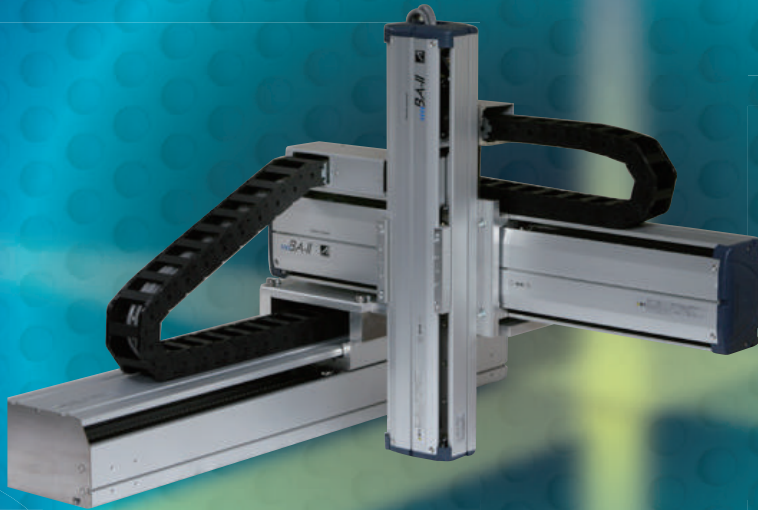


TOSHIBA MACHINE

COMPO ARM
ARM ROBOT

BA-II  **SERIES**



COMPO ARM

BA-II

Ample variations covering from a single axis to orthogonal axes (2 to 4 axes) are lined up to respond to each user's requirements.

● Short cycle time

<Maximum speed>

- Driven by ball screw: 1,200 mm/s
- Driven by timing belt: 2,000 mm/s

● High accuracy

<Positioning repeatability>

- Driven by ball screw: ± 0.01 mm
- Driven by timing belt: ± 0.05 mm

● Absolute specifications for all types

Absolute encoders not requiring home position return are used in all types.

- To back up the encoder, long life lithium battery is used. The battery life is about 50,000 hours (*except for 750W)
A backup lithium battery is equipped on the controller (master unit, slave unit) as standard.

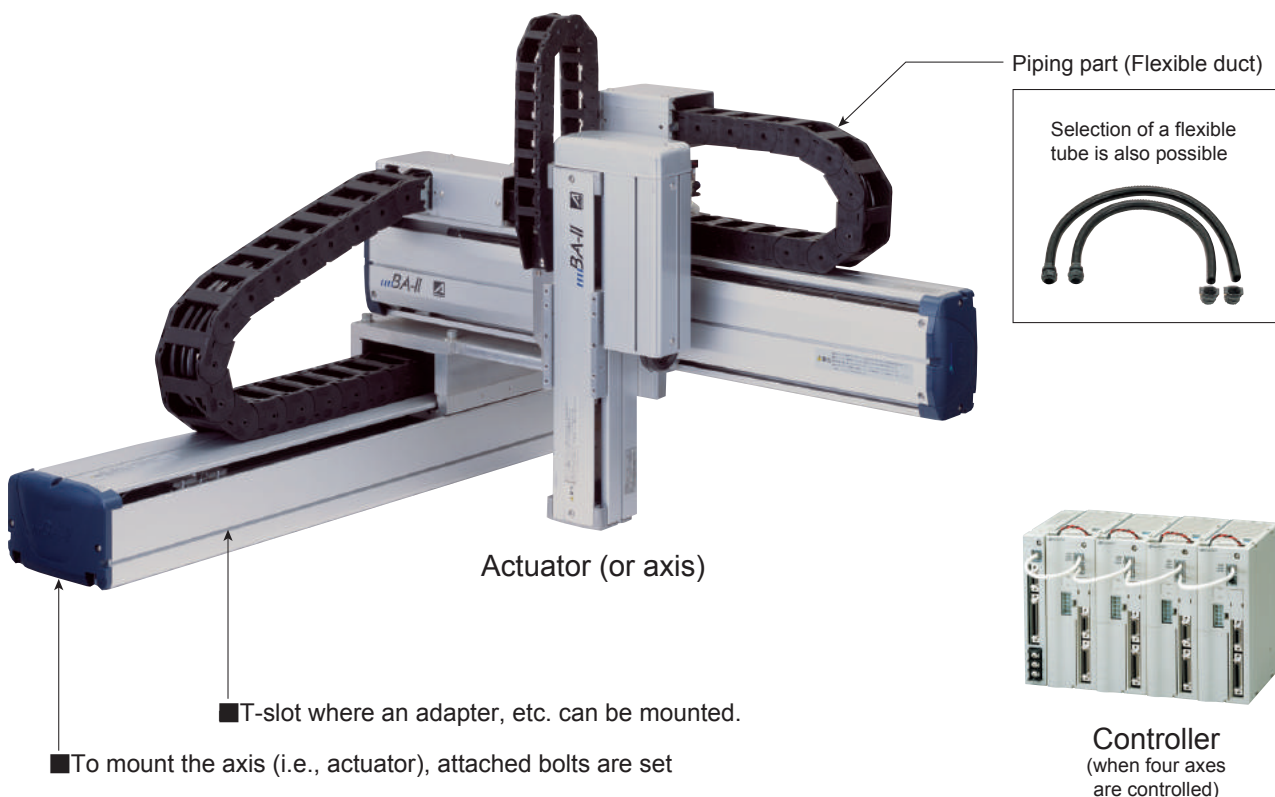
● Use of high-speed CPU

The controller has high-level processing ability through the use of a high-speed CPU.

● Ample variations

The actuator (or axis) comes in the following types; nine ball screw types and seven timing belt types.

The motor set position can be selected from one of the four directions for each axis.



CONTENTS

[Features of actuator]

- ◎ Absolute encoders are equipped on all types as standard.

No home return operation is required. A lithium battery is included as standard for use as the encoder backup battery (battery lifespan: 50,000 hours).

*Except for 750W

- ◎ Minimized space for installation

As four types of motor set positions are available for each axis, you can choose a desired set position according to your installation space, thus saving the space.

- ◎ Attaching importance to basic performance

Highly rigid linear guides are employed for all types.

- ◎ Maintenance-free

Options are available for adding a retainer to the linear guide and adding oilless seals to the ball screws.

[Features of controller]

- ◎ Compact size

Can be neatly housed in the panel and sized similar to miniature AC servo motor driver.

- ◎ Shared design

Multi-power supply (100V, 200V)

*200V or less

The shared master unit can be used at 50W to 200W. Parameters are automatically selected by entering the robot type (6-digit number).

- ◎ Program mode

Available modes include Sequential, External Point, Palletizing, and Pulse String.

*The pulse string mode is available in the CA20-M10 and CA20-M40 only.

- ◎ Supporting CC-Link

Interface with an external equipment can be realized by using CC-Link. Thus, wire-saving and high-speed data communication are possible.

- ◎ Compliant with Safety Category 3

An external safety circuit can be added for enabling compliance with Safety Category 3.

* CA20-M01 only.

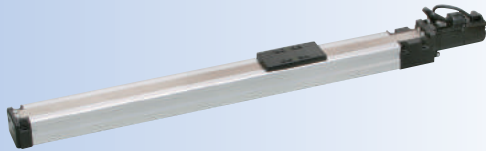
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COMPO ARM

BA-II

ROIbot Lineup

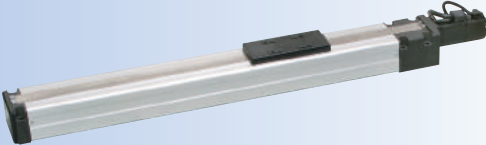
For Transfer of Light Loads ◆ Maximum payload 4kg  30kg



BA2-T5D (Ball screw drive)

- Motor output (W) 50
- Stroke (mm) 50 - 500
- Maximum payload (kg) (Note 1) 5 - 10 (horizontal), 1.5 - 3 (vertical)
- Maximum speed (mm/s) (Note 2) 800 (stroke 450mm max., lead 12mm)
- Positioning repeatability (mm) ±0.02

Available models: Pages 8-9 Description: Page 24



BA2-T7D (Ball screw drive)

- Motor output (W) 50
- Stroke (mm) 50 - 700
- Maximum payload (kg) (Note 1) 12 - 30 (horizontal), 4 - 8 (vertical)
- Maximum speed (mm/s) (Note 2) 800 (stroke 550mm max., lead 12mm)
- Positioning repeatability (mm) ±0.02

Available models: Pages 8-9 Description: Page 25



BA2-T3D (Ball screw drive) Pushrod type

- Motor output (W) 50
- Stroke (mm) 50 - 150
- Maximum payload (kg) (Note 1) 4 (horizontal), 1.9 (vertical)
- Maximum speed (mm/s) 600
- Positioning repeatability (mm) ±0.02

Available models: Pages 9-10 Description: Page 57

BA2-T4D type



BA2-T4D (Ball screw drive) Pushrod type

- Motor output (W) 50
- Stroke (mm) 50 - 200
- Maximum payload (kg) 7 (horizontal), 3.1 (vertical)
- Maximum speed (mm/s) 600
- Positioning repeatability (mm) ±0.02

Available models: Pages 9-10 Description: Page 58



BA2-T5E (Ball screw drive) Pushrod type

- Motor output (W) 100
- Stroke (mm) 50 - 300
- Maximum payload (kg) 25 (horizontal), 6.5 (vertical)
- Maximum speed (mm/s) (Note 2) 600 (stroke 250mm max)
- Positioning repeatability (mm) ±0.02

Available models: Pages 9-10 Description: Page 59



BA2-00D (Harmonic drive)

- Motor output (W) 50
- Maximum payload (kg) 5
- Rotation range 360°
- Maximum speed (deg/s) 360
- Positioning repeatability (deg) ±0.025

Available models: Page 10 Description: Page 55




BA2-00D-RP (Planet gear)

- Motor output (W) 50
- Maximum payload (kg) 10
- Rotation range 360°
- Maximum speed (deg/s) 857
- Positioning repeatability (deg) ±0.125

Available models: Page 10 Description: Page 56

Note 1: The payload varies depending on the lead and motor output.
 Note 2: The speed varies depending on the lead and stroke.

For Transfer of Medium Loads ◆ Maximum payload 15kg  80kg



BA2-10 (Ball screw drive)

- Motor output (W) 100
- Stroke (mm) 100 - 1050
- Maximum payload (kg) (Note 1) 15 - 50 (horizontal), 3 - 22 (vertical)
- Maximum speed (mm/s) (Note 2) 1200 (stroke 600mm max., lead 20mm)
- Positioning repeatability (mm) ±0.01

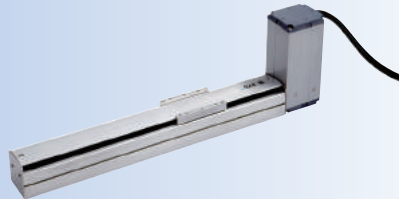
Available models: Pages 8-9 Description: Pages 26-27



BA2-30 (Ball screw drive)

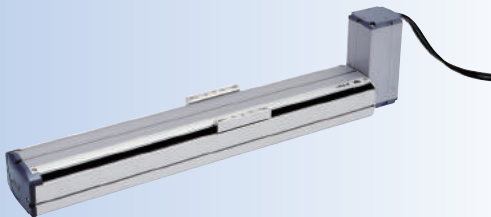
- Motor output (W) 100, 200
- Stroke (mm) 100 - 1050
- Maximum payload (kg) (Note 1) 20 - 80 (horizontal), 3 - 40 (vertical)
- Maximum speed (mm/s) (Note 2) 1200 (stroke 600mm max., lead 20mm)
- Positioning repeatability (mm) ±0.01

Available models: Pages 8-9 Description: Pages 28-31



- Motor output (W) 100, 200
- Stroke (mm) 100 - 1850
- Maximum payload (kg) (Note 1) 10 - 20 (horizontal)
- Maximum speed (mm/s) (Note 2) 2000 (lead 42mm)
- Positioning repeatability (mm) ±0.05

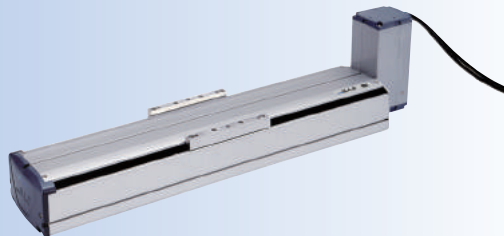
Available models: Page 8 Description: Pages 41-44



BA2-30 (Timing belt drive)

- Motor output (W) 100, 200
- Stroke (mm) 100 - 2500
- Maximum payload (kg) (Note 1) 10 - 40 (horizontal)
- Maximum speed (mm/s) (Note 2) 2000 (lead 42mm)
- Positioning repeatability (mm) ±0.05

Available models: Page 8 Description: Pages 45-48



BA2-50 (Timing belt drive)

- Motor output (W) 200, 400
- Stroke (mm) 200 - 2500
- Maximum payload (kg) (Note 1) 20 - 40 (horizontal)
- Maximum speed (mm/s) (Note 2) 2000 (lead 42mm)
- Positioning repeatability (mm) ±0.05

Available models: Page 8 Description: Pages 49-52

Note 1: The payload varies depending on the lead and motor output.
 Note 2: The speed varies depending on the lead and stroke.

For Transfer of Heavy Loads ◆ Maximum payload 60kg  250kg



BA2-50 (Ball screw drive)

- Motor output (W) 200, 400
- Stroke (mm) 200 - 1500
- Maximum payload (kg) (Note 1) 60 - 150 (horizontal), 3 - 60 (vertical)
- Maximum speed (mm/s) (Note 2) 1200 (stroke 600mm max., lead 20mm)
- Positioning repeatability (mm) ±0.01

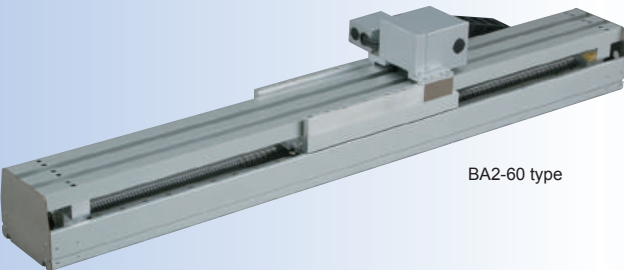
Available models: Pages 8-9 Description: Pages 32-35



BA2-60 (Ball screw drive)

- Motor output (W) 400, 750
- Stroke (mm) 150 - 1700
- Maximum payload (kg) (Note 1) 25 - 250
- Maximum speed (mm/s) (Note 2) 2400 (stroke 700mm max., lead 40mm 400W)
1800 (stroke 1000mm max., lead 40mm 750W)
- Positioning repeatability (mm) ±0.01

Available models: Pages 8-9 Description: Pages 38-39



BA2-60 type

BA2-50 (Ball screw nut rotation system)

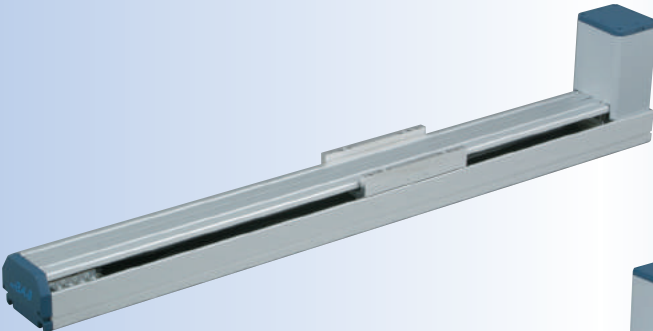
- Motor output (W) 200, 400
- Stroke (mm) 1100 - 2500
- Maximum payload (kg) (horizontal) (Note 1) 60 - 100
- Maximum speed (mm/s) 1000
- Positioning repeatability (mm) ±0.05

Available models: Pages 8 Description: Pages 36-37

BA2-60 (Ball screw nut rotation system)

- Motor output (W) 750
- Stroke (mm) 1000 - 4400
- Maximum payload (kg) (horizontal) 200
- Maximum speed (mm/s) 1000
- Positioning repeatability (mm) ±0.05

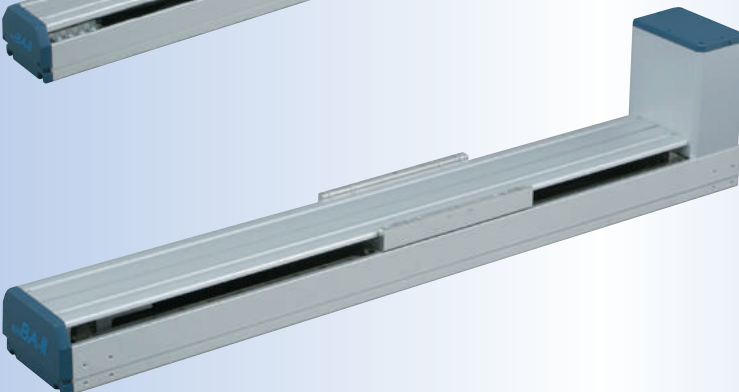
Available models: Page 8 Description: Page 40



BA2-50 (Timing belt drive)

- Motor output (W) 400
- Stroke (mm) 150 - 4450
- Maximum payload (kg) (horizontal) 100
- Maximum speed (mm/s) 1000
- Positioning repeatability (mm) ±0.05

Available models: Page 8 Description: Page 53



BA2-60 (Timing belt drive)

- Motor output (W) 750
- Stroke (mm) 150 - 4450
- Maximum payload (kg) (horizontal) 100 - 200
- Maximum speed (mm/s) 1000
- Positioning repeatability (mm) ±0.05

Available models: Page 8 Description: Page 54

Note 1: The payload varies depending on the lead and motor output.
Note 2: The speed varies depending on the lead and stroke.

Cleanroom Specifications

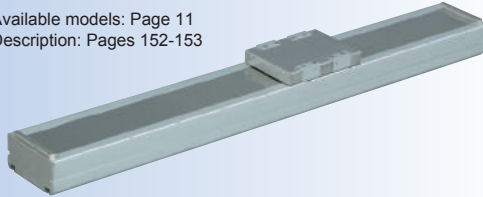
Class 10

- Axis features a special cleanroom design for realizing a cleanliness of Class 10 (0.1µm)
- Highest available speed at Class 10! Maximum speed of 1200mm/s
- Airtight structure using low particulate generation seals
- Provides high cleanliness with a low air intake (60 normal liters/min for BD10)
- 2-axis orthogonal (X-Y table shape) specifications are also available.

BA2-30 (Ball screw drive)

- Motor output (W) 100, 200
- Stroke (mm) 100 - 1000
- Maximum payload (kg) (horizontal) (Note 1) . . . 30 - 100
- Maximum speed (mm/s) (Note 2) . . . 1200 (stroke 600mm max., lead 20mm)
- Positioning repeatability (mm) ±0.01

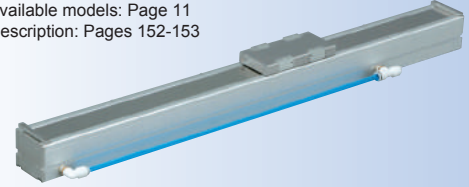
Available models: Page 11
Description: Pages 152-153



BA2-10 (Ball screw drive)

- Motor output (W) 100
- Stroke (mm) 100 - 1000
- Maximum payload (kg) (horizontal) (Note 1) . . . 20 - 50
- Maximum speed (mm/s) (Note 2) . . . 1200 (stroke 600mm max., lead 20mm)
- Positioning repeatability (mm) ±0.01

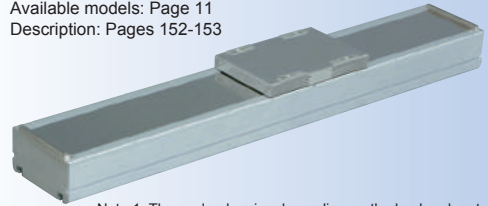
Available models: Page 11
Description: Pages 152-153



BA2-50 (Ball screw drive)

- Motor output (W) 200, 400
- Stroke (mm) 200 - 1500
- Maximum payload (kg) (horizontal) (Note 1) . . . 60 - 150
- Maximum speed (mm/s) (Note 2) . . . 1200 (stroke 600mm max., lead 20mm)
- Positioning repeatability (mm) ±0.01

Available models: Page 11
Description: Pages 152-153



Note 1: The payload varies depending on the lead and motor output.
Note 2: The speed varies depending on the lead and stroke.

[Orthogonal axes] Typical Examples

Other combinations of multiple models are possible.

2 axes (X-Y)

Type selection: Page 12
See Pages 62 - 82.



2 axes (X-Z)

Type selection: Page 12
See Pages 83 - 94.



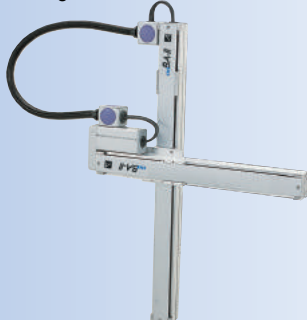
2 axes (Y-Z)

Type selection: Page 13
See Pages 95 - 107.



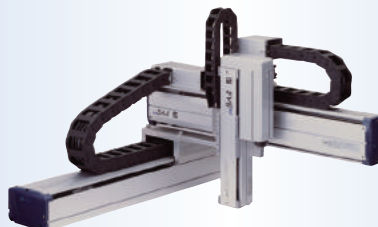
2 axes (Z-Y)

Type selection: Page 13
See Pages 108 - 118.



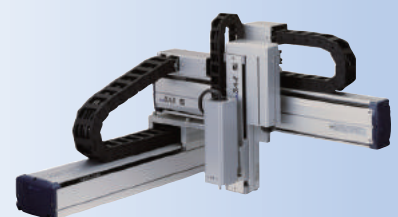
3 axes (X-Y-Z)

Type selection: Pages 14 - 15.
See Pages 119 - 139.



4 axes (X-Y-Z-R)

Type selection: Page 16
See Pages 140 - 147.



[Components of control system] Controller

Master unit
See Pages 176 - 183.



CA20-M10

High-performance master unit
See Pages 184 - 186.



CA10-M00B

See Pages 190 - 196.



CA20-M00



CA20-M01
(Compliant with Safety Category 3)

High-performance master unit
See Pages 187 - 189.



CA10-M01B-CC

Slave unit
See Pages 197 - 199.



CA20-S10

[Components of control system] Options

☆ Other options are also available.

Teach pendant
See Page 203



TPH-2A



TPH-4C



TPX-4A
(Compliant with Safety Category 3)

Extension I/O unit
See Page 204



CA20-EX-A20

Regenerative discharge unit
See Page 202



ABSU-2000

Type Selection

Single Axis Specifications

Single axis payload table (horizontal) 8

Single axis payload table (vertical, rotation) 9

Cleanroom specifications (vertical, rotation) 11

2-Axis Combination

2-axis (X-Y) combination payload table 12

2-axis (X-Z) combination payload table 12

2-axis (Y-Z) combination payload table 13

2-axis (Z-Y) combination payload table 13

3-Axis Combination

3-axis (X-Y-Z) combination payload table 14

4-Axis Combination

4-axis (X-Y-Z-R) combination payload table 16

Single axis payload table (horizontal)

Ball screw driven

Ref. page	Type	Stroke (mm)	Lead (mm)	Max. speed (mm/s)	Max. payload (kg)
P24	BA2-T5D	50~500	⑫	800	5
			⑥	400	10
P25	BA2-T7D	50~700	⑫	800	12
			⑥	400	30
P26 } P27	BA2-10E	100~1050	⑳	1200	15
			⑩	600	30
			⑤	300	50
			P28 } P29	BA2-30E	100~1050
⑩	600	50			
			⑤	300	50
			P30 } P31	BA2-30F	100~1000
⑩	600	80			
			⑤	300	80
			P32 } P33	BA2-50F	200~1500
⑩	600	100			
			⑤	300	100
			P34 } P35	BA2-50G	200~1500
⑩	600	150			
			⑤	300	150
			P36 } P37	BA2-50F-LT	1100~2500
⑳	1200	100			
P38	BA2-60G	200~1500	④⑩	2000	25
			⑳	1200	100
			⑩	600	150
			P39	BA2-60J	200~1700
⑳	900	200			
			⑩	450	250
			P40	BA2-60J-LT	1100~4400

Single axis payload table (horizontal)

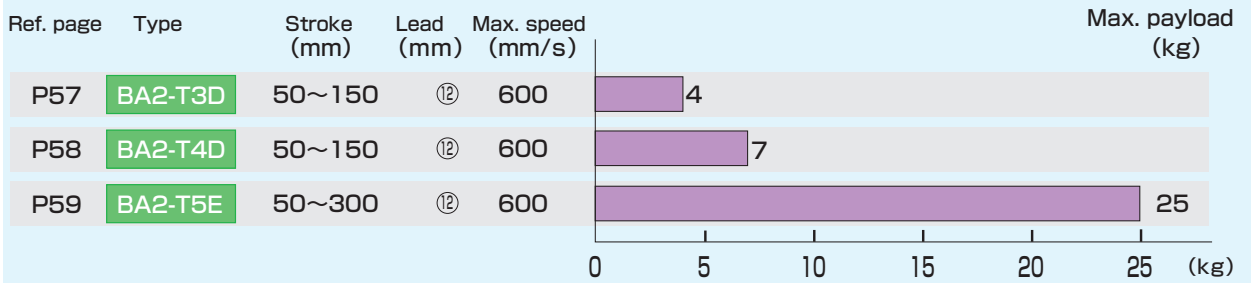
Timing belt driven

Ref. page	Type	Stroke (mm)	Lead (mm)	Max. speed (mm/s)	Max. payload (kg)
P41 ~P42	BA2-10E	100~1850	⑳	1000	15
P43 ~P44	BA2-10F	100~1800	④⑳	2000	10
			⑳	1000	20
P45 ~P46	BA2-30E	100~2500	⑳	1000	15
P47 ~P48	BA2-30F	100~2500	④⑳	2000	20
			⑳	1000	40
P49 ~P50	BA2-50F	200~2500	⑳	1000	40
P51 ~P53	BA2-50G	200~2500	④⑳	2000	20
		50~4450	⑬	1000	100
P54	BA2-60J	150~4450	⑬	1000	200

* When a regenerative discharge unit is used.

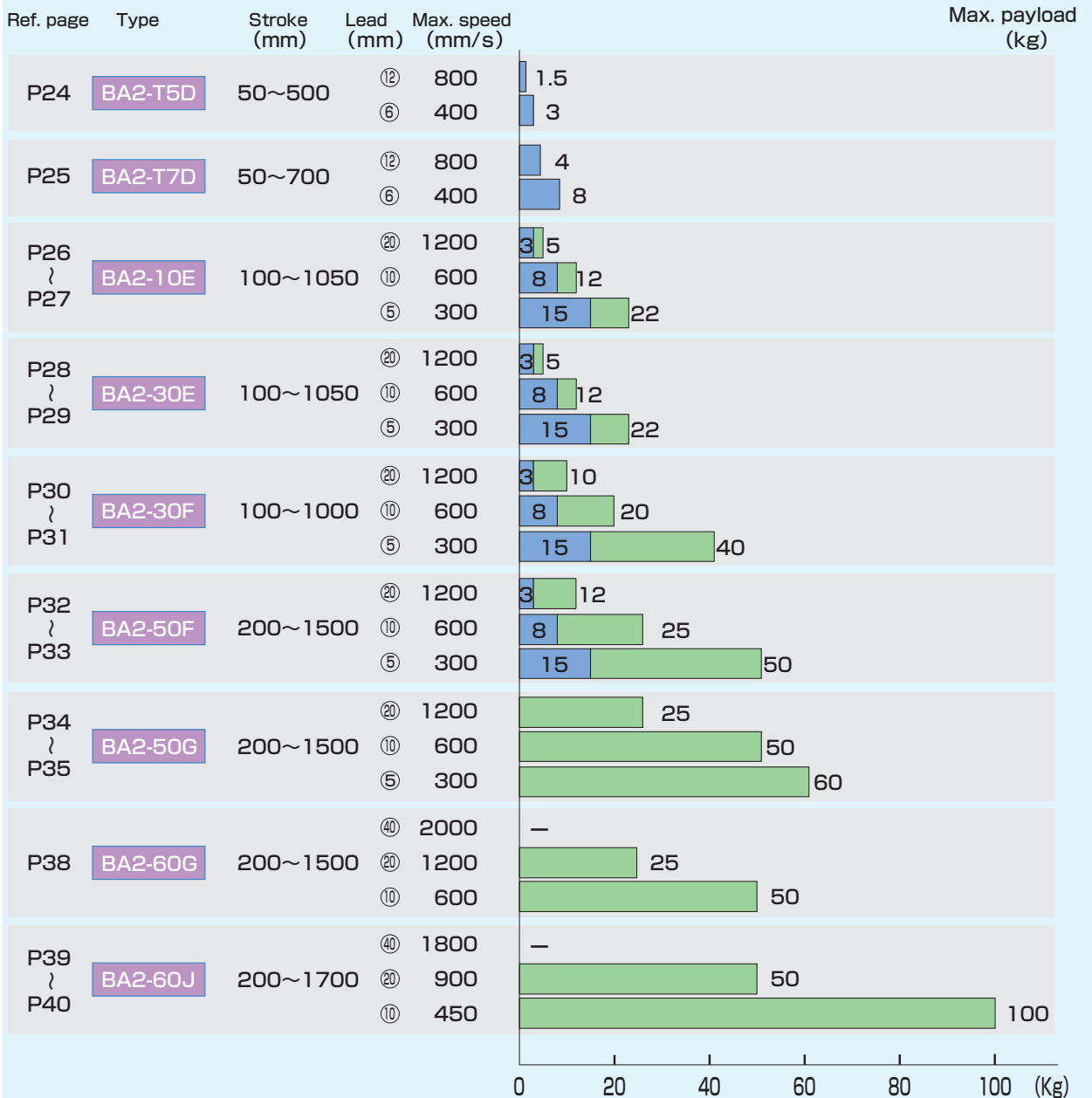
Single axis payload table (horizontal)

Ball screen driven (pushrod type)



Single axis payload table (vertical)

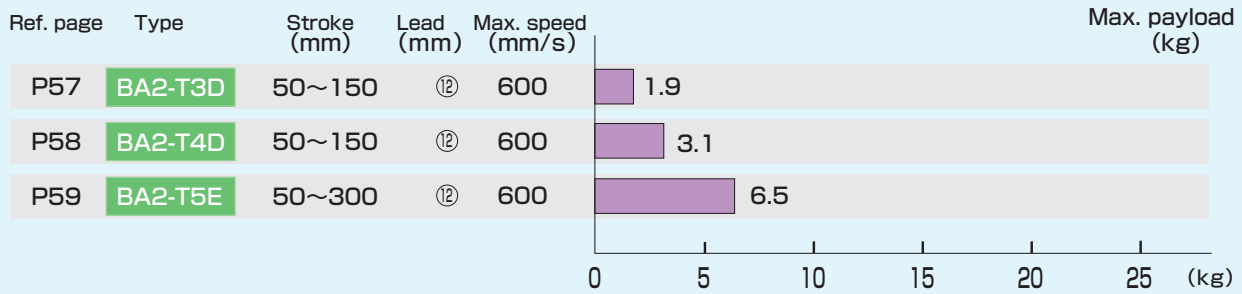
Ball screen driven



* When a regenerative discharge unit is used.

Single axis payload table (vertical)

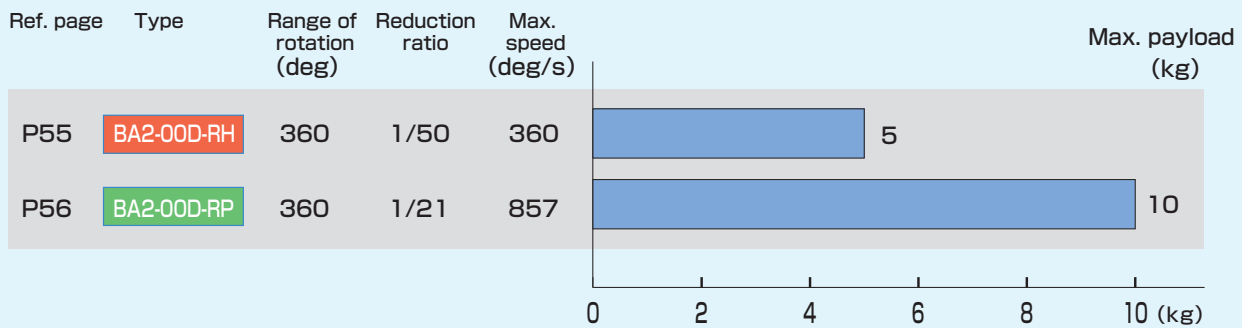
Ball screen driven (pushrod type)



Single axis payload table (rotation)

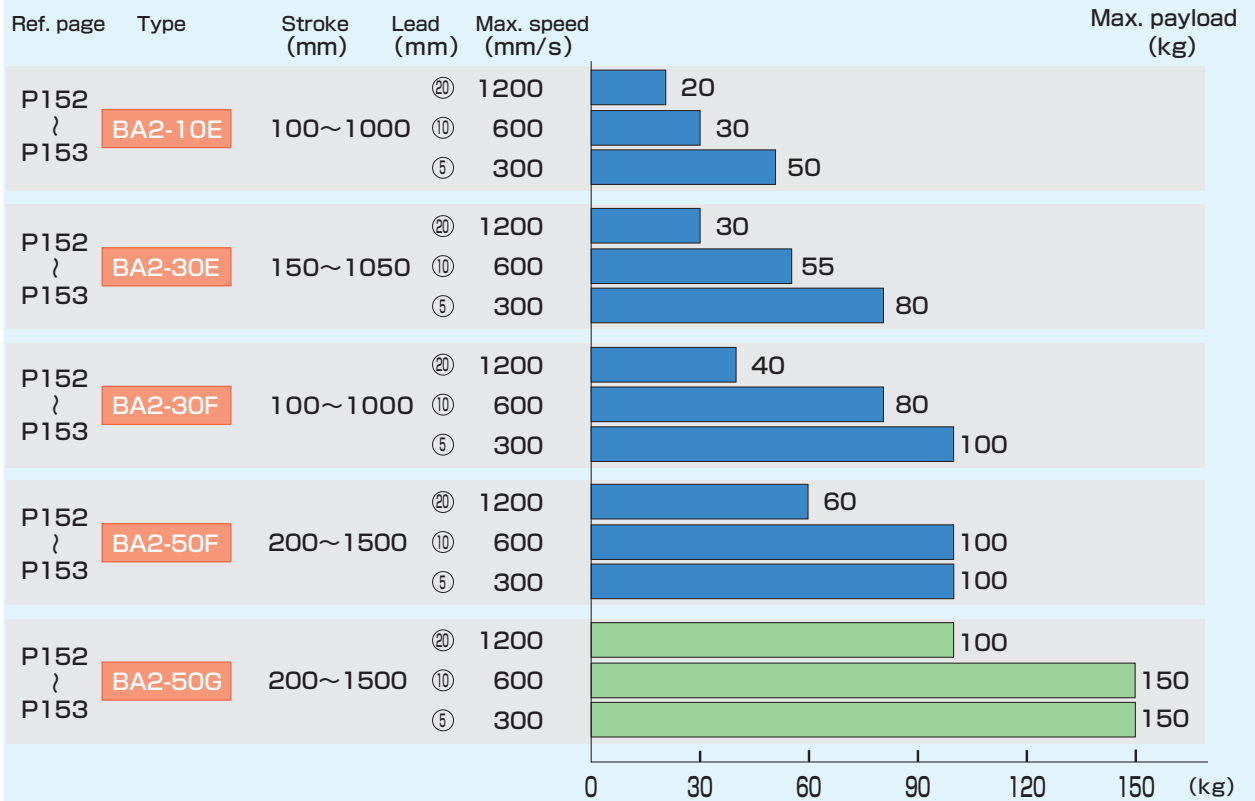
Harmonic drive

Planet gear



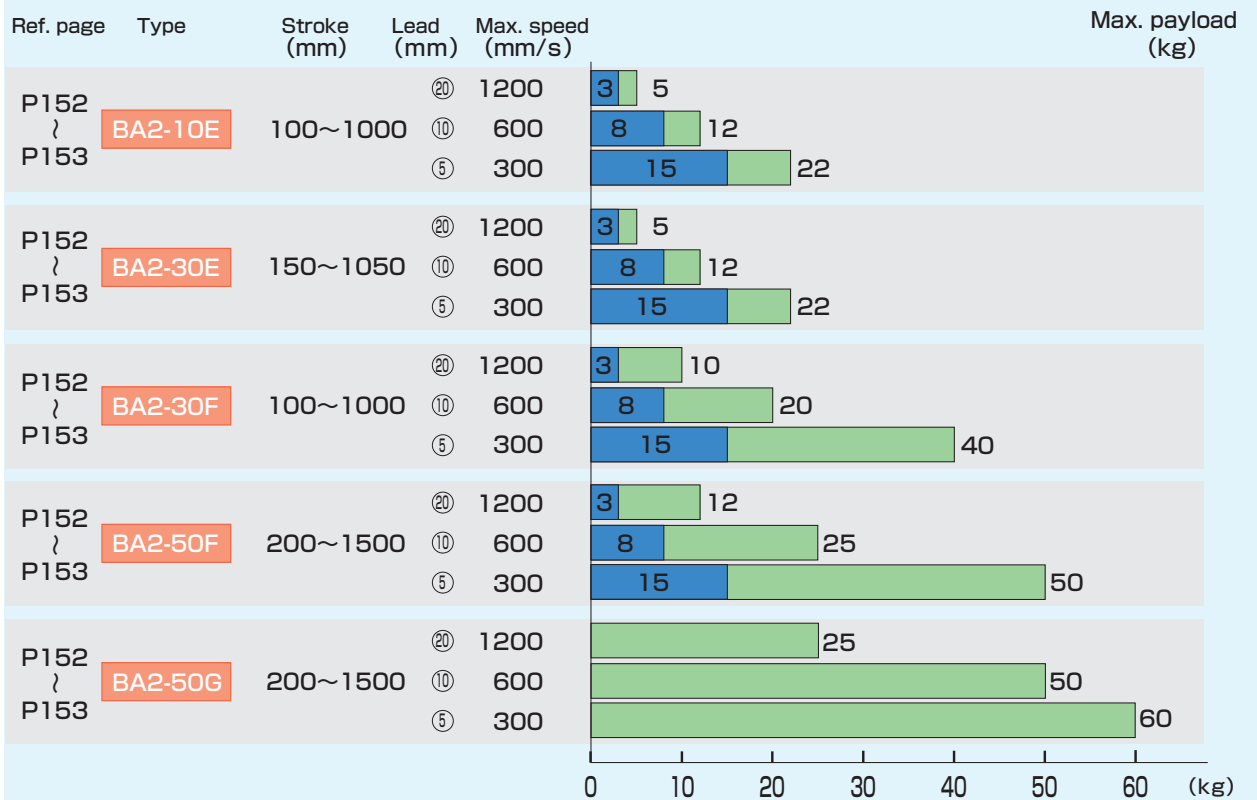
Single axis payload table (horizontal)

Cleanroom specifications



Single axis payload table (vertical)

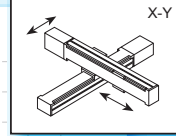
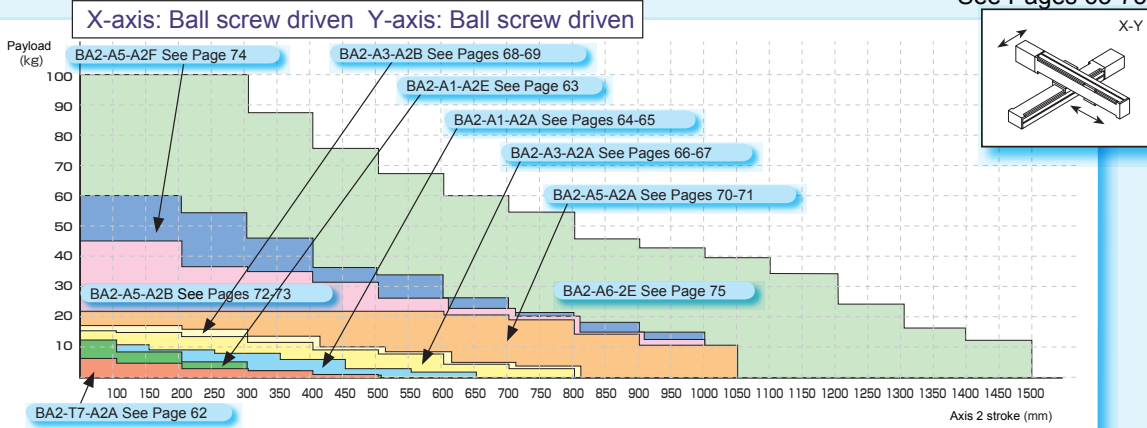
Cleanroom specifications



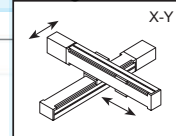
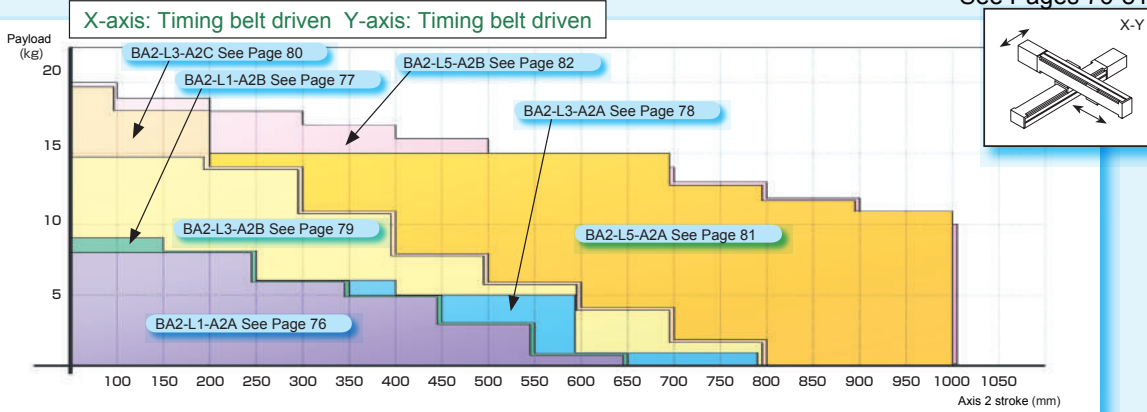
* When a regenerative discharge unit is used.

