

5 Phase Stepper Motor Low Profile Slide Table Type

Without Motor Brake

Series LXF

Direct Acting Guide

Ball Screw
ø8mm/2mm lead

How to Order

LXFH5 **BC** — **Stroke** **S** — **GD** **1**

Home position switch

| | |
|-----|-------------------------|
| Nil | None |
| S | Yes (cable length 0.3m) |

Proximity switch type

| | |
|-----|------|
| Nil | None |
|-----|------|

Refer to the table on the right for proximity switch part numbers.

Number of proximity switches

| | |
|---|--------|
| 1 | 1 pc. |
| 2 | 2 pcs. |
| ⋮ | ⋮ |
| 6 | 6 pcs. |

Proximity switch types

| Symbol | Model | Wiring/ Output type | Lead wire length (m) | Contact |
|--------|--|---------------------|----------------------|------------------|
| GN | With sensor rail and sensor plate without proximity switch | | | |
| G | GXL-8F | 3 wire/NPN | 1 | N.O. (A contact) |
| GD | GXL-8FI | 3 wire/NPN | 1 | N.O. (A contact) |
| GB | GXL-8FB | 3 wire/NPN | 1 | N.C. (B contact) |
| GDB | GXL-8FIB | 3 wire/NPN | 1 | N.C. (B contact) |
| GU | GXL-8FU | 2 wire/solid state | 1 | N.O. (A contact) |
| GUB | GXL-8FUB | 2 wire/solid state | 1 | N.C. (B contact) |

* Refer to page 318 for detailed specifications of proximity switches.

Specifications

| Standard stroke | | mm | 25 | 50 | 75 | 100 |
|----------------------|-----------------------------|---|---|-----|-----|-----|
| Performance | Body weight | kg | 0.8 | 1.0 | 1.1 | 1.2 |
| | Operating temperature range | °C | 5 to 40 (with no condensation) | | | |
| | Work load | kg | 3 (2) horizontal <small>Note 1)</small> | | | |
| | Speed | mm/s | to 30 <small>Note 2)</small> | | | |
| | Positioning repeatability | mm | ±0.03 | | | |
| Main parts | Motor | 5 phase stepper motor (without brake) | | | | |
| | Lead screw | Ball screw ø8mm, 2mm lead | | | | |
| | Guide | Direct acting guide | | | | |
| Home position switch | Model | Photo micro sensor EE-SX672 | | | | |
| Driver | Model | LC6D-507AD (Refer to page 306 for details.) | | | | |

Note 1) When mounting a work piece to the actuator's end plate, its weight should be within the value inside ().

Note 2) Since vibration may increase with low speed operation, use 2mm/s or more as a guide for speed.

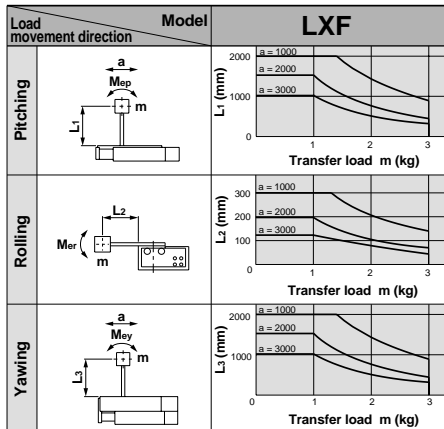
Allowable Moment (N·m)

Allowable static moment

| | |
|----------|---|
| Pitching | 4 |
| Rolling | 3 |
| Yawing | 4 |

m : Transfer load (kg)
L : Overhang to work piece center of gravity (mm)
a : Work piece acceleration (mm/sec²)
Me : Dynamic moment

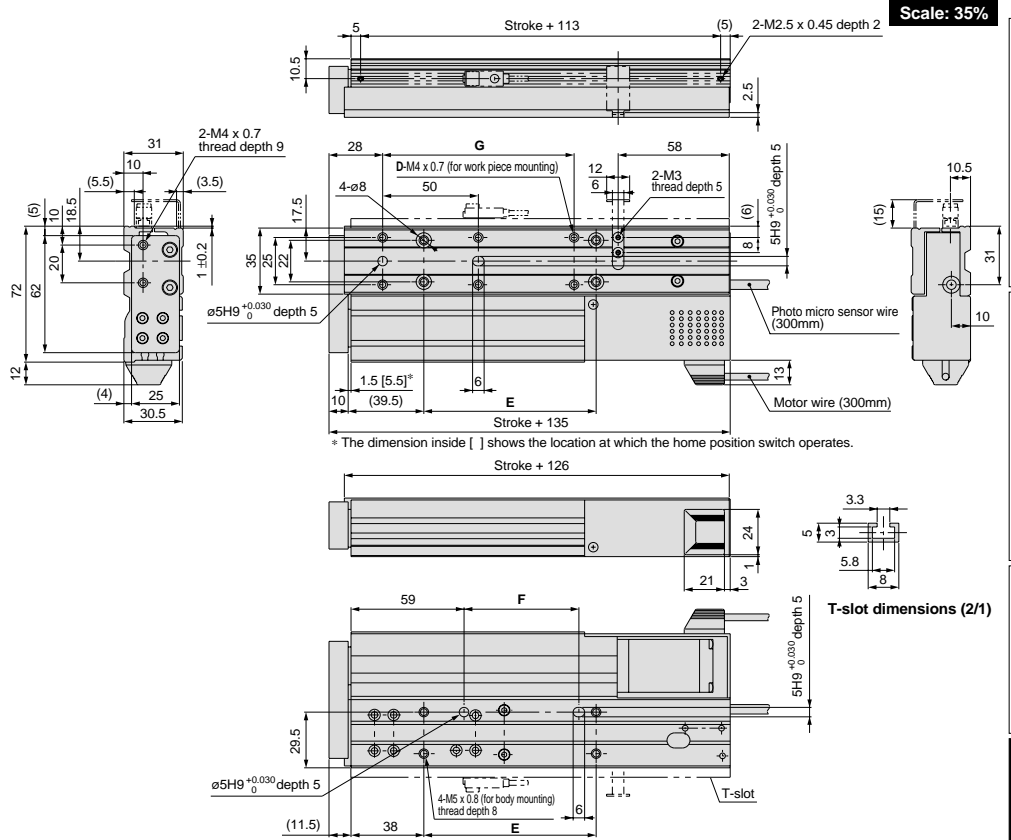
Allowable dynamic moment



Refer to page 304 for deflection data.

