NEW

Linear Motor series

Multimotion actuator/cluster linear motor/ball spline shaft motor

CCR/CCM/RLT

For details, visit THK at www.thk.com

* Product information is updated regularly on the THK website.
Linear Motion (LM) & Rotation

CCM (LM) + RLT (Rotation) = Multimotion Actuator CCR

Features

- LM & rotation is integrated in one package
  Multimotion actuator with independently controllable LM and rotation.

- FL mode (force control)
  The force can be controlled while easily controlling the speed and position.
  * For more information on the FL mode, see P.14.

- Lightweight and Compact
  Multi-motion Actuator equipped with integrated encoder realizes light weight and compact size allows higher speed for higher productivity.
  - Minimum size is 200g
  - Width: 14mm or more Height: 46.8mm or more

- Hollow shaft employed
  This can be used as an air flow path.
CCM (LM) and RLT (rotation) may also be used alone.

**LM Cluster linear motor CCM**  
- Lightweight and compact size realized by integral molding
- Forcer part is made of resin with excellent electrical insulation property and thermal conductivity
- Assembly of multiple shafts closely contacted is possible (lamination)

**Rotation Ball spline shaft motor RLT**  
- Hollow shaft employed
- Ball spline employed for rotation shaft
- Linear guide is possible during rotation
- Compact servo motor with an integral encoder is used

**Control device**  
- MD: High-performance driver compatible with FL mode. (Optional)
- XD: Small driver with converged functions.
- CD: Multiple-shaft driver that can control up to 4 shafts. (The standard mode is CCM only)
Linear Motor series CCR/CCM/RLT

CCR
Multimotion actuator

Example applications

For flipping work

For work alignment
Features

1. **LM and Rotation**
   Multimotion actuator with independently controllable LM and rotation. The compact design with the integral position detecting system realizes compact size and process time reduction.

2. **Hollow shaft**
   As the movable shaft is a hollow, it can be used as an air flow path.

3. **FL mode (force control)**
   While controlling force, the speed and position can also be controlled with simple programming. As driving is possible only with I/O contact input, a system can be built with simple configuration.
   
   * FL mode is optional. Only compatible with driver MD.

Compatible drivers

This unit is compatible with the following drivers. For more information on each driver, see P.29.

- **Driver MD**
  High-performance driver compatible with FL mode. (Optional)

- **Driver XD**
  Small driver with converged functions.
# Basic Specifications

### CCM (LM)

<table>
<thead>
<tr>
<th>Item</th>
<th>Motor type</th>
<th>CCR05-S</th>
<th>CCR05-M</th>
<th>CCR07-S</th>
<th>CCR07-M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>MD, XD</td>
<td>10W</td>
<td>24V DC</td>
<td>24V DC</td>
<td>24V DC</td>
</tr>
<tr>
<td>Maximum thrust (^1) [N]</td>
<td>5.1</td>
<td>10.4</td>
<td>9.4</td>
<td>19.3</td>
<td></td>
</tr>
<tr>
<td>Rated thrust (^2) [N]</td>
<td>2.3</td>
<td>4.7</td>
<td>5.4</td>
<td>11.4</td>
<td></td>
</tr>
<tr>
<td>Encoder resolution [µm]</td>
<td>1.64</td>
<td></td>
<td>2.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum speed [m/s]</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

\(^1\) Values with the average temperature of armature winding at 100°C in ambient temperature of 20°C.

\(^2\) Values when the unit is used individually. If you want to use laminated motors, contact THK.

Note: If CCR is mounted vertically, the moving elements fall by their own weight in the event of power shutdown or any alarm. Please consider using a brake to prevent this.

### RLT (rotation)

<table>
<thead>
<tr>
<th>Item</th>
<th>Motor type</th>
<th>CCR05-S</th>
<th>CCR05-M</th>
<th>CCR07-S</th>
<th>CCR07-M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>MD, XD</td>
<td>10W</td>
<td>24V DC</td>
<td>24V DC</td>
<td>24V DC</td>
</tr>
<tr>
<td>Maximum torque (^1) [N·m]</td>
<td>8.0 × 10(^{-3})</td>
<td>29.9 × 10(^{-3})</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated torque (^2) [N·m]</td>
<td>3.5 × 10(^{-3})</td>
<td>12.0 × 10(^{-3})</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Encoder resolution [deg]</td>
<td>0.011 (32768 divisions)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum rotational speed [min(^{-1})]</td>
<td></td>
<td></td>
<td></td>
<td>1000</td>
<td></td>
</tr>
</tbody>
</table>

\(^1\) Values with the average temperature of armature winding at 100°C in ambient temperature of 20°C.

\(^2\) Values when the unit is used individually. If you want to use laminated motors, contact THK.