2-axis (X-Y) combination payload table

See Pages 63-75

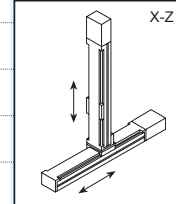
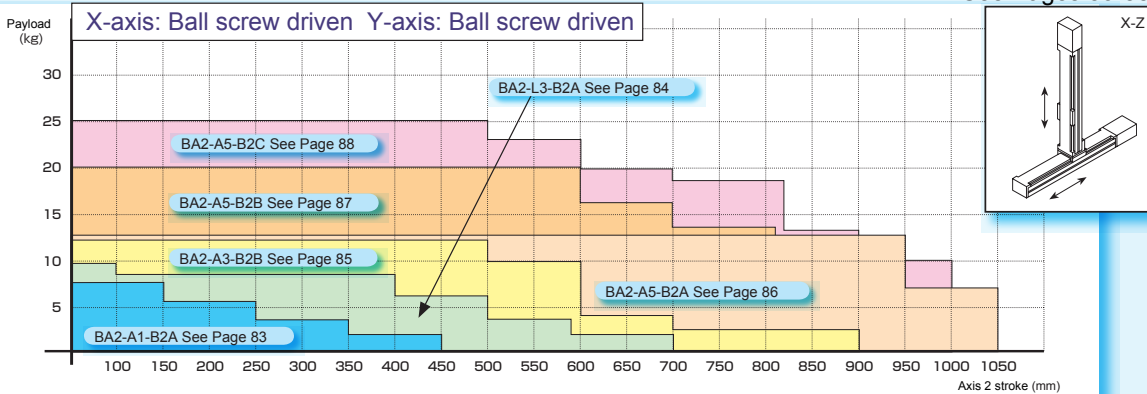


See Pages 76-81

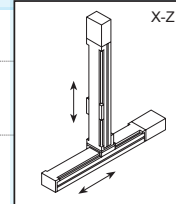
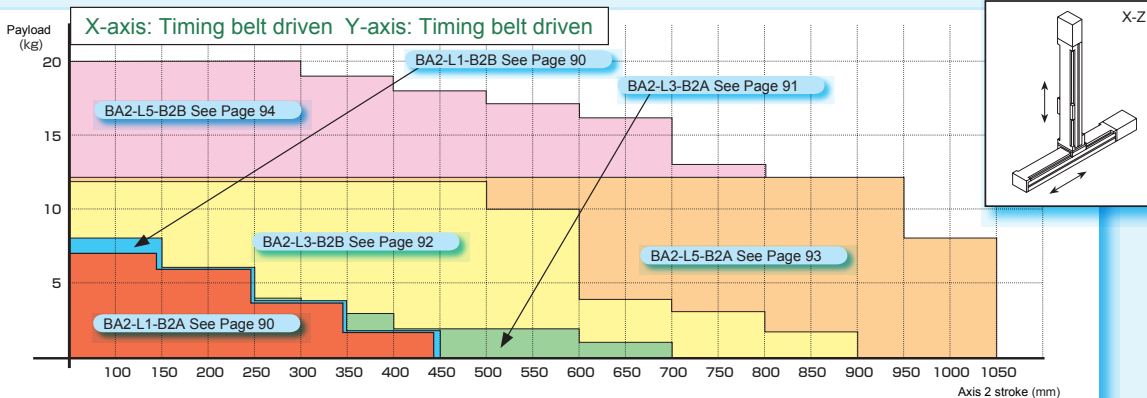


2-axis (X-Z) combination payload table

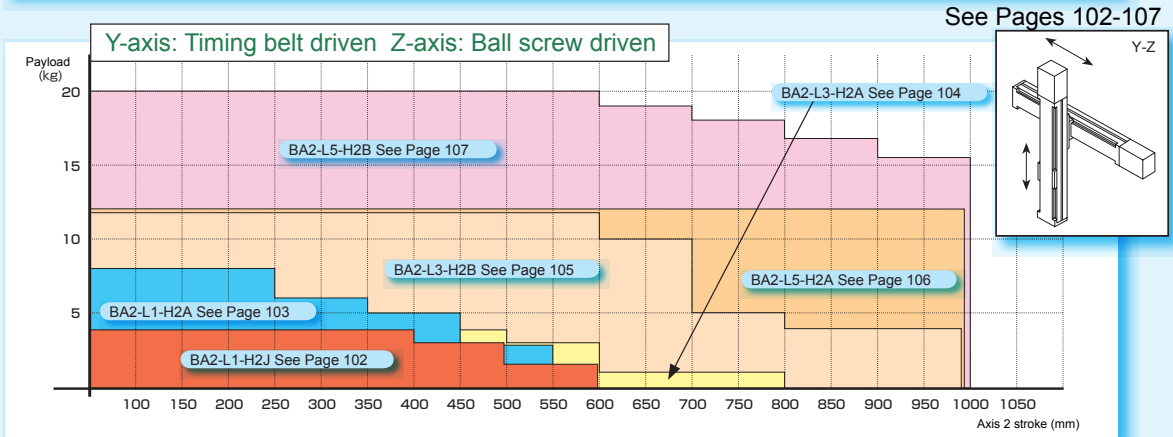
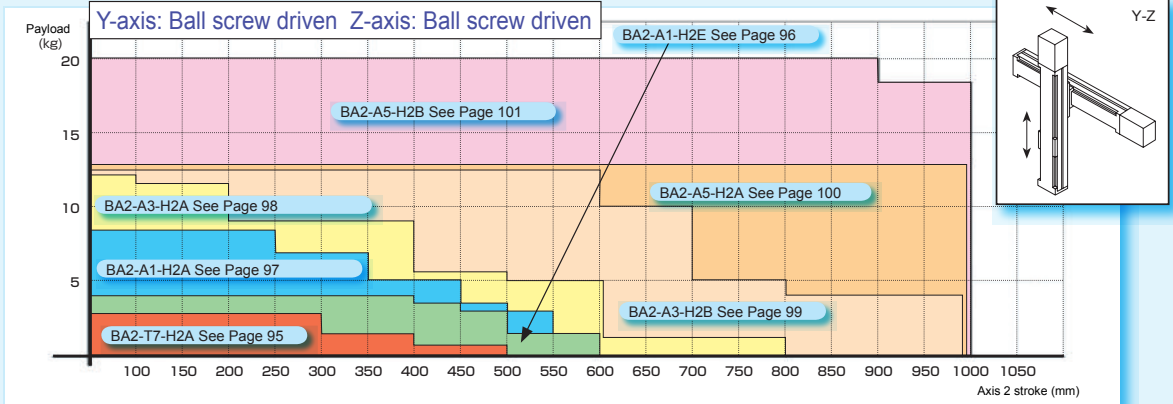
See Pages 83-88



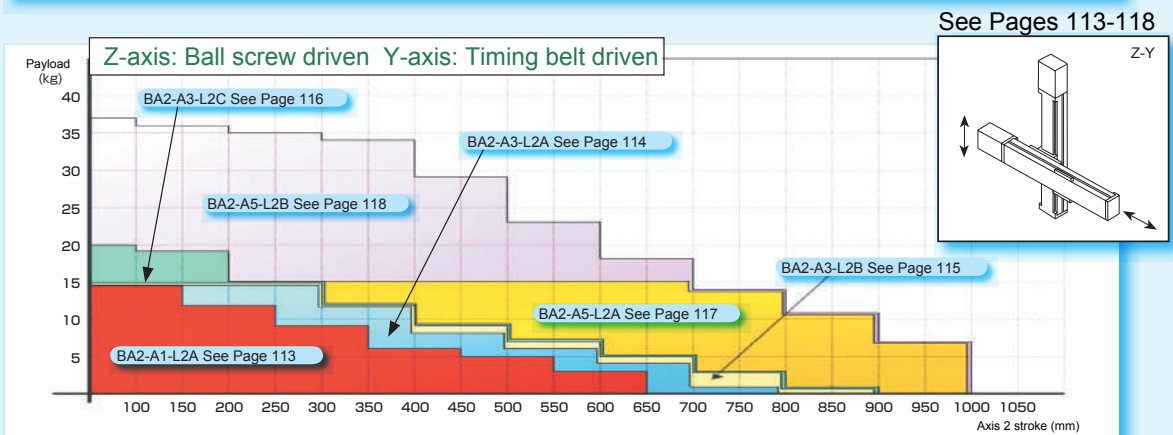
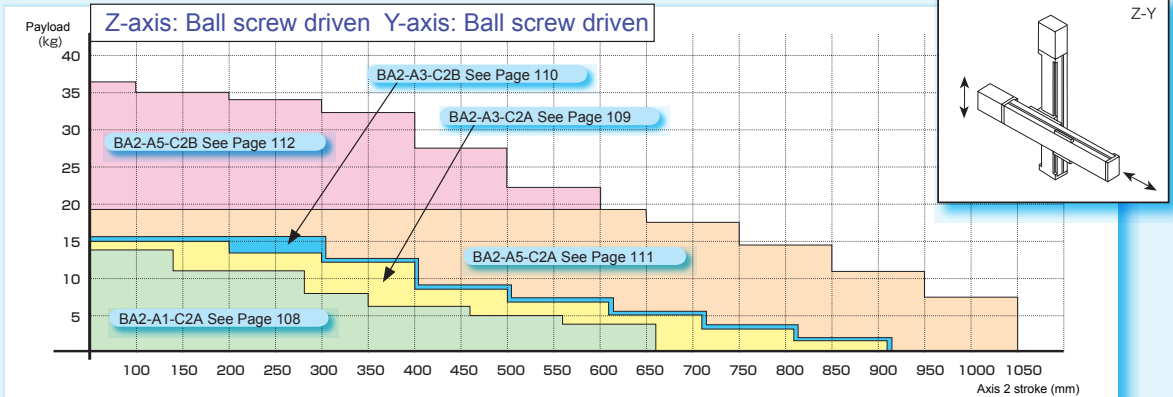
See Pages 89-94



2-axis (Y-Z) combination payload table



2-axis (Z-Y) combination payload table

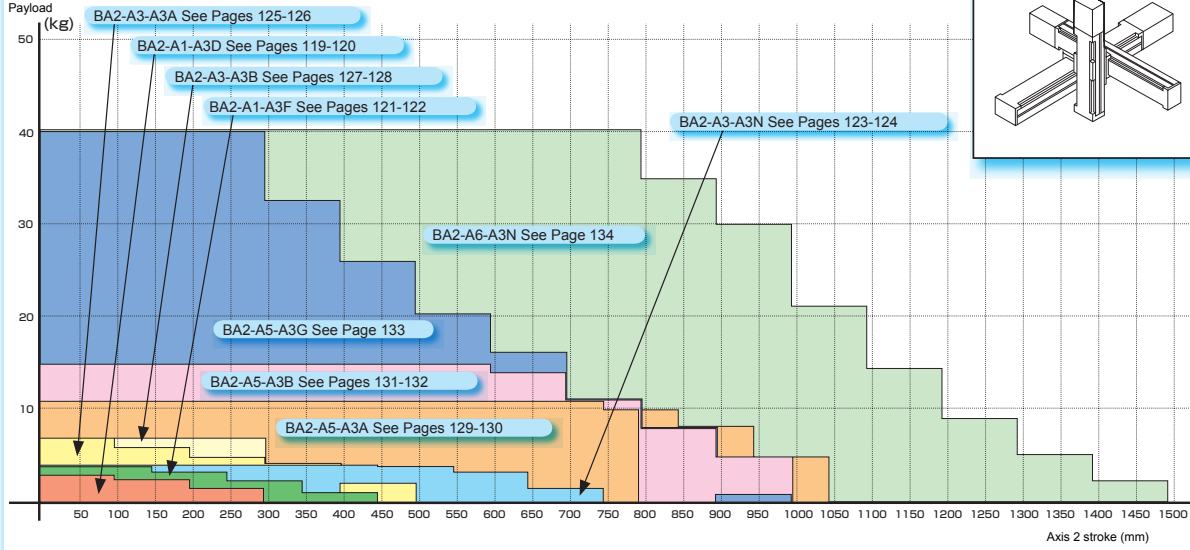


3-axis (X-Y-Z) combination payload table

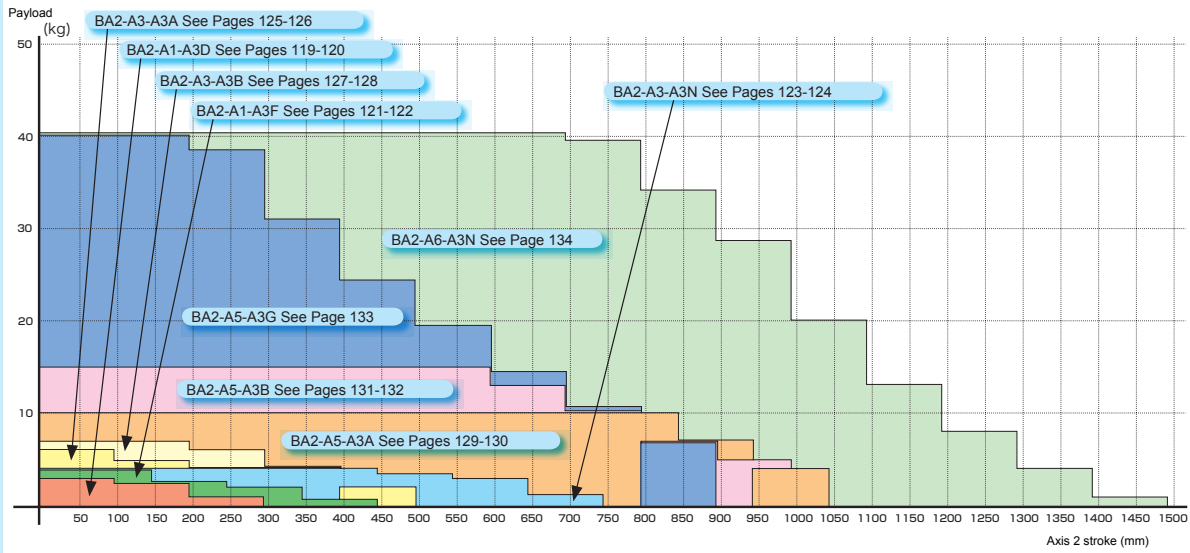
X-axis: Ball screw driven Y-axis: Ball screw driven Z-axis: Ball screw driven

See Pages 119-134

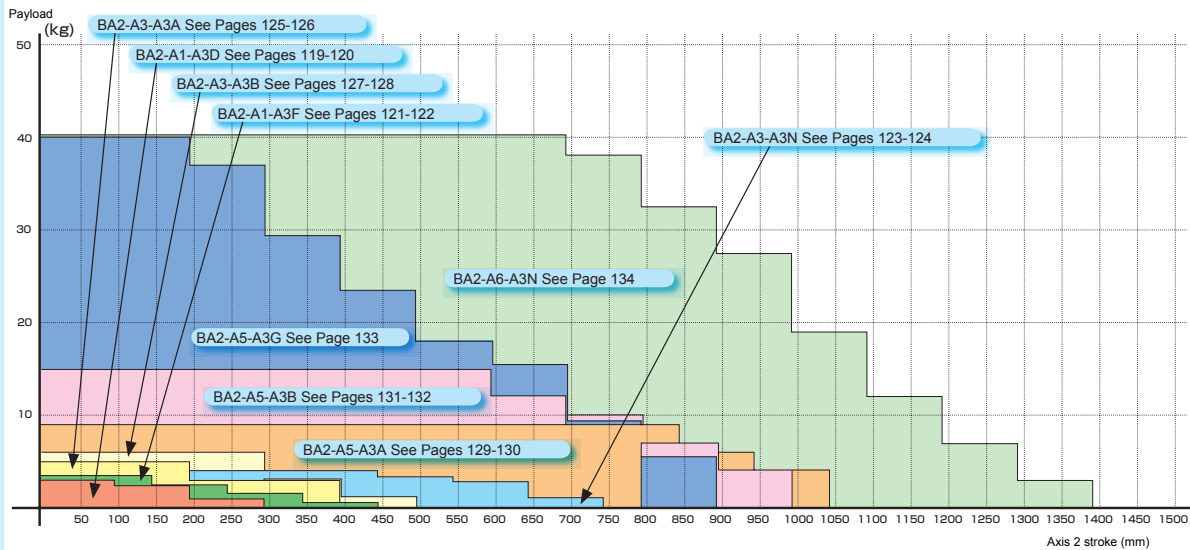
Z-axis stroke: 50-150 mm



Z-axis stroke: 200-250 mm



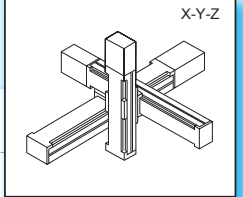
Z-axis stroke: 300-350 mm



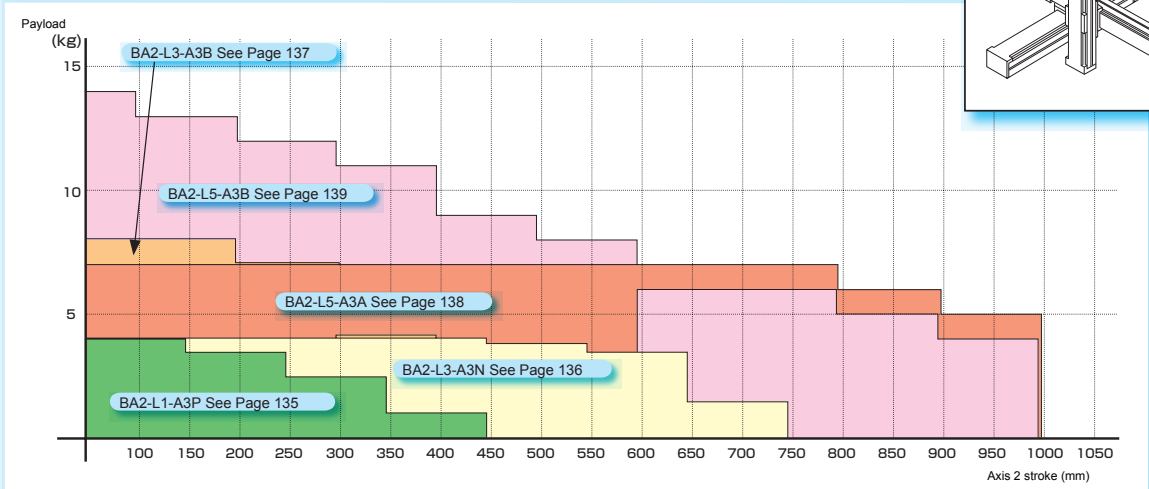
3-axis (X-Y-Z) combination payload table

X-axis: Timing belt driven Y-axis: Timing belt driven Z-axis: Ball screw driven

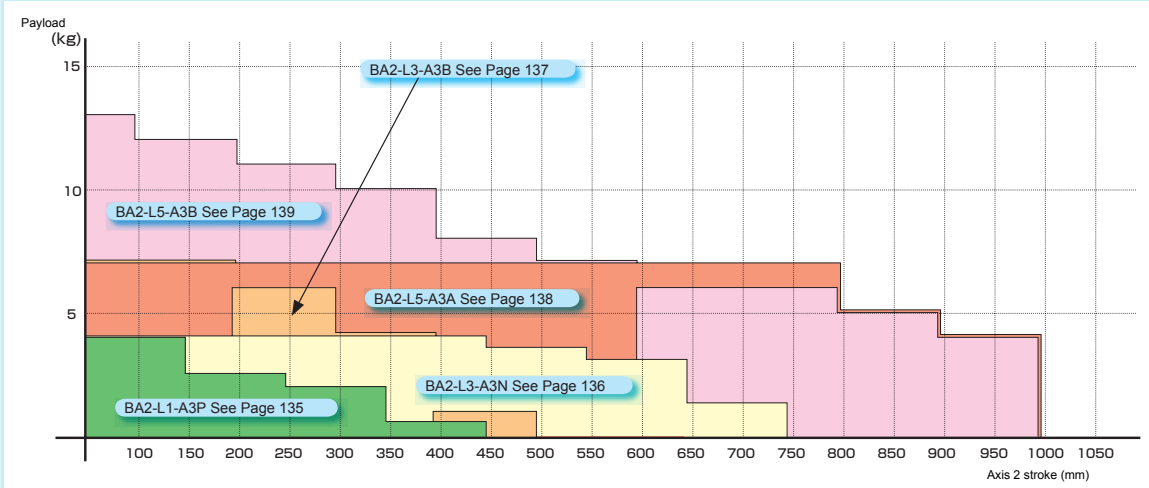
See Pages 135-139



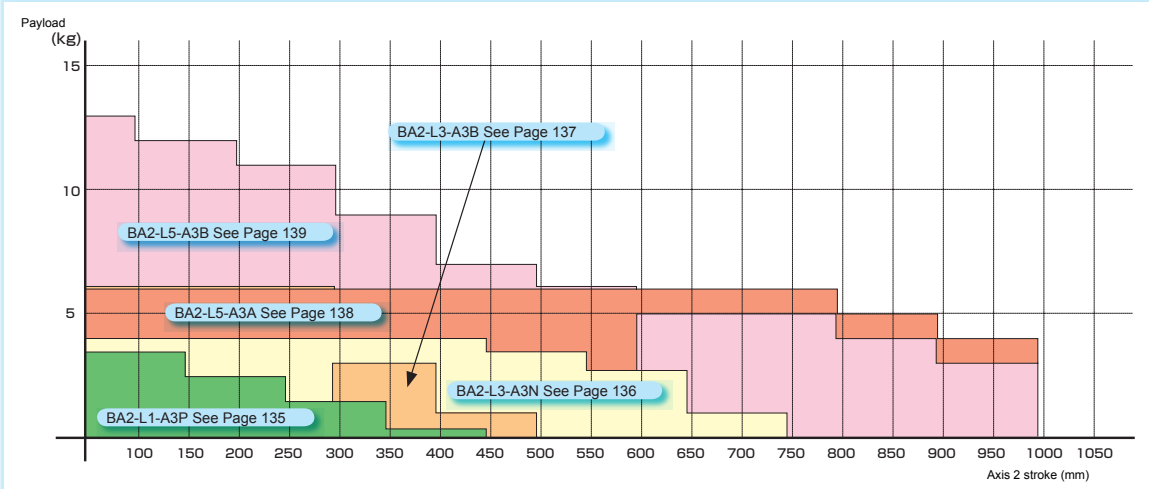
Z-axis stroke: 50-150 mm



Z-axis stroke: 200-250 mm



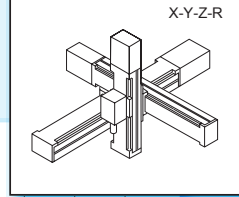
Z-axis stroke: 300-350 mm



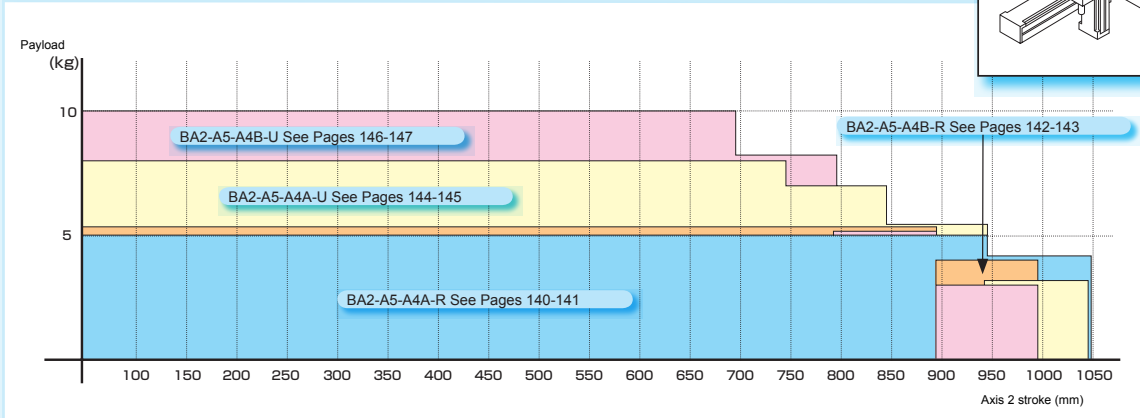
4-axis (X-Y-Z-R) combination payload table

X-axis: Ball screw driven Y-axis: Ball screw driven Z-axis: Ball screw driven R-axis: Rotating axis

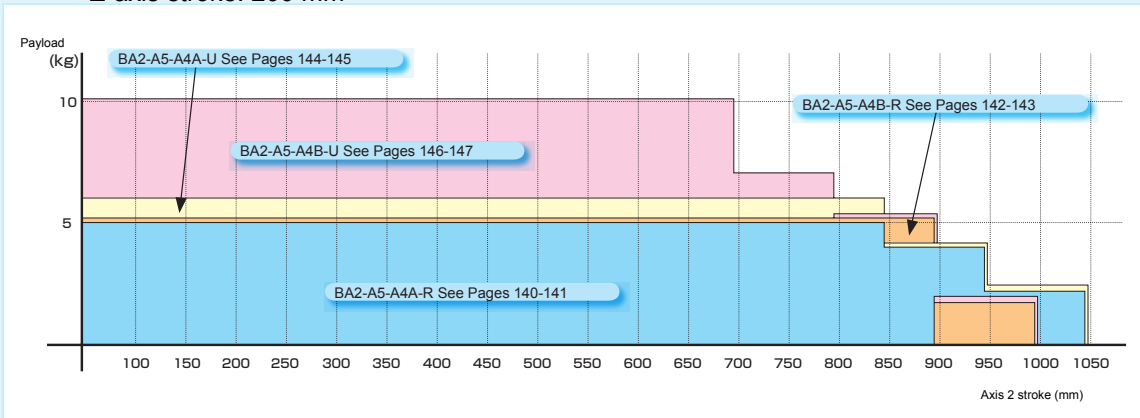
See Pages 140-147



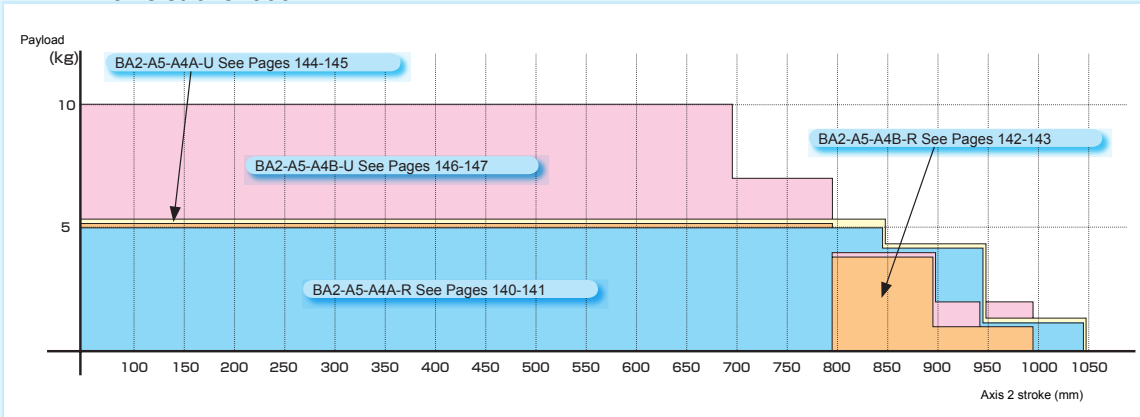
Z-axis stroke: 100 mm



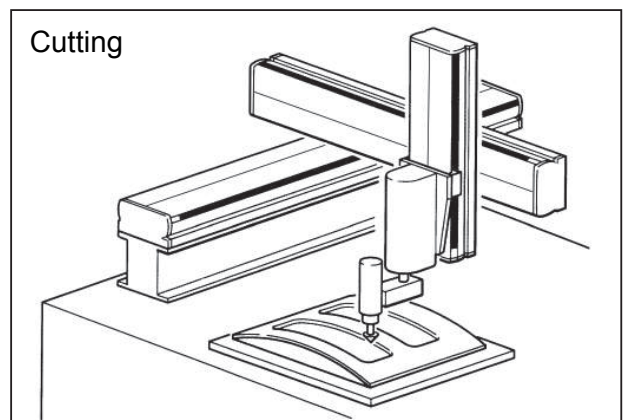
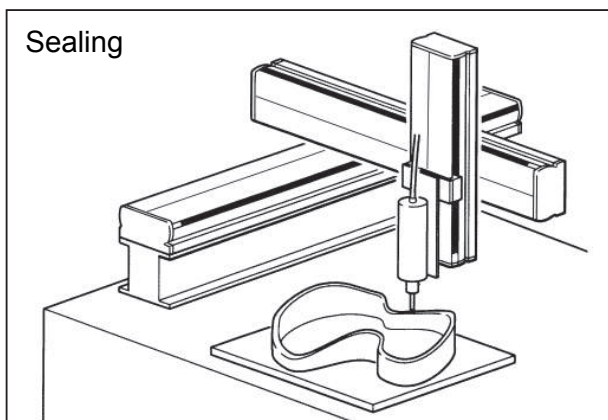
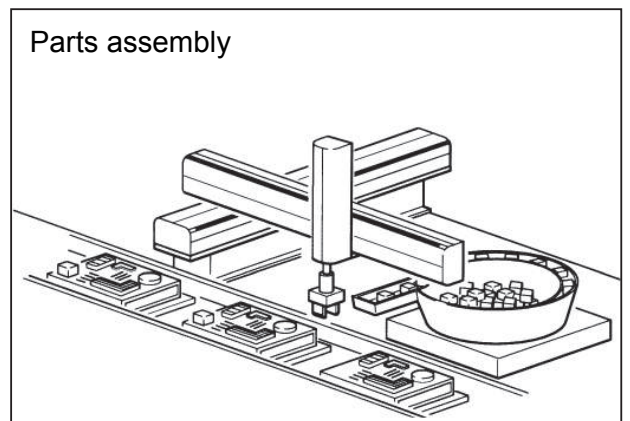
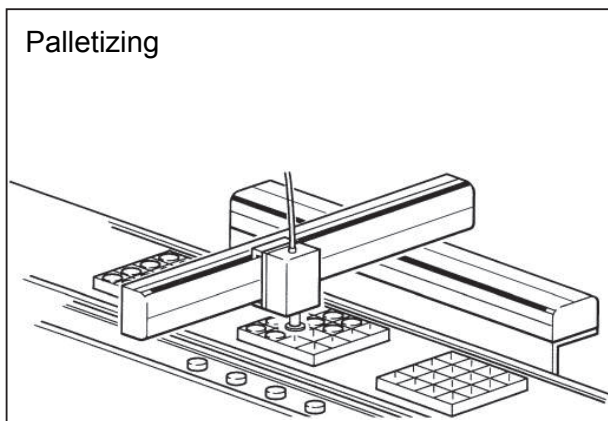
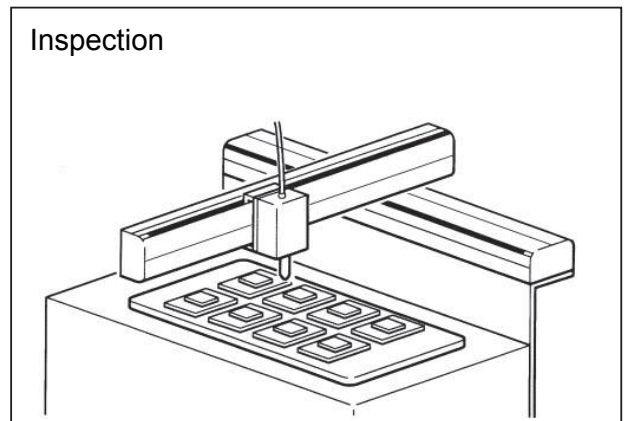
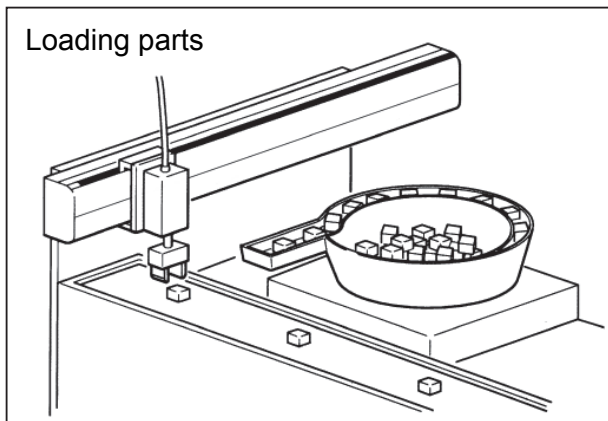
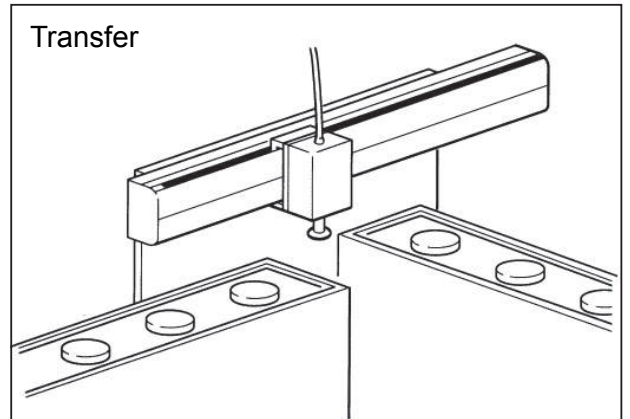
Z-axis stroke: 200 mm



Z-axis stroke: 300 mm



■ Example applications



Before you read this manual

■ Definition of terms ■

[Axis1 and Axis2]: When forming an orthogonal axes configuration, an axis which is mounted directly on the user-provided equipment is called the “Axis 1”, and the other axis which is mounted on the Axis 1 with a bracket is called the “Axis 2”.

[Straight axis]: An axis whose ball screw and servo motor shaft centers are placed along a straight line.

[Right side mounted axis, Left side mounted axis and Bottom side mounted axis]: An axis whose servo motor is turned back, which is coupled with a ball screw via a timing belt. When the motor is located on the right side when seen from the end block side of the actuator with the slider of the actuator facing up, this axis is called the “right side mounted motor axis.” Likewise, when it is located on the left side and bottom side, the axis is called the “left side mounted motor axis” and “bottom side mounted motor axis”, respectively.

[Long slider type]: Used for the traveling type axis 2 (BB30, BB50) or for an axis on which large load moment is exerted.

[Medium slider type]: Used for the axis 1 of an orthogonal axes configuration or as the standard axis of a single axis configuration.

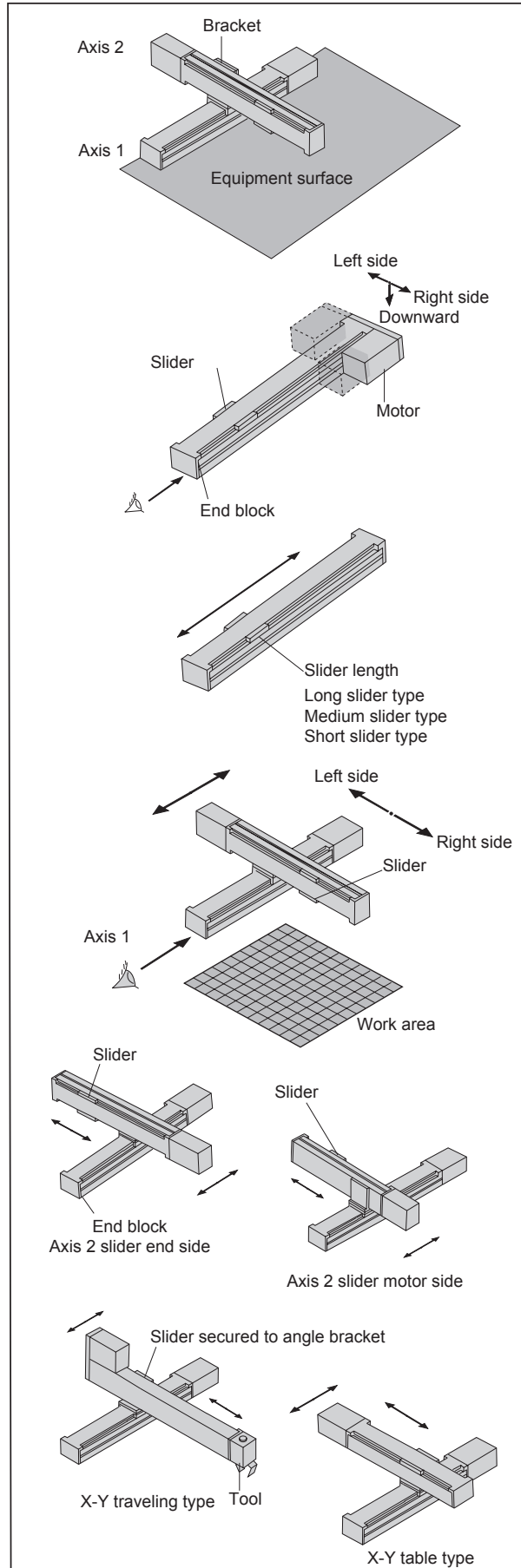
[Short slider type]: Used for a single axis with relatively small load moment or for the axis 2 and axis 3 of an orthogonal axes configuration.

[Work area]: The location of the work area is defined by the side (right or left) when viewed from the end block side of the axis 1 in an orthogonal axes configuration.

[Axis 2 slider motor side]: When the Axis 2 slider is seen from the end block side of the Axis 1 in an orthogonal axes configuration, it is located on the rear side of the axis. (When the slider is located on the front side (standard), it is called the “slider end side”.

[Axis traveling type]: Generally, the frame of the actuator (axis) is secured and the slider moves. For the axis traveling type, the slider is secured and the frame of the actuator moves. A hand or other tooling is attached to the end block at the end of the frame.

[Table type]: In a single or orthogonal axes configuration, the slider surface is horizontal and faces up to allow the work from the upper side.



Terms used in the manual

Terms used throughout this publication are classified into the two groups; general robot terms and those specific to Toshiba Machine robots.

■ Terms used for actuator (or axis)

[Slider]

The part of the actuator which moves along a straight line. A hand or other tooling is assembled to the slider.

When a bracket for axis combination is mounted on the slider, two axes system can be configured.

This is also called the "saddle" in overseas nations.

[Drive system]

Components for power transformation, such as ball screw and timing belt, which are used to drive the movable part of the actuator.

[Maximum speed]

Maximum speed (mm/s) which the actuator can attain under specified conditions (payload, for instance).

[Maximum Payload]

Maximum Payload (kg) under specified conditions (acceleration/ deceleration time, speed, rigidity, service life, etc.).

[Allowable load moment]

Allowable force (moment) in N·m (kg·m) which acts on the movable part (slide) of the actuator. It comes in two types; static and dynamic.

[Positioning repeatability]

Repeatability of positioning operations obtained under the same conditions using the same method. The difference between the maximum and minimum values of the result is figured out, then "±" sign is attached to half the difference.

[Resolution]

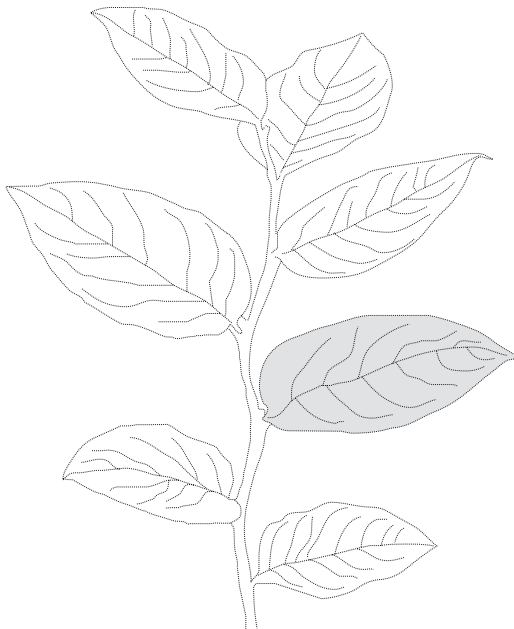
Minimum travel distance of an axis, which can be set during robot teaching.

[Acceleration/deceleration time (ta)]

The time (seconds) spent until the movable part of the actuator accelerates and reaches its set speed, or the time (seconds) spent until it slows down from its set speed and stops.

This factor is used as a condition for determining the maximum Payload and tact (or cycle) time.

Normally, this value can be specified in a program.



■ Terms used for controller

[Sequential mode]

A mode in which program steps are executed one by one in order.

[Palletizing mode]

A mode in which traveling and loading operations (i.e., palletizing operation) can be executed easily by specifying points to move, the number of points, etc.

The following motions are available.

- From a given point to another point on a matrix (1 to M)
- From a point on a matrix to a given point (M to 1)
- From a point on a matrix to another point on another matrix (M to M)

[Easy mode]

A mode in which designation of points to move, call of hand motion routines after movement (i.e., subroutines) and designation of steps to be executed next can be programmed and executed easily without considering any complex program structures. (A regular motion pattern is simply registered as a mode.)

[External point designation mode]

A mode in which only positioning motions are executed by specifying a PLC (i.e., sequencer) connected to inputs and digital switches, without using normal controller instruction words. Coordinates, speed and acceleration of specified points should be set in the table registered in the controller beforehand.

[Pulse train input mode]

A mode in which a pulse sent from a pulse generator (positioning controller, etc.) is used to locate the axis in real time at a speed as per its frequency and proportional to the number of pulses. Its frequency and proportional to the number of pulses.

[Continuous mode]

A mode in which each step of a program is executed sequentially in either of sequential, easy and palletizing modes every time the START pushbutton switch on the teach pendant is pressed. (Normally used mode)

[Step mode]

A mode in which each single step of program is executed and stopped in either of sequential, easy and palletizing modes every time the START pushbutton switch on the teach pendant is pressed. (Program check mode)

[Manual mode]

A mode in which a program is executed and stopped after axis feed or input/output command is executed in either of sequential, easy and palletizing modes every time the START pushbutton switch on the teach pendant is pressed or the start input is given. (Test run mode, check mode before day's operation)

[Remote teaching]

A method of teaching the robot to move to a desired position by pressing move keys on the teach pendant (remote operation) in the servo ON condition.

[Direct teaching]

A method of directly teaching the robot arm by operator's hand to a desired position and of teaching the robot such a position in the servo OFF condition.

[MDI (Manual data input)]

A method of directly entering desired coordinates through the keyboard (numerical input) according to the display shown on the teach pendant.

Selection of single axis specifications

The set designation is shown below. Also refer to Pages 20 to 47.
This page can be used as an order sheet. Enter each quantity, including options.

Set designation	BA2 - <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> - <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> - <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> - <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> - <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>	Q'ty
	<div style="display: flex; justify-content: space-around; font-size: small;"> ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ </div>	

① Type of axis

- 10 : BB10
- 30 : BB30
- 50 : BB50
- 60 : BB60
- T3 : BBT3
- T4 : BBT4
- T5 : BBT5
- T7 : BBT7
- 00 : R-axis

② Type of motor

- D : 50W absolute
- E : 100W absolute
- F : 200W absolute
- G : 400W absolute
- J : 750W absolute

③ Axis structure

Ball screw driven	Timing belt driven	R-axis
ST : Straight axis	BT : Motor facing up	RH : Harmonic drive
UR : Right side mounted motor axis	BU : Motor facing down	RP : Planet gear
UL : Left side mounted motor axis	BR : Motor facing right	
UU : Bottom side mounted motor axis	BL : Motor facing left	
LT : Nut rotation drive with flexible duct left mounted		
RT : Nut rotation drive with flexible duct right mounted		

④ Type of slider

- S : Short slider
- M : Medium slider
- L : Long slider
- A : L type bracket (R-axis)
- F : Flange type (R-axis)

⑤ Lead

Ball screw driven	Timing belt driven
05 : 5 mm	19 : 19.555 mm
06 : 6 mm	21 : 21 mm
10 : 10 mm	42 : 42 mm
12 : 12 mm	
20 : 20 mm	
40 : 40 mm	

⑥ Brake

- N : Without brake
- B : With brake

⑦ Stroke

- 10 : 100 mm ~ 90 : 900 mm
- A0 : 1000 mm ~ H0 : 1700 mm
- J0 : 1800 mm ~ N0 : 2200 mm
- P0 : 2300 mm ~ V0 : 2900 mm
- W00 : 3000 mm ~ W90 : 3900mm
- X00 : 4000 mm ~ X80 : 4800mm
- 36 : 360 deg. (R-axis)

⑧ Master unit (Controller)

- 0 : Without controller
- 1 : CA20-M10, CA20-M40 (Note)
- 2 : CA10-M00B
- 3 : CA10-M01B
- 4 : CA20-M00
- 5 : CA20-M01
- 6 : CA20-M00-0V
- 7 : CA20-M01-0V

⑨ Cable length (between axis(actuator)and controller)

- 3 : 3 m
- 5 : 5 m
- 7 : 7 m
- 9 : 9 m
- B : 11 m
- D : 13 m

⑩ Field-bus

- 0 : None
- C : CC-Link
- D : DeviceNet

⑪ Axis options

- 0 : None
- C : Clean
- D : Dustproof
- E : Oilless ball screw

Note: This is automatically selected based on the motor capacity.