5 Phase Stepper Motor/Without Motor Brake *Series LXF*

Dimensions/LXFH5BC



| Model | D | E | F | G |
|-------------|---|----|----|------|
| LXFH5BC-25 | 4 | 60 | 30 | (50) |
| LXFH5BC-50 | 4 | 90 | 60 | (50) |
| LXFH5BC-75 | 6 | 90 | 60 | 100 |
| LXFH5BC-100 | 6 | 90 | 60 | 100 |

Positioning Time Guide (for Horizontal Mount)

For transfer load of 0kg

| Positioning distance (mm) | | Positioning time (sec) | | | | |
|---------------------------|----|------------------------|-----|-----|------|--|
| | | 1 | 10 | 50 | 100 | |
| Speed (mm/s) | 10 | 0.2 | 1.1 | 5.1 | 10.1 | |
| | 20 | 0.1 | 0.6 | 2.6 | 5.1 | |
| | 30 | 0.1 | 0.4 | 1.7 | 3.4 | |

For transfer load of 2kg

| Positioning distance (mm) | | Positioning time (sec) | | | | |
|---------------------------|----|------------------------|-----|-----|------|--|
| | | 1 | 10 | 50 | 100 | |
| Speed (mm/s) | 10 | 0.2 | 1.1 | 5.1 | 10.1 | |
| | 20 | 0.1 | 0.6 | 2.6 | 5.1 | |
| | 30 | 0.1 | 0.4 | 1.7 | 3.4 | |

For transfer load of 1kg

| Positioning distance (mm) | | Positioning time (sec) | | | | |
|---------------------------|----|------------------------|-----|-----|------|--|
| | | 1 | 10 | 50 | 100 | |
| Speed (mm/s) | 10 | 0.2 | 1.1 | 5.1 | 10.1 | |
| | 20 | 0.1 | 0.6 | 2.6 | 5.1 | |
| | 30 | 0.1 | 0.4 | 1.7 | 3.4 | |

For transfer load of 3kg

| Positioning distance (mm) | | Positioning time (sec) | | | | |
|---------------------------|----|------------------------|-----|-----|------|--|
| | | 1 | 10 | 50 | 100 | |
| Speed (mm/s) | 10 | 0.2 | 1.1 | 5.1 | 10.1 | |
| | 20 | 0.1 | 0.6 | 2.6 | 5.1 | |
| | 30 | 0.1 | 0.4 | 1.7 | 3.4 | |

Refer to page 303 for acceleration time.

5 Phase Stepper Motor

Low Profile Slide Table Type

Without Motor Brake

Series LXF

Direct Acting Guide

Ball Screw

∅8mm/5mm lead

How to Order

LXFH5 **BD** — **Stroke** **S** — **GD** **1**

Home position switch

| | |
|-----|-------------------------|
| Nil | None |
| S | Yes (cable length 0.3m) |

Proximity switch type

| | |
|-----|------|
| Nil | None |
|-----|------|

Refer to the table on the right for proximity switch part numbers.

Number of proximity switches

| | |
|---|--------|
| 1 | 1 pc. |
| 2 | 2 pcs. |
| ⋮ | ⋮ |
| 6 | 6 pcs. |

Proximity switch types

| Symbol | Model | Wiring/ Output type | Lead wire length (m) | Contact |
|--------|--|---------------------|----------------------|------------------|
| GN | With sensor rail and sensor plate without proximity switch | | | |
| G | GXL-8F | 3 wire/NPN | 1 | N.O. (A contact) |
| GD | GXL-8FI | 3 wire/NPN | 1 | N.O. (A contact) |
| GB | GXL-8FB | 3 wire/NPN | 1 | N.C. (B contact) |
| GDB | GXL-8FIB | 3 wire/NPN | 1 | N.C. (B contact) |
| GU | GXL-8FU | 2 wire/solid state | 1 | N.O. (A contact) |
| GUB | GXL-8FUB | 2 wire/solid state | 1 | N.C. (B contact) |

* Refer to page 318 for detailed specifications of proximity switches.

Specifications

| | | Standard stroke | mm | 25 | 50 | 75 | 100 |
|----------------------|-----------------------------|---|--|-----|-----|-----|-----|
| Performance | Body weight | kg | | 0.8 | 1.0 | 1.1 | 1.2 |
| | Operating temperature range | °C | 5 to 40 (with no condensation) | | | | |
| | Work load | kg | 3 (2) horizontal <small>Note 1</small> | | | | |
| | Speed | mm/s | to 80 <small>Note 2</small> | | | | |
| | Positioning repeatability | mm | ±0.03 | | | | |
| Main parts | Motor | 5 phase stepper motor (without brake) | | | | | |
| | Lead screw | Ball screw ∅8mm, 5mm lead | | | | | |
| | Guide | Direct acting guide | | | | | |
| Home position switch | Model | Photo micro sensor EE-SX672 | | | | | |
| Driver | Model | LC6D-507AD (Refer to page 306 for details.) | | | | | |

Note 1) When mounting a work piece to the actuator's end plate, its weight should be within the value inside ().

Note 2) Since vibration may increase with low speed operation, use 5mm/s or more as a guide for speed.

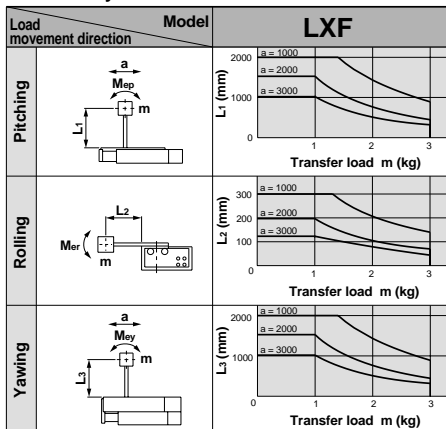
Allowable Moment (N·m)

Allowable static moment

| | |
|----------|---|
| Pitching | 4 |
| Rolling | 3 |
| Yawing | 4 |

m : Transfer load (kg)
L : Overhang to work piece center of gravity (mm)
a : Work piece acceleration (mm/sec²)
Me : Dynamic moment

