Discontinue

CKD

SM-396064-A

INSTRUCTION MANUAL

ELECTRIC SLIDER

KBB Series

KBB-30

SLIDER INSTRUCTION MANUAL

- Read this manual carefully and thoroughly before using this product.
- Pay extra attention to the instructions concerning safety.
- After reading this manual, keep it in a safe and convenient place.

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Introduction

Before using the Electric Slider KBB series, read through and completely understand this instruction manual to assure correct use.
For general details on the Electric Slider KBB series, see the instruction manual (basic) provided separately.

Cautions

1. The contents of this manual are subject to change without prior notice.
2. The contents of this manual are subject to change without prior notice to effect improvements.
3. All efforts have been made to assure the contents of this manual. If you have any questions, or find any mistakes, however, please contact CKD.
4. CKD will not be held responsible for any effects caused by using this equipment, regardless of Item 3 above.
5. This equipment does not have an explosion-proof structure. Take utmost care of the operating environment.

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General Descriptions

- This manual describes the axis type expression method, specifications and motor replacement procedures, etc., according to the type of axis.
- For the installation, see the instruction manual (installation of actuator) provided separately.

Section 1 Safety

1.1 Safety Instructions

- Before the installation, programming, operation, maintenance and inspection of the equipment, be sure to read through this manual so that you can use the Electric Slider with safety.
- After you have read this manual, keep it nearby for future reference.

Be sure to strictly observe the following safety instructions to assure correct use of the Electric Slider KBB.

This manual contain the important information to prevent injury to the operators and persons nearby, to prevent damage to assets and to assure correct use of the equipment.
Make sure that you have well understood the following details (indications and symbols) before reading this manual. Always observe the information that is noted.

This means that "incorrect handling will lead to fatalities or serious injuries."

This means that "incorrect handling" may lead to personal injuries or physical damage (i.e., damages to building, household goods, domestic animals and pets).

Note

Briefly describes the points and notices for the operating procedures, and the points for using the equipment efficiently.

⚠ WARNING
• **Install the safety fences to prevent anyone from entering the working envelope of the robot.** When the door is attached to the safety fence, the robot should be stopped at emergency at the same time that the door has opened.
• **Connect the EMERGENCY STOP pushbutton switch to the emergency stop input terminal of the controller and mount the same switch at an easy-to-operate place in an emergency.** The EMEGENCY STOP switch must not be reset automatically and cannot be reset negligently by any person.
• **Wiring should be done safely and completely according to the Electrical Installations Technical Requirements and Interior Wiring Requirements of Japan.** Incorrect wiring will result in an electric shock or a fire.
• **The equipment MUST NOT be repaired or modified without prior written permission from the manufacturer.** Otherwise, an accident or damage will be caused.
• **Before the maintenance and inspection, be sure to turn off the controller main power switch. Take all necessary measures to prevent anyone other than the worker engaged in adjustment of the robot from negligently turning the power on. (Lock the switch and put a tag showing "DO NOT turn the power on.") Also, DO NOT touch the controller interior three (3) minutes after the power is turned off.** Otherwise, you may get an electric shock due to residual voltage of the capacitor.
• **DO NOT touch the motor, heat sink and cement resistor in the controller.** They are too hot and you may get burnt. Before performing inspection, take enough time to cool them off.
• **DO NOT pour water on the equipment interior or exterior, or drain water from it. Otherwise, you may get an electric shock, or the equipment will be damaged.** When the equipment has contaminated, wipe it off with a hard squeezed cloth. DO NOT use a thinner, benzine or other organic solvent.

• **DO NOT throw away metals, combustibles or other contaminant into the opening of this equipment.** A fire or an electric shock will be caused.
• **DO NOT put your finger or hand on the movable part or opening of the equipment.** Otherwise, you may get injured.
• **When using the actuator in other than the horizontal state, be sure to select the actuator with brake.** Otherwise, the slider will drop at power OFF, and you will be injured.
• **As the equipment is heavy, make sure of its weight and gravity center position and disconnect the cables when carrying the equipment.** Also, DO NOT carry the equipment with the slider. Otherwise, the slider will move and you will get injured.
• **DO NOT use this equipment for the living body as a massaging machine.** Otherwise, you will be injured due to incorrect teaching or mis-operation.
• **This equipment has not a sealed structure. During use, grease of the ball screw or wear of the belt may scatter from the opening of the equipment.** When using this equipment for food and chemical applications, take appropriate measures against entry of them.
• **Enter the robot type and initialize the memory correctly.** Otherwise, the robot may move unexpectedly and you will be injured.
• **DO NOT use this equipment in an atmosphere of inflammable gas or an atmosphere inducing an explosion.** As this equipment is not explosion-proof, it may explode in the worst occasion.
• **DO NOT damage, break, process, forcibly bend, stretch, place a heavy object on or pinch the cables (power cable, controller cable).** Otherwise, an electric shock or a fire will be caused.
• **Should an abnormality such as smoke or nasty smell occur, turn the power off immediately and stop using the equipment.** If the equipment is used continuously, an electric shock or a fire will be caused.

- **When using the side mounted motor axis in the vertical condition, be sure to check for the belt on a regular basis. Replace the belt every 3,000-hour operation.**

  If the belt whose service life already ended is used continuously, it may be broken or the slider may drop, and you will be injured.

CAUTION

- **DO NOT place the equipment at a place where the ambient temperature exceeds 40°C, or where the temperature changes sharply, causing condensing, or where it is exposed to direct sunlight.**

  Additionally, if the equipment is installed at a narrow place, the ambient temperature rises due to heat generation in the controller itself or external device, which will result in malfunction or mis-operation of the equipment.

- **DO NOT use the equipment at a place where an impact or vibration is involved. Also, DO NOT use the equipment in an atmosphere where conductive dust, corrosive gas or oil mist generates.**

  Otherwise, a fire, electric shock, malfunction or mis-operation will be caused.

- **DO NOT use the equipment at a place where too much dust or dirt exists.**

  If the equipment is used at such a place, it may malfunction because this equipment is not dust-proof.

- **DO NOT use repair parts other than those designated by the manufacturer.**

  Otherwise, the equipment cannot be operated to its full capacity and will cause malfunction.

- **Mount the robot on a highly rigid frame.**

  If rigidity of the frame is not enough, vibration (or resonance) may be caused during the robot operation, adversely affecting the operation.

Attention:

For the safety instructions which seem especially important, relevant warning label is attached to the equipment.

When the label attached to the equipment has peeled off or the characters are defaced and unreadable, please procure it from our sales agent in your territory by specifying the part number, and attach it to the original place.

Warning label for actuator
Part number: KBB-55620157

! **WARNING**	• Before the installation, programming, operation, maintenance and inspection of the equipment, be sure to read through this manual so that you can use the ROI BOT with safety. • Install the safety fences to prevent anyone from entering the working envelope of the robot. • DO NOT put your finger or hand on the movable part or opening of the equipment. Otherwise, you may get injured. • When using the actuator in other than the horizontal state, be sure to select the actuator with brake. Otherwise, the slider will drop at power OFF, and you will be injured.

1.2 To Use the Equipment Safely

The details of this paragraph are the same as those in Para. 1.2 of the KBB series instruction manual (basic) provided separately. Read through this paragraph before using the equipment.

Section 2 List of Shipment

2.1 List of Shipment

The actuator to be shipped normally consists of the following parts.

(1) Actuator

(2) Oval head bolts (M6 × 30)

- The following bolts are attached per each axis (i.e., actuator).

Axis stroke (mm) (Both straight and side mounted motor axes)	Attached quantity
100 ~ 200	12
250 ~ 600	16
650 ~ 1,050	20

Section 3 Axis Specifications

3.1 Type of Axis and Name of Each Part

- Type of axis
  The type of axis is as shown below.

KBB–30F–ST–M20N–40–C

Series name

Frame number (Note 1)

00	R-axis
10	S size
30	M size
50	L size

Type of axis

ST	Straight axis
UR	Right side mounted motor axis
UL	Left side mounted motor axis
UU	Bottom side mounted motor axis

Lead of ball screw

20	20 mm
10	10 mm
05	5 mm

Axis variation (Note 3)

C	Clean
D	Simple dust-proof

Axis stroke (Note 4)

00	100 mm
15	150 mm
20	200 mm
:	:
A0	1,000 mm
A5	1,050 mm
:	:
F0	1,500 mm

Type of motor

A	100 W incremental
D	50 W absolute
E	100 W absolute
F	200 W absolute
G	400 W absolute

Type of slider

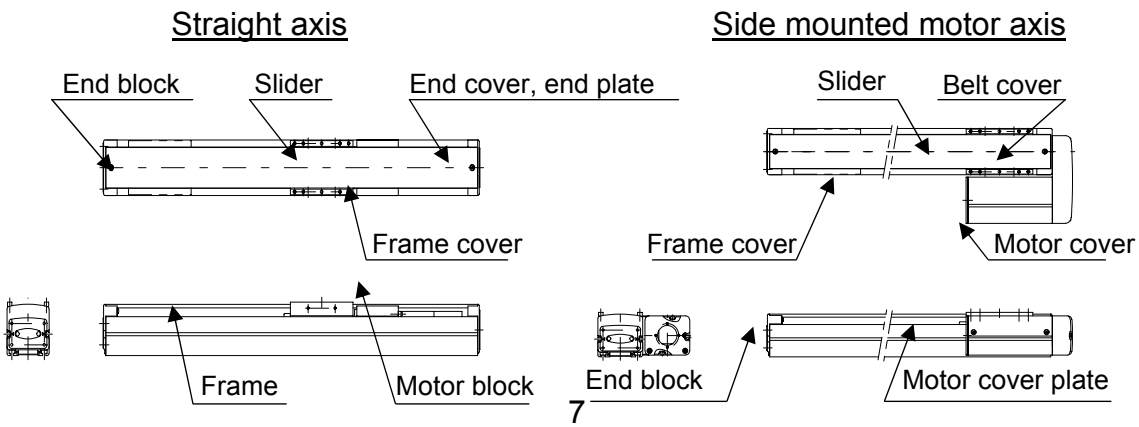
S	Short slider
M	Medium slider (Note 2)
L	Long slider

Brake

N	None
B	Provided

Note 1: Frame width: S size 78 mm, M size 130 mm, L size 160 mm
Note 2: For the KBB-10 model, the standard slider is used.
Note 3: For the KBB-50 model, only the simple dust-proof type is used.
Note 4: For the KBB-10 and KBB-30 models, the longest stroke is 1,050 mm.

