



CRS 6-axis Cartesian Robot (CRS-XB/XG) Assembly Procedures Edition 1

Catalog No. : ME0417-1B

Thank you for purchasing an IAI product.

Assemble your product correctly by referring to this Assembly Procedures.

Be sure to read the operation manual (DVD) supplied separately for each actuator and handle the actuator correctly.

No.	Model	Number of Axes	Assembling (Fixed) Method	Wiring Method	Assembly Direction	Drawing No. Assembled Component List	Drawing No. Assembly Procedures	Stated Pages
①	CRS-XBA□	6-axes (X, Y, Z, R, B, T)	XYB (Y-axis Base Mount) + Z-axis Base Mount Type	Cable track	1, 3	GMM20-001 (1/3)	GMM20-002	5 to 10
②	CRS-XBB□	6-axes (X, Y, Z, R, B, T)	XYB (Y-axis Base Mount) + Z-axis Slider Fixed Type High Velocity / High Payload	Cable track	1, 3	GMM20-001 (1/3)	GMM20-003	11 to 16
③	CRS-XGA□	6-axes (X, Y, Z, R, B, T)	XYG (Gantry Y-axis Horizontally Oriented Wall Mount) + Z-axis Base Mount Type	Cable track	1, 3	GMM20-001 (2/3)	GMM20-004	17 to 22
④	CRS-XGB□	6-axes (X, Y, Z, R, B, T)	XYG (Gantry Y-axis Horizontally Oriented Wall Mount) + Z-axis Slider Fixed Type High Velocity / High Payload	Cable track	1, 3	GMM20-001 (2/3)	GMM20-005	23 to 28

CRS 6-axis Cartesian Robot Assembly Procedures Completion Drawing List

Catalog No. GMM20-001

1/3

① XYB (Y-axis Base Mount) + Z-axis Base Mount Type CRS-XBA□

[Assembly Procedures]
Drawing No. : GMM20-002

[Model]
CRS-XBA□

Assembly Direction (1, 3)

[Structuring Axes]

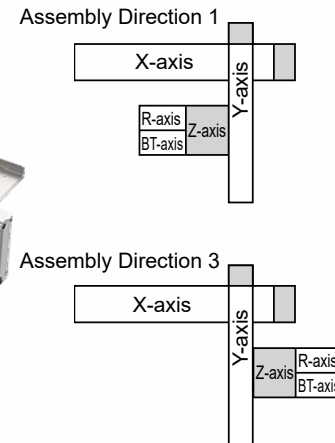
Axis Name	Actuator Model Code
X-Axis	RCP6-WSA14C-16
Y-Axis	RCP6-WSA12C-12
Z-Axis	RCP6-TA7R-4-DB (*)
R-Axis	RCP6-RTFML
B-Axis /T-Axis	WU-S

* Double block type

[Assembled parts]

[1] X-axis actuator	[2] XY bracket assembly	[3] Y-axis actuator	[4] Y slider plate (S)	[5] Z-axis actuator	[6] Z base plate (S)
[7] ZR bracket	[8] Hollow rotary	[9] RBT bracket	[10] Wrist unit assembly	[11] Z cable fixing bracket	[12] Z guide rail (S)
[13] Z track mounting bracket (S)	[14] ZR cable track assembly * Refer to Page 4 for linkable quantity	[15] Y track mounting bracket (S14)(S23)	[16] Y guide rail (S)	[17] YZ cable track * Refer to Page 4 for linkable quantity	[18] X track mounting bracket (S1) (S3)
[19] X guide rail (S)	[20] XY cable track * Refer to Page 4 for linkable quantity	[21] RBT cable fixing bracket assembly			

[Assembly Direction]



② XYB (Y-axis Base Mount) + Z-axis Slider Fixed Type CRS-XBB□ High Velocity / High Payload

[Assembly Procedures]
Drawing No. : GMM20-003

[Model]
CRS-XBB□

Assembly Direction (1, 3)

[Structuring Axes]

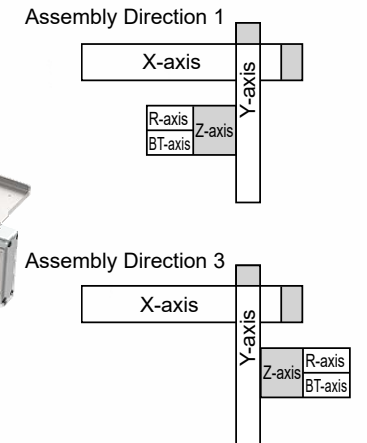
Axis Name	Actuator Model Code
X-Axis	RCS4-WSA16C-20
Y-Axis	RCS4-WSA14C-16
Z-Axis	RCS4-SA8R-10-W (*)
R-Axis	RCP6-RTFML
B-Axis /T-Axis	WU-M

* Double slider type

[Assembled parts]

[1] X-axis actuator	[2] XY bracket assembly	[3] Y-axis actuator	[4] Y slider plate (M)	[5] Z-axis actuator	[6] Z slider plate
[7] ZR bracket assembly	[8] Hollow rotary	[9] RBT bracket	[10] Wrist unit assembly	[11] Z guide rail (M)	[12] Z track mounting bracket (M)
[13] ZR cable track assembly * Refer to Page 4 for linkable quantity	[14] Y track mounting bracket (M14)(M23)	[15] Y guide rail (M)	[16] YZ cable track * Refer to Page 4 for linkable quantity	[17] X track mounting bracket (M14)(M23)	[18] X guide rail (S)
[19] XY cable track * Refer to Page 4 for linkable quantity	[20] RBT cable fixing bracket assembly				

[Assembly Direction]



CRS 6-axis Cartesian Robot Assembly Procedures Completion Drawing List

Catalog No. GMM20-001

2/3

3 XYG(Gantry Y-axis Horizontally Oriented Wall Mount)
+ Z-axis Base Mount Type
CRS-XGA□

[Assembly Procedures]
Drawing No. : GMM20-004

[Assembly Direction]

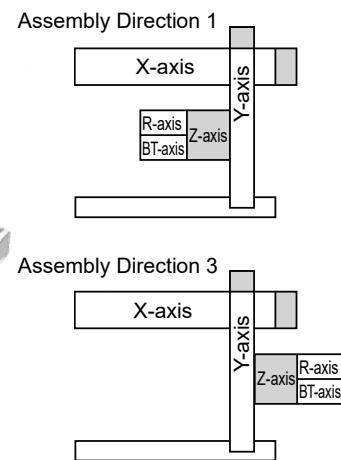
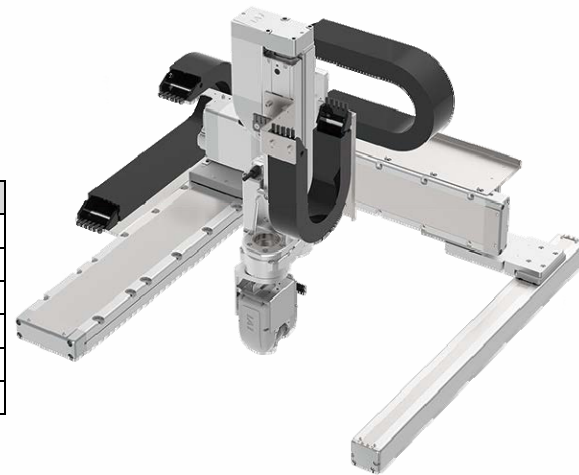
[Model]
CRS-XGA□

Assembly Direction (1, 3)

[Structuring Axes]

Axis Name	Actuator Model Code
X-Axis	RCP6-WSA14LC-16 (*1)
Guide module	RCG-SA6C01
Y-Axis	RCP6-WSA12C-12
Z-Axis	RCP6-TA7R-4-DB (*2)
R-Axis	RCP6-RTFML
B-Axis /T-Axis	WU-S

*1 Long slider type, *2 Double block type



[Assembled parts]

[1] X-axis actuator 	[2] XY bracket assembly 	[3] Y-axis actuator 	[4] Y slider plate (S) 	[5] Guide module 	[6] Joint bracket assembly
[7] Pin bracket assembly 	[8] Z-axis actuator 	[9] Z base plate (S) 	[10] ZR bracket 	[11] Hollow rotary 	[12] RBT bracket
[13] Wrist unit assembly 	[14] Z cable fixing bracket 	[15] Z guide rail (S) 	[16] Z track mounting bracket (S) 	[17] ZR cable track assembly * Refer to Page 4 for linkable quantity 	[18] Y track mounting bracket (S14)(S23)
[19] Y guide rail (S) 	[20] YZ cable track * Refer to Page 4 for linkable quantity 	[21] X track mounting bracket (S1)(S3) 	[22] X guide rail (S) 	[23] XY cable track * Refer to Page 4 for linkable quantity 	[24] RBT cable fixing bracket assembly

4 XYG (Gantry Y-axis Horizontally Oriented Wall Mount)
+ Z-axis Slider Fixed Type
CRS-XGB□ High Velocity / High Payload

[Assembly Procedures]
Drawing No. : GMM20-005

[Assembly Direction]

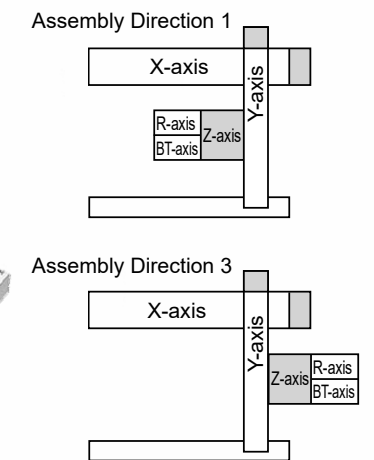
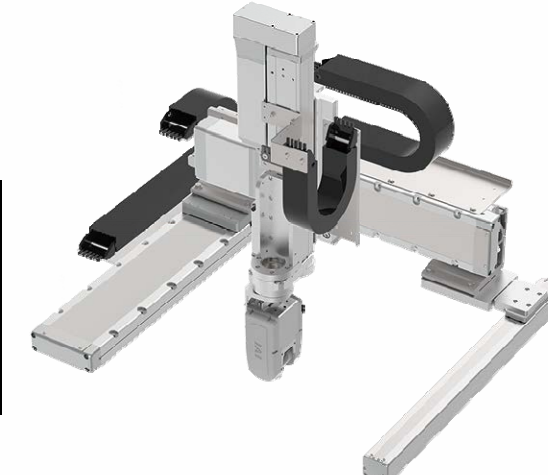
[Model]
CRS-XGB□

Assembly Direction (1, 3)

[Structuring Axes]

Axis Name	Actuator Model Code
X-Axis	RCS4-WSA16C-20
Guide module	RCG-SA6C02
Y-Axis	RCS4-WSA14C-16
Z-Axis	RCS4-SA8R-10-W (*)
R-Axis	RCP6-RTFML
B-Axis /T-Axis	WU-M

* Double slider type



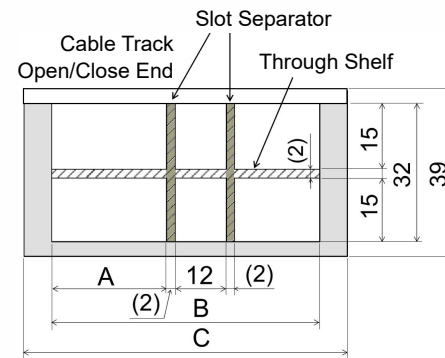
[Assembled parts]

[1] X-axis actuator 	[2] XY bracket assembly 	[3] Y-axis actuator 	[4] Y slider plate (M) 	[5] Guide module 	[6] Joint bracket assembly
[7] Pin bracket assembly 	[8] Z-axis actuator 	[9] Z slider plate 	[10] ZR bracket assembly 	[11] Hollow rotary 	[12] RBT bracket
[13] Wrist unit assembly 	[14] Z guide rail (M) 	[15] Z track mounting bracket (M) 	[16] ZR cable track assembly * Refer to Page 4 for linkable quantity 	[17] Y track mounting bracket (M14)(M23) 	[18] Y guide rail (M)
[19] YZ cable track * Refer to Page 4 for linkable quantity 	[20] X track mounting bracket (M14)(M23) 	[21] X guide rail (S) 	[22] XY cable track * Refer to Page 4 for linkable quantity 	[23] RBT cable fixing bracket assembly 	

About Cable Track

In this page states the dimensions of the cable track, linkable quantity / slot separator quantity / through shelf quantity.

No.	Cable Track Model Code	Cable Track Model Code	A [mm]	B [mm]	C [mm]
1	CT	B17.4.075.0	22	50	60.5
2	CTM	B17.5.075.0	27	63	76
3	CTL	B17.6.075.0	27	80	93
4	CTXL	B17.7.075.0	27	100	113



① ③ CRS-XBA/XGA

1st Cabling (Cable Track between XY) Not available for Cable Track Model Code CT

X-Axis Stroke	mm	50	100	150	200	250	300	350	400	450	500	550
Link Quantity	Quantity	14	14	15	16	17	18	19	19	20	21	22
Slot Separator Quantity	Quantity	14	14	16	16	18	18	20	20	20	22	22
Through Shelf Quantity	Quantity	7	7	8	8	9	9	10	10	10	11	11

X-Axis Stroke	mm	600	650	700	750	800						
Link Quantity	Quantity	23	23	24	25	26						
Slot Separator Quantity	Quantity	24	24	24	26	26						
Through Shelf Quantity	Quantity	12	12	12	13	13						

2nd Cabling (Cable Track between YZ)

① CRS-XBA Not available for Cable Track Model Code CTXL

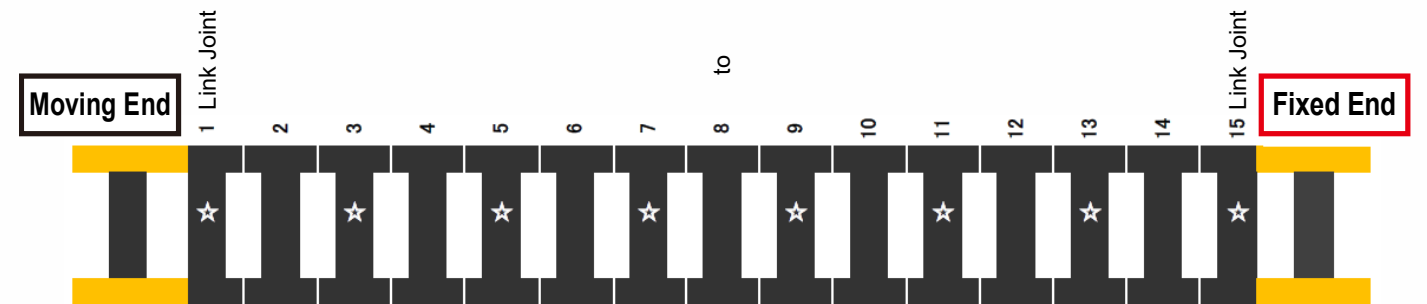
Y-Axis Stroke	mm	50	100	150	200	250	300					
Link Quantity	Quantity	12	14	15	17	19	20					
Slot Separator Quantity	Quantity	12	14	16	18	20	20					
Through Shelf Quantity	Quantity	6	7	8	9	10	10					

③ CRS-XGA Not available for Cable Track Model Code CTXL

Y-Axis Stroke	mm	350	400	450	500	550	600					
Link Quantity	Quantity	22	24	25	27	28	30					
Slot Separator Quantity	Quantity	22	24	26	28	28	30					
Through Shelf Quantity	Quantity	11	12	13	14	14	15					

3rd Cabling (Cable Track between ZR) Not available for Cable Track Model Codes CTL and CTXL

Z-Axis Stroke	mm	90	140	190								
Link Quantity	Quantity	15	15	15								
Slot Separator Quantity	Quantity	16	16	16								
Through Shelf Quantity	Quantity	8	8	8								



* Attach the slot separators and the through shelves in every two links from the first link. (Points indicated with ☆ in the figure above)

② ④ CRS-XBB/XGB

1st Cabling (Cable Track between XY) Not available for Cable Track Model Code CT

X-Axis Stroke	mm	50	100	150	200	250	300	350	400	450	500	550
Link Quantity	Quantity	16	17	18	18	19	20	21	22	23	23	24
Slot Separator Quantity	Quantity	16	18	18	18	20	20	22	22	24	24	24
Through Shelf Quantity	Quantity	8	9	9	9	10	10	11	11	12	12	12

X-Axis Stroke	mm	600	650	700	750	800	850	900	950	1000	1050	1100
Link Quantity	Quantity	25	26	27	28	28	29	30	31	32	32	33
Slot Separator Quantity	Quantity	26	26	28	28	28	30	30	32	32	32	34
Through Shelf Quantity	Quantity	13	13	14	14	14	15	15	16	16	16	17

2nd Cabling (Cable Track between YZ)

② CRS-XBB Not available for Cable Track Model Code CTXL

Y-Axis Stroke	mm	50	100	150	200	250	300					
Link Quantity	Quantity	12	14	16	17	19	20					
Slot Separator Quantity	Quantity	12	14	16	18	20	20					
Through Shelf Quantity	Quantity	6	7	8	9	10	10					

④ CRS-XGB Not available for Cable Track Model Code CTXL

Y-Axis Stroke	mm	350	400	450	500	550	600					
Link Quantity	Quantity	22	24	25	27	28	30					
Slot Separator Quantity	Quantity	22	24	26	28	28	30					
Through Shelf Quantity	Quantity	11	12	13	14	14	15					

3rd Cabling (Cable Track between ZR) Not available for Cable Track Model Code CTXL

Z-Axis Stroke	mm	100	150	200								
Link Quantity	Quantity	13	14	16								
Slot Separator Quantity	Quantity	14	14	16								
Through Shelf Quantity	Quantity	7	7	8								

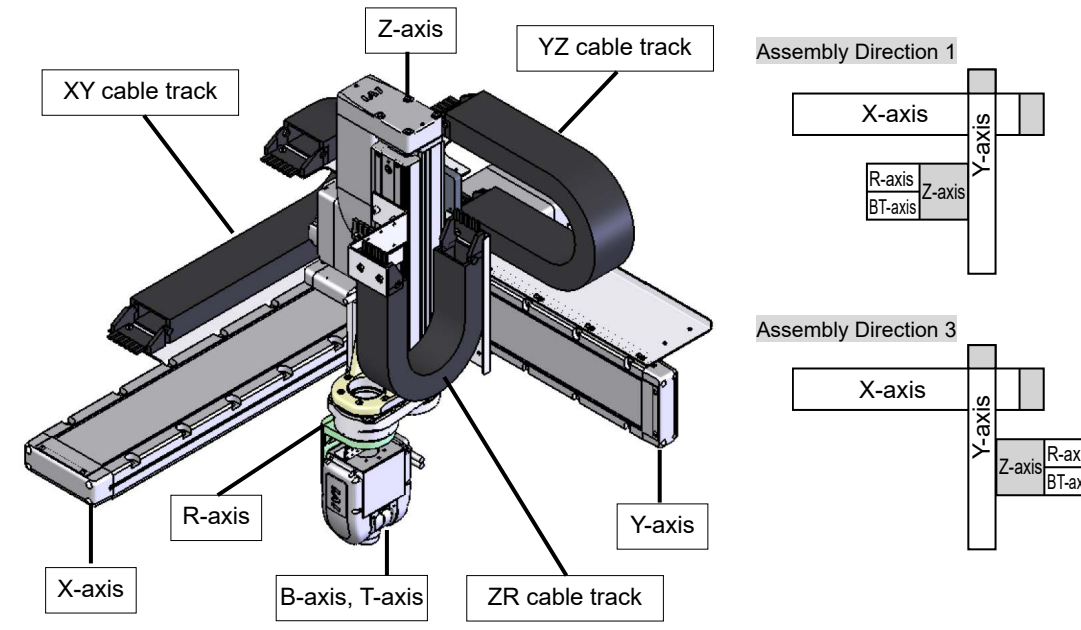
Caution :

- 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.

[Tools to be Prepared] Hex wrench, Open-end wrench

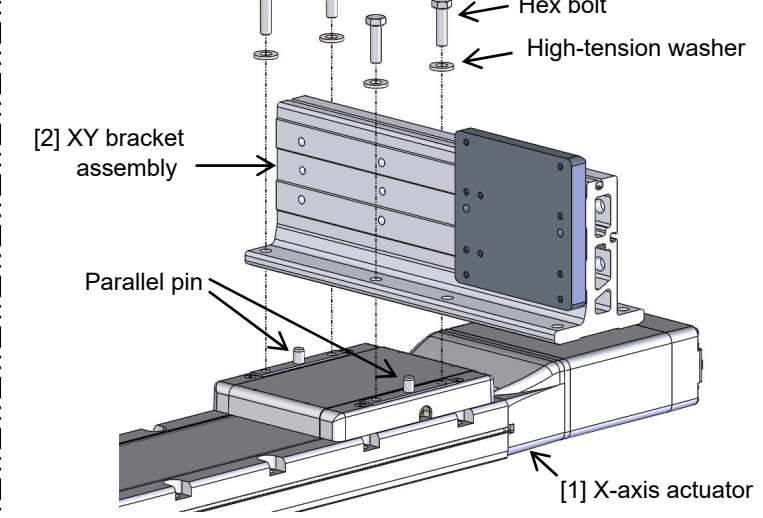
0 It is necessary to have **20** Installing X Guide Rail first when **[1]** X-axis Actuator is to be fixed on a platform

This assembly manual shows an example of building CRS-XBA Combined Direction 1
 The directions of an actuator and brackets in Combined Direction 3 differ, but refer to this drawing for assembly.



1 Installing XY Bracket

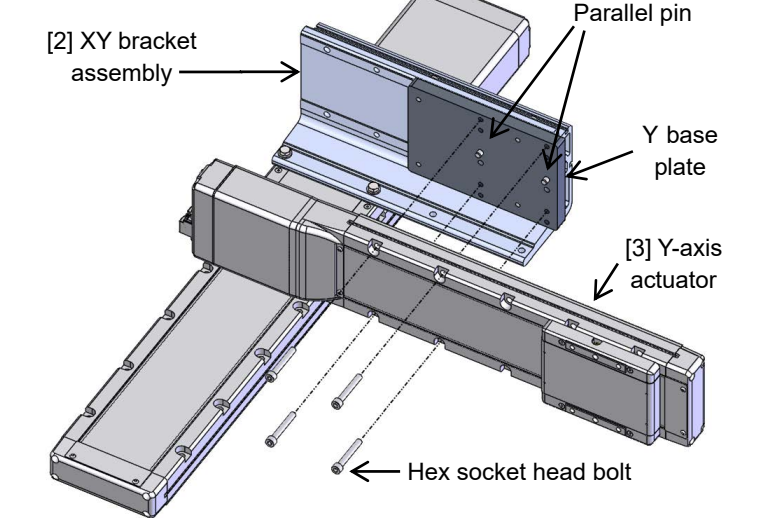
1. Attach **[2]** XY bracket assembly to the slider on **[1]** X-axis actuator.



Part Name	Specifications	Quantity	Tightening torque
Hex bolt	M8 × 30	4	29.97 N·m
High-tension washer	φ8.5 × φ18 × 2.3	4	----
Parallel pin	φ8 × 18	2	----

2 Installing Y-axis Actuator

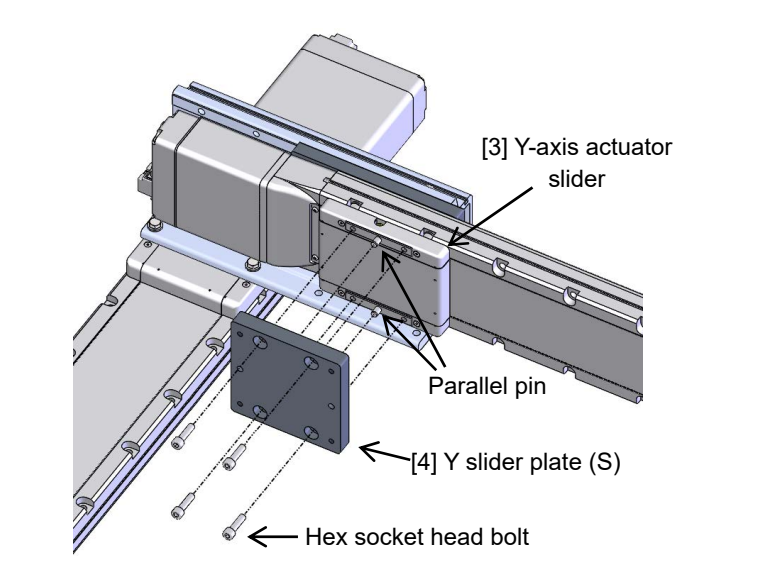
1. Attach **[3]** Y-axis actuator to Y base plate on **[2]** XY bracket assembly.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M6 × 45	4	12.34 N·m
Parallel pin	φ6 × 15	2	----

3 Installing Y Slider Plate

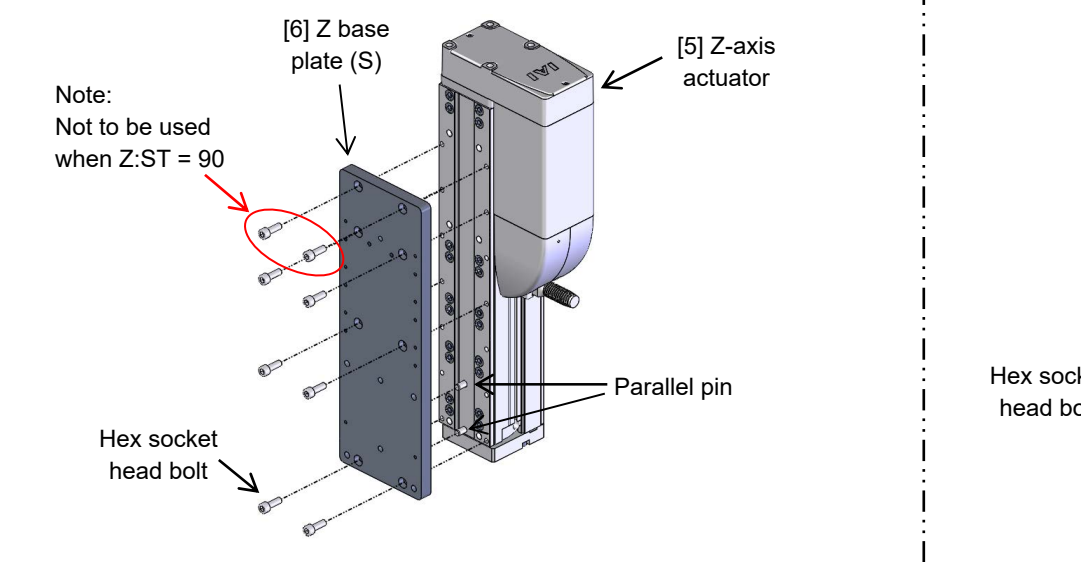
1. Attach **[4]** Y slider plate (S) to the **[3]** Y-axis actuator slider.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M6 × 18	4	12.34 N·m
Parallel pin	φ6 × 15	2	----

4 Assembling Z-axis Assembly

1. Attach **[6]** Z base plate (S) to the base surface of **[5]** Z-axis actuator.

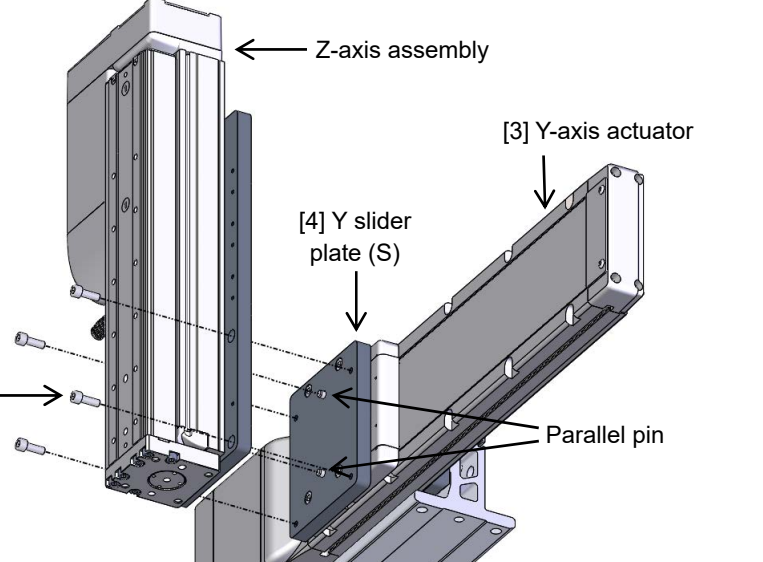


Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M6 × 18	8 (Note 1)	12.34 N·m
Parallel pin	φ6 × 15	2	----

Note 1: Use only six pieces of screws when the Z-axis stroke is 90mm.

5 Installing Z-axis Assembly

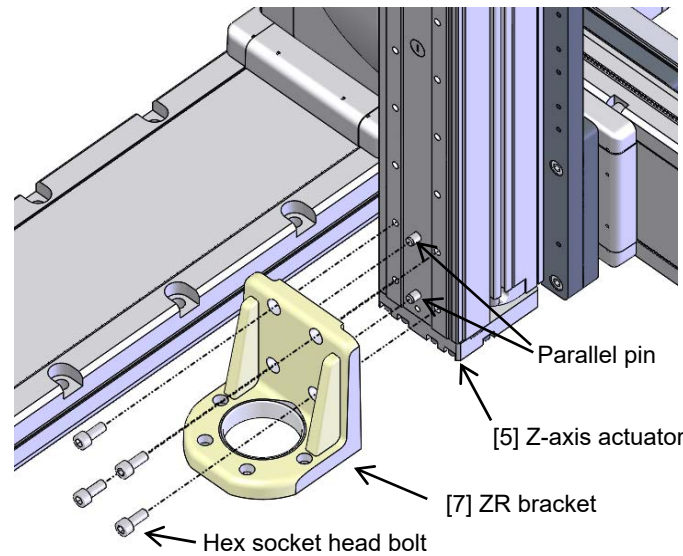
1. Attach Z-axis assembly built in **4** to **[4]** Y slider plate (S).



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M6 × 18	4	12.34 N·m
Parallel pin	φ6 × 15	2	----

6 Installing ZR Bracket

1. Attach [7] ZR bracket to [5] Z-axis actuator.



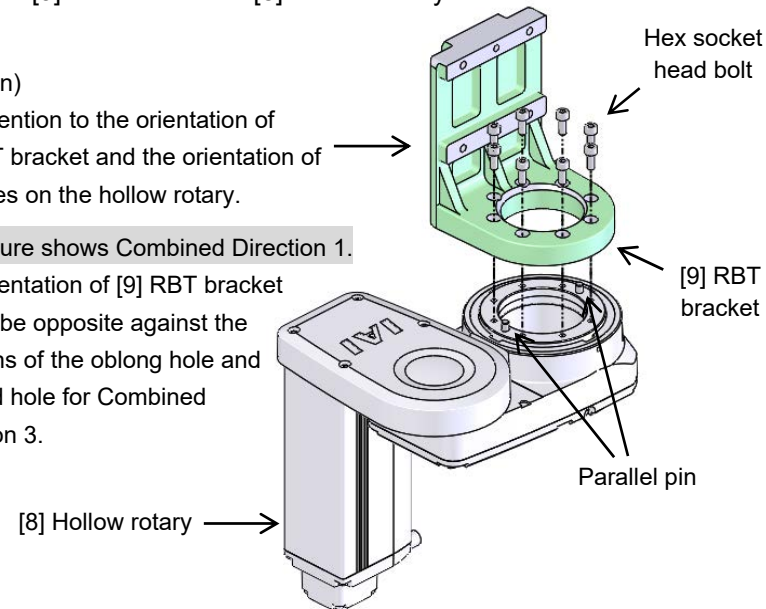
Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M6 × 15	4	12.34 N·m
Parallel pin	φ6 × 10	2	----

7 Assembling Hollow Rotary and RBT Bracket

1. Attach [9] RBT bracket to [8] Hollow rotary.

(Caution)
Pay attention to the orientation of [9] RBT bracket and the orientation of pin holes on the hollow rotary.