# Features

- **Maximum thrust/Maximum torque**
- **Rated thrust/Rated torque**

*When making selections, contact THK.*
System Configuration

- Driver MD/Driver XD specifications

* For driver combination and cables, refer to the model configuration page (P.7).

Note: A motion controller, connection cable between a motion controller and driver, DC power supply and its peripherals to be provided by customer.
### Model Configuration

<table>
<thead>
<tr>
<th>Model</th>
<th>Motor type</th>
<th>Stroke</th>
<th>Encoder</th>
<th>For CCM (LM)</th>
<th>For RLT (Rotation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCR05</td>
<td>S</td>
<td>015</td>
<td>EN</td>
<td>MD24F</td>
<td>MD24</td>
</tr>
<tr>
<td>CCR07</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CCR05**
- S: Type S
- M: Type M

**CCR07**
- 010: 10mm to 027: 27.5mm
- EN: Position Detecting System

See Table 1. Stroke list. *For more information, see CCR dimensions (P.9 to 12).

### Table 1. Stroke list

<table>
<thead>
<tr>
<th>Stroke symbol</th>
<th>CCR05</th>
<th>CCR07</th>
</tr>
</thead>
<tbody>
<tr>
<td>010: 10.0mm</td>
<td>012: 12.5mm</td>
<td>015: 15.0mm</td>
</tr>
</tbody>
</table>

### Table 2. Driver list

<table>
<thead>
<tr>
<th>Driver symbol</th>
<th>(5) CCM (LM) driver</th>
<th>(6) RLT (rotation) driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD24</td>
<td>MD-001-024DC-A-CPS</td>
<td>MD-001-024DC-A-CPS-FL</td>
</tr>
<tr>
<td>MD24F</td>
<td>MD-001-024DC-A-CPS</td>
<td>XD-001-024DC-A-CPS-FL</td>
</tr>
<tr>
<td>XD24</td>
<td></td>
<td>XD-001-024DC-A-CPS</td>
</tr>
</tbody>
</table>

**MD24**
- Driver MD
- 24: 24V DC specifications
- F: FL mode
  * FL mode is optional only for CCM (LM).

**MD24F**
- Driver MD FL mode specifications

**XD24**
- Driver XD

### Table 3. Cable list

<table>
<thead>
<tr>
<th>Driver</th>
<th>Power cable</th>
<th>Encoder cable</th>
<th>Power supply cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD</td>
<td>CCKD-**</td>
<td>CCXE-**</td>
<td>MKP24-01</td>
</tr>
<tr>
<td>XD</td>
<td></td>
<td></td>
<td>XKP24-01</td>
</tr>
</tbody>
</table>

**is to be replaced with a symbol corresponding to cable length (See 10 Cable length).**

The same power cable and encoder cable are used for CCM (LM) and RLT (rotation).
**Model configuration coding**


<table>
<thead>
<tr>
<th>Cover</th>
<th>Sensors</th>
<th>Standard</th>
<th>Cable length</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>N</td>
<td>CE</td>
<td>03</td>
</tr>
</tbody>
</table>

- **N**: No cover
- **Q**: Proximity sensor for rotation [N.O. contact] x 1
- **CE**: CE marking compliant product
- **03**: 3m

See Table 3. Cable list.
* Power cable and encoder cable of the same length are used for CCM (LM) and RLT (rotation).

Note) The above model configuration includes an actuator, a driver and cables. If you want an actuator only, contact THK.

Motion controller and connection cable between motion controller and driver to be provided by customer.

**Actuator**
- CCR05 Type S
- Stroke 15mm
- With position detecting system

**Cable**
- 3m length x 2 sets

**Driver**
- MD (for LM) FL mode specifications
- MD (for rotation)

Note) GX-F8A x 1 (Panasonic Industrial Devices SUNX Co., Ltd.)
If you select no proximity sensor, please provide a proximity sensor.
Note) Connect the proximity sensor with a controller provided by customer.

**Pages for detailed description**

<table>
<thead>
<tr>
<th>Page</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P.5</td>
<td>(2) Motor type Basic specifications and features</td>
</tr>
<tr>
<td>P.9 to 12</td>
<td>(3) Stroke Dimensions</td>
</tr>
<tr>
<td>P.5</td>
<td>(4) Encoder Basic specifications and features</td>
</tr>
<tr>
<td>P.29 to 31</td>
<td>(5) and (6) Drivers Specifications and dimensions</td>
</tr>
<tr>
<td>P.6, P.32 to 33</td>
<td>(10) Cable length System configuration and options</td>
</tr>
</tbody>
</table>
Linear Motor series  CCR/CCM/RLT