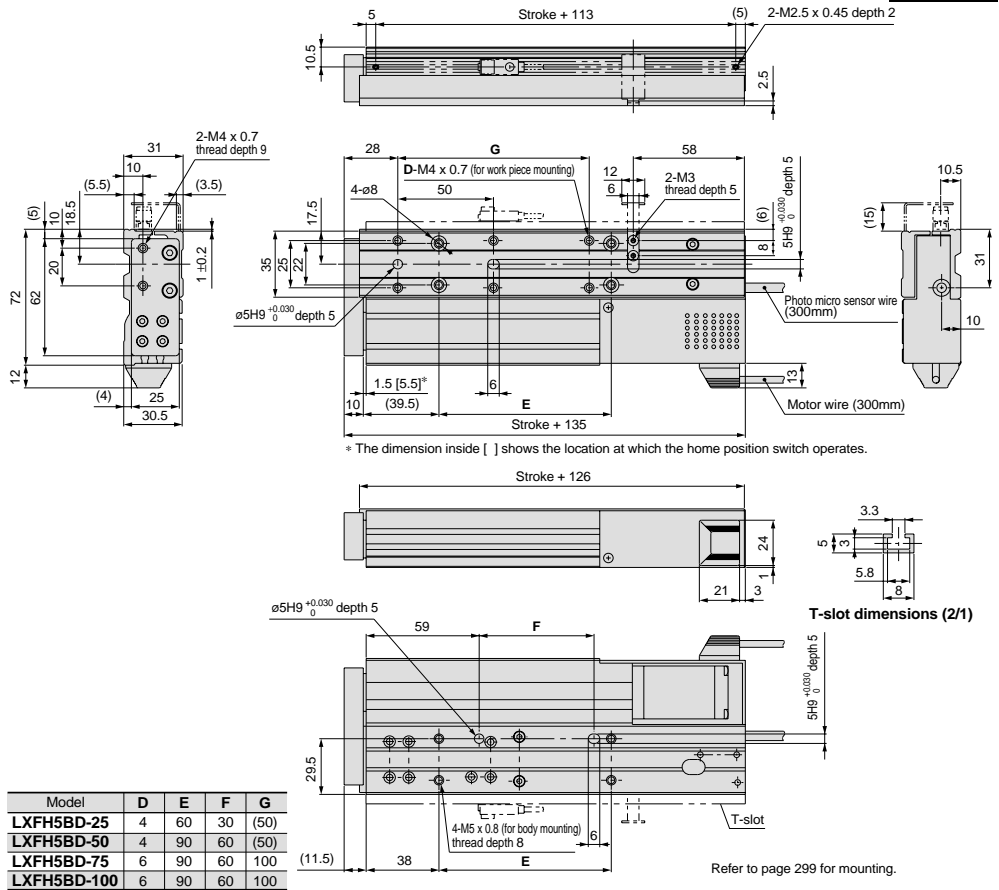
Allowable dynamic moment



Refer to page 304 for deflection data.

Dimensions/LXFH5BD

Scale: 35%



| Model | D | E | F | G |
|-------------|---|----|----|------|
| LXFH5BD-25 | 4 | 60 | 30 | (50) |
| LXFH5BD-50 | 4 | 90 | 60 | (50) |
| LXFH5BD-75 | 6 | 90 | 60 | 100 |
| LXFH5BD-100 | 6 | 90 | 60 | 100 |

Positioning Time Guide (for Horizontal Mount)

For transfer load of 0kg

| Positioning distance (mm) | | Positioning time (sec) | | | |
|---------------------------|----|------------------------|-----|-----|------|
| | | 1 | 10 | 50 | 100 |
| Speed (mm/s) | 10 | 0.2 | 1.1 | 5.1 | 10.1 |
| | 40 | 0.1 | 0.3 | 1.3 | 2.6 |
| | 80 | 0.1 | 0.2 | 0.7 | 1.3 |

For transfer load of 2kg

| Positioning distance (mm) | | Positioning time (sec) | | | |
|---------------------------|----|------------------------|-----|-----|------|
| | | 1 | 10 | 50 | 100 |
| Speed (mm/s) | 10 | 0.2 | 1.1 | 5.1 | 10.1 |
| | 40 | 0.1 | 0.3 | 1.3 | 2.6 |
| | 80 | 0.1 | 0.2 | 0.7 | 1.3 |

For transfer load of 1kg

| Positioning distance (mm) | | Positioning time (sec) | | | |
|---------------------------|----|------------------------|-----|-----|------|
| | | 1 | 10 | 50 | 100 |
| Speed (mm/s) | 10 | 0.2 | 1.1 | 5.1 | 10.1 |
| | 40 | 0.1 | 0.3 | 1.3 | 2.6 |
| | 80 | 0.1 | 0.2 | 0.7 | 1.3 |

For transfer load of 3kg

| Positioning distance (mm) | | Positioning time (sec) | | | |
|---------------------------|----|------------------------|-----|-----|-----|
| | | 1 | 10 | 50 | 100 |
| Speed (mm/s) | 10 | 0.2 | 1.1 | 5.1 | 10 |
| | 40 | 0.1 | 0.3 | 1.3 | 2.6 |
| | 80 | 0.1 | 0.2 | 0.7 | 1.3 |

Refer to page 303 for acceleration time.

Short Stroke Type

With Motor Brake/Without Motor Brake

Series **LXF/LXP/LXS**

Low Particulate Generation Specification

How to Order

Low Profile Slide Table Type LXFH 5 B C — 25 — — — GD 1 — X60

Guide Rod Type LXPB 2 B C — 50 — — B — F9N 1 — X60

High Rigidity Slide Table Type LXSH 2 B C — 50 — — B — F9N 1 — X60

Motor type

| | |
|---|-----------------------|
| 2 | 2 phase stepper motor |
| 5 | 5 phase stepper motor |

Lead screw type

| | |
|---|------------|
| B | Ball screw |
|---|------------|

Lead screw lead

| | |
|---|-----|
| C | 2mm |
| D | 5mm |

Stroke

| Model | Stroke (mm) | | | | | | | |
|-------|-------------|----|----|-----|-----|-----|-----|-----|
| | 25 | 50 | 75 | 100 | 125 | 150 | 175 | 200 |
| LXF | ● | ● | ● | ● | | | | |
| LXP | | ● | ● | ● | ● | ● | ● | ● |
| LXS | | ● | ● | ● | ● | ● | | |

Low particulate generation specification

Number of auto/proximity switches

| | |
|---|--------|
| 1 | 1 pc. |
| 2 | 2 pcs. |
| ⋮ | ⋮ |
| 6 | 6 pcs. |

Auto/Proximity switch type

| | |
|-----|------|
| Nil | None |
|-----|------|

Refer to the tables below for auto/proximity switch part numbers.

