

X-axis Linear Servo Type Cartesian Robot

Assembly Procedures First Edition

Thank you for purchasing an IAI product.

Assemble your product correctly by referring to these Assembly Procedures.

LSA (Large Size Linear Servo Actuator) + ISA configuration unit

No.	Number of configured axes	Z-axis installation method	Model	Drawing No.
1	2 axes		ICSPA2-B1L□H	GMM07-067
2	3 axes	Z-axis base mount	ICSPA3-B1L□HB3H (M)	GMM07-068
3	3 axes	Z-axis slider mount	ICSPA3-B1L□HS3M	GMM07-069
4	4 axes		ICSPA4-B2L1H	GMM07-070
5	6 axes	Z-axis base mount	ICSPA6-B2L1HB3H (M)	GMM07-071
6	6 axes	Z-axis slider mount	ICSPA6-B2L1HS3M	GMM07-072

X-axis Linear Servo Type Cartesian Robot – High-precision 2-axis Specification

[Model]
ICSPA2-B1L ① H

[1] XY configuration direction

[1] XY configuration directions

[Assembled parts]

[1] XY bracket [2] Guide rail [3] Cable track
[4] Connector box [5] Connector cover [6] Box cover
[7] Joint cover [8] Grommet with film [9] Controller-actuator cable with cable fix cap
[10] Metal cover

[Constituent axes]

Constituent axis	Model
X-axis	LSA-W21SS-I-400- (stroke) -T2-L-□
Y-axis	ISPA-MYM-I-200-20- (stroke) -T2-AQ

* Either of NT1 (for configurations 1 and 3) or NT2 (for configurations 2 and 4) comes to □ in the model code above.

[Assembly Procedure] Drawing No.: GMM07-067

X-axis Linear Servo Type Cartesian Robot – High-precision 3-axis Specification, Z-axis Base Mount

[Model]
ICSPA3-B1L ① HB3H (M)

H: Z-axis high-speed type
M: Z-axis medium-speed type
[1] XY configuration direction

[1] XY configuration directions

[Assembled parts]

[1] XY bracket [2] Guide rail [3] Cable track 1 [11] YZ plate [12] Track mounting plate [13] Track support bracket
[4] Connector box 1 [5] Connector cover [6] Box cover 1 [14] Track mounting bracket 2 [15] Cable track 2 [16] Connector box 2
[7] Joint cover 1 [8] Grommet with film [9] Controller-actuator cable with cable fix cap [17] Box cover 2 [18] Joint cover 2
[10] Metal cover

[Constituent axes]

Constituent axis	Model
X-axis	LSA-W21SS-I-400- (stroke) -T2-L-□
Y-axis	ISPA-MYM-I-200-20- (stroke) -T2-AQ
Z-axis	ISPA-MXM-I-200-20<10>- (stroke) -T2-AQ-B

* Either of NT1 (for configurations 1 and 3) or NT2 (for configurations 2 and 4) comes to □ in the model code above.

[Assembly Procedure] Drawing No.: GMM07-068

X-axis Linear Servo Type Cartesian Robot – High-precision 3-axis Specification, Z-axis Slider Mount

[Model]
ICSPA3-B1L ① HS3M

M: Z-axis medium-speed type
[1] XY configuration direction

[1] XY configuration directions

[Assembled parts]

[1] XY bracket [2] Guide rail [3] Cable track 1 [11] YZ bracket [12] Track mounting plate [13] Track support bracket
[4] Connector box 1 [5] Connector cover [6] Box cover 1 [14] Track mounting bracket 2 [15] Track mounting bracket 3 [16] Cable track 2
[7] Joint cover 1 [8] Grommet with film [9] Controller-actuator cable with cable fix cap [17] Connector box 2 [18] Box cover 2 [19] Joint cover 2
[10] Metal cover

[Constituent axes]

Constituent axis	Model
X-axis	LSA-W21SS-I-400- (stroke) -T2-L-□
Y-axis	ISPA-MYM-I-200-20- (stroke) -T2-AQ
Z-axis	ISPA-MZM-I-200-10- (stroke) -T2-AQ-B-NM

* Either of NT1 (for configurations 1 and 3) or NT2 (for configurations 2 and 4) comes to □ in the model code above.

[Assembly Procedure] Drawing No.: GMM07-069

X-axis Linear Servo Type Cartesian Robot – High-precision 4-axis Specification

[Model]
ICSPA4-B2L 1 H

[1] XY configuration direction

[1] XY configuration directions

[Assembled parts]

[1] XY bracket [2] XY bracket [3] Guide rail [4] Cable track [5] Connector cover [6] Wiring box bracket [7] Wiring box cover [8] Grommet with film [9] Controller-actuator cable with cable fix cap
[10] Metal cover

[Constituent axes]

Constituent axis	Model
X-axis	LSA-W21SM-I-400- (stroke) -T2-L-NT1
Y1-axis	ISPA-MYM-I-200-20- (stroke) -T2-AQ
Y2-axis	ISPA-MYM-I-200-20- (stroke) -T2-AQ

[Assembly Procedure] Drawing No.: GMM07-070

X-axis Linear Servo Type Cartesian Robot – High-precision 6-axis Specification, Z-axis Base Mount

[Model]
ICSPA6-B2L 1 HB3H (M)

H: Z-axis high-speed type
M: Z-axis medium-speed type
[1] XY configuration direction

[1] XY configuration directions

[Assembled parts]

[1] XY bracket [2] XY bracket [3] Guide rail [11] YZ plate [12] Track mounting plate [13] Track support bracket
[4] Cable track 1 [5] Connector cover [6] Wiring box bracket [14] Track mounting bracket 2 [15] Cable track 2 [16] Connector box
[7] Wiring box cover [8] Grommet with film [9] Controller-actuator cable with cable fix cap [17] Box cover [18] Joint cover
[10] Metal cover

[Constituent axes]

Constituent axis	Model
X-axis	LSA-W21SM-I-400- (stroke) -T2-L-NT1
Y1-axis	ISPA-MYM-I-200-20- (stroke) -T2-AQ
Y2-axis	ISPA-MYM-I-200-20- (stroke) -T2-AQ
Z1-axis	ISPA-MXM-I-200-20<10>- (stroke) -T2-AQ-B
Z2-axis	ISPA-MXM-I-200-20<10>- (stroke) -T2-AQ-B

[Assembly Procedure] Drawing No.: GMM07-071

X-axis Linear Servo Type Cartesian Robot – High-precision 6-axis Specification, Z-axis Slider Mount

[Model]
ICSPA6-B2L 1 HS3M

M: Z-axis medium-speed type
[1] XY configuration direction

[1] XY configuration directions

[Assembled parts]

[1] XY bracket [2] XY bracket [3] Guide rail [11] YZ bracket [12] Track mounting plate [13] Track support bracket
[4] Cable track 1 [5] Connector cover [6] Wiring box bracket [14] Track mounting bracket 2 [15] Track mounting bracket 3 [16] Cable track 2
[7] Wiring box cover [8] Grommet with film [9] Controller-actuator cable with cable fix cap [17] Connector box [18] Box cover [19] Joint cover
[10] Metal cover

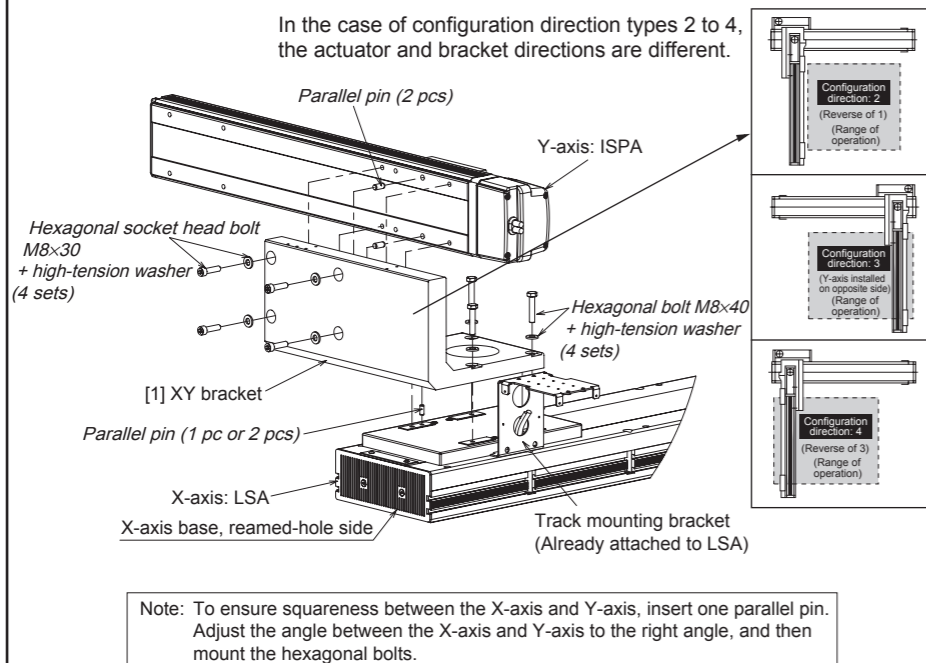
[Constituent axes]

Constituent axis	Model
X-axis	LSA-W21SM-I-400- (stroke) -T2-L-NT1
Y1-axis	ISPA-MYM-I-200-20- (stroke) -T2-AQ
Y2-axis	ISPA-MYM-I-200-20- (stroke) -T2-AQ
Z1-axis	ISPA-MZM-I-200-10- (stroke) -T2-AQ-B-NM
Z2-axis	ISPA-MZM-I-200-10- (stroke) -T2-AQ-B-NM

[Assembly Procedure] Drawing No.: GMM07-072

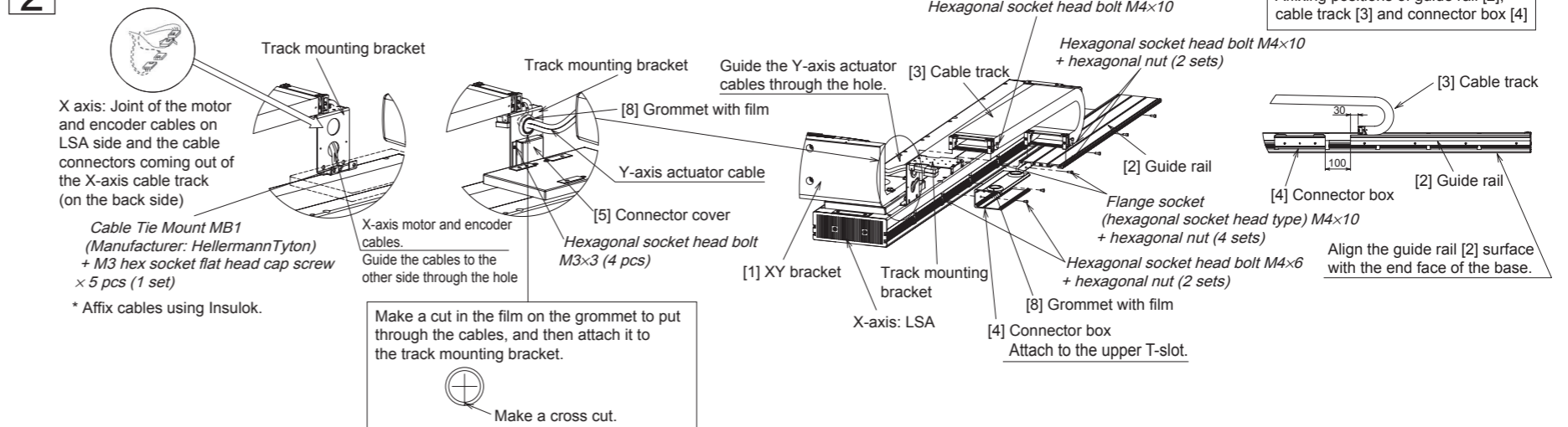
⚠ Caution: ● Although each part has been chamfered to remove sharp edges, exercise due caution during the assembly to prevent injury. If necessary, wear gloves or other protective gears.
● Exercise due caution during the assembly to prevent pinching of hands and fingers.

1 [Tools] Allen wrench, spanner wrench



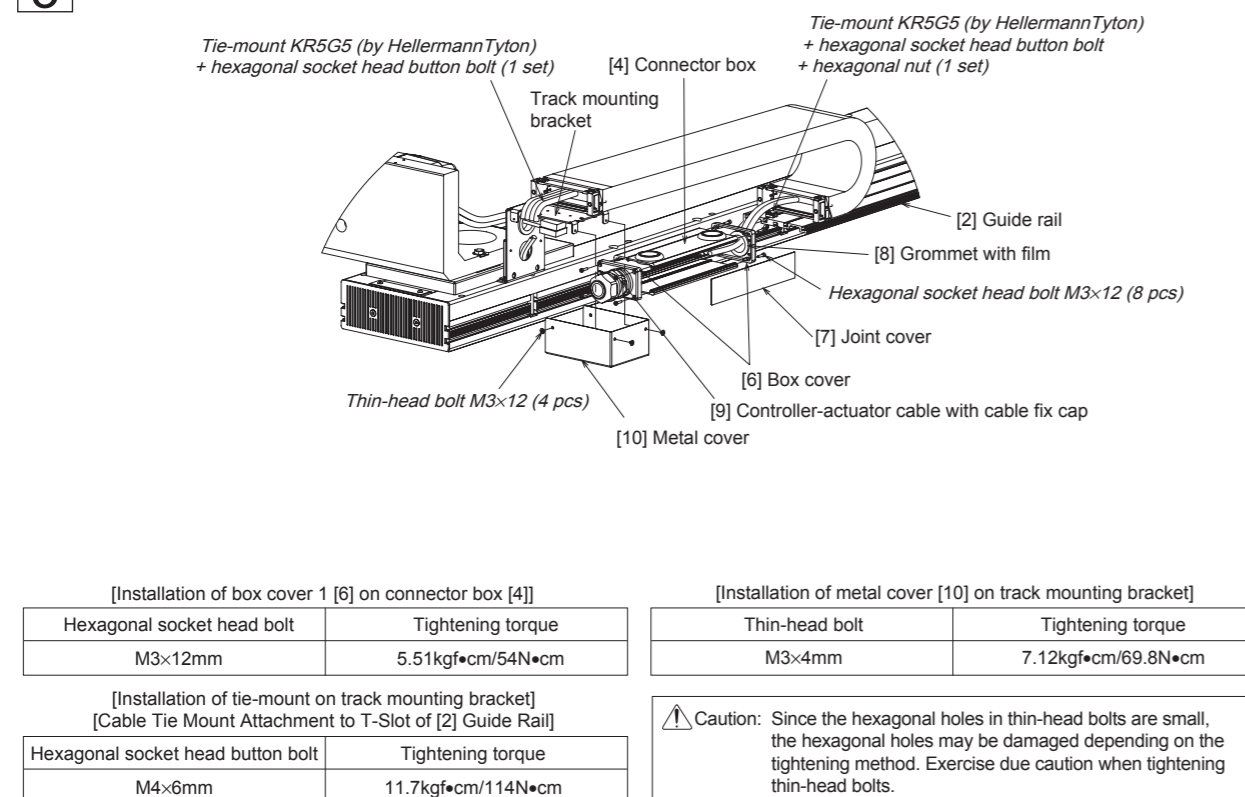
[Installation of X-axis: LSA on XY bracket [1]]			[Installation of Y-axis: ISPA on XY bracket [1]]		
Parallel pin	Hexagonal bolt	Tightening torque	Parallel pin	Hexagonal socket head bolt	Tightening torque
φ6h7×15	M8×40mm	306kgf•cm/2997N•cm	φ8h7×18	M8×30mm	306kgf•cm/2997N•cm