- Name of each part



3.2 Single Axis Specifications

- Specifications
  Type of axis: KBB–30E–□□–□□□□–□□

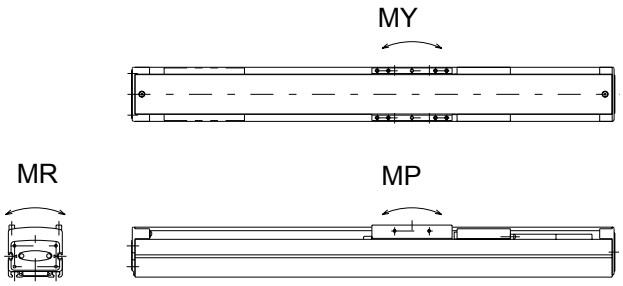
Motor		100 W absolute AC servo motor		
Drive system		Use of ball screw Diameter 15 mm Lead 20 mm, 10 mm, 5 mm		
Guide system		Linear guide (double) Bearing block: Four (4) pcs.		
Maximum payload mass (Note 1)	Lead of ball screw	Horizontal	Vertical	
			—	Regenerative unit used
	20 mm	20 kg	3 kg	5 kg
	10 mm	50 kg	8 kg	12 kg
	5 mm	50 kg	15 kg	22 kg
Maximum speed (Note 2)	Lead of ball screw 20 mm	1,200 mm/s		
	Lead of ball screw 10 mm	600 mm/s		
	Lead of ball screw 5 mm	300 mm/s		
Permissible static moment (Note 3)	Medium slider	MR: 510 N·m, MP: 430 N·m, MY: 370 N·m		
	Long slider	MR: 510 N·m, MP: 750 N·m, MY: 650 N·m		
Repeatability		±0.01 mm		
Resolution		0.01 mm		
Rated thrust (axial force)	Lead of ball screw 20 mm	64 N		
	Lead of ball screw 10 mm	128 N		
	Lead of ball screw 5 mm	256 N		

Note 1: These are the values when the acceleration/deceleration time is 0.36 s or over.

Note 2: The maximum speed differs with the axis stroke as shown below.

- Axis stroke 600 mm or less: Specified values
- Axis stroke 650 mm ~ 700 mm:
  1,000 mm/s when the lead of ball screw is 20 mm.
  500 mm/s when the lead of ball screw is 10 mm.
  250 mm/s when the lead of ball screw is 5 mm.
- Axis stroke 700 mm ~ 800 mm:
  800 mm/s when the lead of ball screw is 20 mm.
  400 mm/s when the lead of ball screw is 10 mm.
  200 mm/s when the lead of ball screw is 5 mm.
- Axis stroke 850 mm ~ 1,050 mm:
  600 mm/s when the lead of ball screw is 20 mm.
  300 mm/s when the lead of ball screw is 10 mm.
  150 mm/s when the lead of ball screw is 5 mm.

Note 3:



MR: Rolling moment
MP: Pitching moment
MY: Yawing moment

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Type of axis: KBB–30F–□□–□□□□–□□

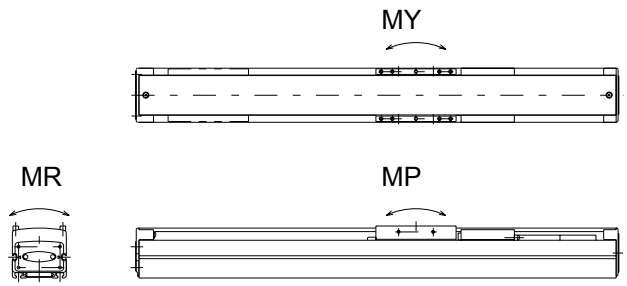
Motor		200 W absolute AC servo motor		
Drive system		Use of ball screw Diameter 15 mm Lead 20 mm, 10 mm, 5 mm		
Guide system		Linear guide (double) Bearing block: Four (4) pcs.		
Maximum payload mass (Note 1)	Lead of ball screw	Horizontal	Vertical	
			—	Regenerative unit used
	20 mm	40 kg	3 kg	10 kg
	10 mm	80 kg	8 kg	20 kg
	5 mm	80 kg	15 kg	40 kg
Maximum speed (Note 2)	Lead of ball screw 20 mm	1,200 mm/s		
	Lead of ball screw 10 mm	600 mm/s		
	Lead of ball screw 5 mm	300 mm/s		
Permissible static moment (Note 3)	Medium slider	MR: 510 N·m, MP: 430 N·m, MY: 370 N·m		
	Long slider	MR: 510 N·m, MP: 750 N·m, MY: 650 N·m		
Repeatability		±0.01 mm		
Resolution		0.01 mm		
Rated thrust (axial force)	Lead of ball screw 20 mm	160 N		
	Lead of ball screw 10 mm	320 N		
	Lead of ball screw 5 mm	640 N		

Note 1: These are the values when the acceleration/deceleration time is 0.36 s or over.

Note 2: The maximum speed differs with the axis stroke as shown below.

- Axis stroke 600 mm or less: Specified values
- Axis stroke 650 mm ~ 700 mm:
  1,000 mm/s when the lead of ball screw is 20 mm.
  500 mm/s when the lead of ball screw is 10 mm.
  250 mm/s when the lead of ball screw is 5 mm.
- Axis stroke 700 mm ~ 800 mm:
  800 mm/s when the lead of ball screw is 20 mm.
  400 mm/s when the lead of ball screw is 10 mm.
  200 mm/s when the lead of ball screw is 5 mm.
- Axis stroke 850 mm ~ 1,050 mm:
  600 mm/s when the lead of ball screw is 20 mm.
  300 mm/s when the lead of ball screw is 10 mm.
  150 mm/s when the lead of ball screw is 5 mm.

Note 3:



MR: Rolling moment
MP: Pitching moment
MY: Yawing moment

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- Axis dimensions

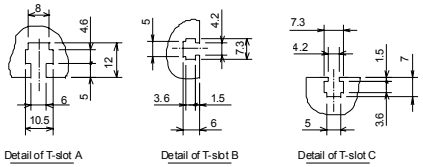
(1) Straight axis

[KBB−30E−ST−***] (100 W absolute motor specifications)

Type		KBB-30E-ST-M**N-15	KBB-30E-ST-M**N-25	KBB-30E-ST-M**N-35	KBB-30E-ST-N**N-45	KBB-30E-ST-M**N-55	KBB-30E-ST-M**N-65	KBB-30E-ST-N**N-75	KBB-30E-ST-N**N-85	KBB-30E-ST-M**N-95	KBB-30E-ST-M**N-A5
	With brake	KBB-30E-ST-M**B-15	KBB-30E-ST-M**B-25	KBB-30E-ST-M**B-35	KBB-30E-ST-N**B-45	KBB-30E-ST-M**B-55	B30E-ST-M**B-65	KBB-30E-ST-N**B-75	KBB-30E-ST-N**B-85	KBB-30E-ST-M**B-95	KBB-30E-ST-M**B-A5
Stroke X (mm)		150	250	350	450	550	650	750	850	950	1050
Full length L (mm)		528 (568)	628 (668)	728 (768)	828 (868)	928 (968)	1028 (1068)	1128 (1168)	1228 (1268)	1328 (1368)	1428 (1468)
Mass of axis (kg)		8.3 (8.9)	9.5 (10.1)	10.7 (11.3)	11.9 (12.5)	13.1 (13.7)	14.3 (14.9)	15.5 (16.1)	16.7 (17.3)	17.9 (18.5)	19.1 (19.7)

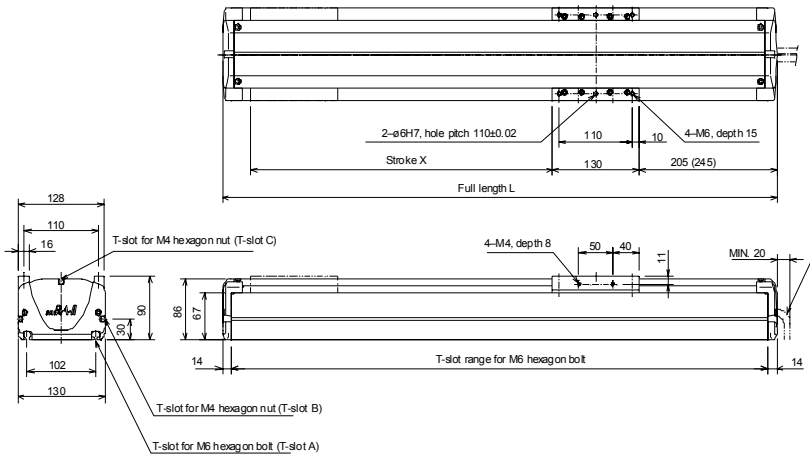
Type		KBB-30E-ST-L**N-15	KBB-30E-ST-L**N-25	KBB-30E-ST-L**N-35	KBB-30E-ST-L**N-45	KBB-30E-ST-L**N-55	KBB-30E-ST-L**N-65	KBB-30E-ST-L**N-75	KBB-30E-ST-L**N-85	KBB-30E-ST-L**N-95	KBB-30E-ST-L**N-A5
	With brake	KBB-30E-ST-L**B-15	KBB-30E-ST-L**B-25	KBB-30E-ST-L**B-35	KBB-30E-ST-L**B-45	KBB-30E-ST-L**B-55	KBB-30E-ST-L**B-65	KBB-30E-ST-L**B-75	KBB-30E-ST-L**B-85	KBB-30E-ST-L**B-95	KBB-30E-ST-L**B-A5
Stroke X (mm)		150	250	350	450	550	650	750	850	950	1050
Full length L (mm)		528 (568)	628 (668)	728 (768)	828 (868)	928 (968)	1028 (1068)	1128 (1168)	1228 (1268)	1328 (1368)	1428 (1468)
Mass of axis (kg)		8.6 (9.2)	9.8 (10.4)	11.0 (11.6)	12.2 (12.8)	13.4 (14.0)	14.6 (15.2)	15.8 (16.4)	17.0 (17.6)	18.2 (18.8)	19.4 (20.0)

Note: The values in parentheses are applicable when the axis (actuator) is provided with brake.
"***" of the type signifies the lead of ball screw.
(20 when the lead of ball screw is 20 mm, 10 when it is 10 mm, and 05 when it is 5 mm.)