Brake

| | |
|-----|---------------|
| Nil | Without brake |
| B | With brake |

Home position switch

| | |
|-----|-------------------------|
| Nil | None |
| S | Yes (cable length 0.3m) |

Auto switch types

| Symbol | Model | Wiring/Output type | Lead wire length (m) | Contact | Applicable actuator |
|--------|--------|--------------------|----------------------|------------------|---------------------|
| F9N | D-F9N | 3 wire/NPN | 0.5 | N.O. (A contact) | LXP LXS |
| F9P | D-F9P | 3 wire/PNP | 0.5 | N.O. (A contact) | |
| F9G | D-F9G | 3 wire/NPN | 0.5 | N.C. (B contact) | |
| F9H | D-F9H | 3 wire/PNP | 0.5 | N.C. (B contact) | |
| F9GL | D-F9GL | 3 wire/NPN | 3 | N.C. (B contact) | |
| F9HL | D-F9HL | 3 wire/PNP | 3 | N.C. (B contact) | |
| F9B | D-F9B | 2 wire | 0.5 | N.O. (A contact) | |
| F9NL | D-F9NL | 3 wire/NPN | 3 | N.O. (A contact) | |
| F9PL | D-F9PL | 3 wire/PNP | 3 | N.O. (A contact) | |
| F9BL | D-F9BL | 2 wire | 3 | N.O. (A contact) | |

* When using both auto and proximity switches, list the proximity switch part number after the auto switch part number. Example) **F9N1G2**

Proximity switch types

| Symbol | Model | Wiring/Output type | Lead wire length (m) | Contact | Applicable actuator |
|--------|---|--------------------|----------------------|------------------|---------------------|
| GN | With sensor rail and sensor plate, without proximity switch | | | | |
| G | GXL-8F | 3 wire/NPN | 1 | N.O. (A contact) | LXF LXS |
| GD | GXL-8FI | 3 wire/NPN | 1 | N.O. (A contact) | |
| GB | GXL-8FB | 3 wire/NPN | 1 | N.C. (B contact) | |
| GDB | GXL-8FIB | 3 wire/NPN | 1 | N.C. (B contact) | |
| GU | GXL-8FU | 2 wire/Solid state | 1 | N.O. (A contact) | |
| GUB | GXL-8FUB | 2 wire/Solid state | 1 | N.C. (B contact) | |

* Refer to page 318 for detailed specifications of proximity switches.

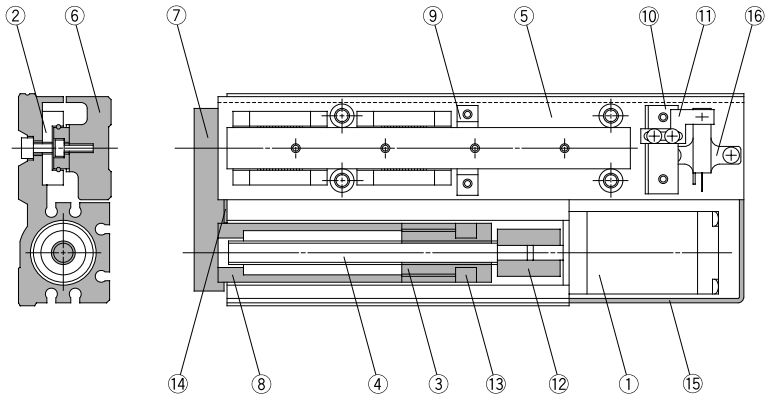
Specifications

| Model | LXF | LXP | LXS |
|------------|---|---|--|
| Guide type | Direct acting guide Stainless steel, With low particulate generating grease | Ball bushing Stainless steel, With low particulate generating grease | High rigidity direct acting guide Stainless steel, With low particulate generating grease |
| Lead screw | Ball screw ø8mm 2mm/5mm lead Black chrome coating + Special fluororesin coating, AFE grease (made by THK) applied | | |

For basic specifications such as allowable moment, refer to the "Standard" pages for equivalent products listed on Features pages 3 and 4.

Construction

Series LXF



Parts list

| No. | Description | Material | Note |
|-----|---------------------|-------------------|----------|
| 1 | Motor | — | |
| 2 | Direct acting guide | — | |
| 3 | Nut | Resin/Alloy steel | |
| 4 | Rolled screw | Alloy steel | |
| 5 | Body | Aluminum alloy | Anodized |
| 6 | Table | Aluminum alloy | Anodized |
| 7 | End plate | Aluminum alloy | Anodized |
| 8 | Tube | Aluminum alloy | Anodized |
| 9 | Stopper A | — | |

Parts list

| No. | Description | Material | Note |
|-----|--------------------|----------------|-----------|
| 10 | Stopper B | Aluminum alloy | |
| 11 | Sensor plate | Mild steel | Chromated |
| 12 | Coupling | Aluminum alloy | |
| 13 | Magnet | — | |
| 14 | Bumper | Rubber | |
| 15 | Motor cover | Resin | |
| 16 | Photo micro sensor | — | |

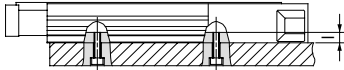
Mounting

Series LXF

Actuator mounting

An actuator can be mounted from two directions, which can be selected depending on the equipment or work piece.

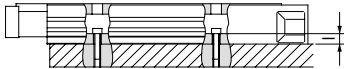
1. Tapped holes



| Model | Bolt | Max. tightening torque N·m | Max. screw-in depth (/mm) |
|-------|----------|-------------------------------|------------------------------|
| LXF | M5 x 0.8 | 4.4 | 8 |

Caution Use bolts at least 0.5mm shorter than the maximum screw-in depth, so they do not touch the body.