CCR05 Type S
Stroke: 10 to 25mm

Dimensions

<table>
<thead>
<tr>
<th>Motor type</th>
<th>Stroke symbol</th>
<th>ST Stroke [mm]</th>
<th>L Overall length [mm]</th>
<th>Main unit weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCR05-S</td>
<td>010</td>
<td>10.0</td>
<td>149</td>
<td></td>
</tr>
<tr>
<td></td>
<td>015</td>
<td>15.0</td>
<td>154</td>
<td></td>
</tr>
<tr>
<td></td>
<td>020</td>
<td>20.0</td>
<td>159</td>
<td></td>
</tr>
<tr>
<td></td>
<td>025</td>
<td>25.0</td>
<td>164</td>
<td></td>
</tr>
</tbody>
</table>
### Dimensions

**Motor type** | **Stroke symbol** | **ST Stroke [mm]** | **L Overall length [mm]** | **Main unit weight [kg]**
---|---|---|---|---
CCR05-M | 010 | 10.0 | 216 | 0.3
| 015 | 15.0 | 221 |
| 020 | 20.0 | 226 |
| 025 | 25.0 | 231 |
## Dimensions

**Motor type** | **Stroke symbol** | **ST Stroke [mm]** | **L Overall length [mm]** | **Main unit weight [kg]**  
--- | --- | --- | --- | ---  
CCR07-S | 012 | 12.5 | 192 |  
| 017 | 17.5 | 197 | 0.4  
| 022 | 22.5 | 202 |  
| 027 | 27.5 | 207 |
### Dimensions

<table>
<thead>
<tr>
<th>Motor type</th>
<th>Stroke symbol</th>
<th>Stroke [mm]</th>
<th>Overall length [mm]</th>
<th>Main unit weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCR07-M</td>
<td>012</td>
<td>12.5</td>
<td>282</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>017</td>
<td>17.5</td>
<td>287</td>
<td></td>
</tr>
<tr>
<td></td>
<td>022</td>
<td>22.5</td>
<td>292</td>
<td></td>
</tr>
<tr>
<td></td>
<td>027</td>
<td>27.5</td>
<td>297</td>
<td></td>
</tr>
</tbody>
</table>
Linear Motor series  CCR/CCM/RLT

Linear motor series

CCM

Cluster linear motor

Example applications

Pressing of curved surface

Pressing buttons
Features

1 FL mode (force control)

The force can be controlled while easily controlling the speed and position. As driving is possible only with I/O contact input, a system can be built with simple configuration.

* FL mode is optional.

As CCM is designed with narrow width, lamination at narrower pitches is possible.

Can be laminated

Lightweight and compact

Special resin with high electrical insulation and high thermal conductivity is used for the forcer section of CCM. In addition, integral molding of the forcer realizes a lightweight and compact linear motor.

Compatible drivers

This unit is compatible with the following drivers. For more information on each driver, see P.29 and P.30.

Driver MD
High-performance driver compatible with FL mode. (optional)

Driver XD
Small driver with converged functions.

Driver CD
Multiple-shaft driver that can control up to 4 shafts.
Basic Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>CCM03S</th>
<th>CCM03M</th>
<th>CCM05S</th>
<th>CCM05M</th>
<th>CCM07S</th>
<th>CCM07M</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Motor type</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MD, CD</td>
<td>24V DC</td>
<td></td>
<td>24V DC</td>
<td>24V DC</td>
<td>24V DC</td>
<td>24V DC</td>
</tr>
<tr>
<td><strong>Compatible drivers</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>XD</td>
<td>-</td>
<td>-</td>
<td>10W</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Power supply voltage of main circuit</strong></td>
<td>24V DC</td>
<td>24V DC</td>
<td>24V DC</td>
<td>24V DC</td>
<td>24V DC</td>
<td>24V DC</td>
</tr>
<tr>
<td><strong>Power supply voltage of control circuit</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Capacity</strong></td>
<td>10W</td>
<td>10W</td>
<td>10W</td>
<td>10W</td>
<td>10W</td>
<td>10W</td>
</tr>
<tr>
<td><strong>Maximum thrust</strong> (N)</td>
<td>2.6</td>
<td>5.3</td>
<td>5.1 (9.1)</td>
<td>10.4 (18.4)</td>
<td>9.4 (19.3)</td>
<td>19.3 (39.1)</td>
</tr>
<tr>
<td><strong>Rated thrust</strong> (N)</td>
<td>0.8</td>
<td>1.7</td>
<td>2.3</td>
<td>4.7</td>
<td>5.4</td>
<td>11.4</td>
</tr>
<tr>
<td><strong>Encoder resolution [\mu m]</strong></td>
<td>1.17</td>
<td>1.64</td>
<td>2.20</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Maximum speed</strong> [m/s]**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1 CCM03S/M is only compatible with driver MD.
*2 Values with the average temperature of armature winding at 100°C in ambient temperature of 20°C. Specifications when the unit is used individually or the mounting pitch (P14) is the following recommended pitch.
CCM03S/M: 18mm or longer, CCM05S/M: 24mm or longer, CCM07S/M: 35mm or longer
*3 Values for 48V DC are shown in parentheses. Contact THK for details.