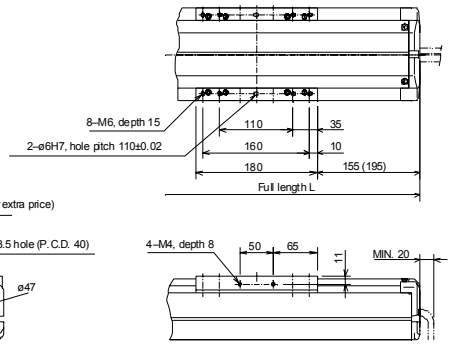


Detail of T-slot A　Detail of T-slot B　Detail of T-slot C

[KBB−30E−ST−M***]



[KBB−30E−ST−L***]



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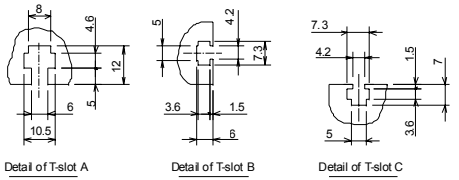
[KBB−30F−ST−***] (200 W absolute motor specifications)

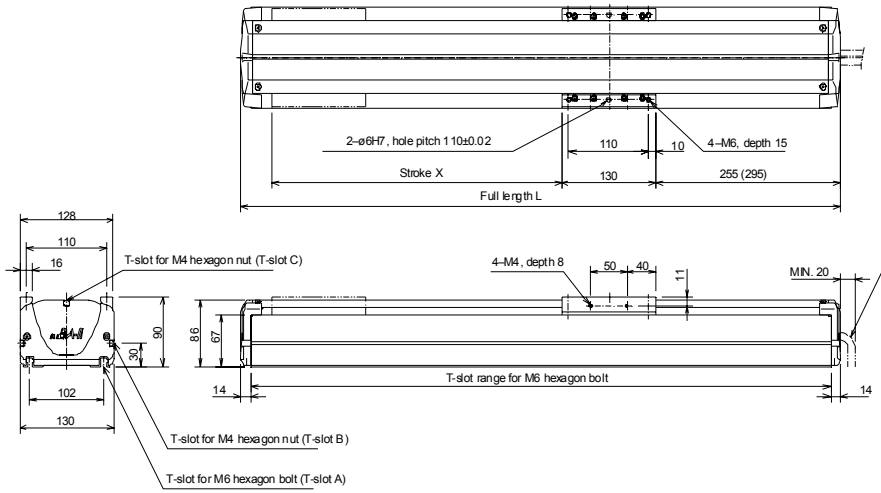
Type		KBB-30F-ST-M**N-10	KBB-30F-ST-M**N-20	KBB-30F-ST-M**N-30	KBB-30F-ST-M**N-40	KBB-30F-ST-M**N-50	KBB-30F-ST-M**N-60	KBB-30F-ST-M**N-70	KBB-30F-ST-M**N-80	KBB-30F-ST-M**N-90	KBB-30F-ST-M**N-A0
	With brake	KBB-30F-ST-M**B-10	KBB-30F-ST-M**B-20	KBB-30F-ST-M**B-30	KBB-30F-ST-M**B-40	KBB-30F-ST-M**B-50	KBB-30F-ST-M**B-60	KBB-30F-ST-M**B-70	KBB-30F-ST-M**B-80	KBB-30F-ST-M**B-90	KBB-30F-ST-M**B-A0
Stroke X (mm)		100	200	300	400	500	600	700	800	900	1000
Full length L (mm)		528 (568)	628 (668)	728 (768)	828 (868)	928 (968)	1028 (1068)	1128 (1168)	1228 (1268)	1328 (1368)	1428 (1468)
Mass of axis (kg)		9.6 (10.2)	10.8 (11.4)	12.0 (12.6)	13.2 (13.8)	14.4 (15.0)	15.6 (16.2)	16.8 (17.4)	18.0 (18.6)	19.2 (19.8)	20.4 (21.0)

Type		KBB-30F-ST-L**N-15	KBB-30F-ST-L**N-25	KBB-30F-ST-L**N-35	KBB-30F-ST-L**N-45	KBB-30F-ST-L**N-55	KBB-30F-S T-L**N-65	KBB-30F-ST-L**N-75	KBB-30F-ST-L**N-85	KBB-30F ST L**N-95
	With brake	KBB-30F-ST-L**B-15	KBB-30F-ST-L**B-25	KBB-30F-ST-L**B-35	KBB-30F-ST-L**B-45	KBB-30F-ST-L**B-55	KBB-30F-S T-L**B-65	KBB-30F-ST-L**B-75	KBB-30F-ST-L**B-85	KBB-30F-ST-L**B-95
Stroke X (mm)		150	250	350	450	550	650	750	850	950
Full length L (mm)		628 (668)	728 (768)	828 (868)	928 (968)	1028 (1068)	1128 (1168)	1228 (1268)	1328 (1368)	1428 (1468)
Mass of axis (kg)		11.1 (11.7)	12.3 (12.9)	13.5 (14.1)	14.7 (15.3)	15.9 (16.5)	17.1 (17.7)	18.3 (18.9)	19.5 (20.1)	20.7 (21.3)

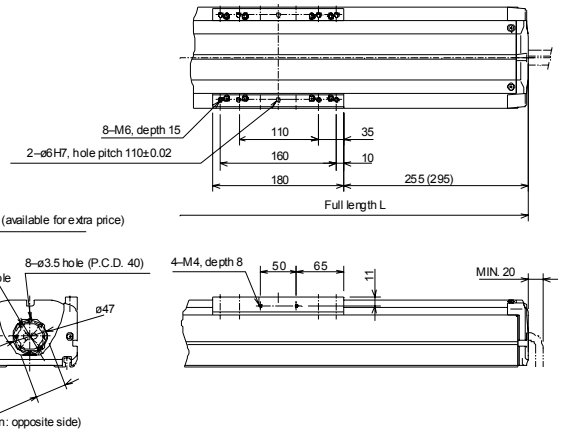
Note: The values in parentheses are applicable when the axis (actuator) is provided with brake.
"***" of the type signifies the lead of ball screw.
(20 when the lead of ball screw is 20 mm, 10 when it is 10 mm, and 05 when it is 5 mm.)



[KBB−30F−ST−M***]



[KBB−30F−ST−L***]

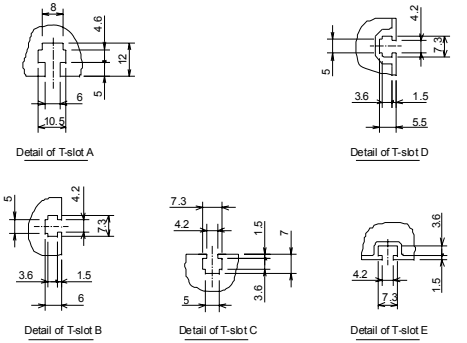


(2) Right side mounted motor axis

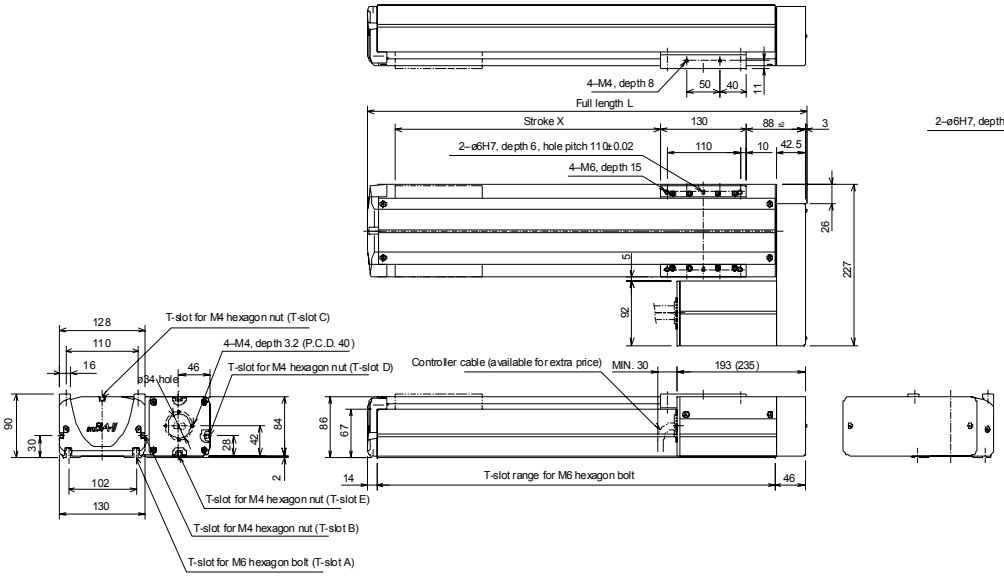
Type		KBB-30E-UR-M**N-10	KBB-30E-UR-M**N-20	KBB-30E-UR-M**N-30	KBB-30E-UR-M**N-40	KBB-30E-UR-M**N-50	KBB-30E-UR-M**N-60	KBB-30E-UR-M**N-70	KBB-30E-UR-M**N-80	KBB-30E-UR-M**N-90	KBB-30E-UR-M**N-A0
	With brake	KBB-30E-UR-M**B-10	KBB-30E-UR-M**B-20	KBB-30E-UR-M**B-30	KBB-30E-UR-M**B-40	KBB-30E-UR-M**B-50	KBB-30E-UR-M**B-60	KBB-30E-UR-M**B-70	KBB-30E-UR-M**B-80	KBB-30E-UR-M**B-90	KBB-30E-UR-M**B-A0
Stroke X (mm)		100	200	300	400	500	600	700	800	900	1000
Full length L (mm)		363	463	563	663	763	863	963	1063	1163	1263
Mass of axis (kg)		7.8 (8.2)	9.0 (9.4)	10.2 (10.6)	11.4 (11.8)	12.6 (13.0)	13.8 (14.2)	15.0 (15.4)	16.2 (16.6)	17.4 (17.8)	18.6 (19.0)

Type		KBB-30E-UR-L**N-15	KBB-30E-UR-L**N-25	KBB-30E-UR-L**N-35	KBB-30E-UR-L**N-45	KBB-30E-UR-L**N-55	KBB-30E-UR-L**N-65	KBB-30E-UR-L**N-75	KBB-30E-UR-L**N-85	KBB-30E-UR-L**N-95
	With brake	KBB-30E-UR-L**B-15	KBB-30E-UR-L**B-25	KBB-30E-UR-L**B-35	KBB-30E-UR-L**B-45	KBB-30E-UR-L**B-55	KBB-30E-UR-L**B-65	KBB-30E-UR-L**B-75	KBB-30E-UR-L**B-85	KBB-30E-UR-L**B-95
Stroke X (mm)		150	250	350	450	550	650	750	850	950
Full length L (mm)		463	563	663	763	863	963	1063	1163	1263
Mass of axis (kg)		9.3 (9.7)	10.5 (10.9)	11.7 (12.1)	12.9 (13.3)	14.1 (14.5)	15.3 (15.7)	16.5 (16.9)	17.7 (18.1)	18.9 (19.3)

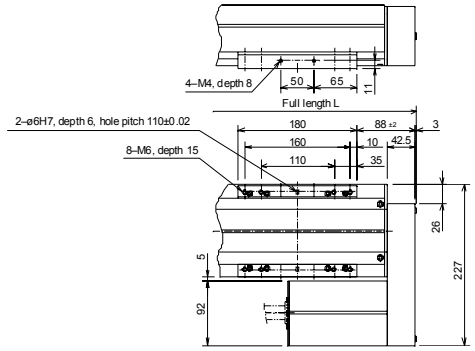
Note: The values in parentheses are applicable when the axis (actuator) is provided with brake.
"***" of the type signifies the lead of ball screw.
(20 when the lead of ball screw is 20 mm, 10 when it is 10 mm, and 05 when it is 5 mm.)