Options

Designation	Type	Remarks	Q'ty
I/O cable	CA10-IC-A ⑫ 0	For master unit and slave unit	
	ICBL- ⑫ 00	For high-performance master unit and extension I/O unit (CA10-EX-B40)	
	CA10-IC-B ⑫ 0	For extension I/O unit (CA20-EX-A20)	
	⑫ Cable length 3 : 3 m 5 : 5 m		
Extension I/O unit	CA20-EX-A20	For master unit and slave unit	
	CA10-EX-B40	For high-performance master unit (CA10-M00B)	
Regenerative discharge unit	ABSU-2000	For type of motor 50, 100, 200 W	
	ABSU-4000	For type of motor 400 W	
Home position change sensor	HBS-BA10	For ball screw driven axis	
	HBS-BA20, HBS-BA20L	For timing belt driven axis	
Teach pendant	TPH-2A	For master unit	
	TPH-4C	For master unit and high-performance master unit	
Software for personal computer	SF-98D		
Communication cable	PCBL-31		
Link cable	CA10-LC-A ⑬	Required when extending a link cable from standard 150 mm.	
	⑬ Cable length 03:300 mm 10:1000 mm		

Single Axis Specifications

Ball Screw Driven

BA2-T5	24
BA2-T7	25
BA2-10	26
BA2-30	28
BA2-50	32
BA2-60	38

Timing Belt Driven

BA2-10	41
BA2-30	45
BA2-50	49
BA2-60	54

R-Axis

BA2-00D-RH	55
BA2-00D-RP	56

Pushrod

BA2-T3	57
BA2-T4	58
BA2-T5	59

[Set designation]

BA2 – T5D – ST – M 12 N – 40 – 1 3

Type of slider M : Medium slider	Lead 06 : 6mm 12 : 12mm	Brake N : Without brake B : With brake	Stroke See Page 20	Controller 0 : None 1 : CA20 – M10 Other: See page 20	Cable length 3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m
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[Specifications]

Motor	50 W AC servo motor (absolute)		
Drive system	Precisely rolled ball screw (equivalent to C7), thread outer diameter 8 mm		
Stroke (mm) (in increments of 50 mm)	Medium slider	50 ~ 450	500
	Type designation	05 ~ 45	50
Maximum speed (mm/s)	Lead 6 mm	400	340
	Lead 12 mm	800	630
Maximum Payload (kg) Acceleration/deceleration time: 0.3 sec or over	Lead 6 mm	Horizontal transfer: 10 Vertical transfer: 3	
	Lead 12 mm	Horizontal transfer: 5 Vertical transfer: 1.5	
Positioning repeatability (mm)	± 0.02		
Resolution (mm)	0.01		
Allowable static load moment (N·m)	Medium slider MR : 31 MP : 12 MY : 12		
Brake	Braking while not excited, voltage DC24 V		
Master controller	Select from CA20-MM <input type="checkbox"/> , CA10 – M0 <input type="checkbox"/> B		

Notes: * When using the axis as a vertical axis, select the type with brake.

* The maximum Payload signifies a load exerted on top of the slider. Also refer to the dynamic load moment given in pages 212 to 220.

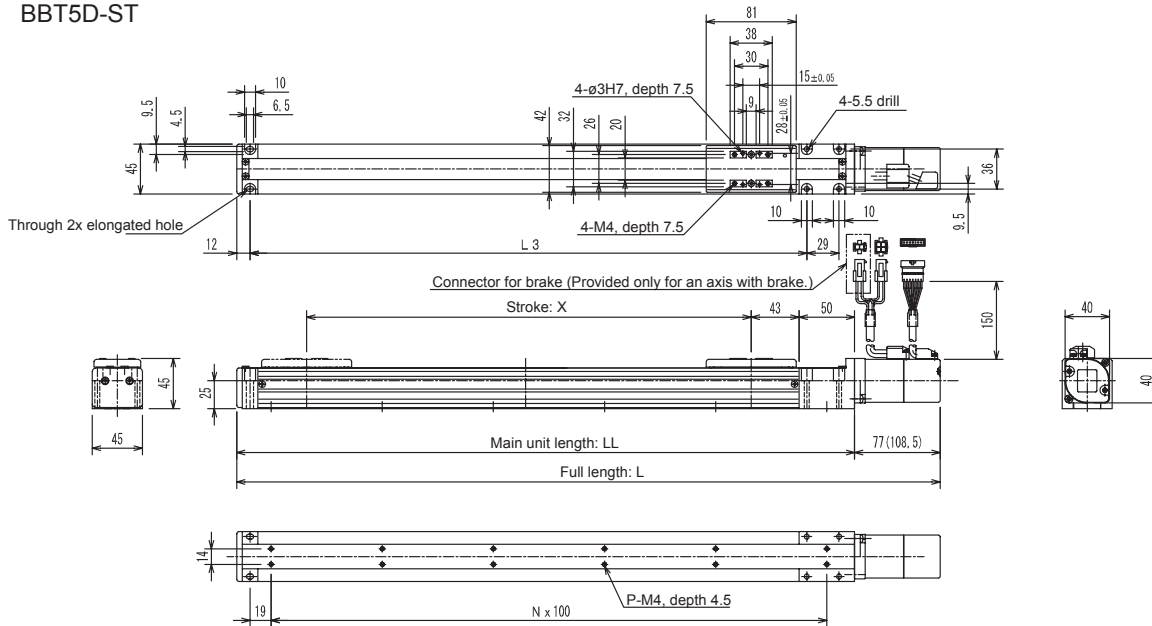
Ball-screw driven

[Axis designation]

BBT5D – ST – M 12 N – 40

Type of slider M : Medium slider	Lead 06 : 6mm 12 : 12mm	Brake N : Without brake B : With brake	Stroke See page 20
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BBT5D-ST



Stroke X (mm)	50	100	150	200	250	300	350	400	450	500
Full length L (mm)	283(314.5)	333(364.5)	383(414.5)	433(464.5)	483(514.5)	533(564.5)	583(614.5)	633(664.5)	683(714.5)	733(764.5)
Main unit length LL (mm)	206	256	306	356	406	456	506	556	606	656
L3 (mm)	151	201	251	301	351	401	451	501	551	601
No. of holes P (q'ty)	4	6	6	8	8	10	10	12	12	14
Intervals between mounting holes N	1	2	2	3	3	4	4	5	5	6
Weight (kg)	1.2(1.4)	1.3(1.5)	1.4(1.6)	1.5(1.7)	1.6(1.8)	1.7(1.9)	1.8(2.0)	1.9(2.1)	2.0(2.2)	2.2(2.4)

* Values in parentheses are for the axis with brake.

[Set designation]

BA2 – T7D – ST – M 12 N – 40 – 13

Type of slider M : Medium slider	Lead 06 : 6mm 12 : 12mm	Brake N : Without brake B : With brake	Stroke See Page 20	Controller 0 : None 1 : CA20 – M10 Other: See page 20	Cable length 3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m
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[Specifications]

Motor	50 WAC servo motor (absolute)			
Drive system	Precisely rolled ball screw (equivalent to C7), thread outer diameter 12 mm			
Stroke (mm) (in increments of 50 mm)	Medium slider	50 ~ 550	600	700
	Type designation	05 ~ 55	60	70
Maximum speed (mm/s)	Lead 6 mm	400	340	250
	Lead 12 mm	800	680	500
Maximum Payload (kg) Acceleration/deceleration time: 0.3 sec or over	Lead 6 mm	Horizontal transfer: 30 Vertical transfer: 8		
	Lead 12 mm	Horizontal transfer: 12 Vertical transfer: 4		
Positioning repeatability (mm)	± 0.02			
Resolution (mm)	0.01			
Allowable static load moment (N·m)	Medium slider MR : 58 MP : 25.7 MY : 25.7			
Brake	Braking while not excited, voltage DC24 V			
Master controller	Select from CA20-M <input type="checkbox"/> , CA10 – M0 <input type="checkbox"/> B			

Notes: * When using the axis as a vertical axis, select the type with brake.
* The maximum Payload signifies a load exerted on top of the slider. Also refer to the dynamic load moment given in pages 212 to 220.

[Axis designation]

BBT7D – ST – M 12 N – 40

Type of slider M : Medium slider	Lead 06 : 6mm 12 : 12mm	Brake N : Without brake B : With brake	Stroke See Page 20
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BBT7D-ST

Technical drawing of the BBT7D-ST axis assembly. The drawing includes side and front views with various dimensions and specifications. Key features include:

- Through 2x elongated hole
- 4-ø3H7, depth 10
- 4-M5, depth 10
- 4-5.5 drill
- Connector for brake (Provided only for an axis with brake.)
- Stroke: X
- Main unit length: LL
- Full length: L
- 77 (108.5)
- N x 100
- P-M5, depth 9

Stroke X (mm)	50	100	150	200	250	300	350	400	450	500	550	600	700
Full length L (mm)	314(345.5)	364(395.5)	414(445.5)	464(495.5)	514(545.5)	564(595.5)	614(645.5)	664(695.5)	714(745.5)	764(795.5)	814(845.5)	864(895.5)	964(995.5)
Main unit length LL (mm)	237	287	337	387	437	487	537	587	637	687	737	787	887
L3 (mm)	171	221	271	321	371	421	471	521	571	621	671	721	821
No. of holes P (q'ty)	4	6	6	8	8	10	10	12	12	14	14	16	18
Intervals between mounting holes N	1	2	2	3	3	4	4	5	5	6	6	7	8
Weight (kg)	2.3(2.5)	2.5(2.7)	2.7(2.9)	2.9(3.1)	3.1(3.3)	3.3(3.5)	3.5(3.7)	3.7(3.9)	3.9(4.1)	4.1(4.3)	4.3(4.5)	4.5(4.7)	4.9(5.1)

* Values in parentheses are for the axis with brake.

[Set designation]

BA2 - 10E - ST - M 20 N - 40 - 1 3

Axis structure	Type of slider	Lead	Brake	Stroke	Controller	Cable length
ST : Straight axis UR : Right side mounted motor axis UL : Left side mounted motor axis UU : Bottom side mounted motor axis	S : Short slider M : Medium slider	05 : 5mm 10 : 10mm 20 : 20mm	N : Without brake B : With brake	See page 20	0 : None 1 : CA20 - M10 Other: See page 20	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m

[Specifications]

Motor	100 WAC servo motor (absolute)				
Drive system	Ground ball screw (C7), thread outer diameter 15 mm				
Stroke (mm) (in increments of 100 mm)	Short slider	150 ~ 650	750	850	950, 1050
	Type designation	15 ~ 65	75	85	95, A5
	Medium slider	100 ~ 600	700	800	900, 1000
	Type designation	10 ~ 60	70	80	90, A0
Maximum speed (mm/s) Values in < > signify the acceleration/deceleration time in seconds when the maximum Payload is loaded.	Lead 20 mm	1200<0.36>	1000<0.3>	800<0.24>	600<0.18>
	Lead 10 mm	600<0.36>	500<0.3>	400<0.24>	300<0.18>
	Lead 5 mm	300<0.36>	250<0.3>	200<0.24>	150<0.18>
Maximum Payload (kg)	Lead 20 mm	Horizontal transfer: 15		Vertical transfer: 3 (5)	
	Lead 10 mm	Horizontal transfer: 30		Vertical transfer: 8 (12)	
	Lead 5 mm	Horizontal transfer: 50		Vertical transfer: 15 (22)	
Positioning repeatability (mm)	± 0.01				
Resolution (mm)	0.01				
Allowable static load moment (N·m)	Short slider MR : 49 MP : 14 MY : 13 Medium slider MR : 59 MP : 59 MY : 54				
Brake	Braking while not excited, voltage DC24 V				
Master controller	Select from CA20 - M <input type="checkbox"/> , CA10 - M0 <input type="checkbox"/> B				

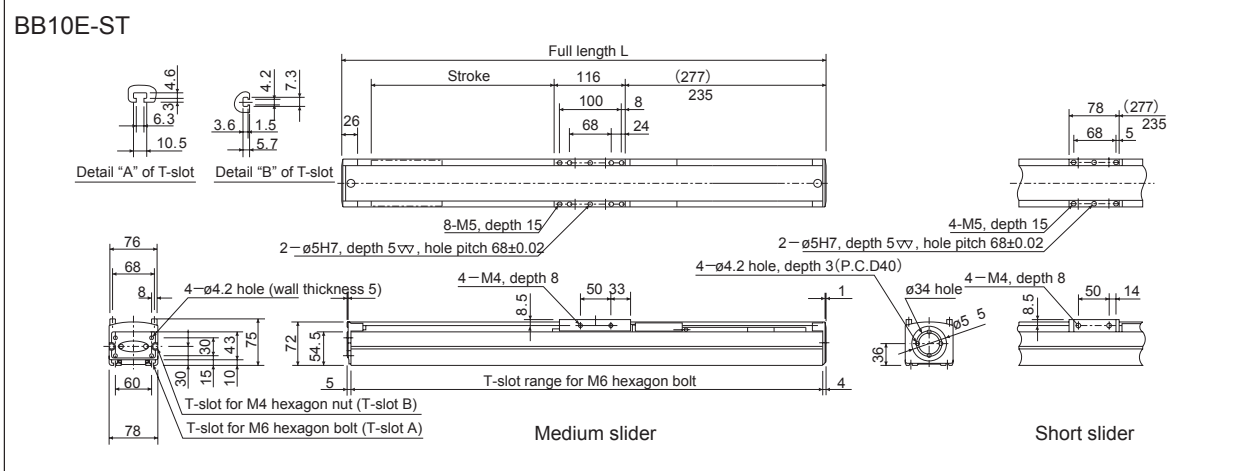
- Notes:
- * When using the axis as a vertical axis, select the type with brake.
 - * The maximum Payload signifies a load exerted on top of the slider. Also refer to the dynamic load moment given in pages 212 to 220.
 - * The values in parentheses under "Maximum Payload" are applicable when a regenerative discharge unit ABSU-2000 is equipped.
 - * The acceleration/deceleration time represents the time until the axis reaches a programmed speed.

[Axis designation]

BB10E - ST - M 20 N - 40

Axis structure	Type of slider	Lead	Brake	Stroke
ST : Straight axis UR : Right side mounted motor axis UL : Left side mounted motor axis UU : Bottom side mounted motor axis	S : Short slider M : Medium slider	05 : 5mm 10 : 10mm 20 : 20mm	N : Without brake B : With brake	See page 20

[Dimensions]

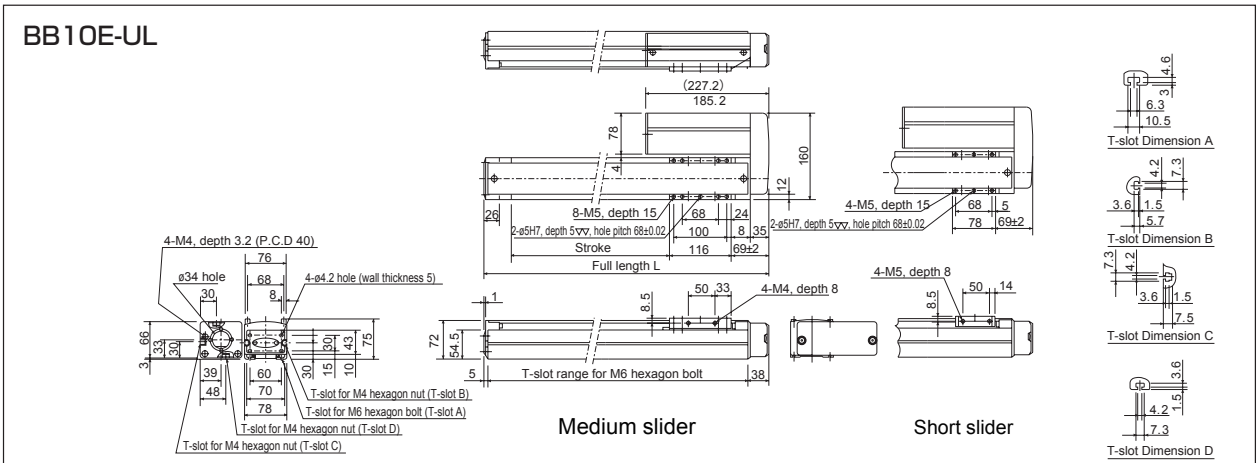
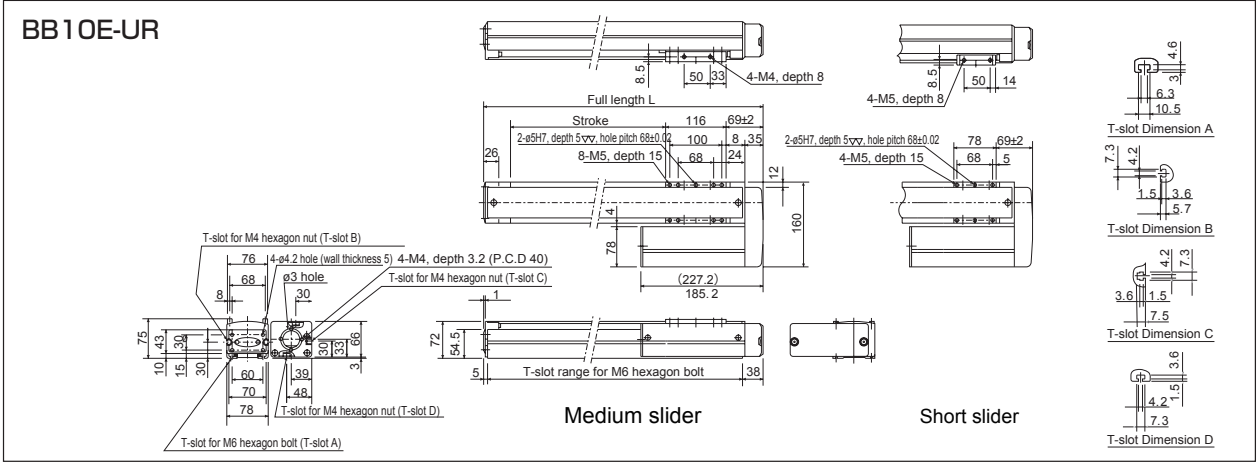


Medium slider	Stroke (mm)	100	200	300	400	500	600	700	800	900	1000
Full length L (mm)		498(540)	598(640)	698(740)	798(840)	898(940)	998(1040)	1098(1140)	1198(1240)	1298(1340)	1398(1440)
Weight (kg)		4.9(5.3)	5.6(6.0)	6.3(6.7)	7.0(7.4)	7.7(8.1)	8.4(8.8)	9.1(9.5)	9.8(10.2)	10.5(10.9)	11.2(11.6)

* Values in parentheses are for the axis with brake.

Short slider	Stroke (mm)	150	250	350	450	550	650	750	850	950	1050
Full length L (mm)		498(540)	598(640)	698(740)	798(840)	898(940)	998(1040)	1098(1140)	1198(1240)	1298(1340)	1398(1440)
Weight (kg)		4.6(5.0)	5.3(5.7)	6.0(6.4)	6.7(7.1)	7.4(7.8)	8.1(8.5)	8.8(9.2)	9.5(9.9)	10.2(10.6)	10.9(11.3)

* Values in parentheses are for the axis with brake.

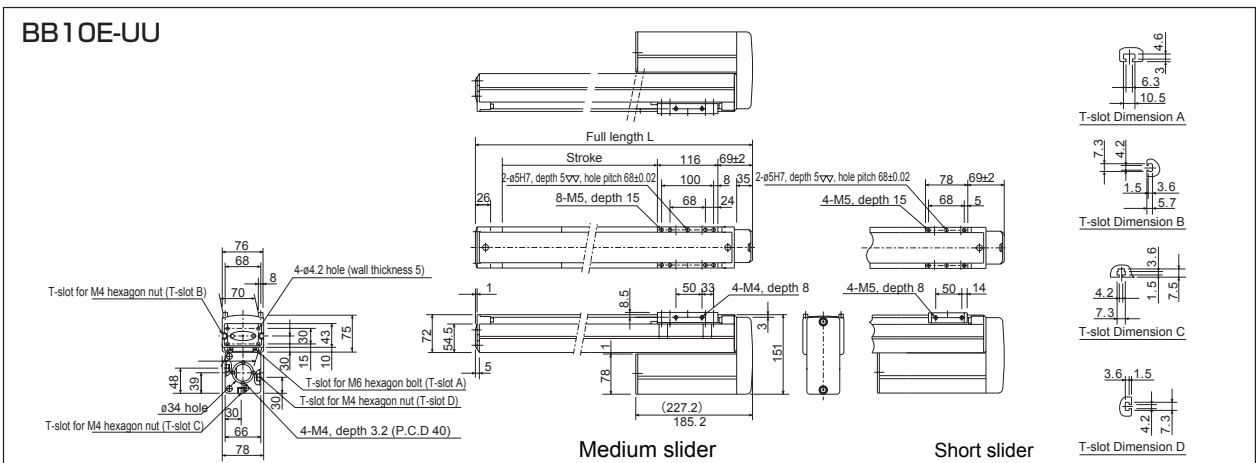


Common to BB10E-UR and UL.

Medium slider	Stroke (mm)	100	200	300	400	500	600	700	800	900	1000
	Full length L (mm)	332	432	532	632	732	832	932	1032	1132	1232
	Weight (kg)	5.0(5.4)	5.7(6.1)	6.4(6.8)	7.1(7.5)	7.8(8.2)	8.5(8.9)	9.2(9.6)	9.9(10.3)	10.6(11.0)	11.3(11.7)

Short slider	Stroke (mm)	150	250	350	450	550	650	750	850	950	1050
	Full length L (mm)	332	432	532	632	732	832	932	1032	1132	1232
	Weight (kg)	4.7(5.1)	5.4(5.8)	6.1(6.5)	6.8(7.2)	7.5(7.9)	8.2(8.6)	8.9(9.3)	9.6(10.0)	10.3(10.7)	11.0(11.4)

* Values in parentheses are for the axis with brake.



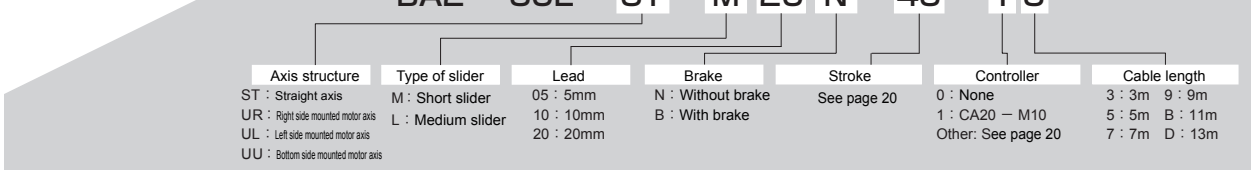
BB10E-UU

Medium slider	Stroke (mm)	200	300	400	500	600	700	800	900	1000
	Full length L (mm)	432	532	632	732	832	932	1032	1132	1232
	Weight (kg)	5.7(6.1)	6.4(6.8)	7.1(7.5)	7.8(8.2)	8.5(8.9)	9.2(9.6)	9.9(10.3)	10.6(11.0)	11.3(11.7)

Short slider	Stroke (mm)	250	350	450	550	650	750	850	950	1050
	Full length L (mm)	432	532	632	732	832	932	1032	1132	1232
	Weight (kg)	5.4(5.8)	6.1(6.5)	6.8(7.2)	7.5(7.9)	8.2(8.6)	8.9(9.3)	9.6(10.0)	10.3(10.7)	11.0(11.4)

* Values in parentheses are for the axis with brake.

[Set designation]



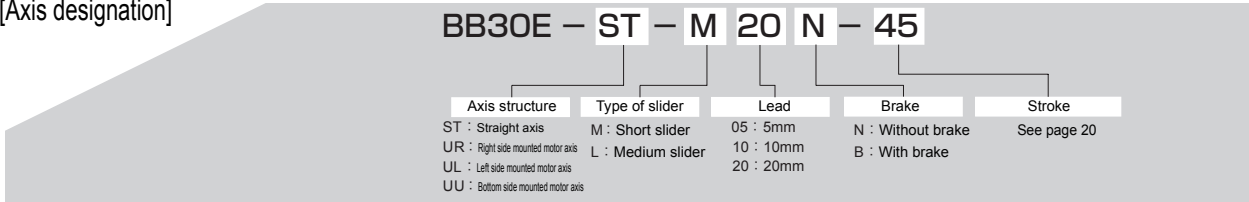
[Specifications]

Motor	100 W AC servo motor (absolute)				
Drive system	Ground ball screw (C7), thread outer diameter 15 mm				
Stroke (mm) (in increments of 100 mm)	Short slider	100 ~ 600 [150 ~ 650]	700 [750]	800 [850]	900, 1000 [950, 1050]
	Type designation	10 ~ 60 [15 ~ 65]	70 [75]	80 [85]	90, A0 [95, A5]
	Long slider	150 ~ 550 [150 ~ 650]	650 [750]	750 [850]	850, 950 [950, 1050]
	Type designation	15 ~ 55 [15 ~ 65]	65 [75]	75 [85]	85, 95 [95, A5]
Maximum speed (mm/s) Values in <> signify the acceleration/deceleration time in seconds when the maximum Payload is loaded.	Lead 20 mm	1200<0.36>	1000<0.3>	800<0.24>	600<0.18>
	Lead 10 mm	600<0.36>	500<0.3>	400<0.24>	300<0.18>
	Lead 5 mm	300<0.36>	250<0.3>	200<0.24>	150<0.18>
Maximum Payload (kg)	Lead 20 mm	Horizontal transfer: 20		Vertical transfer: 3 (5)	
	Lead 10 mm	Horizontal transfer: 50		Vertical transfer: 8 (12)	
	Lead 5 mm	Horizontal transfer: 50		Vertical transfer: 15 (22)	
Positioning repeatability (mm)	± 0.01				
Resolution (mm)	0.01				
Allowable static load moment (N·m)	Medium slider MR : 510 MP : 430 MY : 370 Long slider MR : 510 MP : 750 MY : 650				
Brake	Braking while not excited, voltage DC24 V				
Master controller	Select from CA20 – M <input type="checkbox"/> <input type="checkbox"/> , CA10 – M0 <input type="checkbox"/> B				

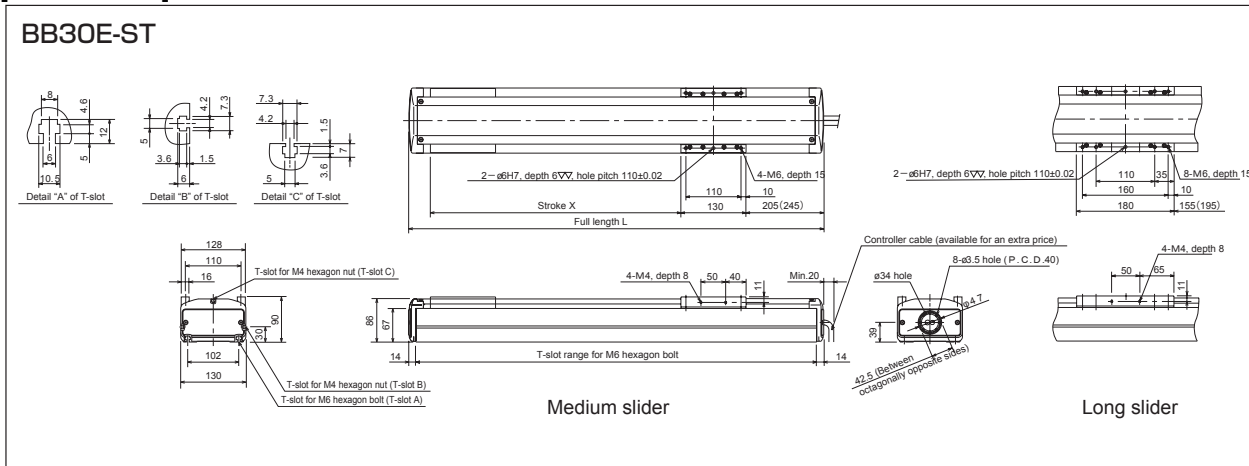
- Notes:
- * When using the axis as a vertical axis, select the type with brake.
 - * The maximum Payload signifies a load exerted on top of the slider. Also refer to the dynamic load moment given in pages 212 to 220.
 - * The values in parentheses under "Maximum Payload" are applicable when a regenerative discharge unit ABSU-2000 is equipped.
 - * The acceleration/deceleration time represents the time until the axis reaches a programmed speed.

Ball-screw driven

[Axis designation]

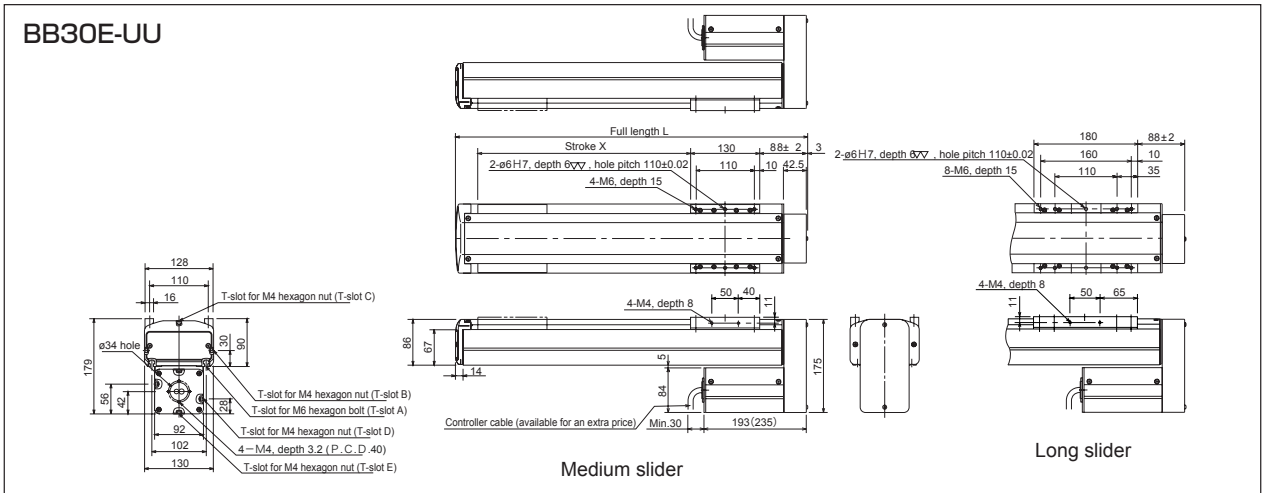
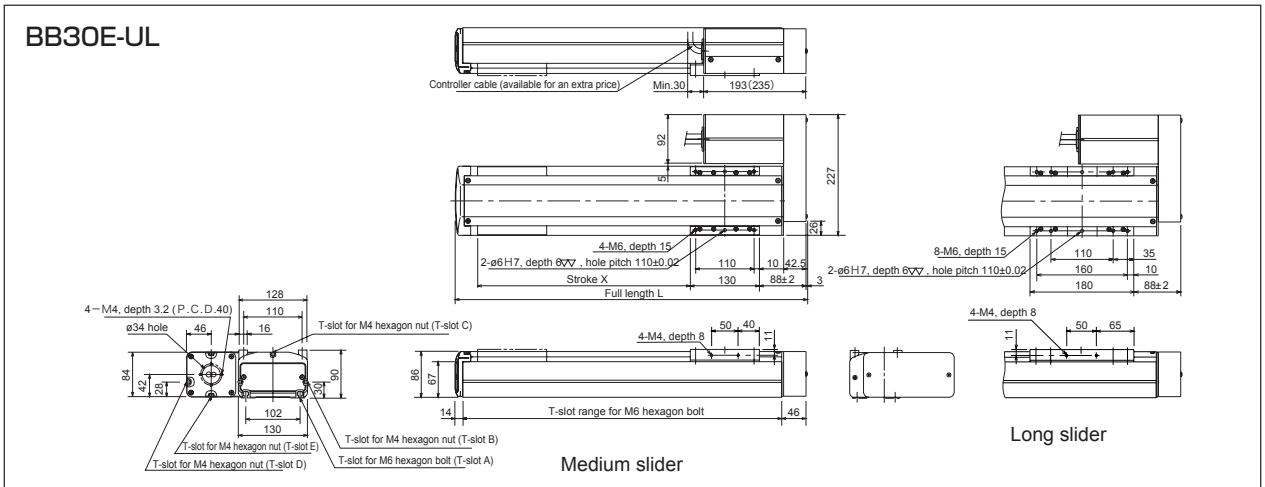
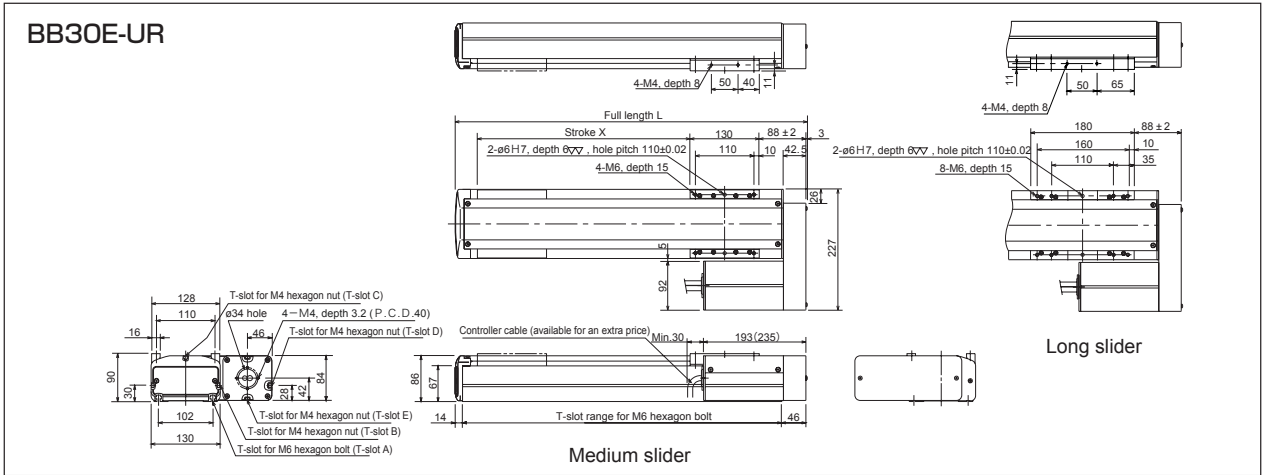


[Dimensions]

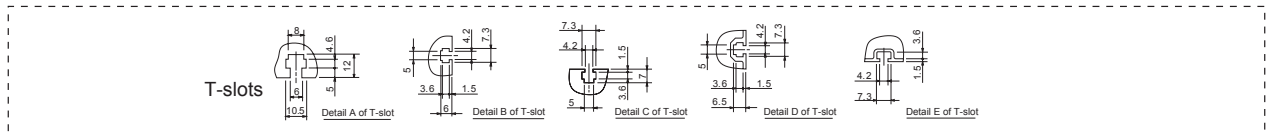


Medium slider	Stroke (mm)	150	250	350	450	550	650	750	850	950	1050
	Full length L (mm)	528(568)	628(668)	728(768)	828(868)	928(968)	1028(1068)	1128(1168)	1228(1268)	1328(1368)	1428(1468)
	Weight (kg)	8.3(8.9)	9.5(10.1)	10.7(11.3)	11.9(12.5)	13.1(13.7)	14.3(14.9)	15.5(16.1)	16.7(17.3)	17.9(18.5)	19.1(19.7)
Long slider	Stroke (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)
	Weight (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)

* Values in parentheses are for the axis with brake.



Common to BB30E-UR, UL and UU.



Common to BB30E-UR, UL and UU.

Medium slider	Stroke (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
	Weight (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)

Common to BB30E-UR, UL and UU.

Long slider	Stroke (mm)	150	250	350	450	550	650	750	850	950
	Full length L (mm)	463	563	663	763	863	963	1063	1163	1263
	Weight (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)

* Values in parentheses are for the axis with brake.

[Set designation]

BA2 – 30F – ST – M 20 N – 40 – 1 3

Axis structure	Type of slider	Lead	Brake	Stroke	Controller	Cable length
ST : Straight axis UR : Right side mounted motor axis UL : Left side mounted motor axis UU : Bottom side mounted motor axis	M : Short slider L : Medium slider	05 : 5mm 10 : 10mm 20 : 20mm	N : Without brake B : With brake	See page 20	0 : None 1 : CA20 – M10 Other: See page 20	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m

[Specifications]

Motor	200 W AC servo motor (absolute)				
Drive system	Ground ball screw (C7), thread outer diameter 15 mm				
Stroke (mm) (in increments of 100 mm)	Medium slider	100 ~ 600	700	800	900, 1000
	Type designation	10 ~ 60	70	80	90, A0
	Long slider	150 ~ 550	650	750	850, 950
	Type designation	15 ~ 55	65	75	85, 95
Maximum speed (mm/s) Values in < > signify the acceleration/deceleration time in seconds when the maximum Payload is loaded.	Lead 20 mm	1200<0.36>	1000<0.3>	800<0.24>	600<0.18>
	Lead 10 mm	600<0.36>	500<0.3>	400<0.24>	300<0.18>
	Lead 5 mm	300<0.36>	250<0.3>	200<0.24>	150<0.18>
Maximum Payload (kg)	Lead 20 mm	Horizontal transfer: 40		Vertical transfer: 3 (10)	
	Lead 10 mm	Horizontal transfer: 80		Vertical transfer: 8 (20)	
	Lead 5 mm	Horizontal transfer: 80		Vertical transfer: 15 (40)	
Positioning repeatability (mm)	± 0.01				
Resolution (mm)	0.01				
Allowable static load moment (N·m)	Medium slider MR : 510 MP : 430 MY : 370 Long slider MR : 510 MP : 750 MY : 650				
Brake	Braking while not excited, voltage DC24 V				
Master controller	Select from CA20 – M □□, CA10 – M0 □B				

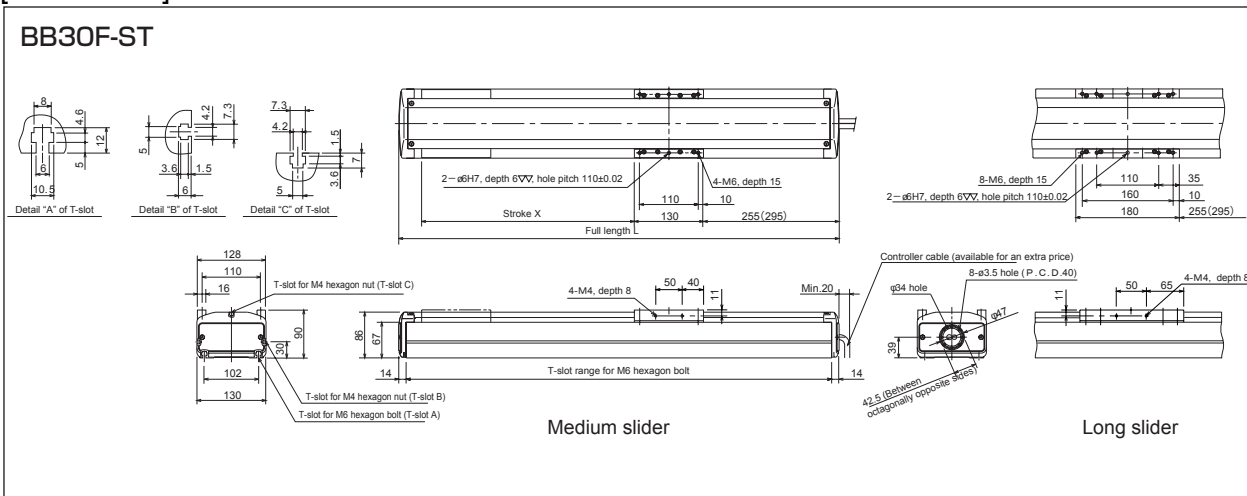
- Notes: * When using the axis as a vertical axis, select the type with brake.
 * The maximum Payload signifies a load exerted on top of the slider. Also refer to the dynamic load moment given in pages 212 to 220.
 * The values in parentheses under "Maximum Payload" are applicable when a regenerative discharge unit ABSU-2000 is equipped.
 * The acceleration/deceleration time represents the time until the axis reaches a programmed speed.