**Features**

When making selections, contact THK.
**Model Configuration**

<table>
<thead>
<tr>
<th>Motor type</th>
<th>Stroke</th>
<th>Power cable terminal processing</th>
<th>Power cable</th>
<th>Encoder</th>
<th>Encoder cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCM05S</td>
<td>012</td>
<td>C</td>
<td>D01</td>
<td>EN</td>
<td>E01</td>
</tr>
<tr>
<td>CCM05M</td>
<td>012</td>
<td>C</td>
<td>D03</td>
<td>EN</td>
<td>E01</td>
</tr>
<tr>
<td>CCM05S</td>
<td>038</td>
<td>F</td>
<td>D05</td>
<td>EN</td>
<td>E01</td>
</tr>
</tbody>
</table>

CCM05S: CCM05 Type S
CCM05M: CCM05 Type M
CCM07S: CCM07 Type S
CCM07M: CCM07 Type M

006: 6.5mm to 038: 38mm

- C: Standard connector
- F: No connector processing
- D01: Cable length 1m
- D03: Cable length 3m
- D05: Cable length 5m
- EN: Standard installation of position detecting system CPS
- ER: Inversed installation of position detecting system CPS
- E01: Cable length 1m
- E03: Cable length 3m
- E05: Cable length 5m

Note: The above model configuration includes an actuator and cables. Please contact THK separately when you place an order of a driver.

A motion controller and cable between a controller and driver to be provided by the customer.

**Table 1. Stroke list**

<table>
<thead>
<tr>
<th>Stroke symbol</th>
<th>CCM03</th>
<th>CCM05</th>
<th>CCM07</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke</td>
<td>006: 6.5mm</td>
<td>012: 12.5mm</td>
<td>008: 8.0mm</td>
</tr>
<tr>
<td></td>
<td>011: 11.5mm</td>
<td>017: 17.5mm</td>
<td>013: 13.0mm</td>
</tr>
<tr>
<td></td>
<td>016: 16.5mm</td>
<td>022: 22.5mm</td>
<td>018: 18.0mm</td>
</tr>
<tr>
<td></td>
<td>021: 21.5mm</td>
<td>027: 27.5mm</td>
<td>023: 23.0mm</td>
</tr>
<tr>
<td></td>
<td>026: 26.5mm</td>
<td>032: 32.5mm</td>
<td>028: 28.0mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>033: 33.0mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>038: 38.0mm</td>
</tr>
</tbody>
</table>

**Model configuration coding**

**CCM05M – 032 – C – D03 – EN – E03**

- CCM05 Type M
- Stroke 32.5mm
- CPS standard installation

- Power cable length 3m
- Encoder cable length 3m

See Table 1. Stroke list.

**Pages for detailed description**

1. Motor type Basic specifications and features
   - P.15
2. Stroke Dimensions
   - P.19 to 21
3. Power cable System configuration and options
   - P.17 to 18, P.32 to 33
4. Encoder Basic specifications and dimensions
   - P.15, P.19 to 21
5. Encoder cable System configuration and options
   - P.17 to 18, P.32 to 33
### System Configuration

#### Driver MD specifications

- **Main circuit power supply**: MKP24-01 (Main circuit and control circuit power supply cable) - Cable length: 1m
- **Encoder cable**: CCKE-**

*Only required for 48V DC specifications.*

*Note: A motion controller, connection cable between a motion controller and driver, DC power supply and its peripherals to be provided by customer.*

#### Driver XD specifications

- **Main circuit power supply**: XKP24-01 (Main circuit and control circuit power supply cable) - Cable length: 1m
- **Encoder cable**: CCKE-**

*Only required for 48V DC specifications.*

*Note: A motion controller, connection cable between a motion controller and driver, DC power supply and its peripherals to be provided by customer.*
● Driver CD specifications

- **Main circuit and control circuit power supply**
  - 24V DC
- **Driver CD**
  - CKP-01: (Main circuit and control circuit power supply cable)
    - Cable length: 1m
- **CCKD**: (Power cable)
  - Cable length: 0.3m
- **CCKE**: (Encoder cable)
  - Cable length: 1m, 3m, 5m
- **CCM**
- **CKS-02**: (I/O cable)
  - Cable length: 2m
- **CKDC-003**: (Power conversion cable)
  - Cable length: 1m

**Cable length**
- Power cable CCKD: 1m, 3m, 5m
- Encoder cable CCKE: 1m, 3m, 5m

*Note* Motion controller, DC power supply and its peripherals to be provided by customer.
ELECTRIC ACTUATORS

Linear Motor series  CCR/CCM/RLT

CCM03 Type S/Type M
Stroke: 6.5 to 26.5mm

Dimensions

- **Type S**

- **Type M**

- CPS inverted installation (common to Type S and Type M)