2

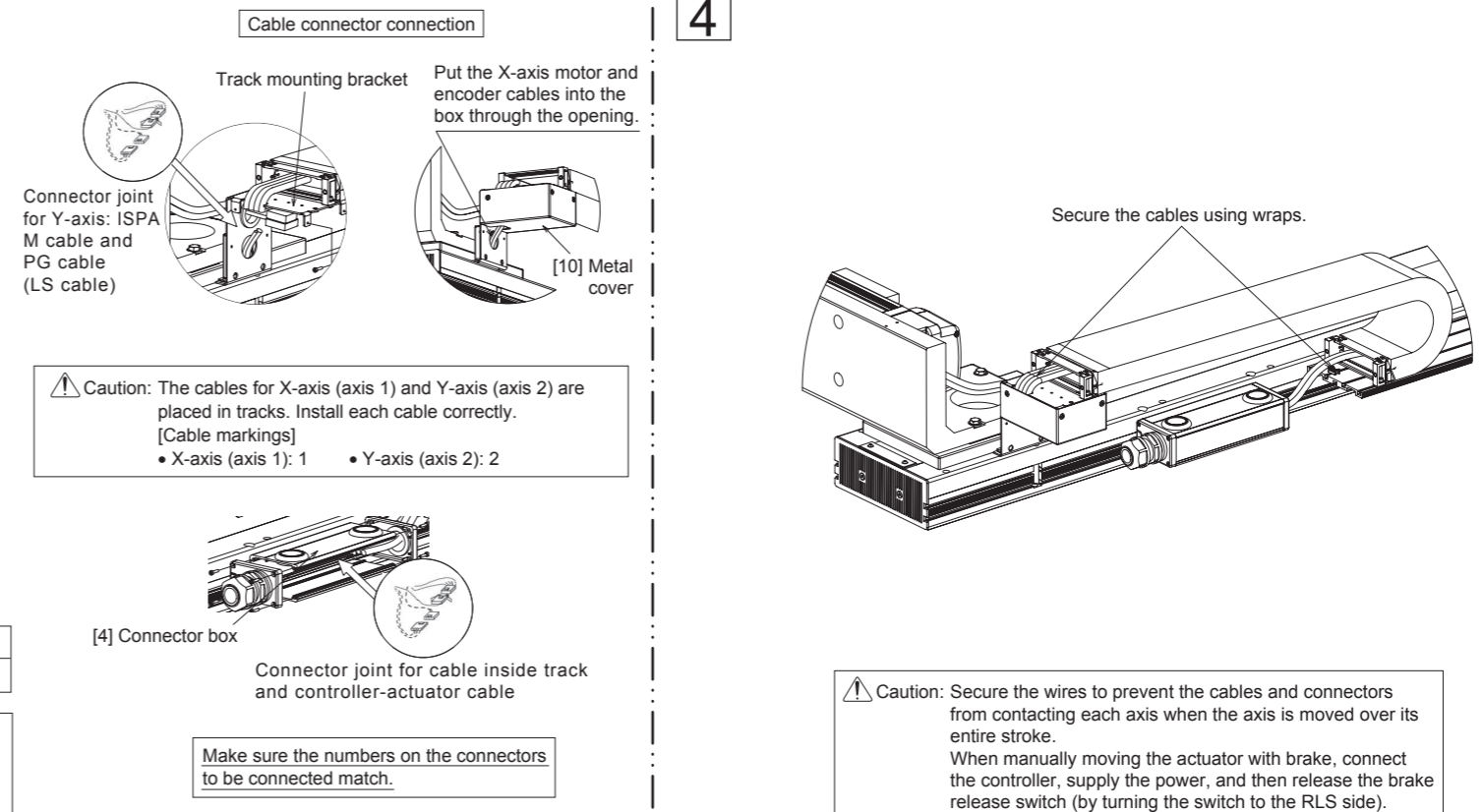


[5] Connector cover Attachment to Track Mounting Bracket]		[Installation of X-axis: LSA side of guide rail [2] in the upper T-slot]	
Hexagonal socket head bolt	Tightening torque	Flange socket (hexagonal socket head type)	Tightening torque
M3×3mm	15.8kgf•cm/154N•cm	M4×10mm	18.0kgf•cm/176N•cm

3

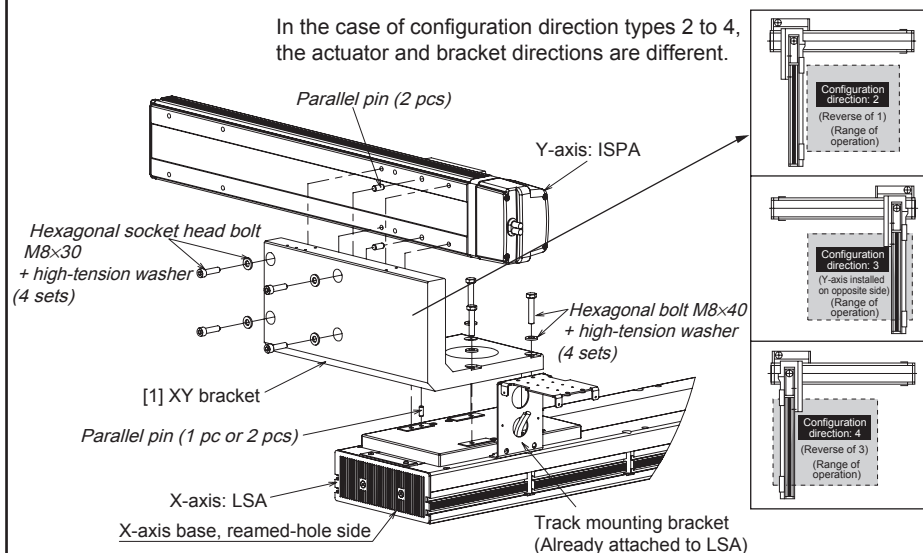


4



⚠ Caution: ● Although each part has been chamfered to remove sharp edges, exercise due caution during the assembly to prevent injury. If necessary, wear gloves or other protective gears.
● Exercise due caution during the assembly to prevent pinching of hands and fingers.

1 [Tools] Allen wrench, spanner wrench



Note: To ensure squareness between the X-axis and Y-axis, insert one parallel pin. Adjust the angle between the X-axis and Y-axis to the right angle, and then mount the hexagonal bolts.

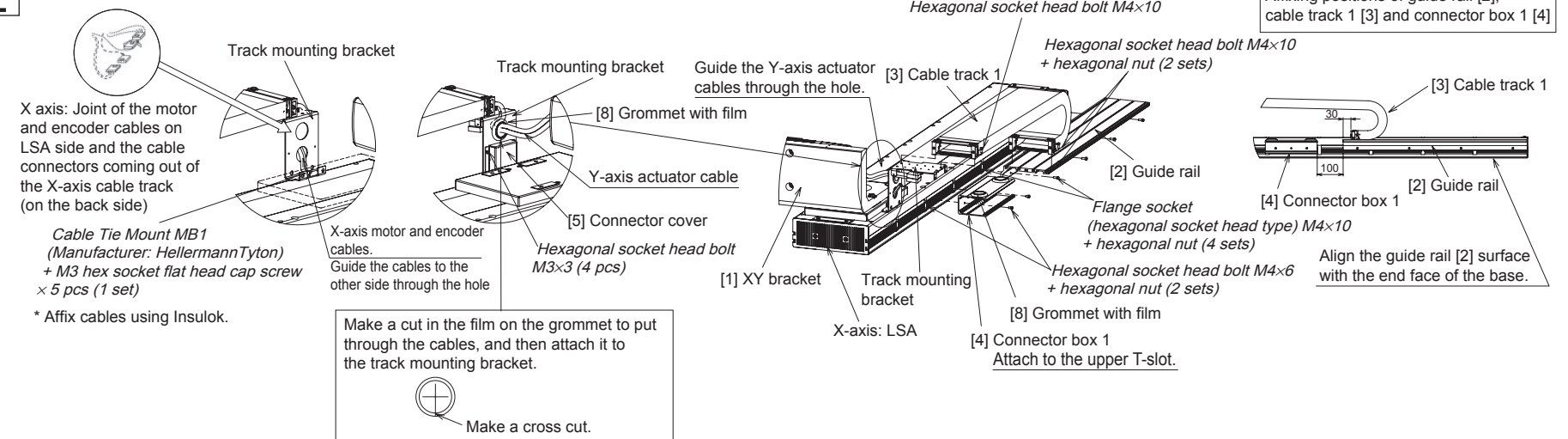
[Installation of X-axis: LSA on XY bracket [1]]

Parallel pin	Hexagonal bolt	Tightening torque
φ6h7×15	M8×40mm	306kgf•cm/2997N•cm

[Installation of Y-axis: ISPA on XY bracket [1]]

Parallel pin	Hexagonal socket head bolt	Tightening torque
φ8h7×18	M8×30mm	306kgf•cm/2997N•cm

2



[Cable Tie Mount Attachment to Track Mounting Bracket]

Hexagonal socket head bolt	Tightening torque
M3×5mm	15.8kgf•cm/154N•cm

[Installation of X-axis: LSA side of connector box 1 [4] in the upper T-slot]

Hexagonal socket head bolt	Tightening torque
M4×6mm	18.0kgf•cm/176N•cm

[Installation of cable track 1 [3] on track mounting bracket]
[Installation of guide rail [2] for cable track 1 [3] in T-slot]

Hexagonal socket head bolt	Tightening torque
M4×10mm	36.7kgf•cm/359N•cm

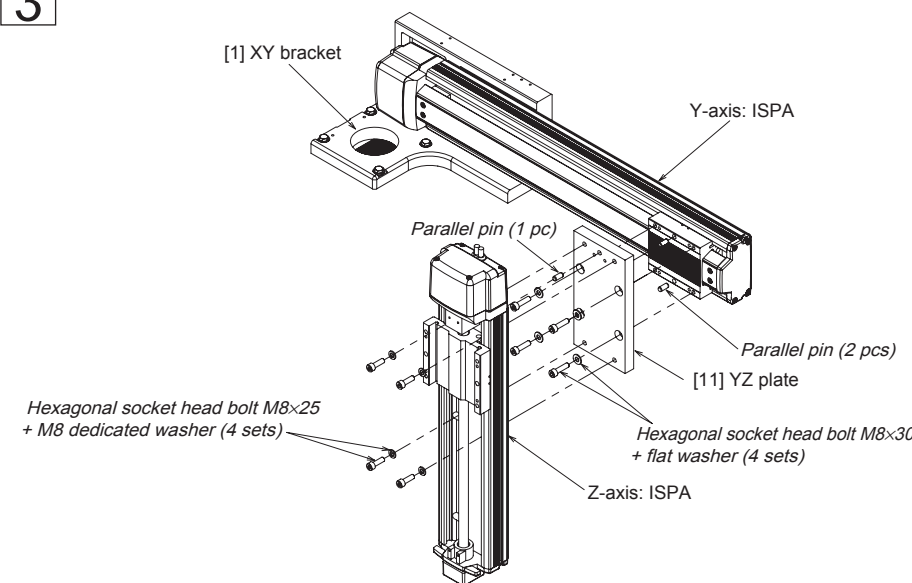
[[5] Connector cover Attachment to Track Mounting Bracket]

Hexagonal socket head bolt	Tightening torque
M3×3mm	15.8kgf•cm/154N•cm

[Installation of X-axis: LSA side of guide rail [2] in the upper T-slot]

Flange socket (hexagonal socket head type)	Tightening torque
M4×10mm	18.0kgf•cm/176N•cm

3



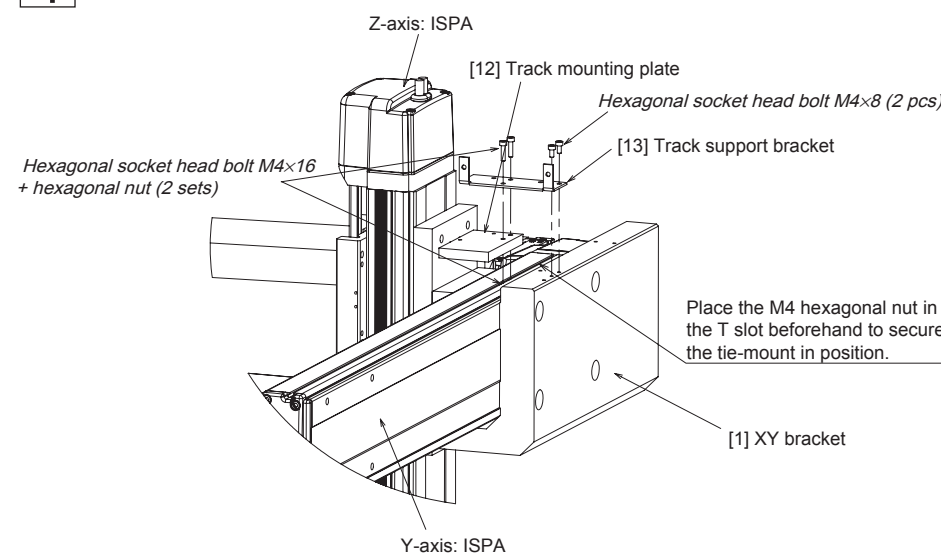
[Installation of YZ plate [11] on Y-axis: ISPA]

Parallel pin	Hexagonal socket head bolt	Tightening torque
φ8h7×18	M8×30mm	306kgf•cm/2997N•cm

[Installation of Z-axis: ISPA on YZ plate [11]]

Parallel pin	Hexagonal socket head bolt	Tightening torque
φ8h7×25	M8×25mm	306kgf•cm/2997N•cm

4



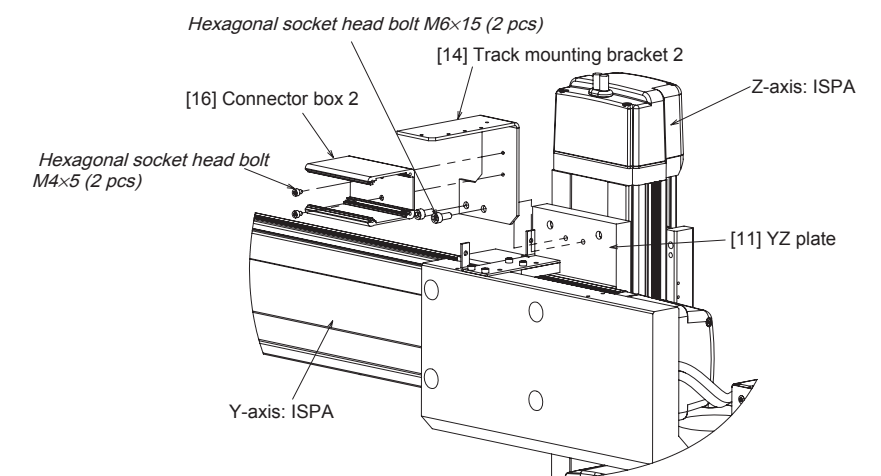
[Installation of track support bracket [13] on XY bracket [1]]

Hexagonal socket head bolt	Tightening torque
M4×8mm	36.7kgf•cm/359N•cm

[Installation of track support metal [13] on track mounting plate [12]]

Hexagonal socket head bolt	Tightening torque
M4×16mm	36.7kgf•cm/359N•cm

5



[Installation of track mounting bracket 2 [14] on YZ plate [11]]

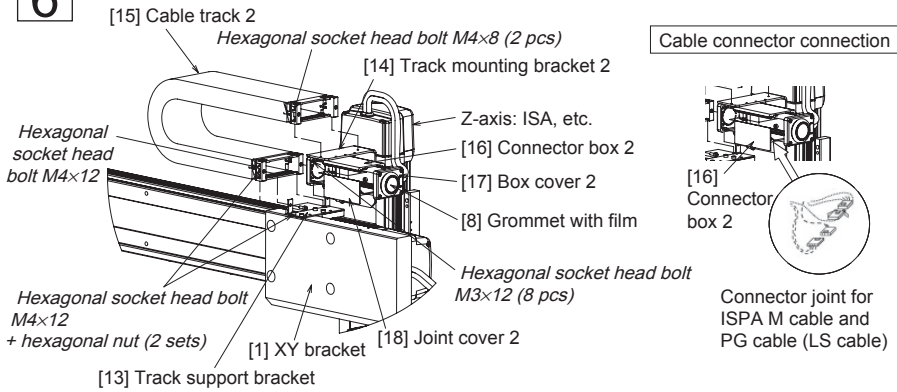
Hexagonal socket head bolt	Tightening torque
M6×15mm	126kgf•cm/1234N•cm

[Installation of connector box 2 [16] on track mounting bracket 2 [14]]

Hexagonal socket head bolt	Tightening torque
M4×5mm	18.0kgf•cm/176N•cm

* This assembly procedure applies to configuration direction 1. If other configuration direction such as 2, 3 or 4 is used, the actuator and bracket directions vary. However, you can still use this assembly drawing as a reference.