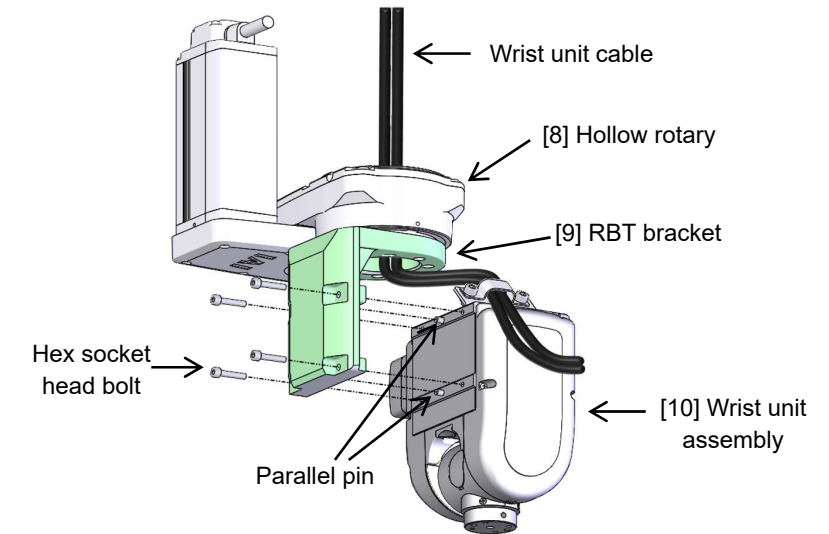
This figure shows Combined Direction 1.
The orientation of [9] RBT bracket should be opposite against the positions of the oblong hole and reamed hole for Combined Direction 3.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M4 × 10	8	3.59 N·m
Parallel pin	φ4 × 8	2	----

8 Installing Wrist Unit

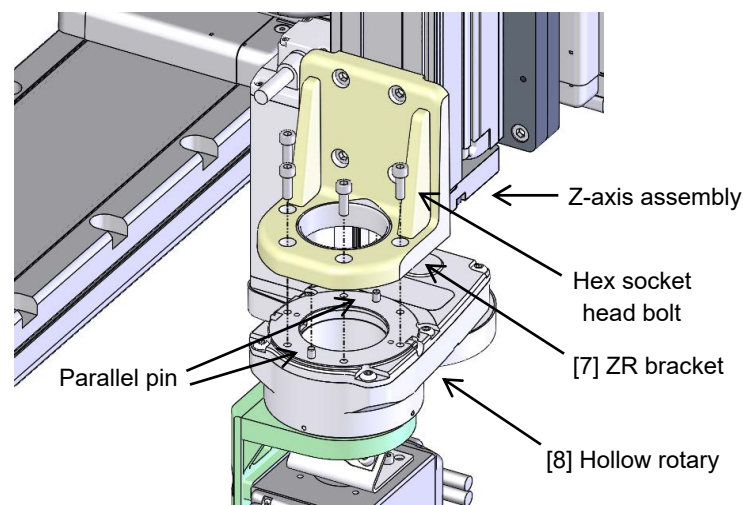
1. Put the cable on the wrist unit through the hollow on [8] Hollow rotary.
2. Attach [10] Wrist unit assembly to [9] RBT bracket.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M4 × 20	4	3.59 N·m
Parallel pin	φ4 × 8	2	----

9 Installing Hollow Rotary

1. Put the cable on the wrist unit through the hollow on [7] ZR bracket.
2. Attach [8] Hollow rotary to [7] ZR bracket.

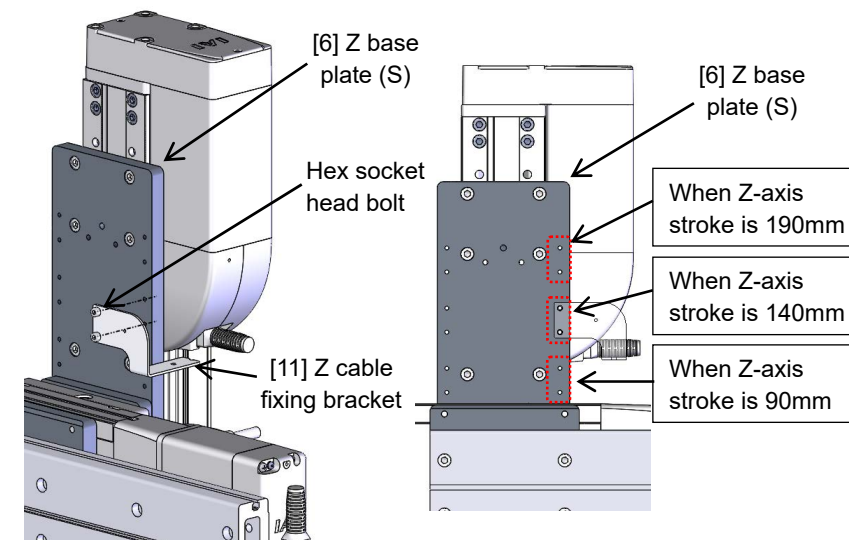


Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M5 × 15	4	7.27 N·m
Parallel pin	φ4 × 8	2	----

10 Installing Z Cable Fixing Bracket

1. Attach [11] Z cable fixing bracket to [6] Z base plate (S).

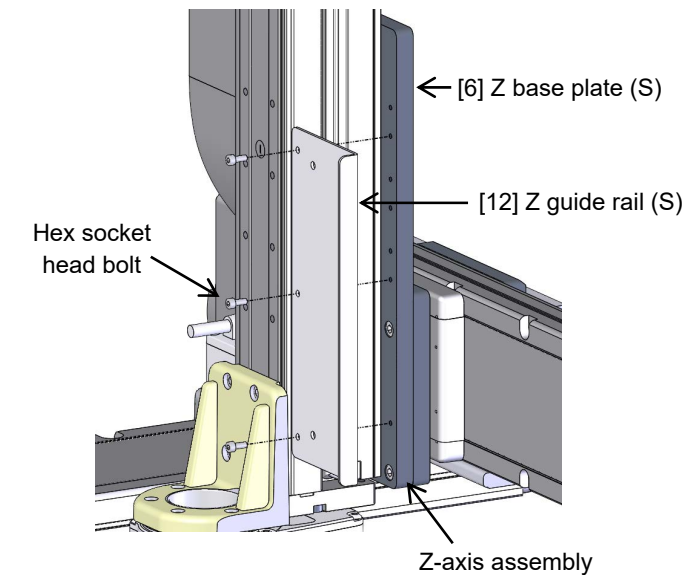
(Caution) The position to attach should differ depending on the Z-axis stroke.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M4 × 10	2	3.59 N·m

11 Installing Z Guide Rail

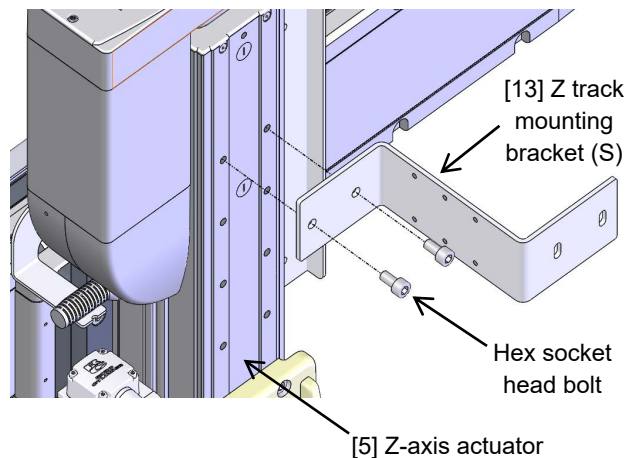
1. Attach [12] Z guide rail (S) to [6] Z base plate (S).



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M4 × 10	3	3.59 N·m

12 Installing Z Track Mounting Bracket

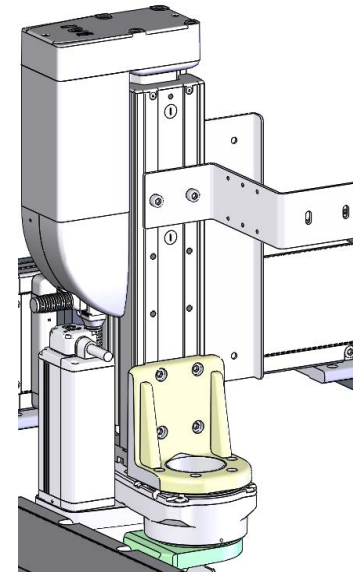
- Attach [13] Z track mounting bracket to [5] Z-axis actuator (S).
- (Caution) The position to attach should differ depending on the Z-axis stroke.



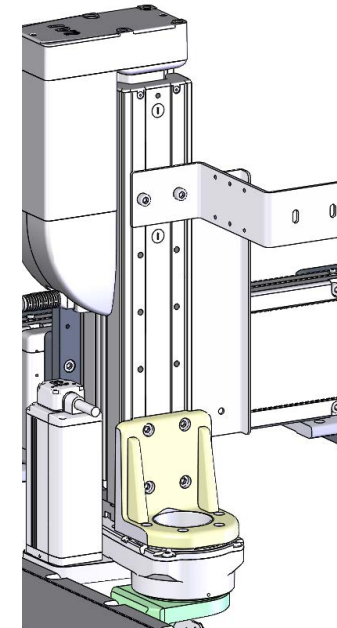
Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M6 × 12	2	12.34 N·m

Attachment Positions for each Type of Z-axis Strokes

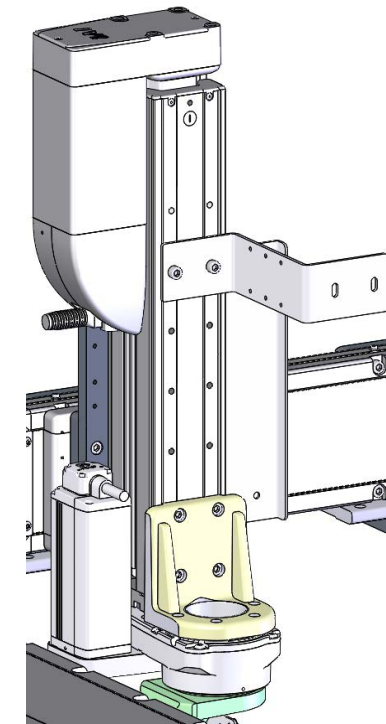
When Z-axis stroke is 90mm



When Z-axis stroke is 140mm

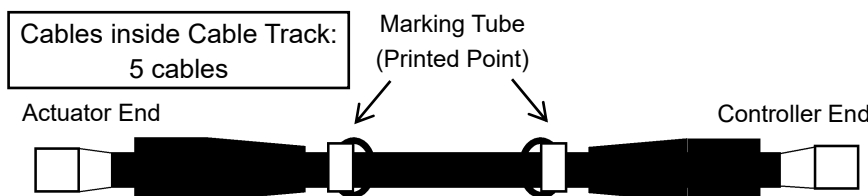


When Z-axis stroke is 190mm



13 Check on Cable on ZR Cable Track Assembly

- Check which cable is for each axis one by one by looking at the print on the marking tube on five cables in the cable track.
- * The cables inside the cable track for the R-axis/B-axis/T-axis are laid out in [14] ZR cable track assembly.



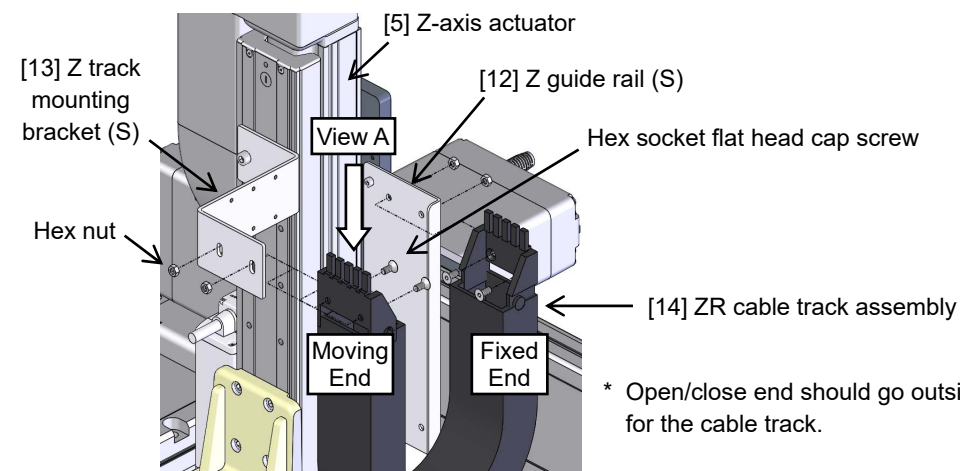
■ Marking Tube Printing Detail

Axis No.	Construction Axis	Symbol	Printing Detail	Remark
2	Y-axis	Y	MPG2	
3	Z-axis	Z	MPG3	
4	Hollow Rotary (R-axis)	R	MPG4	Already laid out in ZR cable track assembly
5	Wrist Swing (B-axis)	B	MPG5	Already laid out in ZR cable track assembly
6	Wrist Rotation (T-axis)	T	MPG6	Already laid out in ZR cable track assembly

14 Installing ZR Cable Track Assembly

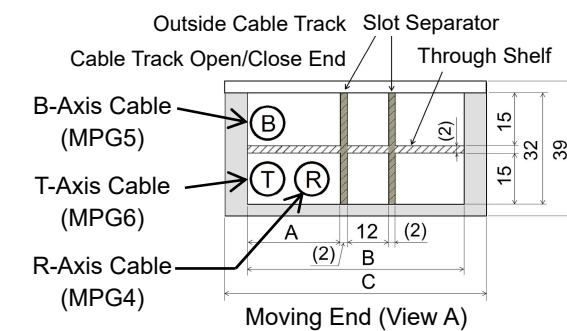
- Join [14] ZR cable track assembly that cables are already laid to [13] Z track mounting bracket (S) and to [12] Z guide rail (S).

* In case of difficulty in tightening screws due to blockage of cables, cut the cable ties on the cables. After installation is complete, put the cables back in the cable track to the original position and fix them with cable ties.



Part Name	Specifications	Quantity	Tightening torque
Hex socket flat head cap screw	M5 × 12	4	5.10 N·m
Hex nut	M5 Class 1	4	----

Cables inside ZR Cable Track Layout (Already Laid out)



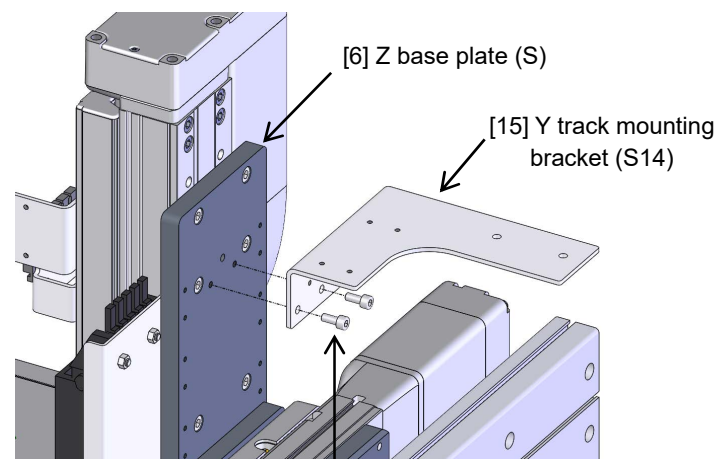
Check the symbols of the "3rd wiring cable track" in the model code for the type of ZR Cable Track selected at order. The size of each type of the cable tracks are as shown in the table below.

3rd (ZR) Cable Track		Dimensional Unit: mm		
Model Code	Cable Track Model Code	A	B	C
CT	B17.4.075.0	22	50	60.5
CTM	B17.5.075.0	27	63	76

15 Installing Y Track Mounting Bracket

- Attach [15] Y track mounting bracket (S14) ^(Note 1) to [6] Z base plate (S).

Note 1 Attach [15] Y track mounting bracket (S23) for Combined Direction 3.

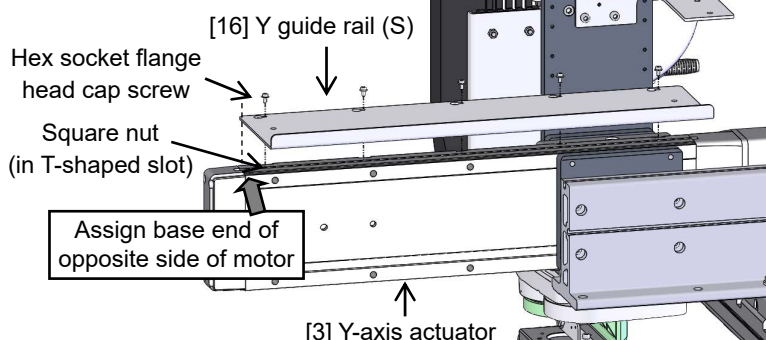


Hex socket head bolt

Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M5 × 12	2	7.27 N·m

16 Installing Y Guide Rail

- Insert a square nut to the T-shaped slot on the top of [3] Y-axis actuator to attach [16] Y guide rail (S).
- Adjust the base end on the opposite side of the motor on [3] Y-axis actuator so it aligns with the end of [16] Y guide rail (S).



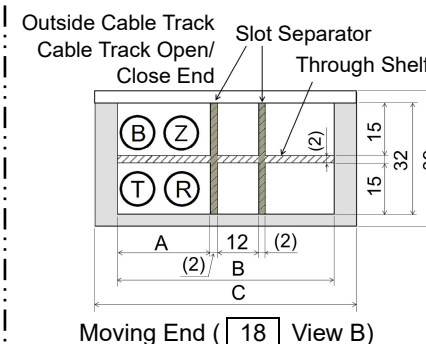
Part Name	Specifications	Quantity	Tightening torque
Hex socket flange head cap screw	M3 × 6	3 to 7 ^(Note 1)	1.62 N·cm
Square nut	Square nut M3	3 to 7 ^(Note 1)	----

Note 1: The quantity is subject to change depending on the stroke of Y-axis.

17 Assembling YZ Cable Track Assembly

- Check the symbols of the "2nd wiring cable track" in the model code for the type of [17] YZ cable track selected at order.
- Check the size of the cable track and attachment positions of the slot separators and through shelves in the table below.
- Store the cables inside the cable track for the R-axis / T-axis below [17] YZ cable track. (Refer to the figure below)
- Attach the slot separators and the through shelves in every two links from the first link on the moving end.
- Store the cables inside the cable track for the Z-axis / B-axis above [17] YZ cable track. (Refer to the figure below)

Cables inside YZ Cable Track Layout

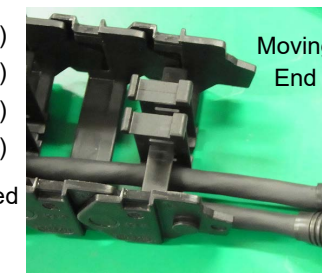


2nd (YZ) Cable Track Dimensional Unit: mm

Model Code	Cable Track Model Code	A	B	C
CT	B17.4.075.0	22	50	60.5
CTM	B17.5.075.0	27	63	76
CTL	B17.6.075.0	27	80	93

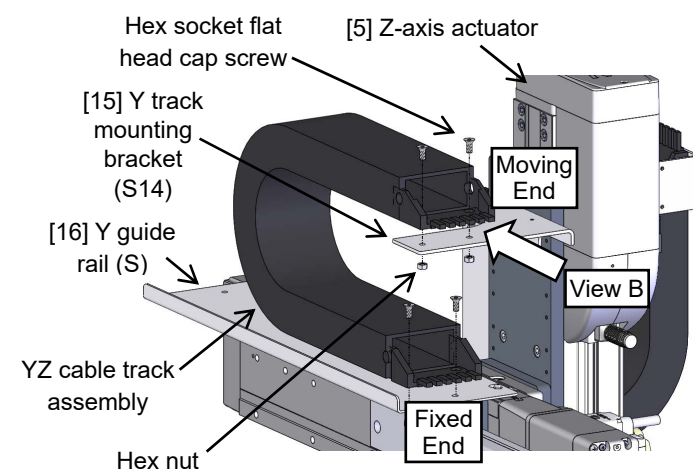
- Ⓩ : Z-Axis Cable (MPG3)
- Ⓡ : R-Axis Cable (MPG4)
- Ⓟ : B-Axis Cable (MPG5)
- Ⓣ : T-Axis Cable (MPG6)

The cables are to be justified to the left from the view on the moving end.



18 Installing YZ Cable Track Assembly

- Attach YZ Cable Track Assembly built in [17] to [15] Y track mounting bracket (S14) and [16] Y guide rail (S).
- * Open/close end should go outside for the cable track.

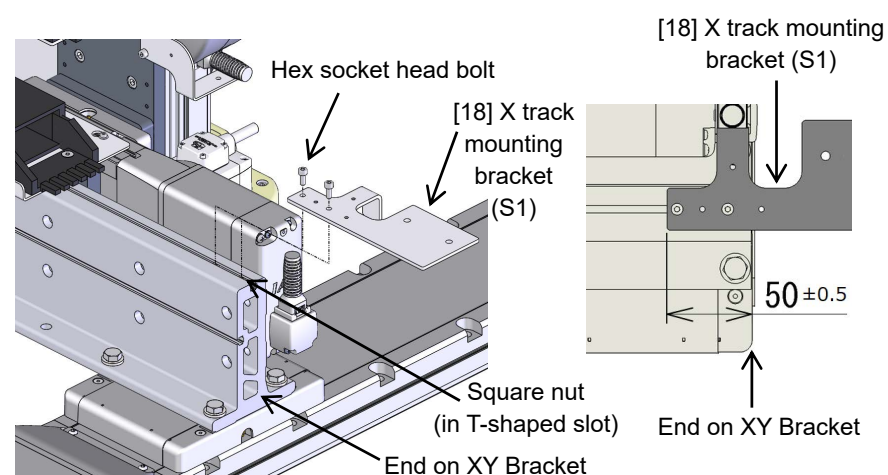


Part Name	Specifications	Quantity	Tightening torque
Hex socket flat head cap screw	M5 × 12	4	5.10 N·m
Hex nut	M5 Class 1	4	----

19 Installing X Track Mounting Bracket

- Insert a square nut to the T-shaped slot on the top of XY bracket to attach [18] X track mounting bracket (S1) ^(Note 1).
- Adjust the positions of the end of ZY Bracket and the end of [18] X track mounting bracket (S1) so the distance between them falls into 50 ± 0.5mm.

Note 1 Attach [18] X track mounting bracket (S3) for Combined Direction 3.

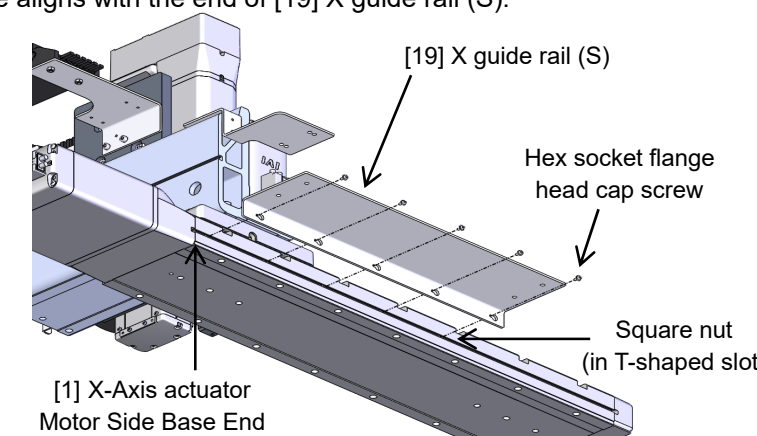


Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M4 × 10	2	3.59 N·m
Square nut	Square nut M4	2	----

20 Installing X Guide Rail

* This procedure is to be conducted before [1] X-axis actuator is installed on the platform.

- Insert a square nut to the T-shaped slot on the top of [1] X-axis actuator to attach [19] X guide rail (S).
- Adjust the position of [1] X-axis actuator so its base end on the motor side aligns with the end of [19] X guide rail (S).



Part Name	Specifications	Quantity	Tightening torque
Hex socket flange head cap screw	M3 × 6	3 to 8 ^(Note 1)	1.62 N·m
Square nut	Square nut M3	3 to 8 ^(Note 1)	----

Note 1: The quantity is subject to change depending on the stroke of X-axis.

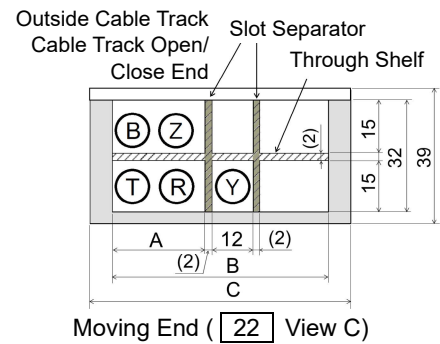
Read "Common Contents for Wiring" in the last page.

CRS 6-axis Cartesian Robot XBA Type (Model: CRS-XBA) XYB (Y-axis Base Mount) + Z-axis Base Mount Type		
Drawing No.	GMM20-002	5/6

21 Assembling XY Cable Track Assembly

1. Check the symbols of the "1st wiring cable track" in the model code for the type of [20] XY cable track selected at order.
2. Check the size of the cable track and attachment positions of the slot separators and through shelves in the table below.
3. Store the cables inside the cable track for the Y-axis / R-axis / T-axis below [20] XY cable track. (Refer to the figure below)
4. Attach the slot separators and the through shelves in every two links from the first link on the moving end.
5. Store the cables inside the cable track for the Z-axis / B-axis above [20] XY cable track. (Refer to the figure below)

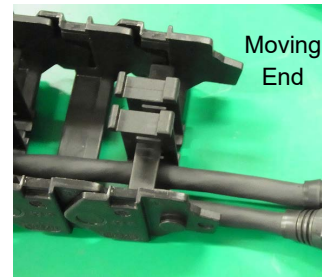
Cables inside XY Cable Track Layout



1st (XY) Cable Track Dimensional Unit: mm

Model Code	Cable Track Model Code	A	B	C
CTM	B17.5.075.0	27	63	76
CTL	B17.6.075.0	27	80	93
CTXL	B17.7.075.0	27	100	113

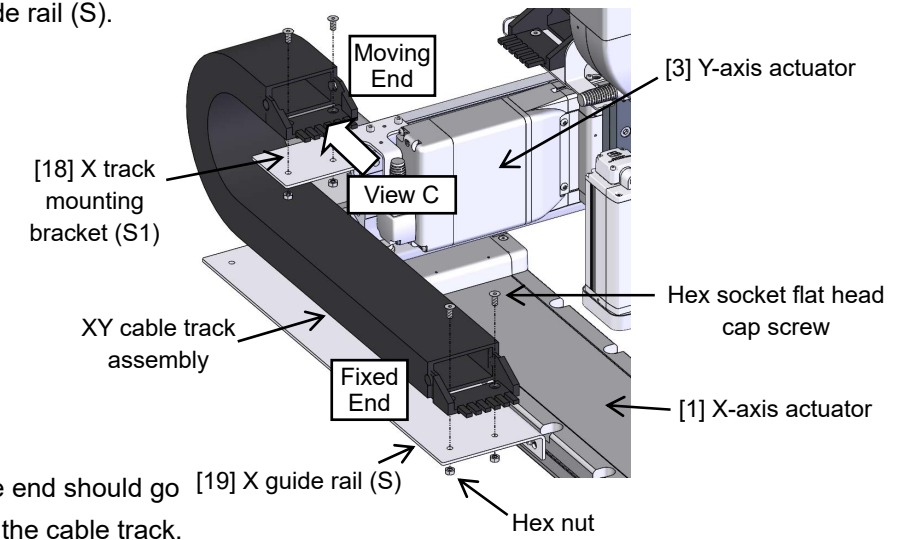
- Ⓨ : Y-Axis Cable (MPG2)
- Ⓩ : Z-Axis Cable (MPG3)
- Ⓡ : R-Axis Cable (MPG4)
- Ⓟ : B-Axis Cable (MPG5)
- Ⓣ : T-Axis Cable (MPG6)



* The cables are to be justified to the left from the view on the moving end.

22 Installing XY Cable Track Assembly

1. Attach XY cable track assembly built in [21] to [18] X track mounting bracket (S1) and [19] X guide rail (S).

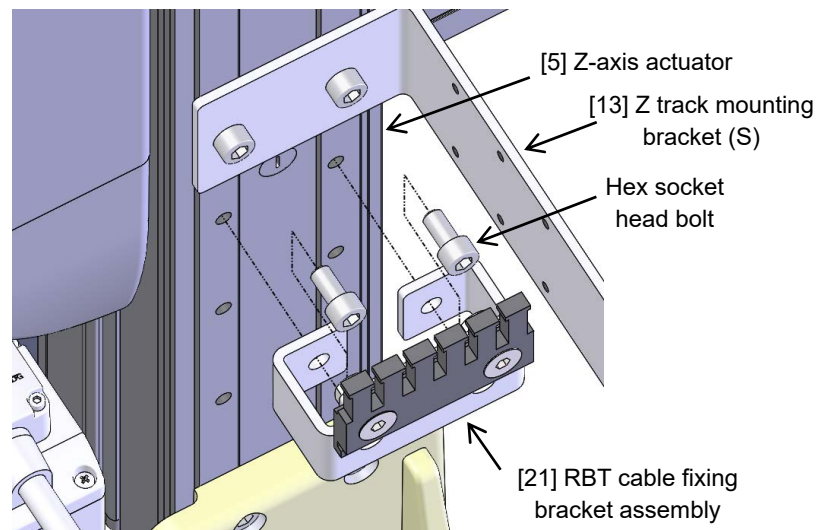


* Open/close end should go [19] X guide rail (S) outside for the cable track.

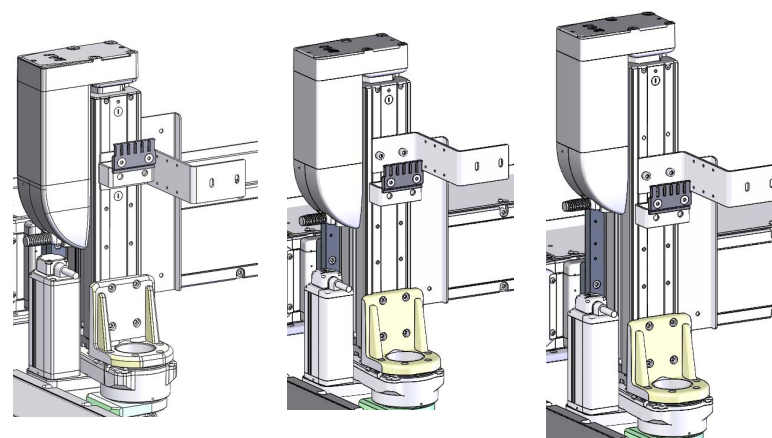
Part Name	Specifications	Quantity	Tightening torque
Hex socket flat head cap screw	M5 × 12	4	5.10 N·m
Hex nut	M5 Class 1	4	----

23 Installing RBT Cable Fixing Bracket Assembly

1. Attach [21] RBT cable fixing bracket assembly to [5] Z-axis actuator.
(Caution) The position to attach should differ depending on the Z-axis stroke.