[KBB-30E-UR-M***]



[KBB-30E-UR-L***]



Discontinue

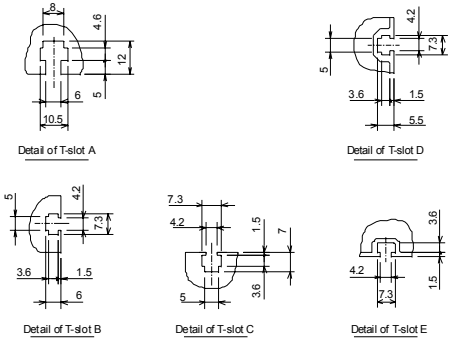
[KBB−30F−UR−***] (200 W absolute motor specifications)

Type		KBB-30F-UR-M**N-10	KBB-30F-UR-M**N-20	KBB-30F-UR-M**N-30	KBB-30F-UR-M**N-40	KBB-30F-UR-M**N-50	KBB-30F-UR-M**N-60	KBB-30F-UR-M**N-70	KBB-30F-UR-M**N-80	KBB-30F-UR-M**N-90	KBB-30F-UR-M**N-A0
	Without brake										
	With brake	KBB-30F-UR-M**B-10	KBB-30F-UR-M**B-20	KBB-30F-UR-M**B-30	KBB-30F-UR-M**B-40	KBB-30F-UR-M**B-50	KBB-30F-UR-M**B-60	KBB-30F-UR-M**B-70	KBB-30F-UR-M**B-80	KBB-30F-UR-M**B-90	KBB-30F-UR-M**B-A0
Stroke X (mm)		100	200	300	400	500	600	700	800	900	1000
Full length L (mm)		363	463	563	663	763	863	963	1063	1163	1263
Mass of axis (kg)		8.5 (9.1)	9.7 (10.3)	10.9 (11.5)	12.1 (12.7)	13.3 (13.9)	14.5 (15.1)	15.7 (16.3)	16.9 (17.5)	18.1 (18.7)	19.3 (19.9)

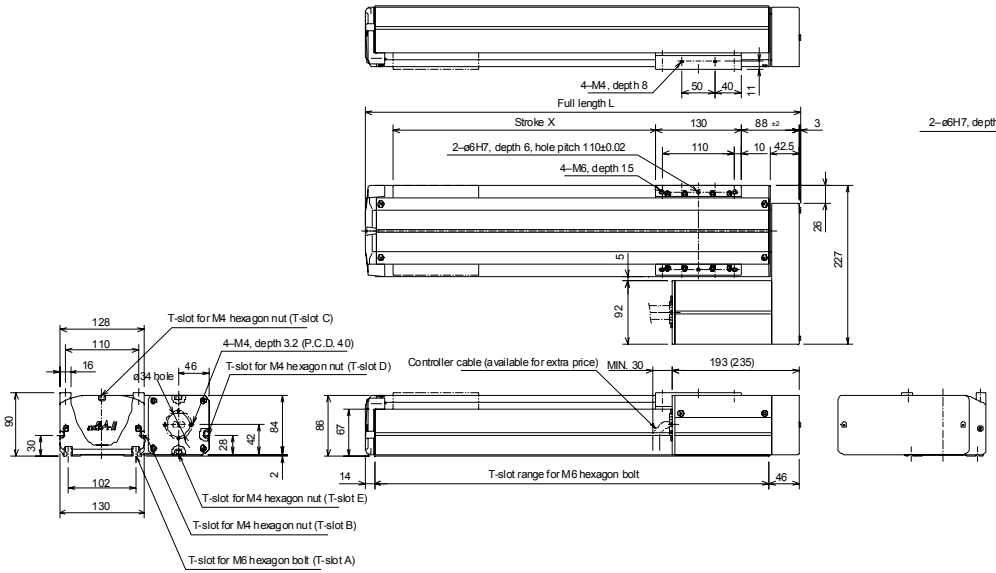
Type		KBB-30F-UR-L**N-15	KBB-30F-UR-L**N-25	KBB-30F-UR-L**N-35	KBB-30F-UR-L**N-45	KBB-30F-UR-L**N-55	KBB-30F-UR-L**N-65	KBB-30F-UR-L**N-75	KBB-30F-UR-L**N-85	KBB-30F-UR-L**N-95
	Without brake									
	With brake	KBB-30F-UR-L**B-15	KBB-30F-UR-L**B-25	KBB-30F-UR-L**B-35	KBB-30F-UR-L**B-45	KBB-30F-UR-L**B-55	KBB-30F-UR-L**B-65	KBB-30F-UR-L**B-75	KBB-30F-UR-L**B-85	KBB-30F-UR-L**B-95
Stroke X (mm)		150	250	350	450	550	650	750	850	950
Full length L (mm)		463	563	663	763	863	963	1063	1163	1263
Mass of axis (kg)		10.0 (10.6)	11.2 (11.8)	12.4 (13.0)	13.6 (14.2)	14.8 (15.4)	16.0 (16.6)	17.2 (17.8)	18.4 (19.0)	19.6 (20.2)

Note: The values in parentheses are applicable when the axis (actuator) is provided with brake

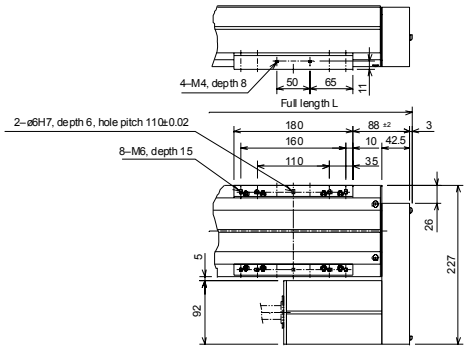
"***" of the type signifies the lead of ball screw.
(20 when the lead of ball screw is 20 mm, 10 when it is 10 mm, and 05 when it is 5 mm.)



[KBB−30F−UR−M***]



[KBB−30F−UR−L***]



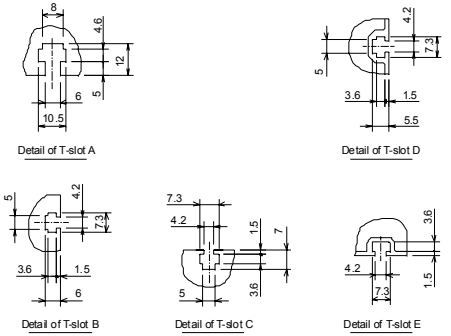
(3) Left side mounted motor axis

[KBB−30E−UL−***] (100 W absolute motor specifications)

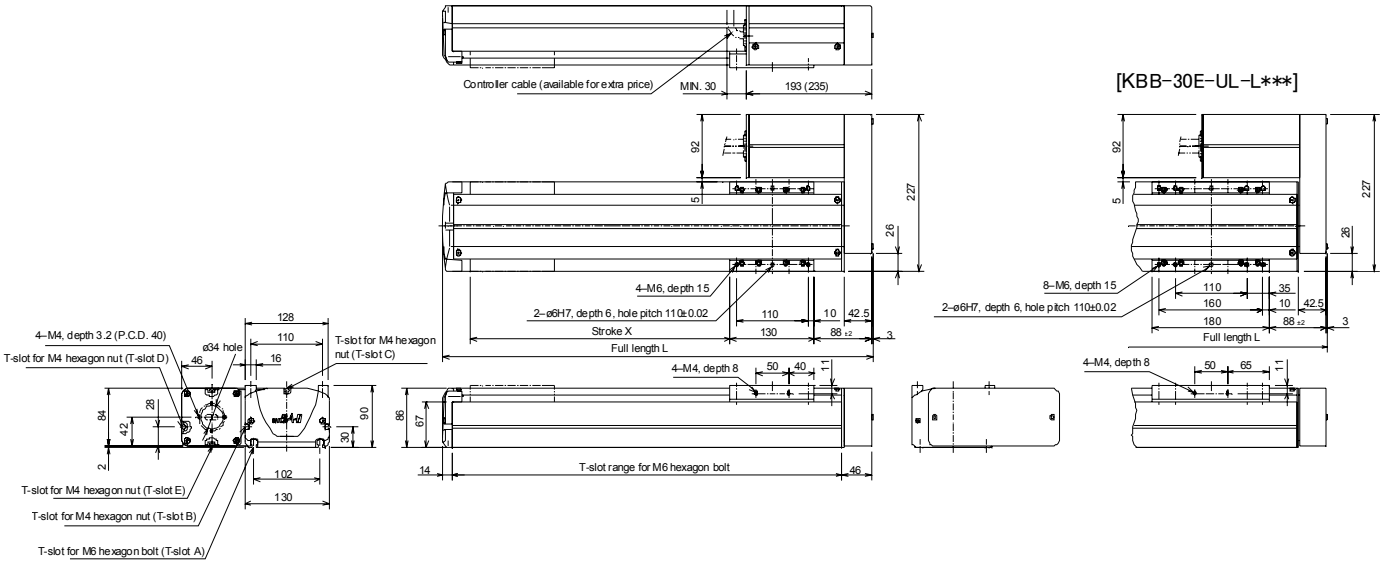
Type		KBB-30E-UL-M**N-10	KBB-30E-UL-M**N-20	KBB-30E-UL-M**N-30	KBB-30E-UL-M**N-40	KBB-30E-UL-M**N-50	KBB-30E-UL-M**N-60	KBB-30E-UL-M**N-70	KBB-30E-UL-M**N-80	KBB-30E-UL-M**N-90	KBB-30E-UL-M**N-A0
	With brake	KBB-30E-UL-M**B-10	KBB-30E-UL-M**B-20	KBB-30E-UL-M**B-30	KBB-30E-UL-M**B-40	KBB-30E-UL-M**B-50	KBB-30E-UL-M**B-60	KBB-30E-UL-M**B-70	KBB-30E-UL-M**B-80	KBB-30E-UL-M**B-90	KBB-30E-UL-M**B-A0
Stroke X (mm)		100	200	300	400	500	600	700	800	900	1000
Full length L (mm)		363	463	563	663	763	863	963	1063	1163	1263
Mass of axis (kg)		7.8 (8.2)	9.0 (9.4)	10.2 (10.6)	11.4 (11.8)	12.6 (13.0)	13.8 (14.2)	15.0 (15.4)	16.2 (16.6)	17.4 (17.8)	18.6 (19.0)

Type		KBB-30E-UL-L**N-15	KBB-30E-UL-L**N-25	KBB-30E-UL-L**N-35	KBB-30E-UL-L**N-45	KBB-30E-UL-L**N-55	KBB-30E-UL-L**N-65	KBB-30E-UL-L**N-75	KBB-30E-UL-L**N-85	KBB-30E-UL-L**N-95
	With brake	KBB-30E-UL-L**B-15	KBB-30E-UL-L**B-25	KBB-30E-UL-L**B-35	KBB-30E-UL-L**B-45	KBB-30E-UL-L**B-55	KBB-30E-UL-L**B-65	KBB-30E-UL-L**B-75	KBB-30E-UL-L**B-85	KBB-30E-UL-L**B-95
Stroke X (mm)		150	250	350	450	550	650	750	850	950
Full length L (mm)		463	563	663	763	863	963	1063	1163	1263
Mass of axis (kg)		9.3 (9.7)	10.5 (10.9)	11.7 (12.1)	12.9 (13.3)	14.1 (14.5)	15.3 (15.7)	16.5 (16.9)	17.7 (18.1)	18.9 (19.3)

Note: The values in parentheses are applicable when the axis (actuator) is provided with brake.
"***" of the type signifies the lead of ball screw.
(20 when the lead of ball screw is 20 mm, 10 when it is 10 mm, and 05 when it is 5 mm.)