6



[Installation of cable track 2 [15] on track support bracket [13]]

Hexagonal socket head bolt	Tightening torque
M4×12mm	36.7kgf•cm/359N•cm

[Installation of cable track 2 [15] on XY bracket [1]]

Hexagonal socket head bolt	Tightening torque
M4×12mm	36.7kgf•cm/359N•cm

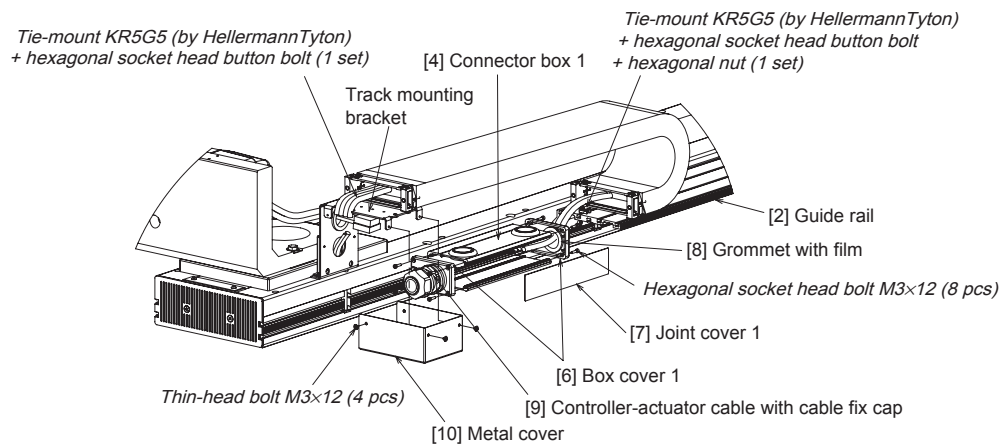
[Installation of cable track 2 [15] on track mounting bracket 2 [14]]

Hexagonal socket head bolt	Tightening torque
M4×8mm	36.7kgf•cm/359N•cm

[Installation of box cover 2 [17] on connector box 2 [16]]

Hexagonal socket head bolt	Tightening torque
M3×12mm	5.51kgf•cm/54N•cm

7



[Installation of box cover 1 [6] on connector box 1 [4]]

Hexagonal socket head bolt	Tightening torque
M3×12mm	5.51kgf•cm/54N•cm

[Installation of tie-mount on track mounting bracket]
[Cable Tie Mount Attachment to T-Slot of [2] Guide Rail]

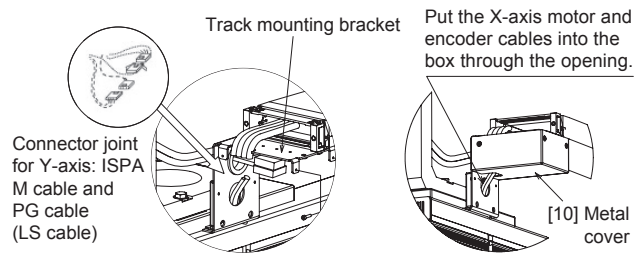
Hexagonal socket head button bolt	Tightening torque
M4×6mm	11.7kgf•cm/114N•cm

[Installation of metal cover [10] on track mounting bracket]

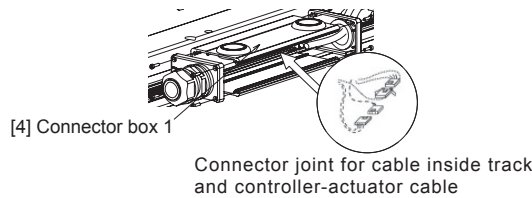
Thin-head bolt	Tightening torque
M3×4mm	7.12kgf•cm/69.8N•cm

⚠ Caution: Since the hexagonal holes in thin-head bolts are small, the hexagonal holes may be damaged depending on the tightening method. Exercise due caution when tightening thin-head bolts.

Cable connector connection

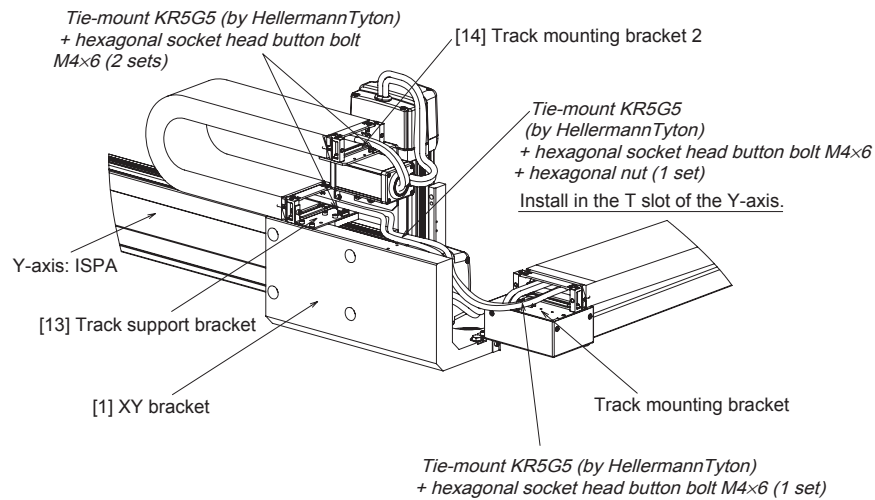


⚠ Caution: The cables for X-axis (axis 1), Y-axis (axis 2) and Z-axis (axis 3) are placed in tracks. Install each cable correctly.
[Cable markings]
• X-axis (axis 1): 1 • Y-axis (axis 2): 2 • Z-axis (axis 3): 3



Make sure the numbers on the connectors to be connected match.

8



[Installation of tie-mount in track mounting bracket 2 [14]]

[Installation of tie-mount on track support bracket [13]]

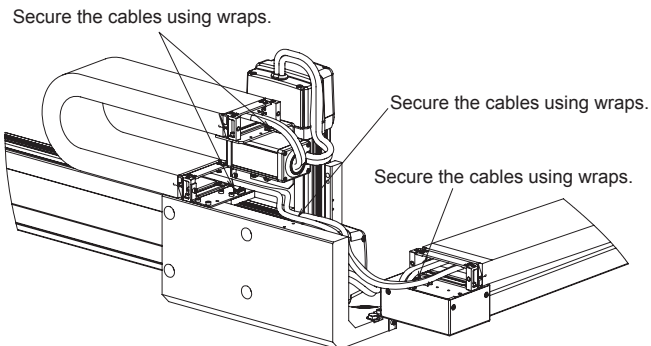
[Installation of tie-mount in T slot of Y-axis: ISPA]

[Installation of tie-mount on track mounting bracket]

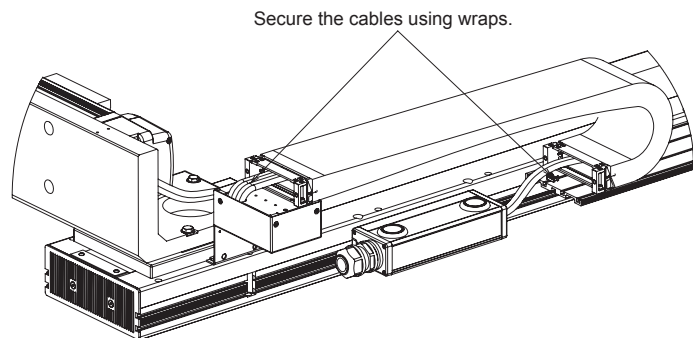
Hexagonal socket head button bolt	Tightening torque
M4×6mm	11.7kgf•cm/114N•cm

9

Z-axis cables



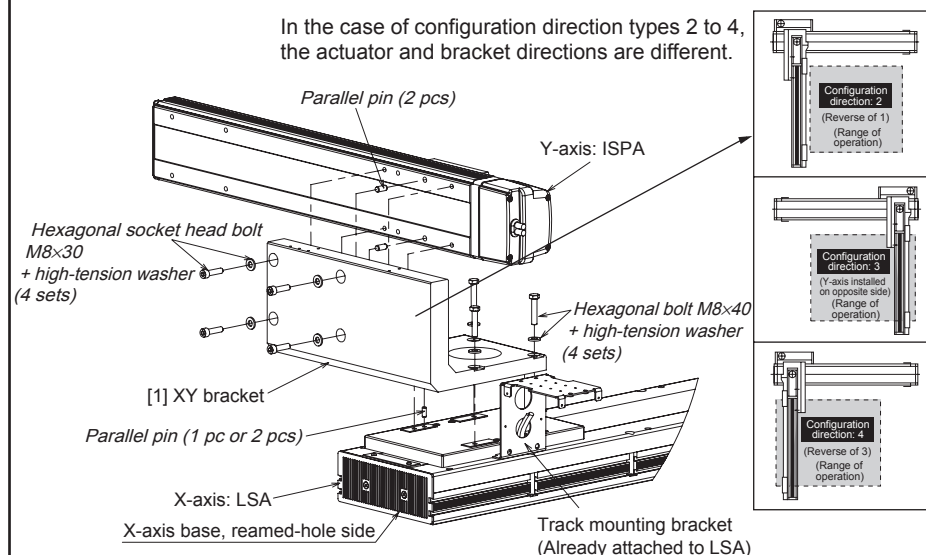
X-axis, Y-axis cables



⚠ Caution: Secure the wires to prevent the cables and connectors from contacting each axis when the axis is moved over its entire stroke.
When manually moving the actuator with brake, connect the controller, supply the power, and then release the brake release switch (by turning the switch to the RLS side).

⚠ Caution: ● Although each part has been chamfered to remove sharp edges, exercise due caution during the assembly to prevent injury. If necessary, wear gloves or other protective gears.
● Exercise due caution during the assembly to prevent pinching of hands and fingers.

1 [Tools] Allen wrench, spanner wrench



Note: To ensure squareness between the X-axis and Y-axis, insert one parallel pin. Adjust the angle between the X-axis and Y-axis to the right angle, and then mount the hexagonal bolts.

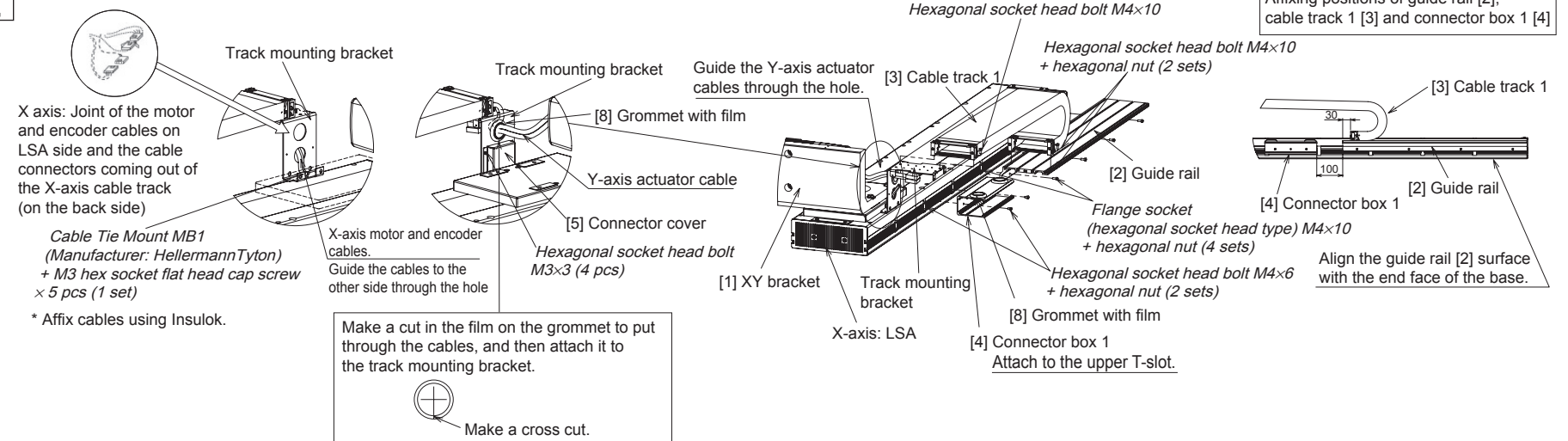
[Installation of X-axis: LSA on XY bracket [1]]

Parallel pin	Hexagonal bolt	Tightening torque
φ6h7×15	M8×40mm	306kgf•cm/2997N•cm

[Installation of Y-axis: ISPA on XY bracket [1]]

Parallel pin	Hexagonal socket head bolt	Tightening torque
φ8h7×18	M8×30mm	306kgf•cm/2997N•cm

2



[Cable Tie Mount Attachment to Track Mounting Bracket]

Hexagonal socket head bolt	Tightening torque
M3×5mm	15.8kgf•cm/154N•cm

[Installation of X-axis: LSA side of connector box 1 [4] in the upper T-slot]

Hexagonal socket head bolt	Tightening torque
M4×6mm	18.0kgf•cm/176N•cm

[Installation of cable track 1 [3] on track mounting bracket]
[Installation of guide rail [2] for cable track 1 [3] in T-slot]

Hexagonal socket head bolt	Tightening torque
M4×10mm	36.7kgf•cm/359N•cm

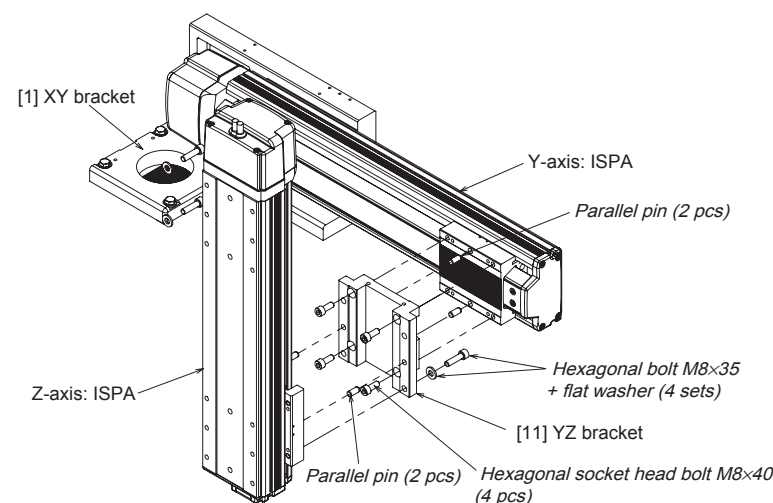
[5] Connector cover Attachment to Track Mounting Bracket]

Hexagonal socket head bolt	Tightening torque
M3×3mm	15.8kgf•cm/154N•cm

[Installation of X-axis: LSA side of guide rail [2] in the upper T-slot]

Flange socket (hexagonal socket head type)	Tightening torque
M4×10mm	18.0kgf•cm/176N•cm

3



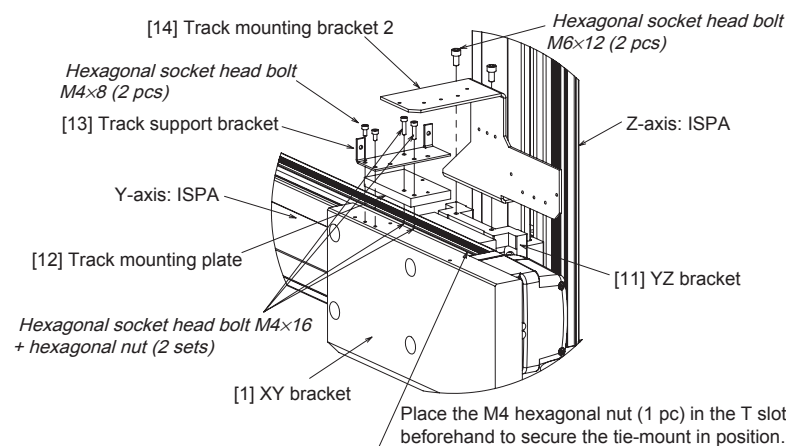
[Installation of YZ bracket [11] on Y-axis: ISPA]

Parallel pin	Hexagonal bolt	Tightening torque
φ8h7×18	M8×35mm	117kgf•cm/1148N•cm

[Installation of Z-axis: ISPA on YZ bracket [11]]

Parallel pin	Hexagonal socket head bolt	Tightening torque
φ8h7×18	M8×40mm	306kgf•cm/2997N•cm