Attachment Positions for each Type of Z-axis Strokes



When Z-axis stroke is 90mm (Note 1)

When Z-axis stroke is 140mm

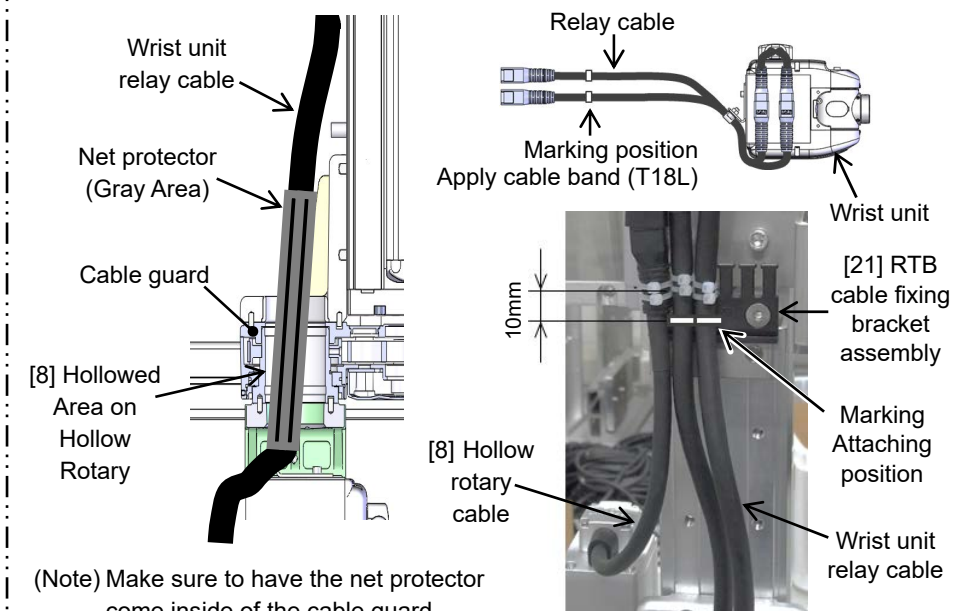
When Z-axis stroke is 190mm

Note 1 In case of the Z-axis stroke at 90mm, have it tightened together with [13] Z track mounting bracket

Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M6 × 12	2	12.34 N·m

24 Wiring for Wrist Unit and Hollow Rotary

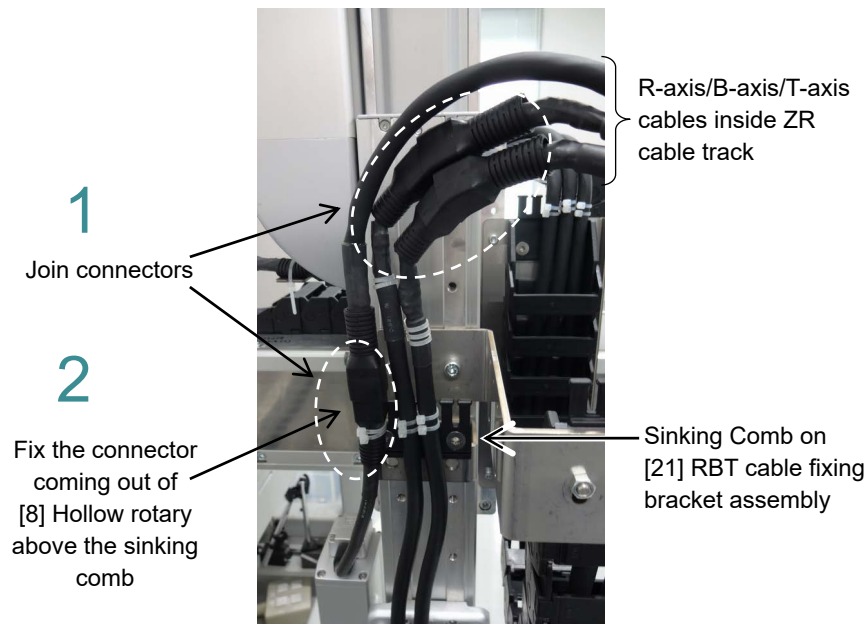
1. Affix the wrist unit relay cables come through the hollow part of [8] Hollow rotary on the sinking comb of [21] RTB cable fixing bracket assembly with two cable bands applied on each cable.
At that time, be aware of a marking on the wrist unit relay cables in order to have looseness in wiring of the relay cables so that the cables are fixed with a cable band at the position shown in the figure below.



(Note) Make sure to have the net protector come inside of the cable guard.

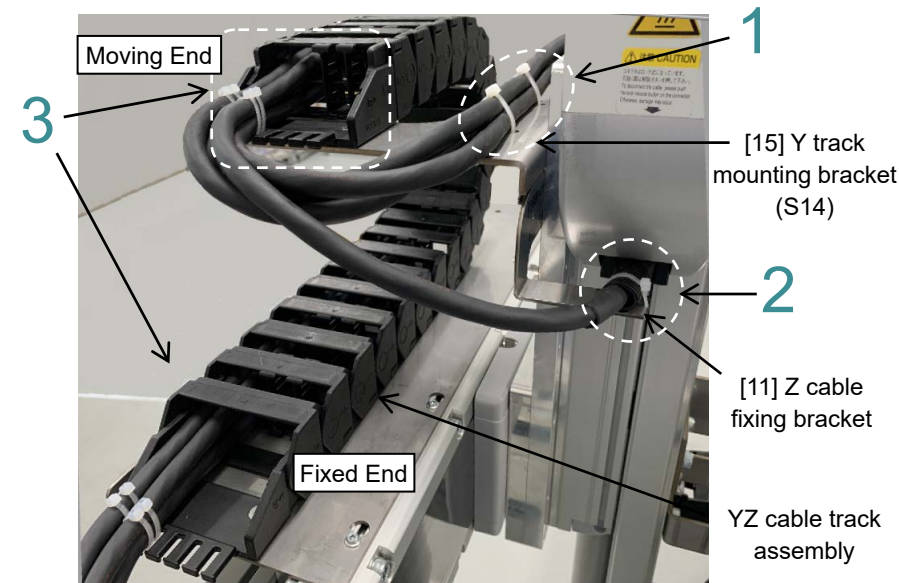
25 Connectivity of Cables inside ZR Cable Track and Actuator Cables

1. Connect the connectors on the cables inside the cable track for the R-axis/B-axis/T-axis in ZR Cable Track to the cable on each actuator.
2. Fix the cables on [8] Hollow rotary at the sinking comb on [21] RTB fixing bracket assembly so the connector coming out of [8] Hollow rotary comes above the sinking comb.



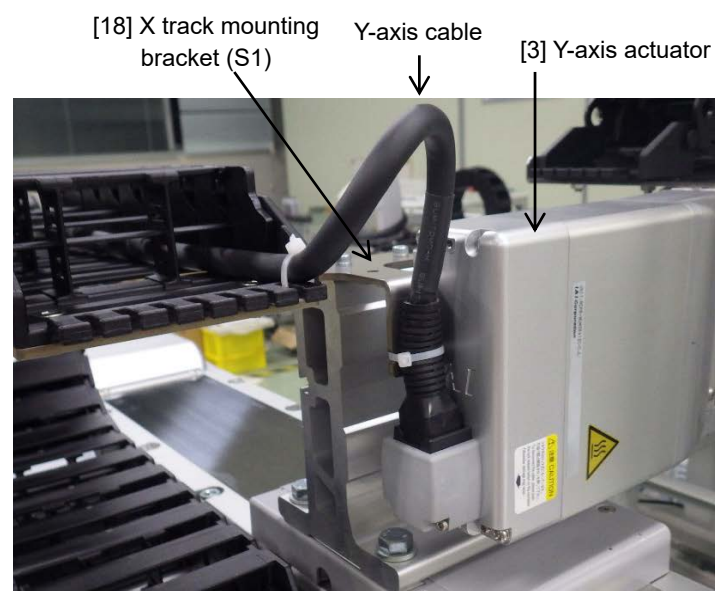
26 Wiring for Cables inside YZ Cable Track

1. Using the hole on [15] Y track mounting bracket (S14), fix the B-axis/T-axis cables on the wrist unit and the R-axis cable on [8] Hollow rotary together with a cable band.
2. Using the groove on [11] Z cable fixing bracket, fix the root of the Z-axis cable with a cable band.
3. Fix the Z-axis/R-axis/B-axis/T-axis cables inside the cable track on the moving end and fixed end of YZ cable track assembly with cable bands.



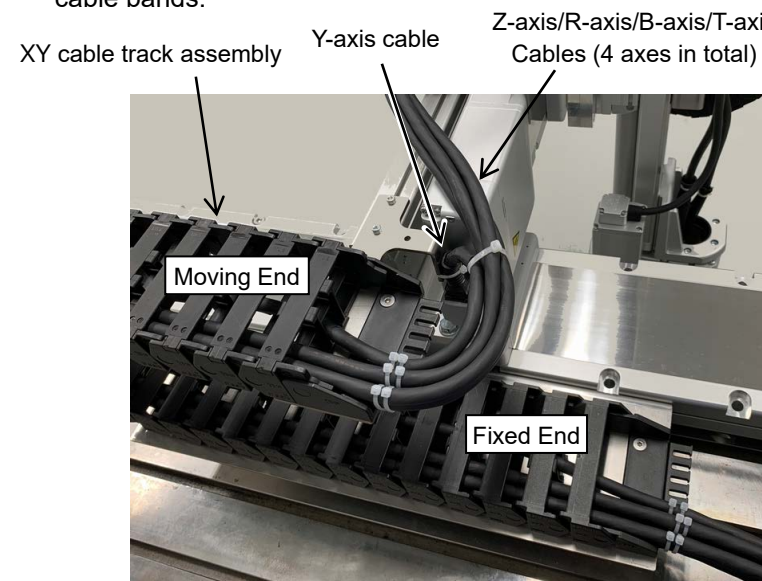
27 Fixing Y-Axis Cable

1. Fix the root of the Y-axis cable on [18] X track mounting bracket (S1) with a cable band.



28 Wiring for Cables inside XY Cable Track

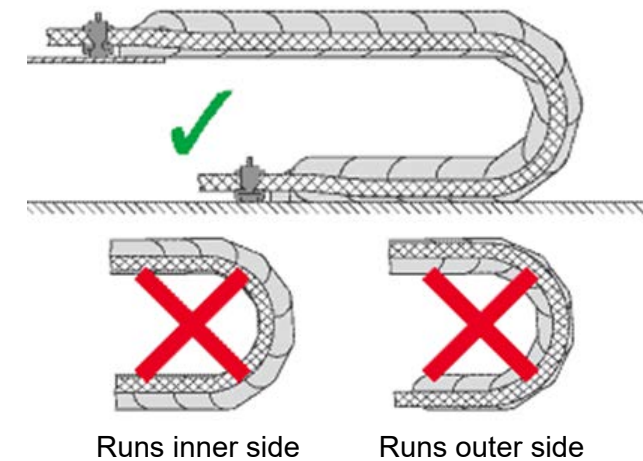
1. Fix the Y-axis/Z-axis/R-axis/B-axis/T-axis cables inside the cable track on the moving end and fixed end of XY Cable Track Assembly with cable bands.



Common Contents for Wiring

Caution for Fixing Cables inside Cable Track

- (1) Adjust the length of cables inside a cable track so they would not inside or outside.

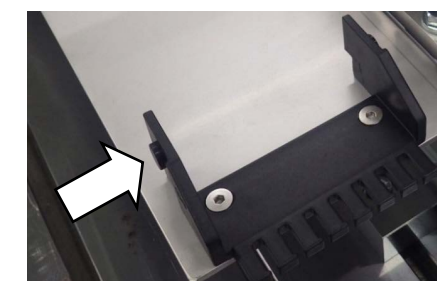


- (2) To fix at the sinking comb, use two cable bands on one cable.



Distinguishing Fixed End / Moving End of Cable Track

The end with projections at the joint of sides of a sinking comb and a cable track should be the fixed end.



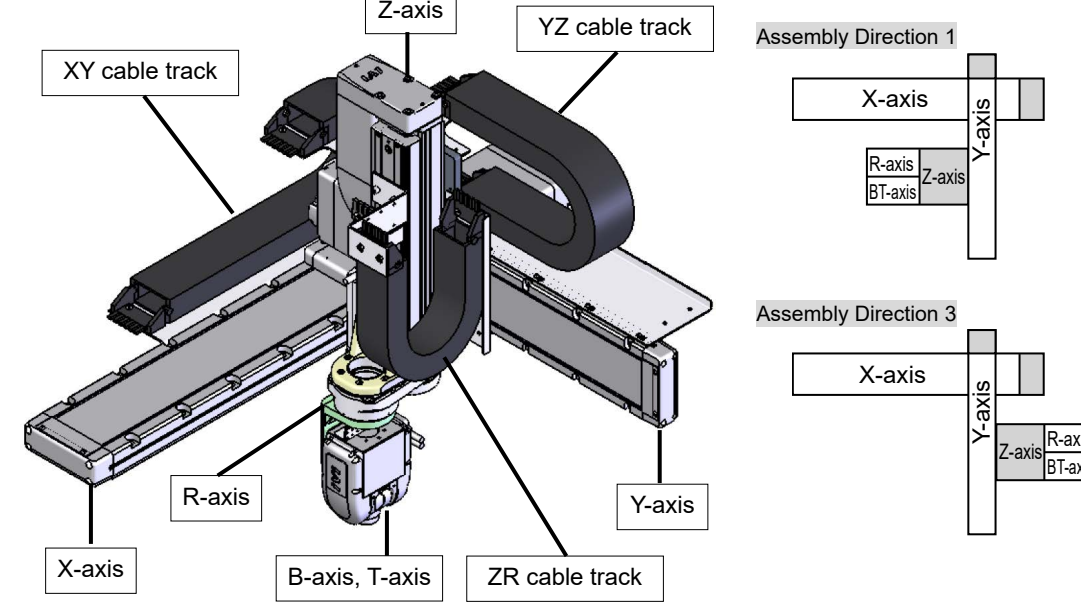
Caution : • Although each part has been chamfered to remove sharp edges, exercise due caution during the assembly to prevent injury. If necessary, wear gloves or other protective gears.
 • Exercise due caution during the assembly to prevent pinching of hands and fingers.

[Tools to be Prepared] Hex wrench, Open-end wrench

0 It is necessary to have **19** Installing X Guide Rail first when [1] X-axis Actuator is to be fixed on a platform for assembly work.

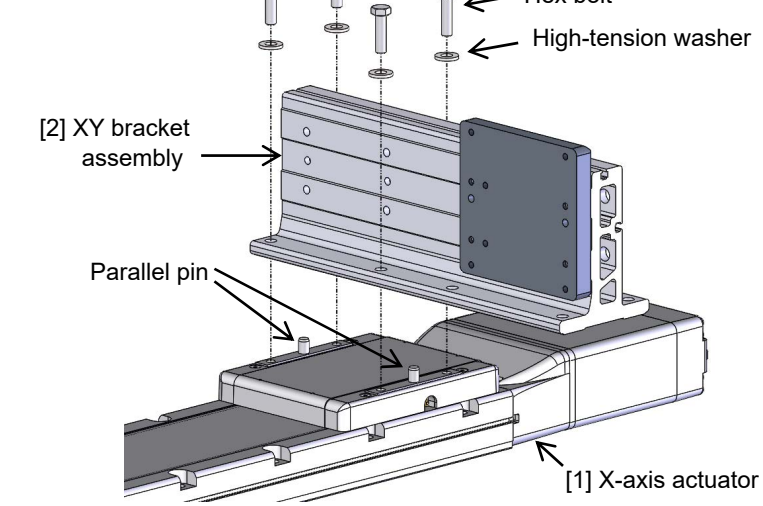
This assembly manual shows an example of building CRS-XBB Combined Direction 1

The directions of an actuator and brackets in Combined Direction 3 differ, but refer to this drawing for assembly.



1 Installing XY Bracket

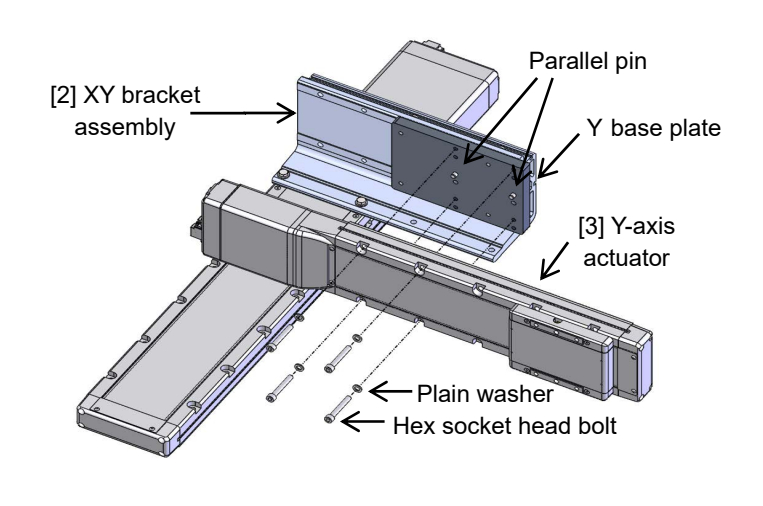
1. Attach [2] XY bracket assembly to the slider on [1] X-axis actuator.



Part Name	Specifications	Quantity	Tightening torque
Hex bolt	M8 × 35	4	29.97 N·m
High-tension washer	φ8.5 × φ18 × 2.3	4	----
Parallel pin	φ8 × 18	2	----

2 Installing Y-axis Actuator

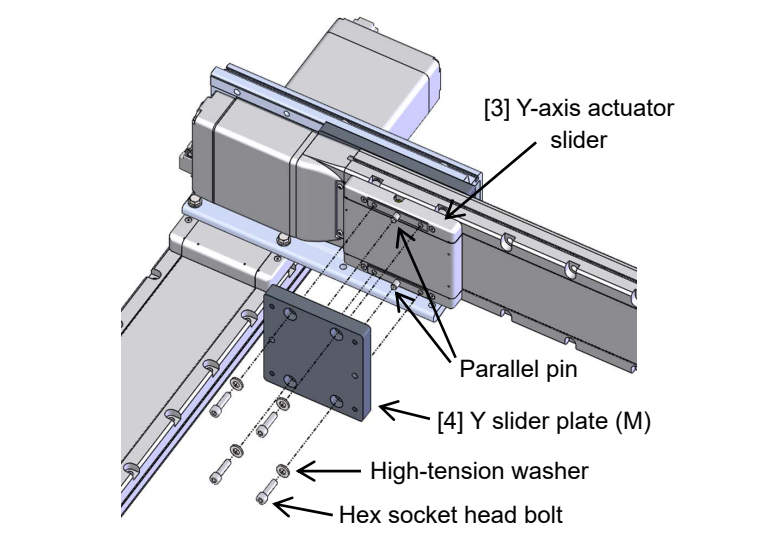
1. Attach [3] Y-axis actuator to Y base plate on [2] XY bracket assembly.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M8 × 55	4	29.97 N·m
Plain washer	φ8.5 × φ14.8 × 2	4	----
Parallel pin	φ8 × 18	2	----

3 Installing Y Slider Plate

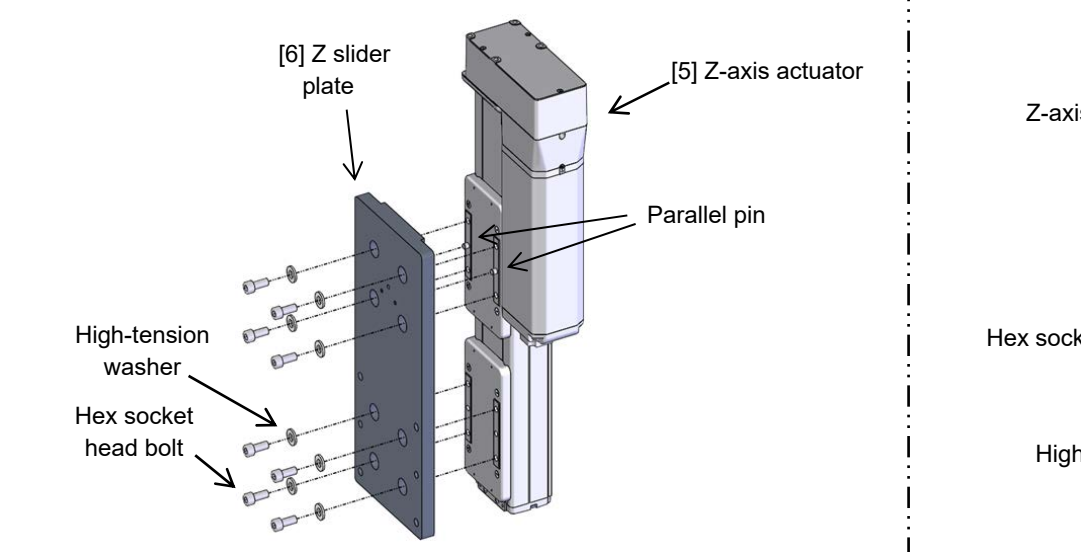
1. Attach [4] Y slider plate (M) to the [3] Y-axis actuator slider.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M8 × 30	4	29.97 N·m
High-tension washer	φ8.5 × φ18 × 2.3	4	----
Parallel pin	φ8 × 18	2	----

4 Assembling Z-axis Assembly

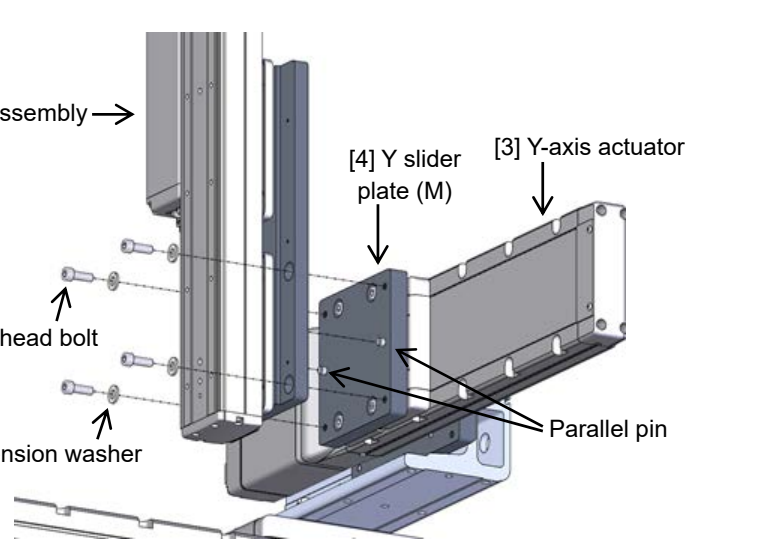
1. Attach [6] Z slider plate to the base surface of [5] Z-axis actuator.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M8 × 20	8	29.97 N·m
High-tension washer	φ8.5 × φ18 × 2.3	8	----
Parallel pin	φ6 × 15	2	----

5 Installing Z-axis Assembly

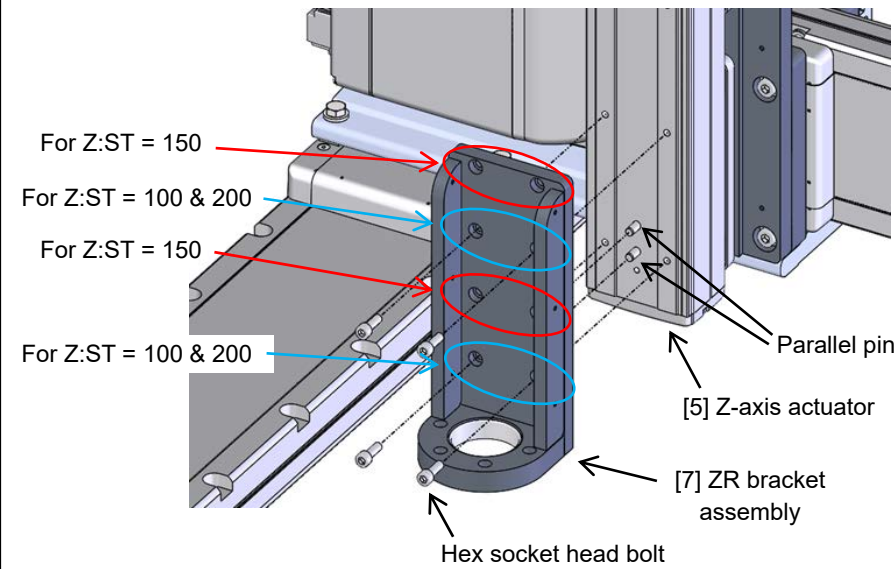
1. Attach Z-axis assembly built in [4] to [4] Y slider plate (M).



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M8 × 25	4	29.97 N·m
High-tension washer	φ8.5 × φ18 × 2.3	4	----
Parallel pin	φ8 × 18	2	----

6 Installing ZR Bracket

1. Attach [7] ZR bracket assembly to [5] Z-axis actuator.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt ^(Note 1)	M6 × 18	4	12.34 N·m
Parallel pin	φ6 × 15	2	----

Note 1: The holes for tightening should differ depending on the Z-axis stroke.

7 Assembling Hollow Rotary and RBT Bracket

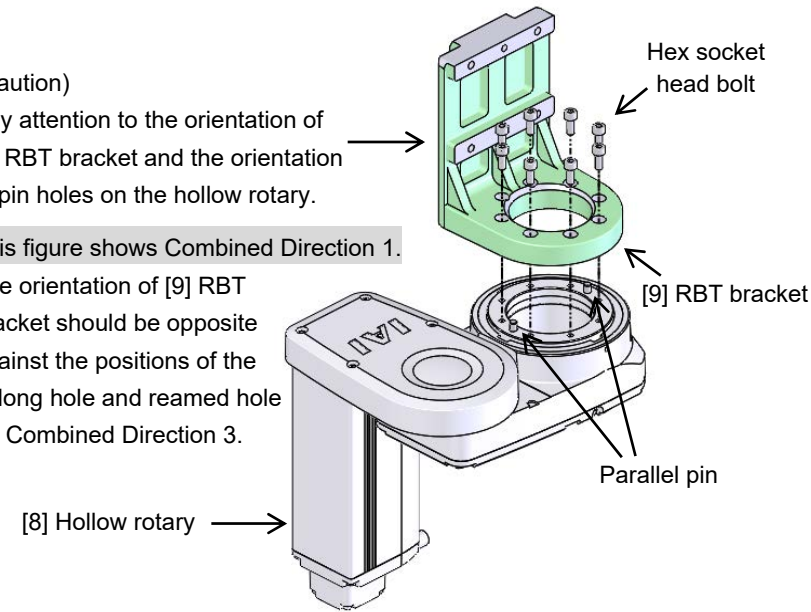
1. Attach [9] RBT bracket to [8] Hollow rotary.

(Caution)

Pay attention to the orientation of [9] RBT bracket and the orientation of pin holes on the hollow rotary.

This figure shows Combined Direction 1.

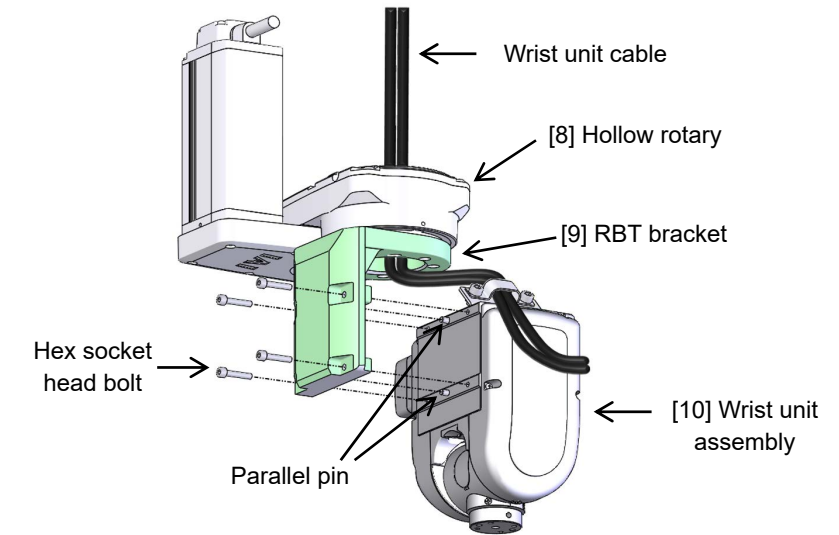
The orientation of [9] RBT bracket should be opposite against the positions of the oblong hole and reamed hole for Combined Direction 3.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M4 × 10	8	3.59 N·m
Parallel pin	φ4 × 8	2	----

8 Installing Wrist Unit

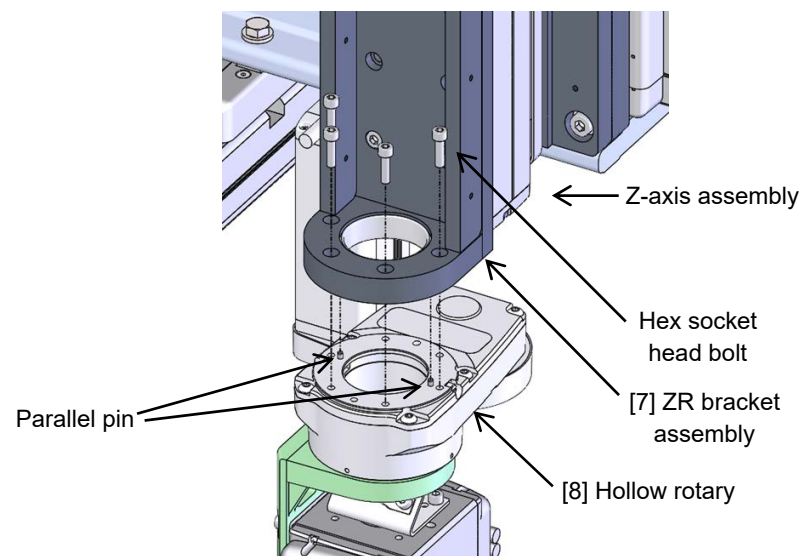
1. Put the cable on the wrist unit through the hollow on [8] Hollow rotary.
2. Attach [10] Wrist unit assembly to [9] RBT bracket.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M5 × 15	4	7.27 N·m
Parallel pin	φ5 × 10	2	----

9 Installing Hollow Rotary

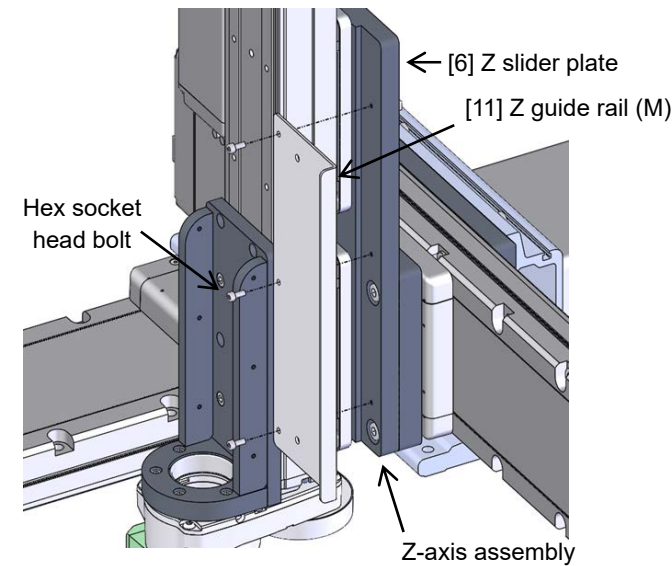
1. Put the cable on the wrist unit through the hollow on [7] ZR bracket assembly.
2. Attach [8] Hollow rotary to [7] ZR bracket assembly



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M5 × 18	4	7.27 N·m
Parallel pin	φ3 × 6	2	----

10 Installing Z Guide Rail

1. Attach [11] Z guide rail (M) to [6] Z slider plate.

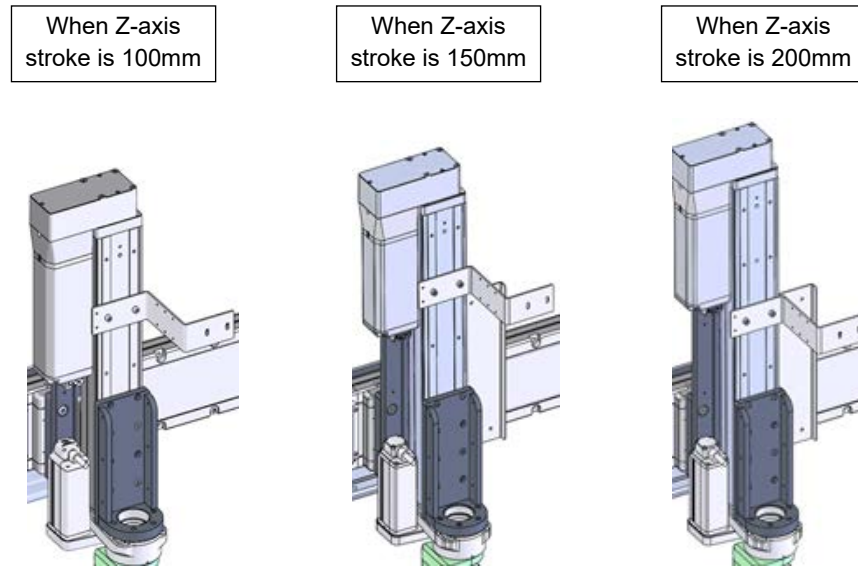
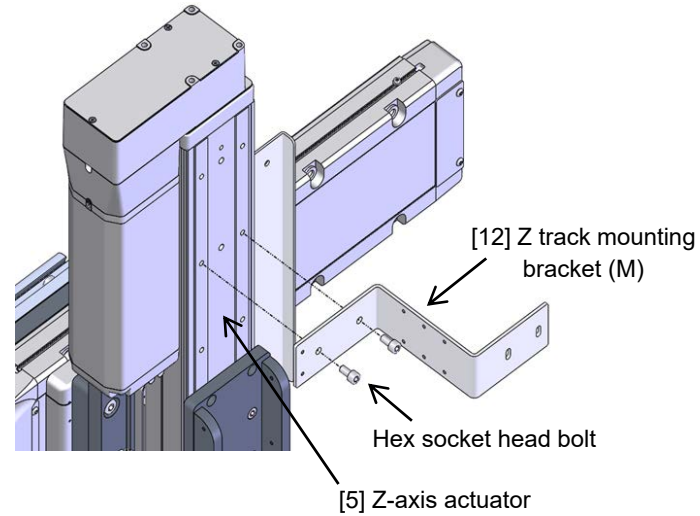


Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M4 × 10	3	3.59 N·m

Read "Common Contents for Wiring" in the last page.