[Axis designation]

BB30F – ST – M 20 N – 40

Axis structure	Type of slider	Lead	Brake	Stroke
ST : Straight axis UR : Right side mounted motor axis UL : Left side mounted motor axis UU : Bottom side mounted motor axis	M : Medium slider L : Long slider	05 : 5mm 10 : 10mm 20 : 20mm	N : Without brake B : With brake	See page 20

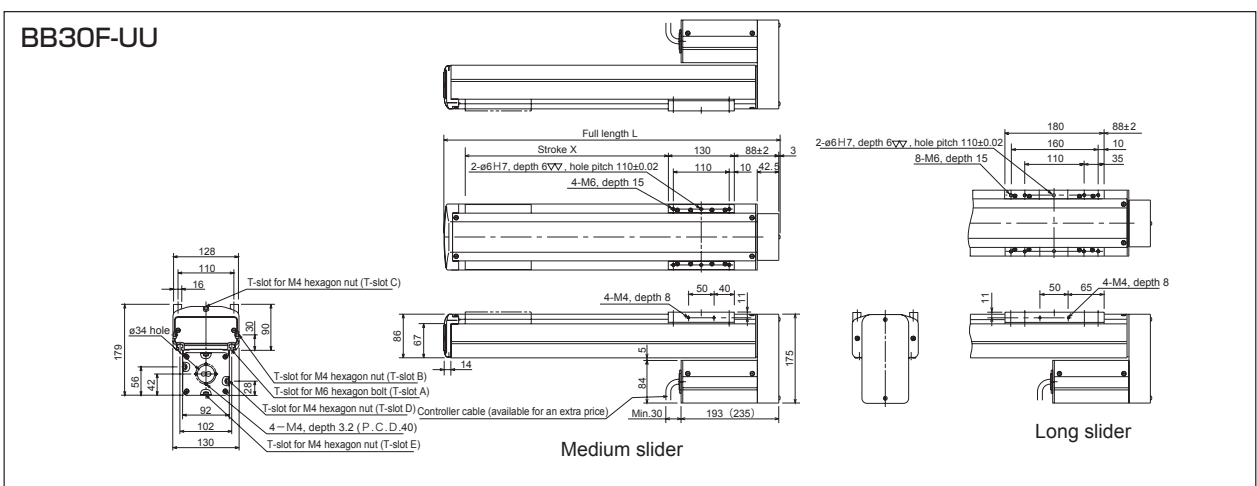
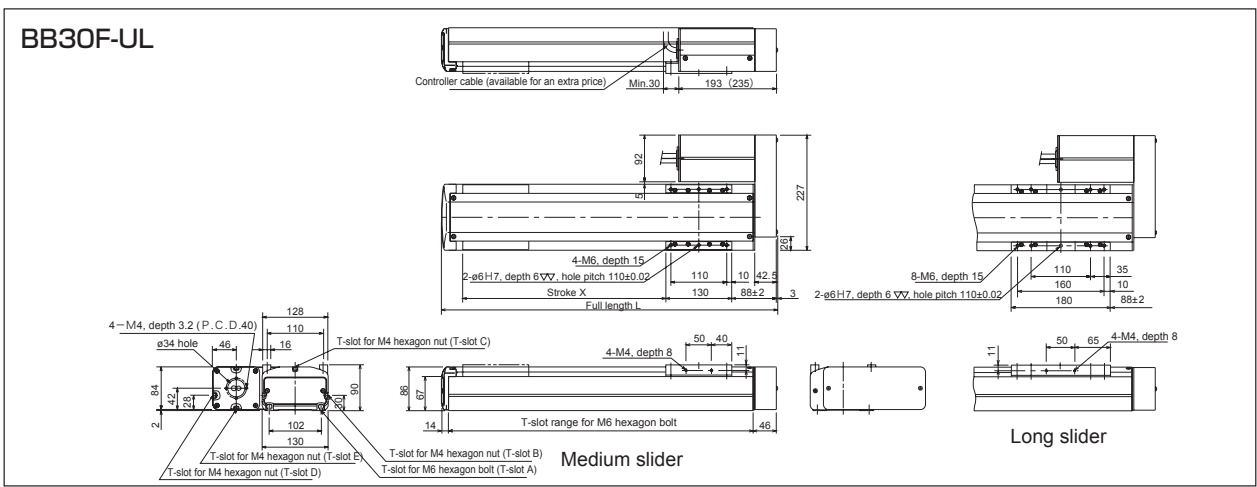
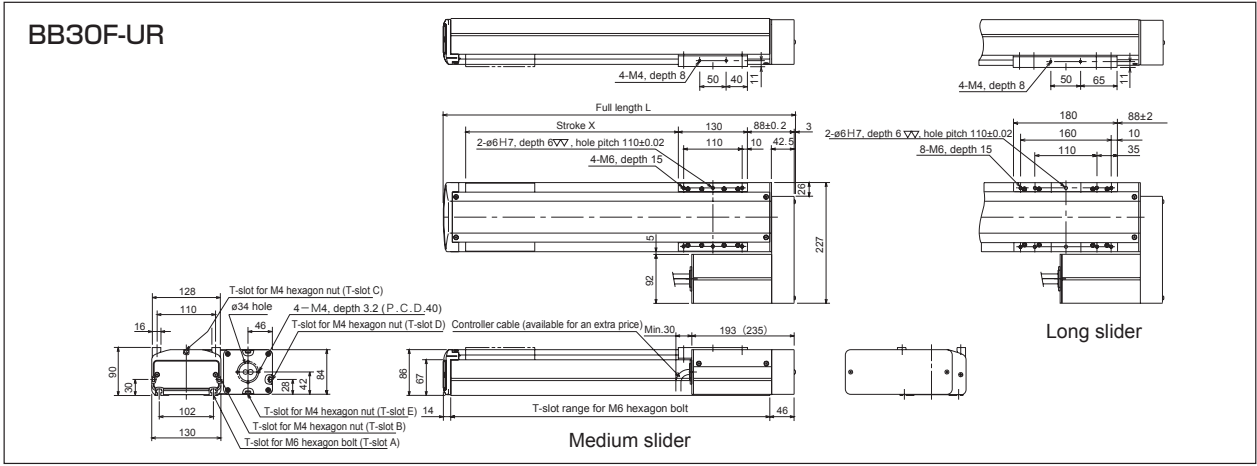
[Dimensions]



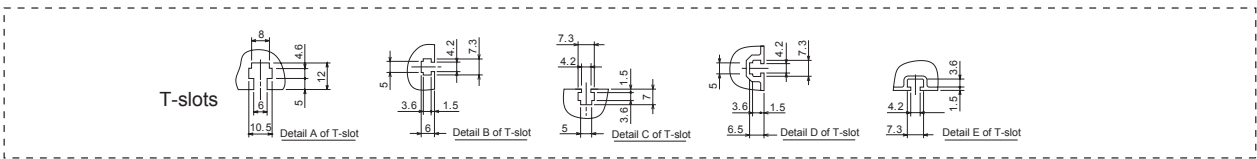
Medium slider	Stroke (mm)	100	200	300	400	500	600	700	800	900	1000
	Full length L (mm)	528(568)	628(668)	728(768)	828(868)	928(968)	1028(1068)	1128(1168)	1228(1268)	1328(1368)	1428(1468)
	Weight (kg)	9.6(10.2)	10.8(11.4)	12.0(12.6)	13.2(13.8)	14.4(15.0)	15.6(16.2)	16.8(17.4)	18.0(18.6)	19.2(19.8)	20.4(21.0)

Long slider	Stroke (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)
	Weight (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)

* Values in parentheses are for the axis with brake.



Common to BB30F-UR, UL and UU.



Common to BB30F-UR, UL and UU.

Medium slider	Stroke (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
	Weight (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)

Common to BB30F-UR, UL and UU.

Long slider	Stroke (mm)	150	250	350	450	550	650	750	850	950
	Full length L (mm)	463	563	663	763	863	963	1063	1163	1263
	Weight (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)

* Values in parentheses are for the axis with brake.

Ball-screw driven

[Set designation]

BA2 – 50F – ST – M 20 N – 40 – 1 3

Axis structure	Type of slider	Lead	Brake	Stroke	Controller	Cable length
ST : Straight axis UR : Right side mounted motor axis UL : Left side mounted motor axis UU : Bottom side mounted motor axis	M : Medium slider L : Long slider	05 : 5mm 10 : 10mm 20 : 20mm	N : Without brake B : With brake	See page 20	0 : None 1 : CA20 – M10 Other: See page 20	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m

[Specifications]

Motor	200 W AC servo motor (absolute)							
Drive system	Ground ball screw (C7), thread outer diameter 20 mm							
Stroke (mm) (in increments of 100 mm)	Medium slider	200 ~ 600	700, 800	900, 1000	1100, 1200	1300	1400	1500
	Type designation	20 ~ 60	70, 80	90, A0	B0, C0	D0	E0	F0
Maximum speed (mm/s) Values in <> signify the acceleration/deceleration time in seconds when the maximum Payload is loaded.	Long slider	250 ~ 550	650, 750	850, 950	1050, 1150	1250	1350	1450
	Type designation	25 ~ 55	65, 75	85, 95	A5, B5	C5	D5	E5
Maximum Payload (kg)	Lead 20 mm	Horizontal transfer: 60 (Note 1)		Vertical transfer: 3 (12) (Note 2)				
	Lead 10 mm	Horizontal transfer: 100		Vertical transfer: 8 (25)				
Positioning repeatability (mm)	Lead 5 mm	Horizontal transfer: 100		Vertical transfer: 15 (50)				
		± 0.01						
Resolution (mm)	0.01							
Allowable static load moment (N·m)	Medium slider MR : 2080 MP : 2160 MY : 1820 Long slider MR : 2080 MP : 3150 MY : 2640							
Brake	Braking while not excited, voltage DC24 V							
Master controller	Select from CA20 – M <input type="checkbox"/> , CA10 – M0 <input type="checkbox"/> B							

- Notes: * When using the axis as a vertical axis, select the type with brake.
 * The maximum Payload signifies a load exerted on top of the slider. Also refer to the dynamic load moment given in pages 212 to 220.
 * The values in parentheses under "Maximum Payload" are applicable when a regenerative discharge unit ABSU-2000 is equipped.
 * The acceleration/deceleration time represents the time until the axis reaches a programmed speed.
- Note 1: When master power voltage is 110 to 120 V or 220 V to 240 V with Payload larger than 50 kg, a regenerative discharge unit (ABSU-2000) is required. When the axis speed exceeds 1,000 mm/s, allowable Payload is 50 kg.
- Note 2: When the axis speed exceeds 1,000 mm/s and a regenerative discharge unit is used, allowable Payload is 7 kg.

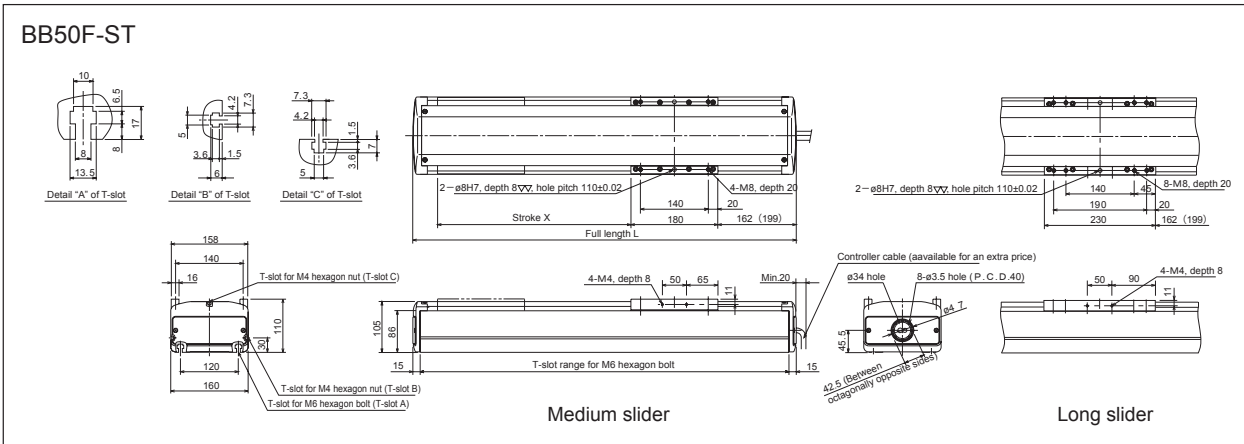
Ball-screw driven

[Axis designation]

BB50F – ST – M 20 N – 40

Axis structure	Type of slider	Lead	Brake	Stroke
ST : Straight axis UR : Right side mounted motor axis UL : Left side mounted motor axis UU : Bottom side mounted motor axis	M : Medium slider L : Long slider	05 : 5mm 10 : 10mm 20 : 20mm	N : Without brake B : With brake	See page 20

[Dimensions]



Medium slider

Stroke (mm)	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
Full length L (mm)	593(630)	693(730)	793(830)	893(930)	993(1030)	1093(1130)	1193(1230)	1293(1330)	1393(1430)	1493(1530)	1593(1630)	1693(1730)	1793(1830)	1893(1930)
Weight (kg)	16.1(16.9)	18.0(18.8)	19.9(20.7)	21.8(22.6)	23.7(24.5)	25.6(26.4)	27.5(28.3)	29.4(30.2)	31.3(32.1)	33.2(34.0)	35.1(35.9)	37.0(37.8)	38.9(39.7)	40.8(41.6)

* Values in parentheses are for the axis with brake.

Long slider

Stroke (mm)	250	350	450	550	650	750	850	950	1050	1150	1250	1350	1450
Full length L (mm)	693(730)	793(830)	893(930)	993(1030)	1093(1130)	1193(1230)	1293(1330)	1393(1430)	1493(1530)	1593(1630)	1693(1730)	1793(1830)	1893(1930)
Weight (kg)	18.6(19.4)	20.5(21.3)	22.4(23.2)	24.3(25.1)	26.2(27.0)	28.1(28.9)	30.0(30.8)	31.9(32.7)	33.8(34.6)	35.7(36.5)	37.6(38.4)	39.5(40.3)	41.4(42.2)

* Values in parentheses are for the axis with brake.

[Set designation]

BA2 – 50G – ST – M 20 N – 40 – 1 3

Axis structure	Type of slider	Lead	Brake	Stroke	Controller	Cable length
ST : Straight axis UR : Right side mounted motor axis UL : Left side mounted motor axis UU : Bottom side mounted motor axis	M : Medium slider L : Long slider	05 : 5mm 10 : 10mm 20 : 20mm	N : Without brake B : With brake	See page 20	0 : None 1 : CA20 – M10 Other: See page 20	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m

[Specifications]

Motor	200 W AC servo motor (absolute)							
Drive system	Ground ball screw (C7), thread outer diameter 20 mm							
Stroke (mm) (in increments of 100 mm)	Medium slider	200 ~ 600	700, 800	900, 1000	1100, 1200	1300	1400	1500
	Type designation	20 ~ 60	70, 80	90, A0	B0, C0	D0	E0	F0
	Long slider	250 ~ 550	650, 750	850, 950	1050, 1150	1250	1350	1450
	Type designation	25 ~ 55	65, 75	85, A95	A5, B5	C5	D5	E5
Maximum speed (mm/s) Values in <> signify the acceleration/deceleration time in seconds when the maximum Payload is loaded.	Lead 20 mm	1200<0.36>	1100<0.33>	1000<0.3>	700<0.21>	500<0.15>	400<0.12>	300<0.1>
	Lead 10 mm	600<0.36>	550<0.33>	500<0.3>	350<0.21>	250<0.15>	200<0.12>	150<0.1>
	Lead 5 mm	300<0.36>	280<0.33>	250<0.3>	180<0.21>	130<0.15>	100<0.12>	80<0.1>
Maximum Payload (kg)	Lead 20 mm	Horizontal transfer: 100			Vertical transfer: 25			
	Lead 10 mm	Horizontal transfer: 150			Vertical transfer: 50			
	Lead 5 mm	Horizontal transfer: 150			Vertical transfer: 60			
Positioning repeatability (mm)	± 0.01							
Resolution (mm)	0.01							
Allowable static load moment (N·m)	Medium slider MR : 2080 MP : 2160 MY : 1820				Long slider MR : 2080 MP : 3150 MY : 2640			
Brake	Braking while not excited, voltage DC24 V							
Master controller	Select from CA20 – M <input type="checkbox"/> , CA10 – M0 <input type="checkbox"/> B							

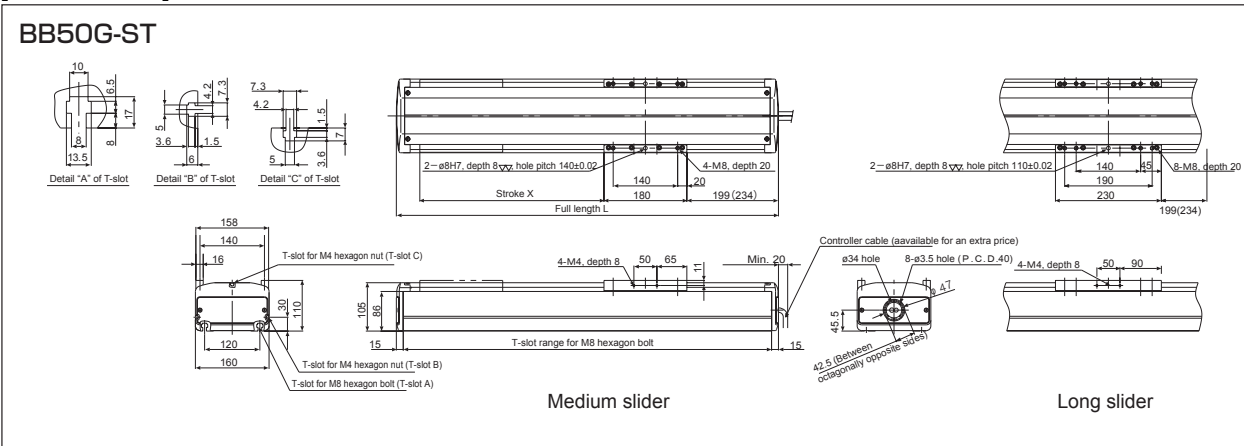
- Notes: * When using the axis as a vertical axis, select the type with brake.
 * The maximum Payload signifies a load exerted on top of the slider. Also refer to the dynamic load moment given in pages 212 to 220.
 * The values in parentheses under "Maximum Payload" are applicable when a regenerative discharge unit ABSU-4000 is equipped.
 * The acceleration/deceleration time represents the time until the axis reaches a programmed speed.

[Axis designation]

BB50G – ST – M 20 N – 40

Axis structure	Type of slider	Lead	Brake	Stroke
ST : Straight axis UR : Right side mounted motor axis UL : Left side mounted motor axis UU : Bottom side mounted motor axis	M : Medium slider L : Long slider	05 : 5mm 10 : 10mm 20 : 20mm	N : Without brake B : With brake	See page 20

[Dimensions]



Medium slider

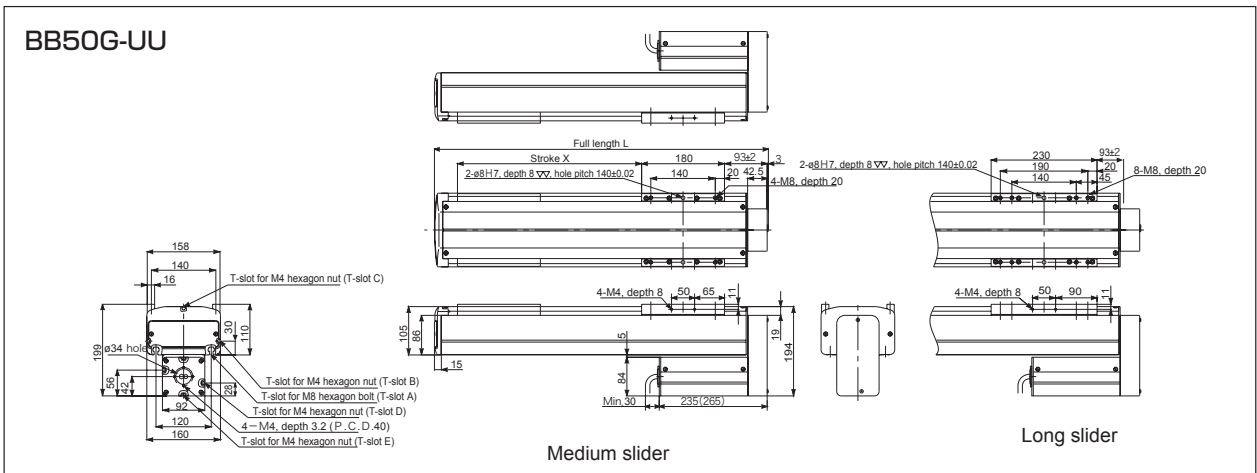
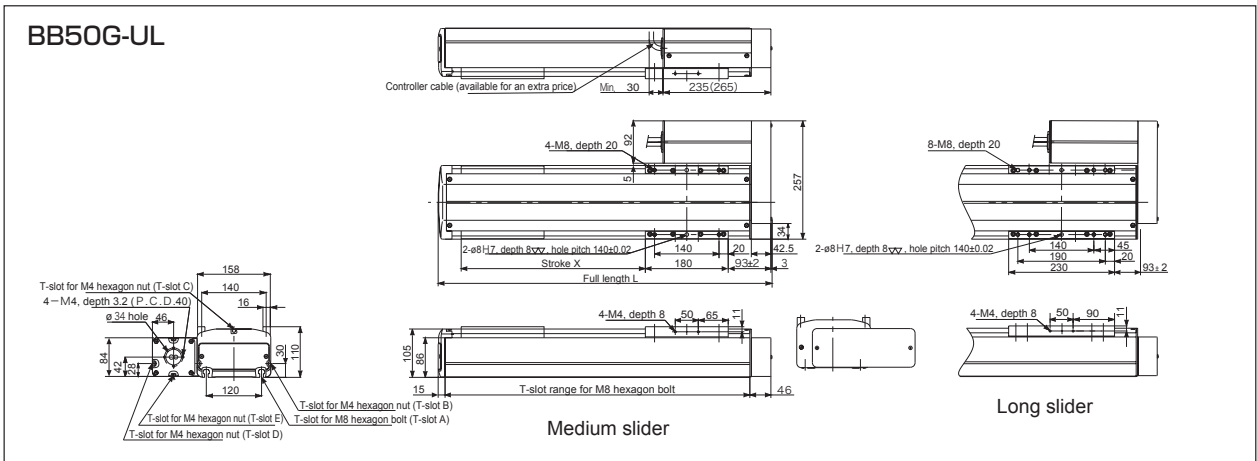
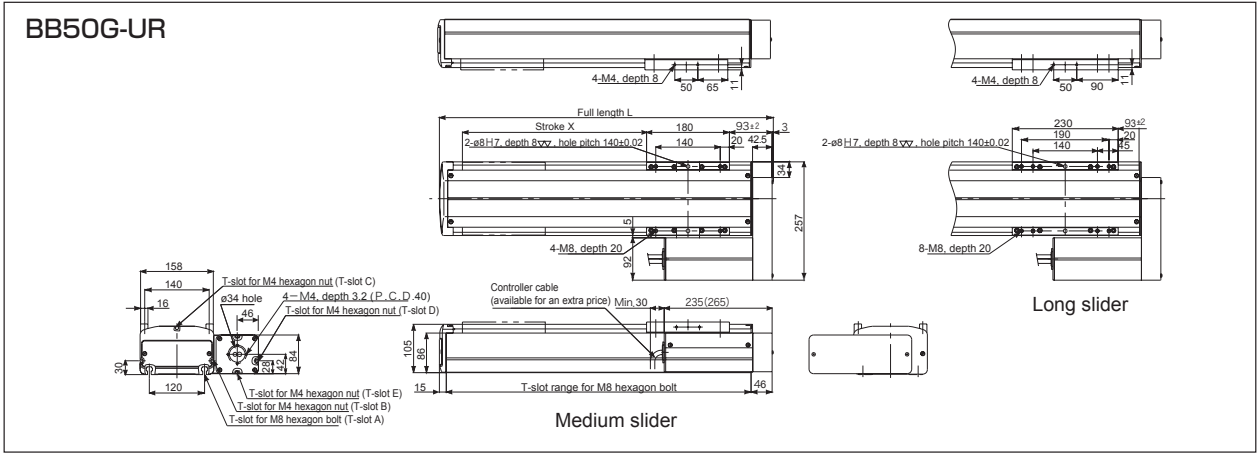
Stroke (mm)	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
Full length L (mm)	630(665)	730(765)	830(865)	930(965)	1030(1065)	1130(1165)	1230(1265)	1330(1365)	1430(1465)	1530(1565)	1630(1665)	1730(1765)	1830(1865)	1930(1965)
Weight (kg)	17.1(18.0)	19.0(19.9)	20.9(21.8)	22.8(23.7)	24.7(25.6)	26.6(27.5)	28.5(29.4)	30.4(31.3)	32.3(33.2)	34.2(35.1)	36.1(37.0)	38.0(38.9)	39.9(40.8)	41.8(42.7)

* Values in parentheses are for the axis with brake.

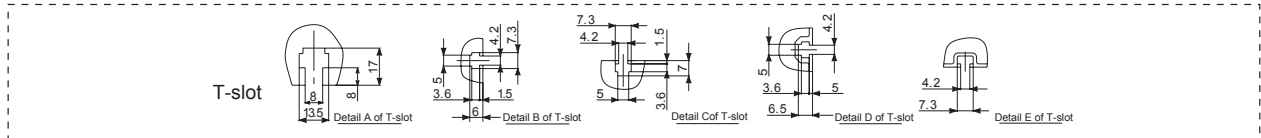
Long slider

Stroke (mm)	250	350	450	550	650	750	850	950	1050	1150	1250	1350	1450
Full length L (mm)	730(765)	830(865)	930(965)	1030(1065)	1130(1165)	1230(1265)	1330(1365)	1430(1465)	1530(1565)	1630(1665)	1730(1765)	1830(1865)	1930(1965)
Weight (kg)	19.6(20.5)	21.5(22.4)	23.4(24.3)	25.3(26.2)	27.2(28.1)	29.1(30.0)	31.0(31.9)	32.9(33.8)	34.8(35.7)	36.7(37.6)	38.6(39.5)	40.5(41.4)	42.4(43.3)

* Values in parentheses are for the axis with brake.



Common to BB50G-UR, UL and UU.



Medium slider Common to BB50G-UR, UL and UU.

Stroke (mm)	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
Full length L (mm)	526	626	726	826	926	1026	1126	1226	1326	1426	1526	1626	1726	1826
Weight (kg)	12.5(13.1)	14.4(15.0)	16.3(16.9)	18.2(18.8)	20.1(20.7)	22.0(22.6)	23.9(24.5)	25.8(26.4)	27.7(28.3)	29.6(30.2)	31.5(32.1)	33.4(34.0)	35.3(35.9)	37.2(37.8)

* Values in parentheses are for the axis with brake.

Long slider Common to BB50G-UR, UL and UU.

Stroke (mm)	250	350	450	550	650	750	850	950	1050	1150	1250	1350	1450
Full length L (mm)	626	726	826	926	1026	1126	1226	1326	1426	1526	1626	1726	1826
Weight (kg)	15.0(15.6)	16.9(17.5)	18.8(19.4)	20.7(21.1)	22.6(23.2)	24.5(25.1)	26.4(27.0)	28.3(28.9)	30.2(30.8)	32.1(32.7)	34.0(34.6)	35.9(36.5)	37.8(38.4)

* Values in parentheses are for the axis with brake.

Ball-screw driven

[Set designation]
Long stroke axis

BA2 - 50F - LT - M 20 N - R0 - 1 3

Flexible duct mounting position	Type of slider	Lead	Brake	Stroke	Controller	Cable length
LT : Left RT : Right	M : Medium slider L : Long slider	05 : 5mm 10 : 10mm 20 : 20mm	N : Without brake B : With brake	See page 20	0 : None 1 : CA20 - M10 Other: See page 20	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m

[Specifications]

Ordered product: Confirm the delivery from us at every order entry.

Motor	200 W AC servo motor (absolute)															
Drive system	Ball screw (nut rotation type), thread outer diameter 20 mm															
Stroke (mm) (in increments of 100 mm)	Medium slider	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500
	Type designation	B0	C0	D0	E0	F0	G0	H0	J0	K0	L0	M0	N0	P0	Q0	R0
	Long slider	1150	1250	1350	1450	1550	1650	1750	1850	1950	2050	2150	2250	2350	2450	
	Type designation	B5	C5	D5	E5	F5	G5	H5	J5	K5	L5	M5	N5	P5	Q5	
Maximum speed (mm/s)	Lead 20 mm	1000														
Maximum Payload (kg) Acceleration/deceleration time: 0.6 sec.	Horizontal transfer: 60															
Positioning repeatability (mm)	± 0.05															
Resolution (mm)	0.01															
Allowable static load moment (N·m)	Medium slider MR : 2080 MP : 2160 MY : 1820 Long slider MR : 2080 MP : 3150 MY : 2640															
Master controller	Select from CA20 - M <input type="checkbox"/> , CA10 - M0 <input type="checkbox"/> B															

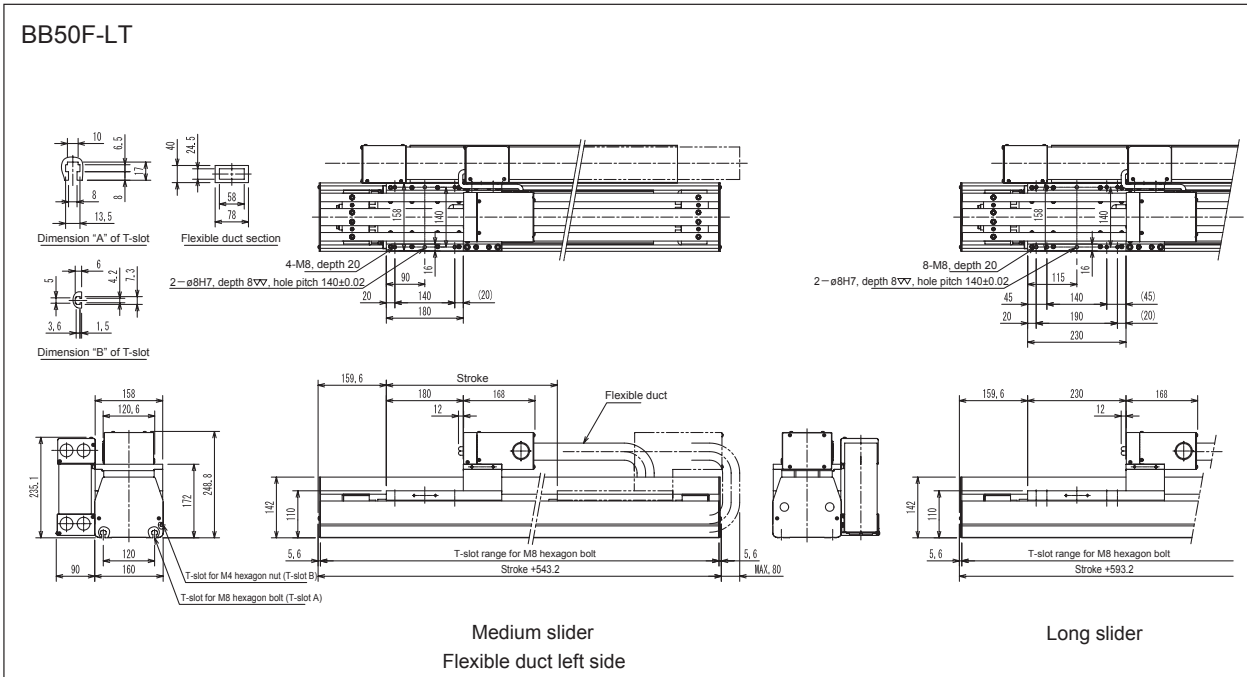
- Notes: * The maximum Payload signifies a load exerted on top of the slider. Also refer to the dynamic load moment given in pages 212 to 220.
 * For the 200 W type, when master power voltage is 110 V to 120 V or 220 V to 240 V with Payload larger than 50 kg, a regenerative discharge unit (ABSU-2000) is required.
 * The acceleration/deceleration time represents the time until the axis reaches a programmed speed.

Ball-screw driven

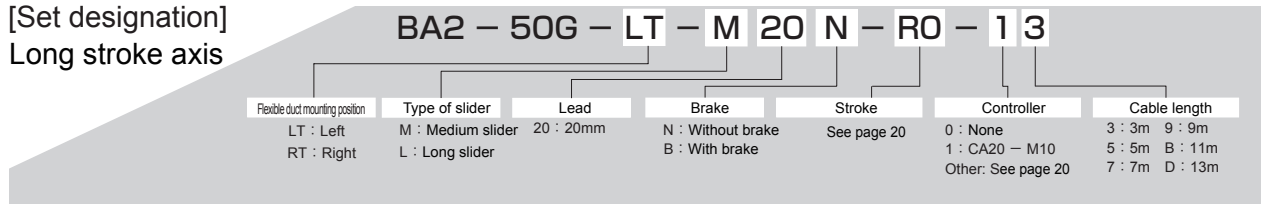
[Axis designation]

BB50F - LT - M 20 N - R0

Flexible duct mounting position	Type of slider	Lead	Brake	Stroke
LT : Left RT : Right	M : Medium slider L : Long slider	20 : 20mm	N : Without brake	See page 20



[Set designation]
Long stroke axis



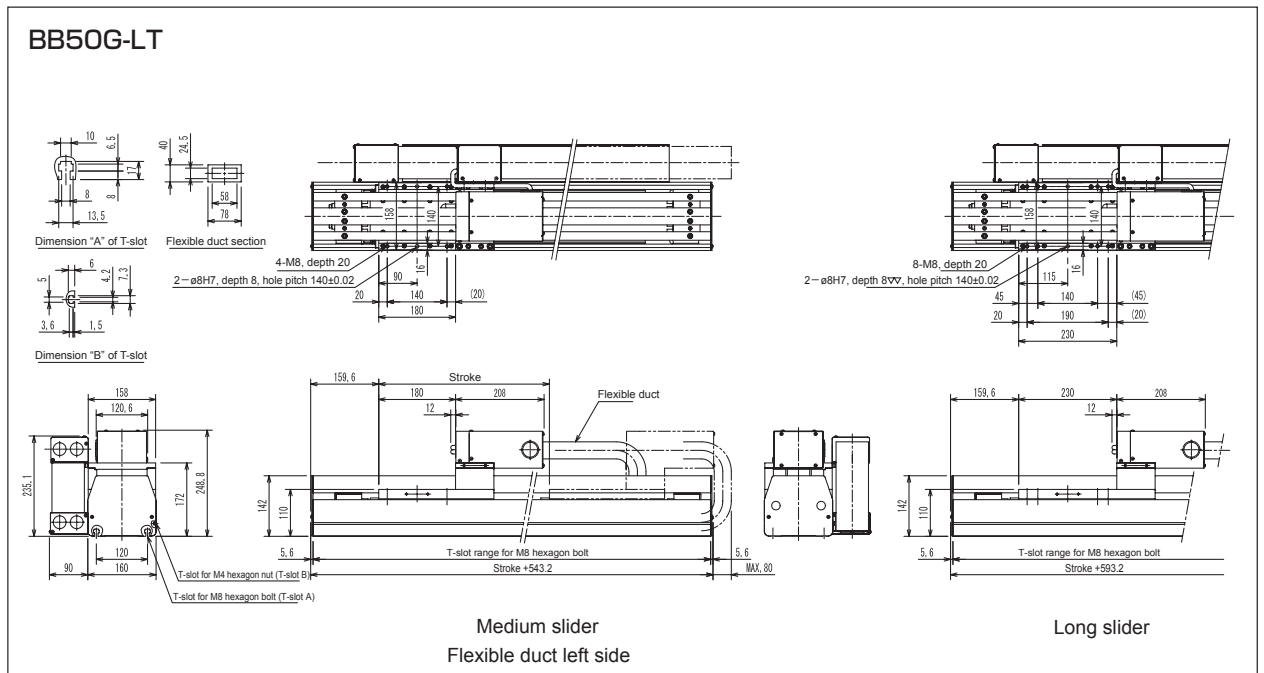
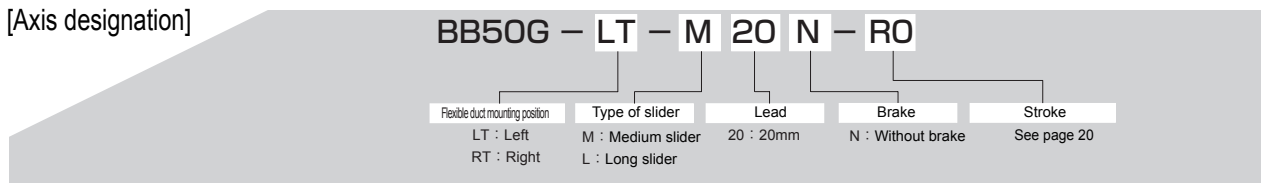
[Specifications]

Ordered product: Confirm the delivery from us at every order entry.

Motor	400 W AC servo motor (absolute)															
Drive system	Ball screw (nut rotation type), thread outer diameter 20 mm															
Stroke (mm) (in increments of 100 mm)	Medium slider	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500
	Type designation	B0	C0	D0	E0	F0	G0	H0	J0	K0	L0	M0	N0	P0	Q0	R0
	Long slider	1150	1250	1350	1450	1550	1650	1750	1850	1950	2050	2150	2250	2350	2450	
	Type designation	B5	C5	D5	E5	F5	G5	H5	J5	K5	L5	M5	N5	P5	Q5	
Maximum speed (mm/s)	Lead 20 mm	1000														
Maximum Payload (kg) Acceleration/deceleration time: 0.3 sec.	Horizontal transfer: 100															
Positioning repeatability (mm)	± 0.05															
Resolution (mm)	0.01															
Allowable static load moment (N·m)	Medium slider MR : 2080 MP : 2160 MY : 1820 Long slider MR : 2080 MP : 3150 MY : 2640															
Master controller	Select from CA20 – M <input type="checkbox"/> , CA10 – M0 <input type="checkbox"/>															

Notes: * The maximum Payload signifies a load exerted on top of the slider. Also refer to the dynamic load moment given in pages 212 to 220.
* For the 400 W type, a regenerative discharge unit (ABSU-4000) is required, irrespective of Payload.
* The acceleration/deceleration time represents the time until the axis reaches a programmed speed.

[Axis designation]



[Set designation]

BA2 – 60G – ST – M 20 N – 40 – 1 3

Type of slider	Lead	Brake	Stroke	Controller	Cable length
M : Medium slider L : Long slider	10 : 10mm 20 : 20mm 40 : 40mm	N : Without brake B : With brake	See page 20	0 : None 1 : CA20 – M10 Other: see page 20	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m

[Specifications]

Motor	400 W AC servo motor (absolute)								
Drive system	Ball screw (nut rotation type), thread outer diameter 20 mm								
Stroke (mm) (in increments of 100 mm)	Medium slider	200 ~ 700	800	900	1000	1100	1200	1300	1400,1500
	Type designation	20 ~ 70	80	90	A0	B0	C0	D0	E0,F0
	Long slider	150 ~ 650	750	850	950	1050	1150	1250	1350,1450
	Type designation	15 ~ 65	75	85	95	A5	B5	C5	D5,E5
Maximum speed (mm/s) Values in <> signify the acceleration/deceleration time in seconds when the maximum Payload is loaded.	Lead 40 mm	2400 <0.36>	2000 <0.3>	1600 <0.24>	1400 <0.21>	1200 <0.18>	1000 <0.15>	800 <0.12>	600 <0.1>
	Lead 20 mm	1200 <0.36>	1000 <0.3>	800 <0.24>	700 <0.21>	600 <0.18>	500 <0.15>	400 <0.12>	300 <0.1>
	Lead 10 mm	600 <0.36>	500 <0.3>	400 <0.24>	350 <0.21>	300 <0.18>	250 <0.15>	200 <0.12>	150 <0.1>
	Lead 40 mm	Horizontal transfer: 25		Vertical transfer: -		Horizontal transfer: 100		Vertical transfer: 25	
Maximum Payload (kg)	Lead 20 mm	Horizontal transfer: 100		Vertical transfer: 25		Horizontal transfer: 150		Vertical transfer: 50	
	Lead 10 mm	Horizontal transfer: 150		Vertical transfer: 50		Horizontal transfer: 150		Vertical transfer: 50	
	Lead 40 mm	Horizontal transfer: 25		Vertical transfer: -		Horizontal transfer: 100		Vertical transfer: 25	
Positioning repeatability (mm)	± 0.01								
Resolution (mm)	0.01								
Allowable static load moment (N·m)	Medium slider	MR : 2700	MP : 3000	MY : 2250	Long slider	MR : 2700	MP : 4750	MY : 3450	
Brake	Braking while not excited, voltage DC24 V								
Master controller	Select from CA20 – M <input type="checkbox"/> , CA10 – M0 <input type="checkbox"/> B								

- Notes:
- * When using the axis as a vertical axis, select the type with brake.
 - * The maximum Payload signifies a load exerted on top of the slider.
 - * The values in parentheses under "Maximum Payload" are applicable when a regenerative discharge unit ABSU-4000 is equipped.
 - * The acceleration/deceleration time represents the time until the axis reaches a programmed speed.
 - * The model with a 40mm lead is a manufactured-to-order product.

[Axis designation]

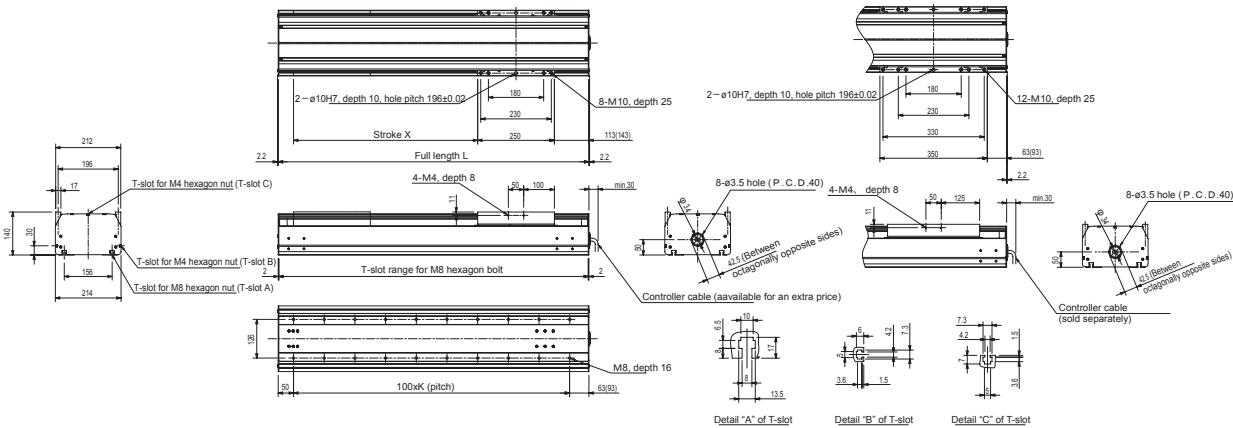
BB60G – ST – M 20 N – 40

Type of slider	Lead	Brake	Stroke
M : Medium slider L : Long slider	10 : 10mm 20 : 20mm 40 : 40mm	N : Without brake B : With brake	See page 20

BB60G-ST

Medium slider

Long slider



Medium slider

Stroke (mm)	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
Full length L (mm)	613(643)	713(743)	813(843)	913(943)	1013(1043)	1113(1143)	1213(1243)	1313(1343)	1413(1443)	1513(1543)	1613(1643)	1713(1743)	1813(1843)	1913(1943)
K	5(5)	6(6)	7(7)	8(8)	9(9)	10(10)	11(11)	12(12)	13(13)	14(14)	15(15)	16(16)	17(17)	18(18)
Weight (kg)	24.3(25.5)	27.1(28.2)	29.8(31.0)	32.6(33.7)	35.3(36.5)	38.1(39.2)	40.8(42.0)	43.6(44.7)	46.3(47.5)	49.1(50.2)	51.8(53.0)	54.6(55.7)	57.3(58.5)	60.1(61.2)

* Values in parentheses are for the axis with brake.

Long slider

Stroke (mm)	150	250	350	450	550	650	750	850	950	1050	1150	1250	1350	1450
Full length L (mm)	613(643)	713(743)	813(843)	913(943)	1013(1043)	1113(1143)	1213(1243)	1313(1343)	1413(1443)	1513(1543)	1613(1643)	1713(1743)	1813(1843)	1913(1943)
K	5(5)	6(6)	7(7)	8(8)	9(9)	10(10)	11(11)	12(12)	13(13)	14(14)	15(15)	16(16)	17(17)	18(18)
Weight (kg)	25.8(27.0)	28.6(29.7)	31.3(32.5)	34.1(35.2)	36.8(38.0)	39.6(40.7)	42.3(43.5)	45.1(46.2)	47.8(49.0)	50.6(51.7)	53.3(54.5)	56.1(57.2)	58.8(60.0)	61.6(62.7)

* Values in parentheses are for the axis with brake.