2. Through holes

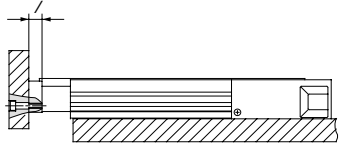


| Model | Bolt | Max. tightening torque N·m | Body thickness (/mm) |
|-------|----------|-------------------------------|-------------------------|
| LXF | M4 x 0.7 | 2.1 | 8 |

Work piece mounting

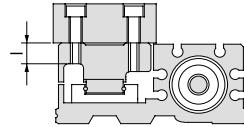
Work pieces can be mounted on two sides of the actuator.

1. Front mount type



| Model | Bolt | Max. tightening torque N·m | Body thickness (/mm) |
|-------|----------|-------------------------------|-------------------------|
| LXF | M4 x 0.7 | 2.1 | 10 |

2. Top mount type



| Model | Bolt | Max. tightening torque N·m | Max. screw-in depth (/mm) |
|-------|----------|-------------------------------|------------------------------|
| LXF | M4 x 0.7 | 2.1 | 8 |

Caution Use bolts at least 0.5mm shorter than the maximum screw-in depth, so they do not touch the body.

LJ1

LG1

LC1

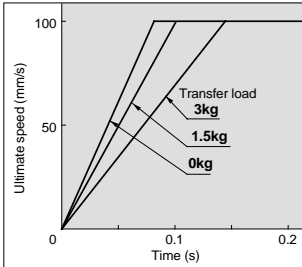
LX

LC6D/LC6C

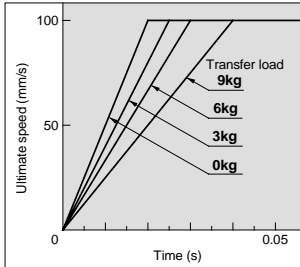
Switches

Acceleration Time Guide/Slide Screw Specification (Horizontal)

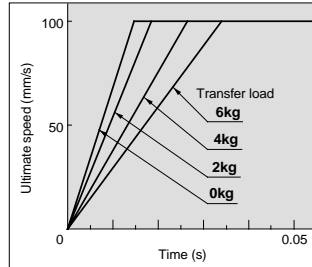
LXFH5SA



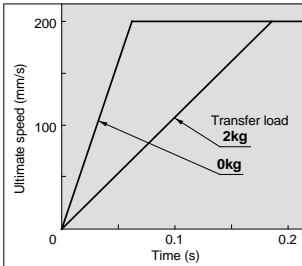
LXPB2SA/LXSH2SA



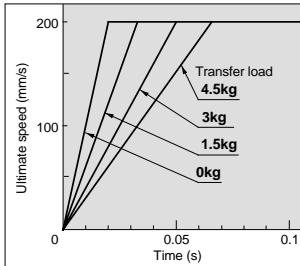
LXPB5SA/LXSH5SA



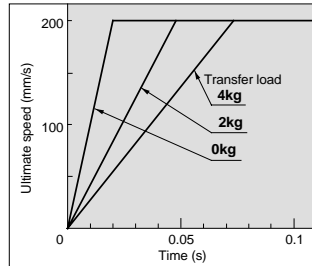
LXFH5SB



LXPB2SB/LXSH2SB

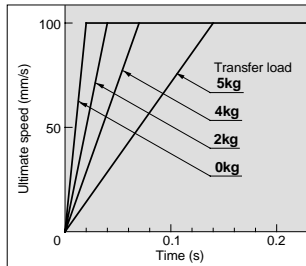


LXPB5SB/LXSH5SB

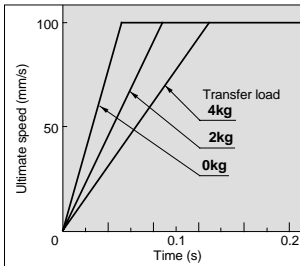


Acceleration Time Guide/Slide Screw Specification (Vertical)

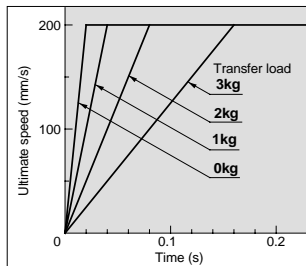
LXPB2SA/LXSH2SA



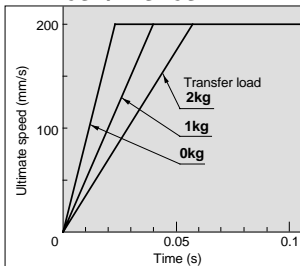
LXPB5SA/LXSH5SA



LXPB2SB/LXSH2SB



LXPB5SB/LXSH5SB

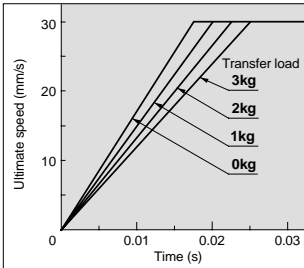


⚠ Caution

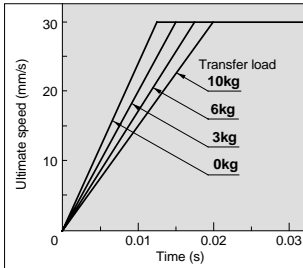
- Transfer loads should not exceed each model's work load specification.
- Determine the acceleration time based on the transfer load and ultimate speed.
- Operating over the graph ranges will cause loss of synchronism.
- The graphs are based on operation using an SMC DC power input type driver with halfstep energization.
- Data fluctuate depending on the operating conditions.