11 Installing Z Track Mounting Bracket

- Attach [12] Z track mounting bracket (M) to [5] Z-axis actuator.
- (Caution) The position to attach should differ depending on the Z-axis stroke.

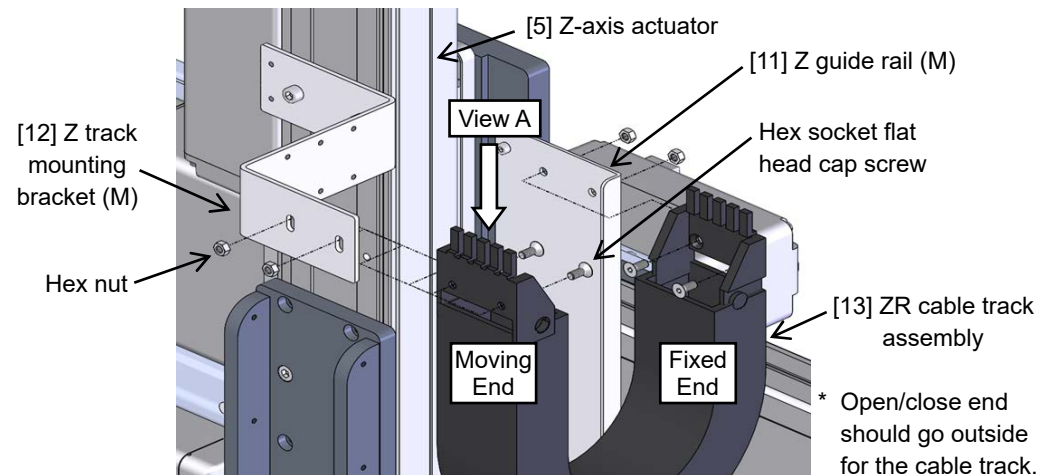


Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M6 × 12	2	12.34 N·m

13 Installing ZR Cable Track Assembly

- Join [13] ZR cable track assembly that cables are already laid to [12] Z track mounting bracket (M) and to [11] Z guide rail (M).

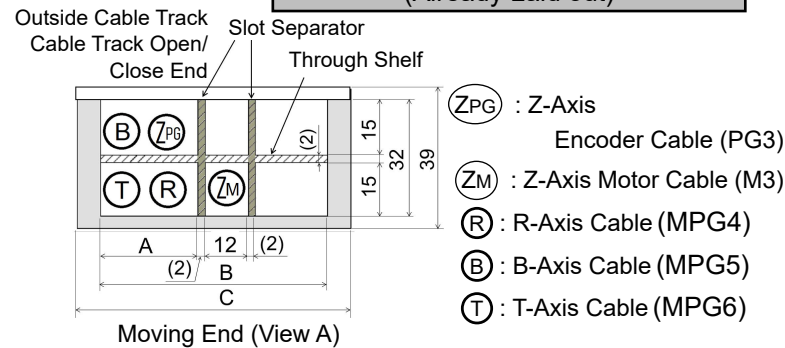
* In case of difficulty in tightening screws due to blockage of cables, cut the cable ties on the cables. After installation is complete, put the cables back in the cable track to the original position and fix them with cable ties.



Part Name	Specifications	Quantity	Tightening torque
Hex socket flat head cap screw	M5 × 12	4	5.10 N·m
Hex nut	M5 Class 1	4	----

Attachment Positions for each Type of Z-axis Strokes

Cables inside ZR Cable Track Layout (Already Laid out)

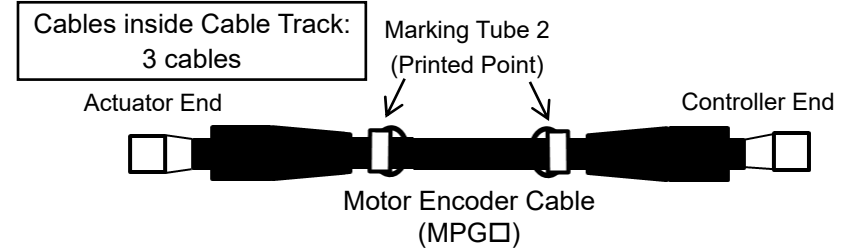
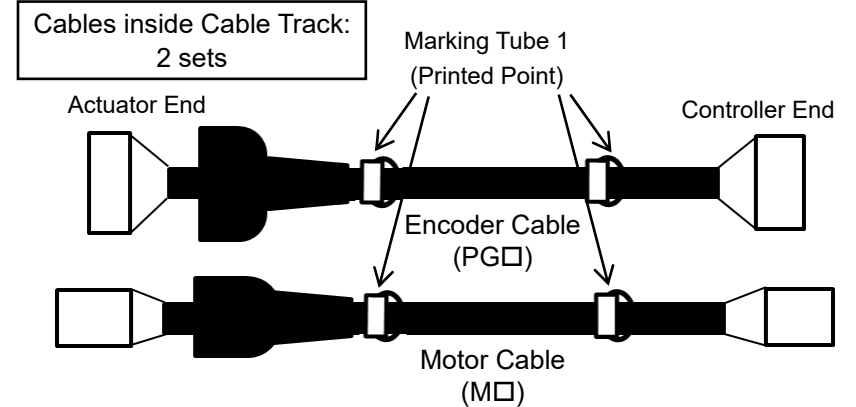


Check the symbols of the "3rd wiring cable track" in the model code for the type of ZR Cable Track selected at order. The size of each type of the cable tracks are as shown in the table below.

3rd (ZR) Cable Track		Dimensional Unit: mm		
Model Code	Cable Track Model Code	A	B	C
CT	B17.4.075.0	22	50	60.5
CTM	B17.5.075.0	27	63	76
CTL	B17.6.075.0	27	80	93

12 Check on Cable on ZR Cable Track Assembly

- Check which cable is for each axis one by one by looking at the print on the marking tube on each cable in each cable track.
- * The cables inside the cable track for the Z-axis/R-axis/B-axis/T-axis are laid out in [13] ZR cable track assembly.



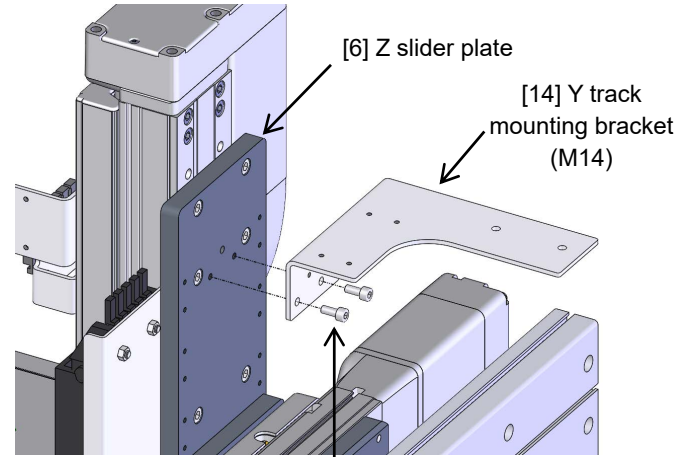
■ Marking Tube Printing Detail

Axis No.	Construction Axis	Symbol	Printing Detail	Remark
2	Y-axis	YM	M2	Printed on Marking Tube 1
		YPG	PG2	Printed on Marking Tube 1
3	Z-axis	ZM	M3	Already laid out in ZR cable track assembly Printed on Marking Tube 1
		ZPG	PG3	Already laid out in ZR cable track assembly Printed on Marking Tube 1
4	Hollow Rotary (R-axis)	R	MPG4	Already laid out in ZR cable track assembly Printed on Marking Tube 2
5	Wrist Swing (B-axis)	B	MPG5	Already laid out in ZR cable track assembly Printed on Marking Tube 2
6	Wrist Rotation (T-axis)	T	MPG6	Already laid out in ZR cable track assembly Printed on Marking Tube 2

14 Installing Y Track Mounting Bracket

- Attach [14] Y track mounting bracket (M14) (Note 1) to [6] Z slider plate.

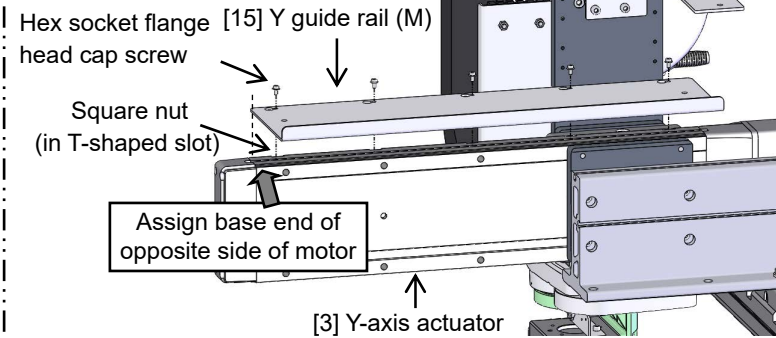
Note 1 Attach [14] Y track mounting bracket (M23) for Combined Direction 3.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M5 × 12	2	7.27 N·m

15 Installing Y Guide Rail

- Insert a square nut to the T-shaped slot on the top of [3] Y-axis actuator to attach [15] Y guide rail (M).
- Adjust the base end on the opposite side of the motor on [3] Y-axis actuator so it aligns with the end of [15] Y guide rail (M).



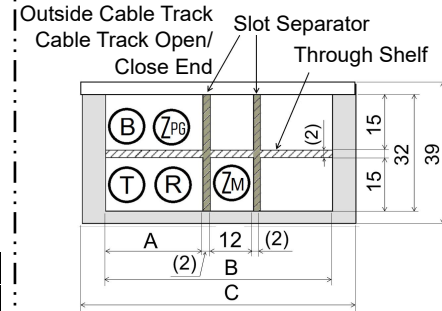
Part Name	Specifications	Quantity	Tightening torque
Hex socket flange head cap screw	M3 × 6	3 to 8 ^(Note 1)	1.62 N·cm
Square nut	Square nut M3	3 to 8 ^(Note 1)	----

Note 1: The quantity is subject to change depending on the stroke of Y-axis.

16 Assembling YZ Cable Track Assembly

- Check the symbols of the "2nd wiring cable track" in the model code for the type of [16] YZ cable track selected at order.
- Check the size of the cable track and attachment positions of the slot separators and through shelves in the table below.
- Store the cables inside the cable track for the Z-axis motor / R-axis / T-axis below [16] YZ cable track. (Refer to the figure below)
- Attach the slot separators and the through shelves in every two links from the first link on the moving end.
- Store the cables inside the cable track for the Z-axis encoder / B-axis above [16] YZ cable track. (Refer to the figure below)

Cables inside YZ Cable Track Layout

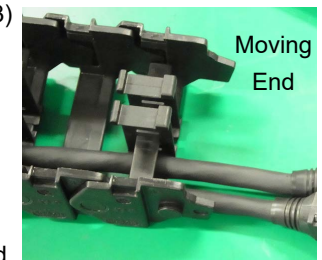


Moving End ([17] View B)

2nd (YZ) Cable Track Dimensional Unit: mm

Model Code	Cable Track Model Code	A	B	C
CT	B17.4.075.0	22	50	60.5
CTM	B17.5.075.0	27	63	76
CTL	B17.6.075.0	27	80	93

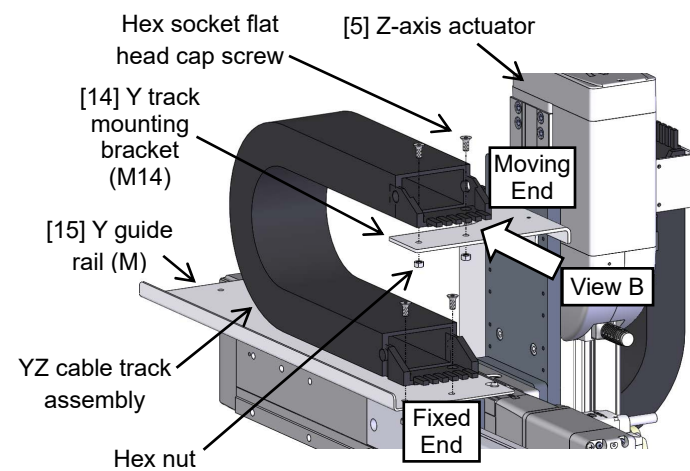
- ZPG : Z-Axis Encoder Cable (PG3)
- ZM : Z-Axis Motor Cable (M3)
- R : R-Axis Cable (MPG4)
- B : B-Axis Cable (MPG5)
- T : T-Axis Cable (MPG6)



* The cables are to be justified to the left from the view on the moving end.

17 Installing YZ Cable Track Assembly

- Attach YZ Cable Track Assembly built in [16] to [14] Y track mounting bracket (M14) and [15] Y guide rail (M).
- * Open/close end should go outside for the cable track.

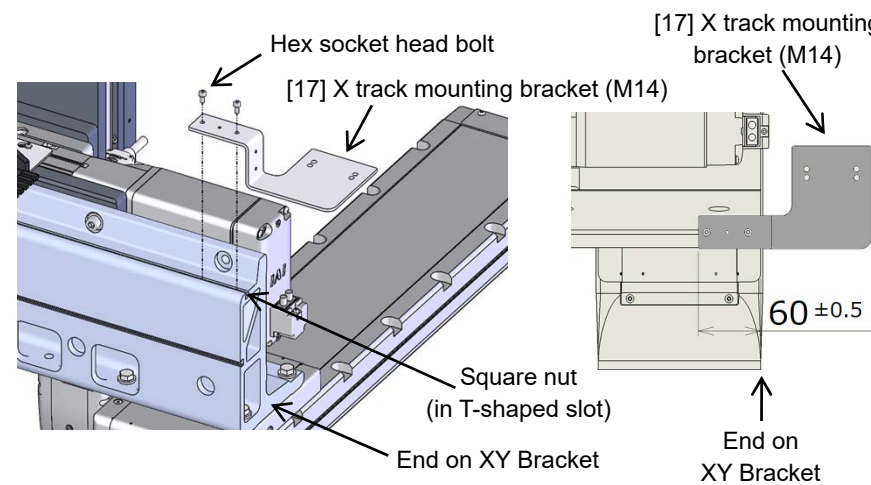


Part Name	Specifications	Quantity	Tightening torque
Hex socket flat head cap screw	M5 × 12	4	5.10 N·m
Hex nut	M5 Class 1	4	----

18 Installing X Track Mounting Bracket

- Insert a square nut to the T-shaped slot on the top of XY bracket to attach [17] X track mounting bracket (M14) (Note 1).
- Adjust the positions of the end of XY Bracket and the end of [17] X track mounting bracket (M14) so the distance between them falls into 60 ± 0.5mm.

Note 1 Attach [17] X track mounting bracket (M23) for Combined Direction 3.

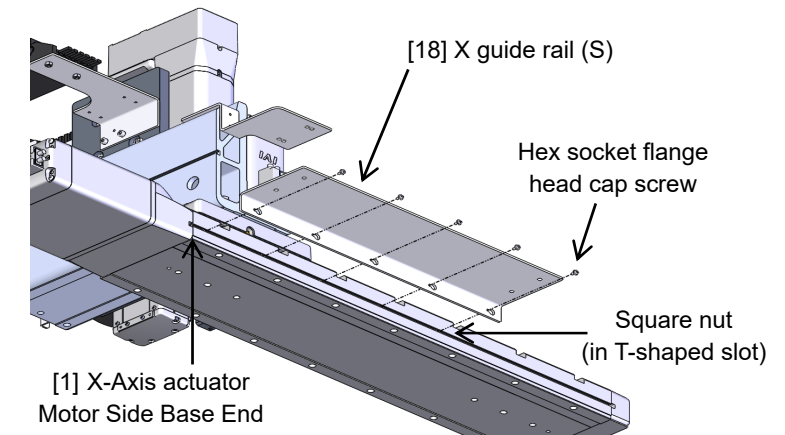


Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M4 × 10	2	3.59 N·m
Square nut	Square nut M4	2	----

19 Installing X Guide Rail

* This procedure is to be conducted before [1] X-axis actuator is installed on the platform.

- Insert a square nut to the T-shaped slot on the top of [1] X-axis actuator to attach [18] X guide rail (S).
- Adjust the position of [1] X-axis actuator so its base end on the motor side aligns with the end of [18] X guide rail (S).



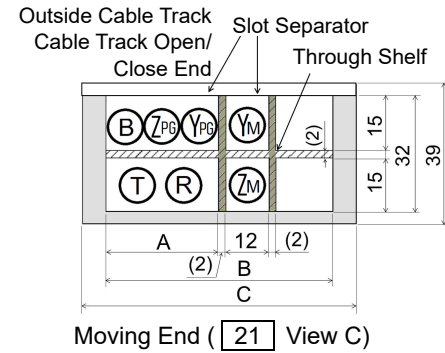
Part Name	Specifications	Quantity	Tightening torque
Hex socket flange head cap screw	M3 × 6	3 to 7 ^(Note 1)	1.62 N·m
Square nut	Square nut M3	3 to 7 ^(Note 1)	----

Note 1: The quantity is subject to change depending on the stroke of X-axis.

20 Assembling XY Cable Track Assembly

1. Check the symbols of the "1st wiring cable track" in the model code for the type of [19] XY cable track selected at order.
2. Check the size of the cable track and attachment positions of the slot separators and through shelves in the table below.
3. Store the cables inside the cable track for the Z-axis motor / R-axis / T-axis below [19] XY cable track. (Refer to the figure below)
4. Attach the slot separators and the through shelves in every two links from the first link on the moving end.
5. Store the cables inside the cable track for the Y-axis / Z-axis encoder / B-axis above [19] XY cable track. (Refer to the figure below)

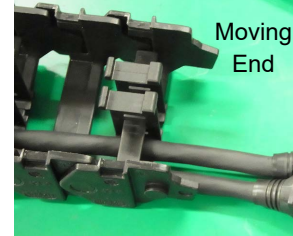
Cables inside XY Cable Track Layout



1st (XY) Cable Track Dimensional Unit: mm

Model Code	Cable Track Model Code	A	B	C
CTM	B17.5.075.0	27	63	76
CTL	B17.6.075.0	27	80	93
CTXL	B17.7.075.0	27	100	113

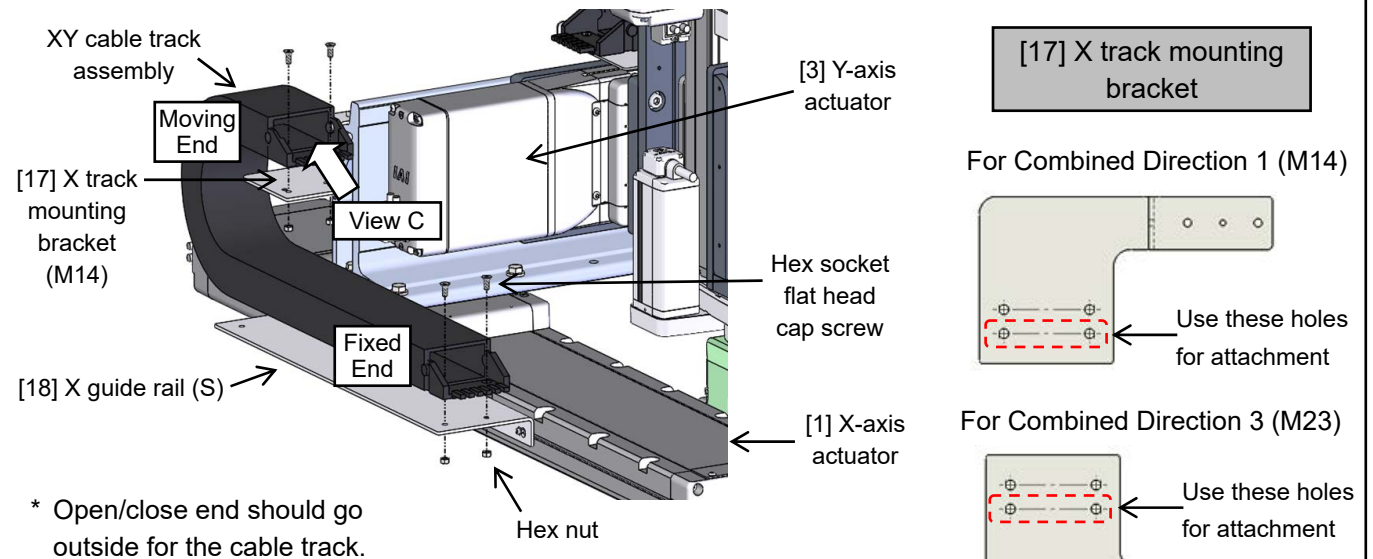
- ⓀPG : Y-Axis Encoder Cable (PG2)
- ⓀM : Y-Axis Motor Cable (M2)
- ⓀPG : Z-Axis Encoder Cable (PG3)
- ⓀM : Z-Axis Motor Cable (M3)
- Ⓚ : R-Axis Cable (MPG4)
- Ⓚ : B-Axis Cable (MPG5)
- Ⓚ : T-Axis Cable (MPG6)



* The cables are to be justified to the left from the view on the moving end.

21 Installing XY Cable Track Assembly

1. Attach XY cable track assembly built in [20] to [17] X track mounting bracket (M14) and [18] X guide rail (S).



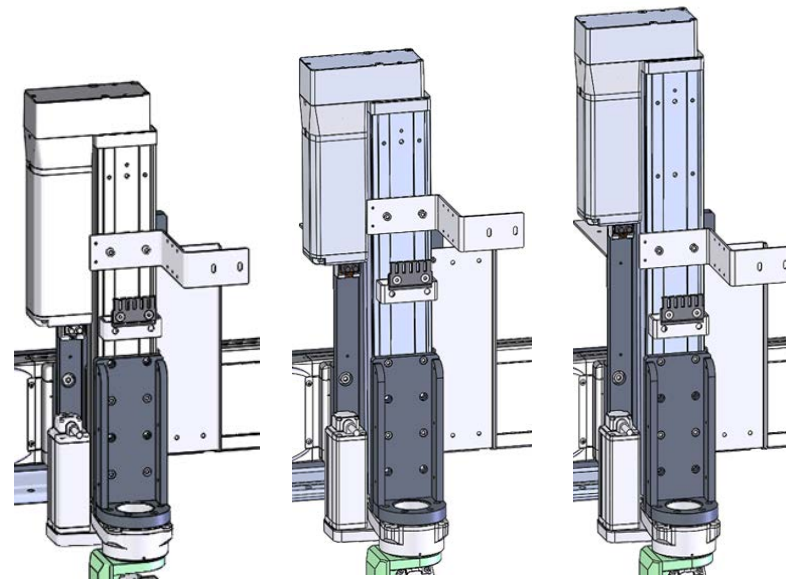
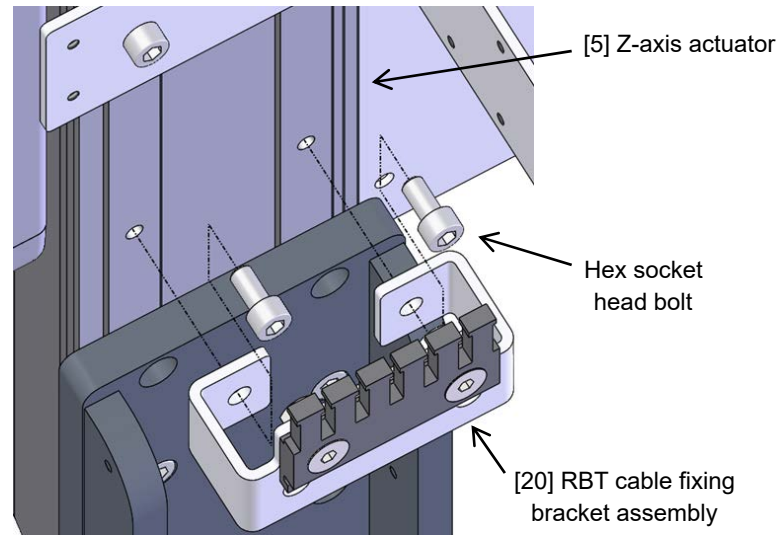
* Open/close end should go outside for the cable track.

Part Name	Specifications	Quantity	Tightening torque
Hex socket flat head cap screw	M5 × 12	4	5.10 N·m
Hex nut	M5 Class 1	4	---

22 Installing RBT Cable Fixing Bracket Assembly

1. Attach [20] RBT cable fixing bracket assembly to [5] Z-axis actuator. (Caution) The position to attach should differ depending on the Z-axis stroke.

Attachment Positions for each Type of Z-axis Strokes



When Z-axis stroke is 100mm

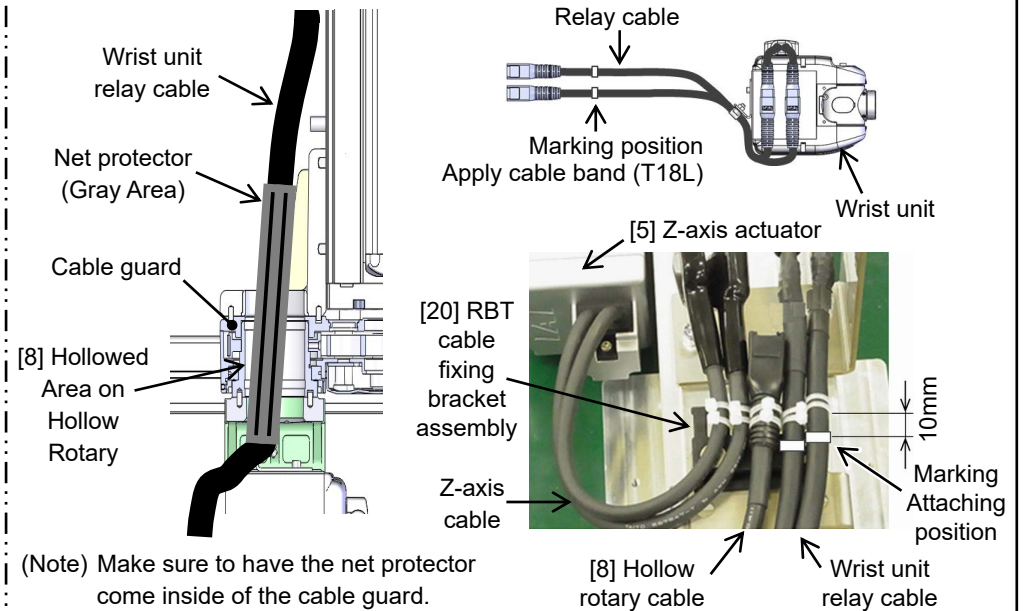
When Z-axis stroke is 150mm

When Z-axis stroke is 200mm

Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M6 × 12	2	12.34 N·m

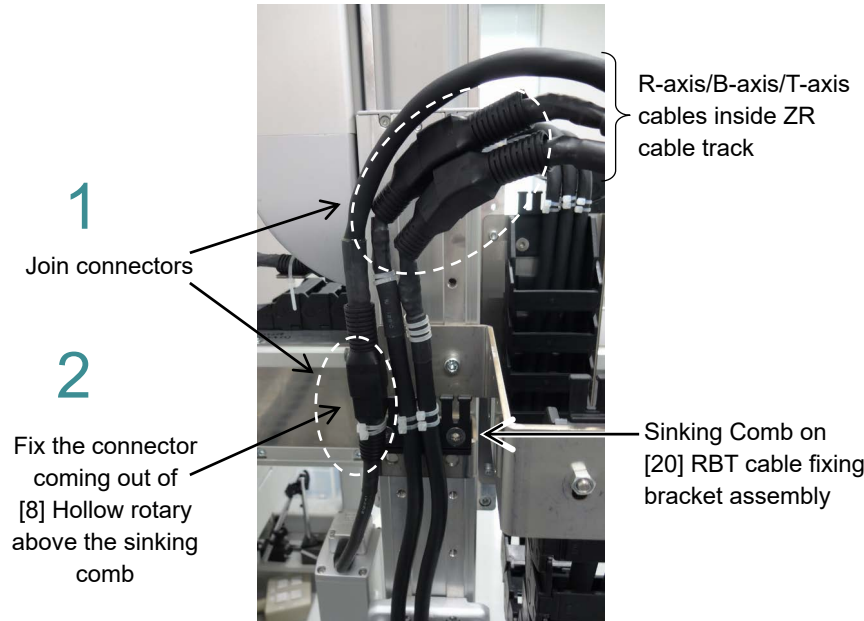
23 Wiring for Wrist Unit, Hollow Rotary and Z-axis Cable

1. Affix the cables coming out of the wrist unit through the hollow part of [8] Hollow rotary on the sinking comb of [20] RTB cable fixing bracket assembly with two cable bands applied on each cable. At that time, be aware of a marking on the wrist unit relay cables in order to have looseness in wiring of the relay cables so that the cables are fixed with a cable band at the position shown in the figure below.
2. Fix the Z-axis cable also at the sinking comb on [20] RTB cable fixing bracket assembly.