[Set designation]

BA2 – 60J – ST – M 20 N – 40 – 6 3

Type of slider	Lead	Brake	Stroke	Controller	Cable length
M : Medium slider L : Long slider	10 : 10mm 20 : 20mm 40 : 40mm	N : Without brake B : With brake	See page 20	0 : None 1 : CA20 – M10 Other: See page 20	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m

[Specifications]

Motor	750 W AC servo motor (absolute)						
Drive system	Ground ball screw (C7), thread outer diameter 25 mm						
Stroke (mm) (in increments of 100 mm)	Medium slider	200 ~ 1000	1100	1200	1300	1400,1500	1600,1700
	Type designation	20 ~ A0	B0	C0	D0	E0,F0	G0,H0
	Long slider	150 ~ 950	1050	1150	1250	1350,1450	1550,1650
	Type designation	15 ~ 95	A5	B5	C5	D5,E5	F5,G5
Maximum speed (mm/s) Values in <> signify the acceleration/deceleration time in seconds when the maximum Payload is loaded.	Lead 40 mm	1800 <0.27>	1400 <0.21>	1200 <0.18>	1000 <0.15>	800 <0.12>	600 <0.1>
	Lead 20 mm	900 <0.27>	700 <0.21>	600 <0.18>	500 <0.15>	400 <0.12>	300 <0.1>
	Lead 10 mm	450 <0.27>	350 <0.21>	300 <0.18>	250 <0.15>	200 <0.12>	150 <0.1>
Maximum Payload (kg)	Lead 40 mm	Horizontal transfer: 50		Vertical transfer: -			
	Lead 20 mm	Horizontal transfer: 200		Vertical transfer: 50			
	Lead 10 mm	Horizontal transfer: 250		Vertical transfer: 100			
Positioning repeatability (mm)	± 0.01						
Resolution (mm)	0.01						
Allowable static load moment (N·m)	Medium slider MR : 3500 MP : 4000 MY : 3000 Long slider MR : 3500 MP : 6200 MY : 4750						
Brake	Braking while not excited, voltage DC24 V						
Master controller	Select from CA20-M0 □-□V						

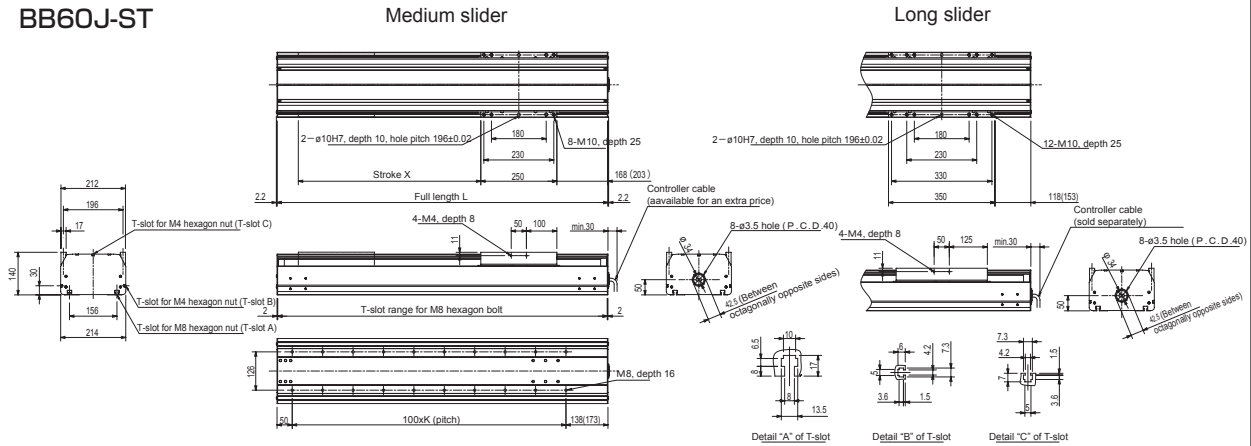
- Notes: * When using the axis as a vertical axis, select the type with brake.
 * The maximum Payload signifies a load exerted on top of the slider.
 * The regenerative discharge unit RGH200A 30Ω (horizontal) or RGH400A 30Ω (vertical) is required regardless of the payload.
 * The acceleration/deceleration time represents the time until the axis reaches a programmed speed.
 * The model with a 40mm lead is a manufactured-to-order product.

[Axis designation]

BB60J – ST – M 20 N – 40

Type of slider	Lead	Brake	Stroke
M : Medium slider L : Long slider	10 : 10mm 20 : 20mm 40 : 40mm	N : Without brake B : With brake	See page 20

BB60J-ST



Medium slider

Stroke (mm)	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700
Full length L (mm)	688(723)	788(823)	888(923)	988(1023)	1088(1123)	1188(1223)	1288(1323)	1388(1423)	1488(1523)	1588(1623)	1688(1723)	1788(1823)	1888(1923)	1988(2023)	2088(2123)	2188(2223)
K	5(5)	6(6)	7(7)	8(8)	9(9)	10(10)	11(11)	12(12)	13(13)	14(14)	15(15)	16(16)	17(17)	18(18)	19(19)	20(20)
Weight (kg)	37.2(38.8)	39.9(41.6)	42.7(44.3)	45.4(47.1)	48.2(49.8)	50.9(52.6)	53.7(55.3)	56.4(58.1)	59.2(60.8)	61.9(63.6)	64.7(66.3)	67.4(69.1)	70.2(71.8)	72.9(74.6)	75.7(77.3)	78.4(80.1)

* Values in parentheses are for the axis with brake.

Long slider

Stroke (mm)	150	250	350	450	550	650	750	850	950	1050	1150	1250	1350	1450	1550	1650
Full length L (mm)	688(723)	788(823)	888(923)	988(1023)	1088(1123)	1188(1223)	1288(1323)	1388(1423)	1488(1523)	1588(1623)	1688(1723)	1788(1823)	1888(1923)	1988(2023)	2088(2123)	2188(2223)
K	5(5)	6(6)	7(7)	8(8)	9(9)	10(10)	11(11)	12(12)	13(13)	14(14)	15(15)	16(16)	17(17)	18(18)	19(19)	20(20)
Weight (kg)	38.7(40.3)	41.4(43.1)	44.2(45.8)	46.9(48.6)	49.7(51.3)	52.4(54.1)	55.2(56.8)	57.9(59.6)	60.7(62.3)	63.4(65.1)	66.2(67.8)	68.9(70.6)	71.7(73.3)	74.4(76.1)	77.2(78.8)	79.9(81.6)

* Values in parentheses are for the axis with brake.

[Set designation]

BA2 – 60J – LT – M 20 N – B0 – 63

Flexible duct mounting position LT : Left RT : Right	Type of slider M : Medium slider L : Long slider	Lead 10 : 10mm 20 : 20mm 40 : 40mm	Brake N : Without brake B : With brake	Stroke See page 20	Controller 0 : None 1 : CA20 – M10 Other: See page 20	Cable length 3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m
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[Specifications]

Motor	750W		
Drive system	Ball screw (nut rotation type)		
Ball screw lead (mm)	20		
Maximum speed (mm/s)	1000		
Maximum Payload (kg) Acceleration/deceleration time: 0.3 sec. or over	200		
Slider type	Medium slider	Long slider	
Stroke (mm)(in crements of 100 mm)	1100 ~ 4400	1000 ~ 4300	
Allowable static load moment (N·m)	MR : 3500 MP : 4000 MY : 3000	MR : 3500 MP : 6200 MY : 4750	
Positioning repeatability (mm)	± 0.05		
Resolution (mm)	0.01		
Master controller	Select from CA20-M0 □-□V		

- * The acceleration/deceleration time represents the time until the axis reaches a programmed speed.
- * The maximum Payload signifies a load exerted on top of the slider.
- * The regenerative discharge unit RGH200A 30Ω is required regardless of the payload.

[Axis designation]

BB60J – LT – M 20 N – B0

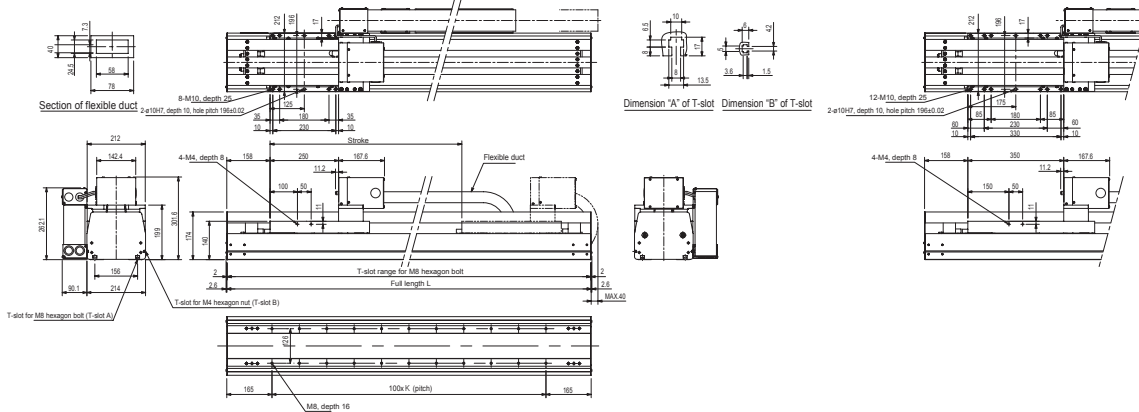
Type of slider M : Medium slider L : Long slider	Lead 10 : 10mm 20 : 20mm 40 : 40mm	Brake N : Without brake B : With brake	Stroke See page 20
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[Dimensions]

BB60J-LT

Medium slider
Flexible duct left side

Long slider
Flexible duct left side



Medium slider

Type	BO	CO	DO	EO	FO	GO	HO	JO	KO	LO	MO	NO	PO	QO	RO	SO	TO
BB60J-LT-20N*	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500	2600	2700
Stroke (mm)	1730	1830	1930	2030	2130	2230	2330	2430	2530	2630	2730	2830	2930	3030	3130	3230	3330
Full length L (mm)	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
K	80.1	83.4	86.6	89.8	93.1	96.3	99.5	102.7	106.0	109.2	112.4	115.7	118.9	122.1	125.4	128.6	131.8
Weight (kg)																	
BB60J-LT-40N*	UD	VO	W00	W10	W20	W30	W40	W50	W60	W70	W80	W90	X00	X10	X20	X30	X40
Stroke (mm)	2800	2900	3000	3100	3200	3300	3400	3500	3600	3700	3800	3900	4000	4100	4200	4300	4400
Full length L (mm)	3430	3530	3630	3730	3830	3930	4030	4130	4230	4330	4430	4530	4630	4730	4830	4930	5030
K	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
Weight (kg)	136.0	139.3	141.5	144.7	148.0	151.2	154.4	157.6	160.9	164.1	167.3	170.6	173.8	177.0	180.3	183.5	186.7

Long slider

Type	AO	BO	CO	DO	EO	FO	GO	HO	JO	KO	LO	MO	NO	PO	QO	RO	SO
BB60J-LT-20N*	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500	2600
Stroke (mm)	1730	1830	1930	2030	2130	2230	2330	2430	2530	2630	2730	2830	2930	3030	3130	3230	3330
Full length L (mm)	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
K	81.1	84.4	87.6	90.8	94.1	97.3	100.5	103.7	107.0	110.2	113.4	116.7	119.9	123.1	126.4	129.6	132.8
Weight (kg)																	
BB60J-LT-40N*	TO	UD	VO	W00	W10	W20	W30	W40	W50	W60	W70	W80	W90	X00	X10	X20	X30
Stroke (mm)	2700	2800	2900	3000	3100	3200	3300	3400	3500	3600	3700	3800	3900	4000	4100	4200	4300
Full length L (mm)	3430	3530	3630	3730	3830	3930	4030	4130	4230	4330	4430	4530	4630	4730	4830	4930	5030
K	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
Weight (kg)	136.0	139.3	142.5	145.7	149.0	152.2	155.4	158.6	161.9	165.1	168.3	171.6	174.8	178.0	181.3	184.5	187.7

[Set designation]

BA2 – 10E – BT – M 21 N – 40 – 1 3

Motor set direction BT : Facing up BR : Facing right BL : Facing left BU : Facing down	Type of slider M : Short slider L : Medium slider	Lead 21 : 21mm	Brake N : Without brake	Stroke See page 20	Controller 0 : None 1 : CA20 – M10 Other: See page 20	Cable length 3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m
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[Specifications]

Motor	100 W AC servo motor (absolute)										
Drive system	Timing belt										
Ball screw lead (mm)	21										
Stroke (mm) (in increments of 100 mm)	Short slider	150 ~ 950	1050	1150	1250	1350	1450	1550	1650	1750	1850
	Type designation	15 ~ 95	A 5	B 5	C 5	D 5	E 5	F 5	G 5	H 5	J 5
	Medium slider	100 ~ 900	1000	1100	1200	1300	1400	1500	1600	1700	1800
	Type designation	10 ~ 90	A 0	B 0	C 0	D 0	E 0	F 0	G 0	H 0	J 0
Maximum speed (mm/s)	1000										
Maximum Payload (kg) Acceleration/deceleration time: 0.3 sec or over	Horizontal transfer: 15										
Positioning repeatability (mm)	± 0.05										
Resolution (mm)	0.01										
Allowable static load moment (N·m)	Short slider MR : 49 MP : 14 MY : 13 Medium slider MR : 59 MP : 59 MY : 54										
Master controller	Select from CA20-M□□, CA10-M0□B										

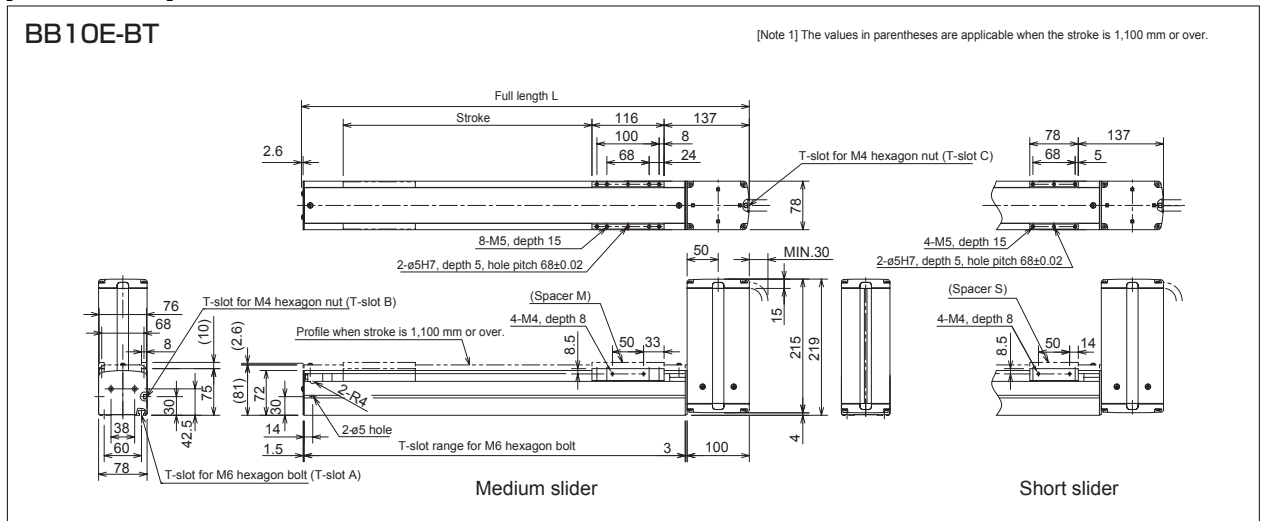
Notes: * The maximum Payload signifies a load exerted on top of the slider. Also refer to the dynamic load moment given in pages 212 to 220.
* The acceleration/deceleration time represents the time until the axis reaches a programmed speed.

[Axis designation]

BB10E – BT – M 21 N – 40

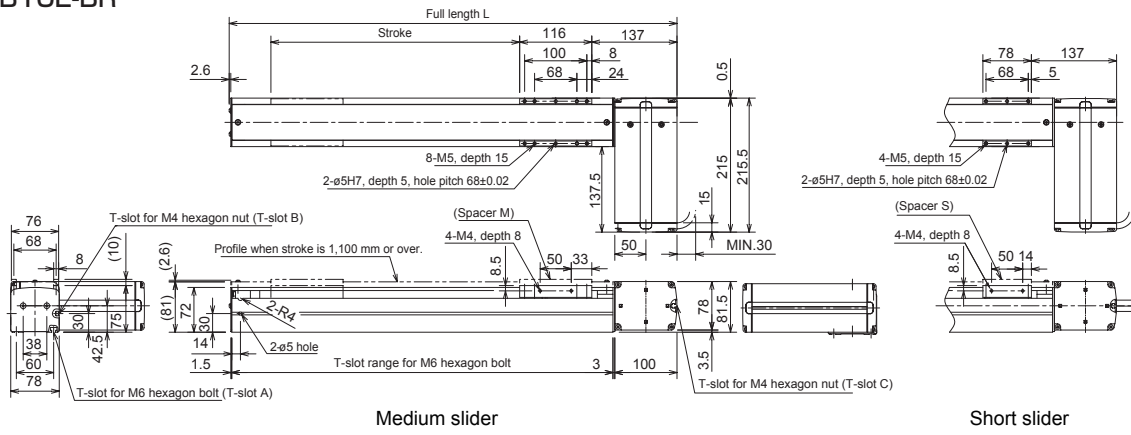
Motor set direction BT : Facing up BR : Facing right BL : Facing left BU : Facing down	Type of slider M : Short slider L : Medium slider	Lead 21 : 21mm	Brake N : Without brake	Stroke See page 20
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[Dimensions]



BB10E-BR

[Note 1] The values in parentheses are applicable when the stroke is 1,100 mm or over.

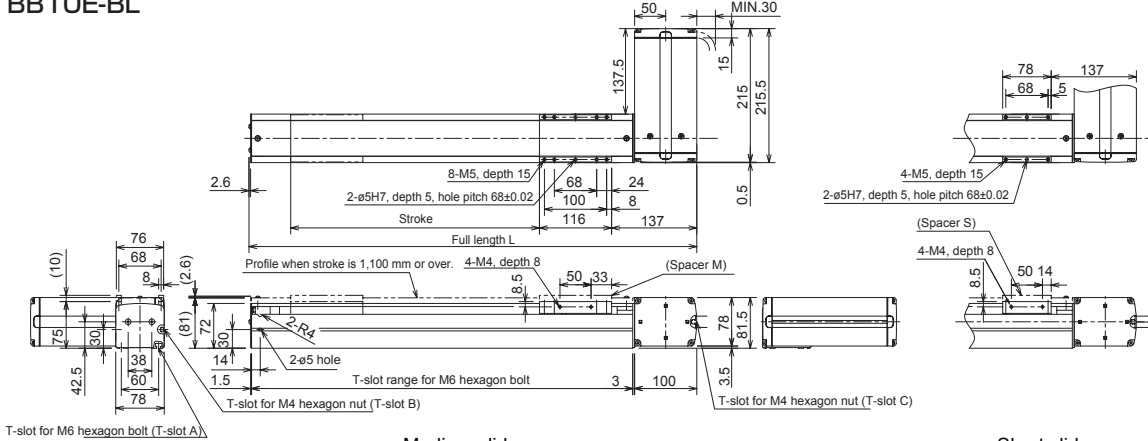


Medium slider

Short slider

BB10E-BL

[Note 1] The values in parentheses are applicable when the stroke is 1,100 mm or over.

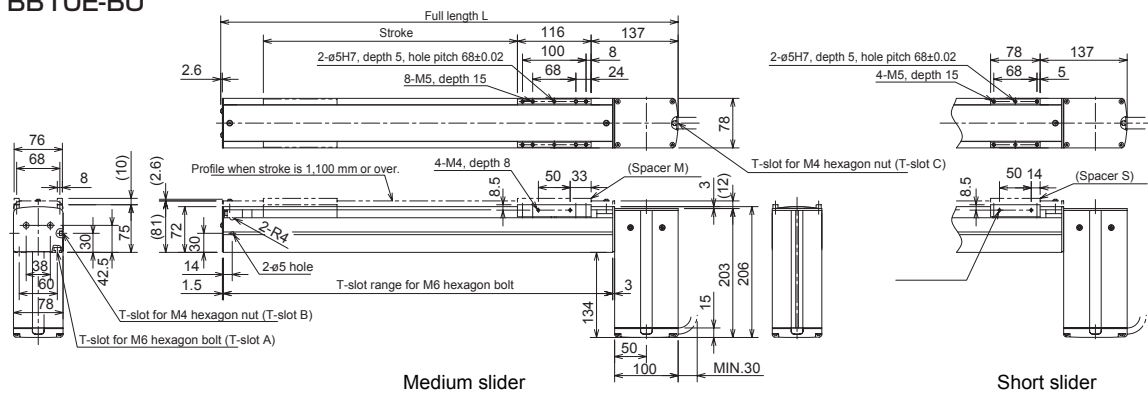


Medium slider

Short slider

BB10E-BU

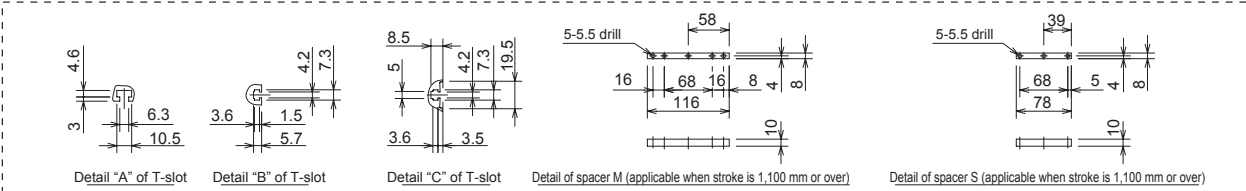
[Note 1] The values in parentheses are applicable when the stroke is 1,100 mm or over.



Medium slider

Short slider

Common to BB10E-BT, BR, BL and BU.



Medium slider Common to BB10E-BT, BR, BL and BU.

Stroke (mm)	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800
Full length L (mm)	420.1	520.1	620.1	720.1	820.1	920.1	1020.1	1120.1	1220.1	1320.1	1420.1	1520.1	1620.1	1720.1	1820.1	1920.1	2020.1	2120.1
Weight (kg)	5.0	5.6	6.2	6.8	7.4	8.0	8.6	9.2	9.8	10.4	11.0	11.6	12.2	12.8	13.4	14.0	14.6	15.2

Short slider Common to BB10E-BT, BR, BL and BU.

Stroke (mm)	150	250	350	450	550	650	750	850	950	1050	1150	1250	1350	1450	1550	1650	1750	1850
Full length L (mm)	420.1	520.1	620.1	720.1	820.1	920.1	1020.1	1120.1	1220.1	1320.1	1420.1	1520.1	1620.1	1720.1	1820.1	1920.1	2020.1	2120.1
Weight (kg)	4.7	5.3	5.9	6.5	7.1	7.7	8.3	8.9	9.5	10.1	10.7	11.3	11.9	12.5	13.1	13.7	14.3	14.9

[Set designation]

BA2 – 10F – BT – M 21 N – 40 – 1 3

Motor set direction BT : Facing up BR : Facing right BL : Facing left BU : Facing down	Type of slider M : Short slider L : Medium slider	Lead 21 : 21mm 42 : 42mm	Brake N : Without brake	Stroke See page 20	Controller 0 : None 1 : CA20 – M10 Other: See page 20	Cable length 3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m
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[Specifications]

Motor	200 W AC servo motor (absolute)										
Drive system	Timing belt										
Ball screw lead (mm)	21, 42										
Stroke (mm) (in increments of 100 mm)	Short slider	150 ~ 950	1050	1150	1250	1350	1450	1550	1650	1750	1850
	Type designation	15 ~ 95	A 5	B 5	C 5	D 5	E 5	F 5	G 5	H 5	J 5
	Medium slider	100 ~ 900	1000	1100	1200	1300	1400	1500	1600	1700	1800
	Type designation	10 ~ 90	A 0	B 0	C 0	D 0	E 0	F 0	G 0	H 0	J 0
Maximum speed (mm/s)	Lead 21	1000									
	Lead 42	2000									
Maximum Payload (kg)	Lead 21	Horizontal transfer: 20, acceleration/deceleration time: 0.3 sec. or over									
	Lead 42	Horizontal transfer: 10, acceleration/deceleration time: 0.5 sec. or over									
Positioning repeatability (mm)	± 0.05										
Resolution (mm)	0.01										
Allowable static load moment (N·m)	Short slider MR : 49 MP : 14 MY : 13 Medium slider MR : 59 MP : 59 MY : 54										
Master controller	Select from CA20-M□□, CA10-M0□B										

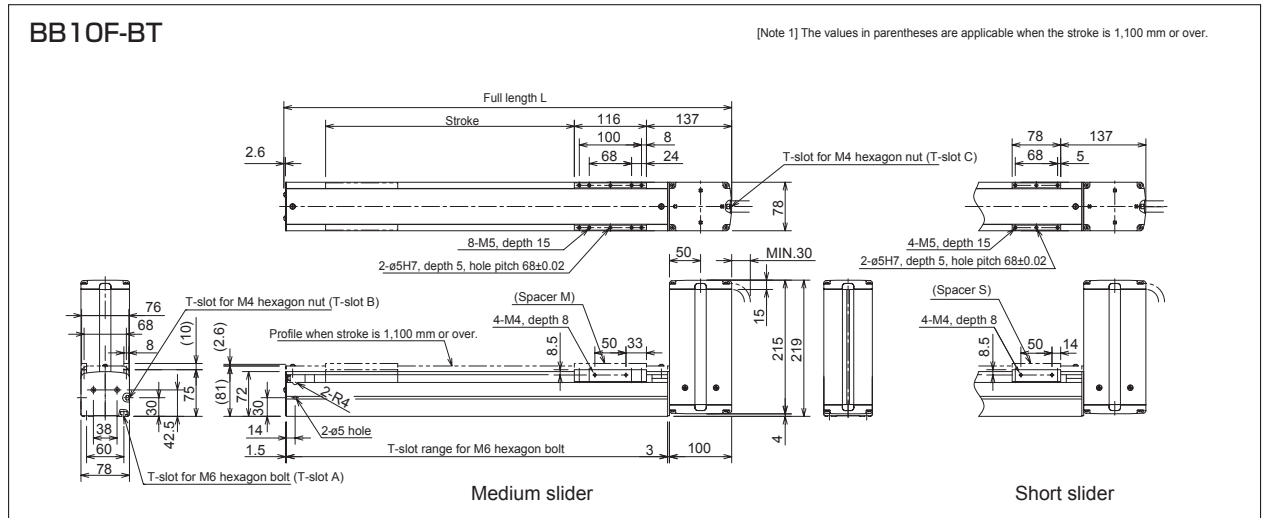
Notes: * The maximum Payload signifies a load exerted on top of the slider. Also refer to the dynamic load moment given in pages 212 to 220.
* The acceleration/deceleration time represents the time until the axis reaches a programmed speed.

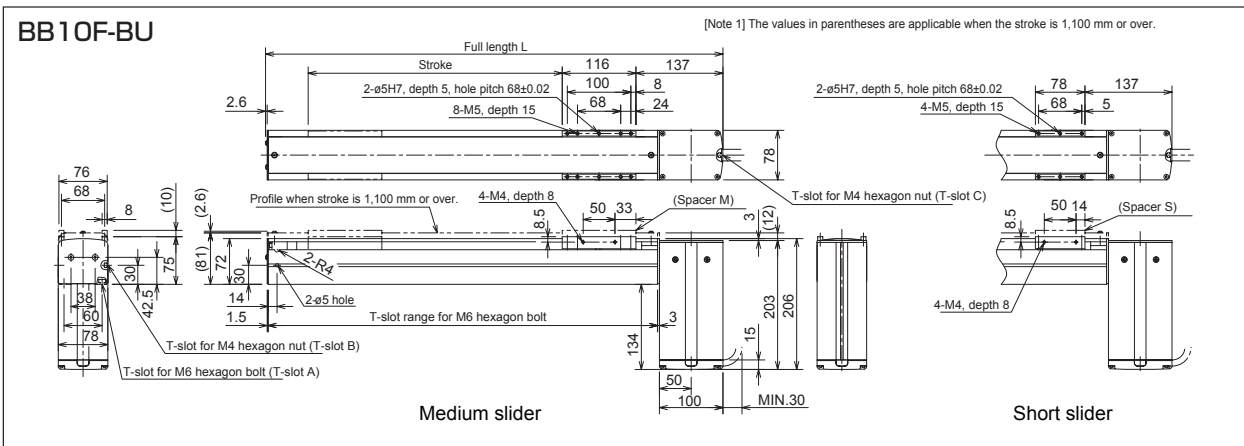
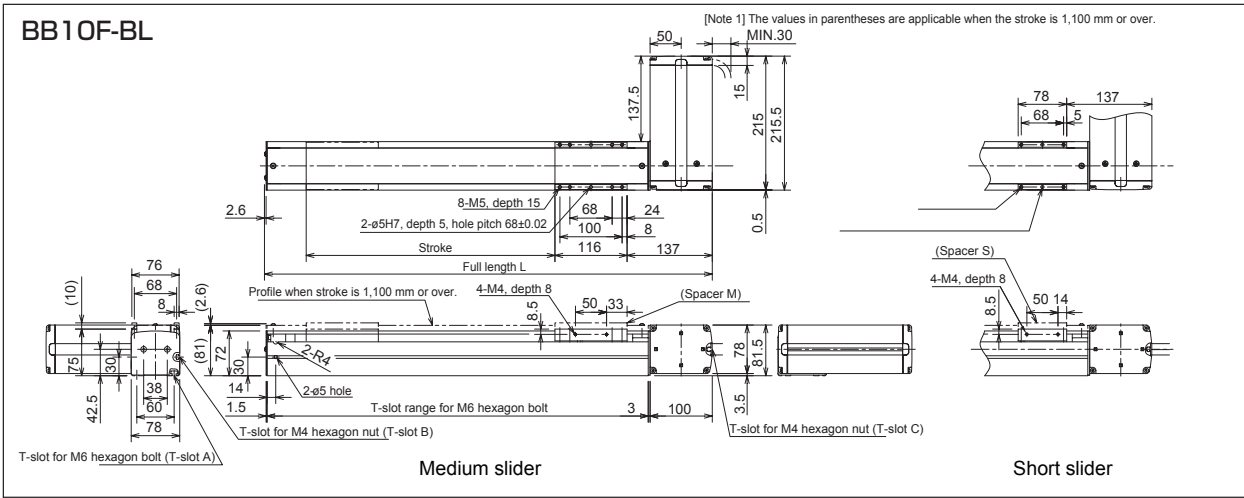
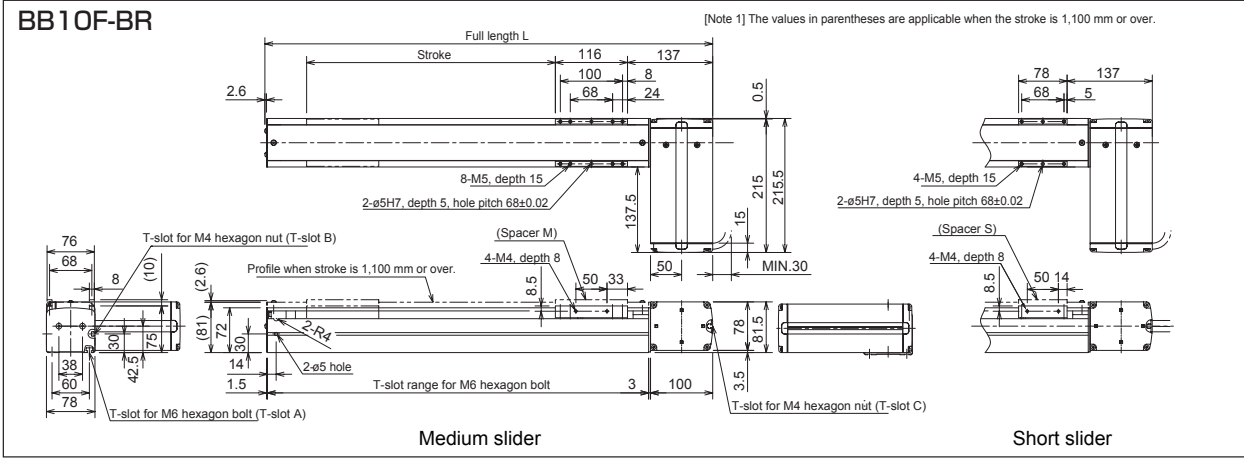
[Axis designation]

BB10F – BT – M 21 N – 40

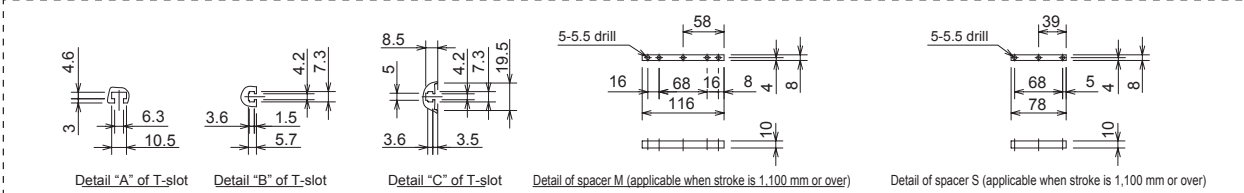
Motor set direction BT : Facing up BR : Facing right BL : Facing left BU : Facing down	Type of slider M : Short slider L : Medium slider	Lead 21 : 21mm 42 : 42mm	Brake N : Without brake	Stroke See page 20
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[Dimensions]





Common to BB10F-BT, BR, BL and BU.



Medium slider Common to BB10F-BT, BR, BL and BU.

Stroke (mm)	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800
Full length L (mm)	420.1	520.1	620.1	720.1	820.1	920.1	1020.1	1120.1	1220.1	1320.1	1420.1	1520.1	1620.1	1720.1	1820.1	1920.1	2020.1	2120.1
Weight (kg)	5.8	6.4	7.0	7.6	8.2	8.8	9.4	10.0	10.6	11.2	11.8	12.4	13.0	13.6	14.2	14.8	15.4	16.0

Short slider Common to BB10F-BT, BR, BL and BU.

Stroke (mm)	150	250	350	450	550	650	750	850	950	1050	1150	1250	1350	1450	1550	1650	1750	1850
Full length L (mm)	420.1	520.1	620.1	720.1	820.1	920.1	1020.1	1120.1	1220.1	1320.1	1420.1	1520.1	1620.1	1720.1	1820.1	1920.1	2020.1	2120.1
Weight (kg)	5.5	6.1	6.7	7.3	7.9	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

[Set designation]

BA2 – 30E – BT – M 21 N – 40 – 1 3

Motor set direction BT : Facing up BR : Facing right BL : Facing left BU : Facing down	Type of slider M : Medium slider L : Long slider	Lead 21 : 21mm	Brake N : Without brake	Stroke See page 20	Controller 0 : None 1 : CA20 – M10 Other: See page 20	Cable length 3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m
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[Specifications]

Motor	100 W AC servo motor (absolute)																	
Drive system	Timing belt																	
Ball screw lead (mm)	21																	
Stroke (mm) (in increments of 100 mm)	Medium slider	100 ~ 900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500
	Type designation	10 ~ 90	A 0	B 0	C 0	D 0	E 0	F 0	G 0	H 0	J 0	K 0	L 0	M 0	N 0	P 0	Q 0	R 0
	Long slider	150 ~ 950	1050	1150	1250	1350	1450	1550	1650	1750	1850	1950	2050	2150	2250	2350	2450	
	Type designation	15 ~ 95	A 5	B 5	C 5	D 5	E 5	F 5	G 5	H 5	J 5	K 5	L 5	M 5	N 5	P 5	Q 5	
Maximum speed (mm/s)	1000																	
Maximum Payload (kg) Acceleration/deceleration time: 0.3 sec or over	Horizontal transfer: 15																	
Positioning repeatability (mm)	± 0.05																	
Resolution (mm)	0.01																	
Allowable static load moment (N·m)	Medium slider MR : 510 MP : 430 MY : 370 Long slider MR : 510 MP : 750 MY : 650																	
Master controller	Select from CA20-M□□, CA10-M□□B																	

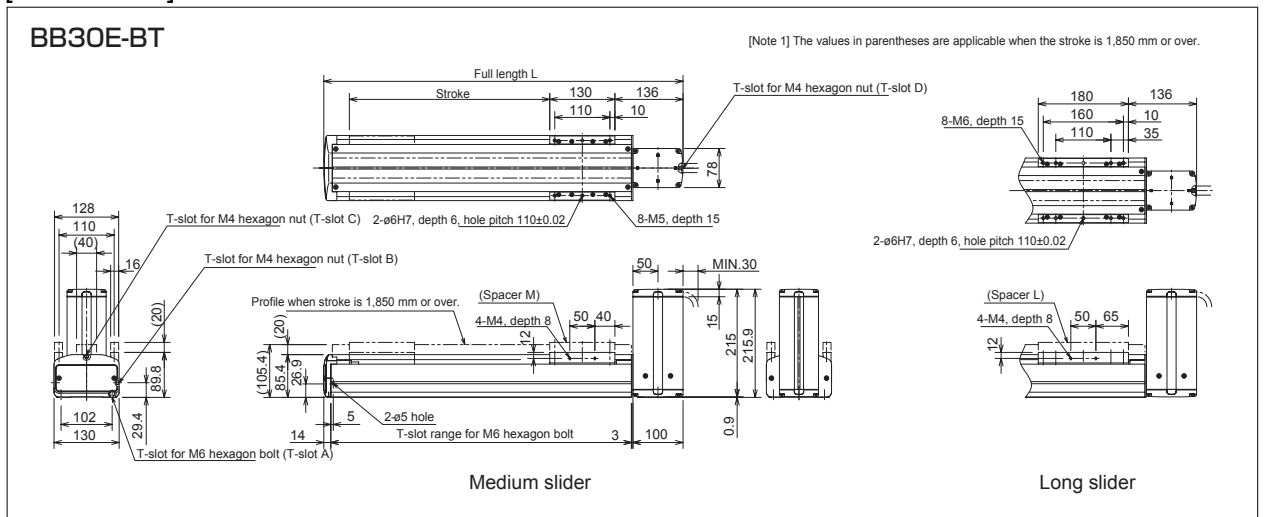
Notes: * The maximum Payload signifies a load exerted on top of the slider. Also refer to the dynamic load moment given in pages 212 to 220.
* The acceleration/deceleration time represents the time until the axis reaches a programmed speed.

[Axis designation]

BB30E – BT – M 21 N – 40

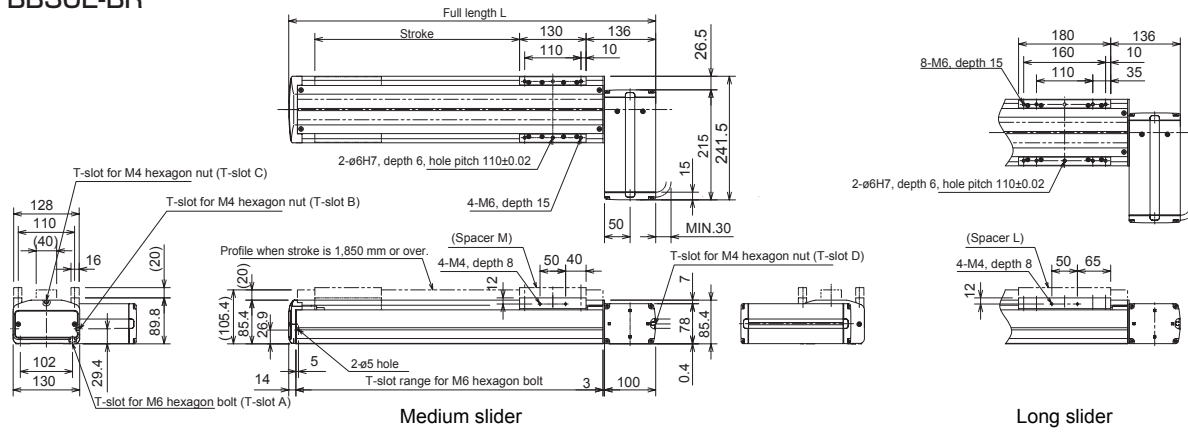
Motor set direction BT : Facing up BR : Facing right BL : Facing left BU : Facing down	Type of slider M : Medium slider L : Long slider	Lead 21 : 21mm	Brake N : Without brake	Stroke See page 20
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[Dimensions]



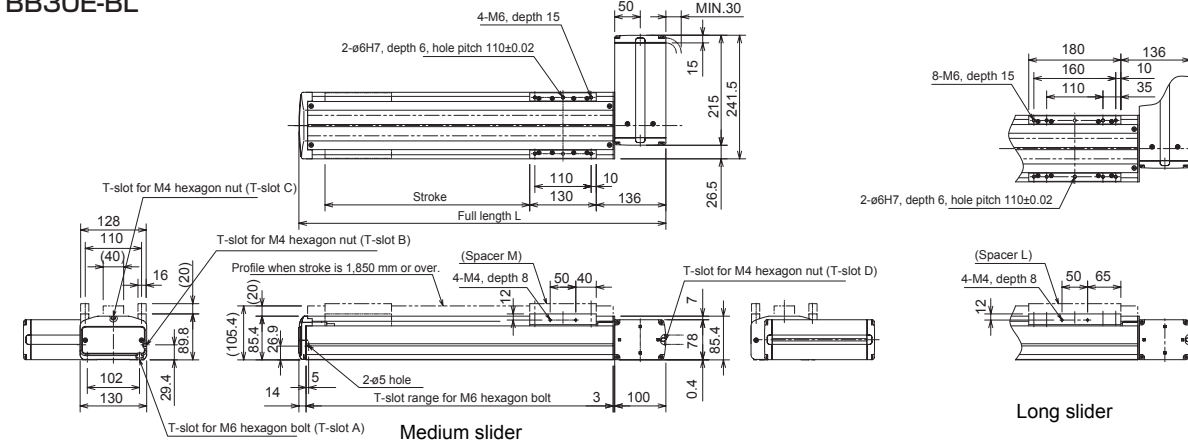
BB30E-BR

[Note 1] The values in parentheses are applicable when the stroke is 1,850 mm or over.



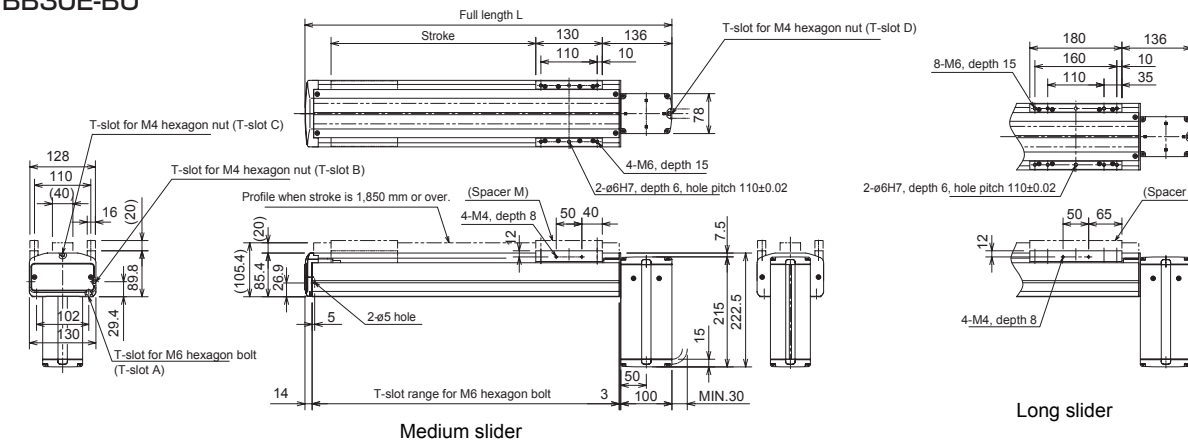
BB30E-BL

[Note 1] The values in parentheses are applicable when the stroke is 1,850 mm or over.