4



[Installation of track support bracket [13] and track mounting plate [12] on Y-axis: ISPA]

Hexagonal socket head bolt	Tightening torque
M4×16mm	36.7kgf•cm/359N•cm

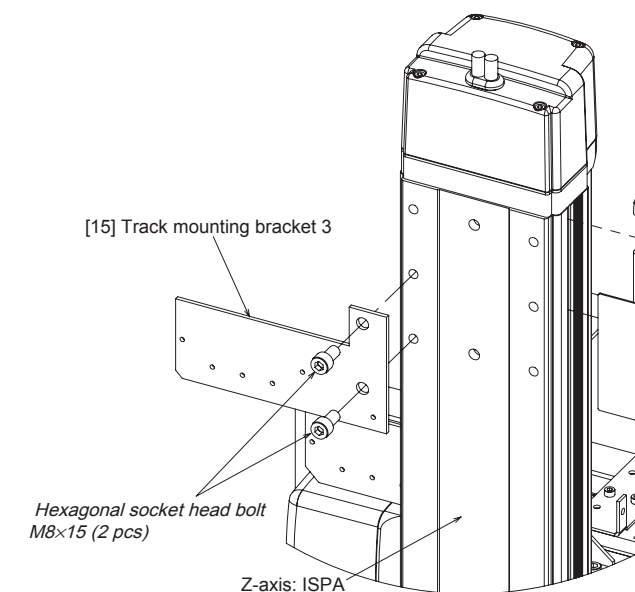
[Installation of track support bracket [13] on XY bracket [1]]

Hexagonal socket head bolt	Tightening torque
M4×8mm	36.7kgf•cm/359N•cm

[Installation of track mounting bracket 2 [14] on YZ bracket [11]]

Hexagonal socket head bolt	Tightening torque
M6×12mm	126kgf•cm/1234N•cm


5



[Installation of track mounting bracket 3 [15] on Z-axis: ISPA]

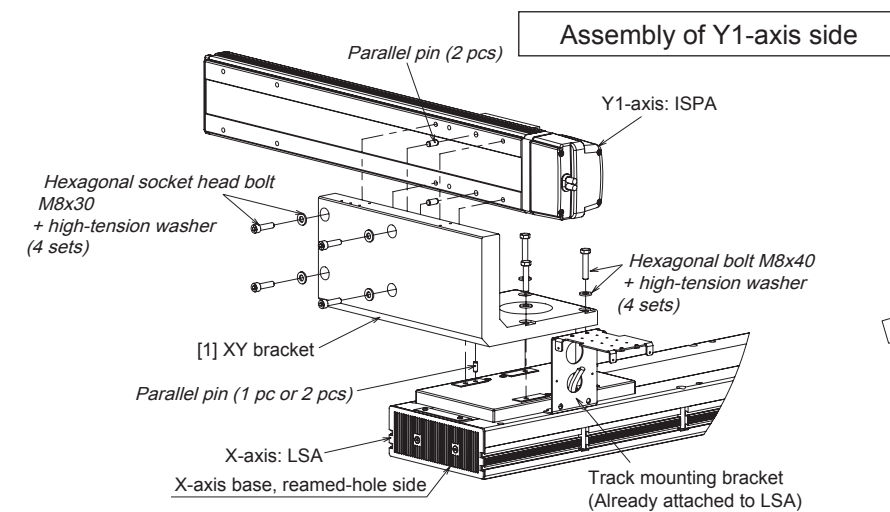
Hexagonal socket head bolt	Tightening torque
M8×15mm	306kgf•cm/2997N•cm

* This assembly procedure applies to configuration direction 1. If other configuration direction such as 2, 3 or 4 is used, the actuator and bracket directions vary. However, you can still use this assembly drawing as a reference.

 **Caution:** Secure the wires to prevent the cables and connectors from contacting each axis when the axis is moved over its entire stroke.
When manually moving the actuator with brake, connect the controller, supply the power, and then release the brake release switch (by turning the switch to the RLS side).

⚠ Caution: ● Although each part has been chamfered to remove sharp edges, exercise due caution during the assembly to prevent injury. If necessary, wear gloves or other protective gears.
● Exercise due caution during the assembly to prevent pinching of hands and fingers.

1 [Tools] Allen wrench, spanner wrench



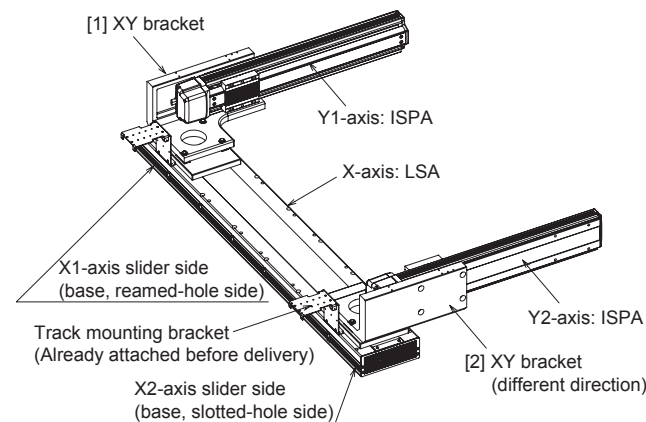
Note: To ensure squareness between the X-axis and Y-axis, insert one parallel pin. Adjust the angle between the X-axis and Y-axis to the right angle, and then mount the hexagonal bolts.

[Installation of X-axis: LSA on XY bracket [1]]

Parallel pin	Hexagonal bolt	Tightening torque
φ6h7×15	M8×40mm	306kgf•cm/2997N•cm

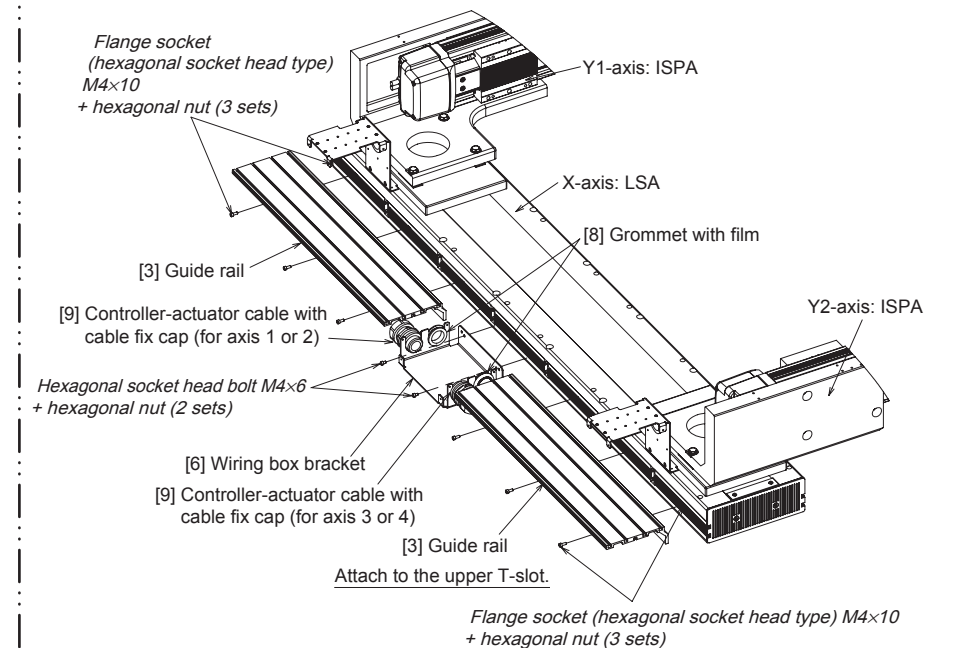
[Installation of Y1-axis: ISPA on XY bracket [1]]

Parallel pin	Hexagonal socket head bolt	Tightening torque
φ8h7×18	M8×30mm	306kgf•cm/2997N•cm



* The direction is different on the Y2-axis side. Assemble the parts by referring to the Y1-axis side.

2

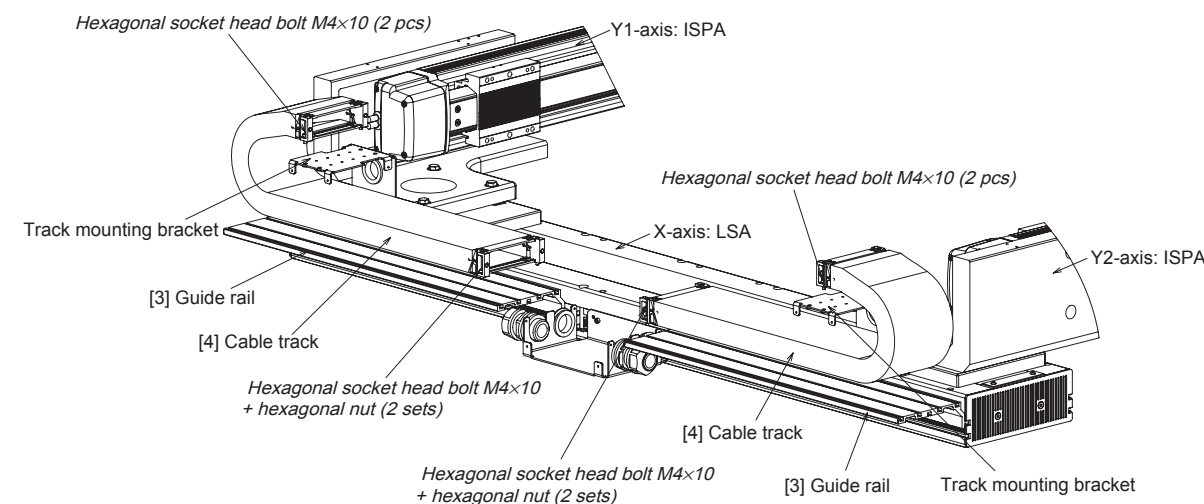


⚠ Caution: The cables for Y1-axis side (axes 1 and 2) and Y2-axis side (axes 3 and 4) are placed in tracks. Install each cable correctly.

[Cable markings]

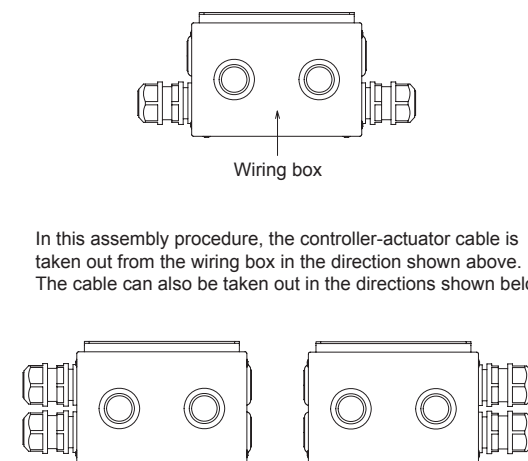
- Y1-axis side (axes 1 and 2): 1-M, PG, (LS), 2-M, PG, (LS)
- Y2-axis side (axes 3 and 4): 3-M, PG, (LS), 4-M, PG, (LS)

3

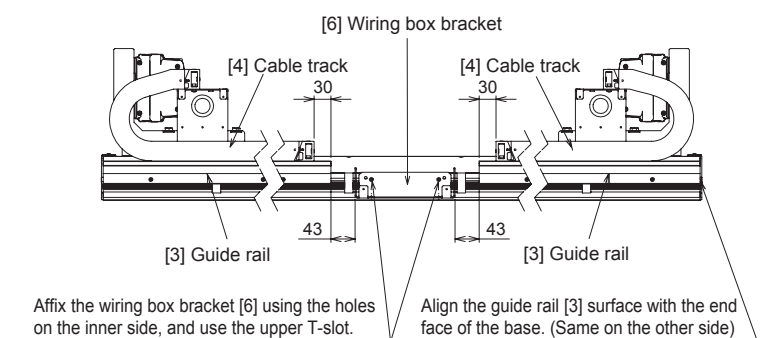


[Installation of cable track [4] on track mounting bracket]
[Installation of guide rail [3] for cable track [4] in T-slot]

Hexagonal socket head bolt	Tightening torque
M4×10mm	36.7kgf•cm/359N•cm



Affixing positions of guide rail [3], cable track 1 [4] and wiring box bracket [6]