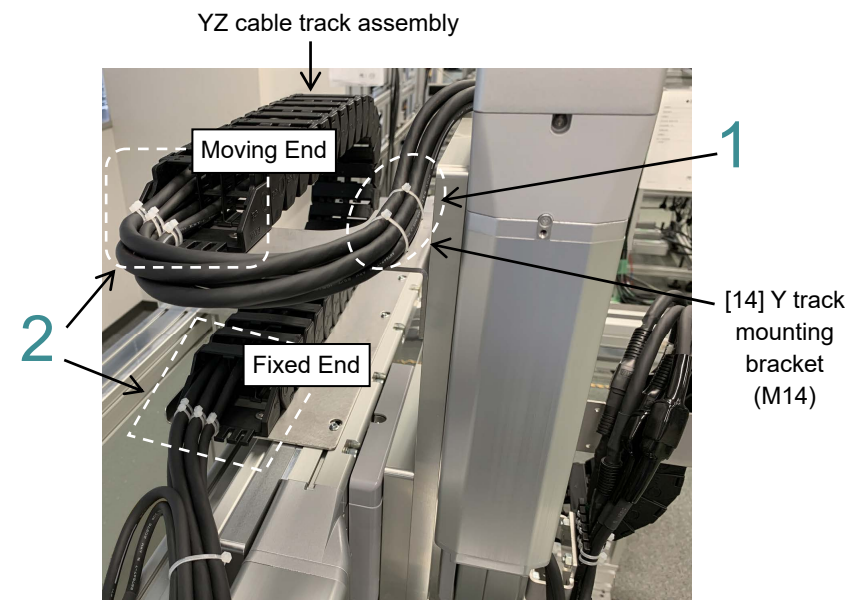
24 Connectivity of Cables inside ZR Cable Track and Actuator Cables

1. Connect the connectors on the cables inside the cable track for the R-axis/B-axis/T-axis in ZR Cable Track to the cable on each actuator.
2. Fix the cables on [8] Hollow rotary at the sinking comb on [20] RTB fixing bracket assembly so the connector coming out of [8] Hollow rotary comes above the sinking comb.



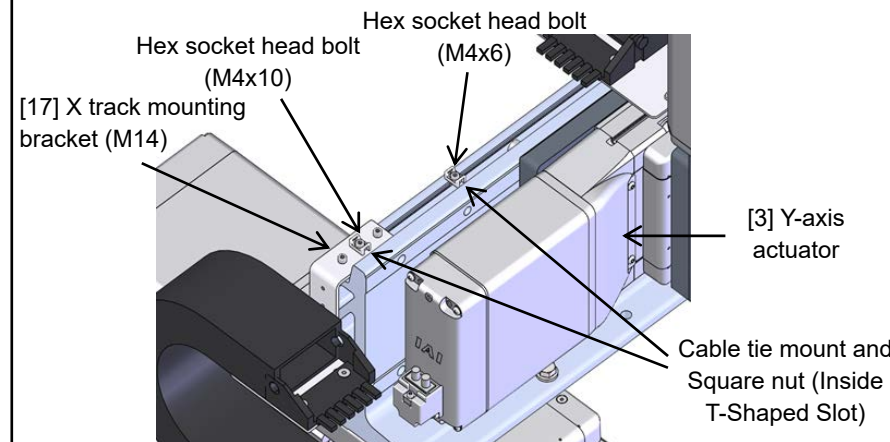
25 Wiring for Cables inside YZ Cable Track

1. Using the hole on [14] Y track mounting bracket (M14), fix the B-axis/T-axis cables on the wrist unit and the R-axis cable on [8] Hollow rotary together with a cable band.
2. Fix the Z-axis/R-axis/B-axis/T-axis cables inside the cable track on the moving end and fixed end of YZ cable track assembly with cable bands.



26 Fixing Y-Axis Connector

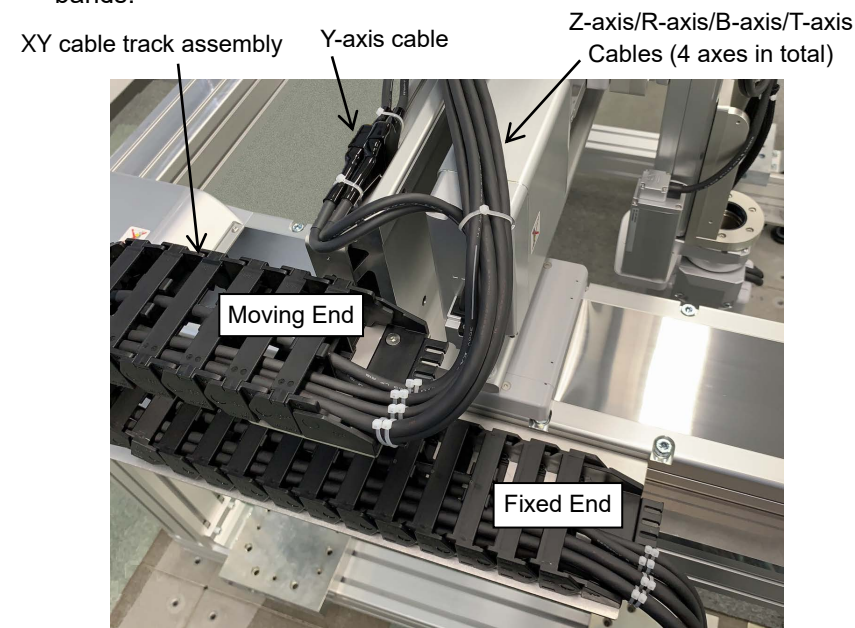
1. Affix the connector on [3] Y-axis actuator to [17] X track mounting bracket (M14) with using cable bands.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt (On Bracket Side)	M4 × 10	1	3.59 N m
Hex socket head bolt	M4 × 6	1	3.59 N m
Square nut	Square nut M4	2	----
Cable tie mount	KR5G5	1	----

27 Wiring for Cables inside XY Cable Track

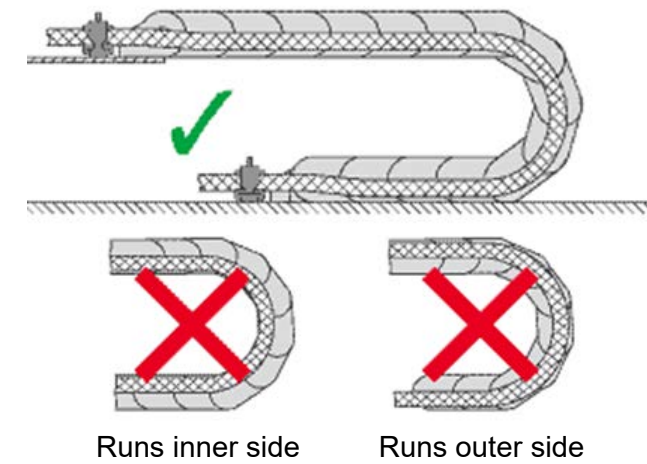
1. Fix the Y-axis/Z-axis/R-axis/B-axis/T-axis cables inside the cable track on the moving end and fixed end of XY Cable Track Assembly with cable bands.



Common Contents for Wiring

Caution for Fixing Cables inside Cable Track

- (1) Adjust the length of cables inside a cable track so they would not inside or outside.

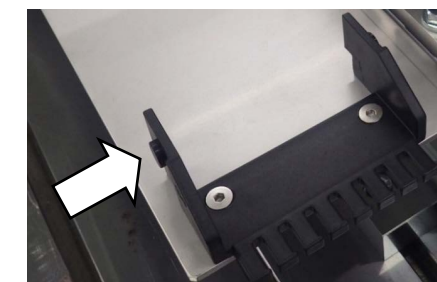


- (2) To fix at the sinking comb, use two cable bands on one cable.



Distinguishing Fixed End / Moving End of Cable Track

The end with projections at the joint of sides of a sinking comb and a cable track should be the fixed end.



Caution :

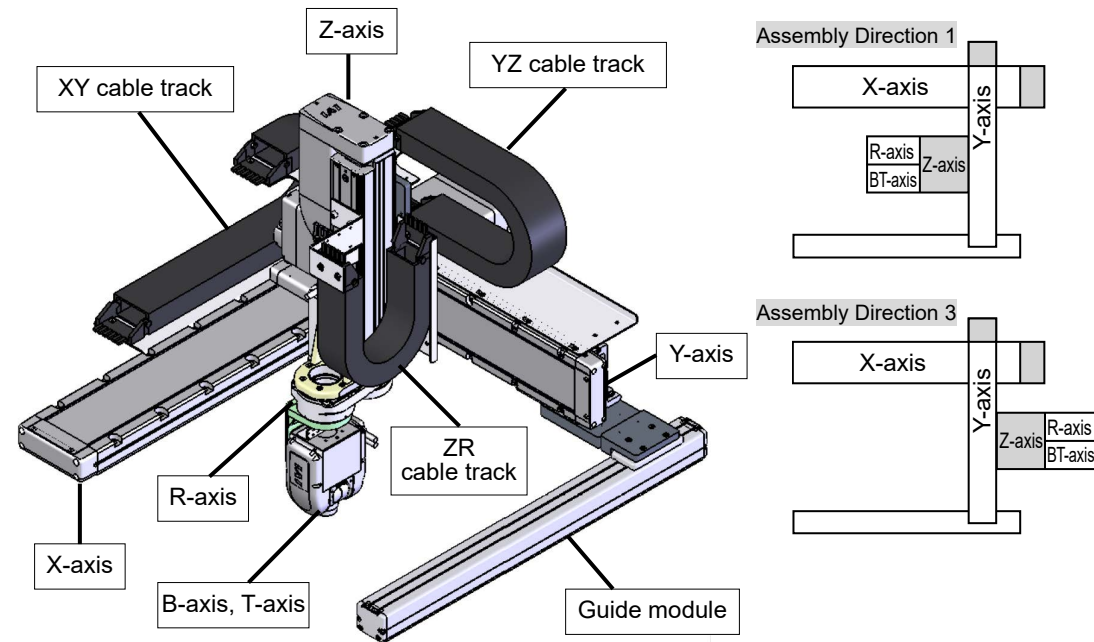
- Although each part has been chamfered to remove sharp edges, exercise due caution during the assembly to prevent injury. If necessary, wear gloves or other protective gears.
- Exercise due caution during the assembly to prevent pinching of hands and fingers.

[Tools to be Prepared] Hex wrench, Open-end wrench

0 It is necessary to have **22** Installing X Guide Rail first when **[1]** X-axis Actuator is to be fixed on a platform for assembly work.

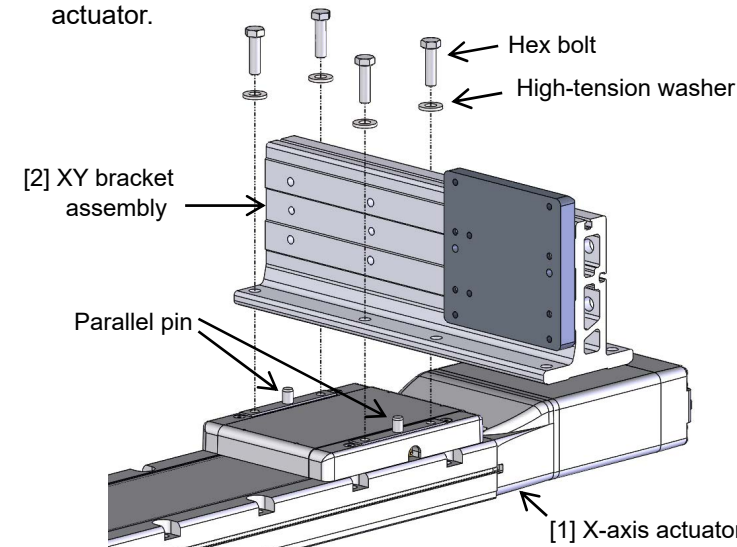
This assembly manual shows an example of building CRS-XGA Combined Direction 1

The directions of an actuator and brackets in Combined Direction 3 differ, but refer to this drawing for assembly.



1 Installing XY Bracket

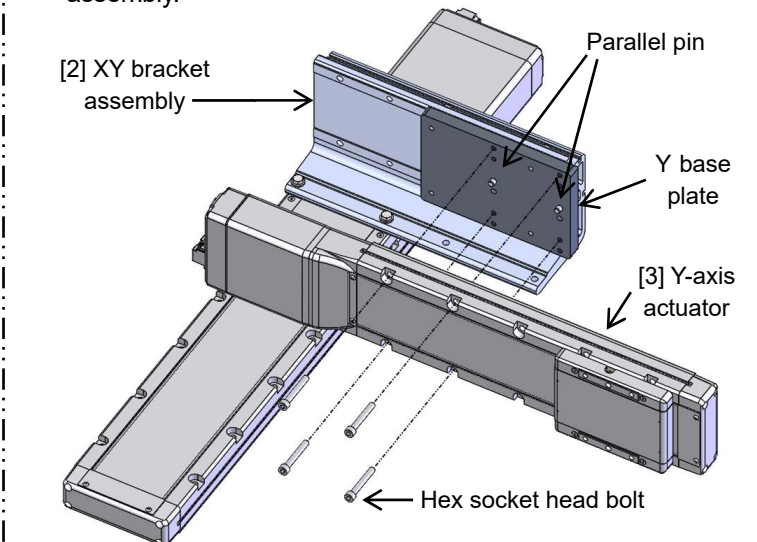
1. Attach [2] XY bracket assembly to the slider on [1] X-axis actuator.



Part Name	Specifications	Quantity	Tightening torque
Hex bolt	M8 × 30	4	29.97 N·m
High-tension washer	φ8.5 × φ18 × 2.3	4	----
Parallel pin	φ8 × 18	2	----

2 Installing Y-axis Actuator

1. Attach [3] Y-axis actuator to Y base plate on [2] XY bracket assembly.

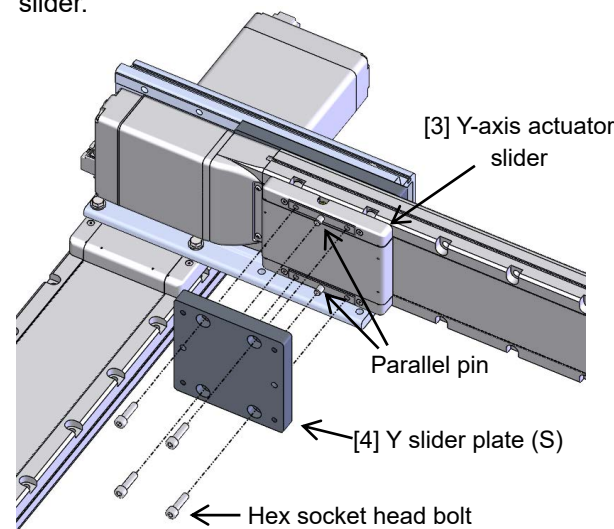


Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M6 × 45	4 (Note 1)	12.34 N·m
Parallel pin	φ8 × 18	2	----

Note 1: Y-axis with its stroke at 450mm or more should use 10 pieces of screws.

3 Installing Y Slider Plate

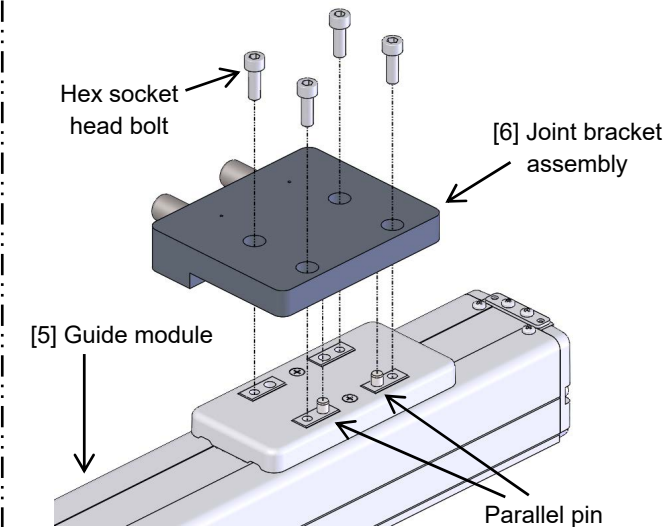
1. Attach [4] Y slider plate (S) to the [3] Y-axis actuator slider.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M6 × 18	4	12.34 N·m
Parallel pin	φ6 × 15	2	----

4 Installing Joint Bracket Assembly

1. Attach [6] Joint bracket assembly to [5] Guide module.



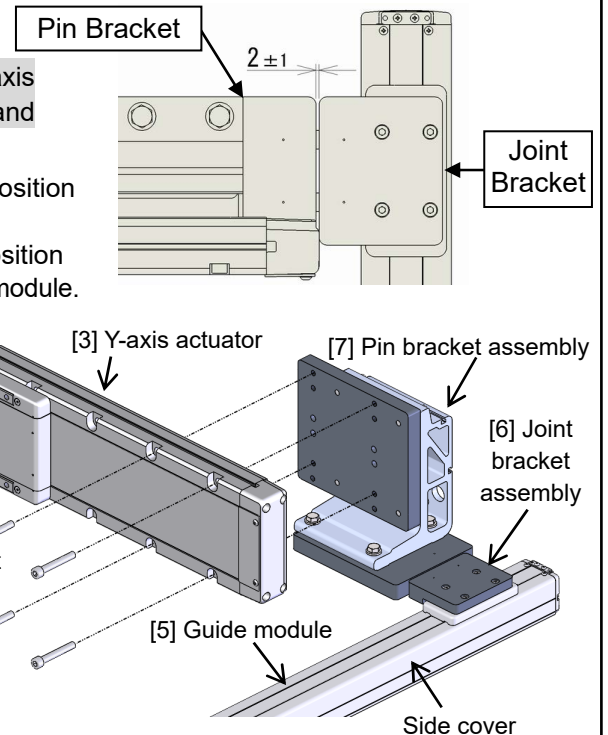
Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M5 × 15	4	7.27 N·m
Parallel pin	φ5 × 10	2	----

5 Linkage of Y-axis Actuator and Guide Module

In this process, alignment of home positions for the master axis ([1] X-axis actuator) and the slave axis ([5] Guide module) and paralleling of them should be conducted.

- Push the slider on [1] X-axis actuator towards the home position manually and mark this position on the X-axis actuator.
- Push the slider on [5] Guide module towards the home position on the X-axis manually and mark this position on the guide module.
- Put in [7] Pin bracket assembly to [6] Joint bracket assembly and attach [3] Y-axis actuator.
- With the slider on [1] X-axis actuator pushed towards the home position on the X-axis (to the position marked in 1), set [5] Guide module to the position marked in 2 and loosely tighten it.
- Have the pin bracket and the joint bracket set parallel so the gap between them is 2 ± 1 mm in the entire range of the X-axis operation.
- Have the attachment screws on [5] Guide module fully tightened.
- Move the X-axis in the full stroke to confirm that it moves smoothly.

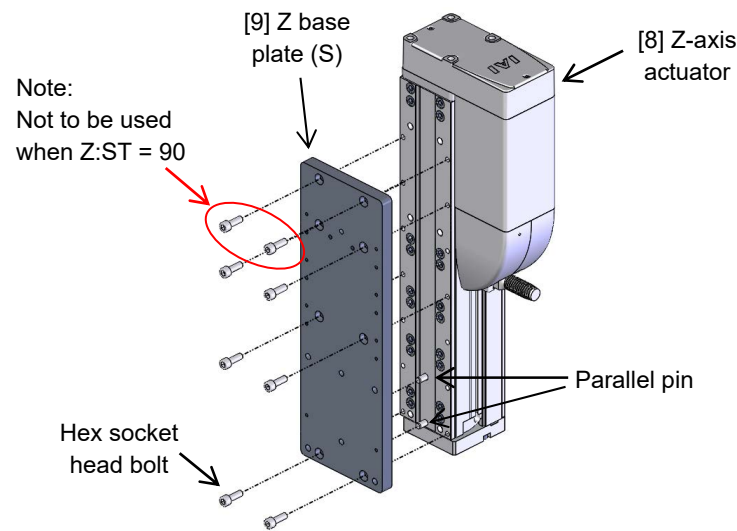
Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M6 × 45	4	12.34 N·m



* Remove the side cover in order to affix [5] Guide module.

6 Assembling Z-axis Assembly

1. Attach [9] Z base plate (S) to the base surface of [8] Z-axis actuator.

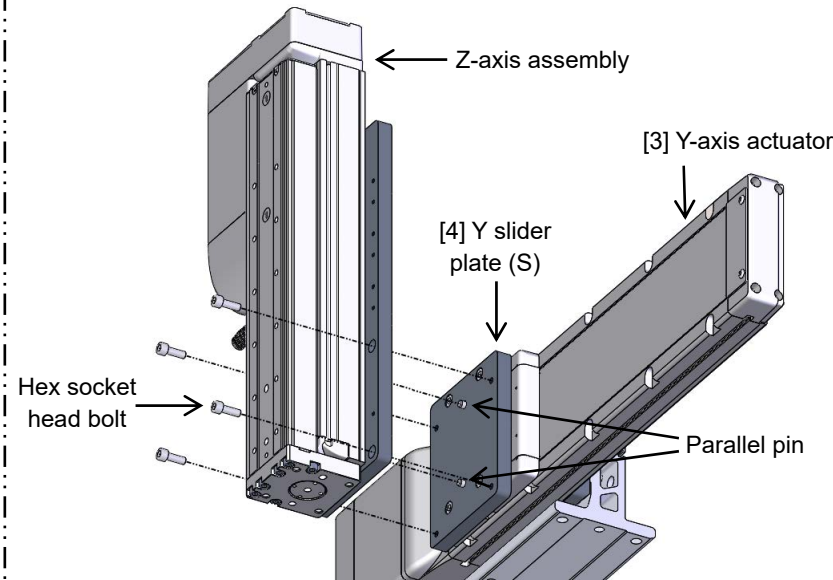


Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M6 × 18	8 (Note 1)	12.34 N·m
Parallel pin	φ6 × 15	2	----

Note 1: Use only six pieces of screws when the Z-axis stroke is 90mm.

7 Installing Z-axis Assembly

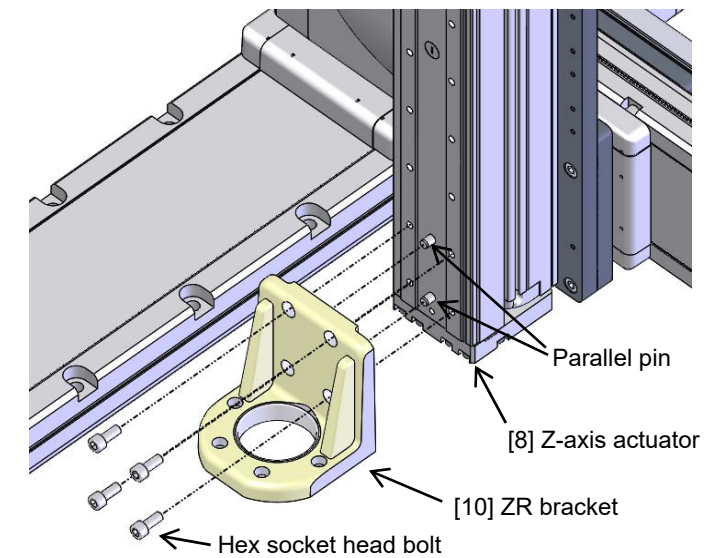
1. Attach Z-axis assembly built in [6] to [4] Y slider plate (S).



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M6 × 18	4	12.34 N·m
Parallel pin	φ6 × 15	2	----

8 Installing ZR Bracket

1. Attach [10] ZR bracket to [8] Z-axis actuator.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M6 × 15	4	12.34 N·m
Parallel pin	φ6 × 10	2	----

9 Assembling Hollow Rotary and RBT Bracket

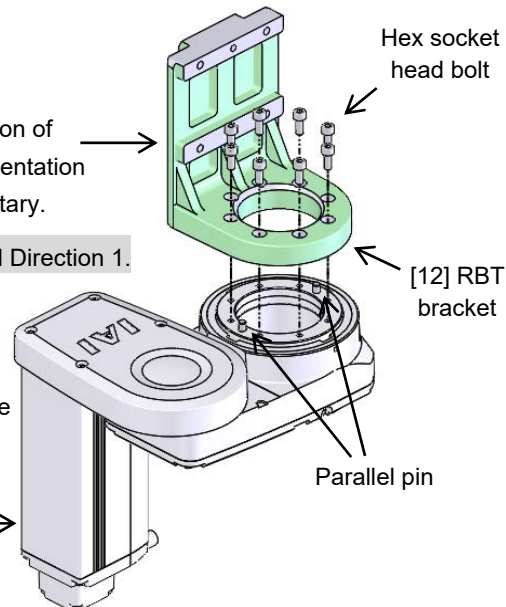
1. Attach [12] RBT bracket to [11] Hollow rotary.

(Caution)

Pay attention to the orientation of [12] RBT bracket and the orientation of pin holes on the hollow rotary.

This figure shows Combined Direction 1.

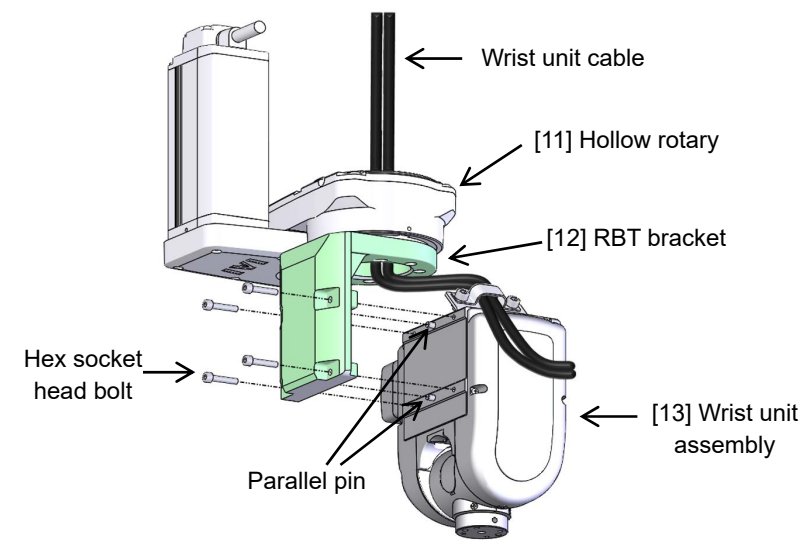
The orientation of [12] RBT bracket should be opposite against the positions of the oblong hole and reamed hole for Combined Direction 3.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M4 × 10	8	3.59 N·m
Parallel pin	φ4 × 8	2	----

10 Installing Wrist Unit

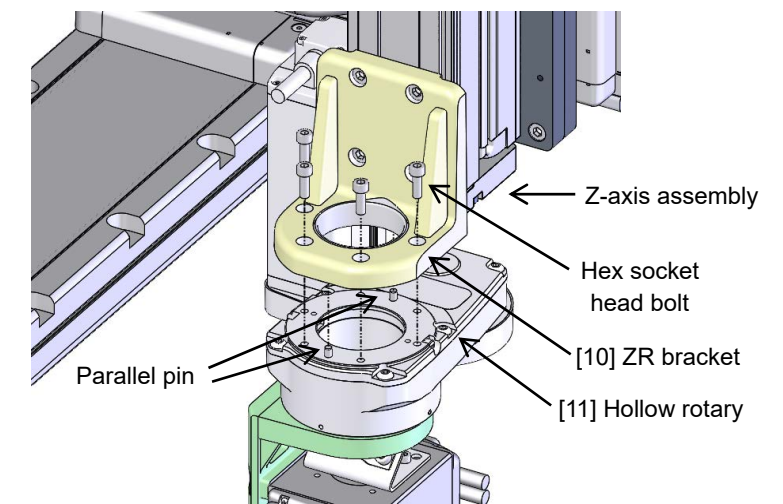
1. Put the cable on the wrist unit through the hollow on [11] Hollow rotary.
 2. Attach [13] Wrist unit assembly to [12] RBT bracket.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M4 × 20	4	3.59 N·m
Parallel pin	φ4 × 8	2	----

11 Installing Hollow Rotary

1. Put the cable on the wrist unit through the hollow on [10] ZR bracket.
 2. Attach [11] Hollow rotary to [10] ZR bracket.

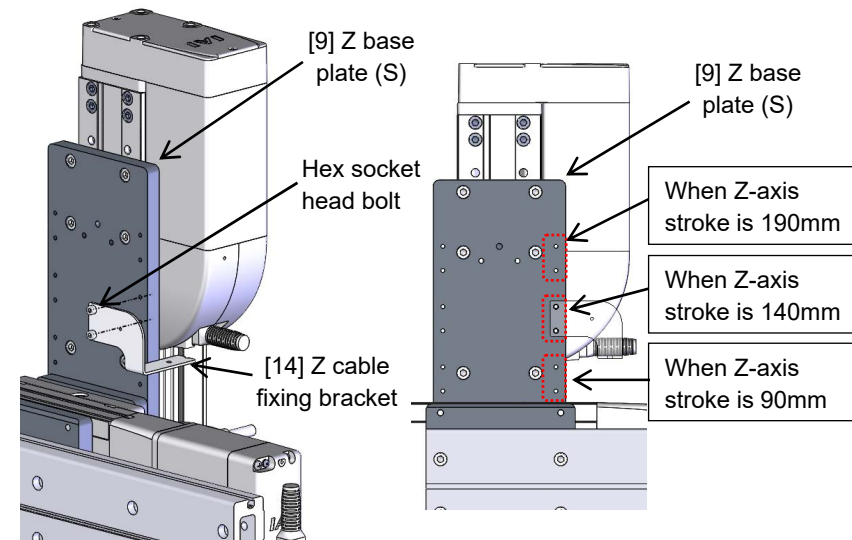


Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M5 × 15	4	7.27 N·m
Parallel pin	φ4 × 8	2	----

Read "Common Contents for Wiring" in the last page.

12 Installing Z Cable Fixing Bracket

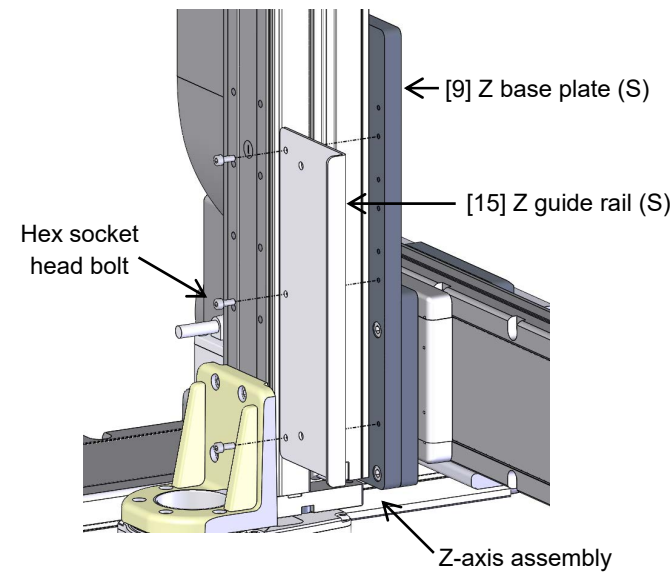
- Attach [14] Z cable fixing bracket to [9] Z base plate (S).
 (Caution) The position to attach should differ depending on the Z-axis stroke.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M4 × 10	2	3.59 N·m

13 Installing Z Guide Rail

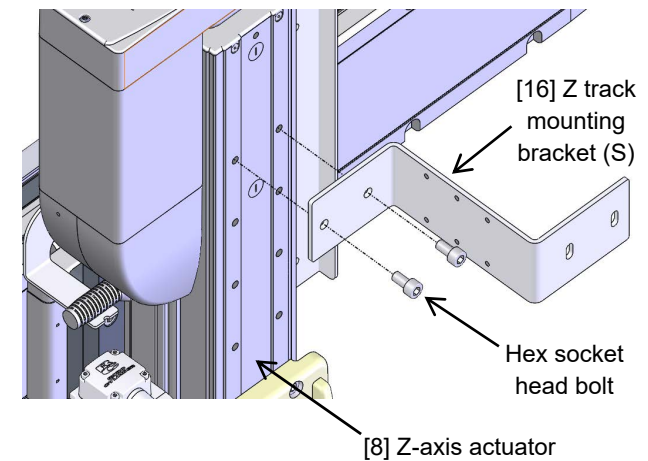
- Attach [15] Z guide rail (S) to [9] Z base plate (S).