<table>
<thead>
<tr>
<th>Motor type</th>
<th>Stroke symbol</th>
<th>ST [mm]</th>
<th>LR [mm]</th>
<th>LF [mm]</th>
<th>Main unit weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCM03S</td>
<td>006</td>
<td>6.5</td>
<td>89</td>
<td>75</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>011</td>
<td>11.5</td>
<td>94</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>016</td>
<td>16.5</td>
<td>99</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>021</td>
<td>21.5</td>
<td>104</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>026</td>
<td>26.5</td>
<td>109</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCM03M</td>
<td>006</td>
<td>6.5</td>
<td>137</td>
<td>123</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>011</td>
<td>11.5</td>
<td>142</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>016</td>
<td>16.5</td>
<td>147</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>021</td>
<td>21.5</td>
<td>152</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>026</td>
<td>26.5</td>
<td>157</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CCM05 Type S/Type M
Stroke: 12.5 to 32.5mm

**Dimensions**

- **Type S**
- **Type M**

<table>
<thead>
<tr>
<th>Motor type</th>
<th>Stroke symbol</th>
<th>ST Stroke [mm]</th>
<th>LR Rod length [mm]</th>
<th>LF Forcer length [mm]</th>
<th>Main unit weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCM05S</td>
<td>012</td>
<td>12.5</td>
<td>128</td>
<td>102</td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td>017</td>
<td>17.5</td>
<td>133</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>022</td>
<td>22.5</td>
<td>138</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>027</td>
<td>27.5</td>
<td>143</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>032</td>
<td>32.5</td>
<td>148</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCM05M</td>
<td>012</td>
<td>12.5</td>
<td>195</td>
<td>169</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>017</td>
<td>17.5</td>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>022</td>
<td>22.5</td>
<td>205</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>027</td>
<td>27.5</td>
<td>210</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>032</td>
<td>32.5</td>
<td>215</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Dimensions

#### Type S

- **Type S/Type M**
- **Stroke**: 8 to 38mm

#### Type M

- **CPS inverted installation (common to Type S and Type M)**

<table>
<thead>
<tr>
<th>Motor type</th>
<th>Stroke symbol</th>
<th>ST [Stroke] [mm]</th>
<th>LR [Rod length] [mm]</th>
<th>LF [Forcer length] [mm]</th>
<th>Main unit weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCM07S</td>
<td>008</td>
<td>8.0</td>
<td>156</td>
<td>129</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>013</td>
<td>13.0</td>
<td>156</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>018</td>
<td>18.0</td>
<td>156</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>023</td>
<td>23.0</td>
<td>156</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>028</td>
<td>28.0</td>
<td>156</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>033</td>
<td>33.0</td>
<td>156</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>038</td>
<td>38.0</td>
<td>156</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCM07M</td>
<td>008</td>
<td>8.0</td>
<td>246</td>
<td>219</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td>013</td>
<td>13.0</td>
<td>246</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>018</td>
<td>18.0</td>
<td>246</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>023</td>
<td>23.0</td>
<td>246</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>028</td>
<td>28.0</td>
<td>246</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>033</td>
<td>33.0</td>
<td>246</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>038</td>
<td>38.0</td>
<td>246</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Actuator configuration example**

The actuator may be designed flexibly in combination with rectilinear guides (LM guide or ball spline, etc.).

Cluster linear motor CCM

Caged Ball LM Guide SRS

Cluster linear motor CCM

Ball spline LT or guide ball bushing LG

*1 For the product and technical information of SRS/LT/LG, see the THK general catalog.

*2 For the installation procedure of CCM (forcer and rod), contact THK.
Example applications

- Stir
- Transfer of work
Features

1. Rotational motor with linear guide
   Ball spline is used as rotating motor shaft. Combining with linear motion products, output shaft can rotate and travel at same time.

2. Position detecting system
   A compact servo motor with an integral position detecting system.

3. Hollow shaft
   As the movable shaft is hollow, it can be used as an air flow path.

Compatible drivers

This unit is compatible with the following drivers. For more information on each driver, see P.29.

Driver MD
High-performance driver.

Driver XD
Small driver with converged functions.
### Basic Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Motor type</th>
<th>RLT4</th>
<th>RLT6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compatible drivers</td>
<td>MD, XD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capacity</td>
<td></td>
<td>10W</td>
<td></td>
</tr>
<tr>
<td>Power supply voltage of main circuit</td>
<td>24V DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power supply voltage of control circuit</td>
<td>24V DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum torque * [N·m]</td>
<td></td>
<td>8.0 × 10⁻³</td>
<td>29.9 × 10⁻³</td>
</tr>
<tr>
<td>Rated torque * [N·m]</td>
<td></td>
<td>3.5 × 10⁻³</td>
<td>12.0 × 10⁻³</td>
</tr>
<tr>
<td>Encoder resolution [deg]</td>
<td></td>
<td>0.011</td>
<td>(32768 divisions)</td>
</tr>
<tr>
<td>Maximum rotational speed [min⁻¹]</td>
<td></td>
<td>1000</td>
<td></td>
</tr>
</tbody>
</table>

* Values with the average temperature of armature winding at 100°C in ambient temperature of 20°C.