[KBB−30E−UL−M***]



[KBB−30E−UL−L***]

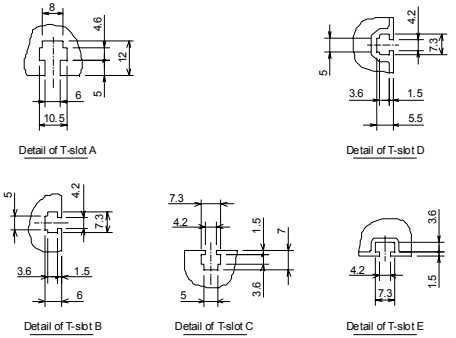
Discontinue

[KBB−30F−UL−***] (200 W absolute motor specifications)

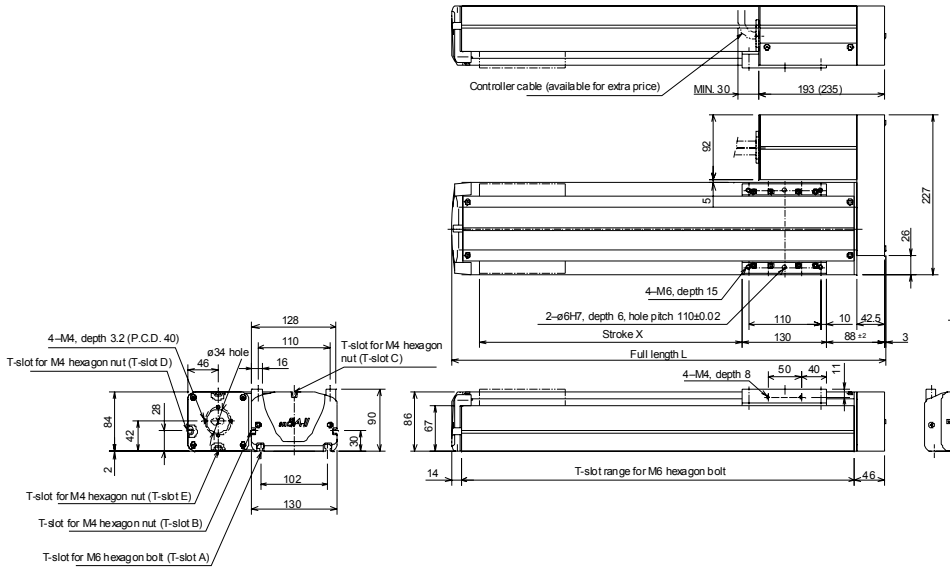
Type		KBB-30F-UL-M**N-10	KBB-30F-UL-M**N-20	KBB-30F-UL-M**N-30	KBB-30F-UL-M**N-40	KBB-30F-UL-M**N-50	KBB-30F-UL-M**N-60	KBB-30F-UL-M**N-70	KBB-30F-UL-M**N-80	KBB-30F-UL-M**N-90	KBB-30F-UL-M**N-A0
	With brake	KBB-30F-UL-M**B-10	KBB-30F-UL-M**B-20	KBB-30F-UL-M**B-30	KBB-30F-UL-M**B-40	KBB-30F-UL-M**B-50	KBB-30F-UL-M**B-60	KBB-30F-UL-M**B-70	KBB-30F-UL-M**B-80	KBB-30F-UL-M**B-90	KBB-30F-UL-M**B-A0
Stroke X (mm)		100	200	300	400	500	600	700	800	900	1000
Full length L (mm)		363	463	563	663	763	863	963	1063	1 163	1263
Mass of axis (kg)		8.5 (9.1)	9.7 (10.3)	10.9 (11.5)	12.1 (12.7)	13.3 (13.9)	14.5 (15.1)	15.7 (16.3)	16.9 (17.5)	18.1 (18.7)	19.3 (19.9)

Type		KBB-30F-UL-L**N-15	KBB-30F-UL-L**N-25	KBB-30F-UL-L**N-35	KBB-30F-UL-L**N-45	KBB-30F-UL-L**N-55	KBB-30F-UL-L**N-65	KBB-30F-UL-L**N-75	KBB-30F-UL-L**N-85	KBB-30F-UL-L**N-95
	With brake	KBB-30F-UL-L**B-15	KBB-30F-UL-L**B-25	KBB-30F-UL-L**B-35	KBB-30F-UL-L**B-45	KBB-30F-UL-L**B-55	KBB-30F-UL-L**B-65	KBB-30F-UL-L**B-75	KBB-30F-UL-L**B-85	KBB-30F-UL-L**B-95
Stroke X (mm)		150	250	350	450	550	650	750	850	950
Full length L (mm)		463	563	663	763	863	963	1063	1163	1263
Mass of axis (kg)		10.0 (10.6)	11.2 (11.8)	12.4 (13.0)	13.6 (14.2)	14.8 (15.4)	16.0 (16.6)	17.2 (17.8)	18.4 (19.0)	19.6 (20.2)

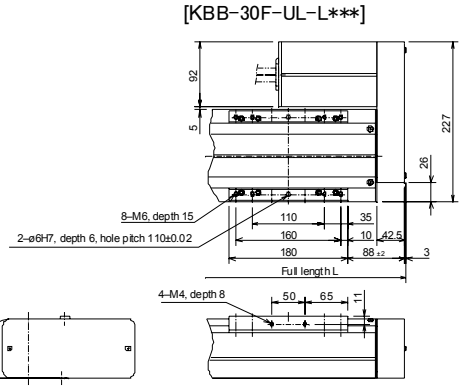
Note: The values in parentheses are applicable when the axis (actuator) is provided with brake.
"***" of the type signifies the lead of ball screw.
(20 when the lead of ball screw is 20 mm, 10 when it is 10 mm, and 05 when it is 5 mm.)



[KBB−30F−UL−M***]



[KBB−30F−UL−L***]



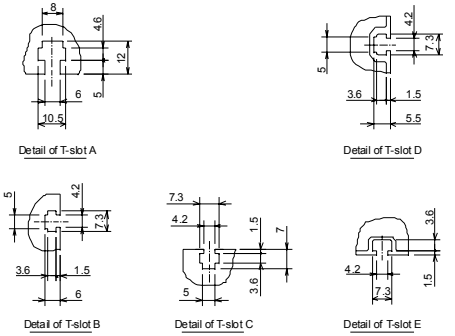
(4) Bottom side mounted motor axis

[KBB−30E−UU−***] (100 W absolute motor specifications)

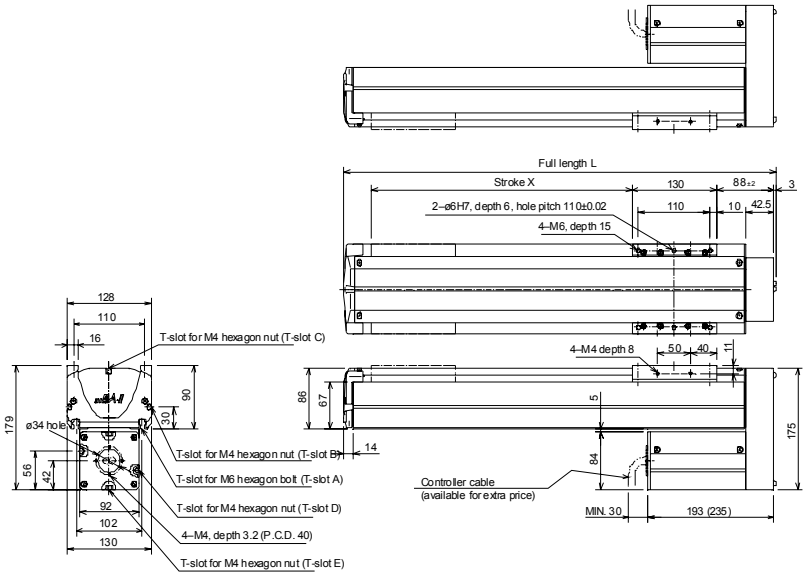
Type		KBB-30E-UU-M**N-10	KBB-30E-UU-M**N-20	KBB-30E-UU-M**N-30	KBB-30E-UU-M**N-40	KBB-30E-UU-M**N-50	KBB-30E-UU-M**N-60	KBB-30E-UU-M**N-70	KBB-30E-UU-M**N-80	KBB-30E-UU-M**N-90	KBB-30E-UU-M**N-A0
	Without brake										
	With brake	KBB-30E-UU-M**B-10	KBB-30E-UU-M**B-20	KBB-30E-UU-M**B-30	KBB-30E-UU-M**B-40	KBB-30E-UU-M**B-50	KBB-30E-UU-M**B-60	KBB-30E-UU-M**B-70	KBB-30E-UU-M**B-80	KBB-30E-UU-M**B-90	KBB-30E-UU-M**B-A0
Stroke X (mm)		100	200	300	400	500	600	700	800	900	1000
Full length L (mm)		363	463	563	663	763	863	963	1063	1163	1263
Mass of axis (kg)		7.8 (8.2)	9.0 (9.4)	10.2 (10.6)	11.4 (11.8)	12.6 (13.0)	13.8 (14.2)	15.0 (15.4)	16.2 (16.6)	17.4 (17.8)	18.6 (19.0)

Type		KBB-30E-UU-M**N-15	KBB-30E-UU-M**N-25	KBB-30E-UU-M**N-35	KBB-30E-UU-M**N-45	KBB-30E-UU-M**N-55	KBB-30E-UU-M**N-65	KBB-30E-UU-M**N-75	KBB-30E-UU-M**N-85	KBB-30E-UU-M**N-95
	Without brake									
	With brake	KBB-30E-UU-L**B-15	KBB-30E-UU-L**B-25	KBB-30E-UU-L**B-35	KBB-30E-UU-L**B-45	KBB-30E-UU-L**B-55	KBB-30E-UU-L**B-65	KBB-30E-UU-L**B-75	KBB-30E-UU-L**B-85	KBB-30E-UU-L**B-95
Stroke X (mm)		150	250	350	450	550	650	750	850	950
Full length L (mm)		463	563	663	763	863	963	1063	1163	1263
Mass of axis (kg)		9.3 (9.7)	10.5 (10.9)	11.7 (12.1)	12.9 (13.3)	14.1 (14.5)	15.3 (15.7)	16.5 (16.9)	17.7 (18.1)	18.9 (19.3)

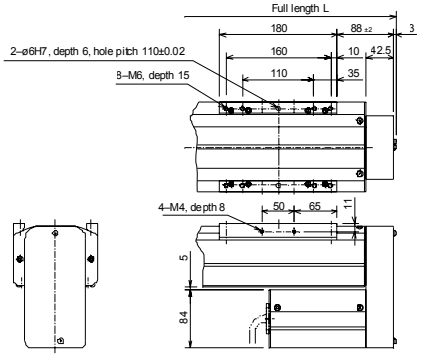
Note: The values in parentheses are applicable when the axis (actuator) is provided with brake.
"***" of the type signifies the lead of ball screw.
(20 when the lead of ball screw is 20 mm, 10 when it is 10 mm, and 05 when it is 5 mm.)