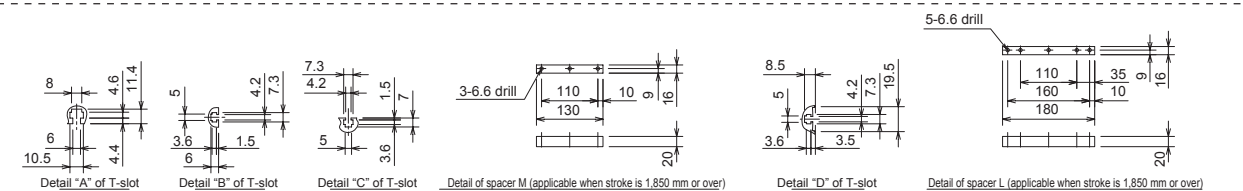


BB30E-BU

[Note 1] The values in parentheses are applicable when the stroke is 1,850 mm or over.



Common to BB30E-BT, BR, BL and BU.



Medium slider Common to BB30E-BT, BR, BL and BU.

Stroke (mm)	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500
Full length L (mm)	417	517	617	717	817	917	1017	1117	1217	1317	1417	1517	1617	1717	1817	1917	2017	2117	2217	2317	2417	2517	2617	2717	2817
Weight (kg)	7.9	9.0	10.1	11.2	12.3	13.4	14.5	15.6	16.7	17.8	18.9	20.0	21.1	22.2	23.3	24.4	25.5	26.6	27.7	28.8	29.9	31.0	32.1	33.2	34.3

Long slider Common to BB30E-BT, BR, BL and BU.

Stroke (mm)	150	250	350	450	550	650	750	850	950	1050	1150	1250	1350	1450	1550	1650	1750	1850	1950	2050	2150	2250	2350	2450
Full length L (mm)	517	617	717	817	917	1017	1117	1217	1317	1417	1517	1617	1717	1817	1917	2017	2117	2217	2317	2417	2517	2617	2717	2817
Weight (kg)	9.3	10.4	11.5	12.6	13.7	14.8	15.9	17.0	18.1	19.2	20.3	21.4	22.5	23.6	24.7	25.8	26.9	28.0	29.1	30.2	31.3	32.4	33.5	34.6

[Set designation]

Timing belt driven axis

BA2 - 30F - BT - M 21 N - 40 - 1 3

Motor set direction	Type of slider	Lead	Brake	Stroke	Controller	Cable length
BT : Facing up BR : Facing right BL : Facing left BU : Facing down	M : Medium slider L : Long slider	21 : 21mm 42 : 42mm	N : Without brake	See page 20	0 : None 1 : CA20 - M10 Other: See page 20	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m

[Specifications]

Motor	200 W AC servo motor (absolute)																	
Drive system	Timing belt																	
Ball screw lead (mm)	21, 42																	
Stroke (mm) (in increments of 100 mm)	Medium slider	100 ~ 900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500
	Type designation	10 ~ 90	A 0	B 0	C 0	D 0	E 0	F 0	G 0	H 0	J 0	K 0	L 0	M 0	N 0	P 0	Q 0	R 0
	Long slider	150 ~ 950	1050	1150	1250	1350	1450	1550	1650	1750	1850	1950	2050	2150	2250	2350	2450	
	Type designation	15 ~ 95	A 5	B 5	C 5	D 5	E 5	F 5	G 5	H 5	J 5	K 5	L 5	M 5	N 5	P 5	Q 5	
Maximum speed (mm/s)	Lead 21	1000																
	Lead 42	2000																
Maximum Payload (kg)	Lead 21	Horizontal transfer: 40, acceleration/deceleration time: 0.3 sec. or over																
	Lead 42	Horizontal transfer: 20, acceleration/deceleration time: 0.5 sec. or over																
Positioning repeatability (mm)	± 0.05																	
Resolution (mm)	0.01																	
Allowable static load moment (N·m)	Medium slider MR : 510 MP : 430 MY : 370 Long slider MR : 510 MP : 750 MY : 650																	
Master controller	Select from CA20-M□□, CA10-M□□B																	

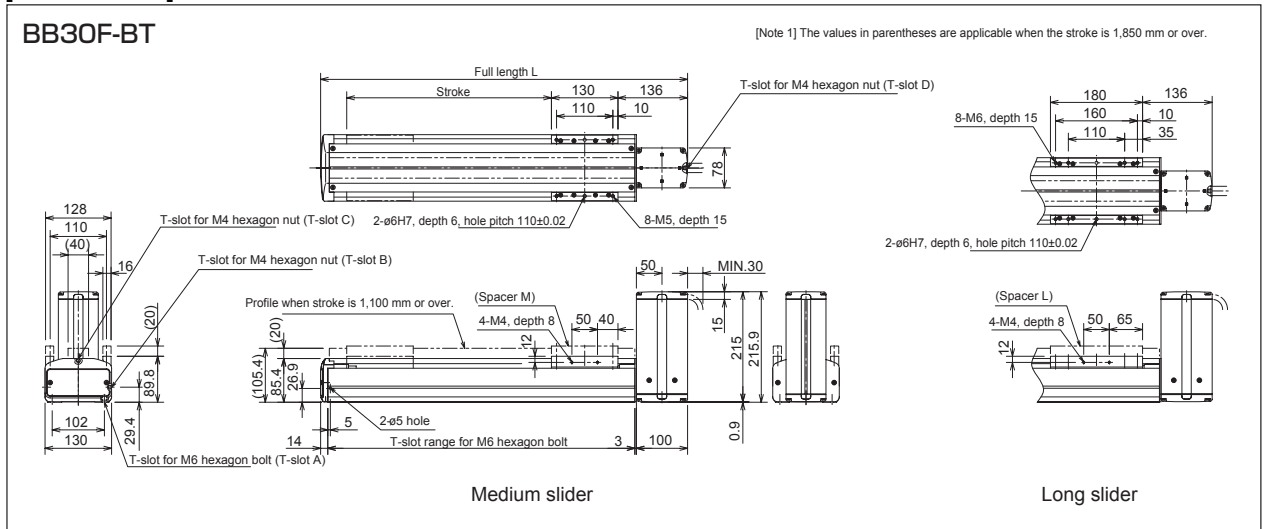
Notes: * The maximum Payload signifies a load exerted on top of the slider. Also refer to the dynamic load moment given in pages 212 to 220.
* The acceleration/deceleration time represents the time until the axis reaches a programmed speed.

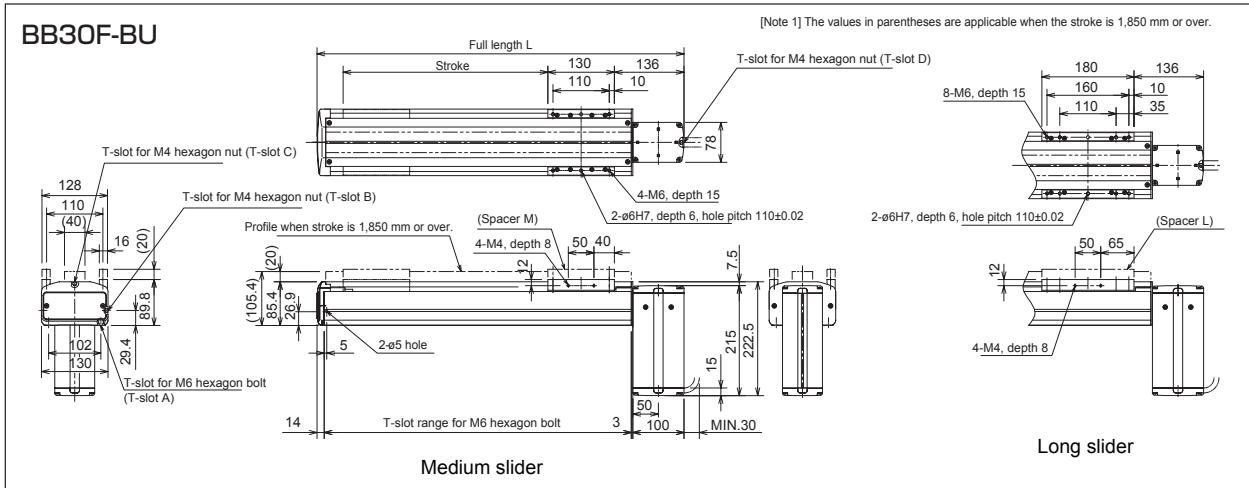
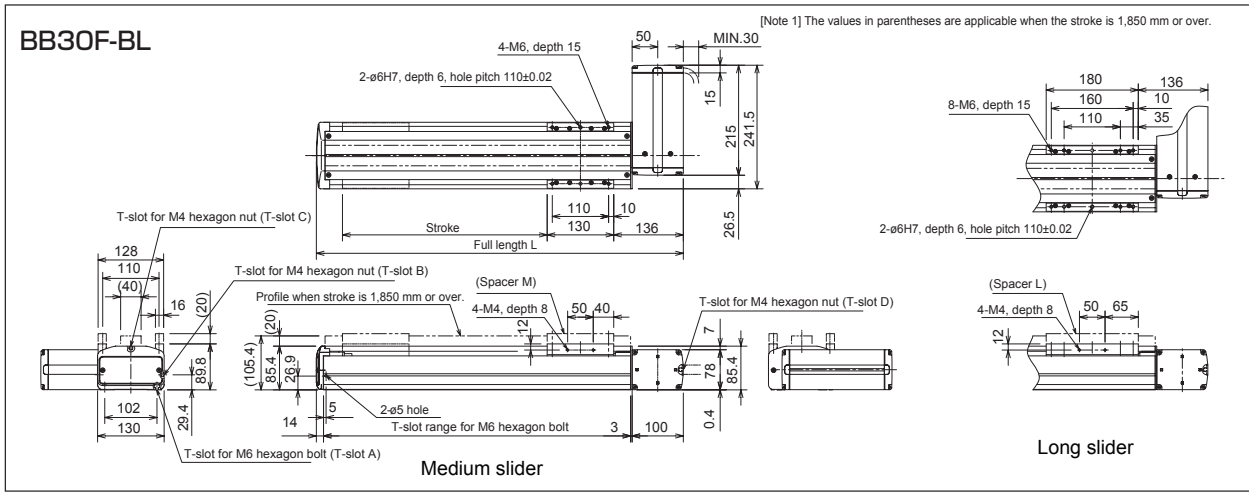
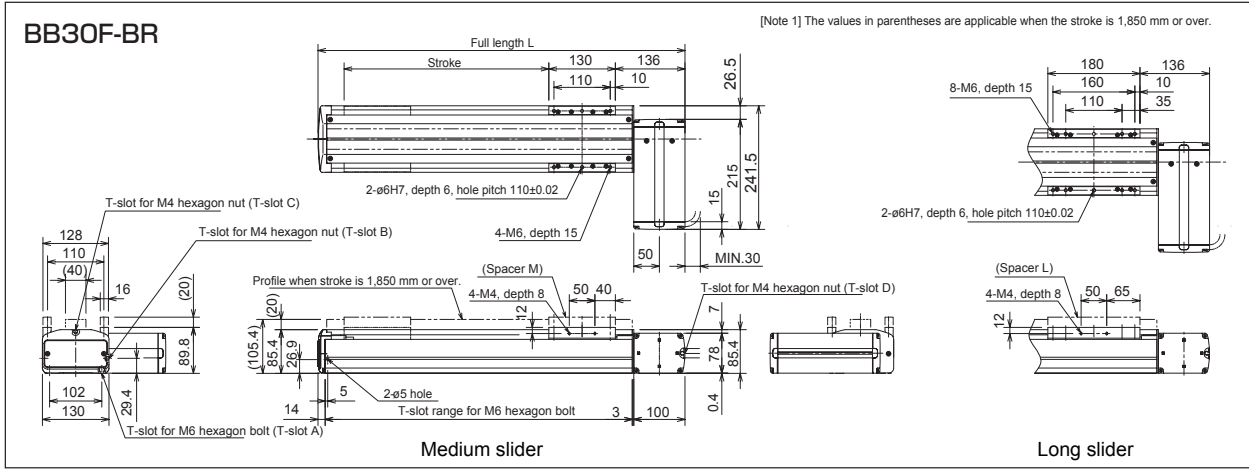
[Axis designation]

BB30F - BT - M 21 N - 40

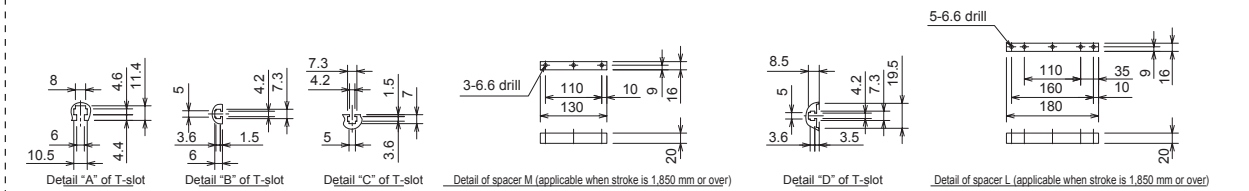
Motor set direction	Type of slider	Lead	Brake	Stroke
BT : Facing up BR : Facing right BL : Facing left BU : Facing down	M : Short slider L : Medium slider	21 : 21mm 42 : 42mm	N : Without brake	See page 20

[Dimensions]





Common to BB30F-BT, BR, BL and BU.



Medium slider Common to BB30F-BT, BR, BL and BU.

Stroke (mm)	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500
Full length L (mm)	417	517	617	717	817	917	1017	1117	1217	1317	1417	1517	1617	1717	1817	1917	2017	2117	2217	2317	2417	2517	2617	2717	2817
Weight (kg)	8.7	9.8	10.9	12.0	13.1	14.2	15.3	16.4	17.5	18.6	19.7	20.8	21.9	23.0	24.1	25.2	26.3	27.4	28.5	29.6	30.7	31.8	32.9	34.0	35.1

Long slider Common to BB30F-BT, BR, BL and BU.

Stroke (mm)	150	250	350	450	550	650	750	850	950	1050	1150	1250	1350	1450	1550	1650	1750	1850	1950	2050	2150	2250	2350	2450
Full length L (mm)	517	617	717	817	917	1017	1117	1217	1317	1417	1517	1617	1717	1817	1917	2017	2117	2217	2317	2417	2517	2617	2717	2817
Weight (kg)	10.1	11.2	12.3	13.4	14.5	15.6	16.7	17.8	18.9	20.0	21.1	22.2	23.3	24.4	25.5	26.6	27.7	28.8	29.9	31.0	32.1	33.2	34.3	35.4

[Set designation]

BA2 – 50F – BT – M 21 N – 40 – 1 3

Motor set direction BT : Facing up BR : Facing right BL : Facing left BU : Facing down	Type of slider M : Medium slider L : Long slider	Lead 21 : 21mm	Brake N : Without brake	Stroke See page 20	Controller 0 : None 1 : CA20 – M10 Other: See page 20	Cable length 3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m
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[Specifications]

Motor	200 W AC servo motor (absolute)																	
Drive system	Timing belt																	
Ball screw lead (mm)	21																	
Stroke (mm) (in increments of 100 mm)	Medium slider	200 ~ 900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500
	Type designation	20 ~ 90	A 0	B 0	C 0	D 0	E 0	F 0	G 0	H 0	J 0	K 0	L 0	M 0	N 0	P 0	Q 0	R 0
	Long slider	250 ~ 950	1050	1150	1250	1350	1450	1550	1650	1750	1850	1950	2050	2150	2250	2350	2450	
	Type designation	25 ~ 95	A 5	B 5	C 5	D 5	E 5	F 5	G 5	H 5	J 5	K 5	L 5	M 5	N 5	P 5	Q 5	
Maximum speed (mm/s)	1000																	
Maximum Payload (kg) Acceleration/deceleration time: 0.3 sec or over	Horizontal transfer: 40																	
Positioning repeatability (mm)	± 0.05																	
Resolution (mm)	0.01																	
Allowable static load moment (N·m)	Medium slider MR : 2080 MP : 2160 MY : 1820 Long slider MR : 2080 MP : 3150 MY : 2640																	
Master controller	Select from CA20-M□□, CA10-M□□B																	

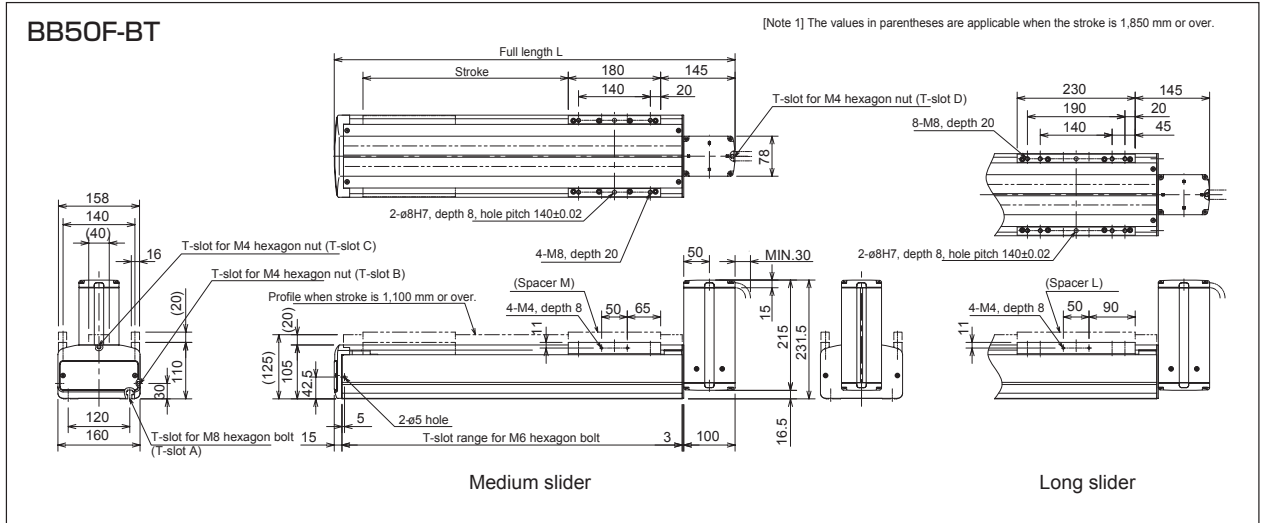
Notes: * The maximum Payload signifies a load exerted on top of the slider. Also refer to the dynamic load moment given in pages 212 to 220.
* The acceleration/deceleration time represents the time until the axis reaches a programmed speed.

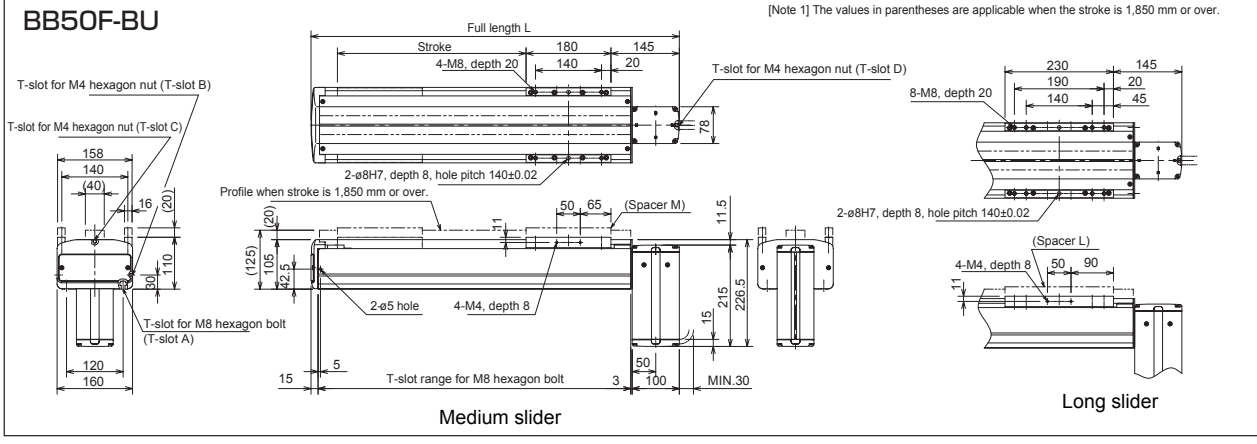
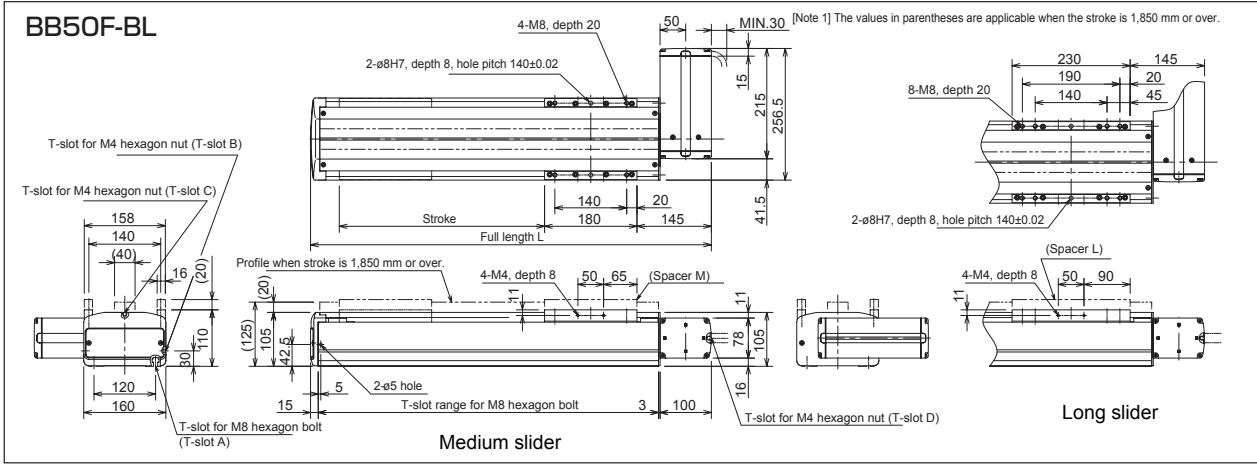
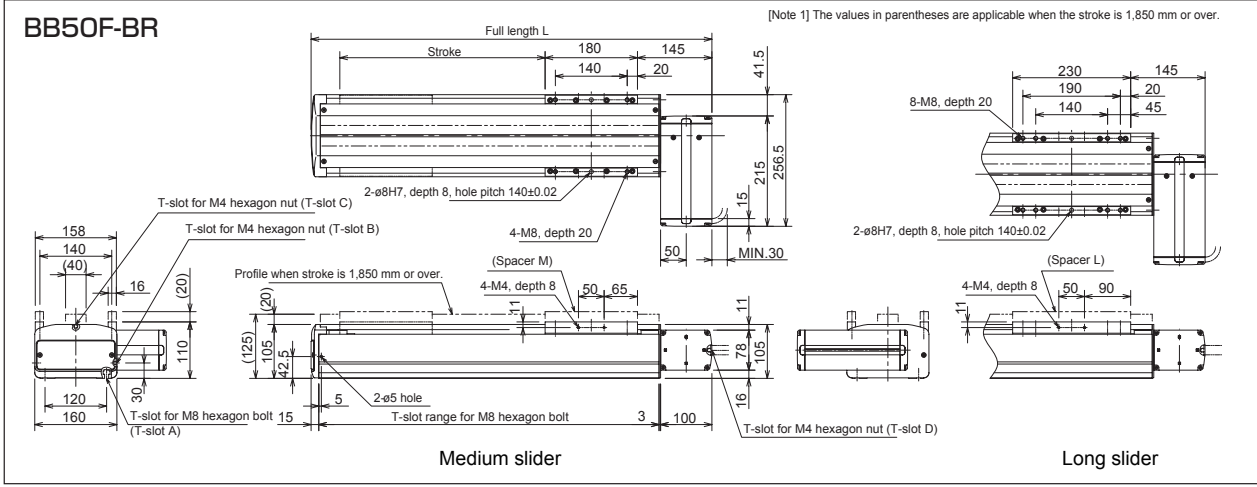
[Axis designation]

BB50F – BT – M 21 N – 40

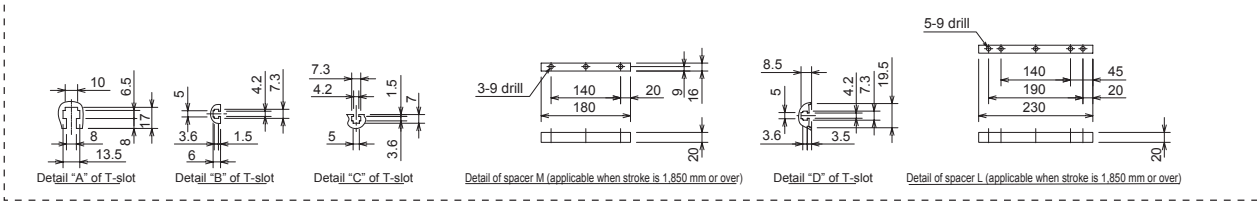
Motor set direction BT : Facing up BR : Facing right BL : Facing left BU : Facing down	Type of slider M : Medium slider L : Long slider	Lead 21 : 21mm	Brake N : Without brake	Stroke See page 20
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[Dimensions]





Common to BB50F-BT, BR, BL and BU.



Medium slider Common to BB50F-BT, BR, BL and BU.

Stroke (mm)	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500
Full length L (mm)	581	681	781	881	981	1081	1181	1281	1381	1481	1581	1681	1781	1881	1981	2081	2181	2281	2381	2481	2581	2681	2781	2881
Weight (kg)	12.9	14.6	16.3	18.0	19.7	21.4	23.1	24.8	26.5	28.2	29.9	31.6	33.3	35.0	36.7	38.4	40.1	41.8	43.5	45.2	46.9	48.6	50.3	52.0

Long slider Common to BB50F-BT, BR, BL and BU.

Stroke (mm)	250	350	450	550	650	750	850	950	1050	1150	1250	1350	1450	1550	1650	1750	1850	1950	2050	2150	2250	2350	2450
Full length L (mm)	681	781	881	981	1081	1181	1281	1381	1481	1581	1681	1781	1881	1981	2081	2181	2281	2381	2481	2581	2681	2781	2881
Weight (kg)	15.2	16.9	18.6	20.3	22.0	23.7	25.4	27.1	28.8	30.5	32.2	33.9	35.6	37.3	39.0	40.7	42.4	44.1	45.8	47.5	49.2	50.9	52.6

[Set designation]

BA2 – 50G – BT – M 42 N – 40 – 1 3

Motor set direction BT : Facing up BR : Facing right BL : Facing left BU : Facing down	Type of slider M : Medium slider L : Long slider	Lead 42 : 42mm	Brake N : Without brake	Stroke See page 20	Controller 0 : None 1 : CA20 – M10 Other: See page 20	Cable length 3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m
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[Specifications]

Motor	400 W AC servo motor (absolute)																	
Drive system	Timing belt																	
Ball screw lead (mm)	42																	
Stroke (mm) (in increments of 100 mm)	Medium slider	200 ~ 900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500
	Type designation	20 ~ 90	A 0	B 0	C 0	D 0	E 0	F 0	G 0	H 0	J 0	K 0	L 0	M 0	N 0	P 0	Q 0	R 0
	Long slider	250 ~ 950	1050	1150	1250	1350	1450	1550	1650	1750	1850	1950	2050	2150	2250	2350	2450	
	Type designation	25 ~ 95	A 5	B 5	C 5	D 5	E 5	F 5	G 5	H 5	J 5	K 5	L 5	M 5	N 5	P 5	Q 5	
Maximum speed (mm/s)	2000																	
Maximum Payload (kg) Acceleration/deceleration time: 0.5 sec or over	Horizontal transfer: 20																	
Positioning repeatability (mm)	± 0.05																	
Resolution (mm)	0.01																	
Allowable static load moment (N·m)	Medium slider MR : 2080 MP : 2160 MY : 1820 Long slider MR : 2080 MP : 3150 MY : 2640																	
Master controller	Select from CA20-M□□, CA10-M0□B																	

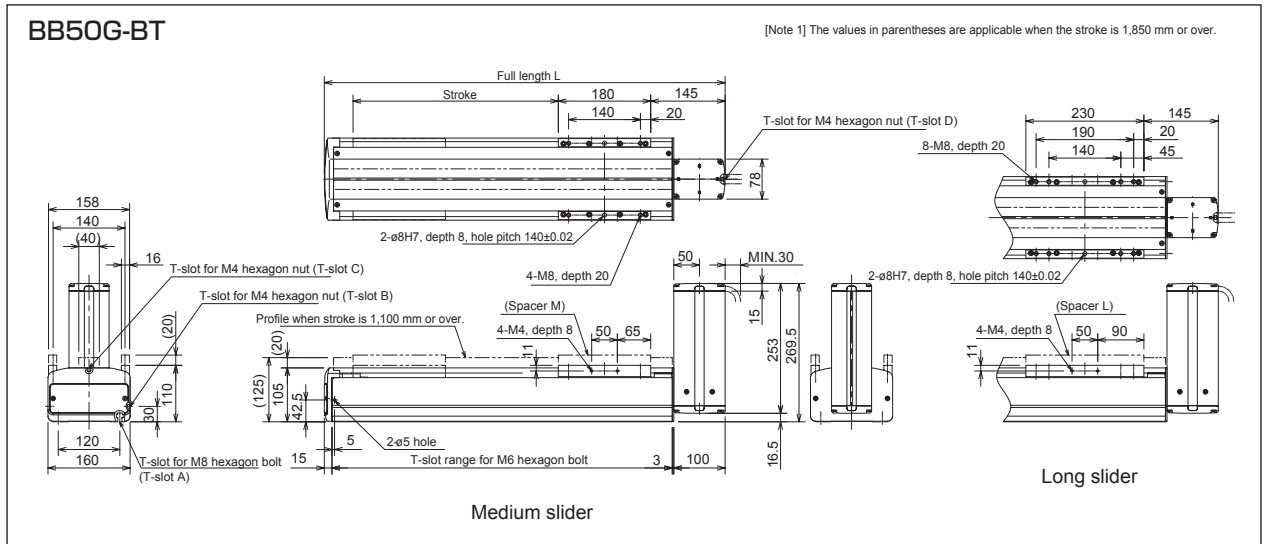
Notes: * The maximum Payload signifies a load exerted on top of the slider. Also refer to the dynamic load moment given in pages 212 to 220.
* The acceleration/deceleration time represents the time until the axis reaches a programmed speed.

[Axis designation]

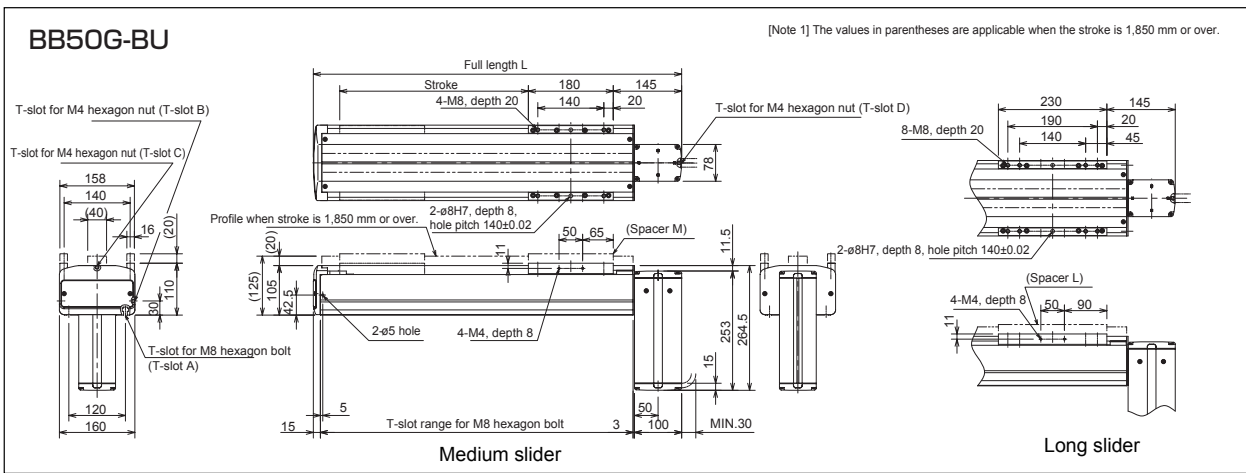
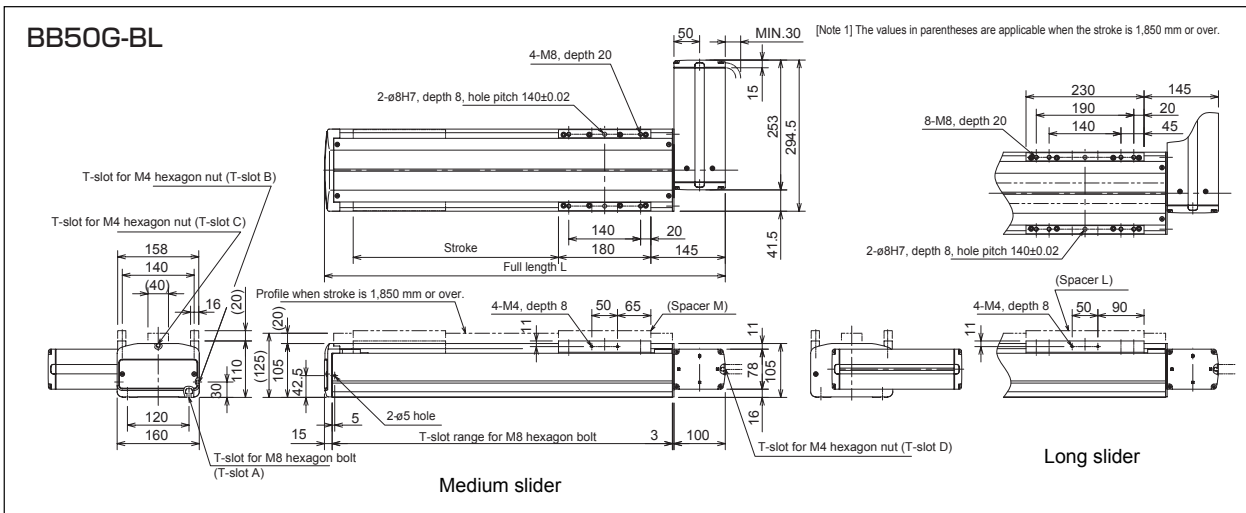
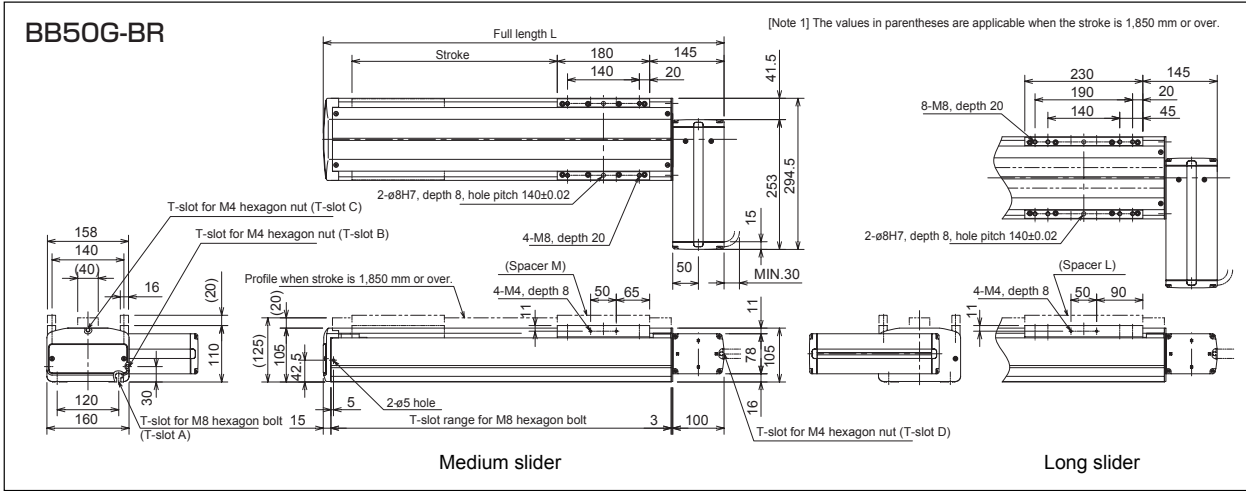
BB50G – BT – M 42 N – 40

Motor set direction BT : Facing up BR : Facing right BL : Facing left BU : Facing down	Type of slider M : Medium slider L : Long slider	Lead 42 : 42mm	Brake N : Without brake	Stroke See page 20
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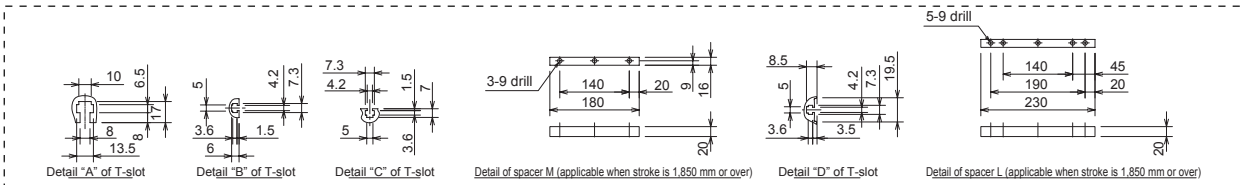
[Dimensions]



Timing Belt Driven



Common to BB50G-BT, BR, BL and BU.



Medium slider Common to BB50G-BT, BR, BL and BU.

Stroke (mm)	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500
Full length L (mm)	581	681	781	881	981	1081	1181	1281	1381	1481	1581	1681	1781	1881	1981	2081	2181	2281	2381	2481	2581	2681	2781	2881
Weight (kg)	13.5	15.2	16.9	18.6	20.3	22.0	23.7	25.4	27.1	28.8	30.5	32.2	33.9	35.6	37.3	39.0	40.7	42.4	44.1	45.8	47.5	49.2	50.9	52.6

Long slider Common to BB50G-BT, BR, BL and BU.

Stroke (mm)	250	350	450	550	650	750	850	950	1050	1150	1250	1350	1450	1550	1650	1750	1850	1950	2050	2150	2250	2350	2450
Full length L (mm)	681	781	881	981	1081	1181	1281	1381	1481	1581	1681	1781	1881	1981	2081	2181	2281	2381	2481	2581	2681	2781	2881
Weight (kg)	15.8	17.5	19.2	20.9	22.6	24.3	26.0	27.7	29.4	31.1	32.8	34.5	36.2	37.9	39.6	41.3	43.0	44.7	46.4	48.1	49.8	51.5	53.2

[Set designation]

BA2 – 50G – BT – L 19 N – A5 – 1 3

Type of slider
L : Long slider

Stroke
See page 20

Controller
0 : None
1 : CA20 – M10
Other: See page 20

Cable length
3 : 3m 9 : 9m
5 : 5m B : 11m
7 : 7m D : 13m

[Specifications]

Motor	400W
Drive system	Timing belt
Ball screw lead (mm)	19.555
Maximum speed (mm/s)	1000
Maximum Payload (kg)	100
Acceleration/deceleration time: 0.3 sec or over (Note 1)	
Slider type	Long slider
Stroke (mm) (in increments of 100 mm)	150 ~ 4450
Allowable static load moment (N·m)	MR : 1800 MP : 2700 MY : 2150
Positioning repeatability (mm)	± 0.05
Resolution (mm)	0.01
Master controller	Select from CA20-M□□, CA10-M0□B

- Notes: * The acceleration/deceleration time represents the time until the axis reaches a programmed speed.
 * The maximum Payload signifies a load exerted on top of the slider.
 * The regenerative discharge unit ABSU-4000 is required regardless of the payload.
 Note 1: A stroke of 1050 mm or more results in an acceleration time of 0.6 seconds or longer.

[Axis designation]

BB 50 G – BT – L 19 N – A5

Type of slider
L : Long slider

Stroke
See page 20

[Dimensions]

BB50G-BT

Note: When the stroke is 3150 mm or more, a part for preventing slack is attached to the frame cover. The dimensions of the spacer on the slider also change.

Type	BB50G-BT L19N-15	BB50G-BT L19N-25	BB50G-BT L19N-35	BB50G-BT L19N-45	BB50G-BT L19N-55	BB50G-BT L19N-65	BB50G-BT L19N-75	BB50G-BT L19N-85	BB50G-BT L19N-95	BB50G-BT L19N-105	BB50G-BT L19N-115	BB50G-BT L19N-125	BB50G-BT L19N-135	BB50G-BT L19N-145	BB50G-BT L19N-155	BB50G-BT L19N-165	BB50G-BT L19N-175	BB50G-BT L19N-185	BB50G-BT L19N-195	BB50G-BT L19N-205	BB50G-BT L19N-215	BB50G-BT L19N-225
Stroke X (mm)	150	250	350	450	550	650	750	850	950	1050	1150	1250	1350	1450	1550	1650	1750	1850	1950	2050	2150	2250
Full length L (mm)	720	820	920	1020	1120	1220	1320	1420	1520	1620	1720	1820	1920	2020	2120	2220	2320	2420	2520	2620	2720	2820
Weight (kg)	26.9	28.3	29.6	31.0	32.3	33.7	35.0	36.4	37.7	39.1	40.5	41.8	43.2	44.5	45.9	47.2	48.6	49.9	51.3	52.6	54.0	55.3

Type	BB50G-BT L19N-P5	BB50G-BT L19N-Q5	BB50G-BT L19N-R5	BB50G-BT L19N-S5	BB50G-BT L19N-T5	BB50G-BT L19N-U5	BB50G-BT L19N-V5	BB50G-BT L19N-W5	BB50G-BT L19N-3150	BB50G-BT L19N-3250	BB50G-BT L19N-3350	BB50G-BT L19N-3450	BB50G-BT L19N-3550	BB50G-BT L19N-3650	BB50G-BT L19N-3750	BB50G-BT L19N-3850	BB50G-BT L19N-3950	BB50G-BT L19N-4050	BB50G-BT L19N-4150	BB50G-BT L19N-4250	BB50G-BT L19N-4350	BB50G-BT L19N-4450
Stroke X (mm)	2350	2450	2550	2650	2750	2850	2950	3050	3150	3250	3350	3450	3550	3650	3750	3850	3950	4050	4150	4250	4350	4450
Full length L (mm)	2920	3020	3120	3220	3320	3420	3520	3620	3720	3820	3920	4020	4120	4220	4320	4420	4520	4620	4720	4820	4920	5020
Weight (kg)	56.7	58.0	59.4	60.7	62.1	63.4	64.8	66.2	67.5	68.9	70.2	71.6	72.9	74.3	75.6	77.0	78.3	79.4	81.0	82.4	83.7	85.1

[Set designation]

BA2 – 60J – BT – M 19 N – A5 – 63

Type of slider

M : Medium slider
L : Long slider

Stroke

See page 20

Controller

0 : None
6 : CA20 – M00 – 0V
Other: See page 20

Cable length

3 : 3m 9 : 9m
5 : 5m B : 11m
7 : 7m D : 13m

[Specifications]

Motor	750W		
Drive system	Timing belt		
Ball screw lead (mm)	19.555		
Maximum speed (mm/s)	1000		
Maximum Payload (kg)	200		
Acceleration/deceleration time: 0.3 sec or over			
Slider type	Medium slider	Long slider	
Stroke (mm) (in increments of 100 mm)	150 ~ 4350	150 ~ 4450	
Allowable static load moment (N·m)	MR : 3500 MP : 4000 MY : 3000	MR : 3500 MP : 6200 MY : 4750	
Positioning repeatability (mm)	± 0.05		
Resolution (mm)	0.01		
Master controller	Select from CA20-M0 <input type="checkbox"/> <input type="checkbox"/> V		

Notes: * The acceleration/deceleration time represents the time until the axis reaches a programmed speed.
* The maximum Payload signifies a load exerted on top of the slider.
* The regenerative discharge unit RGH400A 30Q (BB60J) is required regardless of the payload.