### Model Configuration

**Model configuration coding**

**RLT4 – EN – N – 03**

- **Actuator**
- **Cable**
- **Driver**

- RLT4
- With position detecting system
- Cable length 3m

Note) The above model configuration includes an actuator and cables. Please contact THK when you place an order of a driver.

A motion controller and cable between a controller and driver to be provided by customer.

### Features

**RLT4**

- Maximum torque
- Rated torque

**RLT6**

- Maximum torque
- Rated torque

* When making selections, contact THK.
**System Configuration**

- **Driver MD specifications**

  ![Diagram of Driver MD specifications]

  - **Main circuit and control circuit power supply**
    - 24V DC
    - MKP24-01 (Main circuit and control circuit power supply cable)
    - Cable length: 1m

  - **Cable length**
    - Power cable CCKD: 1m, 3m, 5m
    - Encoder cable CCKE: 1m, 3m, 5m

  Note: A motion controller, connection cable between a motion controller and driver, DC power supply and its peripherals to be provided by customer.

- **Driver XD specifications**

  ![Diagram of Driver XD specifications]

  - **Main circuit and control circuit power supply**
    - 24V DC
    - XKP24-01 (Main circuit and control circuit power supply cable)
    - Cable length: 1m

  - **Cable length**
    - Power cable CCKD: 1m, 3m, 5m
    - Encoder cable CCKE: 1m, 3m, 5m

  Note: A motion controller, connection cable between a motion controller and driver, DC power supply and its peripherals to be provided by customer.
RLT4

Dimensions

<table>
<thead>
<tr>
<th>Motor type</th>
<th>XL(^{1}\times 2) Available range [mm]</th>
<th>X(^1) Limit position [mm]</th>
<th>LS Shaft length [mm]</th>
<th>Shaft weight [kg]</th>
<th>Main unit weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>RLT4</td>
<td>35.0</td>
<td>22.0</td>
<td>150</td>
<td>0.02</td>
<td>0.1</td>
</tr>
</tbody>
</table>

\(^1\) Use beyond the limit position may cause damage.

\(^2\) For proximity sensor specifications, the available range may be narrower depending on the mounting position for the sensor dog. Contact THK for details.

Note) Never remove the ball spline shaft.
## Dimensions

![Diagram of RLT6 Linear Motor series]

### Section A dimensions (detail)
- **M5**: 4.4
- **∅6**: 6

### Section B dimensions (detail)
- **M5**: 4
- **∅6**: 12
- **∅2.5**: 20
- (Hollow hole)

### With proximity sensor specifications
- **Sensor dog**
- **Proximity sensor (GX-F8A)**

### Table: Motor Specifications

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>RLT6</td>
<td>37.5</td>
<td>29.0</td>
<td>183</td>
<td>0.04</td>
<td>0.2</td>
</tr>
</tbody>
</table>

[^1]: Use beyond the limit position may cause damage.
[^2]: For proximity sensor specifications, the available range may be narrower depending on the mounting position for the sensor dog. Contact THK for details.

Note: Never remove the ball spline shaft.
## Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>MD</th>
<th>XD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity</td>
<td>10W</td>
<td></td>
</tr>
</tbody>
</table>

### Appearance

<table>
<thead>
<tr>
<th>Input power supply</th>
<th>Main circuit</th>
<th>Control circuit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply</td>
<td>24V DC ±10%</td>
<td>48V DC ±10%</td>
</tr>
<tr>
<td>Control</td>
<td>24V DC ±10%</td>
<td></td>
</tr>
</tbody>
</table>

### Control

<table>
<thead>
<tr>
<th>Control axis</th>
<th>Single shaft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control method</td>
<td>PWM control, sinusoidal wave driving system</td>
</tr>
<tr>
<td>Auto-tuning</td>
<td>–</td>
</tr>
</tbody>
</table>

### Position detection

<table>
<thead>
<tr>
<th>Position detection</th>
<th>Detection system</th>
<th>Input signal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Incremental</td>
<td>Phase A + Phase B (sinusoidal wave)</td>
</tr>
</tbody>
</table>

### Position control

<table>
<thead>
<tr>
<th>Instruction system</th>
<th>Pulse train (code + pulse train/CCW + CW pulse train/90 deg. phase difference dual phase pulse train)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input signal</td>
<td>Differential line driver (5V DC)</td>
</tr>
<tr>
<td>Frequency</td>
<td>5MHz (max)</td>
</tr>
</tbody>
</table>