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M4 × 10	3	3.59 N·m

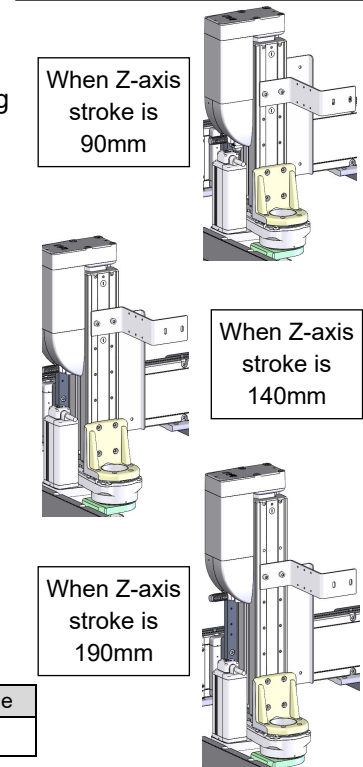
14 Installing Z Track Mounting Bracket

- Attach [16] Z track mounting bracket (S) to [8] Z-axis actuator.
 (Caution) The position to attach should differ depending on the Z-axis stroke.



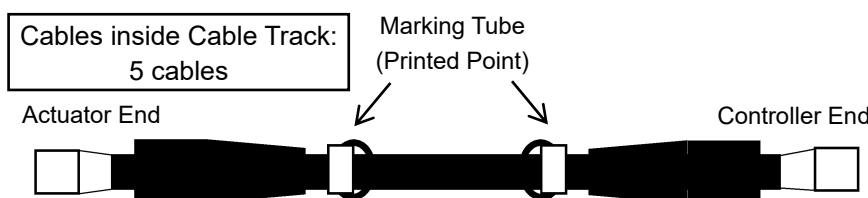
Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M6 × 12	2	12.34 N·m

Attachment Positions for each Type of Z-axis Strokes



15 Check on Cable on ZR Cable Track Assembly

- Check which cable is for each axis one by one by looking at the print on the marking tube on five cables in the cable track.
 * The cables inside the cable track for the R-axis/B-axis/T-axis are laid out in [17] ZR cable track assembly.



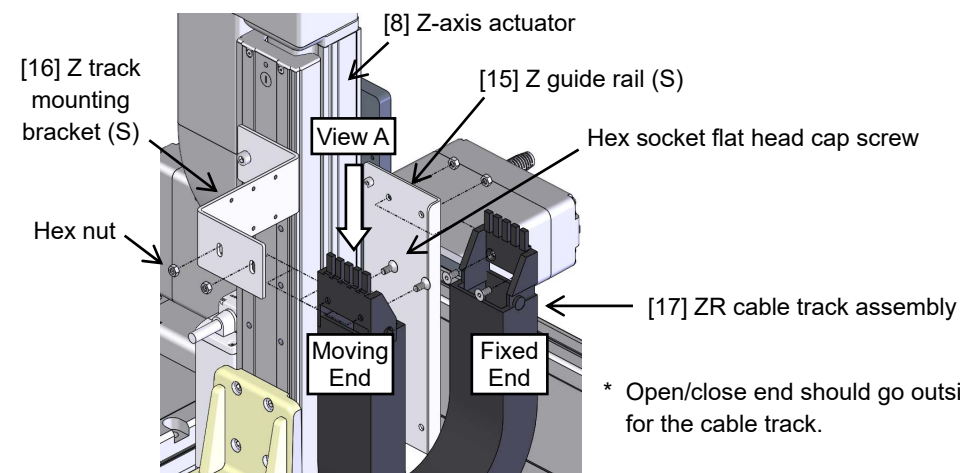
■ Marking Tube Printing Detail

Axis No.	Construction Axis	Symbol	Printing Detail	Remark
2	Y-axis	Y	MPG2	
3	Z-axis	Z	MPG3	
4	Hollow Rotary (R-axis)	R	MPG4	Already laid out in ZR cable track assembly
5	Wrist Swing (B-axis)	B	MPG5	Already laid out in ZR cable track assembly
6	Wrist Rotation (T-axis)	T	MPG6	Already laid out in ZR cable track assembly

16 Installing ZR Cable Track Assembly

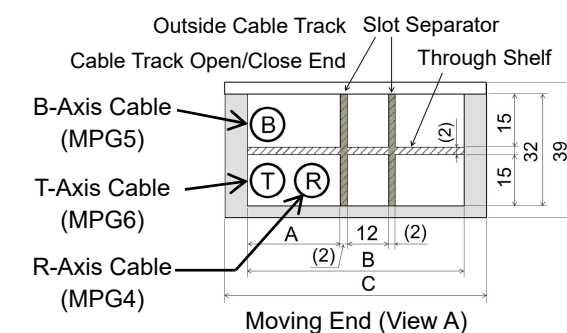
- Join [17] ZR cable track assembly that cables are already laid to [16] Z track mounting bracket (S) and to [15] Z guide rail (S).

* In case of difficulty in tightening screws due to blockage of cables, cut the cable ties on the cables. After installation is complete, put the cables back in the cable track to the original position and fix them with cable ties.



Part Name	Specifications	Quantity	Tightening torque
Hex socket flat head cap screw	M5 × 12	4	5.10 N·m
Hex nut	M5 Class 1	4	----

Cables inside ZR Cable Track Layout (Already Laid out)



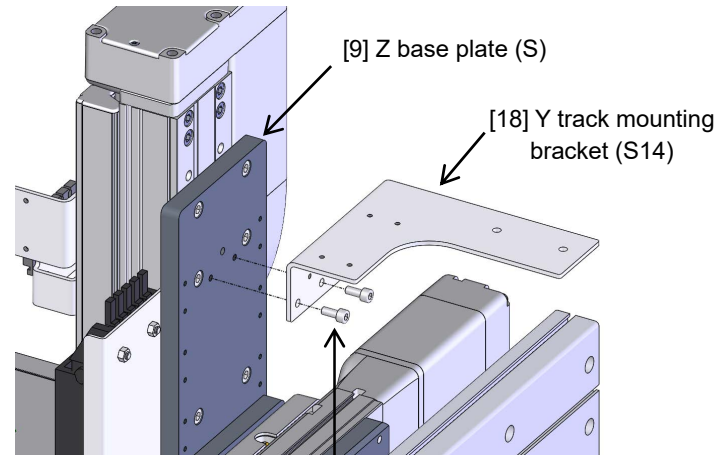
Check the symbols of the "3rd wiring cable track" in the model code for the type of ZR Cable Track selected at order. The size of each type of the cable tracks are as shown in the table below.

3rd (ZR) Cable Track		Dimensional Unit: mm		
Model Code	Cable Track Model Code	A	B	C
CT	B17.4.075.0	22	50	60.5
CTM	B17.5.075.0	27	63	76

17 Installing Y Track Mounting Bracket

1. Attach [18] Y track mounting bracket (S14) (Note 1) to [9] Z base plate (S).

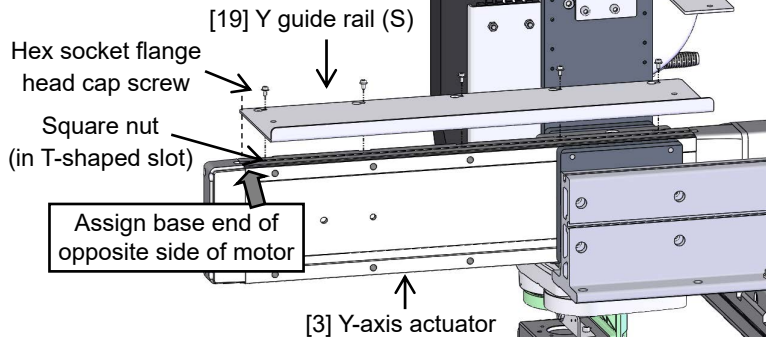
Note 1 Attach [18] Y track mounting bracket (S23) for Combined Direction 3.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M5 × 12	2	7.27 N·m

18 Installing Y Guide Rail

1. Insert a square nut to the T-shaped slot on the top of [3] Y-axis actuator to attach [19] Y guide rail (S).
2. Adjust the base end on the opposite side of the motor on [3] Y-axis actuator so it aligns with the end of [19] Y guide rail (S).



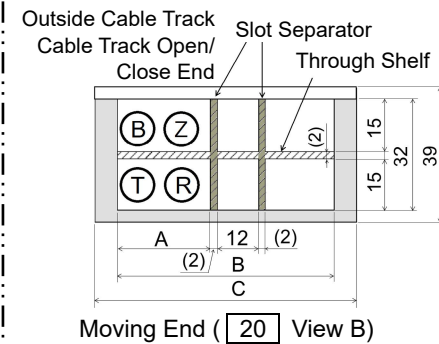
Part Name	Specifications	Quantity	Tightening torque
Hex socket flange head cap screw	M3 × 6	3 to 7 ^(Note 1)	1.62 N·cm
Square nut	Square nut M3	3 to 7 ^(Note 1)	----

Note 1: The quantity is subject to change depending on the stroke of Y-axis.

19 Assembling YZ Cable Track Assembly

1. Check the symbols of the "2nd wiring cable track" in the model code for the type of [20] YZ cable track selected at order.
2. Check the size of the cable track and attachment positions of the slot separators and through shelves in the table below.
3. Store the cables inside the cable track for the R-axis / T-axis below [20] YZ cable track. (Refer to the figure below)
4. Attach the slot separators and the through shelves in every two links from the first link on the moving end.
5. Store the cables inside the cable track for the Z-axis / B-axis above [20] YZ cable track. (Refer to the figure below)

Cables inside YZ Cable Track Layout

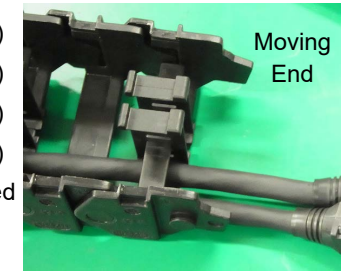


2nd (YZ) Cable Track Dimensional Unit: mm

Model Code	Cable Track Model Code	A	B	C
CT	B17.4.075.0	22	50	60.5
CTM	B17.5.075.0	27	63	76
CTL	B17.6.075.0	27	80	93

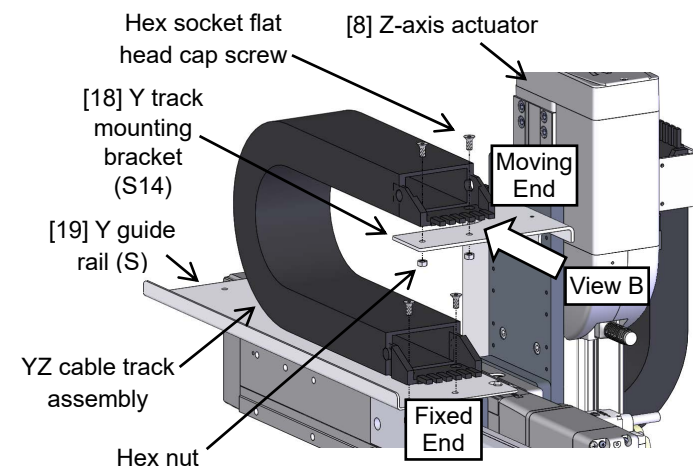
- Ⓩ : Z-Axis Cable (MPG3)
- Ⓡ : R-Axis Cable (MPG4)
- ⓑ : B-Axis Cable (MPG5)
- Ⓣ : T-Axis Cable (MPG6)

The cables are to be justified to the left from the view on the moving end.



20 Installing YZ Cable Track Assembly

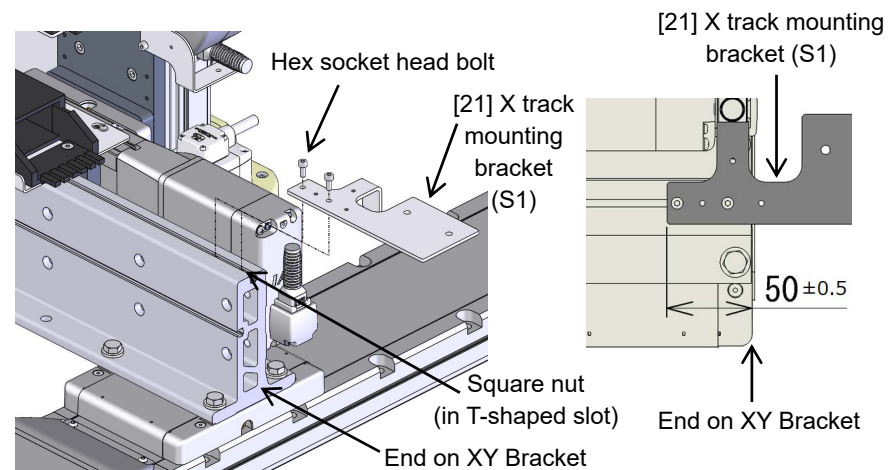
1. Attach YZ Cable Track Assembly built in [19] to [18] Y track mounting bracket (S14) and [19] Y guide rail (S).
- * Open/close end should go outside for the cable track.



Part Name	Specifications	Quantity	Tightening torque
Hex socket flat head cap screw	M5 × 12	4	5.10 N·m
Hex nut	M5 Class 1	4	----

21 Installing X Track Mounting Bracket

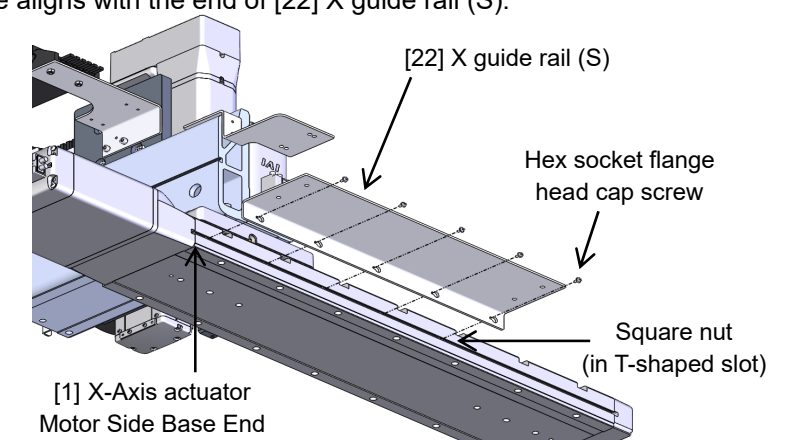
1. Insert a square nut to the T-shaped slot on the top of XY bracket to attach [21] X track mounting bracket (S1) (Note 1).
 2. Adjust the positions of the end of ZY Bracket and the end of [21] X track mounting bracket (S1) so the distance between them falls into 50 ± 0.5mm.
- Note 1 Attach [21] X track mounting bracket (S3) for Combined Direction 3.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M4 × 10	2	3.59 N·m
Square nut	Square nut M4	2	----

22 Installing X Guide Rail

- * This procedure is to be conducted before [1] X-axis actuator is installed on the platform.
1. Insert a square nut to the T-shaped slot on the top of [1] X-axis actuator to attach [22] X guide rail (S).
 2. Adjust the position of [1] X-axis actuator so its base end on the motor side aligns with the end of [22] X guide rail (S).



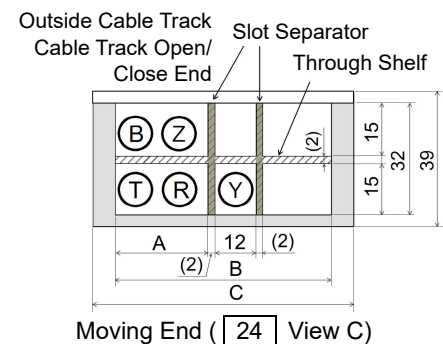
Part Name	Specifications	Quantity	Tightening torque
Hex socket flange head cap screw	M3 × 6	3 to 8 ^(Note 1)	1.62 N·m
Square nut	Square nut M3	3 to 8 ^(Note 1)	----

Note 1: The quantity is subject to change depending on the stroke of X-axis.

23 Assembling XY Cable Track Assembly

1. Check the symbols of the "1st wiring cable track" in the model code for the type of [23] XY cable track selected at order.
2. Check the size of the cable track and attachment positions of the slot separators and through shelves in the table below.
3. Store the cables inside the cable track for the Y-axis / R-axis / T-axis below [23] XY cable track. (Refer to the figure below)
4. Attach the slot separators and the through shelves in every two links from the first link on the moving end.
5. Store the cables inside the cable track for the Z-axis / B-axis above [23] XY cable track. (Refer to the figure below)

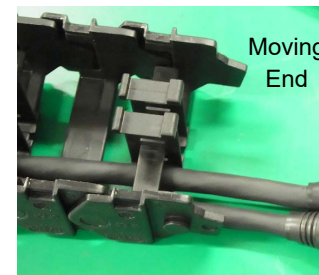
Cables inside XY Cable Track Layout



1st (XY) Cable Track Dimensional Unit: mm

Model Code	Cable Track Model Code	A	B	C
CTM	B17.5.075.0	27	63	76
CTL	B17.6.075.0	27	80	93
CTXL	B17.7.075.0	27	100	113

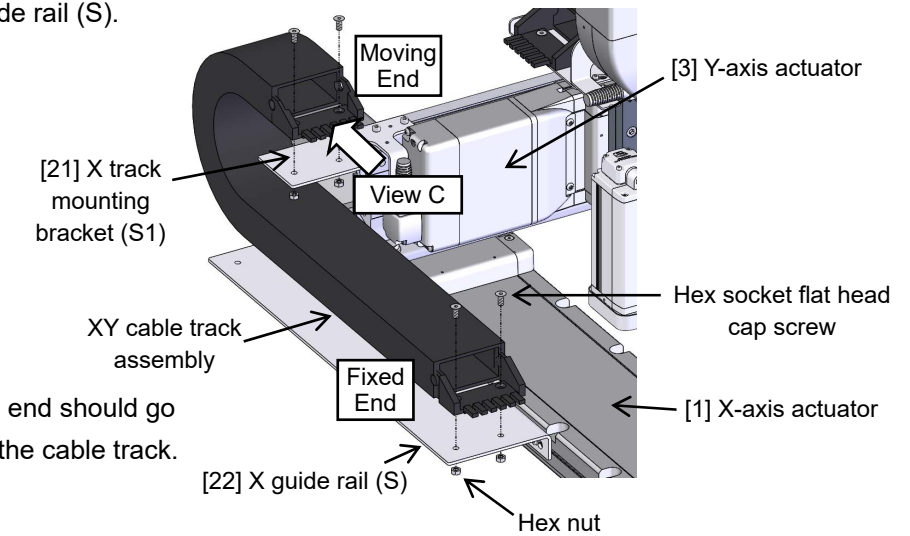
- Ⓨ : Y-Axis Cable (MPG2)
- Ⓩ : Z-Axis Cable (MPG3)
- Ⓡ : R-Axis Cable (MPG4)
- Ⓟ : B-Axis Cable (MPG5)
- Ⓣ : T-Axis Cable (MPG6)



* The cables are to be justified to the left from the view on the moving end.

24 Installing XY Cable Track Assembly

1. Attach XY cable track assembly built in [23] to [21] X track mounting bracket (S1) and [22] X guide rail (S).

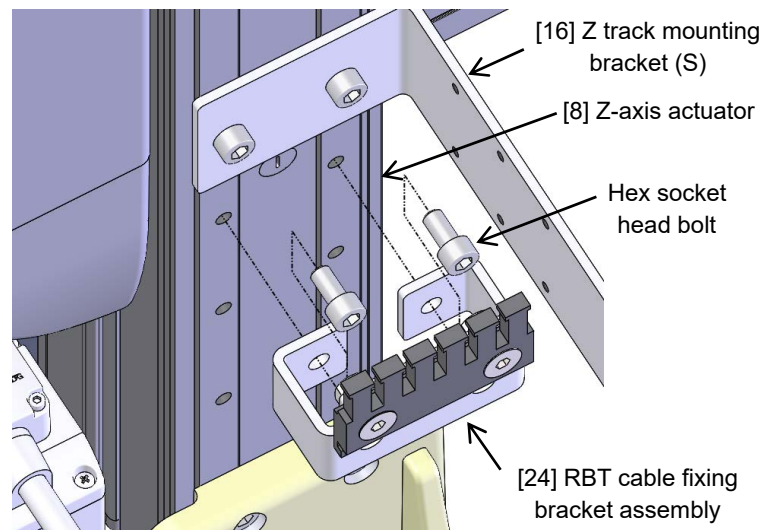


* Open/close end should go outside for the cable track.

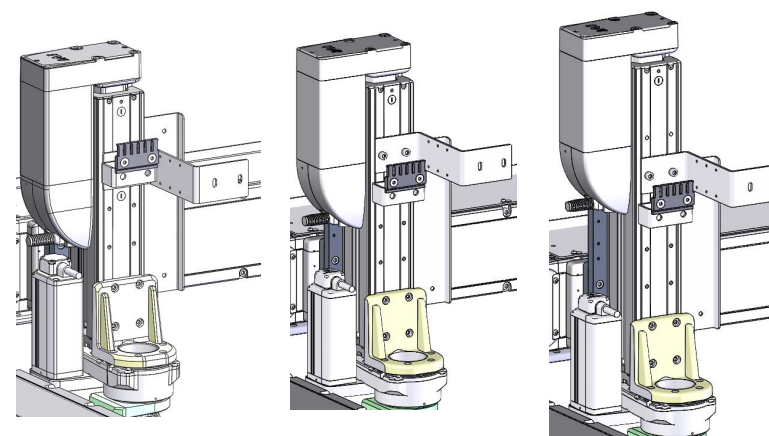
Part Name	Specifications	Quantity	Tightening torque
Hex socket flat head cap screw	M5 × 12	4	5.10 N·m
Hex nut	M5 Class 1	4	----

25 Installing RBT Cable Fixing Bracket Assembly

1. Attach [24] RBT cable fixing bracket assembly to [8] Z-axis actuator.
 (Caution) The position to attach should differ depending on the Z-axis stroke.



Attachment Positions for each Type of Z-axis Strokes



When Z-axis stroke is 90mm (Note 1)

When Z-axis stroke is 140mm

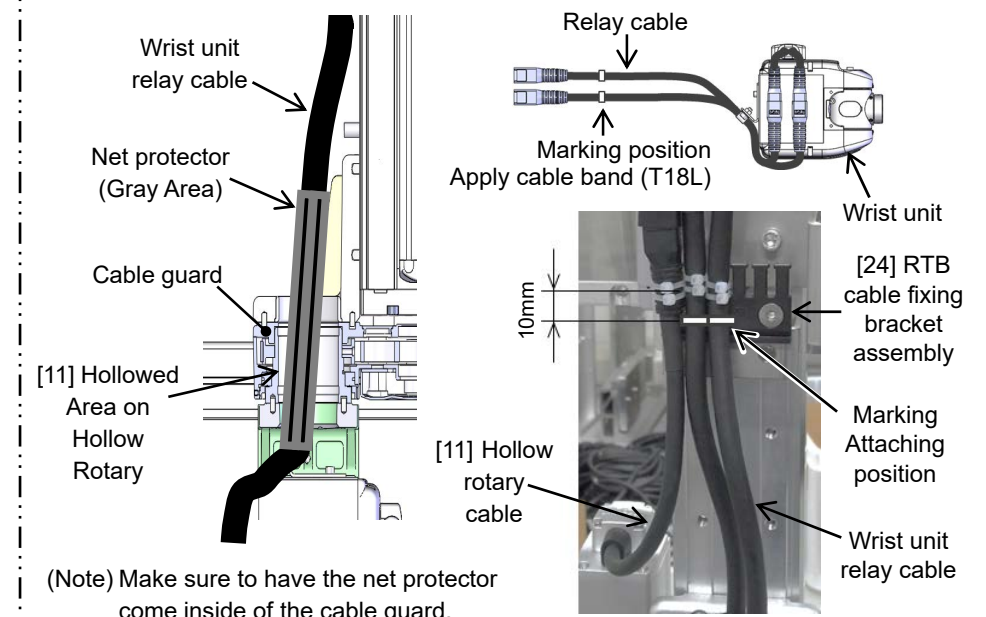
When Z-axis stroke is 190mm

Note 1 In case of the Z-axis stroke at 90mm, have it tightened together with [16] Z track mounting bracket (S).

Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M6 × 12	2	12.34 N·m

26 Wiring for Wrist Unit and Hollow Rotary

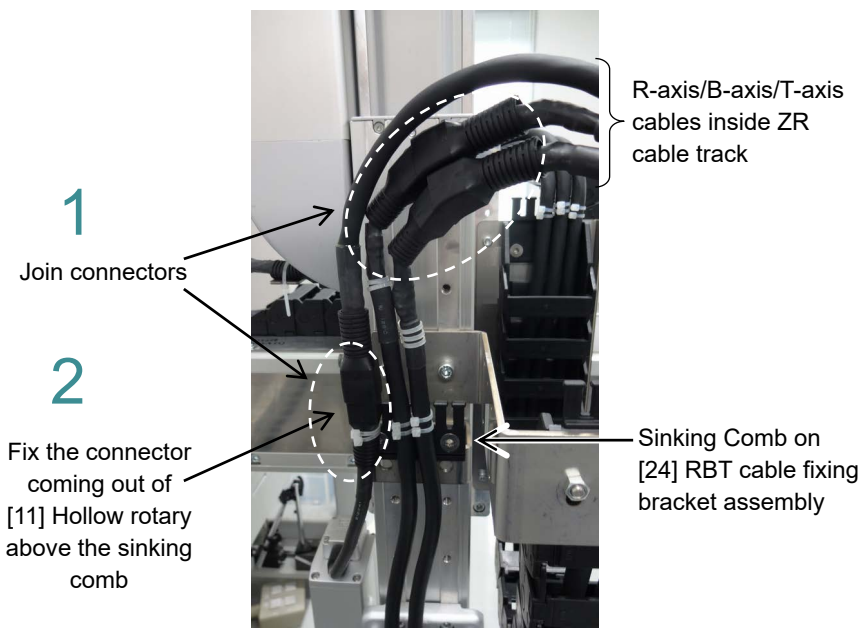
1. Affix the wrist unit relay cables come through the hollow part of [11] Hollow rotary on the sinking comb of [24] RTB cable fixing bracket assembly with two cable bands applied on each cable.
 At that time, be aware of a marking on the wrist unit relay cables in order to have looseness in wiring of the relay cables so that the cables are fixed with a cable band at the position shown in the figure below.



(Note) Make sure to have the net protector come inside of the cable guard.

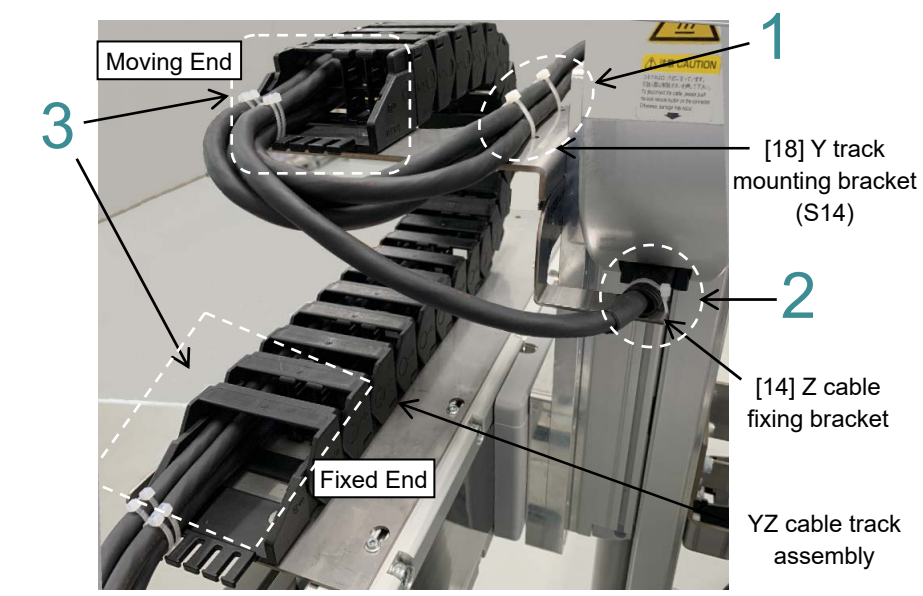
27 Connectivity of Cables inside ZR Cable Track and Actuator Cables

1. Connect the connectors on the cables inside the cable track for the R-axis/B-axis/T-axis in ZR Cable Track to the cable on each actuator.
2. Fix the cables on [11] Hollow rotary at the sinking comb on [24] RTB fixing bracket assembly so the connector coming out of [11] Hollow rotary comes above the sinking comb.



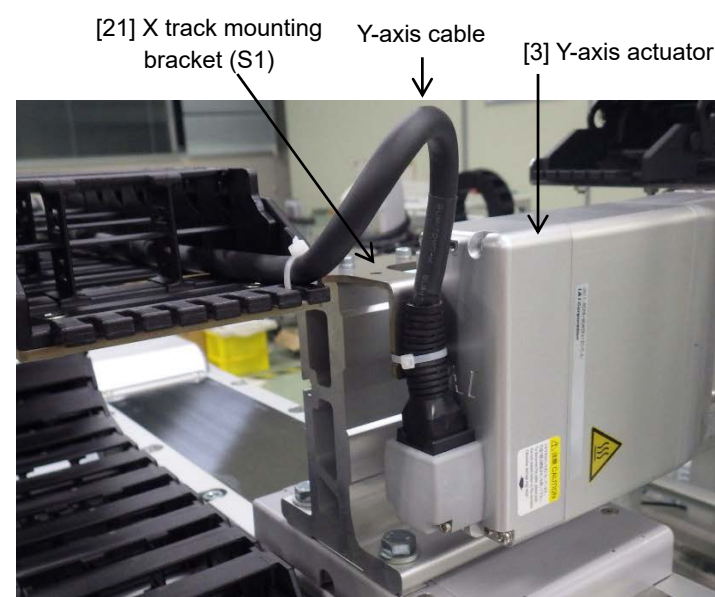
28 Wiring for Cables inside YZ Cable Track

1. Using the hole on [18] Y track mounting bracket (S14), fix the B-axis/T-axis cables on the wrist unit and the R-axis cable on [11] Hollow rotary together with a cable band.
2. Using the groove on [14] Z cable fixing bracket, fix the root of the Z-axis cable with a cable band.
3. Fix the Z-axis/R-axis/B-axis/T-axis cables inside the cable track on the moving end and fixed end of YZ cable track assembly with cable bands.