[KBB−30E−UU−M***]



[KBB−30E−UU−L***]



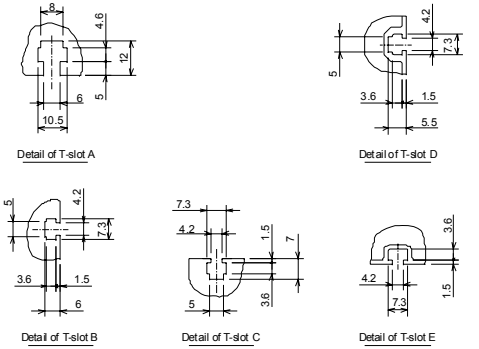
Discontinue

[KBB−30F−UU−✱✱✱] (200 W absolute motor specifications)

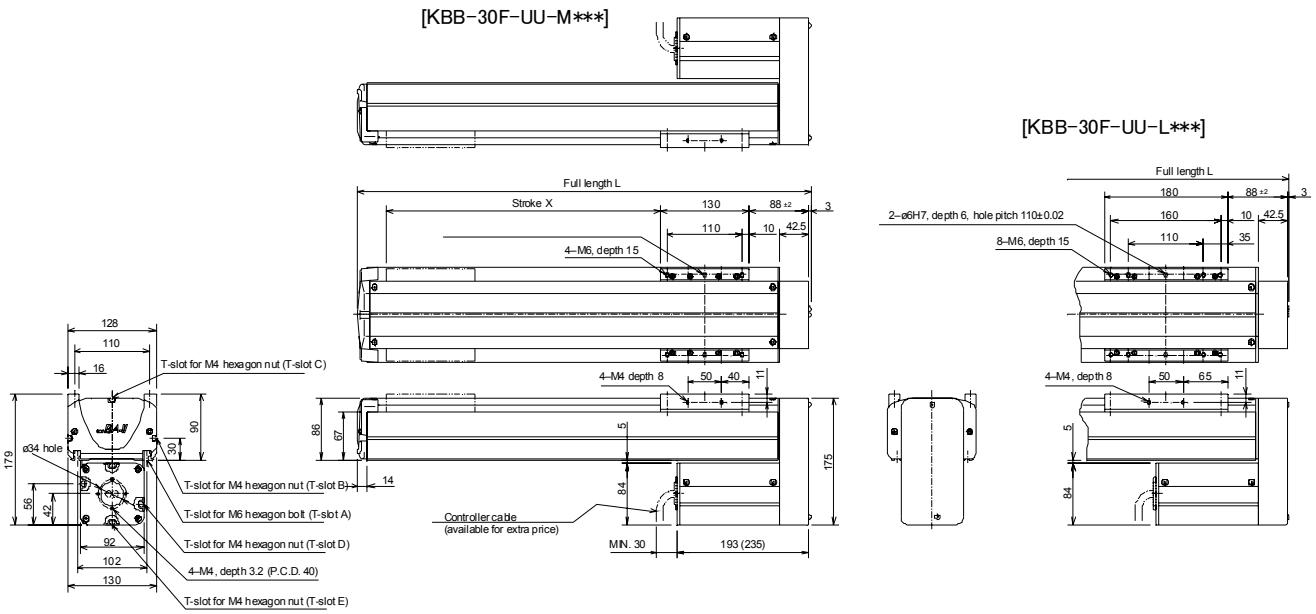
Type		KBB-30F-UU-M✱N-10	KBB-30F-UU-M✱N-20	KBB-30F-UU-M✱N-30	KBB-30F-UU-M✱N-40	KBB-30F-UU-M✱N-50	KBB-30F-UU-M✱N-60	KBB-30F-UU-M✱N-70	KBB-30F-UU-M✱N-80	KBB-30F-UU-M✱N-90	KBB-30F-UU-M✱N-A0
	With brake	KBB-30F-UU-M✱B-10	KBB-30F-UU-M✱B-20	KBB-30F-UU-M✱B-30	KBB-30F-UU-M✱B-40	KBB-30F-UU-M✱B-50	KBB-30F-UU-M✱B-60	KBB-30F-UU-M✱B-70	KBB-30F-UU-M✱B-80	KBB-30F-UU-M✱B-90	KBB-30F-UU-M✱B-A0
Stroke X (mm)		100	200	300	400	500	600	700	800	900	1000
Full length L (mm)		363	463	563	663	763	863	963	1063	1163	1263
Mass of axis (kg)		8.5 (9.1)	9.7 (10.3)	10.9 (11.5)	12.1 (12.7)	13.3 (13.9)	14.5 (15.1)	15.7 (16.3)	16.9 (17.5)	18.1 (18.7)	19.3 (19.9)

Type		KBB-30F-UU-L✱N-15	KBB-30F-UU-L✱N-25	KBB-30F-UU-L✱N-35	KBB-30F-UU-L✱N-45	KBB-30F-UU-L✱N-55	KBB-30F-UU-L✱N-65	KBB-30F-UU-L✱N-75	KBB-30F-UU-L✱N-85	KBB-30F-UU-L✱N-95
	With brake	KBB-30F-UU-L✱B-15	KBB-30F-UU-L✱B-25	KBB-30F-UU-L✱B-35	KBB-30F-UU-L✱B-45	KBB-30F-UU-L✱B-55	KBB-30F-UU-L✱B-65	KBB-30F-UU-L✱B-75	KBB-30F-UU-L✱B-85	KBB-30F-UU-L✱B-95
Stroke X (mm)		150	250	350	450	550	650	750	850	950
Full length L (mm)		463	563	663	763	863	963	1063	1163	1263
Mass of axis (kg)		10.0 (10.6)	11.2 (11.8)	12.4 (13.0)	13.6 (14.2)	14.8 (15.4)	16.0 (16.6)	17.2 (17.8)	18.4 (19.0)	19.6 (20.2)

Note: The values in parentheses are applicable when the axis (actuator) is provided with brake.
"✱✱✱" of the type signifies the lead of ball screw.
(20 when the lead of ball screw is 20 mm, 10 when it is 10 mm, and 05 when it is 5 mm.)



[KBB−30F−UU−M✱✱✱]

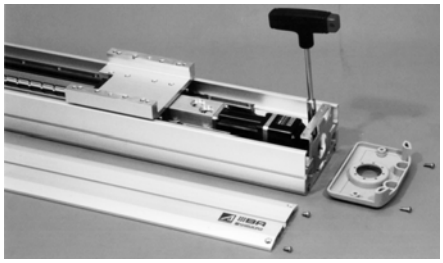


[KBB−30F−UU−L✱✱✱]

Section 4 Maintenance

For the basic maintenance and inspection, see Section 5 of the instruction manual (installation of actuator) provided separately.

4.1 Motor Replacement Procedures



Replace the motor in the following manner.

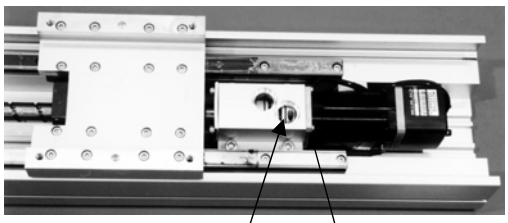
4.1.1 Straight Motor Axis

(1) Remove the frame cover, end cover and end plate.

! CAUTION Be sure to turn the power off before starting the work.

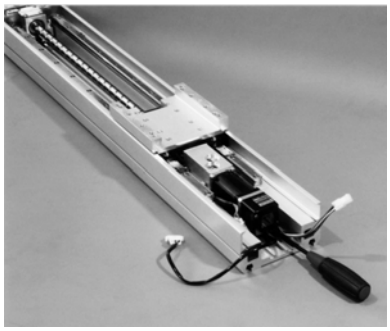
(2) Loosen the bolts on the motor output shaft side of the coupling. (DO NOT loosen the bolts on the ball screw side.)

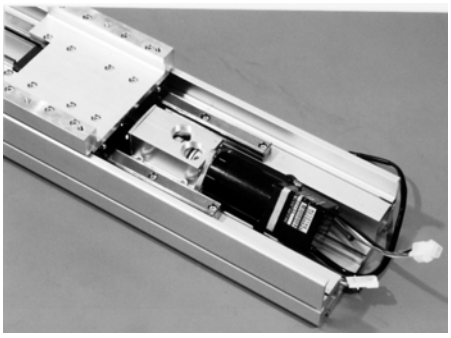
- When the actuator (axis) is provided a brake, perform the above work by removing the motor set screws and rotating the motor.
  For the actuator (axis) of 200 W motor specifications, the motor cannot be rotated due to its dimension. When this happens, contact our sales agent in your territory.



Bolt on motor output shaft side

Motor set screw





Turn the motor.

(3) Disengage the motor from the axis (actuator).

(4) Mount a new motor at the same position so that the motor lead wires face downward. (DO NOT tighten the set bolt of the coupling at this point of time.)

(5) Temporarily connect the axis (actuator) and controller.

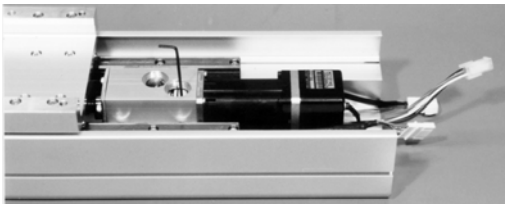
(6) Connect the teach pendant with the controller and perform home return.

! CAUTION

Before the home return, set both the position and speed servo gain values to zero (0).
For the setting procedures, see Para. 11.3.3 of the instruction manual (basic) provided separately.

(7) The motor starts revolving. Move the slider by hand to the vicinity of the home point. (Turn on the home point sensor.)

(8) After the motor has stopped (i.e., after the motor has returned to the home point), move the slider so that the clearance between the slider and motor block can be 73 mm (for KBB–30E–ST–M), 23 mm (for KBB–30E–ST–L) or 11 mm (KBB–30F). Then turn off the controller power and tighten the set bolt of the coupling. (Clamping torque: 1.0 N·m (for KBB–30E) or 1.5 N·m (for KBB–30F))
(See Para. 4.3.)

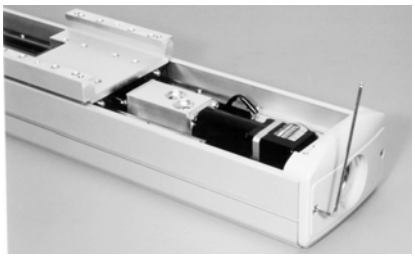


! CAUTION

Be sure to turn off the controller power before clamping the set bolt of the coupling.