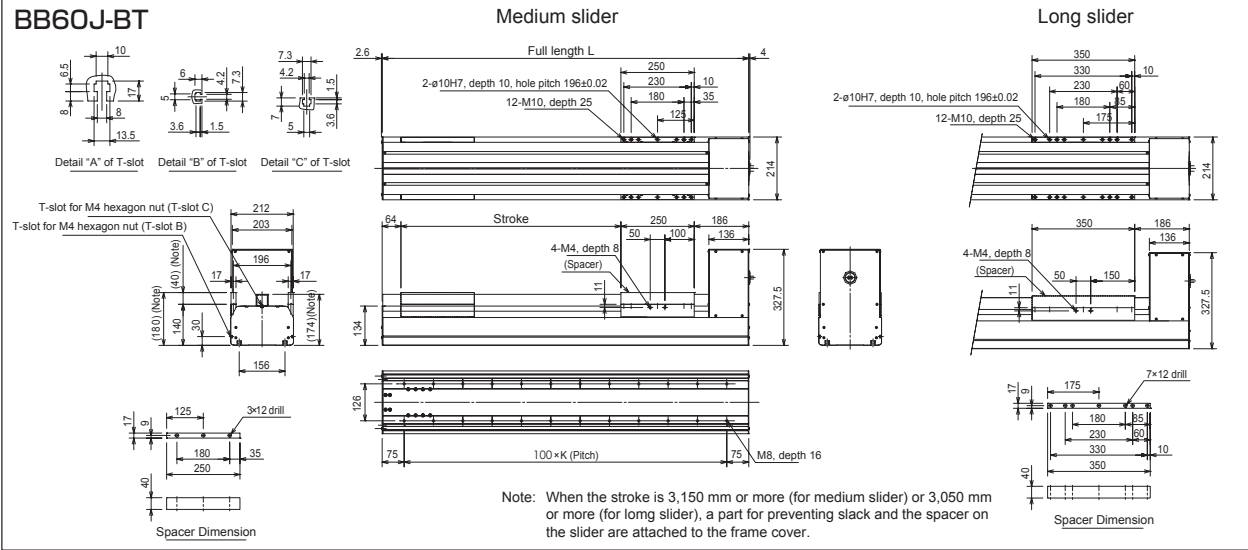
[Axis designation]

BB 60 J – BT – M 19 N – A5

Type of slider
M : Medium slider
L : Long slider

Stroke
See page 20

[Dimensions]



Medium slider

Type	BB60J-BT L19N-15	BB60J-BT L19N-25	BB60J-BT L19N-35	BB60J-BT L19N-45	BB60J-BT L19N-55	BB60J-BT L19N-65	BB60J-BT L19N-75	BB60J-BT L19N-85	BB60J-BT L19N-95	BB60J-BT L19N-105	BB60J-BT L19N-115	BB60J-BT L19N-125	BB60J-BT L19N-135	BB60J-BT L19N-145	BB60J-BT L19N-155	BB60J-BT L19N-165	BB60J-BT L19N-175	BB60J-BT L19N-185	BB60J-BT L19N-195	BB60J-BT L19N-205	BB60J-BT L19N-215	BB60J-BT L19N-225
Stroke X (mm)	150	250	350	450	550	650	750	850	950	1050	1150	1250	1350	1450	1550	1650	1750	1850	1950	2050	2150	2250
Full length L (mm)	850	750	850	950	1050	1150	1250	1350	1450	1550	1650	1750	1850	1950	2050	2150	2250	2350	2450	2550	2650	2750
K	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Weight (kg)	39.5	41.8	44.1	46.4	48.7	51.0	53.3	55.6	57.9	60.2	62.5	64.8	67.1	69.4	71.7	74.0	76.3	78.6	80.9	83.2	85.6	87.9

Type	BB60J-BT L19N-25	BB60J-BT L19N-35	BB60J-BT L19N-45	BB60J-BT L19N-55	BB60J-BT L19N-65	BB60J-BT L19N-75	BB60J-BT L19N-85	BB60J-BT L19N-95	BB60J-BT L19N-105	BB60J-BT L19N-115	BB60J-BT L19N-125	BB60J-BT L19N-135	BB60J-BT L19N-145	BB60J-BT L19N-155	BB60J-BT L19N-165	BB60J-BT L19N-175	BB60J-BT L19N-185	BB60J-BT L19N-195	BB60J-BT L19N-205	BB60J-BT L19N-215	BB60J-BT L19N-225	
Stroke X (mm)	2350	2450	2550	2650	2750	2850	2950	3050	3150	3250	3350	3450	3550	3650	3750	3850	3950	4050	4150	4250	4350	4450
Full length L (mm)	2850	2950	3050	3150	3250	3350	3450	3550	3650	3750	3850	3950	4050	4150	4250	4350	4450	4550	4650	4750	4850	4950
K	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Weight (kg)	90.2	92.5	94.8	97.1	99.4	101.7	104.0	106.3	108.6	110.9	113.2	115.5	117.8	120.1	122.4	124.7	127.0	129.3	131.6	133.9	136.3	138.6

Long slider

Type	BB60J-BT L19N-25	BB60J-BT L19N-35	BB60J-BT L19N-45	BB60J-BT L19N-55	BB60J-BT L19N-65	BB60J-BT L19N-75	BB60J-BT L19N-85	BB60J-BT L19N-95	BB60J-BT L19N-105	BB60J-BT L19N-115	BB60J-BT L19N-125	BB60J-BT L19N-135	BB60J-BT L19N-145	BB60J-BT L19N-155	BB60J-BT L19N-165	BB60J-BT L19N-175	BB60J-BT L19N-185	BB60J-BT L19N-195	BB60J-BT L19N-205	BB60J-BT L19N-215	BB60J-BT L19N-225
Stroke X (mm)	2350	2450	2550	2650	2750	2850	2950	3050	3150	3250	3350	3450	3550	3650	3750	3850	3950	4050	4150	4250	4350
Full length L (mm)	2950	3050	3150	3250	3350	3450	3550	3650	3750	3850	3950	4050	4150	4250	4350	4450	4550	4650	4750	4850	4950
K	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Weight (kg)	93.5	95.8	98.1	100.4	102.7	105.0	107.3	109.6	111.9	114.2	116.5	118.8	121.1	123.4	125.7	128.0	130.3	132.6	134.9	137.3	139.6

Type	BB60J-BT L19N-25	BB60J-BT L19N-35	BB60J-BT L19N-45	BB60J-BT L19N-55	BB60J-BT L19N-65	BB60J-BT L19N-75	BB60J-BT L19N-85	BB60J-BT L19N-95	BB60J-BT L19N-105	BB60J-BT L19N-115	BB60J-BT L19N-125	BB60J-BT L19N-135	BB60J-BT L19N-145	BB60J-BT L19N-155	BB60J-BT L19N-165	BB60J-BT L19N-175	BB60J-BT L19N-185	BB60J-BT L19N-195	BB60J-BT L19N-205	BB60J-BT L19N-215	BB60J-BT L19N-225
Stroke X (mm)	2350	2450	2550	2650	2750	2850	2950	3050	3150	3250	3350	3450	3550	3650	3750	3850	3950	4050	4150	4250	4350
Full length L (mm)	2950	3050	3150	3250	3350	3450	3550	3650	3750	3850	3950	4050	4150	4250	4350	4450	4550	4650	4750	4850	4950
K	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Weight (kg)	93.5	95.8	98.1	100.4	102.7	105.0	107.3	109.6	111.9	114.2	116.5	118.8	121.1	123.4	125.7	128.0	130.3	132.6	134.9	137.3	139.6

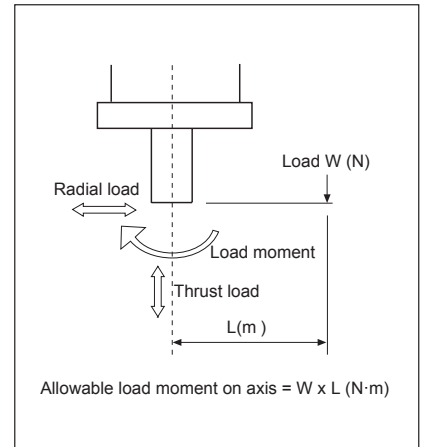
[Set designation]

BA2 – 00D – RH – A 00N – 36 – 1 3

Drive system RH: Harmonic	Mounting A: L-shaped bracket F: Flange type	Range of rotation 360°	Controller 0: None 1: CA20-M10 Other: See page 20	Cable length 3: 3m 9: 9m 5: 5m B: 11m 7: 7m D: 13m
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[Specifications]

Motor	50 W AC servo motor (absolute)	
Drive system	Harmonic drive	
Reduction ratio (deg.)	1/50	
Range of rotation (deg.)	360	
Maximum speed (deg./s)	360	
Maximum Payload (kg)	5	
Acceleration/deceleration time: 0.3 sec. or over		
Rated output torque (N·m)	2.5	
Allowable load inertia (kg·m ²)	0.0485	
Allowable thrust load on axis (N)	49	
Allowable radial load on axis (N)	98	
Allowable load moment on axis (N·m)	0.65	
Positioning repeatability (deg.)	± 0.025	
Resolution (deg.)	0.01	
Mass of axis (kg)	L-shaped bracket	2.0
	Flange type	1.8
Master controller	Select from CA20-M□□ and CA10-M0□B	



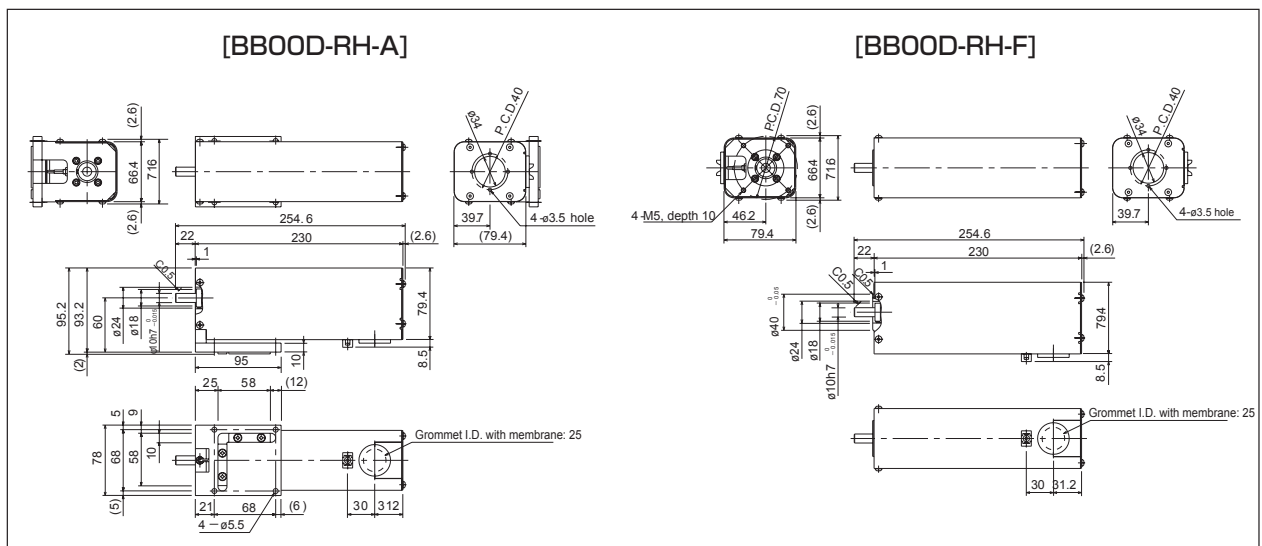
Notes: * The maximum Payload signifies a load measured when only thrust load is exerted on the vertically installed axis.
* The acceleration/deceleration time represents the time until the axis reaches a programmed speed.

[Axis designation]

BBOOD – RH – A

Drive system RH: Harmonic	Mounting A: L-shaped bracket F: Flange type
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[Dimensions]



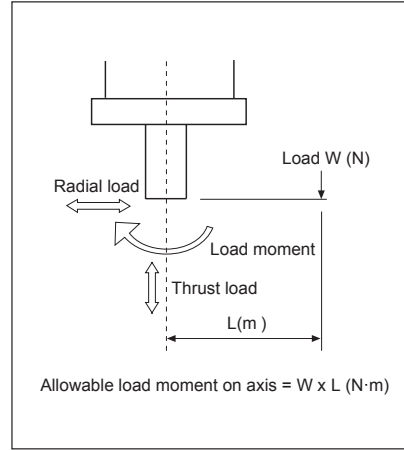
[Set designation]

BA2 – 00D – RP – A 00N – 36 – 1 3

Drive system RP : Harmonic	Mounting A: L-shaped bracket F: Flange type	Range of rotation 360°	Controller 0 : None 1 : CA20-M10 Other: See page 20	Cable length 3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m
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[Specifications]

Motor	50 W AC servo motor (absolute)	
Drive system	Harmonic drive	
Reduction ratio (deg.)	1/21	
Range of rotation (deg.)	360	
Maximum speed (deg. /s)	857	
Maximum Payload (kg)	10	
Acceleration/deceleration time: 0.3 sec. or over	10	
Rated output torque (N·m)	3.9	
Allowable load inertia (kg·m ²)	0.0125	
Allowable thrust load on axis (N)	98	
Allowable radial load on axis (N)	196	
Allowable load moment on axis (N·m)	1.3	
Positioning repeatability (deg.)	±0.125	
Resolution (deg.)	0.01	
Mass of axis (kg)	L-shaped bracket	2.4
	Flange type	2.2
Master controller	Select from CA20-M□□ and CA10-M0□B	



Notes: * The maximum Payload signifies a load measured when only thrust load is exerted on the vertically installed axis.
* The acceleration/deceleration time represents the time until the axis reaches a programmed speed.

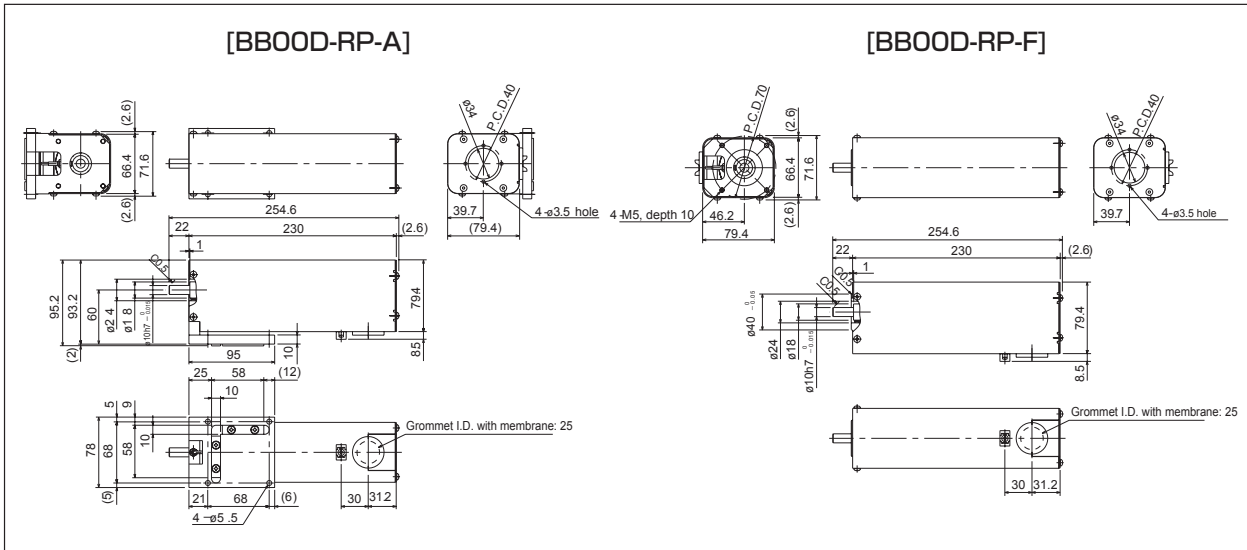
R-AXIS

[Axis designation]

BBOOD – RP – A

Drive system RP : Harmonic	Mounting A: L-shaped bracket F: Flange type
--------------------------------------	--

[Dimensions]



[Set designation]

BA2 – T3D – ST – C 12 N – 10 – 13

Type of slider C : Pushrod type	Lead 12 : 12mm	Brake N : Without brake B : With brake	Stroke See Page 20	Controller 0 : None 1 : CA20 – M10 Other: See page 20	Cable length 3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m
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[Specifications]

Motor	50 W AC servo motor (absolute)	
Drive system	Precisely rolled ball screw (equivalent to C7), thread outer diameter 8 mm	
Stroke (mm) (in increments of 50 mm)	Stroke length	50 ~ 150
	Type designation	05 ~ 15
Maximum speed (mm/s)	600	
Maximum Payload (kg) Acceleration/deceleration time: 0.3 sec or over	Horizontal transfer: 4 Vertical transfer: 1.9	
Positioning repeatability (mm)	± 0.02	
Resolution (mm)	0.01	
Allowable static load moment (N·m)	Do not apply load moment to the rod	
Brake	Braking while not excited, voltage DC24 V	
Master controller	Select from CA20-MM□□, CA10-M0□B	

Notes: * When using the axis as a vertical axis, select the type with brake.

* A dynamic moment of inertia for the load cannot be applied to the rod. Take precautions by using together with a linear guide and other components to ensure that a radial load is not applied to the rod.

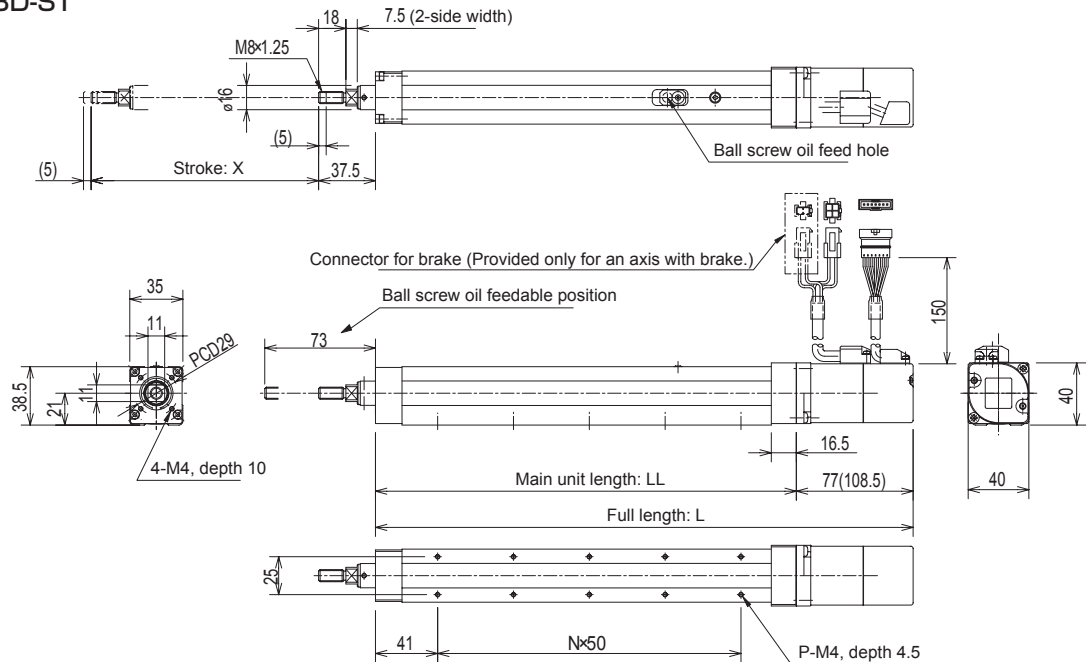
[Axis designation]

BBT3D – ST – C 12 N – 10

Type of slider C : Pushrod type	Lead 12 : 12mm	Brake N : Without brake B : With brake	Stroke See page 20
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Pushrod

BBT3D-ST

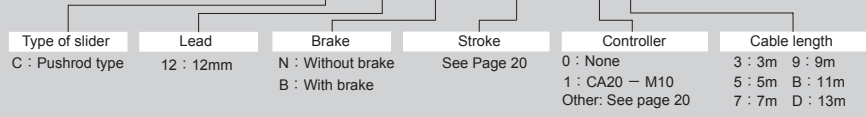


Stroke X (mm)	50	100	150
Full length L (mm)	254.5(286)	304.5(336)	354.5(386)
Main unit length LL (mm)	177.5	227.5	227.5
No. of holes P (q'ty)	4	6	8
Intervals between mounting holes N	2	3	4
Weight (kg)	1.0(1.2)	1.2(1.4)	1.3(1.5)

* Values in parentheses are for the axis with brake.

[Set designation]

BA2 – T4D – ST – C 12 N – 10 – 1 3



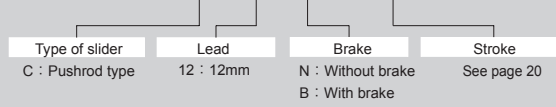
[Specifications]

Motor	50 W AC servo motor (absolute)	
Drive system	Precisely rolled ball screw (equivalent to C7), thread outer diameter 8 mm	
Stroke (mm) (in increments of 50 mm)	Stroke length	50 ~ 200
	Type designation	05 ~ 20
Maximum speed (mm/s)	600	
Maximum Payload (kg) Acceleration/deceleration time: 0.3 sec or over	Horizontal transfer: 7 Vertical transfer: 3.1	
Positioning repeatability (mm)	± 0.02	
Resolution (mm)	0.01	
Allowable static load moment (N·m)	Do not apply load moment to the rod	
Brake	Braking while not excited, voltage DC24 V	
Master controller	Select from CA20-MM□□, CA10-M0□B	

Notes: * When using the axis as a vertical axis, select the type with brake.
 * A dynamic moment of inertia for the load cannot be applied to the rod. Take precautions by using together with a linear guide and other components to ensure that a radial load is not applied to the rod.

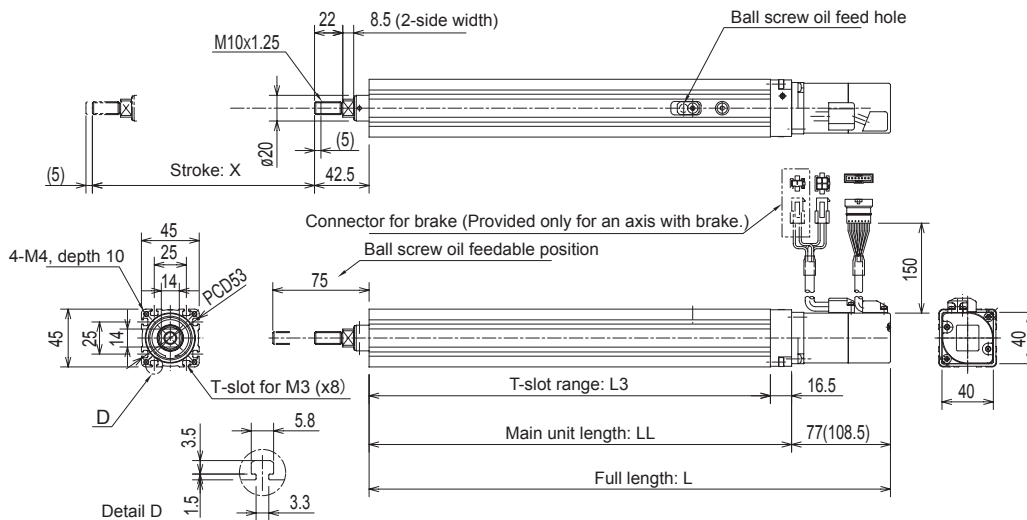
[Axis designation]

BBT4D – ST – C 12 N – 10



Pushrod

BBT4D-ST



Stroke X (mm)	50	100	150	200
Full length L (mm)	256(287.5)	306(337.5)	356(387.5)	406(437.5)
Main unit length LL (mm)	179	229	279	329
T-slot range L3 (mm)	162.5	212.5	262.5	312.5
Weight (kg)	1.5(1.7)	1.8(2.0)	2.0(2.2)	2.3(2.5)

* Values in parentheses are for the axis with brake.

[Set designation]

BA2 – T5E – ST – C 12 N – 10 – 13

Type of slider C : Pushrod type	Lead 12 : 12mm	Brake N : Without brake B : With brake	Stroke See Page 20	Controller 0 : None 1 : CA20 – M10 Other: See page 20	Cable length 3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m
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[Specifications]

Motor	50 W AC servo motor (absolute)		
Drive system	Precisely rolled ball screw (equivalent to C7), thread outer diameter 8 mm		
Stroke (mm) (in increments of 50 mm)	Stroke length	50 ~ 250	300
	Type designation	05 ~ 25	30
Maximum speed (mm/s)	600		470
Maximum Payload (kg) Acceleration/deceleration time: 0.3 sec or over	Horizontal transfer: 25 Vertical transfer: 6.5		
Positioning repeatability (mm)	± 0.02		
Resolution (mm)	0.01		
Allowable static load moment (N·m)	Do not apply load moment to the rod		
Brake	Braking while not excited, voltage DC24 V		
Master controller	Select from CA20-MM <input type="checkbox"/> , CA10 - M0 <input type="checkbox"/> B		

Notes: * When using the axis as a vertical axis, select the type with brake.

* A dynamic moment of inertia for the load cannot be applied to the rod. Take precautions by using together with a linear guide and other components to ensure that a radial load is not applied to the rod.

[Axis designation]

BBT5E – ST – C 12 N – 10

Type of slider C : Pushrod type	Lead 12 : 12mm	Brake N : Without brake B : With brake	Stroke See page 20
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Pushrod

BBT5E-ST

The drawing shows the BBT5E-ST axis assembly. Key dimensions include: M12x1.25 thread, 24mm diameter, 9.5mm (2-side width) ball screw oil feed hole, 45.5mm distance to home position, 55mm main unit length, 83mm distance to connector, 150mm distance to ball screw oil feedable position, 40mm diameter end view, 16.5mm T-slot range L3, and 94.5(135)mm main unit length LL. A detail D shows a T-slot for M3 (x8) with dimensions 7.3, 4.9, 4.5, and 1.5. A table below provides stroke and length data for various configurations.

Stroke X (mm)	50	100	150	200	250	300
Full length L (mm)	294(334.5)	344(384.5)	394(434.5)	444(484.5)	494(534.5)	544(584.5)
Main unit length LL (mm)	199.5	249.5	299.5	349.5	399.5	449.5
T-slot range L3 (mm)	183	233	283	333	383	433
Weight (kg)	2.2(2.4)	2.6(2.8)	3.0(3.2)	3.3(3.5)	3.7(3.9)	4.1(4.3)

* Values in parentheses are for the axis with brake.

Orthogonal Axes Specifications

2-Axis Specifications

X-Y Combination

Ball screw type	62
Timing belt type	76

X-Z Combination

Ball screw type	83
Timing belt type	89

Y-Z Combination

Ball screw type	95
Timing belt type	102

Z-Y Combination

Ball screw type	108
Timing belt type	113

3-Axis Specifications

X-Y-Z Combination

Ball screw type	119
Timing belt type	135

4-Axis Specifications

X-Y-Z-R Combination

Harmonic drive type	140
Planet gear type	144

[Set designation]

BA2 - T7 - A2AR A - 40 40 00 - 00 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed	05 : 50mm	05 : 50mm	0: None	3 : 3m 9 : 9m
L: Left-handed	70 : 700mm	40 : 400mm	1 : CA20-M10 Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

X-axis: Ball screw driven
Motor straight

Y-axis: Ball screw driven
Motor straight

[Specifications]

	X-axis	Y-axis
Type of axis	BBT7D-ST-M12N- □□	BBT5D-ST-M12N- □□
Stroke (mm) (in increments of 50 mm)	50 ~ 600, 700	50 ~ 400
Maximum speed (mm/s)	800 (Note 1)	800
Positioning repeatability (mm)	±0.02	
Lead of ball screw (mm)	12	12
Motor output	50W	50W
Resolution (mm)	0.01	

Note 1: When the stroke is as given below, the maximum speed differs.

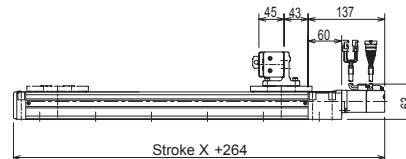
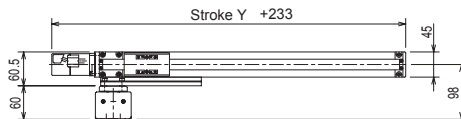
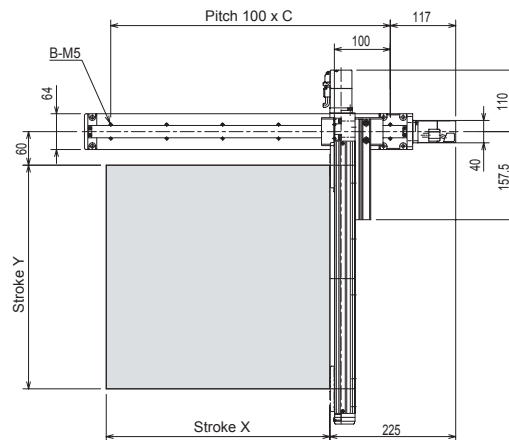
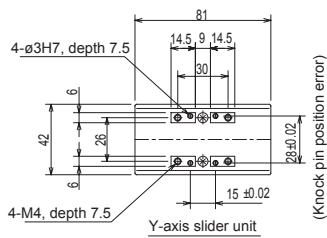
	Stroke (mm)	Maximum speed (mm/s)
X-axis	50 ~ 550	800
	600	680
	700	500

Acceleration/deceleration time when the maximum speed is set: 0.3 sec. or over

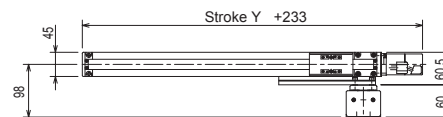
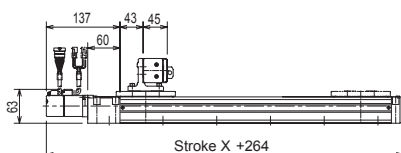
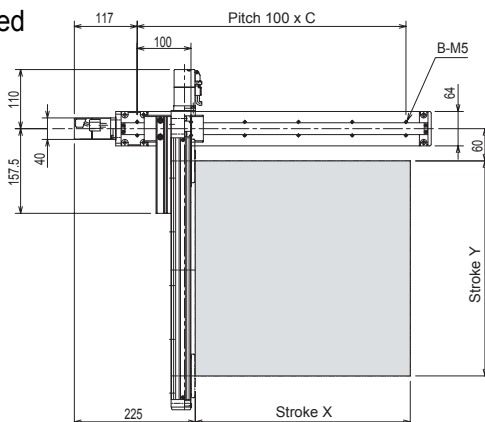
Maximum Payload (kg)	Y-axis stroke							
	50mm	100mm	150mm	200mm	250mm	300mm	350mm	400mm
	5.0	5.0	4.0	4.0	2.0	2.0	1.0	1.0

R: Right-handed

Stroke X (BBT7)	50	100	150	200	250	300	350	400	450	500	550	600	700
No. of holes B	4	6	6	8	8	10	10	12	12	14	14	16	18
Hole-to-hole pitch C	1	2	3	3	4	4	5	5	6	6	7	7	8



L: Left-handed



X-X

[Set designation]

BA2 – A1 – A2ER A – 45 40 00 – OF 1 3

Combined operation R: Right-handed L: Left-handed	Axis 1 stroke 15 : 150mm 95 : 950mm A5 : 1050mm	Axis 2 stroke 05 : 50mm 40 : 400mm	Controller 0: None 1 : CA20-M10 Other: See page 21	Cable length 3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m
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Ball screw type

- X-axis: Ball screw driven
Motor straight
- Y-axis: Ball screw driven
Motor straight

[Specifications]

	X-axis	Y-axis
Type of axis	BB10E-ST-S20N-□5	BBT7D-ST-M12N-□□
Stroke (mm) (in increments of 100 mm for X-axis, 50 mm for Y-axis)	150 ~ 1050	50 ~ 400
Maximum speed (mm/s)	1200 (Note 1)	800
Positioning repeatability (mm)	± 0.01	± 0.02
Lead of ball screw (mm)	20	12
Motor output	100W	50W
Resolution (mm)	0.01	

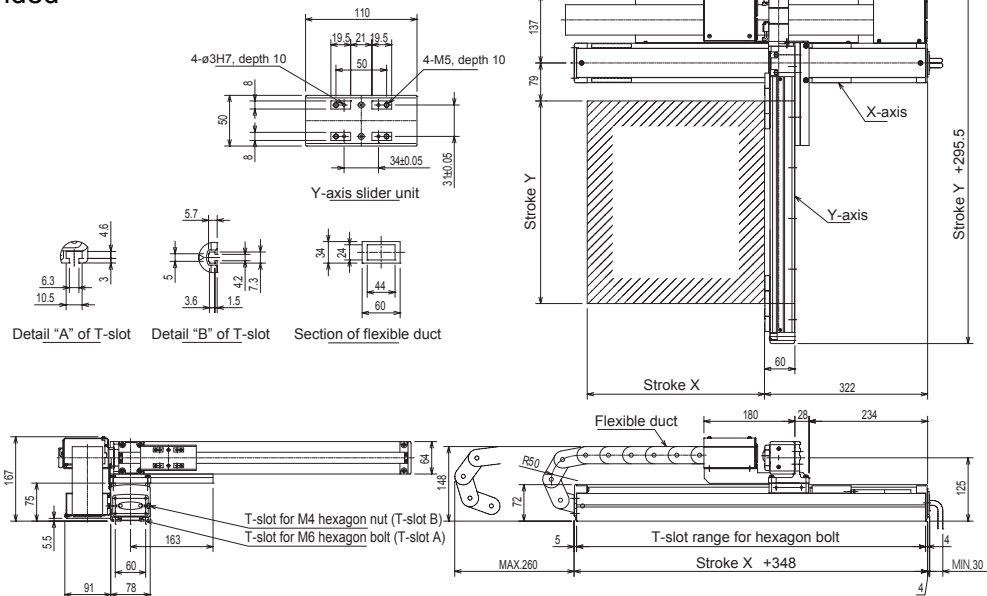
Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
X-axis	750	1000
	850	800
	950 ~ 1050	600

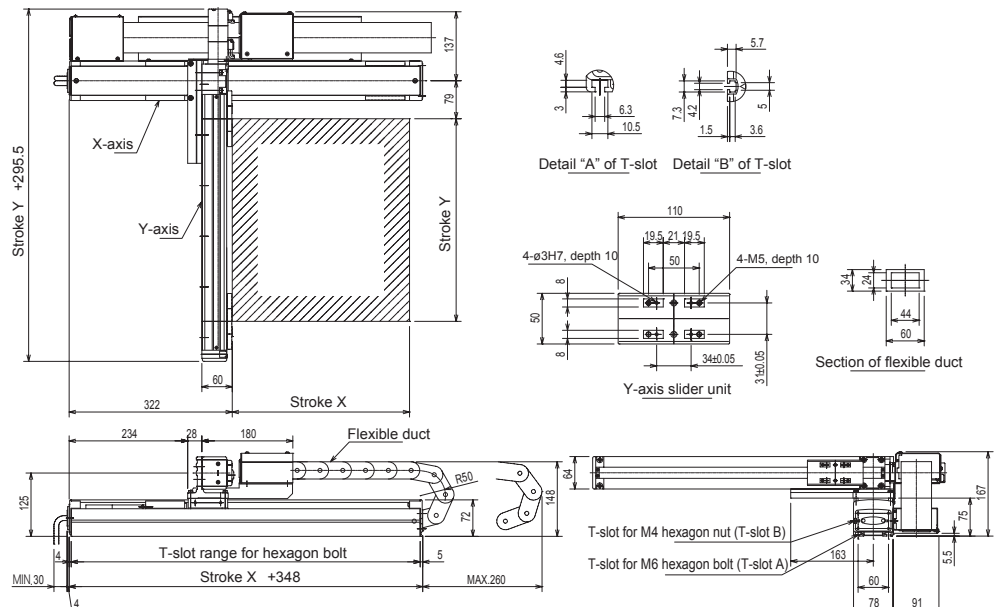
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg)	Y-axis stroke							
	50mm	100mm	150mm	200mm	250mm	300mm	350mm	400mm
	10.5	10.5	6.5	6.5	3.0	3.0	0.5	0.5

R: Right-handed



L: Left-handed



[Set designation]

BA2 – A1 – A2A R A – 40 45 00 – OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed L: Left-handed	10 : 100mm 90 : 900mm A0 : 1000mm	15 : 150mm 65 : 650mm	0: None 1 : CA20-M10 Other: See page 21	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

X-axis: Ball screw driven
Motor straight

Y-axis: Ball screw driven
Motor straight

[Specifications]

	X-axis	Y-axis
Type of axis	BB10E-ST-M20N-□ 0	BB10E-ST-S20N-□ 5
Stroke (mm) (in increments of 100 mm for X-axis, 50 mm for Y-axis)	100 ~ 1000mm	150 ~ 650mm
Maximum speed (mm/s)	1200mm/s (Note 1)	1200mm/s
Positioning repeatability (mm)	± 0.01mm	
Lead of ball screw (mm)	20mm	20mm
Motor output	100W	100W
Resolution (mm)	0.01mm	

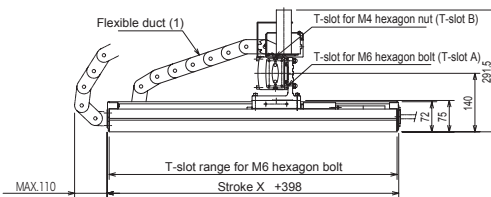
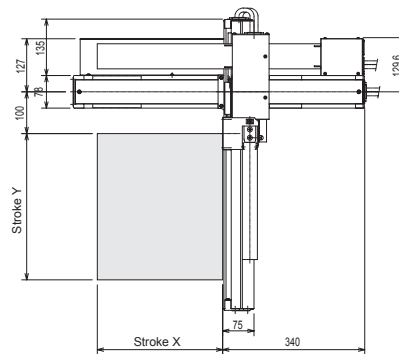
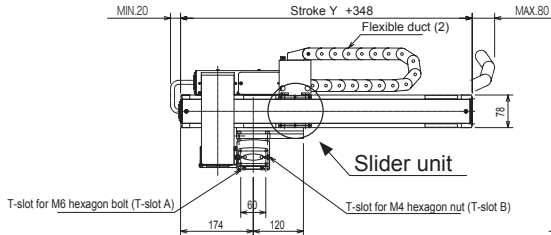
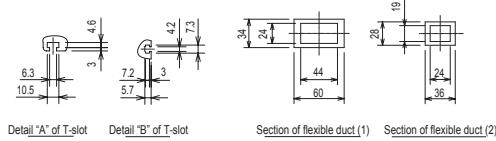
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Note 1: When the stroke is as given below, the maximum speed differs.

