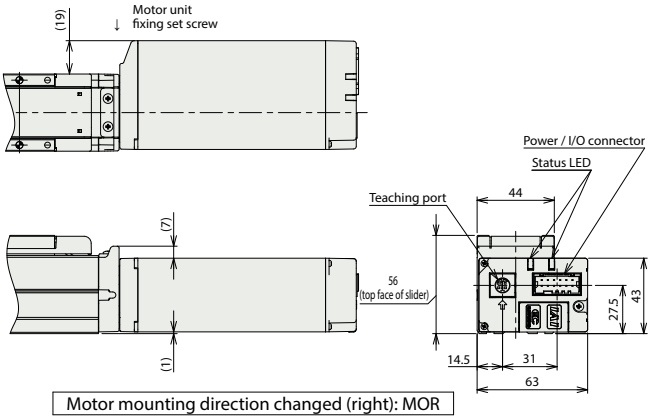
## Mass by stroke

| Stroke | | 50 | 100 | 150 | 200 | 250 | 300 |
|---|---|---|---|---|---|---|---|
| Mass (kg) | Without brake | 1.2 | 1.3 | 1.5 | 1.6 | 1.8 | 1.9 |
| | With brake | 1.3 | 1.5 | 1.6 | 1.8 | 1.9 | 2.1 |

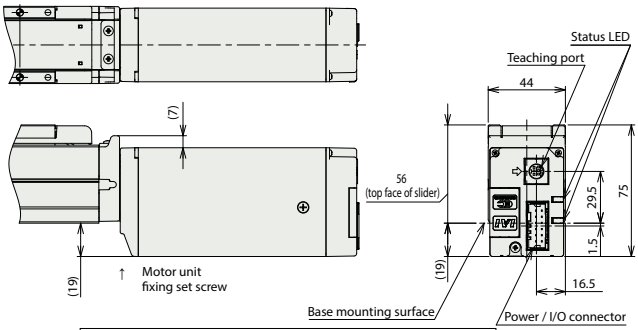
## ■Motor mounting direction changed (option)