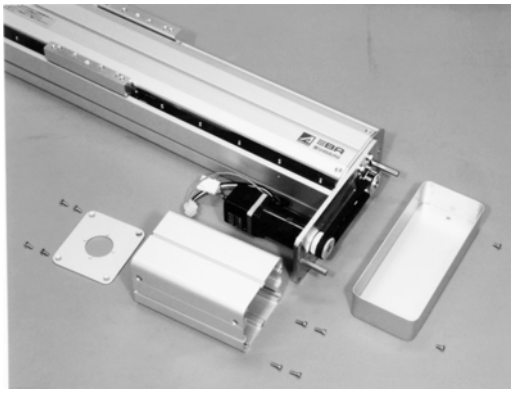
(9) Turn the power on again, set each servo gain value to the original value, then confirm the home return. After the confirmation, turn the power off and disconnect the controller cable.

(10) Mount the frame cover, end cover and end plate on the axis (actuator).



4.1.2 Side Mounted Motor Axis

(1) Remove the covers.



CAUTION Be sure to turn the power off before starting the work.

(2) Loosen the four (4) motor plate set bolts and remove the belt.

(3) Remove the motor and install a new motor at the same position so that the motor lead wires can face the axis (actuator) side (right/left side mounted motor axis) or face crosswise (bottom side mounted motor axis).

(4) Temporarily connect the axis (actuator) and controller, then connect the teach pendant.

(5) Turn on the controller power and perform the home return operation.

! CAUTION

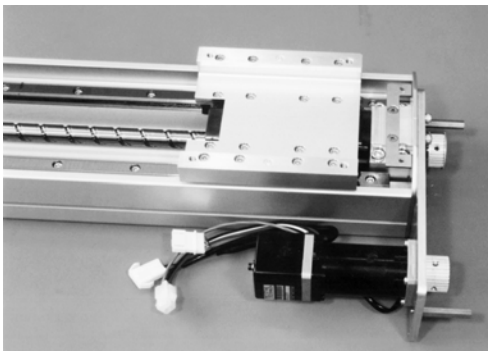
Before the home return, set both the position and speed servo gain values to zero (0).
For the setting procedures, see Para. 11.3.3 of the instruction manual (basic) provided separately.

! CAUTION

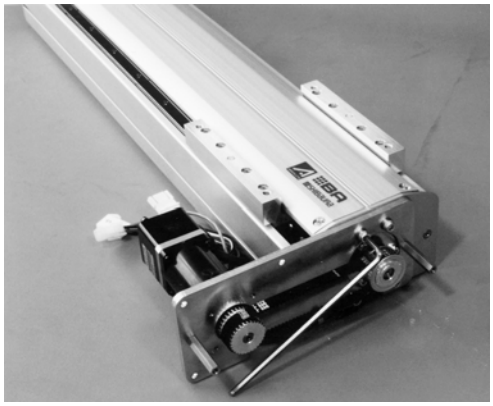
The motor will start. NEVER touch the toothed pulley.

(6) The motor starts revolving. Move the slider to the vicinity of the home point while taking utmost care not to touch the revolving part.

(7) After the motor has stopped (i.e., after the motor has returned to the home point), move the slider so that the clearance between the slider and motor block can be 11 mm (i.e., reference home position). (See Para. 4.3.)



(8) Turn off the controller power and set the belt so that the relative positions of the toothed pulleys on the ball screw side and motor side will not shift. Then tighten the motor plate set bolts while pulling the motor plate with the force of about 78 N (8 kgf).



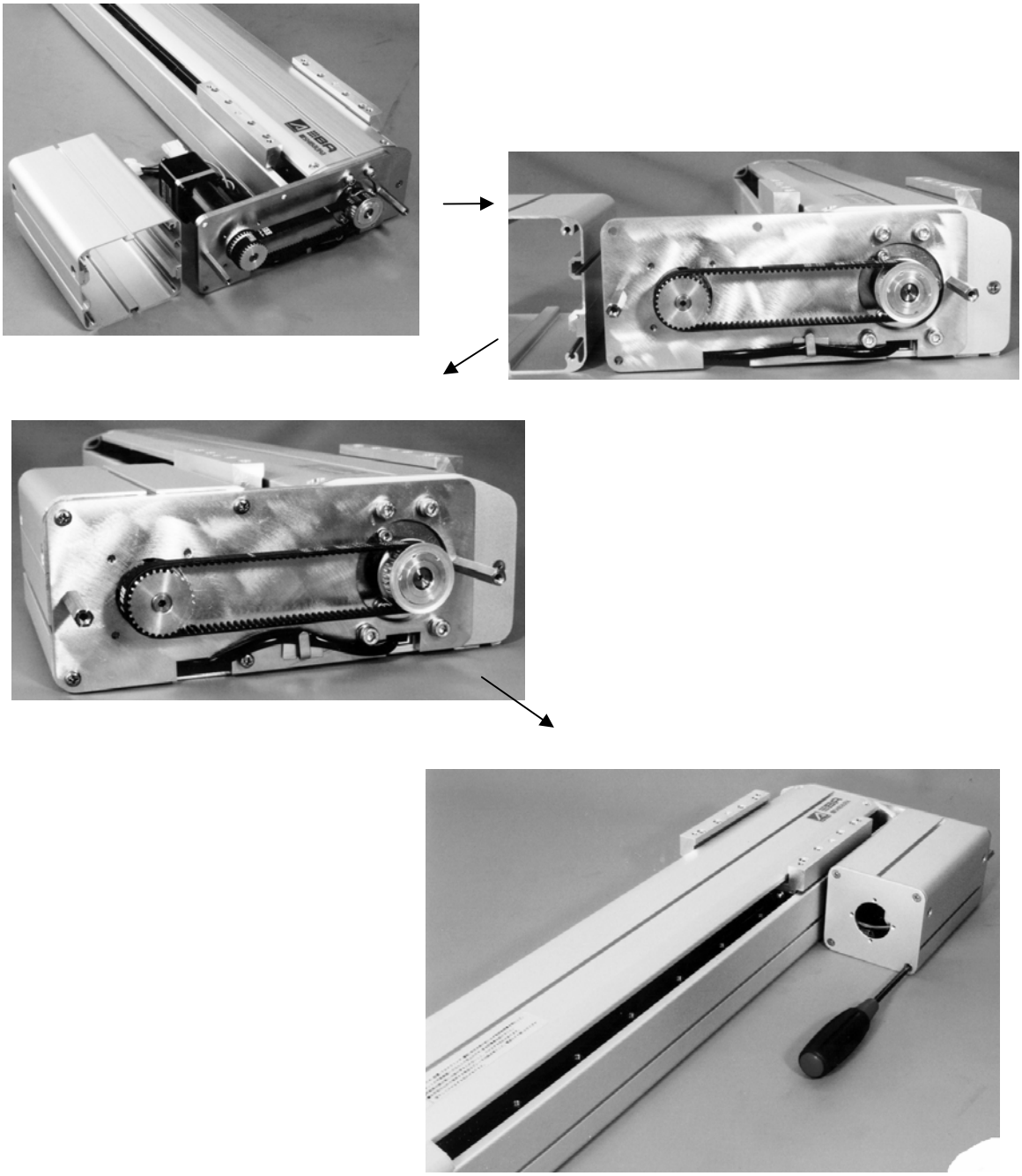
! CAUTION

Be sure to turn off the controller power before engaging the belt.

(9) Turn the power on again, set each servo gain value to the original value, then confirm the home return.

(10) Turn off the controller power and disconnect the controller cable.

(11) Mount the motor cover and motor cover plate as shown below.



(12) Mount the belt cover.

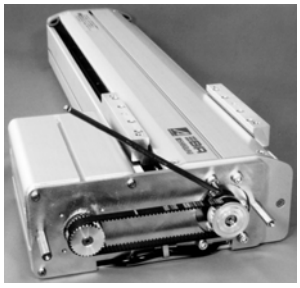
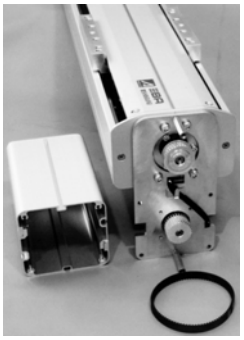
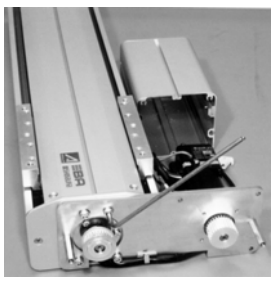
4.2 Changing Side Mounted Motor Direction

When the side mounted motor direction (left, right or bottom) has to be changed, observe the following steps.
For the right and left directions, the common parts are used and no additional part is required to change the direction.
For the bottom direction, the motor plate, belt and belt cover differ from the above.

(1) Remove the covers. (See Step (1) of Para. 4.1.2.)

(2) Remove the belt. (See Step (2) of Para. 4.1.2.)

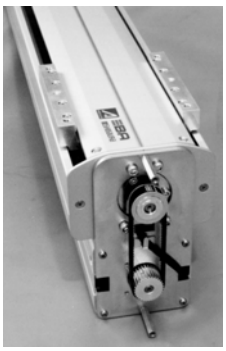
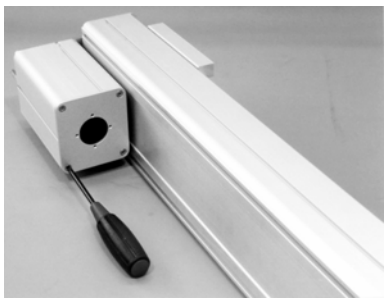
(3) Remove the motor plate set bolts, mount the motor plate in the designated direction, then temporarily tighten the same bolts.
To change the right/left direction, turn over the motor plate and mount it.


→

or


(4) Temporarily connect the controller cable, adjust the home point, then carry out Steps (4) through (10) of Para. 4.1.2.

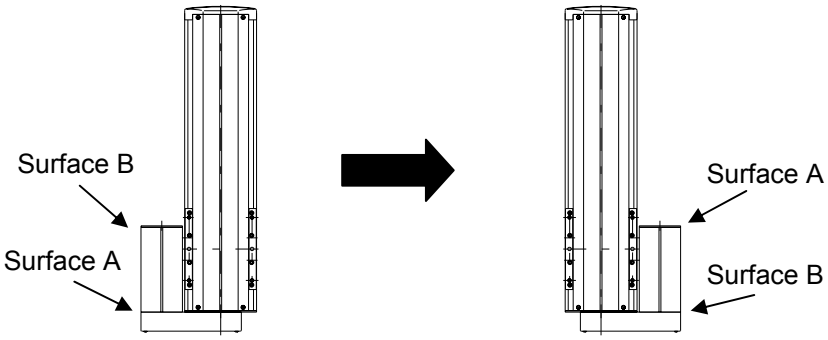
(5) Mount the motor cover and motor cover plate, referring to the following photos.