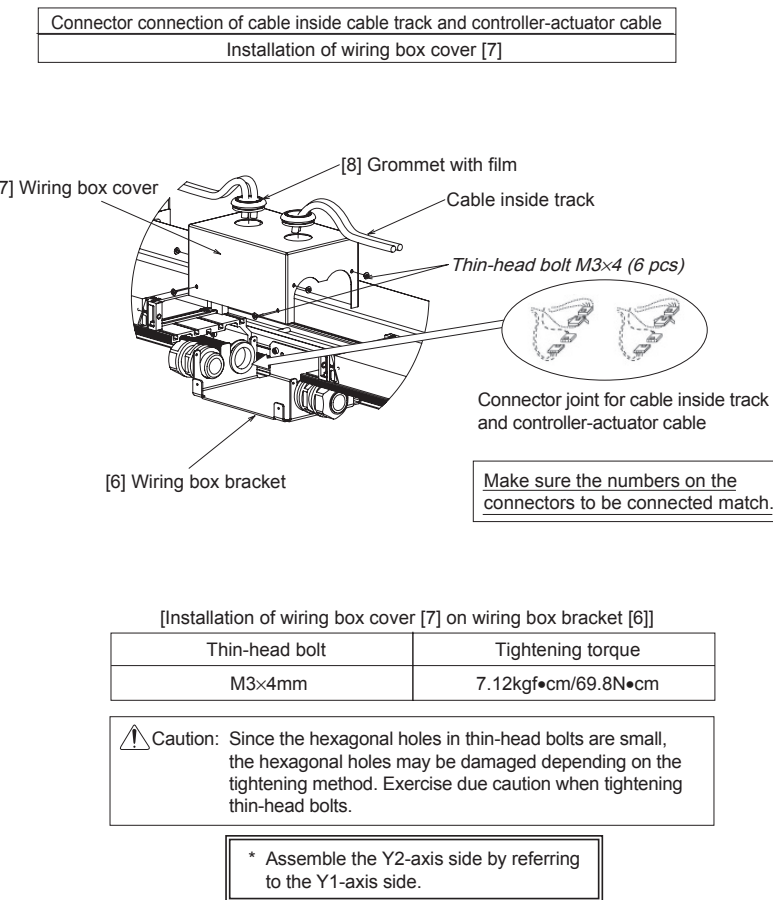
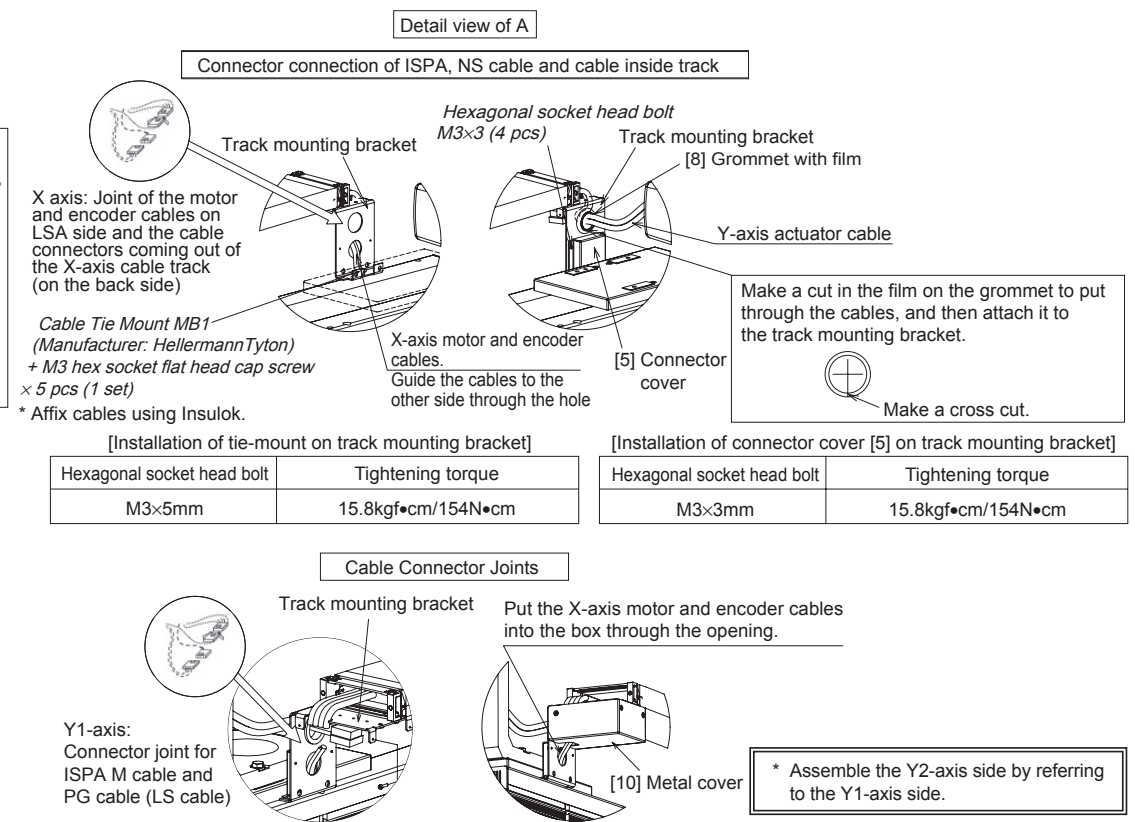
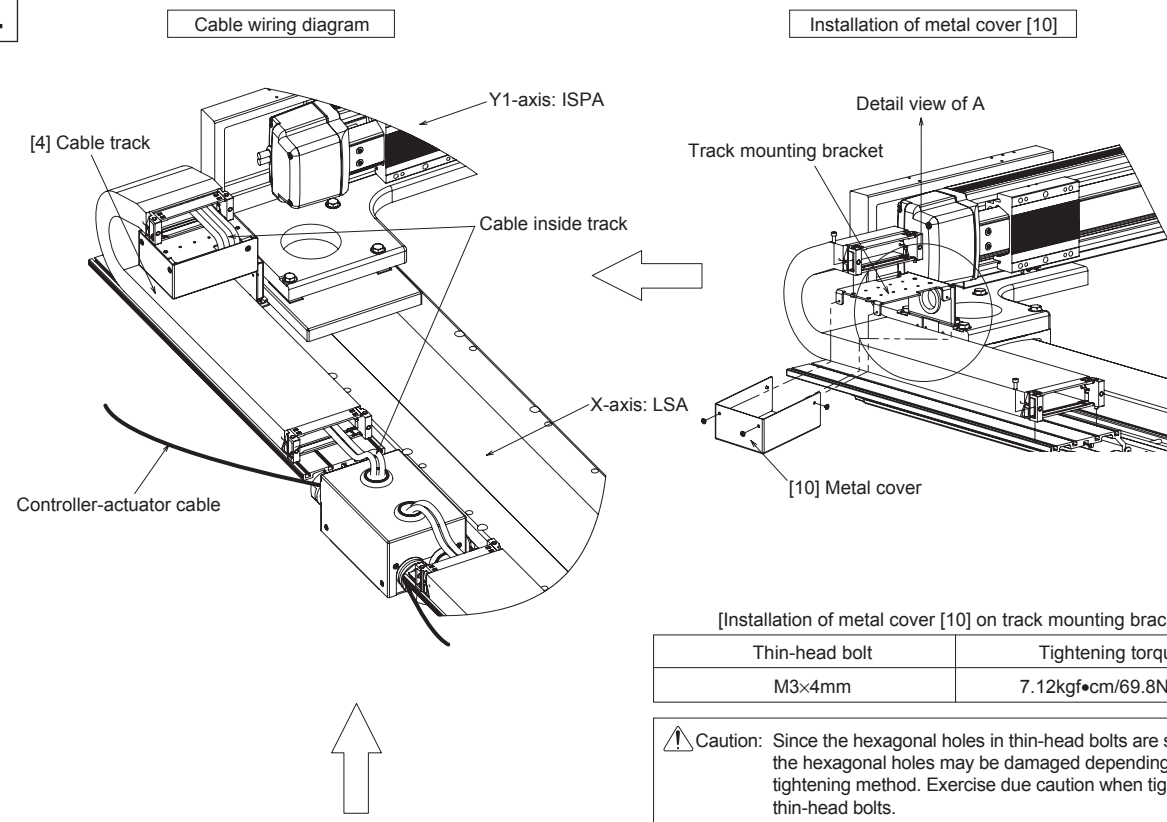
[Installation of wiring box bracket [6] in the upper T slot on X-axis: LSA side]

Hexagonal socket head bolt	Hexagonal socket head bolt
M4×6mm	18.0kgf•cm/176N•cm

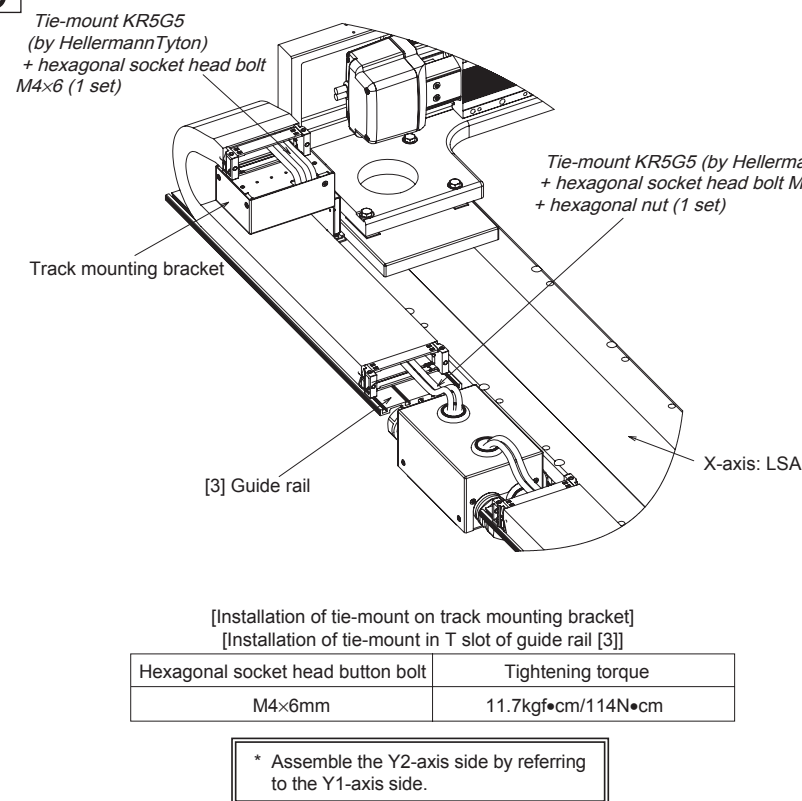
[Installation of guide rail [3] in the upper T slot on X-axis: LSA side]

Flange socket (hexagonal socket head type)	Hexagonal socket head bolt
M4×10mm	18.0kgf•cm/176N•cm

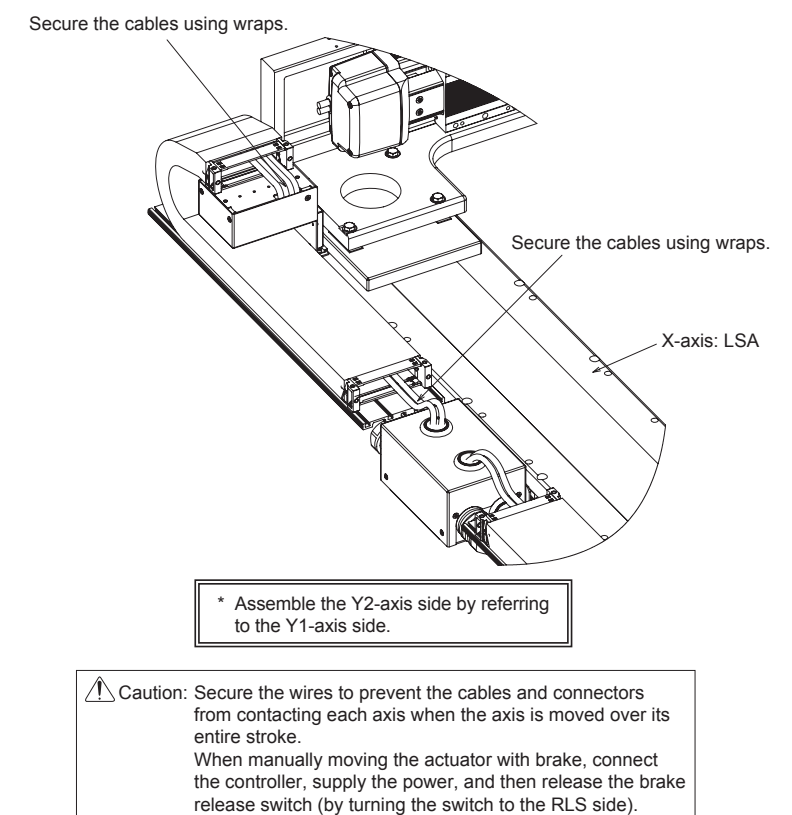
4



5

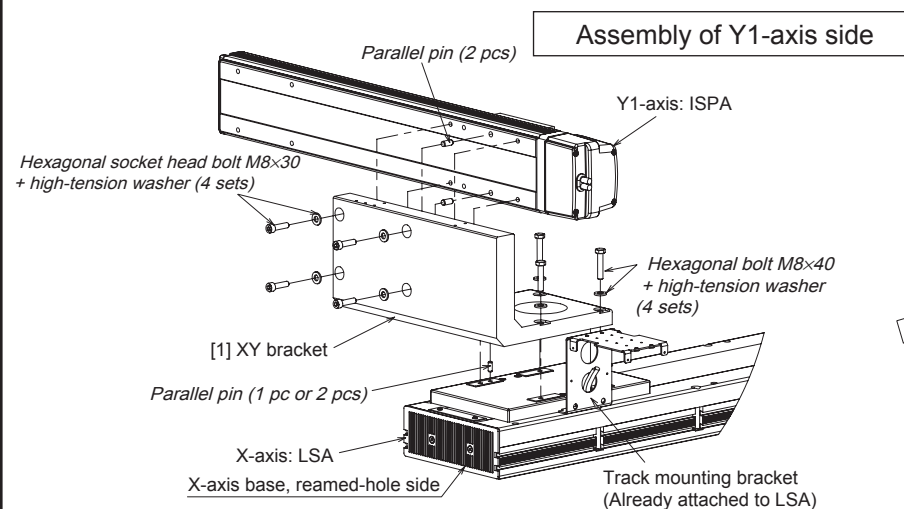


6



⚠ Caution: ● Although each part has been chamfered to remove sharp edges, exercise due caution during the assembly to prevent injury. If necessary, wear gloves or other protective gears.
● Exercise due caution during the assembly to prevent pinching of hands and fingers.

1 [Tools] Allen wrench, spanner wrench



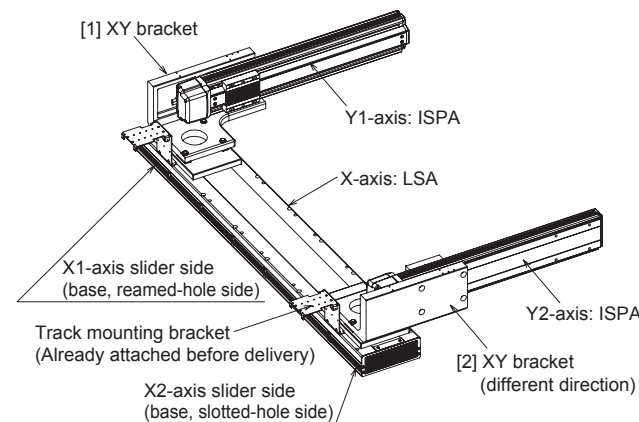
Note: To ensure squareness between the X-axis and Y-axis, insert one parallel pin. Adjust the angle between the X-axis and Y-axis to the right angle, and then mount the hexagonal bolts.

[Installation of X-axis: LSA on XY bracket [1]]

Parallel pin	Hexagonal bolt	Tightening torque
φ6h7×15	M8×40mm	306kgf•cm/2997N•cm

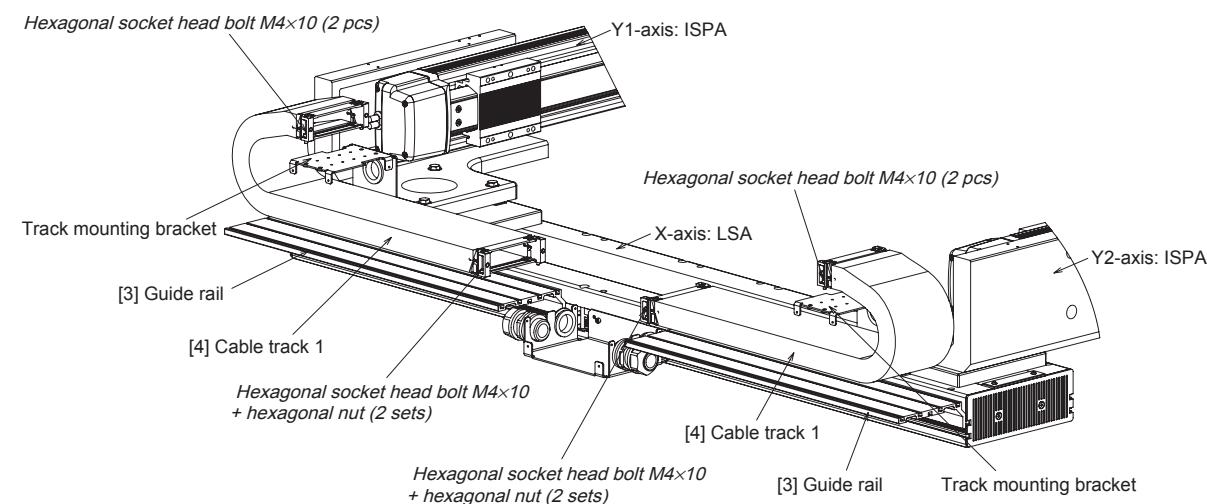
[Installation of Y1-axis: ISPA on XY bracket [1]]

Parallel pin	Hexagonal socket head bolt	Tightening torque
φ8h7×18	M8×30mm	306kgf•cm/2997N•cm



* The direction is different on the Y2-axis side. Assemble the parts by referring to the Y1-axis side.