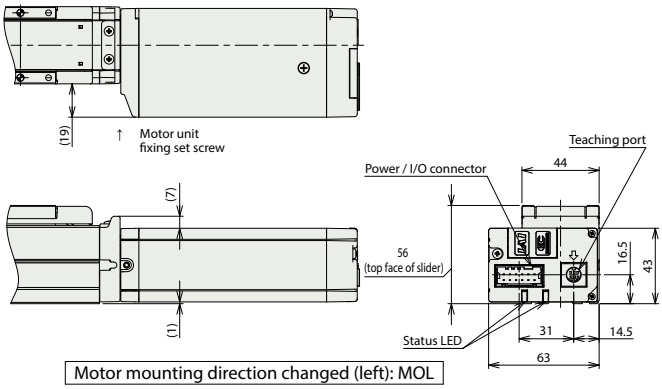

Motor mounting direction changed (top): MOT




Motor mounting direction changed (right): MOR




Motor mounting direction changed (bottom): MOB

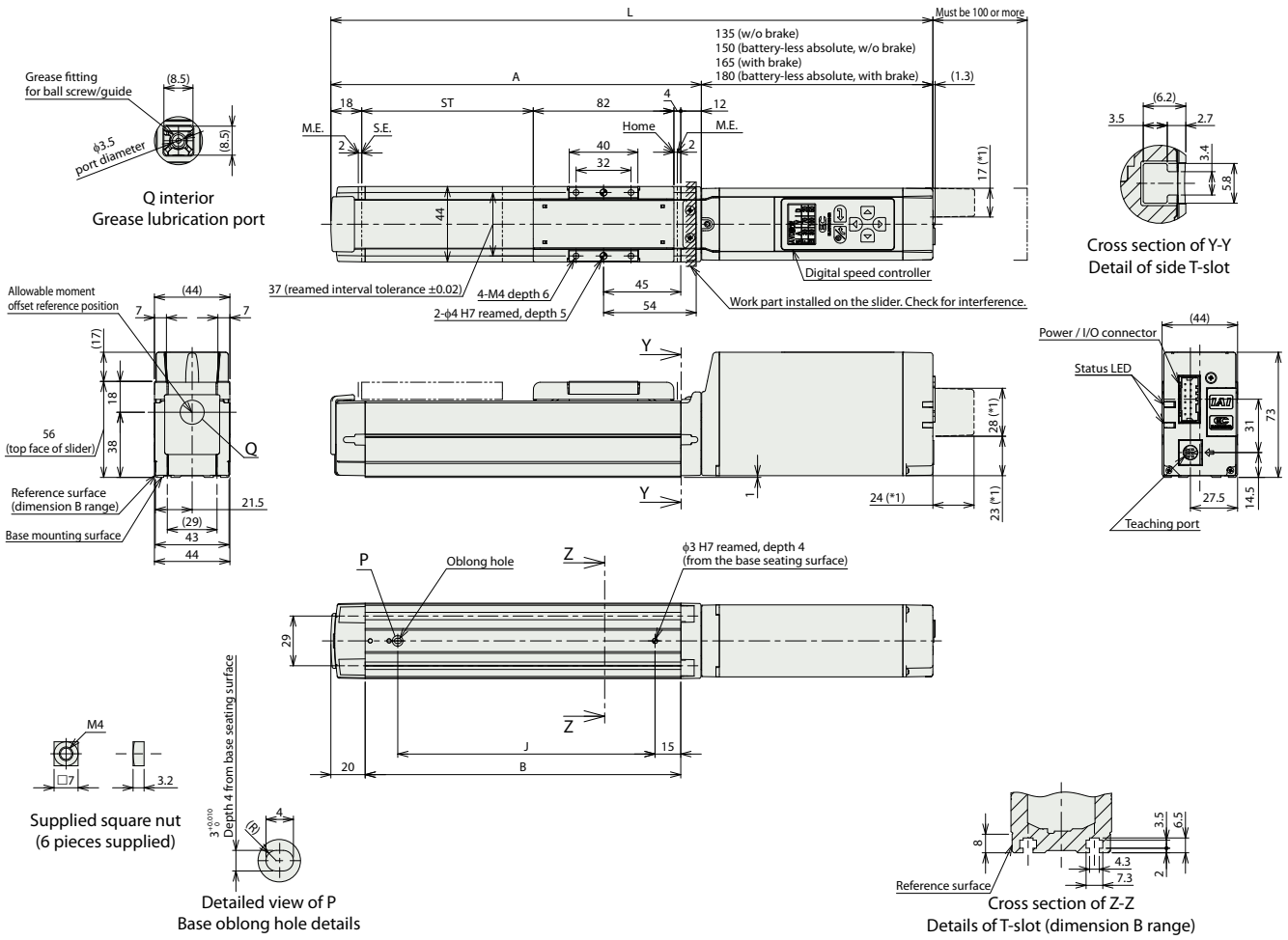



Motor mounting direction changed (left): MOL

## EC-DS4 <with digital speed controller>

*1 Dimensions when wireless communication specification (option) or wireless axis operation specification (option) is selected.
(Note) When the slider is returning to its home position, please be careful of interference from surrounding objects, as it will travel until it reaches the M.E.
(Note) The figures below are for motor installed on top (MOT).