[Bottom side mounted motor]

[Left side mounted motor]

Note: The set surface of the motor cover is reversed for the right side mounted motor axis and left side mounted motor axis.



[Right side mounted motor]

See Step (11) of Para. 4.1.2.

6) Mount the belt cover.

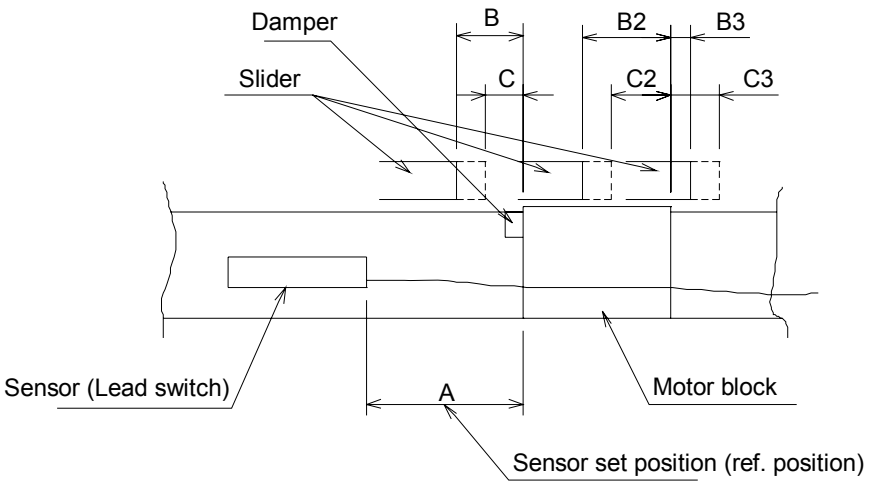
4.3 Adjusting Home Point

To adjust the home position, observe the following procedures.

(1) When the home point sensor is ON (see Note below), each slider position at the home point should be as follows:

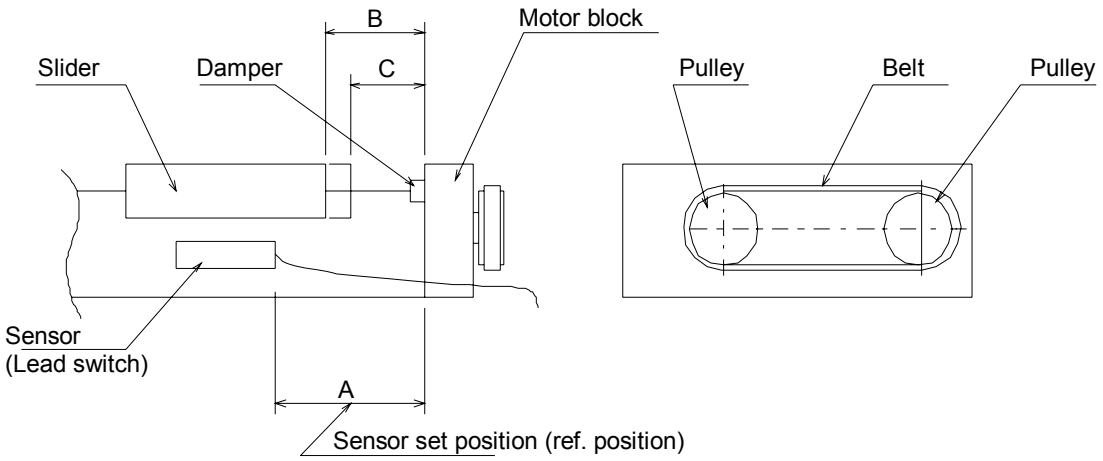
[1] Straight axis

	Sensor set position (ref.)	Home point sensor ON position (Note)			Reference home position		
Applicable axis	A	B	B2	B3	C	C2	C3
KBB–30E–ST–M10 (20)	37 mm	–	49 mm	–	–	44 mm	–
KBB–30E–ST–M05	35 mm	–	47 mm	–	–	44 mm	–
KBB–30E–ST–L10 (20)	37 mm	–	–	1 mm	–	–	6 mm
KBB–30E–ST–L05	35 mm	–	–	3 mm	–	–	6 mm
KBB–30F–ST–M10 (20)	84 mm	25 mm	–	–	20 mm	–	–
KBB–30F–ST–M05	82 mm	23 mm	–	–	20 mm	–	–
KBB–30F–ST–L10 (20)	134 mm	25 mm	–	–	20 mm	–	–
KBB–30F–ST–L05	132 mm	23 mm	–	–	20 mm	–	–



[2] Side mounted motor axis

	Sensor set position (ref.)	Home point sensor ON position	Reference home position
Applicable axis	A	B	C
KBB–30E (F)–U*–M10 (20)	85 mm	16 mm	11 mm
KBB–30E (F)–U*–M05*	83 mm	14 mm	11 mm
KBB–30E (F)–U*–L10 (20)*	135 mm	16 mm	11 mm
KBB–30E (F)–U*–L05*	133 mm	14 mm	11 mm



Note: As the home point sensor uses a lead switch of normal close contact specifications, it is OFF electrically. To facilitate the reader's understanding, however, it is expressed as "ON" in this manual.
The minus (–) overrun position is the position where the slider will not move any further in the motor direction after it comes into contact with the motor block damper. Normally, the position approximately 5 mm toward the motor direction from the reference home position becomes the minus (–) overrun position.

Note The home point sensor should always be ON even if the slider is located at the minus (–) overrun position. If the sensor is OFF when the slider is at the minus (–) overrun position, home return from this position is not possible.

(2) The home point is located at either end of the axis. If the axis apex serves as the home point, a home point change sensor (option) is necessary.

If the home point has to be changed to the vicinity of the stroke center, be sure to mount a stopper at a position about 5 mm of the overrun length from the home point stop position.
The length from the home point sensor ON position to the home point stop position should be 5 mm (when the lead of ball screw is 10 mm or 20 mm) or 3 mm (when the lead of ball screw is 5 mm).

[How to confirm slider position when home point sensor is ON]

- Turn off the controller power, move the slider 50 to 100 mm from the home position, turn the power on, then perform home return. (When the axis (actuator) is equipped with a brake, perform home return in the JOG mode after turning on the controller power.)

- The position where the slider speed changes (from mid speed to low speed) during home return operation becomes the home point sensor ON position. In this occasion, the slider will not stop until the home return completes (i.e., phase Z is detected). (The slider will not stop at the home point sensor ON position.)

■ If the slider has to be stopped at the home point sensor ON position and exact confirmation of this is necessary, observe the following steps.

1. Change the home return method from the phase Z detection to the sensor detection.
To change the method, change the value of No.7 (home return method) of parameter 2 from "0" to "1" through the teach pendant. (For details, see Para. 11.4 of the instruction manual (basic) provided separately.)

2. Turn off the controller power, move the slider 50 mm to 100 mm from the home position, turn the power on, then perform home return. (When the axis (actuator) is equipped with a brake, perform home return in the JOG mode after turning on the controller power.)

3. The position where the slider has stopped after finish of the home return becomes the home point sensor ON position.
(In the sensor detection system, the sensor ON position is the home point.)

! CAUTION

After the confirmation, be sure to return the home return method to the phase Z detection.

■ In addition to the above, the home point sensor ON position can be confirmed in the following manner, only when the axis (actuator) is not provided with a brake.

1. Connect the teach pendant, set the axis (actuator) in the servo-free status, then call the home point sensor monitor screen.

2. Gradually move the axis slider by manual operation from the vicinity of the stroke center to near the home point. Make sure of the position where the home point sensor on the monitor screen of the teach pendant is ON. (See Para. 12.5 of the instruction manual (basic) provided separately.)

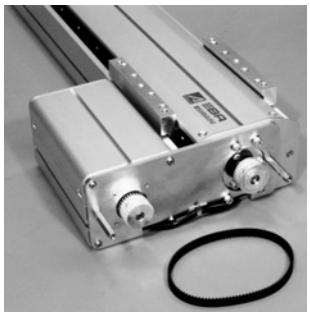
[Move of home point sensor]

- Compare the home point sensor ON position of the slider with length "B" in Para. 4.3. Move the home point sensor position by only the difference between them.

4.4 Belt Replacement Procedures

Replace the belt of the side mounted motor axis in the following manner.

(1) Remove the belt cover, loosen the motor plate set bolts and remove the belt.



CAUTION

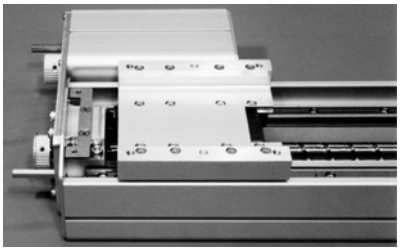
Be sure to turn the power off before starting the work.

(2) Turn on the controller power and perform home return.

CAUTION

Before the home return, set both the position and speed servo gain values to zero (0).
For the setting procedures, see Para. 11.3.3 of the instruction manual (basic) provided separately.
The motor will start. NEVER touch the toothed pulley.

(3) The motor starts revolving. Move the slider to the reference home position (i.e., the clearance between the motor block and slider is 11 mm) while taking careful precautions not to touch the revolving part by hand. The home return will finish and the motor will stop. (See Para. 4.3.)



(4) Mount the belt, referring to Steps (8) and (9) of Para. 4.1.2 above.

(5) Mount the belt cover.

4.5 Replacing Ball Screw

- If replacement of the ball screw is required, contact our sales agent in your territory. NEVER replace the ball screw by the customer.
- Only the ball screw built in a single actuator can be replaced. Replacement of the ball screw built in the machine or combined with other equipment is not possible.

4.6 Replacing Linear Guide

- Like the ball screw, if the linear guide needs to be replaced, contact our sales agent in your territory.

Section 5 Spare Parts

5.1 Spare Parts

If the robot went wrong, but no repair part is available at hand, it cannot be repaired even if a trouble has been found at an early stage. To avoid this, it is recommended that each customer keep the spare parts at hand.

No.	Part name	Description
1	Timing belt	The belt differs between the right/left side mounted axis and the bottom side mounted axis.
2	AC servo motor (Absolute encoder)	For straight axis (100 W)
3	AC servo motor with brake (Absolute encoder)	For straight axis with brake (100 W)
4	AC servo motor with pulley (Absolute encoder)	For all side mounted motor axes (100 W)
5	AC servo motor with brake and pulley (Absolute encoder)	For all side mounted motor axes with brakes (100 W)
6	AC servo motor (Absolute encoder)	For straight axis (200 W)
7	AC servo motor with brake (Absolute encoder)	For straight axis with brake (200 W)
8	AC servo motor with pulley (Absolute encoder)	For all side mounted motor axes (200 W)
9	AC servo motor with brake and pulley (Absolute encoder)	For all side mounted motor axes with brakes (200 W)