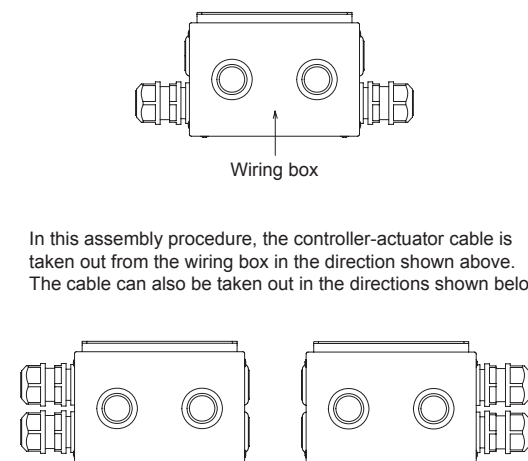
3



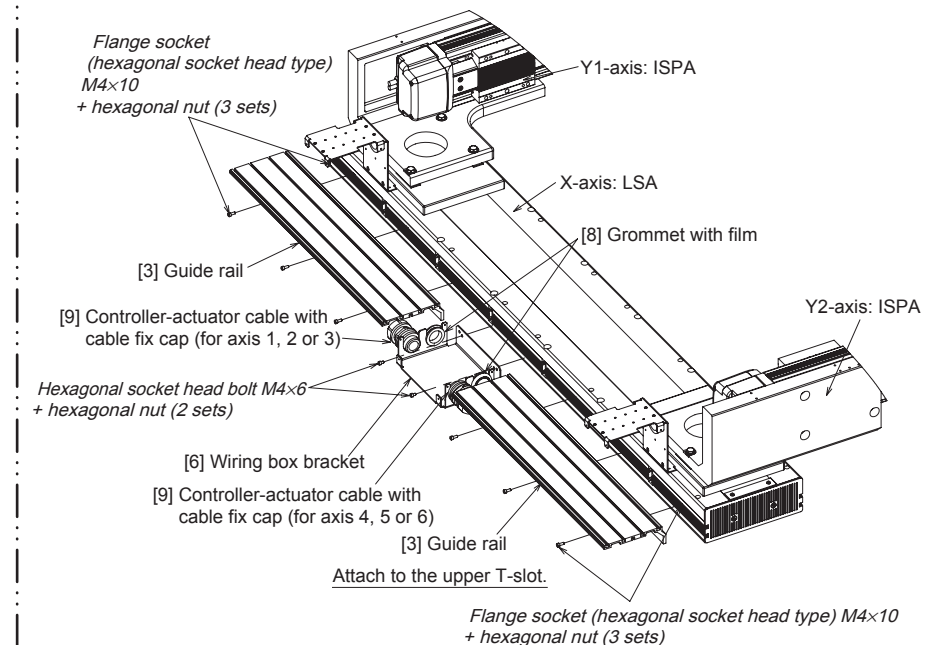
[Installation of cable track 1 [4] on track mounting bracket]

[Installation of guide rail for cable track 1 [4] in T-slot]

Hexagonal socket head bolt	Tightening torque
M4×10mm	36.7kgf•cm/359N•cm

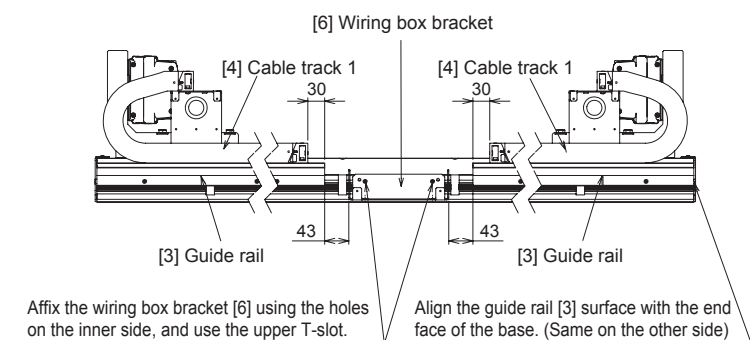


2



⚠ Caution: The cables for Y1-axis side (axes 1, 2 and 3) and Y2-axis side (axes 4, 5 and 6) are placed in tracks. Install each cable correctly.
[Cable markings]
● Y1-axis side (axes 1, 2 and 3): 1-M, PG, (LS), 2-M, PG, (LS), 3-M, PG, (LS)
● Y2-axis side (axes 4, 5 and 6): 4-M, PG, (LS), 5-M, PG, (LS), 6-M, PG, (LS)

Affixing positions of guide rail [3], cable track 1 [4] and wiring box bracket [6]



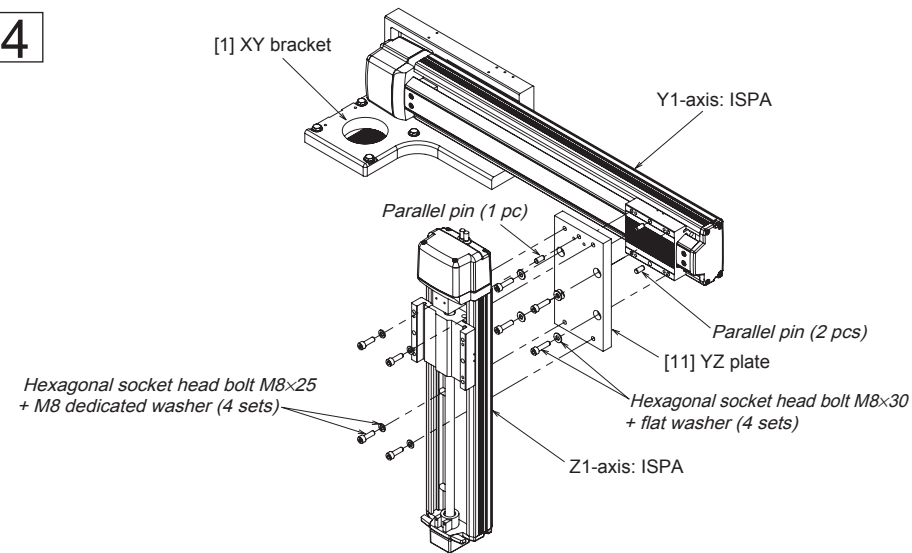
[Installation of wiring box bracket [6] in the upper T slot on X-axis: LSA side]

Hexagonal socket head bolt	Hexagonal socket head bolt
M4×6mm	18.0kgf•cm/176N•cm

[Installation of guide rail [3] in the upper T slot on X-axis: LSA side]

Flange socket (hexagonal socket head type)	Hexagonal socket head bolt
M4×10mm	18.0kgf•cm/176N•cm

4



[Installation of YZ plate [11] on Y1-axis: ISPA]

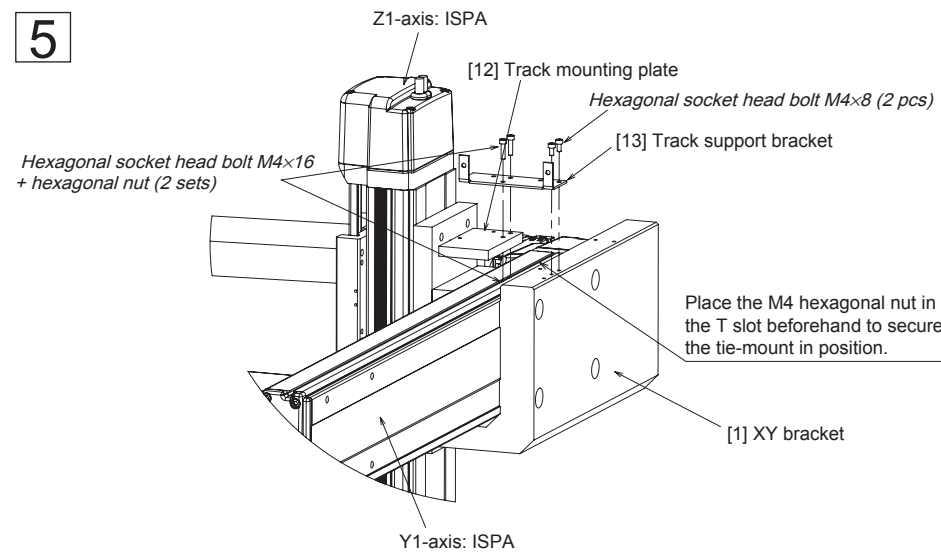
Parallel pin	Hexagonal socket head bolt	Tightening torque
φ8h7×18	M8×30mm	306kgf•cm/2997N•cm

[Installation of Z1-axis: ISPA on YZ plate [11]]

Parallel pin	Hexagonal socket head bolt	Tightening torque
φ8h7×25	M8×25mm	306kgf•cm/2997N•cm

* The direction is different on the Z2-axis side.
Assemble the parts by referring to the Z1-axis side.

5



[Installation of track support bracket [13] on XY bracket [1]]

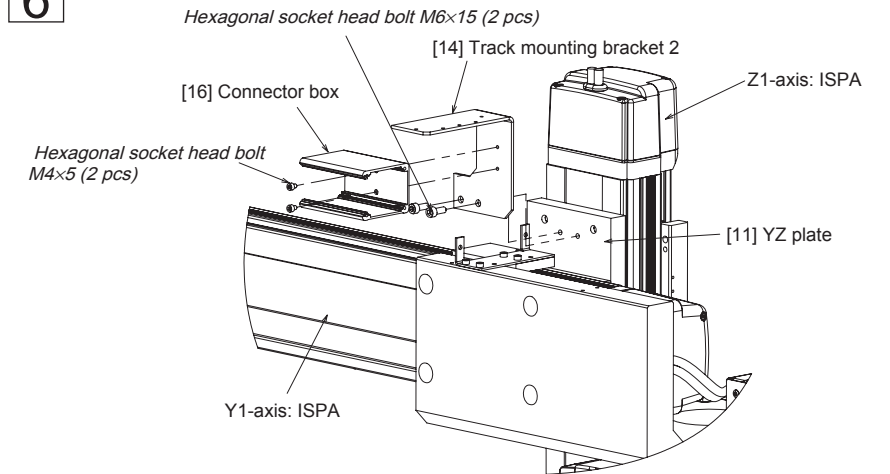
Hexagonal socket head bolt	Tightening torque
M4×8mm	36.7kgf•cm/359N•cm

[Installation of track support metal [13] on track mounting plate [12]]

Hexagonal socket head bolt	Tightening torque
M4×16mm	36.7kgf•cm/359N•cm

* The direction is different on the Z2-axis side.
Assemble the parts by referring to the Z1-axis side.

6



[Installation of track mounting bracket 2 [14] on YZ plate [11]]

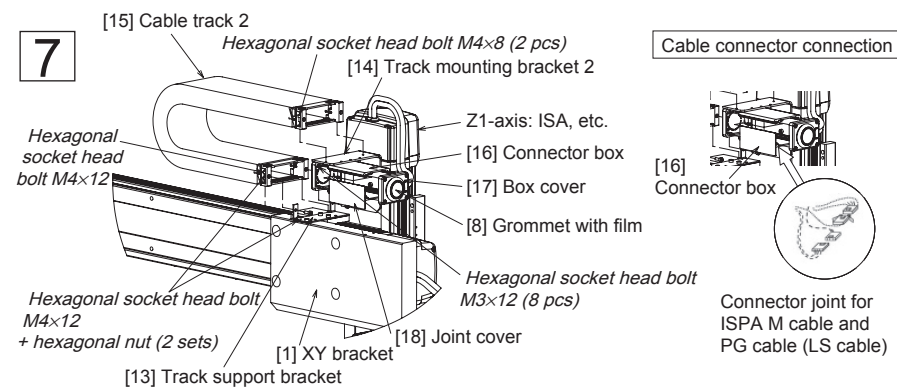
Hexagonal socket head bolt	Tightening torque
M6×15mm	126kgf•cm/1234N•cm

[Installation of connector box [16] on track mounting bracket 2 [14]]

Hexagonal socket head bolt	Tightening torque
M4×5mm	18.0kgf•cm/176N•cm

* The direction is different on the Z2-axis side.
Assemble the parts by referring to the Z1-axis side.

7



[Installation of cable track 2 [15] on track support bracket [13]]

Hexagonal socket head bolt	Tightening torque
M4×12mm	36.7kgf•cm/359N•cm

[Installation of cable track 2 [15] on XY bracket [1]]

Hexagonal socket head bolt	Tightening torque
M4×12mm	36.7kgf•cm/359N•cm

[Installation of cable track 2 [15] on track mounting bracket 2 [14]]

Hexagonal socket head bolt	Tightening torque
M4×8mm	36.7kgf•cm/359N•cm

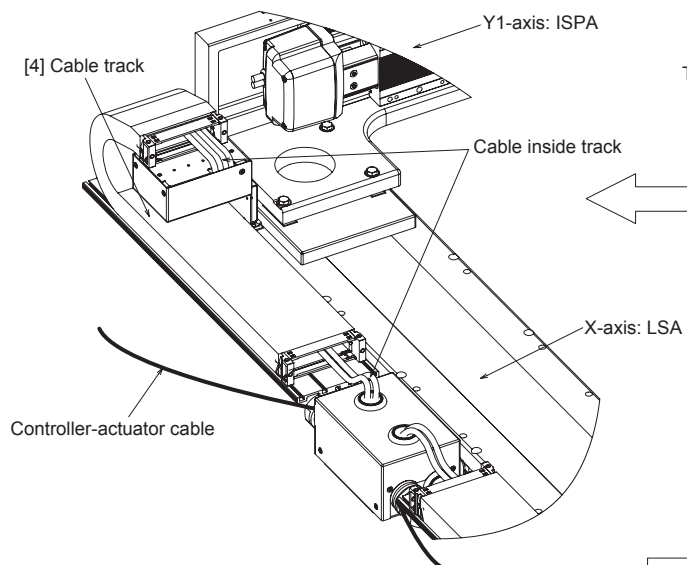
[Installation of box cover [17] on connector box [16]]

Hexagonal socket head bolt	Tightening torque
M3×12mm	5.51kgf•cm/54N•cm

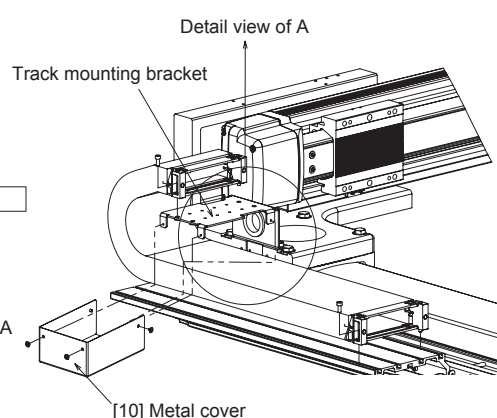
* The direction is different on the Z2-axis side.
Assemble the parts by referring to the Z1-axis side.

8

Cable wiring diagram



Installation of metal cover [10]



Caution:
The cables for X-axis slider on Y1-axis side (axis 1), Y1-axis (axis 2), Z1-axis (axis 3), X-axis slider on Y2-axis side (axis 4), Y2-axis (axis 5) and Z2-axis (axis 6) are placed in tracks. Install each cable correctly.

[Cable markings]

- X-axis slider on Y1-axis side (axis 1): 1
- Y1-axis (axis 2) : 2
- Z1-axis (axis 3) : 3
- X-axis slider on Y2-axis side (axis 4): 4
- Y2-axis (axis 5) : 5
- Z2-axis (axis 6) : 6

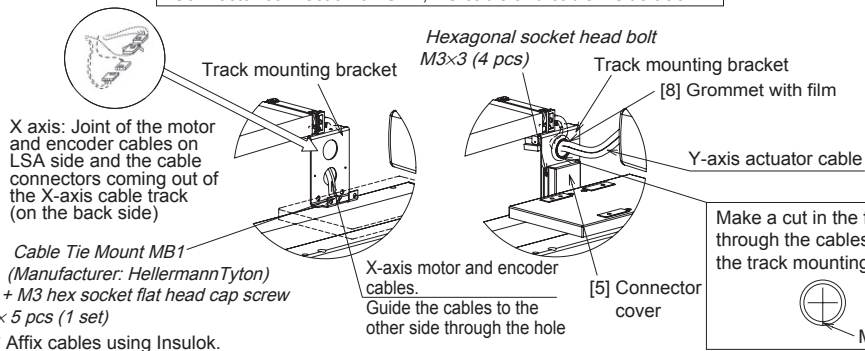
[Installation of metal cover [10] on track mounting bracket]

Thin-head bolt	Tightening torque
M3×4mm	7.12kgf•cm/69.8N•cm

Caution: Since the hexagonal holes in thin-head bolts are small, the hexagonal holes may be damaged depending on the tightening method. Exercise due caution when tightening thin-head bolts.

Detail view of A

Connector connection of ISPA, NS cable and cable inside track



X axis: Joint of the motor and encoder cables on LSA side and the cable connectors coming out of the X-axis cable track (on the back side)

Cable Tie Mount MB1
(Manufacturer: Hellermann Tyton)
+ M3 hex socket flat head cap screw
× 5 pcs (1 set)
* Affix cables using Insulok.

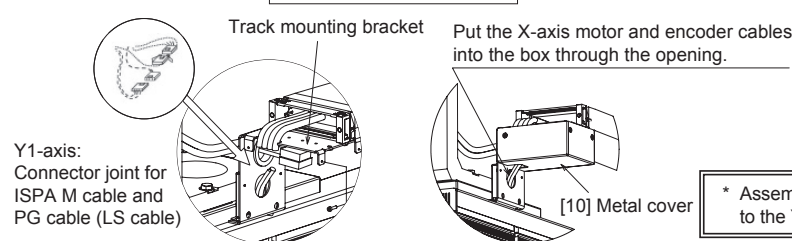
[Installation of tie-mount on track mounting bracket]

Hexagonal socket head bolt	Tightening torque
M3×5mm	15.8kgf•cm/154N•cm

[Installation of connector cover [5] on track mounting bracket]

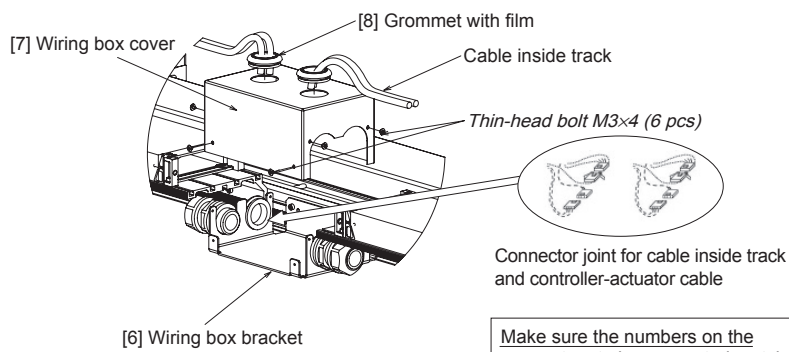
Hexagonal socket head bolt	Tightening torque
M3×3mm	15.8kgf•cm/154N•cm

Cable Connector Joints



* Assemble the Y2-axis side by referring to the Y1-axis side.