Acceleration Time Guide/Ball Screw Specification (Horizontal)

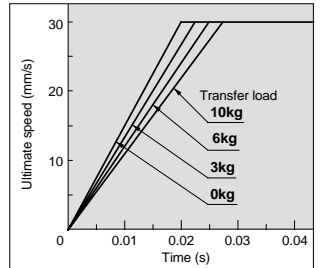
LXFH5BC



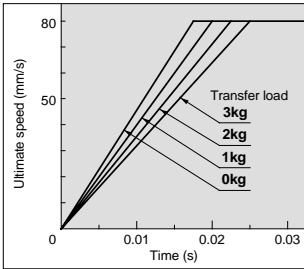
LXPB2BC/LXSH2BC



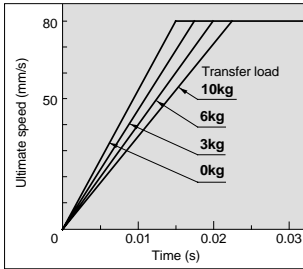
LXPB5BC/LXSH5BC



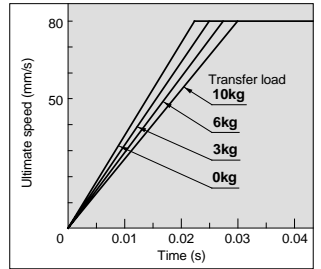
LXFH5BD



LXPB2BD/LXSH2BD

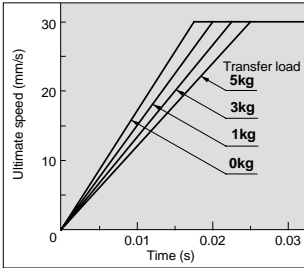


LXPB5BD/LXSH5BD

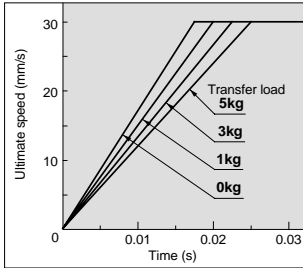


Acceleration Time Guide/Ball Screw Specification (Vertical)

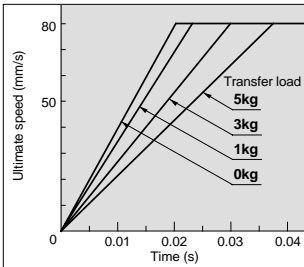
LXPB2BC/LXSH2BC



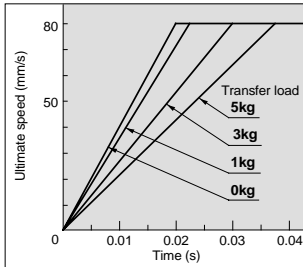
LXPB5BC/LXSH5BC



LXPB2BD/LXSH2BD



LXPB5BD/LXSH5BD



⚠ Caution

- Transfer loads should not exceed each model's work load specification.
- Determine the acceleration time based on the transfer load and ultimate speed.
- Operating over the graph ranges will cause loss of synchronism.
- The graphs are based on operation using an SMC DC power input type driver with halfstep energization.
- Data fluctuate depending on the operating conditions.

LJ1

LG1

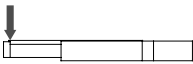

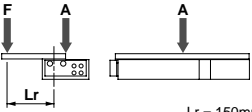
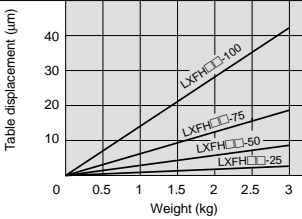
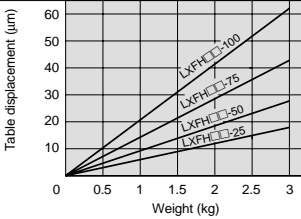
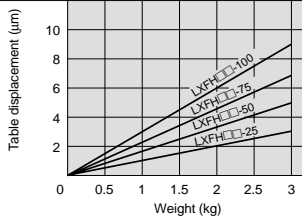
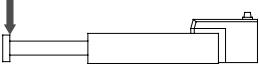
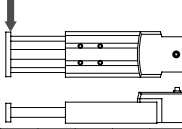
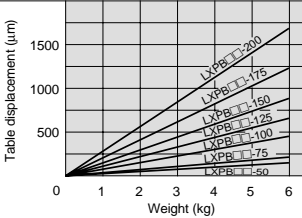
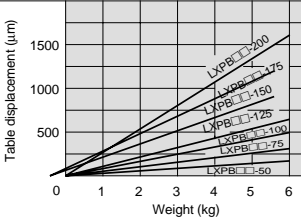
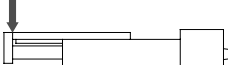

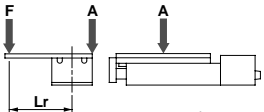
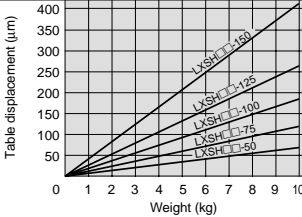
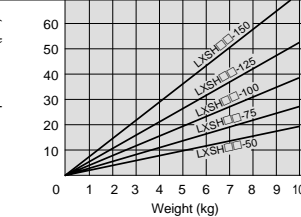
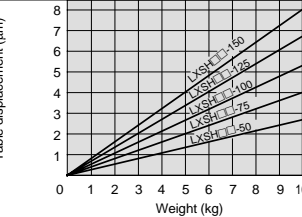
LC1

LX

LC6D/LC6C

Switches

Table Deflection

| | Table displacement by pitch moment load | Table displacement by yaw moment load | Table displacement by roll moment load |
|-----|---|---|---|
| LXF | <p>Displacement at the section indicated by the arrow when a load is applied to this section with the slide table fully extended.</p>  | <p>Displacement at the section indicated by the arrow when a load is applied to this section with the slide table fully extended.</p>  | <p>Displacement at "A" when a load is applied to "F" with the slide table retracted.</p>  <p style="text-align: right;">$L_r = 150\text{mm}$</p> |
| |  |  |  |
| LXP | <p>Displacement at the section indicated by the arrow when a load is applied to this section with the electric actuator fully extended.</p>  | <p>Displacement at the section indicated by the arrow when a load is applied to this section with the electric actuator fully extended.</p>  | |
| |  |  | |
| LXS | <p>Displacement at the section indicated by the arrow when a load is applied to this section with the slide table fully extended.</p>  | <p>Displacement at the section indicated by the arrow when a load is applied to this section with the slide table fully extended.</p>  | <p>Displacement at "A" when a load is applied to "F" with the slide table retracted.</p>  <p style="text-align: right;">$L_r = 200\text{mm}$</p> |
| |  |  |  |



Applicable Actuators

| | |
|--------|---------------------------------|
| D-F9 | Series LXF*, LXP, LXS |
| D-Y7GL | Series LJ1 (non-standard motor) |

* Cannot be mounted on Series LXF with ball screw specification.