### FL mode

<table>
<thead>
<tr>
<th>Instruction system</th>
<th>I/O input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input signal</td>
<td>Photocoupler (24V DC)</td>
</tr>
</tbody>
</table>

### Input/output

<table>
<thead>
<tr>
<th>Position signal output</th>
<th>Phase A, Phase B, Phase Z</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Dedicated input/output</th>
<th>Input point</th>
<th>Output point</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6 points (servo ON, forward drive prohibited, reverse drive prohibited, alarm reset, instruction pulse blocked, and DB input)</td>
<td>2 points (servo ON, alarm reset)</td>
</tr>
<tr>
<td></td>
<td>6 points (servo alarm, alarm code (3 bits), positioning completed and servo ready)</td>
<td>3 points (servo alarm, positioning completed, servo ready)</td>
</tr>
</tbody>
</table>

### Communication

<table>
<thead>
<tr>
<th>Communication</th>
<th>Serial communication</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PC software, D-Assist</td>
</tr>
</tbody>
</table>

### Functions

<table>
<thead>
<tr>
<th>Functions</th>
<th>Display functions</th>
<th>Monitor functions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7-segment LED (2 digits), charge LED and internal power supply LED x 5</td>
<td>Analog monitor x 2</td>
</tr>
</tbody>
</table>

### Protective function

Motor overcurrent, main circuit overvoltage, motor overload, overdrive detection, and electric thermal, etc.

### Peripherals

<table>
<thead>
<tr>
<th>Accessories</th>
<th>I/O connector (with case) and power supply cable</th>
</tr>
</thead>
</table>

### Environment

| Operating/storage temperature | 0 to 50°C (No freezing)/-20 to 85°C (No freezing) |
|                             | 90% RH or below (No condensation) |
| Ambience condition          | Indoor (Free from direct sunlight, corrosive gas, flammable gas, oil mist, dust, water, oil and chemicals) |

### Applicable standards

<table>
<thead>
<tr>
<th>CE Marking</th>
<th>Low voltage directive: EN 61800-5-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL standard</td>
<td>EMC directive: EN 61800-3</td>
</tr>
</tbody>
</table>

### Structure

<table>
<thead>
<tr>
<th>Protection class</th>
<th>IP20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>0.5kg</td>
</tr>
</tbody>
</table>

* FL mode (force control) is an option for the driver MD.
### Actuator correspondence table

<table>
<thead>
<tr>
<th>Actuator</th>
<th>Driver</th>
<th>MD</th>
<th>XD</th>
<th>CD</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCR05</td>
<td>24V DC</td>
<td>48V DC</td>
<td>24V DC</td>
<td>24V DC</td>
</tr>
<tr>
<td>CCR07</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCM03</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCM05</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCM07</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RLT4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RLT6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* FL mode (force control) is an option for the driver MD.
ELECTRIC ACTUATORS
Linear Motor series  CCR/CCM/RLT

MD / XD / CD

Dimensions

MD-001

XD-001

CD-001
Optional

CCKD-***: Power cable

- **Motor side**
  - Receptacle housing: XARR-04VF (JST)
  - Pin contact: SXAM-001T-P0.6 (JST)

- **Driver side**
  - Plug housing: XAP-04V-1 (JST)
  - Socket contact: SXA-001T-P0.6 (JST)

CCKE-***: Encoder cable

- **Encoder side**
  - Plug: TCS7165-210105 (Hosiden)

- **Driver side**
  - Plug: TCX3166-01 (Hosiden)

CKDC-003: Power conversion cable (dedicated to driver CD)

- **Motor side**
  - Receptacle housing: XARR-04VF (JST)
  - Pin contact: SXAM-001T-P0.6 (JST)

- **Driver side**
  - Cover: XM2S-1511 (Omron)
  - Plug: XM3A-1521 (Omron)

CKS-02: I/O cable (dedicated to driver CD)

- **Controller side**
  - Earth only

- **Driver side**
  - Interface cable
  - Non-shield shell kit: 10368-3280-000-0 (3M Japan Limited)
  - Plug: 10168-6000EL (3M Japan Limited)
MKP24-01: Power supply cable (dedicated to driver MD)

<Driver side>

Plug housing  : XAP–03V–1 (JST)
Socket contact: SXA–01T–P0.6 (JST)

Plug housing  : XAP–02V–1 (JST)
Socket contact: SXA–01T–P0.6 (JST)

Lead line: AWG20

MKP48-01: Power supply cable (dedicated to driver MD)

<Driver side>

Plug housing  : XAP–02V–1 (JST)
Socket contact: SXA–01T–P0.6 (JST)

Lead line: AWG20

XKP24-01: Power supply cable (dedicated to driver XD)

<Driver side>

Plug housing  : XAP–02V–1 (JST)
Socket contact: SXA–01T–P0.6 (JST)

Lead line: AWG20

CKP-01: Power supply cable (dedicated to driver CD)

<Driver side>

Cover: XM2S-0911 (Omron)
Plug  : XM3A-0921 (Omron)

Control circuit 24V DC × 2
Lead line: AWG24

Main circuit 24/48V DC × 6
Lead line: AWG24

For earth
Lead line: AWG18

(1000)
Setup tool

To change parameters of driver MD, XD and CD, the PC software D-Assist is required. To use D-Assist, contact THK.