Connector connection of cable inside cable track and controller-actuator cable
Installation of wiring box cover [7]



Make sure the numbers on the connectors to be connected match.

[Installation of wiring box cover [7] on wiring box bracket [6]]

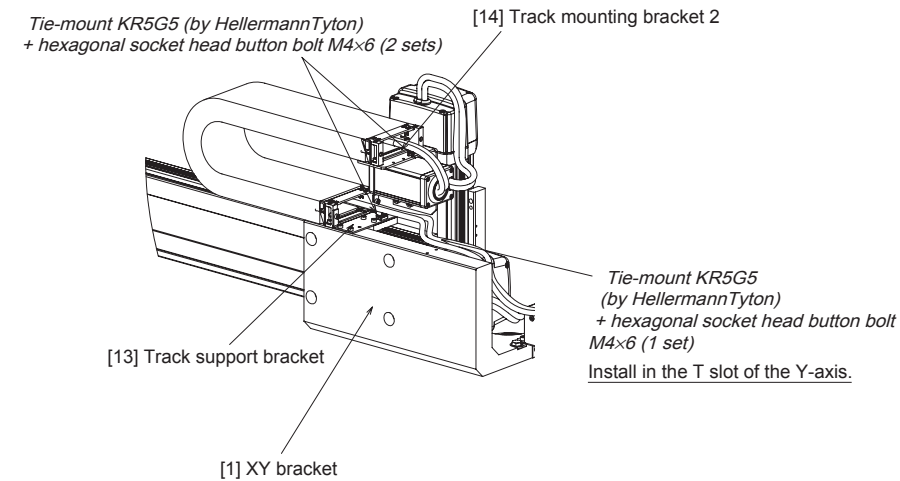
Thin-head bolt	Tightening torque
M3×4mm	7.12kgf•cm/69.8N•cm

Caution: Since the hexagonal holes in thin-head bolts are small, the hexagonal holes may be damaged depending on the tightening method. Exercise due caution when tightening thin-head bolts.

* Assemble the Y2-axis side by referring to the Y1-axis side.

9

Z1-axis cables

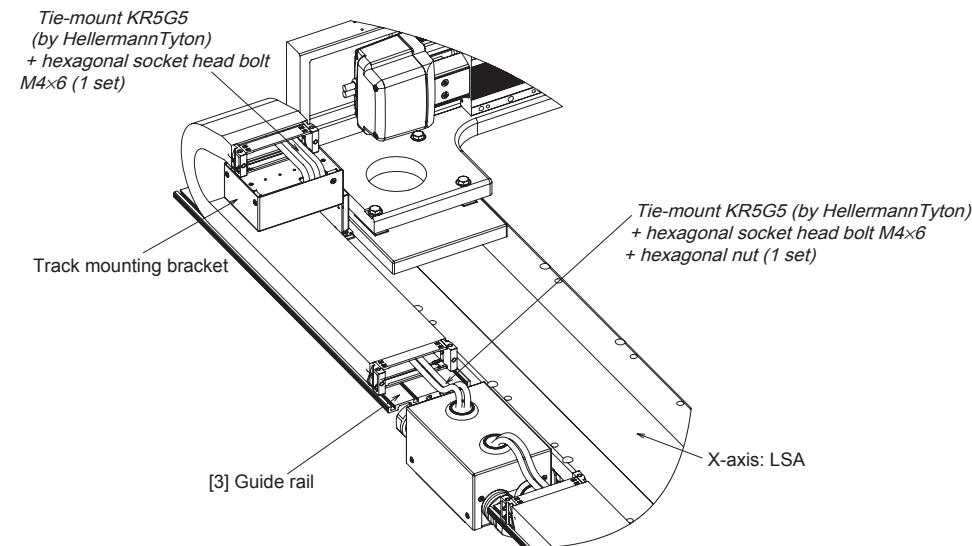


[Installation of tie-mount in track mounting bracket 2 [14]]
[Installation of tie-mount on track support bracket [13]]
[Installation of tie-mount in T slot of Y1-axis: ISPA]

Hexagonal socket head button bolt	Tightening torque
M4×6mm	11.7kgf•cm/114N•cm

* The direction is different on the Z2-axis side.
Assemble the parts by referring to the Z1-axis side.

X-axis, Y1-axis cables



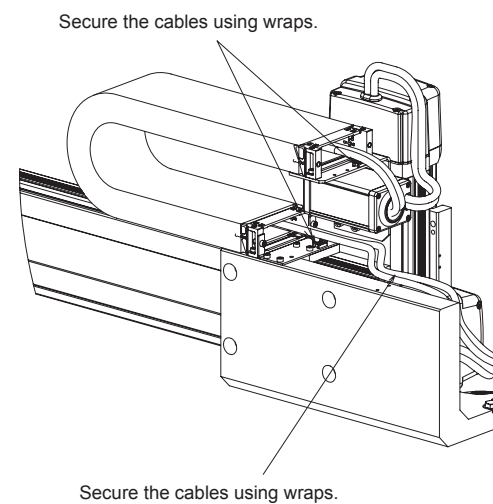
[Installation of tie-mount on track mounting bracket]
[Installation of tie-mount in T slot of guide rail [3]]

Hexagonal socket head button bolt	Tightening torque
M4×6mm	11.7kgf•cm/114N•cm

* Assemble the Y2-axis side by referring
to the Y1-axis side.

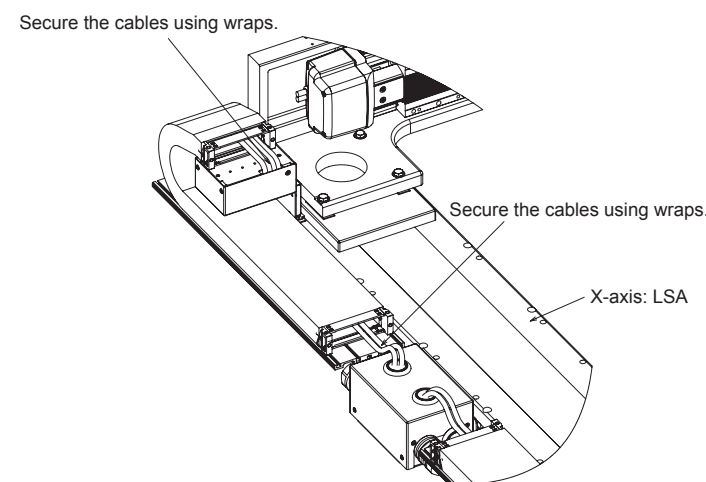
10

Z1-axis cables



* The direction is different on the Z2-axis side.
Assemble the parts by referring to the Z1-axis side.

X-axis, Y1-axis, Z1-axis cables

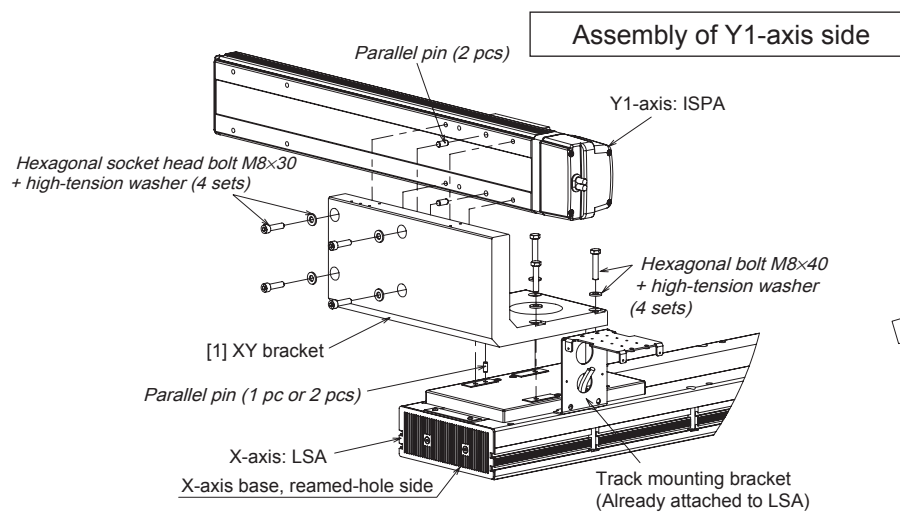


* Assemble the Y2-axis side by referring
to the Y1-axis side.

⚠ Caution: Secure the wires to prevent the cables and connectors
from contacting each axis when the axis is moved over its
entire stroke.
When manually moving the actuator with brake, connect
the controller, supply the power, and then release the brake
release switch (by turning the switch to the RLS side).

⚠ Caution: ● Although each part has been chamfered to remove sharp edges, exercise due caution during the assembly to prevent injury. If necessary, wear gloves or other protective gears.
● Exercise due caution during the assembly to prevent pinching of hands and fingers.

1 [Tools] Allen wrench, spanner wrench



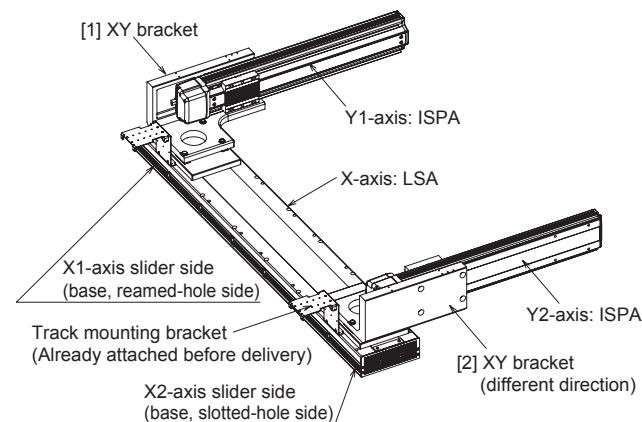
Note: To ensure squareness between the X-axis and Y-axis, insert one parallel pin. Adjust the angle between the X-axis and Y-axis to the right angle, and then mount the hexagonal bolts.

[Installation of X-axis: LSA on XY bracket [1]]

Parallel pin	Hexagonal bolt	Tightening torque
φ6h7×15	M8×40mm	306kgf•cm/2997N•cm

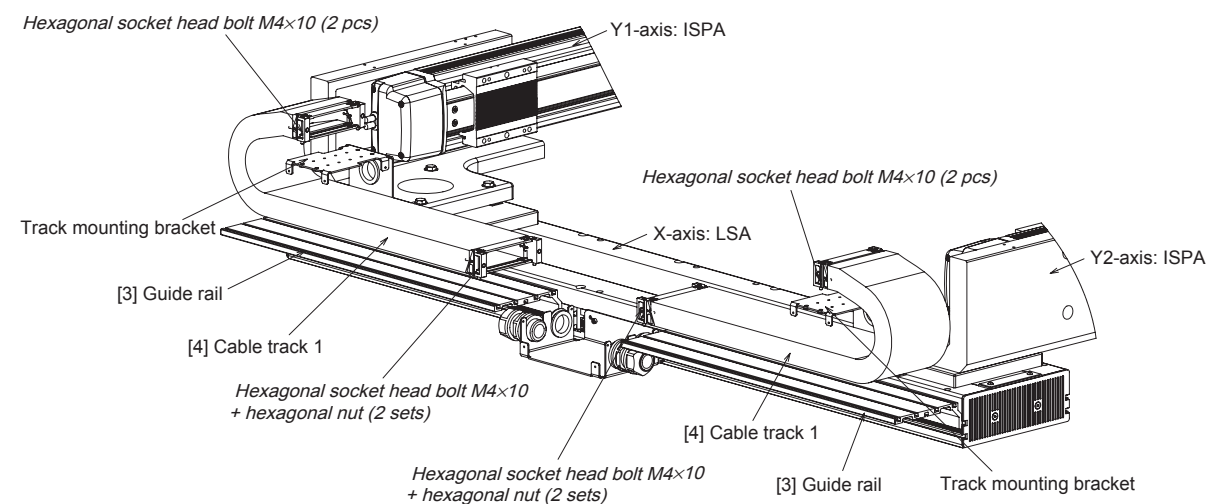
[Installation of Y1-axis: ISPA on XY bracket [1]]

Parallel pin	Hexagonal socket head bolt	Tightening torque
φ8h7×18	M8×30mm	306kgf•cm/2997N•cm



* The direction is different on the Y2-axis side. Assemble the parts by referring to the Y1-axis side.

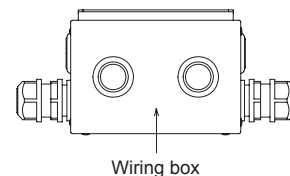
3



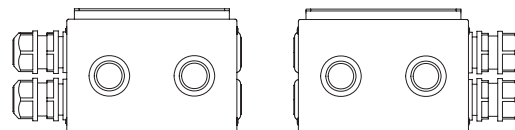
[Installation of cable track 1 [4] on track mounting bracket]

[Installation of guide rail for cable track 1 [4] in T-slot]

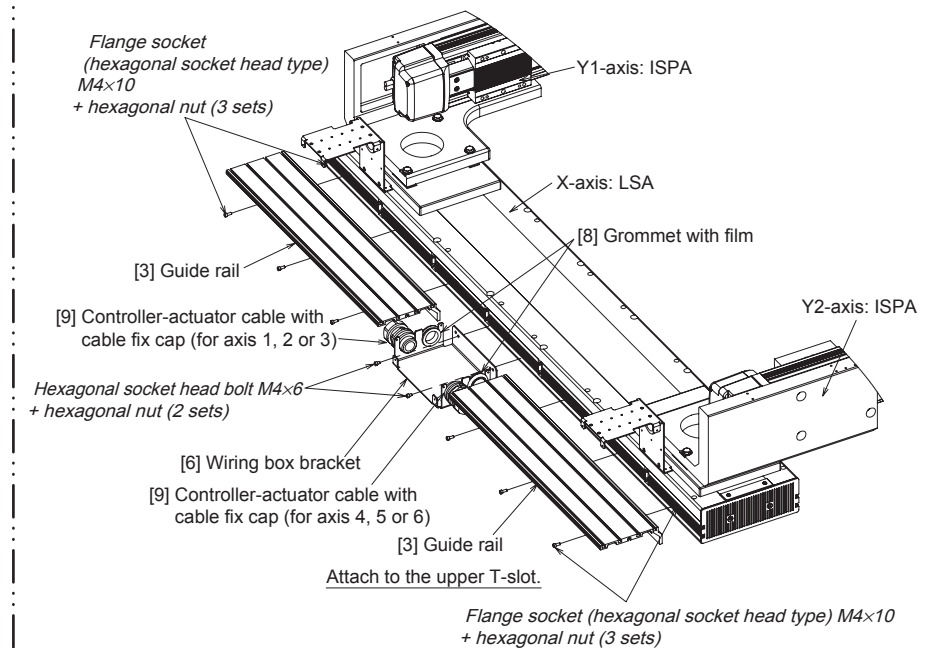
Hexagonal socket head bolt	Tightening torque
M4×10mm	36.7kgf•cm/359N•cm



In this assembly procedure, the controller-actuator cable is taken out from the wiring box in the direction shown above. The cable can also be taken out in the directions shown below.