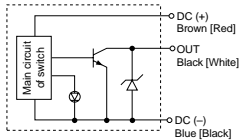
Auto Switch Specifications

| Auto switch part no. | D-F9N | D-F9P | D-F9B | D-F9G | D-F9H |
|-----------------------|---|--------------|---------------------|---|--------------|
| Contact | N.O. (A contact) | | | N.C. (B contact) | |
| Electrical entry | In-line | | | | |
| Wiring type | 3 wire | | 2 wire | 3 wire | |
| Output type | NPN | PNP | — | NPN | PNP |
| Applicable load | IC circuit, Relay, PLC | | 24VDC relay, PLC | IC circuit, Relay, PLC | |
| Power supply voltage | 5, 12, 24VDC (4.5 to 28V) | | — | 5, 12, 24VDC (4.5 to 28V) | |
| Current consumption | 10mA or less | | — | 10mA or less | |
| Load voltage | 28VDC or less | — | 24VDC (10 to 28VDC) | 28VDC or less | — |
| Load current | 40mA or less | 80mA or less | 5 to 40mA | 40mA or less | 80mA or less |
| Internal voltage drop | 1.5V or less (0.8V or less at load current of 10mA) | 0.8V or less | 0.4V or less | 1.5V or less (0.8V or less at load current of 10mA) | 0.8V or less |
| Leakage current | 100µA or less at 24VDC | | 80mA or less | 100µA or less at 24VDC | |
| Indicator light | Red LED lights up when ON | | | Red LED lights up when OFF | |

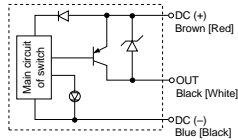
Auto switch internal circuits

Lead wire colors inside [] are those prior to conformity with IEC standards.

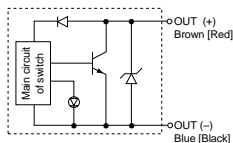
D-F9G, D-Y7GL



D-F9P, D-F9H



D-F9B



- Lead wire ——— Oil resistant heavy duty vinyl cord, ø2.7, 0.15mm² x 3 wire (Brown, Black, Blue [Red, White, Black]), 0.18mm² x 2 wire (Brown, Blue [Red, Black])
- Insulation resistance — 50MΩ or more at 500VDC (between lead wire and case)
- Withstand voltage — 1000VAC for 1 min. (between lead wire and case)
- Indication light — Lights when ON
- Ambient temperature — -10 to 60°C
- Operating time — 1ms or less
- Impact resistance — 1000m/s²

| Auto switch part no. | D-Y7GL |
|-----------------------|---|
| Contact | N.C. (B contact) |
| Electrical entry | In-line |
| Wiring type | 3 wire |
| Output type | NPN |
| Applicable load | IC circuit, Relay, PLC |
| Power supply voltage | 5, 12, 24VDC (4.5 to 28V) |
| Current consumption | 10mA or less |
| Load voltage | 28VDC or less |
| Load current | 40mA or less |
| Internal voltage drop | 1.5V or less (0.8V or less at load current of 10mA) |
| Leakage current | 100µA or less at 24VDC |
| Indicator light | Red LED lights up when OFF |

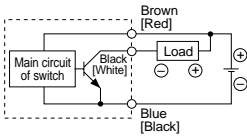
Switches

Solid State Switch Connection and Examples

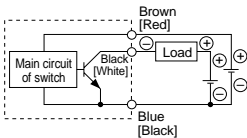
Basic Wiring

3 wire, NPN

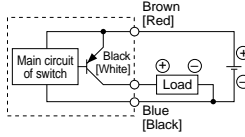
(When the switch power supply and load power supply are the same)



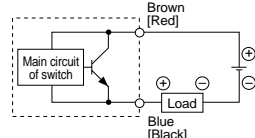
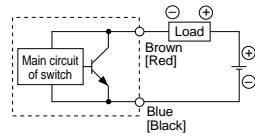
(When the switch power supply and load power supply are separate)



3 wire, PNP

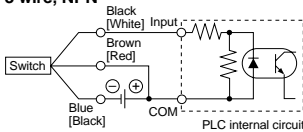


2 wire

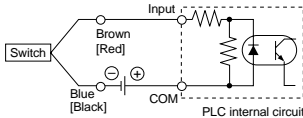


Examples of Connection to PLC

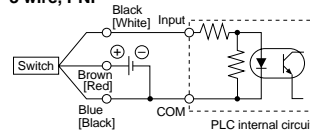
Sink input specifications, 3 wire, NPN



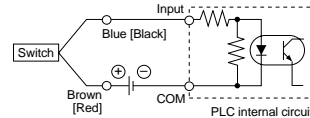
2 wire



Source input specifications, 3 wire, PNP



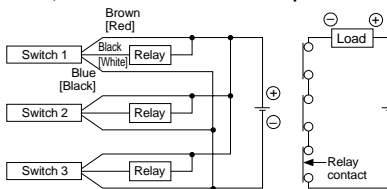
2 wire



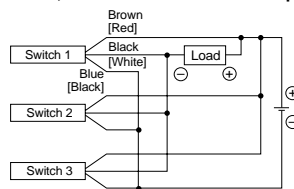
Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

Connection Examples for AND (Series) and OR (Parallel)

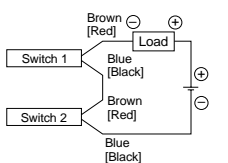
3 wire, AND connection for NPN output



3 wire, OR connection for NPN output



2 wire with 2 switch AND connection

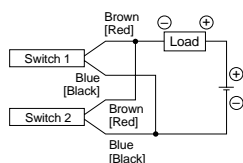


When two switches are connected in series, a load may malfunction because the load voltage will decline when in the ON state. The indicator lights will light up when both of the switches are in the ON state.

Load voltage at ON = Power supply voltage - Residual voltage x 2 pcs.
= 24V - 4V x 2 pcs.
= 16V

Example: Power supply voltage is 24VDC.
Internal voltage drop in switch is 4V.

2 wire with 2 switch OR connection



When two switches are connected in parallel, malfunction may occur because the load voltage will increase when in the OFF state.

Load voltage at OFF = Leakage current x 2 pcs. x Load impedance
= 1mA x 2pcs. = 3kΩ
= 6V

Example: Load impedance is 3kΩ.
Leakage current from switch is 1mA.