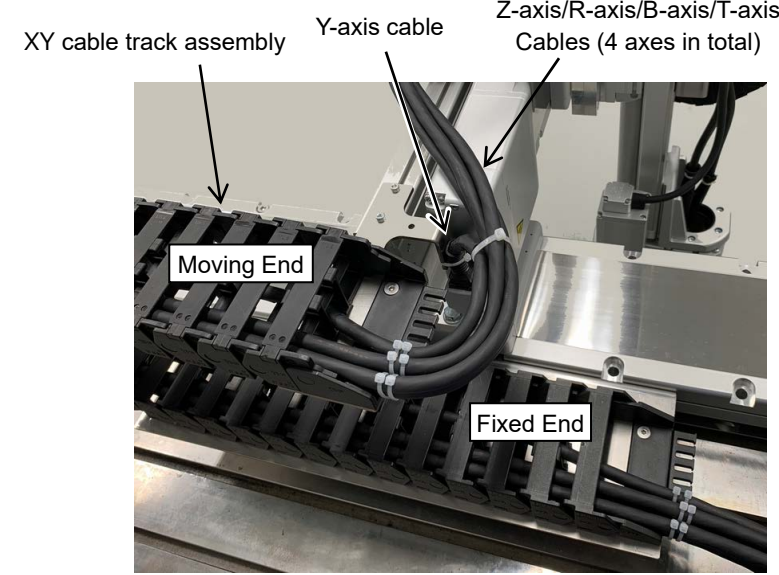
29 Fixing Y-Axis Cable

1. Fix the root of the Y-axis cable on [21] X track mounting bracket (S1) with a cable band.



30 Wiring for Cables inside XY Cable Track

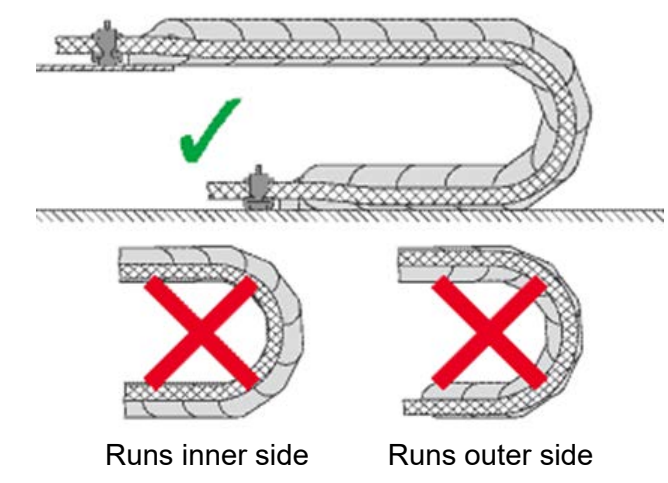
1. Fix the Y-axis/Z-axis/R-axis/B-axis/T-axis cables inside the cable track on the moving end and fixed end of XY Cable Track Assembly with cable bands.



Common Contents for Wiring

Caution for Fixing Cables inside Cable Track

- (1) Adjust the length of cables inside a cable track so they would not inside or outside.

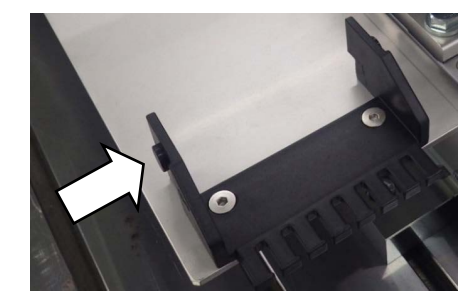


- (2) To fix at the sinking comb, use two cable bands on one cable.



Distinguishing Fixed End / Moving End of Cable Track

The end with projections at the joint of sides of a sinking comb and a cable track should be the fixed end.



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.

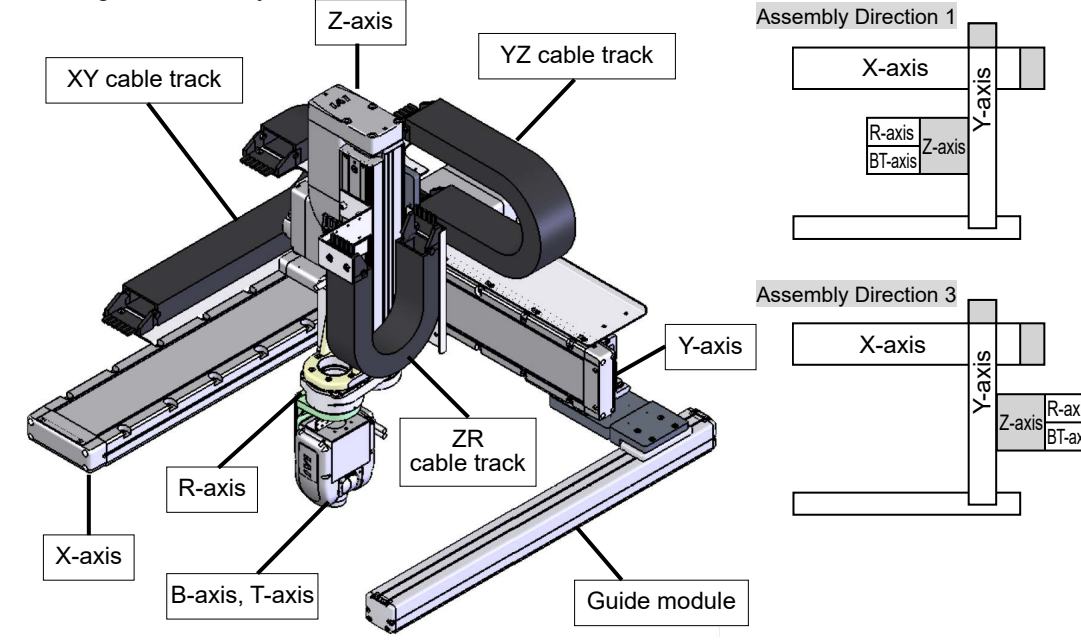
CRS 6-axis Cartesian Robot XGB Type (Model: CRS-XGB)	
XYG (Gantry Y-axis Horizontally Oriented Wall Mount)	
+ Z-axis Slider Fixed Type High Velocity / High Payload	
Drawing No.	GMM20-005
	1/6

[Tools to be Prepared] Hex wrench, Open-end wrench

0 It is necessary to have **21** Installing X Guide Rail first when [1] X-axis Actuator is to be fixed on a platform for assembly work.

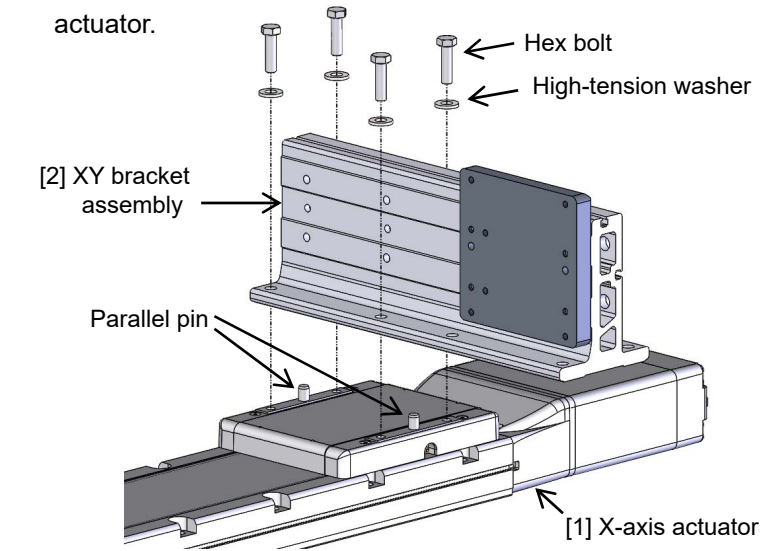
This assembly manual shows an example of building CRS-XGB Combined Direction 1

The directions of an actuator and brackets in Combined Direction 3 differ, but refer to this drawing for assembly.



1 Installing XY Bracket

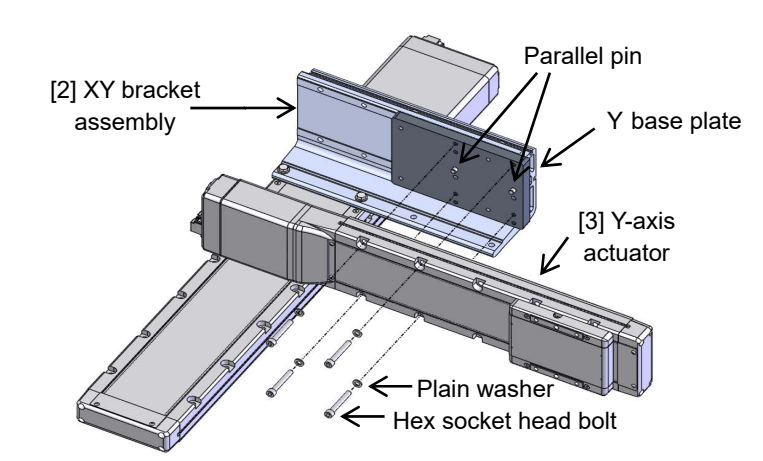
1. Attach [2] XY bracket assembly to the slider on [1] X-axis actuator.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M8 × 55	4 (Note 1)	29.97 N·m
Hex bolt	M8 × 35	4	29.97 N·m
High-tension washer	φ8.5 × φ18 × 2.3	4	----
Parallel pin	φ8 × 18	2	----

2 Installing Y-axis Actuator

1. Attach [3] Y-axis actuator to Y base plate on [2] XY bracket assembly.

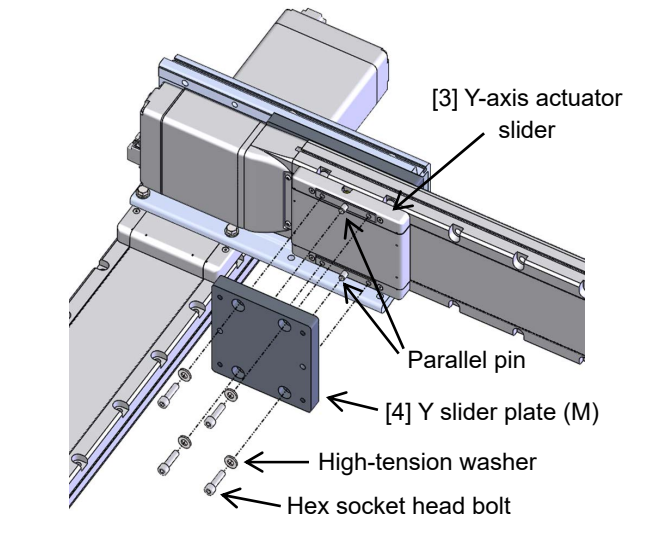


Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M8 × 55	4 (Note 1)	29.97 N·m
Plain washer	φ8.5 × φ14.8 × 2	4 (Note 1)	----
Parallel pin	φ8 × 18	2	----

Note 1: Y-axis with its stroke at 500mm or more should use 10 pieces of screws.

3 Installing Y Slider Plate

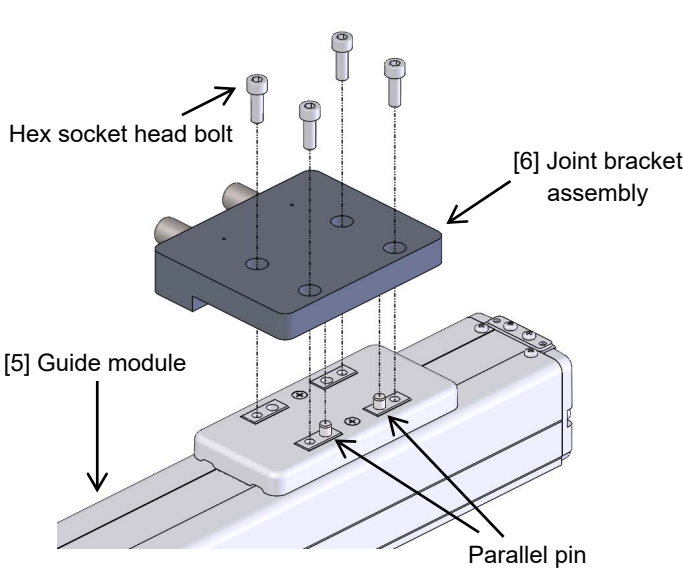
1. Attach [4] Y slider plate (M) to the [3] Y-axis actuator slider.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M8 × 30	4	29.97 N·m
High-tension washer	φ8.5 × φ18 × 2.3	4	----
Parallel pin	φ8 × 18	2	----

4 Installing Joint Bracket Assembly

1. Attach [6] Joint bracket assembly to [5] Guide module.

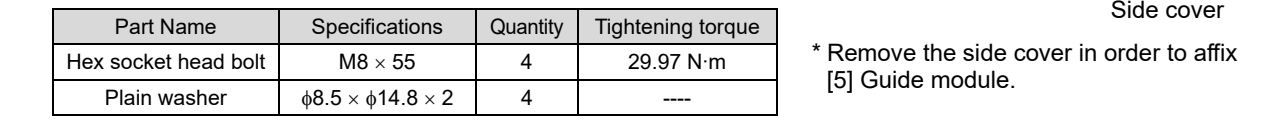


Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M5 × 15	4	7.27 N·m
Parallel pin	φ5 × 10	2	----

5 Linkage of Y-axis Actuator and Guide Module

In this process, alignment of home positions for the master axis ([1] X-axis actuator) and the slave axis ([5] Guide module) and paralleling of them should be conducted.

1. Push the slider on [1] X-axis actuator towards the home position manually and mark this position on the X-axis actuator.
2. Push the slider on [5] Guide module towards the home position on the X-axis manually and mark this position on the guide module.
3. Put in [7] Pin bracket assembly to [6] Joint bracket assembly and attach [3] Y-axis actuator.
4. With the slider on [1] X-axis actuator pushed towards the home position on the X-axis (to the position marked in 1), set [5] Guide module to the position marked in 2 and loosely tighten it.
5. Have the pin bracket and the joint bracket set parallel so the gap between them is 2 ± 1 mm in the entire range of the X-axis operation.
6. Have the attachment screws on [5] Guide module fully tightened.
7. Move the X-axis in the full stroke to confirm that it moves smoothly.

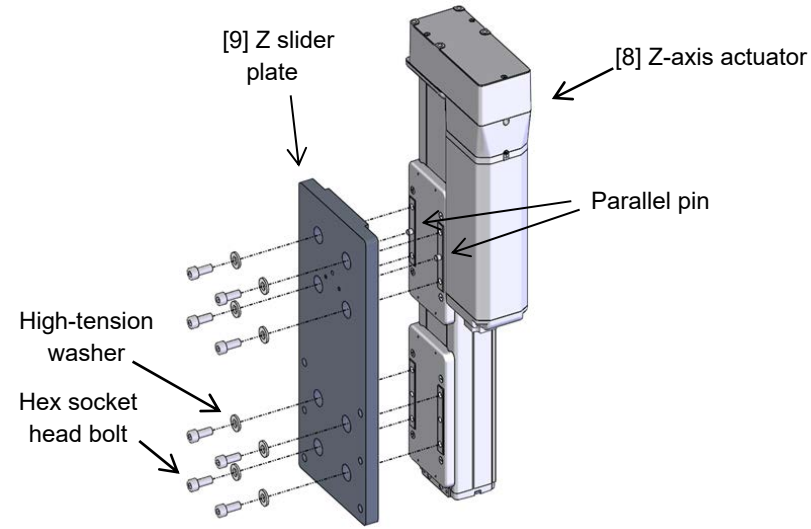


Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M8 × 55	4	29.97 N·m
Plain washer	φ8.5 × φ14.8 × 2	4	----

* Remove the side cover in order to affix [5] Guide module.

6 Assembling Z-axis Assembly

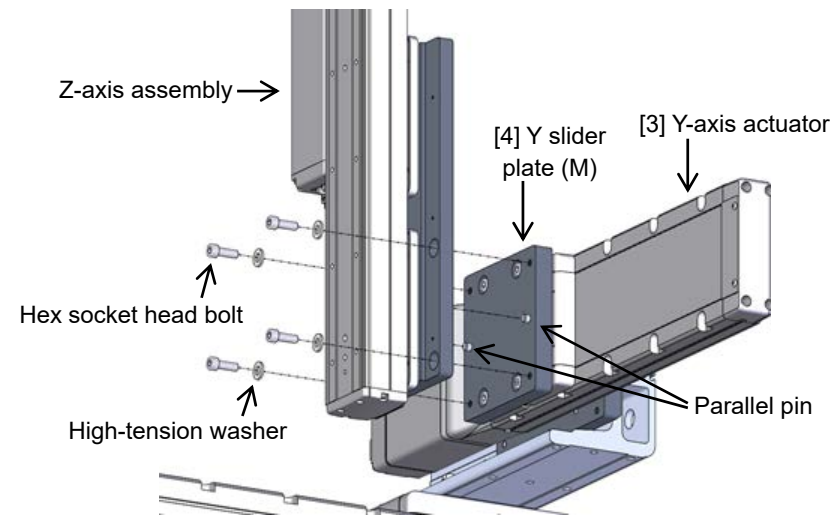
1. Attach [9] Z slider plate to the base surface of [8] Z-axis actuator.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M8 × 20	8	29.97 N·m
High-tension washer	φ8.5 × φ18 × 2.3	8	----
Parallel pin	φ6 × 15	2	----

7 Installing Z-axis Assembly

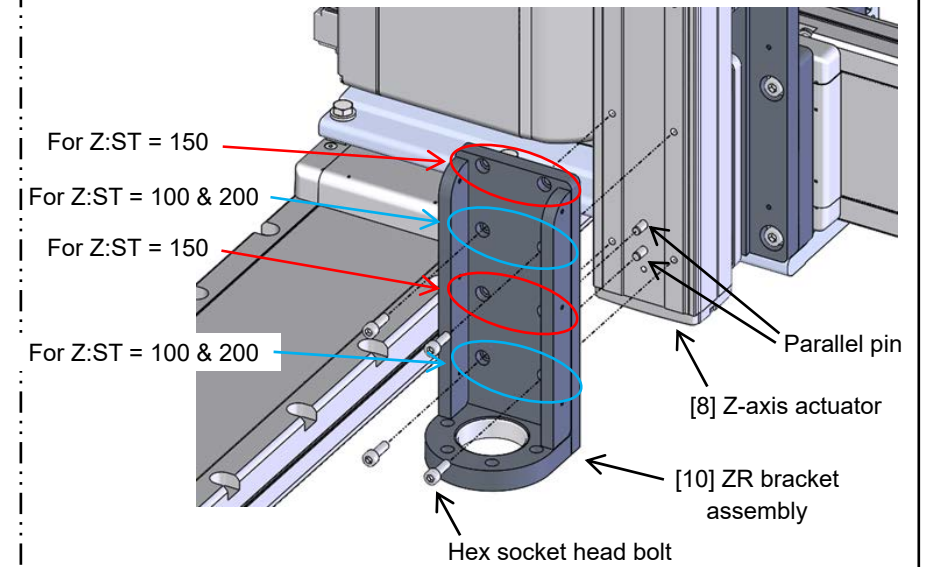
1. Attach Z-axis assembly built in [6] to [4] Y slider plate (M).



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M8 × 25	4	29.97 N·m
High-tension washer	φ8.5 × φ18 × 2.3	4	----
Parallel pin	φ8 × 18	2	----

8 Installing ZR Bracket

1. Attach [10] ZR bracket assembly to [8] Z-axis actuator.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt ^(Note 1)	M6 × 18	4	12.34 N·m
Parallel pin	φ6 × 15	2	----

Note 1: The holes for tightening should differ depending on the Z-axis stroke.

9 Assembling Hollow Rotary and RBT Bracket

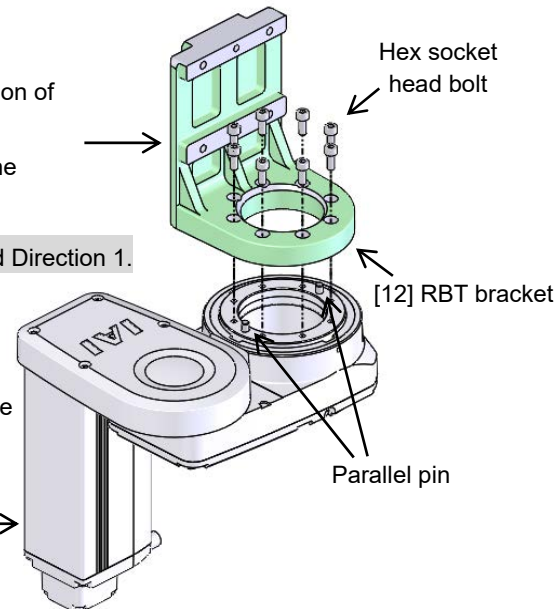
1. Attach [12] RBT bracket to [11] Hollow rotary.

(Caution)

Pay attention to the orientation of [12] RBT bracket and the orientation of pin holes on the hollow rotary.

This figure shows Combined Direction 1.

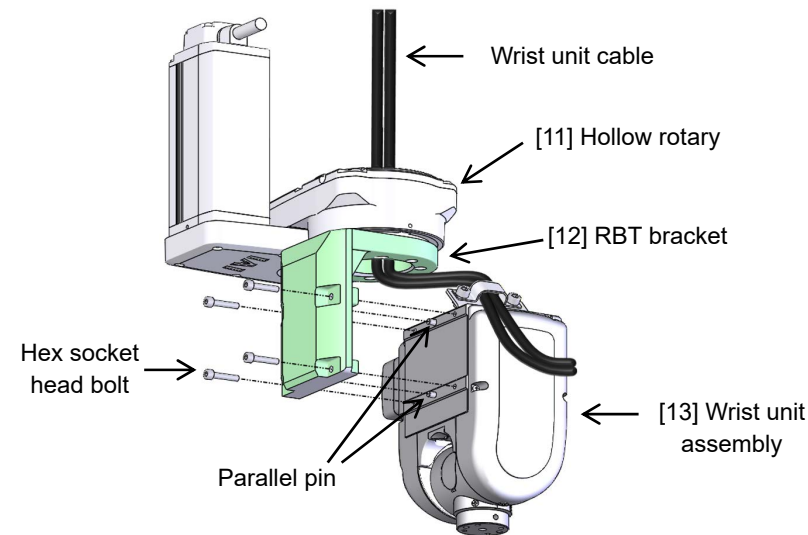
The orientation of [12] RBT bracket should be opposite against the positions of the oblong hole and reamed hole for Combined Direction 3.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M4 × 10	8	3.59 N·m
Parallel pin	φ4 × 8	2	----

10 Installing Wrist Unit

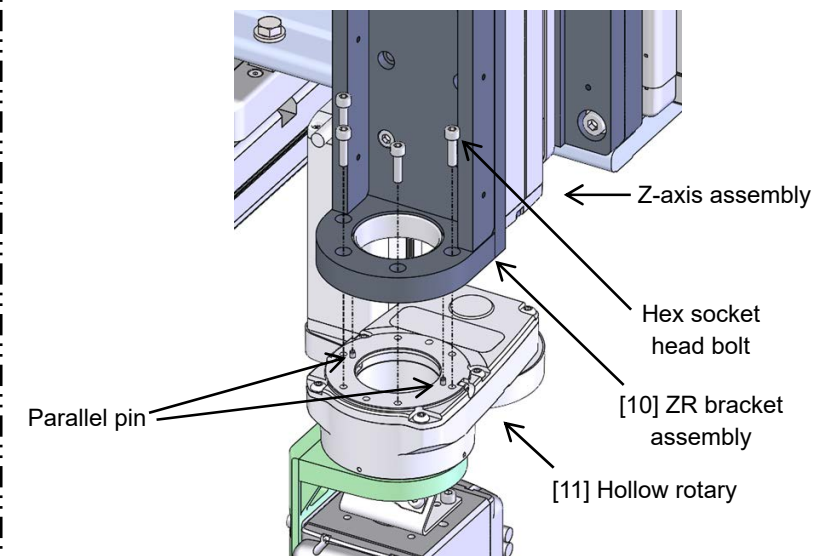
1. Put the cable on the wrist unit through the hollow on [11] Hollow rotary.
2. Attach [13] Wrist unit assembly to [12] RBT bracket.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M5 × 15	4	7.27 N·m
Parallel pin	φ5 × 10	2	----

11 Installing Hollow Rotary

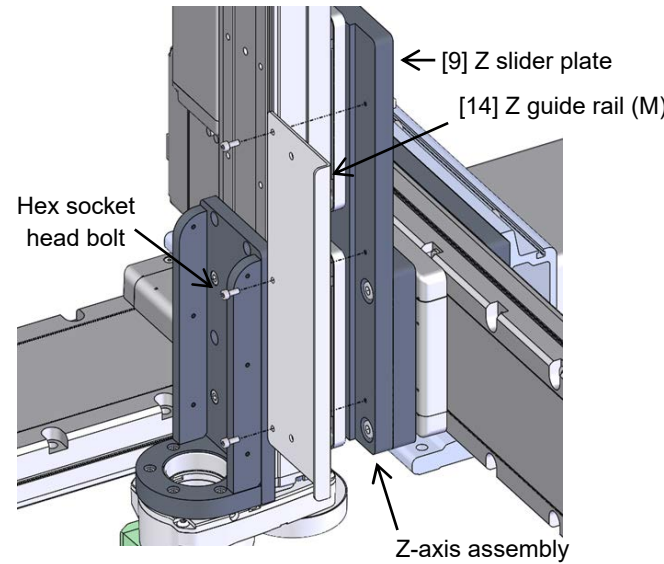
1. Put the cable on the wrist unit through the hollow on [10] ZR bracket assembly.
2. Attach [11] Hollow rotary to [10] ZR bracket assembly.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M5 × 18	4	7.27 N·m
Parallel pin	φ3 × 6	2	----

12 Installing Z Guide Rail

1. Attach [14] Z guide rail (M) to [9] Z slider plate.

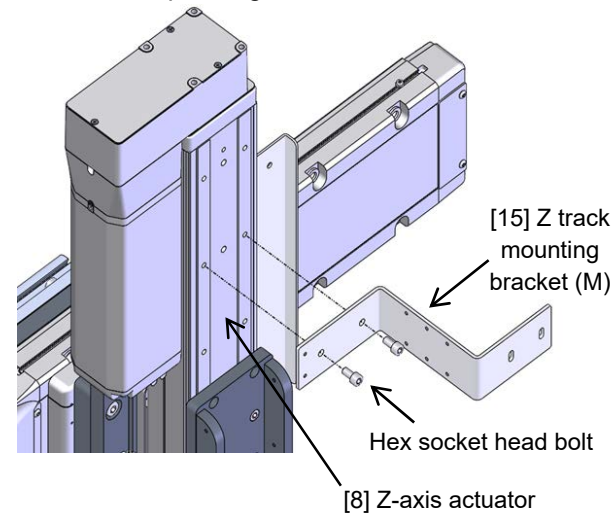


Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M4 × 10	3	3.59 N·m

13 Installing Z Track Mounting Bracket

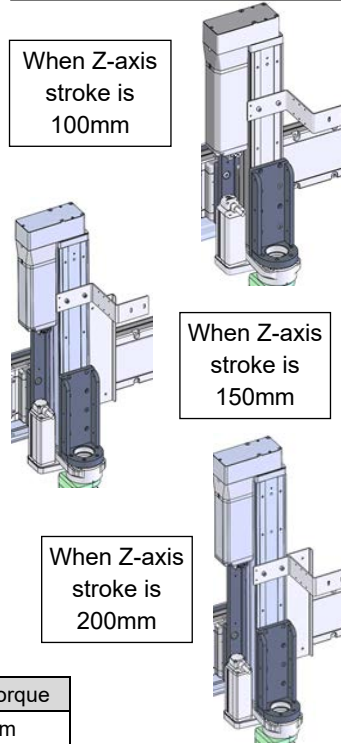
1. Attach [15] Z track mounting bracket (M) to [8] Z-axis actuator.

(Caution) The position to attach should differ depending on the Z-axis stroke.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M6 × 12	2	12.34 N·m

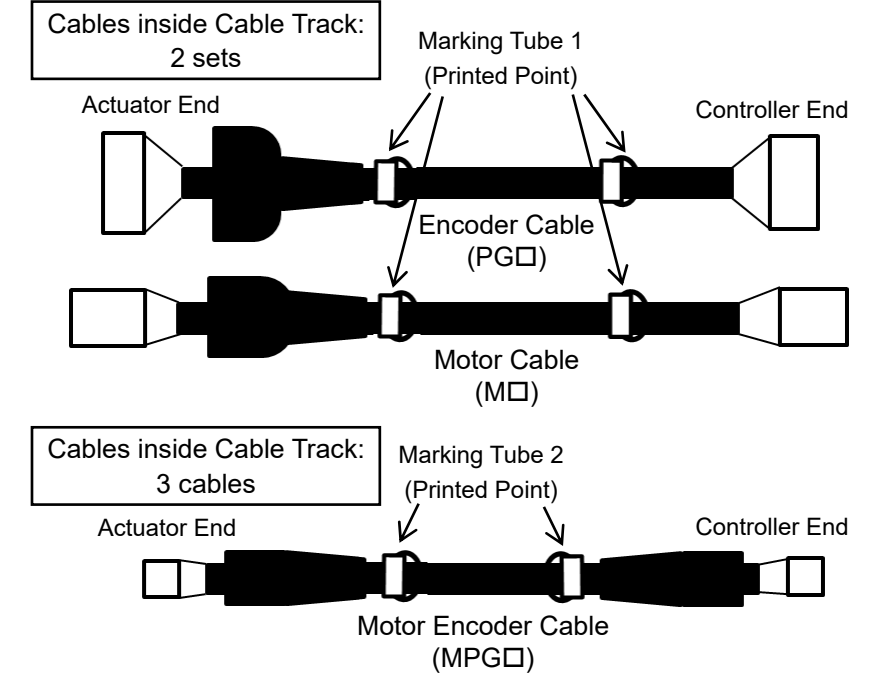
Attachment Positions for each Type of Z-axis Strokes



14 Check on Cable on ZR Cable Track Assembly

1. Check which cable is for each axis one by one by looking at the print on the marking tube on each cable in each cable track.

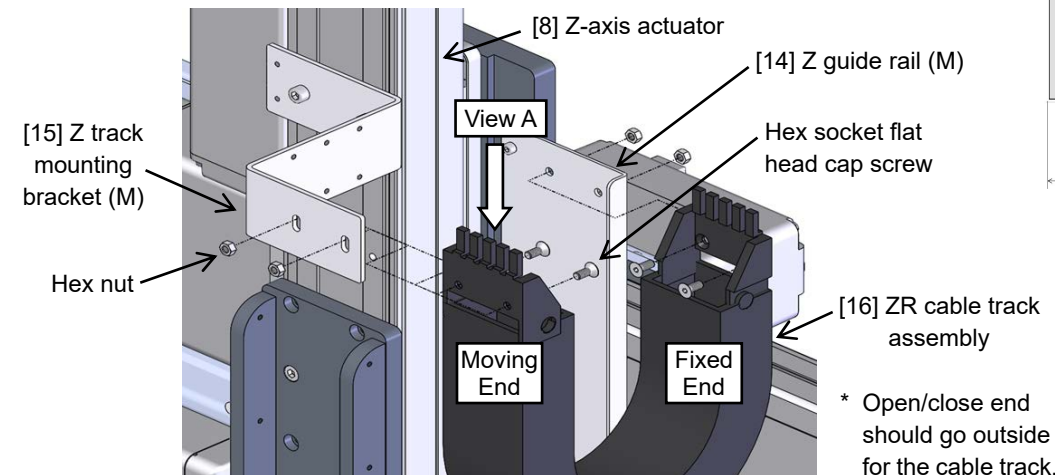
* The cables inside the cable track for the Z-axis/R-axis/B-axis/T-axis are laid out in [16] ZR cable track assembly.



15 Installing ZR Cable Track Assembly

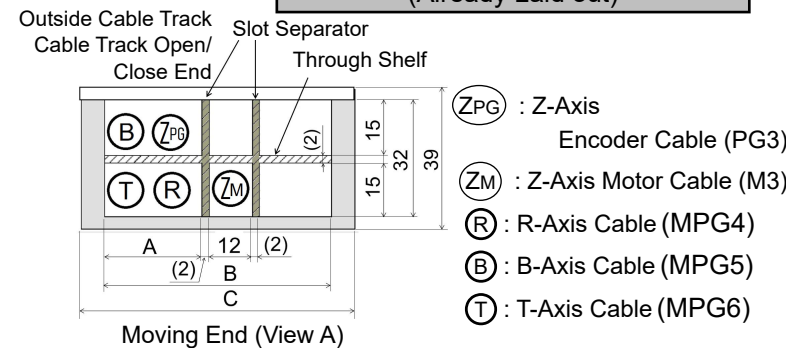
1. Join [16] ZR cable track assembly that cables are already laid to [15] Z track mounting bracket (M) and to [14] Z guide rail (M).