ST: Stroke
M.E: Mechanical end
S.E: Stroke end



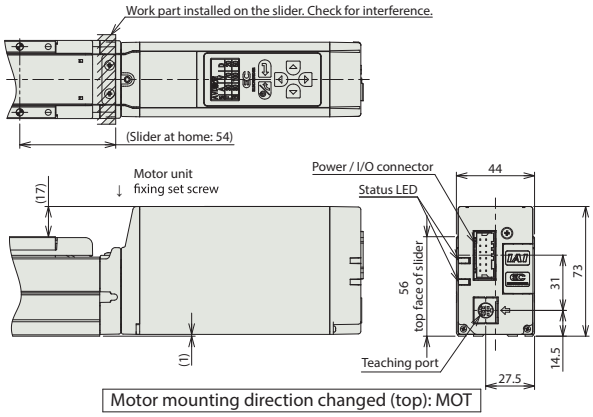

## Dimensions by stroke

| Stroke | | | 50 | 100 | 150 | 200 | 250 | 300 |
|---|---|---|---|---|---|---|---|---|
| L | Incremental | Without brake | 301 | 351 | 401 | 451 | 501 | 551 |
| | | With brake | 331 | 381 | 431 | 481 | 531 | 581 |
| | Battery-less absolute | Without brake | 316 | 366 | 416 | 466 | 516 | 566 |
| | | With brake | 346 | 396 | 446 | 496 | 546 | 596 |
| A | | | 166 | 216 | 266 | 316 | 366 | 416 |
| B | | | 134 | 184 | 234 | 284 | 334 | 384 |
| J | | | 100 | 150 | 200 | 250 | 300 | 350 |

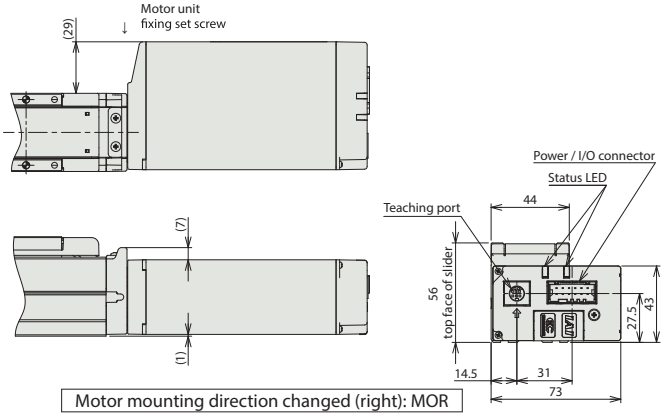
## Mass by stroke

| Stroke | | 50 | 100 | 150 | 200 | 250 | 300 |
|---|---|---|---|---|---|---|---|
| Mass (kg) | Without brake | 1.2 | 1.3 | 1.5 | 1.6 | 1.8 | 1.9 |
| | With brake | 1.4 | 1.5 | 1.7 | 1.8 | 2.0 | 2.1 |

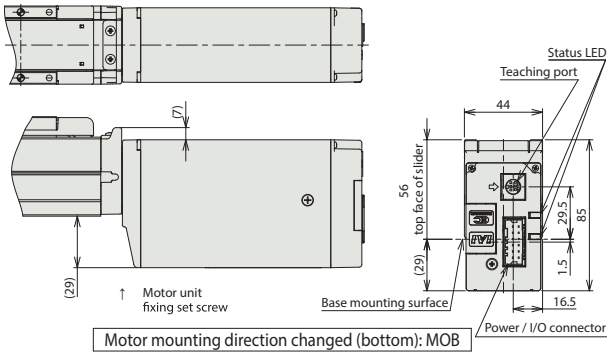
## ■ Motor mounting direction changed (option)



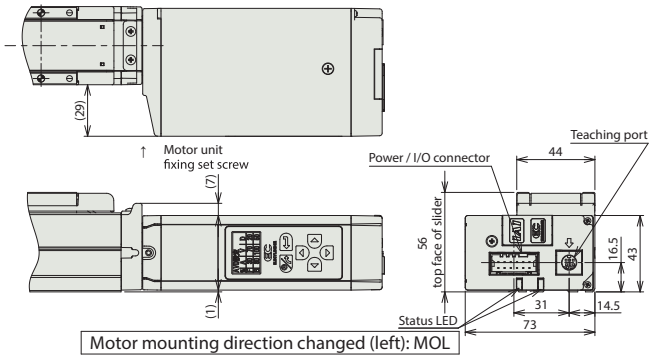

Motor mounting direction changed (top): MOT




Motor mounting direction changed (right): MOR




Motor mounting direction changed (bottom): MOB




Motor mounting direction changed (left): MOL

## ■ Applicable Controllers

(Note) EC series is equipped with a built-in controller. Please refer to P. 2-391 for details on built-in controllers.