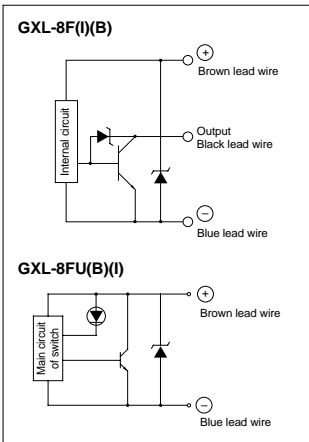
Applicable switch models

| Applicable model | Model type | Part no. | Switch type | |
|------------------|------------|----------|---------------------|-------------------------|
| LXF LXS | G | GXL-8F | Standard | N.O. (A contact) 3 wire |
| | GD | GXL-8FI | Varying frequencies | N.O. (A contact) 3 wire |
| | GB | GXL-8FB | Standard | N.C. (B contact) 3 wire |
| | GDB | GXL-8FIB | Varying frequencies | N.C. (B contact) 3 wire |
| | GU | GXL-8FU | Standard | N.O. (A contact) 2 wire |
| | GUB | GXL-8FUB | Standard | N.C. (B contact) 2 wire |

Switch specifications (SUNX Corporation)

| Part no. | | GXL-8F(I)(B) | GXL-8FU | GXL-8FUB |
|--------------------------------|-----------------------------|--|--|----------|
| Repeatability | | Direction of detecting axis, Perpendicular to detecting axis: 0.04mm or less | | |
| Power supply voltage | | 12 to 24VDC $\pm 10\%$, Ripple P-P 10% or less | | |
| Current consumption | | 15mA | 0.8mA or less (when output is OFF) | |
| Output | | NPN Maximum load current: 100mA Maximum applied voltage: 30VDC Residual voltage: 1V or less | 2 wire solid state DC Load current: 3 to 70mA Residual voltage: 3V or less | |
| Maximum response frequency | | 500Hz | 1kHz | |
| Indicator light | | Red LED (lights up when ON) | Green LED (stable detection) Red LED (unstable detection) | |
| Environmental resistance | Ambient temperature | -10° to 55° C | -25° to 70° C | |
| | Ambient humidity | 45 to 85% RH | | |
| | Noise resistance | Power line: 240Vp, pulse width of 0.5 μ s | | |
| Detecting distance fluctuation | Temperature characteristics | Within $\pm 15/-10\%$ of detecting distance at 20° C within ambient temperature range | | |
| | Voltage characteristics | Within $\pm 2\%$ with $\pm 10\%$ fluctuation of operating voltage | | |
| Cable | | 0.08mm 3 wire heavy duty cable 1m | 0.15mm 2 wire heavy duty cable 1m | |

Proximity switch internal circuit



Proximity Switch/Switch Plate Mounting

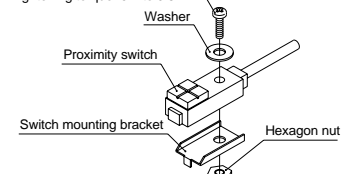
Be sure to use the mounting screws included, and mount the proximity switch as shown in the drawing to the right.

Mount the switch plate as shown below. Always use the proper tightening torque and use a thread locking agent on screws to prevent loosening.

The switch body is made of PBT and acrylic resin. Select a thread locking agent that will not affect these materials.

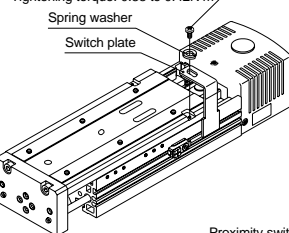
Button head screw (M2.6 x 10)

Tightening torque: 0.4 to 0.5N·m



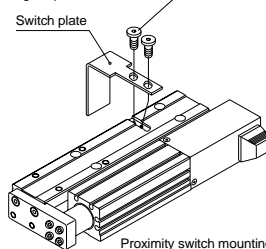
Round head screw (M2.5 x 5)

Tightening torque: 0.38 to 0.42N·m



Thin head screw (M3 x 4)

Tightening torque: 0.38 to 0.42N·m



Proximity switch mounting position

LXF

1mm or more

Proximity switch mounting position

1mm or more

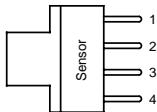
LXS

1mm or more

Standard Photo Micro Sensor for Home Position (OMRON Corporation)

Rating

| | | | |
|----------------------|--|---------------------|---------------------------------|
| Power supply voltage | 5 to 24VDC $\pm 10\%$, Ripple (p-p) 10% or less | | |
| Current consumption | 35mA or less | | |
| Control output | 5 to 24VDC load current (Ic) 100mA, Residual voltage 0.8V or less Load current (Ic) 40mA, Residual voltage 0.4V or less | | |
| Ambient temperature | Operation: -25° to 55° C (When stored: -30° to 80° C) | | |
| Ambient humidity | Operation: 5 to 85%RH (When stored: 5 to 95%RH) | | |
| Part no. | EE-SX672 equivalent | EE-SX673 equivalent | EE-SX674 |
| Applicable actuator | LXF | LXP, LXS | LG1 (non-standard motor) |



Terminal arrangement

| | | |
|---|-------|--------------|
| 1 | Brown | Vcc (⊕) |
| 2 | White | L* |
| 3 | Black | OUTPUT |
| 4 | Blue | GND (OV) (⊖) |

* Normally ON when light is blocked.
However, if the (L) terminal and (⊕) terminal are shorted, it changes to ON when light enters.

Output level circuit

| Operating condition of output transistor | ON when light enters | ON when light is blocked |
|--|---|--|
| Output circuit | | |
| | <p>* Normally ON when light is blocked. However, if the (L) terminal and (⊕) terminal are shorted, it changes to ON when light enters.</p> | |
| Time chart | <p>(“L” and “+” shorted)</p> <p>Light enters Light blocked</p> <p>Lighted indicator light (Red) Light ON Light Off</p> <p>Output Transistor ON OFF</p> <p>Load 1 (Relay) Operate Return</p> <p>Load 2 H L</p> | <p>(“L” and “+” open)</p> <p>Light enters Light blocked</p> <p>Lighted indicator light (Red) Light ON Light Off</p> <p>Output Transistor ON OFF</p> <p>Load 1 (Relay) Operate Return</p> <p>Load 2 H L</p> |

LG1

LG1

LG1

LX

LC6D/LC6C

Switches