* In case of difficulty in tightening screws due to blockage of cables, cut the cable ties on the cables. After installation is complete, put the cables back in the cable track to the original position and fix them with cable ties.



Part Name	Specifications	Quantity	Tightening torque
Hex socket flat head cap screw	M5 × 12	4	5.10 N·m
Hex nut	M5 Class 1	4	----

Cables inside ZR Cable Track Layout (Already Laid out)



Check the symbols of the "3rd wiring cable track" in the model code for the type of ZR Cable Track selected at order. The size of each type of the cable tracks are as shown in the table below.

3rd (ZR) Cable Track		Dimensional Unit: mm		
Model Code	Cable Track Model Code	A	B	C
CT	B17.4.075.0	22	50	60.5
CTM	B17.5.075.0	27	63	76
CTL	B17.6.075.0	27	80	93

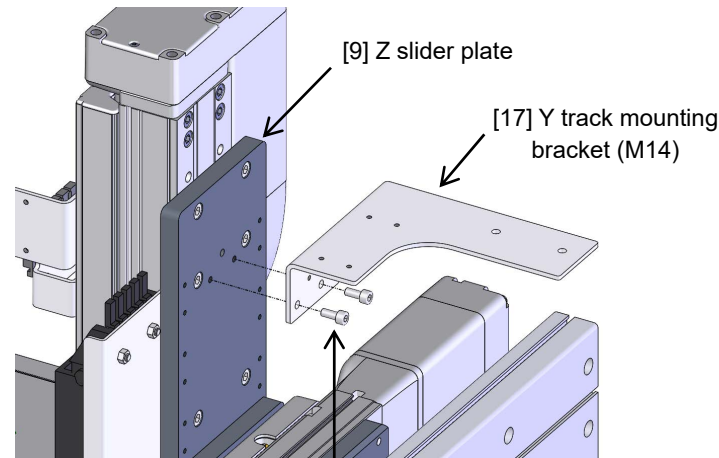
■ Marking Tube Printing Detail

Axis No.	Construction Axis	Symbol	Printing Detail	Remark
2	Y-axis	YM	M2	Printed on Marking Tube 1
		YPG	PG2	Printed on Marking Tube 1
3	Z-axis	ZM	M3	Already laid out in ZR cable track assembly Printed on Marking Tube 1
		ZPG	PG3	Already laid out in ZR cable track assembly Printed on Marking Tube 1
4	Hollow Rotary (R-axis)	R	MPG4	Already laid out in ZR cable track assembly Printed on Marking Tube 2
5	Wrist Swing (B-axis)	B	MPG5	Already laid out in ZR cable track assembly Printed on Marking Tube 2
6	Wrist Rotation (T-axis)	T	MPG6	Already laid out in ZR cable track assembly Printed on Marking Tube 2

16 Installing Y Track Mounting Bracket

- Attach [17] Y track mounting bracket (M14) (Note 1) to [9] Z slider plate.

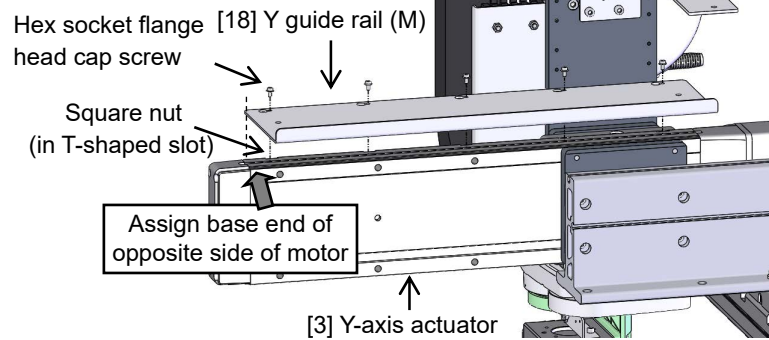
Note 1 Attach [17] Y track mounting bracket (M23) for Combined Direction 3.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M5 × 12	2	7.27 N·m

17 Installing Y Guide Rail

- Insert a square nut to the T-shaped slot on the top of [3] Y-axis actuator to attach [18] Y guide rail (M).
- Adjust the base end on the opposite side of the motor on [3] Y-axis actuator so it aligns with the end of [18] Y guide rail (M).



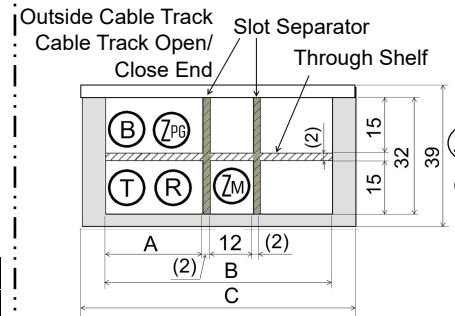
Part Name	Specifications	Quantity	Tightening torque
Hex socket flange head cap screw	M3 × 6	3 to 8 (Note 1)	1.62 N·cm
Square nut	Square nut M3	3 to 8 (Note 1)	----

Note 1: The quantity is subject to change depending on the stroke of Y-axis.

18 Assembling YZ Cable Track Assembly

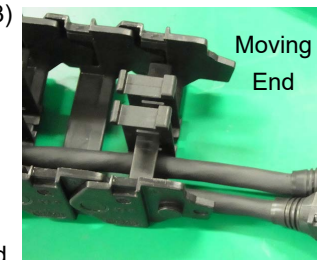
- Check the symbols of the "2nd wiring cable track" in the model code for the type of [19] YZ cable track selected at order.
- Check the size of the cable track and attachment positions of the slot separators and through shelves in the table below.
- Store the cables inside the cable track for the Z-axis motor / R-axis / T-axis below [19] YZ cable track. (Refer to the figure below)
- Attach the slot separators and the through shelves in every two links from the first link on the moving end.
- Store the cables inside the cable track for the Z-axis encoder / B-axis above [19] YZ cable track. (Refer to the figure below)

Cables inside YZ Cable Track Layout



2nd (YZ) Cable Track		Dimensional Unit: mm		
Model Code	Cable Track Model Code	A	B	C
CT	B17.4.075.0	22	50	60.5
CTM	B17.5.075.0	27	63	76
CTL	B17.6.075.0	27	80	93

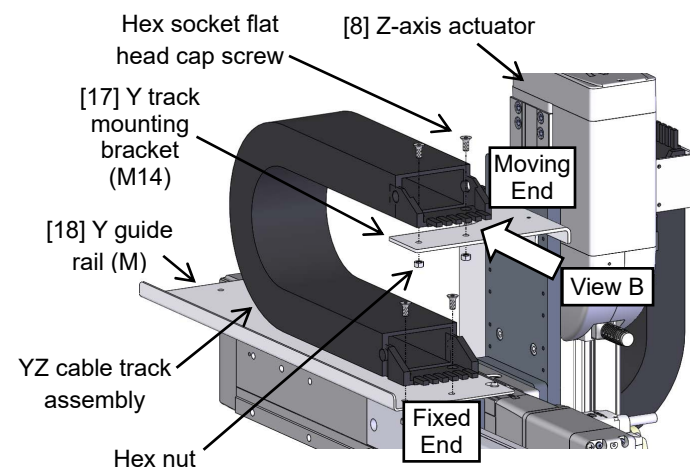
- ZPG : Z-Axis Encoder Cable (PG3)
- ZM : Z-Axis Motor Cable (M3)
- R : R-Axis Cable (MPG4)
- B : B-Axis Cable (MPG5)
- T : T-Axis Cable (MPG6)



Moving End ([19] View B) * The cables are to be justified to the left from the view on the moving end.

19 Installing YZ Cable Track Assembly

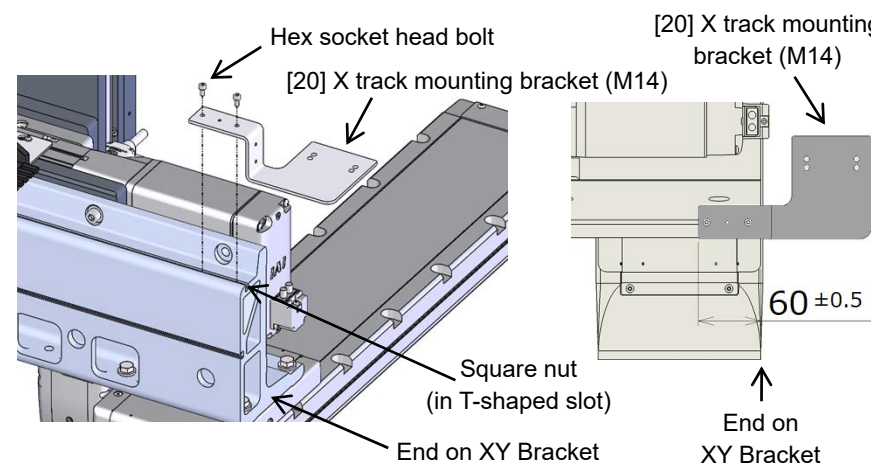
- Attach YZ Cable Track Assembly built in [18] to [17] Y track mounting bracket (M14) and [18] Y guide rail (M).
- * Open/close end should go outside for the cable track.



Part Name	Specifications	Quantity	Tightening torque
Hex socket flat head cap screw	M5 × 12	4	5.10 N·m
Hex nut	M5 Class 1	4	----

20 Installing X Track Mounting Bracket

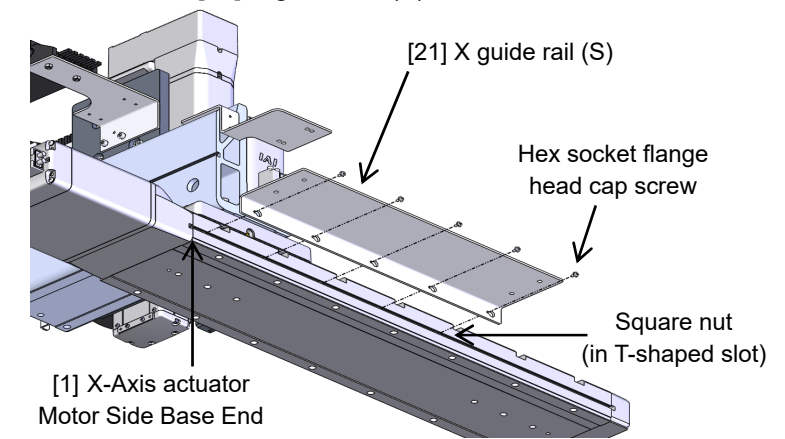
- Insert a square nut to the T-shaped slot on the top of XY bracket to attach [20] X track mounting bracket (M14) (Note 1).
 - Adjust the positions of the end of XY Bracket and the end of [20] X track mounting bracket (M14) so the distance between them falls into 60 ± 0.5 mm.
- Note 1 Attach [20] X track mounting bracket (M23) for Combined Direction 3.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M4 × 10	2	3.59 N·m
Square nut	Square nut M4	2	----

21 Installing X Guide Rail

- * This procedure is to be conducted before [1] X-axis actuator is installed on the platform.
- Insert a square nut to the T-shaped slot on the top of [1] X-axis actuator to attach [21] X guide rail (S).
 - Adjust the position of [1] X-axis actuator so its base end on the motor side aligns with the end of [21] X guide rail (S).



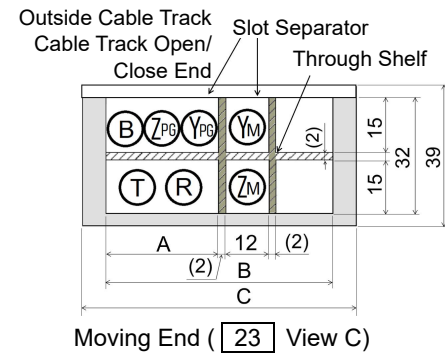
Part Name	Specifications	Quantity	Tightening torque
Hex socket flange head cap screw	M3 × 6	3 to 7 (Note 1)	1.62 N·m
Square nut	Square nut M3	3 to 7 (Note 1)	----

Note 1: The quantity is subject to change depending on the stroke of X-axis.

22 Assembling XY Cable Track Assembly

1. Check the symbols of the "1st wiring cable track" in the model code for the type of [22] XY cable track selected at order.
2. Check the size of the cable track and attachment positions of the slot separators and through shelves in the table below.
3. Store the cables inside the cable track for the Z-axis motor / R-axis / T-axis below [22] XY cable track. (Refer to the figure below)
4. Attach the slot separators and the through shelves in every two links from the first link on the moving end.
5. Store the cables inside the cable track for the Y-axis / Z-axis encoder / B-axis above [22] XY cable track. (Refer to the figure below)

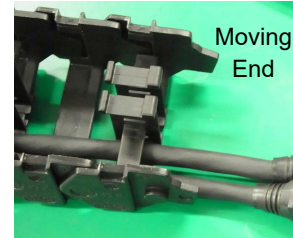
Cables inside XY Cable Track Layout



1st (XY) Cable Track Dimensional Unit: mm

Model Code	Cable Track Model Code	A	B	C
CTM	B17.5.075.0	27	63	76
CTL	B17.6.075.0	27	80	93
CTXL	B17.7.075.0	27	100	113

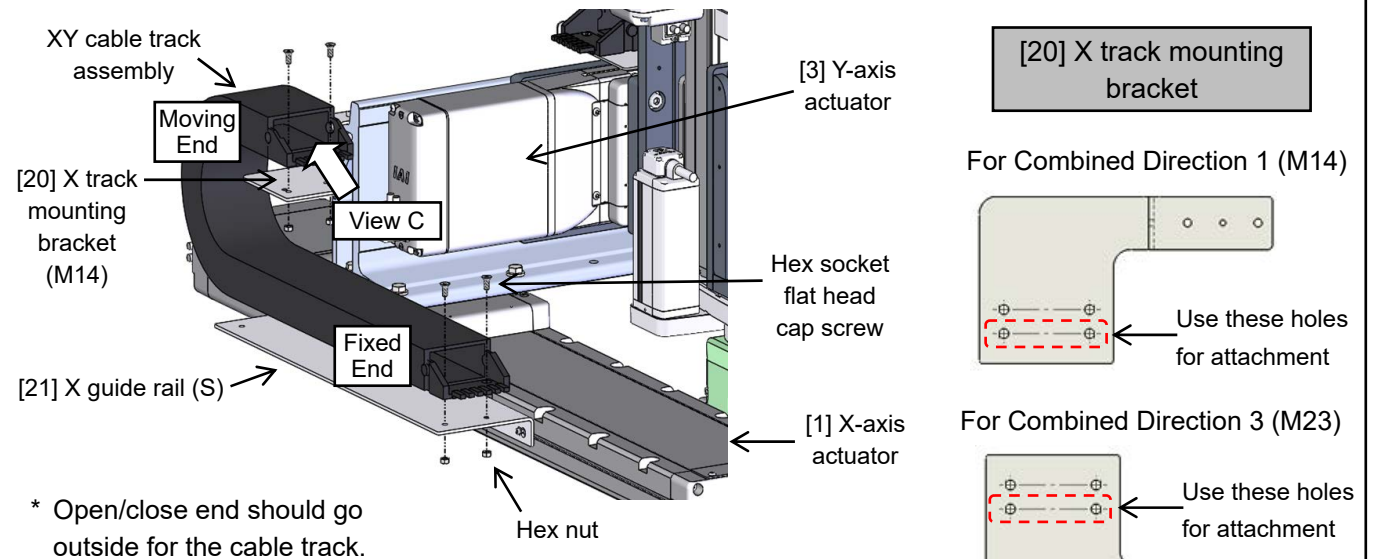
- Ⓨ_{PG} : Y-Axis Encoder Cable (PG2)
- Ⓨ_M : Y-Axis Motor Cable (M2)
- Ⓩ_{PG} : Z-Axis Encoder Cable (PG3)
- Ⓩ_M : Z-Axis Motor Cable (M3)
- Ⓡ : R-Axis Cable (MPG4)
- Ⓟ : B-Axis Cable (MPG5)
- Ⓣ : T-Axis Cable (MPG6)



* The cables are to be justified to the left from the view on the moving end.

23 Installing XY Cable Track Assembly

1. Attach XY cable track assembly built in [22] to [20] X track mounting bracket (M14) and [21] X guide rail (S).



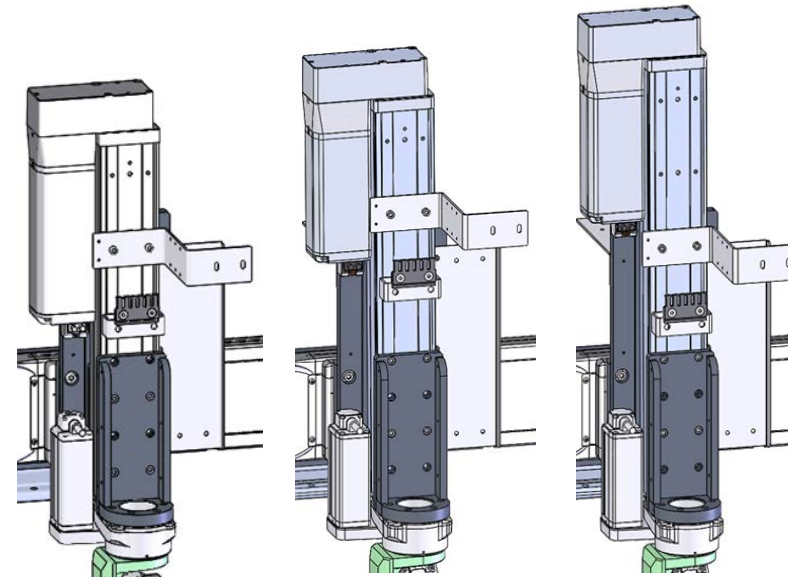
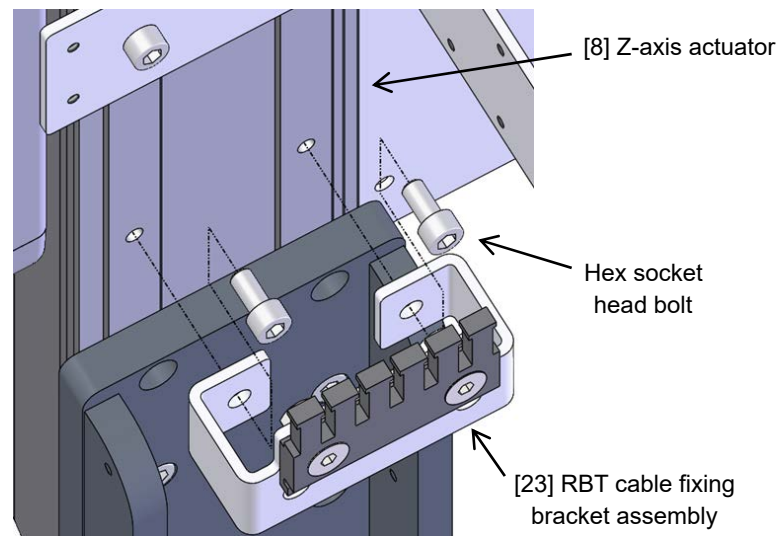
* Open/close end should go outside for the cable track.

Part Name	Specifications	Quantity	Tightening torque
Hex socket flat head cap screw	M5 × 12	4	5.10 N·m
Hex nut	M5 Class 1	4	---

24 Installing RBT Cable Fixing Bracket Assembly

1. Attach [23] RBT cable fixing bracket assembly to [8] Z-axis actuator. (Caution) The position to attach should differ depending on the Z-axis stroke.

Attachment Positions for each Type of Z-axis Strokes



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt	M6 × 12	2	12.34 N·m

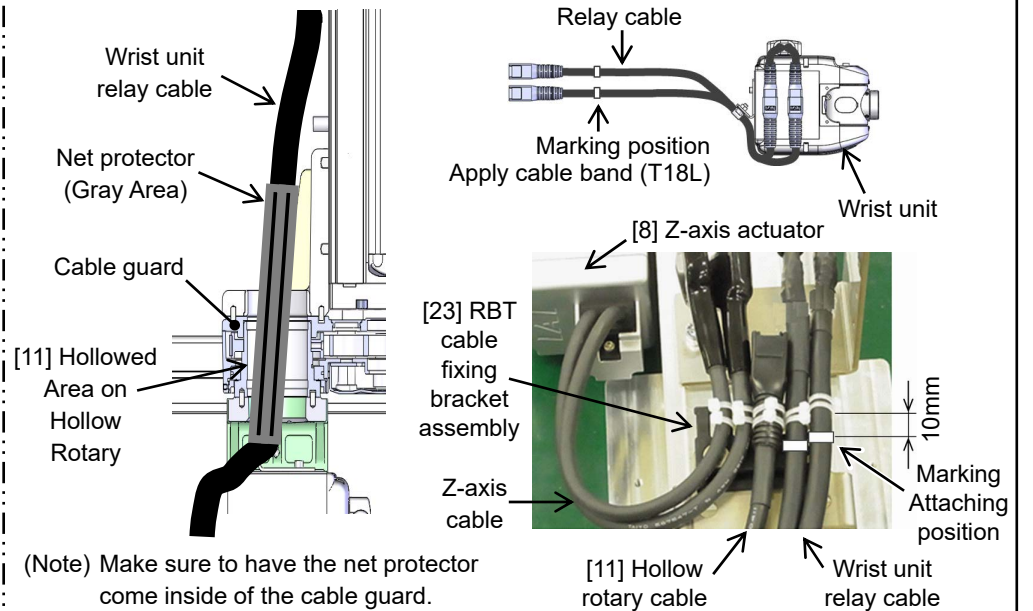
When Z-axis stroke is 100mm

When Z-axis stroke is 150mm

When Z-axis stroke is 200mm

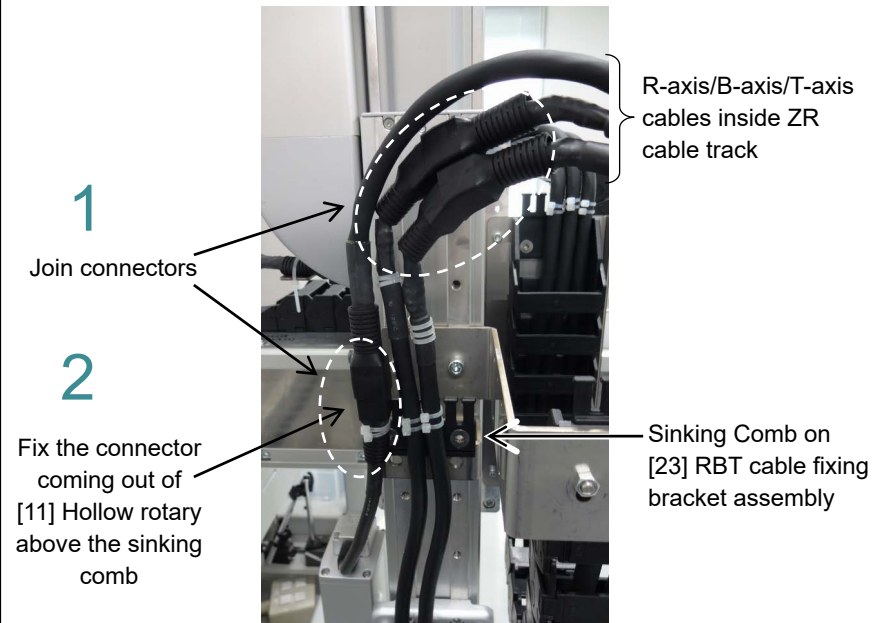
25 Wiring for Wrist Unit, Hollow Rotary and Z-axis Cable

1. Affix the cables coming out of the wrist unit through the hollow part of [11] Hollow rotary on the sinking comb of [23] RTB cable fixing bracket assembly with two cable bands applied on each cable. At that time, be aware of a marking on the wrist unit relay cables in order to have looseness in wiring of the relay cables so that the cables are fixed with a cable band at the position shown in the figure below.
2. Fix the Z-axis cable also at the sinking comb on [23] RTB cable fixing bracket assembly.



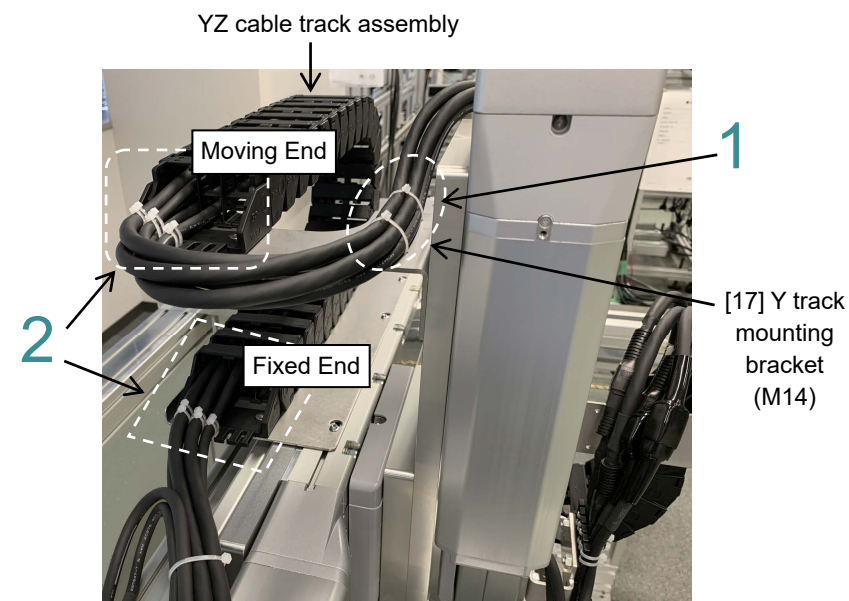
26 Connectivity of Cables inside ZR Cable Track and Actuator Cables

1. Connect the connectors on the cables inside the cable track for the R-axis/B-axis/T-axis in ZR Cable Track to the cable on each actuator.
2. Fix the cables on [11] Hollow rotary at the sinking comb on [23] RTB fixing bracket assembly so the connector coming out of [11] Hollow rotary comes above the sinking comb.



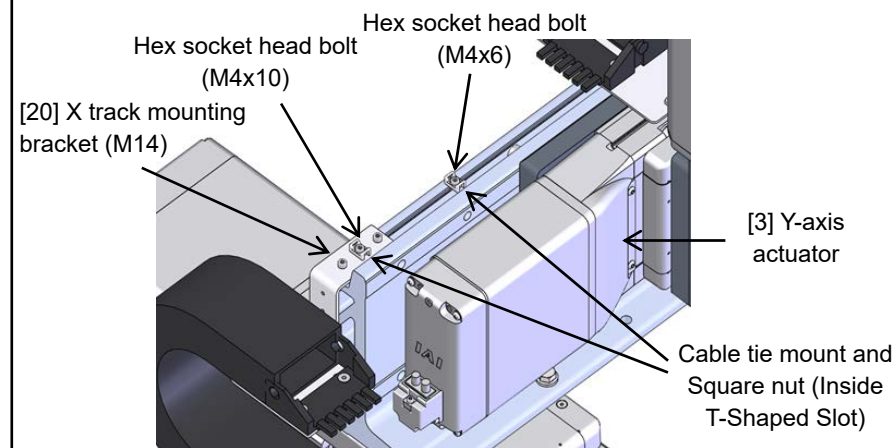
27 Wiring for Cables inside YZ Cable Track

1. Using the hole on [17] Y track mounting bracket (M14), fix the B-axis/T-axis cables on the wrist unit and the R-axis cable on [11] Hollow rotary together with a cable band.
2. Fix the Z-axis/R-axis/B-axis/T-axis cables inside the cable track on the moving end and fixed end of YZ cable track assembly with cable bands.



28 Fixing Y-Axis Connector

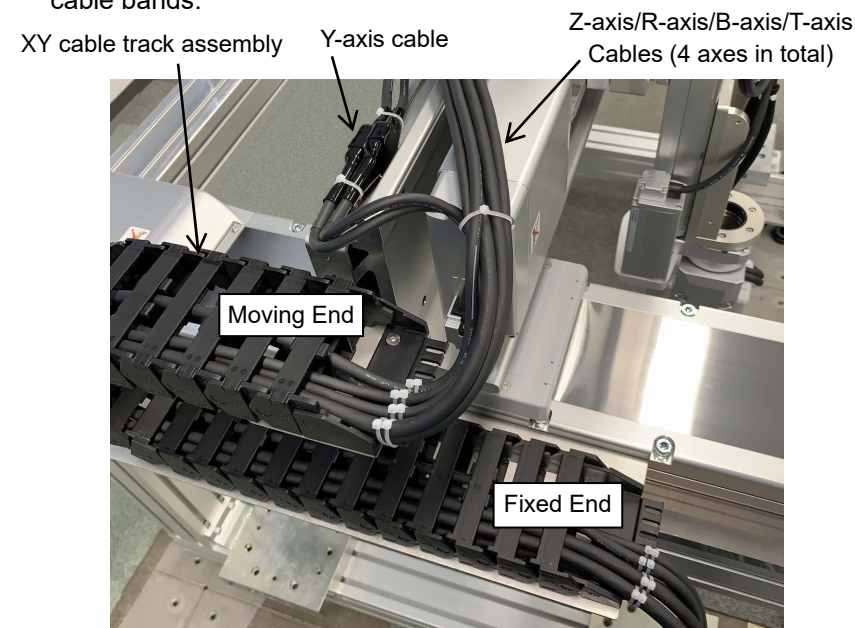
1. Affix the connector on [3] Y-axis actuator to [20] X track mounting bracket (M14) with using cable bands.



Part Name	Specifications	Quantity	Tightening torque
Hex socket head bolt (On Bracket Side)	M4 × 10	1	3.59 N m
Hex socket head bolt	M4 × 6	1	3.59 N m
Square nut	Square nut M4	2	----
Cable tie mount	KR5G5	1	----

29 Wiring for Cables inside XY Cable Track

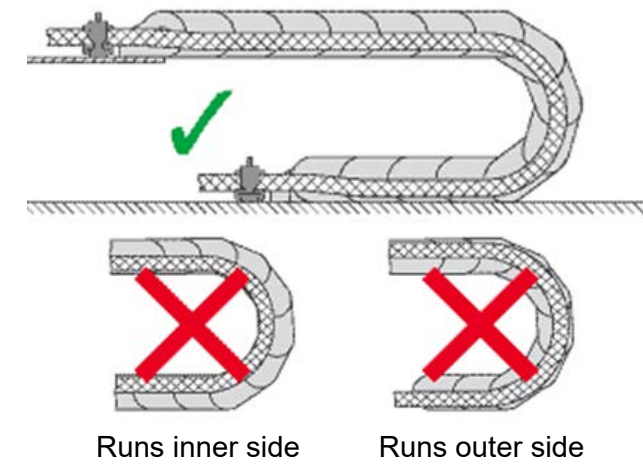
1. Fix the Y-axis/Z-axis/R-axis/B-axis/T-axis cables inside the cable track on the moving end and fixed end of XY Cable Track Assembly with cable bands.



Common Contents for Wiring

Caution for Fixing Cables inside Cable Track

- (1) Adjust the length of cables inside a cable track so they would not inside or outside.



- (2) To fix at the sinking comb, use two cable bands on one cable.



Distinguishing Fixed End / Moving End of Cable Track

The end with projections at the joint of sides of a sinking comb and a cable track should be the fixed end.