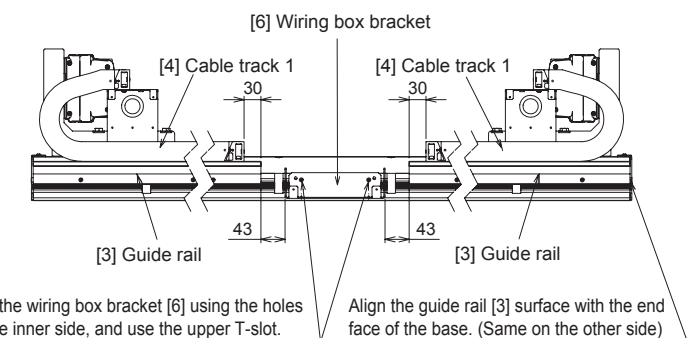


2



⚠ Caution: The cables for Y1-axis side (axes 1, 2 and 3) and Y2-axis side (axes 4, 5 and 6) are placed in tracks. Install each cable correctly.
[Cable markings]
● Y1-axis side (axes 1, 2 and 3): 1-M, PG, (LS), 2-M, PG, (LS), 3-M, PG, (LS)
● Y2-axis side (axes 4, 5 and 6): 4-M, PG, (LS), 5-M, PG, (LS), 6-M, PG, (LS)

Affixing positions of guide rail [3], cable track 1 [4] and wiring box bracket [6]



Affix the wiring box bracket [6] using the holes on the inner side, and use the upper T-slot.

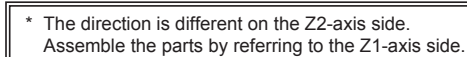
Align the guide rail [3] surface with the end face of the base. (Same on the other side)

[Installation of wiring box bracket [6] in the upper T slot on X-axis: LSA side]

Hexagonal socket head bolt	Hexagonal socket head bolt
M4×6mm	18.0kgf•cm/176N•cm

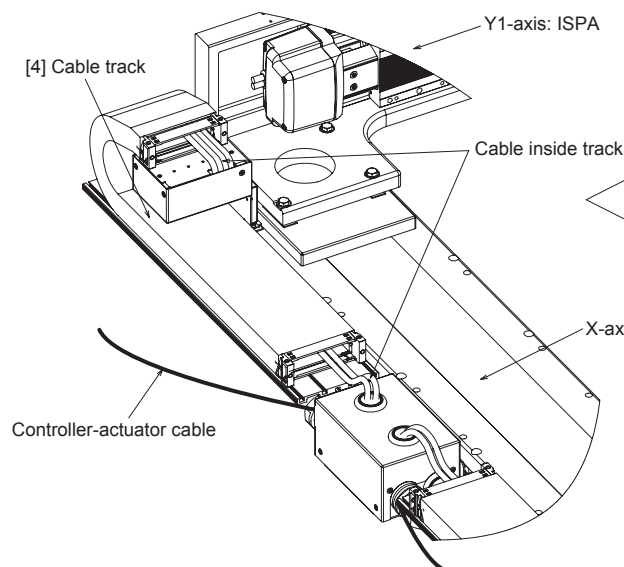
[Installation of guide rail [3] in the upper T slot on X-axis: LSA side]

Flange socket (hexagonal socket head type)	Hexagonal socket head bolt
M4×10mm	18.0kgf•cm/176N•cm

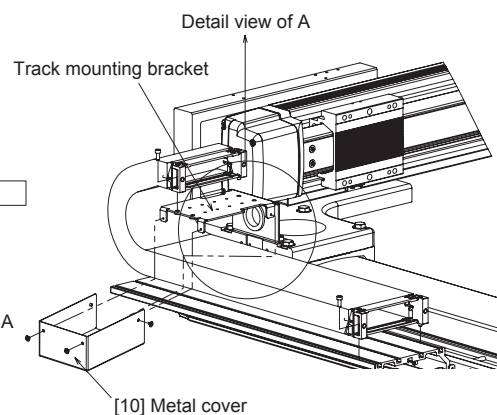


8

Cable wiring diagram



Installation of metal cover [10]



Caution:
The cables for X-axis slider on Y1-axis side (axis 1), Y1-axis (axis 2), Z1-axis (axis 3), X-axis slider on Y2-axis side (axis 4), Y2-axis (axis 5) and Z2-axis (axis 6) are placed in tracks. Install each cable correctly.

[Cable markings]

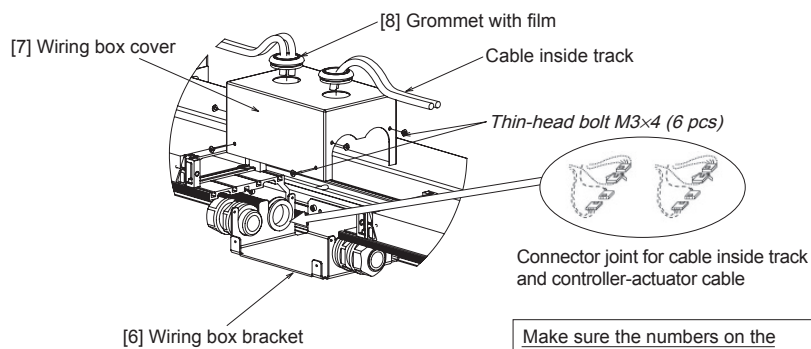
- X-axis slider on Y1-axis side (axis 1): 1
- Y1-axis (axis 2) : 2
- Z1-axis (axis 3) : 3
- X-axis slider on Y2-axis side (axis 4): 4
- Y2-axis (axis 5) : 5
- Z2-axis (axis 6) : 6

[Installation of metal cover [10] on track mounting bracket]

Thin-head bolt	Tightening torque
M3×4mm	7.12kgf•cm/69.8N•cm

Caution: Since the hexagonal holes in thin-head bolts are small, the hexagonal holes may be damaged depending on the tightening method. Exercise due caution when tightening thin-head bolts.

Connector connection of cable inside cable track and controller-actuator cable
Installation of wiring box cover [7]



Make sure the numbers on the connectors to be connected match.

[Installation of wiring box cover [7] on wiring box bracket [6]]

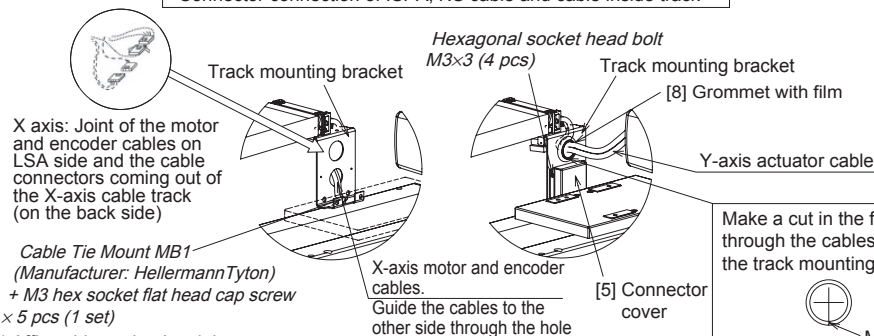
Thin-head bolt	Tightening torque
M3×4mm	7.12kgf•cm/69.8N•cm

Caution: Since the hexagonal holes in thin-head bolts are small, the hexagonal holes may be damaged depending on the tightening method. Exercise due caution when tightening thin-head bolts.

* Assemble the Y2-axis side by referring to the Y1-axis side.

Detail view of A

Connector connection of ISPA, NS cable and cable inside track



* Affix cables using Insulok.

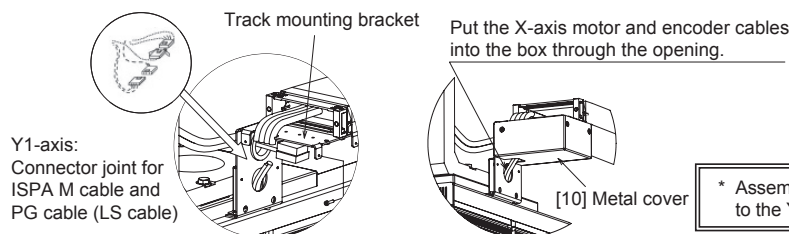
[Installation of tie-mount on track mounting bracket]

Hexagonal socket head bolt	Tightening torque
M3×5mm	15.8kgf•cm/154N•cm

[Installation of connector cover [5] on track mounting bracket]

Hexagonal socket head bolt	Tightening torque
M3×3mm	15.8kgf•cm/154N•cm

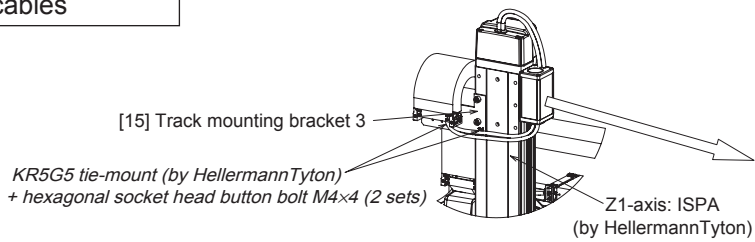
Cable Connector Joints



* Assemble the Y2-axis side by referring to the Y1-axis side.

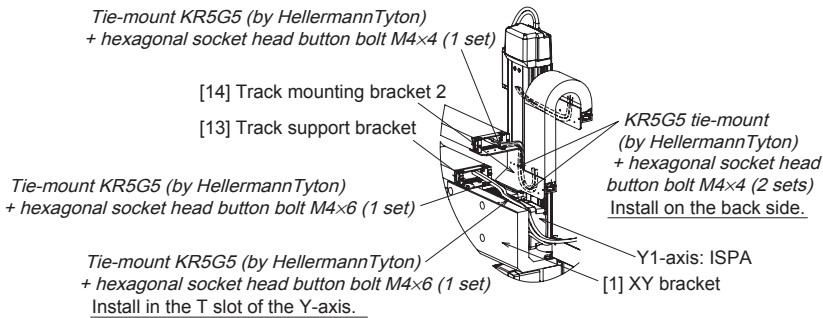
9

Z1-axis cables



[Installation of tie-mount on track mounting bracket 3 [15]]

Hexagonal socket head button bolt	Tightening torque
M4x4mm	11.7kgf•cm/114N•cm



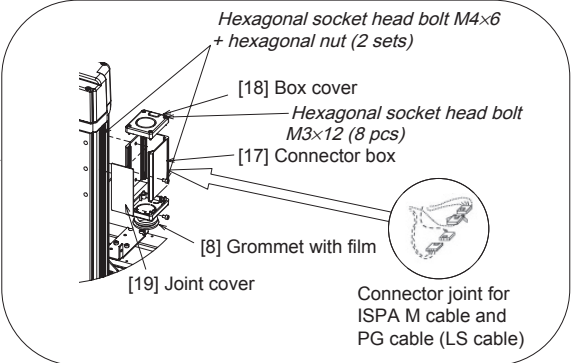
[Installation of tie-mount on track mounting bracket 2 [14]]

Hexagonal socket head button bolt	Tightening torque
M4x4mm	11.7kgf•cm/114N•cm

[Installation of tie-mount on track support bracket [13]]
[Installation of tie-mount in T slot of Y1-axis: ISPA]

Hexagonal socket head button bolt	Tightening torque
M4x6mm	11.7kgf•cm/114N•cm

* The direction is different on the Z2-axis side.
Assemble the parts by referring to the Z1-axis side.



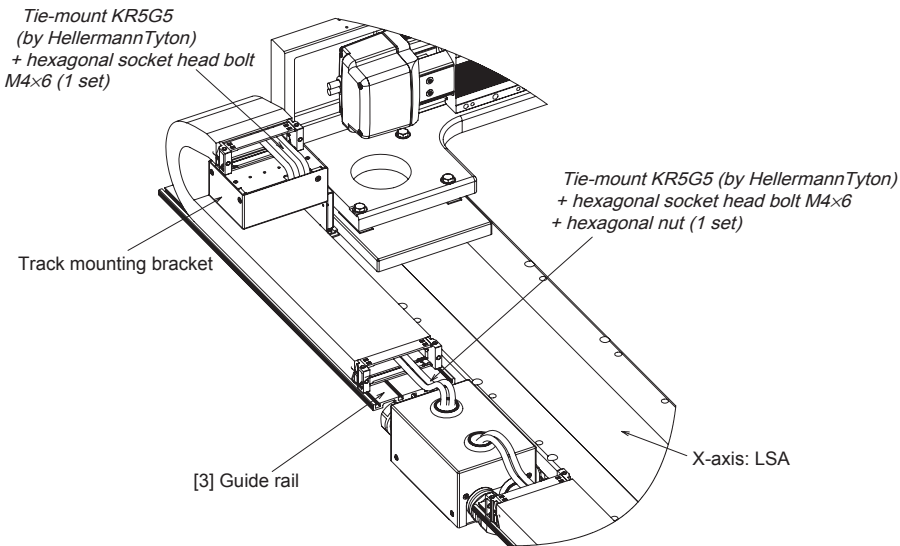
[Installation of connector box [17] on Z1-axis: ISPA]

Hexagonal socket head bolt	Tightening torque
M4x6mm	18.0kgf•cm/176N•cm

[Installation of box cover [18] on connector box [17]]

Hexagonal socket head bolt	Tightening torque
M3x12mm	5.51kgf•cm/54N•cm

X-axis, Y1-axis cables



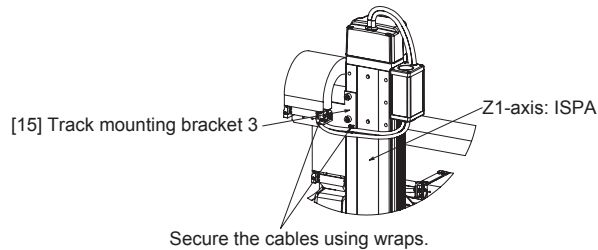
[Installation of tie-mount on track mounting bracket]
[Installation of tie-mount in T slot of guide rail [3]]

Hexagonal socket head button bolt	Tightening torque
M4x6mm	11.7kgf•cm/114N•cm

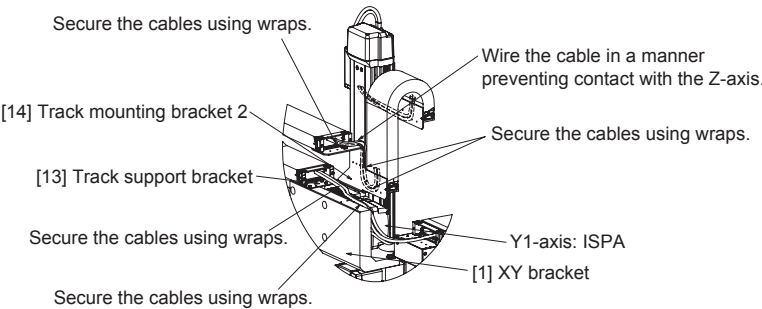
* Assemble the Y2-axis side by referring to the Y1-axis side.

10

Z1-axis cables

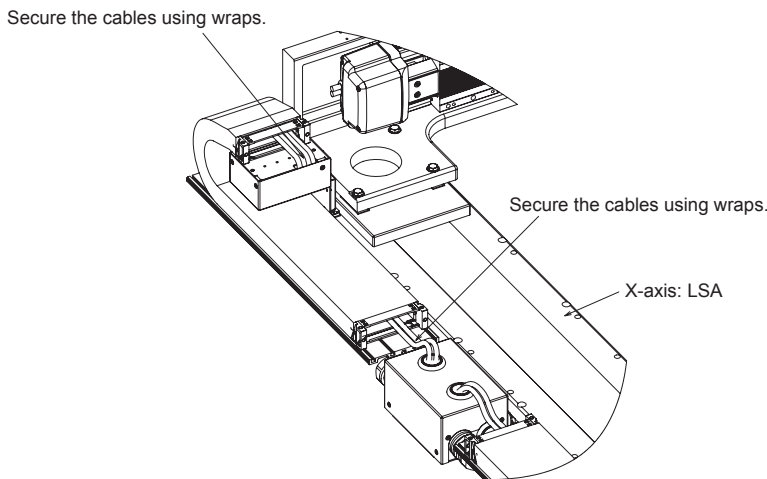


Secure the cables using wraps.



* The direction is different on the Z2-axis side.
Assemble the parts by referring to the Z1-axis side.

X-axis, Y1-axis, Z1-axis cables



* Assemble the Y2-axis side by referring to the Y1-axis side.

⚠ Caution: Secure the wires to prevent the cables and connectors from contacting each axis when the axis is moved over its entire stroke.
When manually moving the actuator with brake, connect the controller, supply the power, and then release the brake release switch (by turning the switch to the RLS side).