PC software, D-Assist

Features
- Easy setting on PC
- You can set parameters on your PC.

Functions
- Check/change/write/save parameters
- Monitor (I/O, position, alarm, and effective load rating)
- Jog/inching operation
- Communication speed setting
- Supported OS: Windows XP, Windows 7 (32bit/64bit)

Note) To use D-Assist, an optional PC communication cable is required.

K232-01: PC communication cable RS-232C

**<Driver side>**
- Modular jack plug: MS6-6 (Kameda)
- (1000)

**<PC side>**
- Hood: XM2S-0911 (Omron)
- Socket: XM2D-0901 (Omron)

- 6-core modular cable: TMC-61V (Kameda)
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SAN FRANCISCO OFFICE
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DETOUR OFFICE
Phone: +1-248-858-9330 Fax: +1-248-858-9455

Precautions on Use

- Safety Precautions
  - Take care not to drop or strike this product. Doing so may cause injury or damage to the unit. If the product is dropped or impacted, functionality may be reduced even if there is no surface damage.
  - Tilting the unit may cause the rod to fall by its own weight.
  - Do not rework or disassemble this product. Doing so may allow foreign materials to enter or loss of functions. Reworking the rod section may cause the magnet to be shattered, resulting in human injury. Also this will cause the risk of electric shock from the driver.
  - The warning labels are attached to the linear motor and driver.
  - Do not place any ferromagnet material (especially metal objects) near the rod. As a strong magnet is packed in the rod, fingers may be pinched between the rod and a metal object due to the magnetic force. In addition, those using a cardiac pacemaker must never come close to it.
  - Do not touch the moving part of the linear motor while it is energized. In addition, do not enter the operating area of the linear motor while the product is operating or in the ready state.
  - Before performing installation, adjustment, checking, or services regarding the linear motor, driver and the relevant connected equipment, make sure to remove all power plugs from the outlet and apply locking or safety plugs so that nobody else can turn on the power. Also display a signboard showing that the work is ongoing at a prominent place.
  - If two or more people are involved in the operation, confirm the procedures such as sequences, signs, and abnormalities in advance, and appoint another person for monitoring the operation.
  - This product is not equipped with functions or devices to prevent falls of moving elements (rod) in servo-off state. When using this unit mounted vertically, please install a fall prevention device to prevent device damage caused by rod falls and ensure safety.
  - Forcer surface may become very hot. When it is energized or after power off, perform any work after checking the forcer is sufficiently cooled.
  - This product is not equipped with functions or devices to prevent falls of moving elements (rod) in servo-off state. When using this unit mounted vertically, please install a fall prevention device to prevent device damage caused by rod falls and ensure safety.

- Environment
  - The wrong environment can cause failures of the linear motor and driver. The best place to use the product is as follows:
    - For linear motor, an indoor location and ambient temperatures from 0 to 40°C, and humidity of 20 to 80%RH (no freezing or condensation).
    - For driver, an indoor location and ambient temperatures from 0 to 50°C, and humidity of 90%RH or below (no freezing or condensation).
  - A place free from corrosive gas and flammable gas.
  - A place free from strong electric and magnetic fields.
  - A place where vibration or impact is not transmitted to the unit.
  - A place that is easily accessible for service and cleaning purposes.

- Storage
  - When storing the unit, enclose it in a package designated by THK and store it in a horizontal orientation in a place with power off and without condensation while avoiding high temperature, low temperature and high humidity.
  - Keep the place that is easily accessible for service and cleaning purposes.
  - A place free from strong electric and magnetic fields.
  - A place free from corrosive gas and flammable gas.
  - A place where vibration or impact is not transmitted to the unit.
  - A place that is easily accessible for service and cleaning purposes.

- Environment
  - The wrong environment can cause failures of the linear motor and driver. The best place to use the product is as follows:
    - For linear motor, an indoor location and ambient temperatures from 0 to 40°C, and humidity of 20 to 80%RH (no freezing or condensation).
    - For driver, an indoor location and ambient temperatures from 0 to 50°C, and humidity of 90%RH or below (no freezing or condensation).
  - A place free from corrosive gas and flammable gas.
  - A place free from strong electric and magnetic fields.
  - A place where vibration or impact is not transmitted to the unit.
  - A place that is easily accessible for service and cleaning purposes.

- Storage
  - When storing the unit, enclose it in a package designated by THK and store it in a horizontal orientation in a place with power off and without condensation while avoiding high temperature, low temperature and high humidity.