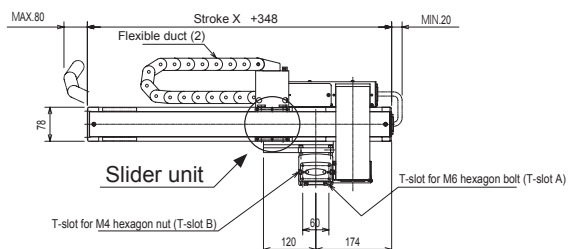
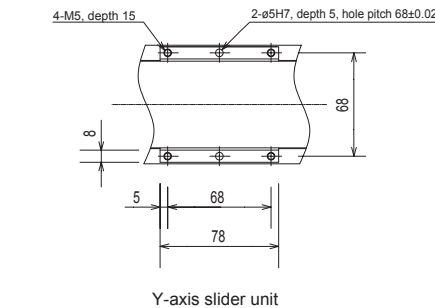
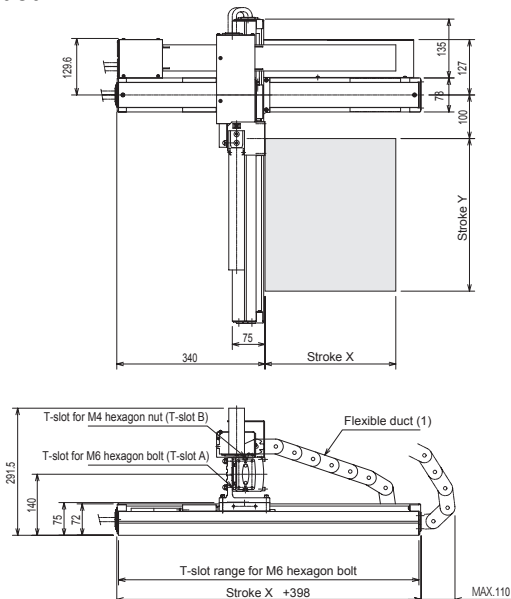
	Stroke (mm)	Maximum speed (mm/s)
X-axis	700	1000
	800	800
	900 ~ 1000	600

Maximum Payload (kg)	Y-axis stroke					
	150mm	250mm	350mm	450mm	550mm	650mm
	9.0	8.0	6.5	5.0	3.0	1.0

R: Right-handed



L: Left-handed



[Set designation]

BA2 - A1 - A2A R E - 40 45 00 - OF 1 3

Combined operation R: Right-handed L: Left-handed	Axis 1 stroke 10 : 100mm 90 : 900mm A0 : 1000mm	Axis 2 stroke 15 : 150mm 65 : 650mm	Controller 0: None 1 : CA20-M10 Other: See page 21	Cable length 3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m
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Ball screw type

- X-axis: Ball screw driven
Motor straight
- Y-axis: Ball screw driven
Motor straight

[Specifications]

	X-axis	Y-axis
Type of axis	BB10E-U □ -M20N- □ 0	BB10E-U □ -S20N- □ 5
Stroke (in increments of 100 mm)	100 ~ 1000mm	150 ~ 650mm
Maximum speed	1200mm/s (Note 1)	1200mm/s
Positioning repeatability	± 0.01mm	
Lead of ball screw	20mm	20mm
Motor output	100W	100W
Resolution	0.01mm	

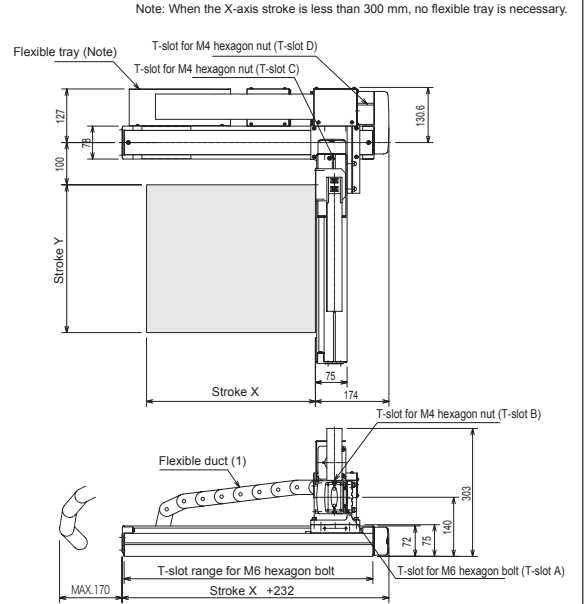
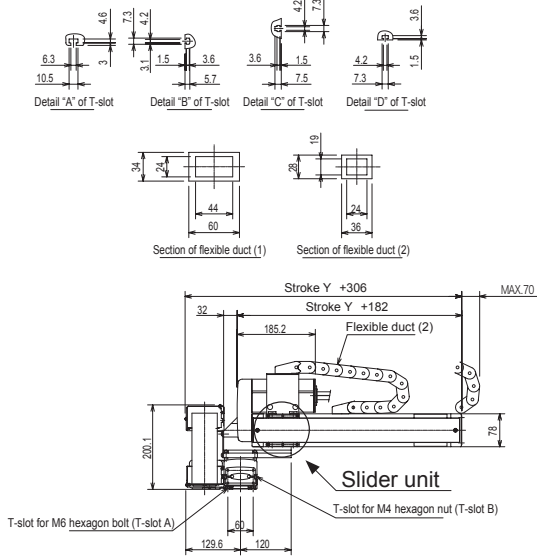
Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
X-axis	700	1000
	800	800
	900 ~ 1000	600

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

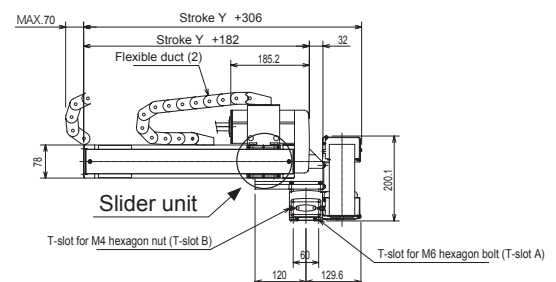
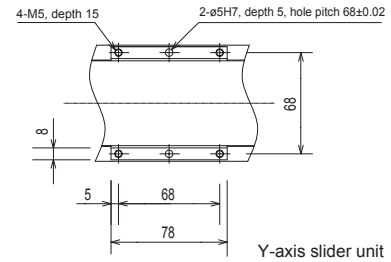
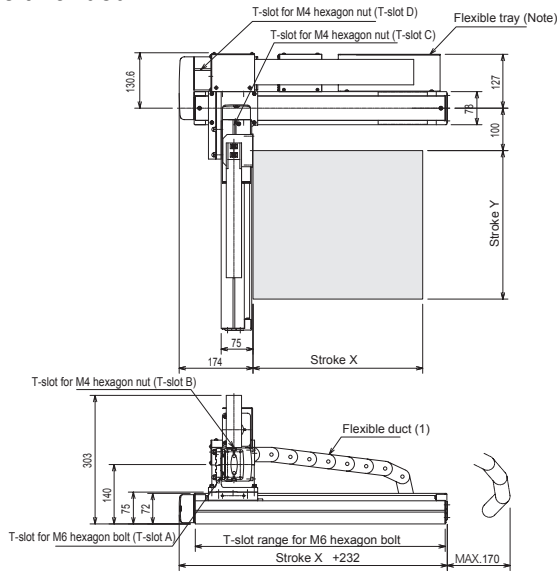
Maximum Payload (kg)	Y-axis stroke					
	150mm	250mm	350mm	450mm	550mm	650mm
	9.0	8.0	6.5	5.0	3.0	1.0

R: Right-handed



Note: When the X-axis stroke is less than 300 mm, no flexible tray is necessary.

L: Left-handed



[Set designation]

BA2 – A3 – A2A R A – 45 40 00 – OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed L: Left-handed	15 : 150mm 95 : 950mm A5 : 1050mm	10 : 100mm 80 : 800mm	0: None 1 : CA20-M10 Other: See page 21	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

X-axis: Ball screw driven
Motor straight
Y-axis: Ball screw driven
Motor straight

[Specifications]

	X-axis	Y-axis
Type of axis	BB30E-ST-M20N-□ 5	BB10E-ST-M20N-□ 0
Stroke (in increments of 100 mm)	150 ~ 1050mm	100 ~ 800mm
Maximum speed	1200mm/s (Note 1)	1200mm/s (Note 1)
Positioning repeatability	± 0.01mm	
Lead of ball screw	20mm	20mm
Motor output	100W	100W
Resolution	0.01mm	

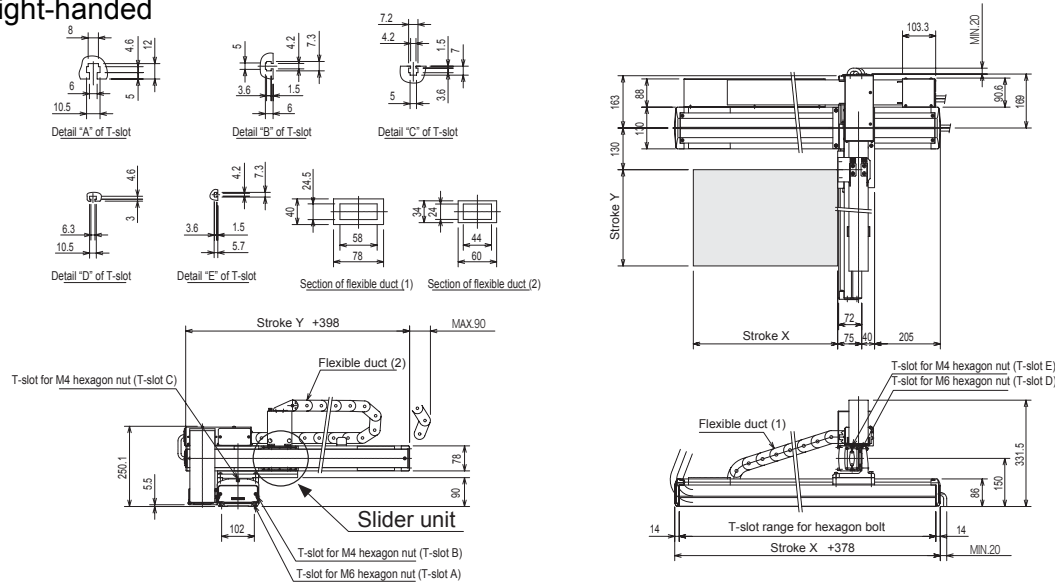
Acceleration/deceleration time when the maximum speed is set: 0.48 sec. or over

Note 1: When the stroke is as given below, the maximum speed differs.

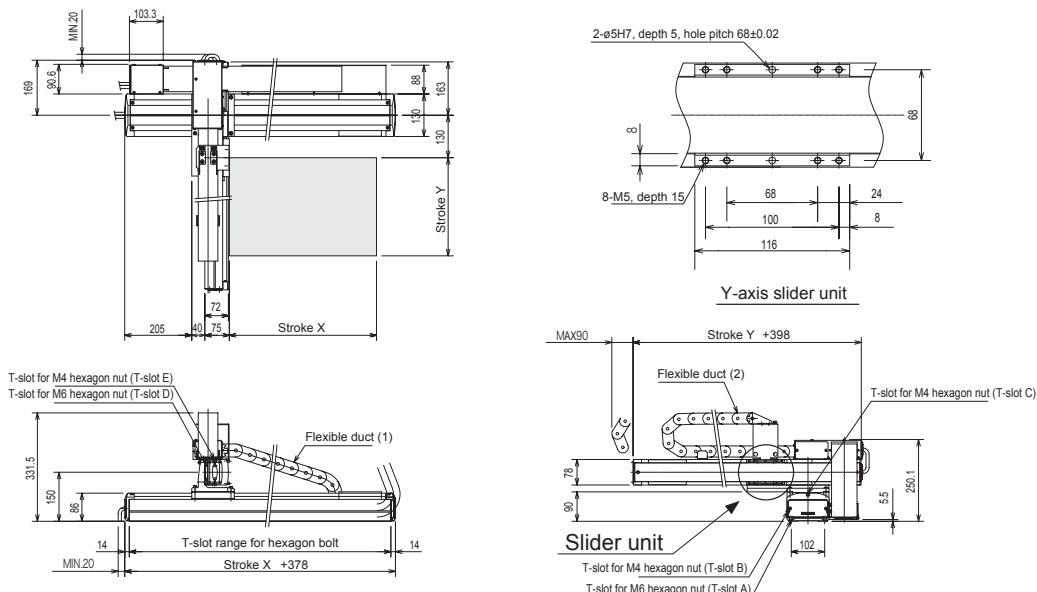
	Stroke (mm)	Maximum speed (mm/s)
X-axis	750	1000
	850	800
	950 ~ 1050	600
Y-axis	700	1000
	800	800

Maximum Payload (kg)	Y-axis stroke							
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm
	13.0	12.0	11.0	10.0	8.0	6.0	3.0	2.0

R: Right-handed



L: Left-handed



X-Y Flexible-duct Spec.

[Set designation]

BA2 - A3 - A2B R A - 40 40 00 - OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed	10 : 100mm	10 : 100mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm	80 : 800mm	1 : CA20-M10 Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

X-axis: Ball screw driven
Motor straight

Y-axis: Ball screw driven
Motor straight

[Specifications]

	X-axis	Y-axis
Type of axis	BB30F-ST-M20N-□0	BB10E-ST-M20N-□0
Stroke (in increments of 100 mm)	100 ~ 1000mm	100 ~ 800mm
Maximum speed	1200mm/s (Note 1)	1200mm/s (Note 1)
Positioning repeatability	± 0.01mm	
Lead of ball screw	20mm	20mm
Motor output	200W	100W
Resolution	0.01mm	

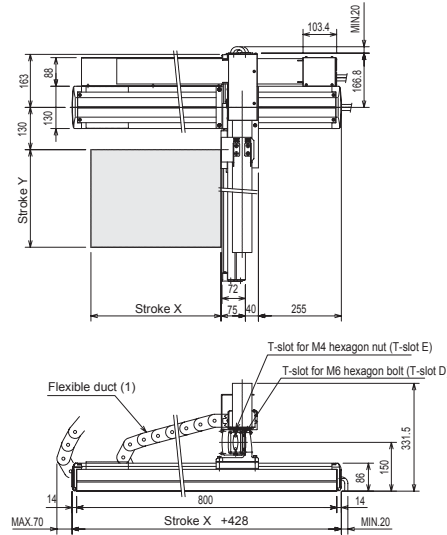
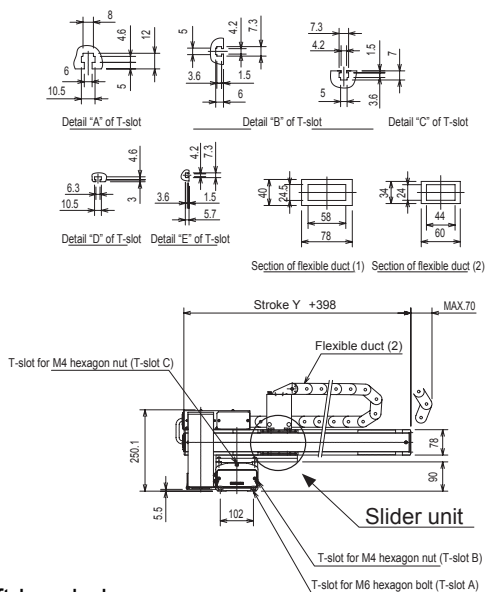
Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
X-axis	700	1000
	800	800
	900 ~ 1000	600
Y-axis	700	1000
	800	800

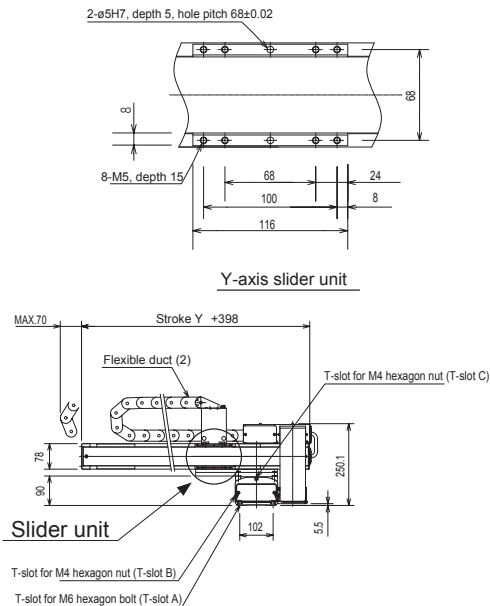
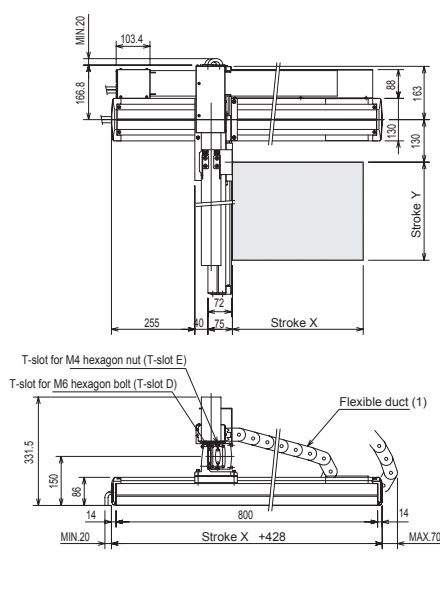
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg)	Y-axis stroke							
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm
	15.0	15.0	14.0	11.0	8.0	6.0	4.0	2.0

R: Right-handed



L: Left-handed



X-Y Flexible-duct Spec.

[Set designation]

BA2 - A3 - A2B R E - 40 40 00 - OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed L: Left-handed	10 : 100mm 90 : 900mm A0 : 1000mm	10 : 100mm 80 : 800mm	0: None 1 : CA20-M10 Other: See page 21	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

- X-axis: Ball screw driven
Motor straight
- Y-axis: Ball screw driven
Motor straight

[Specifications]

	X-axis	Y-axis
Type of axis	BB30F-U □ -M20N- □ 0	BB10E-U □ -M20N- □ 0
Stroke (in increments of 100 mm)	100 ~ 1000mm	100 ~ 800mm
Maximum speed	1200mm/ s (Note 1)	1200mm/ s (Note 1)
Positioning repeatability	± 0.01 mm	
Lead of ball screw	20mm	20mm
Motor output	200W	100W
Resolution	0.01mm	

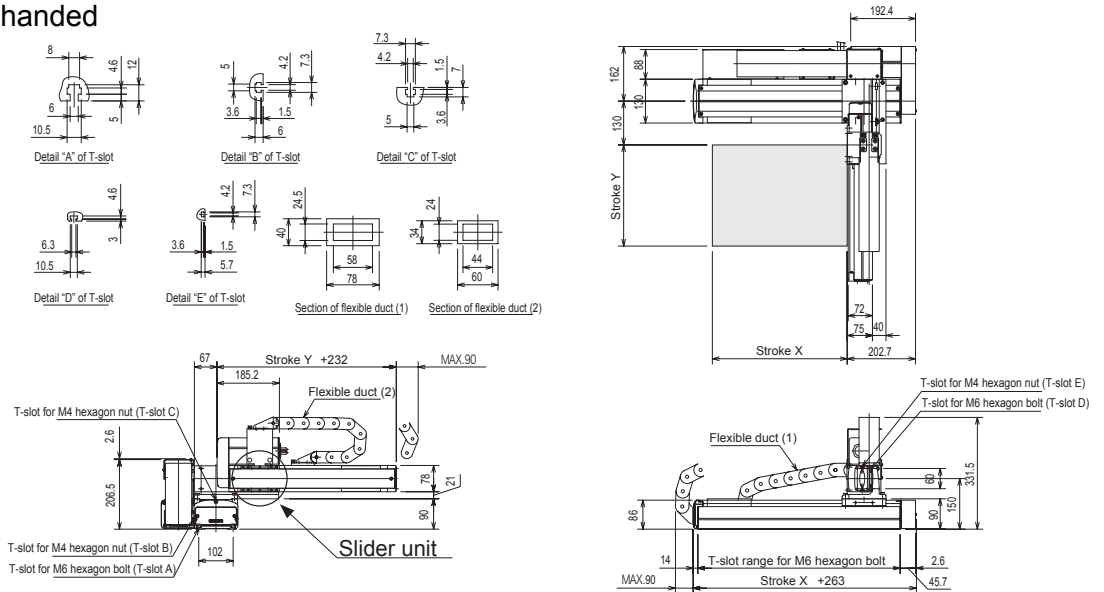
Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
X-axis	700	1000
	800	800
	900 ~ 1000	600
Y-axis	700	1000
	800	800

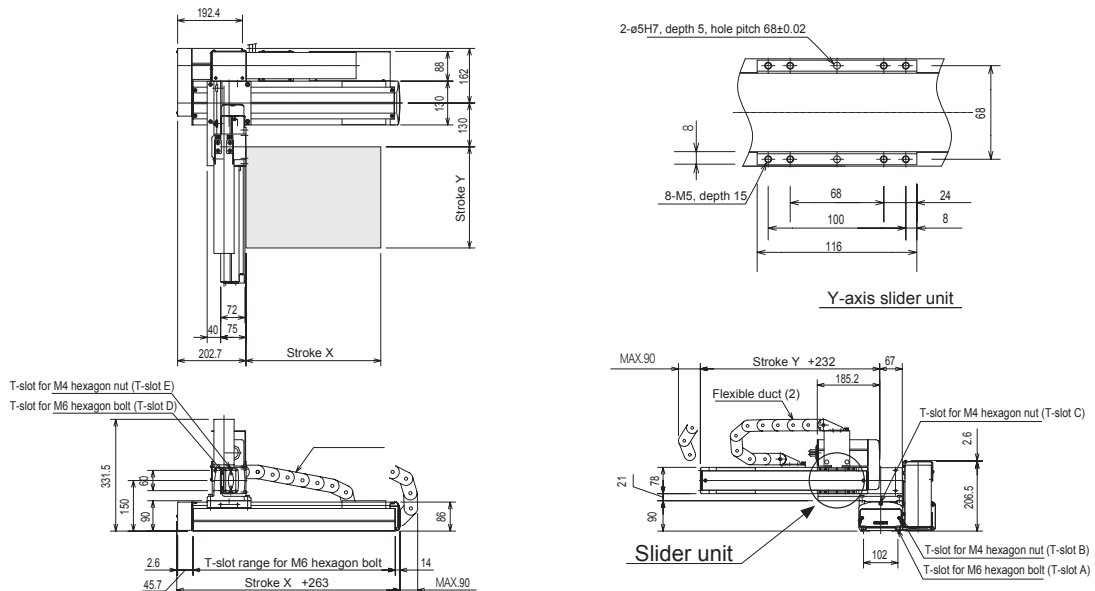
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg)	Y-axis stroke							
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm
	15.0	15.0	14.0	11.0	8.0	6.0	4.0	2.0

R: Right-handed



L: Left-handed



[Set designation]

BA2 – A5 – A2A R A – 40 45 00 – OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed	20 : 200mm	15 : 150mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm F0 : 1500mm	95 : 950mm A5 : 1050mm	1 : CA20-M10 Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

X-axis: Ball screw driven
Motor straight

Y-axis: Ball screw driven
Motor straight

Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
X-axis	700 ~ 800	1100
	900 ~ 1000	1000
	1100 ~ 1200	700
	1300	500
	1400	400
Y-axis	1500	300
	750	1000
	850	800
	950 ~ 1050	600

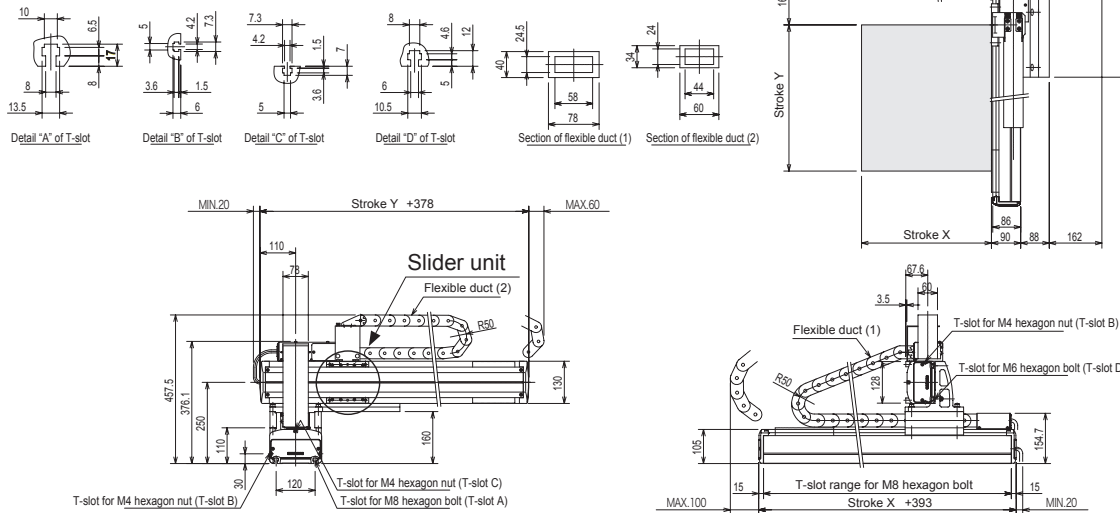
[Specifications]

	X-axis	Y-axis
Type of axis	BB50F-ST-M20N-□ 0	BB30E-ST-M20N-□ 5
Stroke (in increments of 100 mm)	200 ~ 1500mm	150 ~ 1050mm
Maximum speed	1200mm/s (Note 1)	1200mm/s (Note 1)
Positioning repeatability	± 0.01mm	
Lead of ball screw	20mm	20mm
Motor output	200W	100W
Resolution	0.01mm	

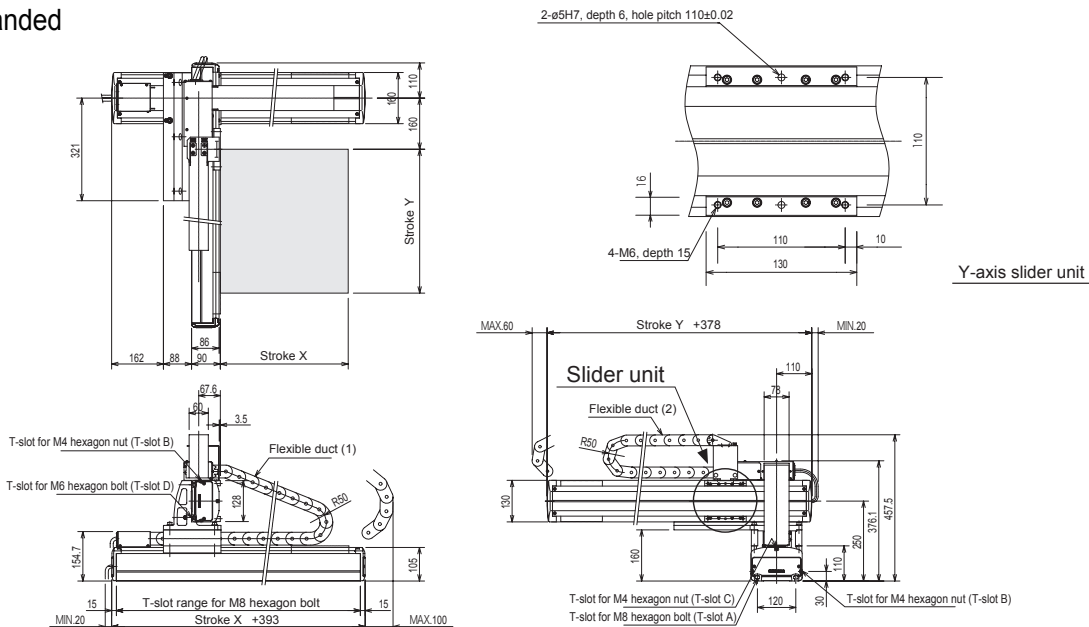
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg)	Y-axis stroke									
	150mm	250mm	350mm	450mm	550mm	650mm	750mm	850mm	950mm	1050mm
	20.0	20.0	20.0	20.0	20.0	20.0	19.0	17.0	14.0	11.0

R: Right-handed



L: Left-handed



Orthogonal Axes Specifications

[Set designation]

BA2 – A5 – A2A R G – 40 45 00 – OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed	20 : 200mm	15 : 150mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm F0 : 1500mm	95 : 950mm A5 : 1050mm	1 : CA20-M10 Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

X-axis: Ball screw driven
Motor straight

Y-axis: Ball screw driven
Motor straight

Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
X-axis	700 ~ 800	1100
	900 ~ 1000	1000
	1100 ~ 1200	700
	1300	500
	1400	400
Y-axis	1500	300
	750	1000
	850	800
	950 ~ 1050	600

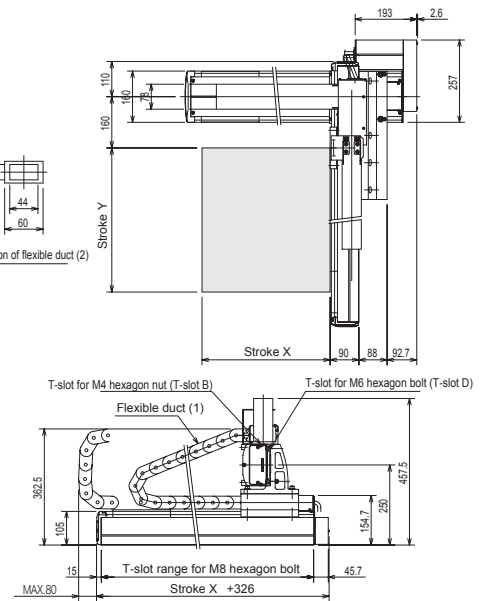
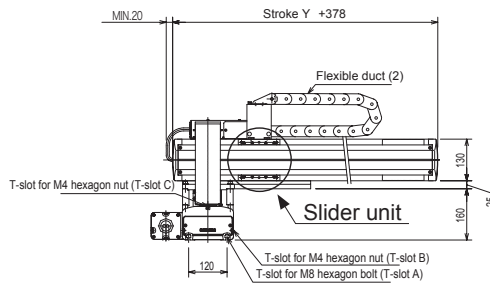
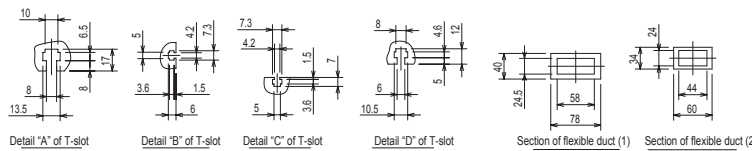
[Specifications]

	X-axis	Y-axis
Type of axis	BB50F-U □ -M20N- □ 0	BB30E-ST-M20N- □ 5
Stroke (in increments of 100 mm)	200 ~ 1500mm	150 ~ 1050mm
Maximum speed	1200mm/s (Note 1)	1200mm/s (Note 1)
Positioning repeatability	± 0.01mm	
Lead of ball screw	20mm	20mm
Motor output	200W	100W
Resolution	0.01mm	

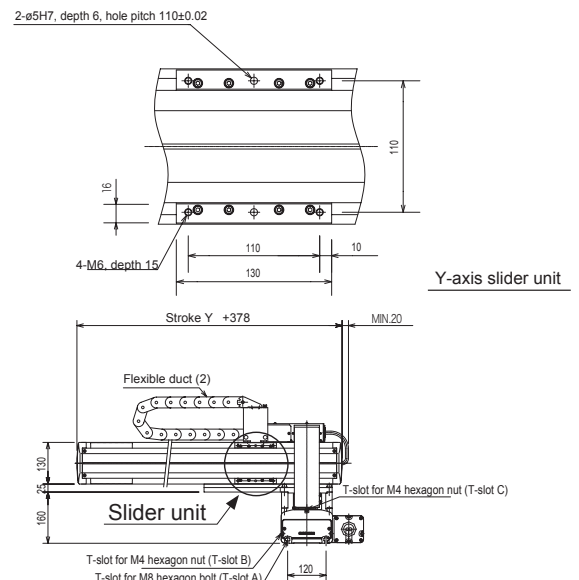
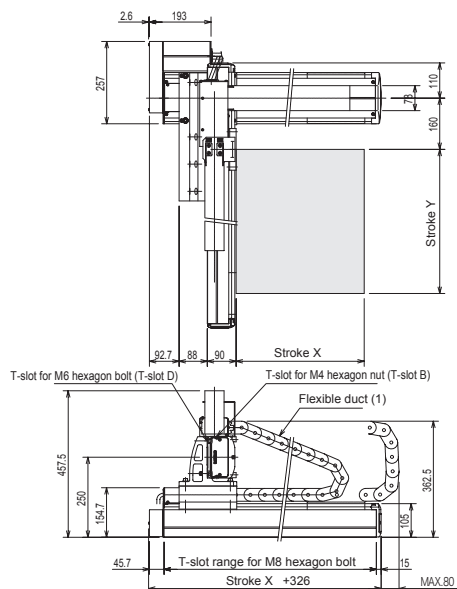
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg)	Y-axis stroke									
	150mm	250mm	350mm	450mm	550mm	650mm	750mm	850mm	950mm	1050mm
	20.0	20.0	20.0	20.0	20.0	20.0	19.0	17.0	14.0	11.0

R: Right-handed



L: Left-handed



X-Y Flexible-duct Spec. Space-saving type

[Set designation]

BA2 - A5 - A2B R A - 40 40 00 - OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed L: Left-handed	20 : 200mm 90 : 900mm A0 : 1000mm F0 : 1500mm	10 : 100mm 90 : 900mm A0 : 1000mm	0: None 1 : CA20-M10 Other: See page 21	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

X-axis: Ball screw driven
Motor straight

Y-axis: Ball screw driven
Motor straight

Note 1: When the stroke is as given below, the maximum speed differs.

[Specifications]

	X-axis	Y-axis
Type of axis	BB50F-ST-M20N-□ 0	BB30F-ST-M20N-□ 0
Stroke (in increments of 100 mm)	200 ~ 1500mm	100 ~ 1000mm
Maximum speed	1200mm/s (Note 1)	1200mm/s (Note 1)
Positioning repeatability	±0.01 mm	
Lead of ball screw	20mm	20mm
Motor output	200W	200W
Resolution	0.01 mm	

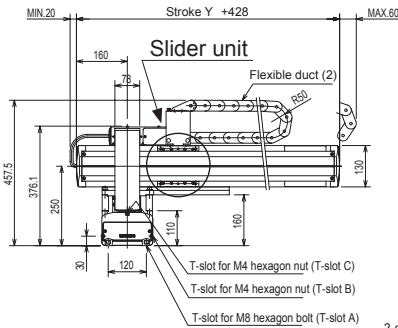
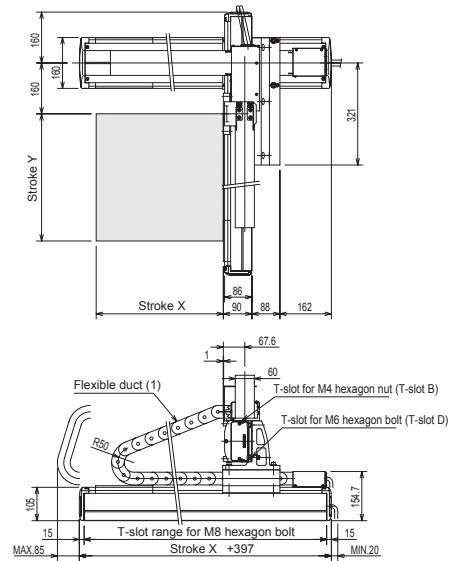
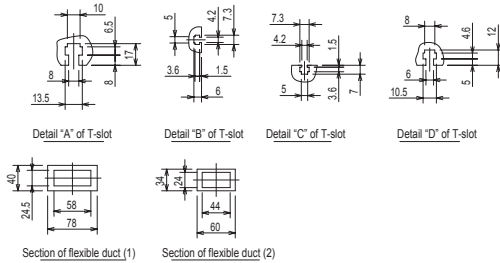
	Stroke (mm)	Maximum speed (mm/s)
X-axis	700 ~ 800	1100
	900 ~ 1000	1000
	1100 ~ 1200	700
	1300	500
	1400	400
Y-axis	1500	300
	700	1000
	800	800
	900 ~ 1000	600

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

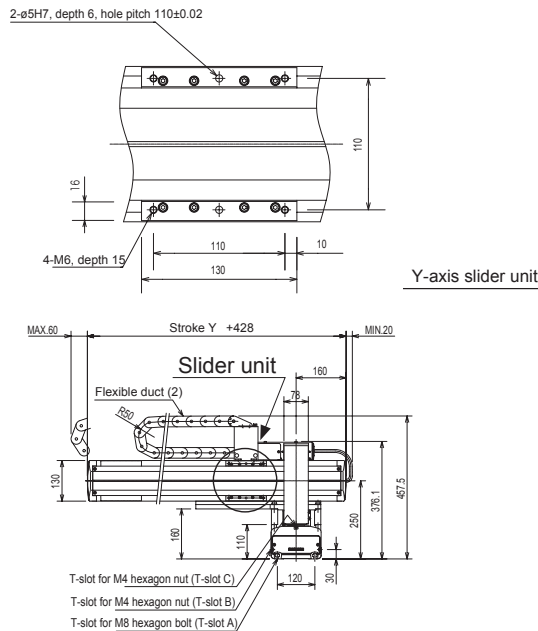
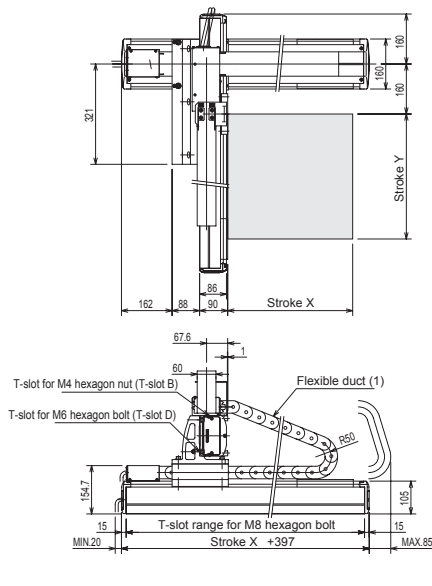
Maximum Payload (kg)	Y-axis stroke									
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm
	40.0 (31.0)	40.0 (30.0)	33.0 (29.0)	31.0 (28.0)	27.0	23.0	20.0	17.0	14.0	12.0

When the X-axis speed exceeds 1,000 m/s, the values in parentheses are used for the maximum Payload.

R: Right-handed



L: Left-handed



[Set designation]

BA2 – A5 – A2B R G – 40 40 00 – OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed L: Left-handed	20 : 200mm 90 : 900mm A0 : 1000mm F0 : 1500mm	10 : 100mm 90 : 900mm A0 : 1000mm	0: None 1 : CA20-M10 Other: See page 21	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

- X-axis: Ball screw driven
Motor straight
- Y-axis: Ball screw driven
Motor straight

Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
X-axis	700 ~ 800	1100
	900 ~ 1000	1000
	1100 ~ 1200	700
	1300	500
	1400	400
Y-axis	700	1000
	800	800
	900 ~ 1000	600

[Specifications]

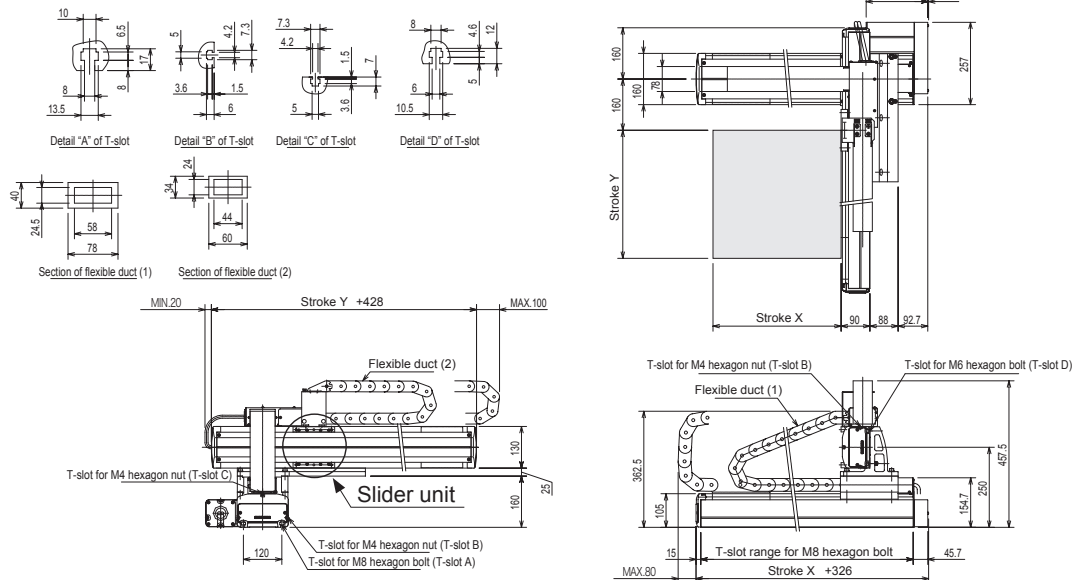
	X-axis	Y-axis
Type of axis	BB50F-U □ -M20N- □ 0	BB30F-ST-M20N- □ 0
Stroke (in increments of 100 mm)	200 ~ 1500mm	100 ~ 1000mm
Maximum speed	1200mm/s (Note 1)	1200mm/s (Note 1)
Positioning repeatability	±0.01 mm	
Lead of ball screw	20mm	20mm
Motor output	200W	200W
Resolution	0.01 mm	

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

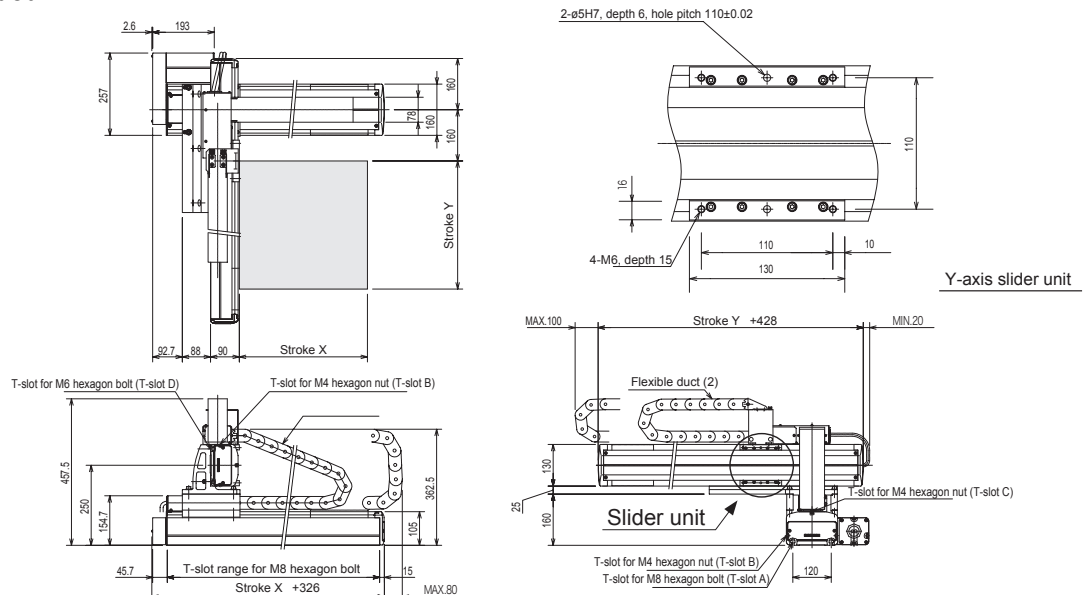
Maximum Payload (kg)	Y-axis stroke									
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm
	40.0 (31.0)	40.0 (30.0)	33.0 (29.0)	31.0 (28.0)	27.0	23.0	20.0	17.0	14.0	12.0

When the X-axis speed exceeds 1,000 m/s, the values in parentheses are used for the maximum Payload.

R: Right-handed



L: Left-handed



[Set designation]

BA2 - A5 - A2FR A - 40 40 00 - OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed	20 : 200mm	20 : 200mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm F0 : 1500mm	90 : 900mm A0 : 1000mm	1 : CA20-M40 Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

- X-axis: Ball screw driven
Motor straight
- Y-axis: Ball screw driven
Motor straight

[Specifications]

	X-axis	Y-axis
Type of axis	BB50G-ST-M20N-□ 0	BB50F-ST-M20N-□ 0
Stroke (mm) (in increments of 100 mm)	200 ~ 1500	200 ~ 1000
Maximum speed (mm/s)	1200 (Note 1)	1200 (Note 1)
Positioning repeatability (mm)	± 0.01	
Lead of ball screw (mm)	20	20
Motor output	400W	200W
Resolution (mm)	0.01	

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

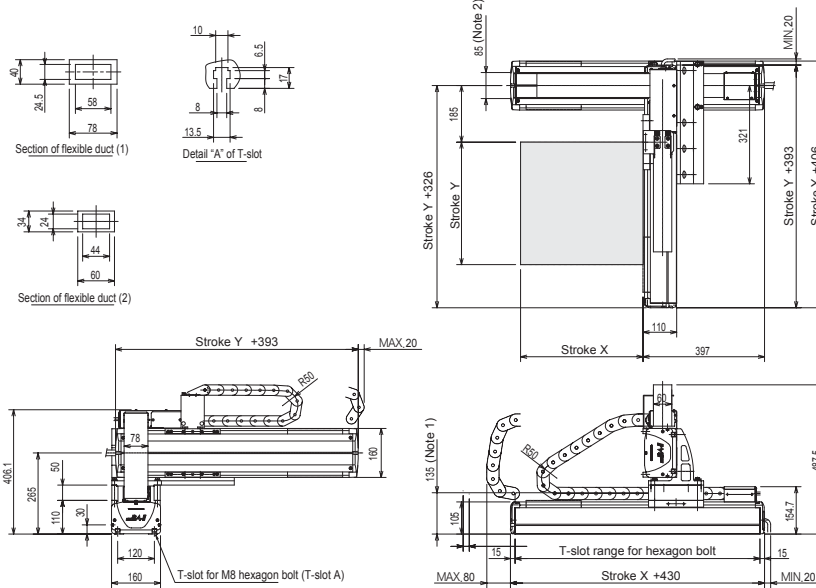
Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
X-axis	700 ~ 800	1100
	900 ~ 1000	1000
	1100 ~ 1200	700
	1300	500
	1400	400
Y-axis	700 ~ 800	1100
	900 ~ 1000	1000

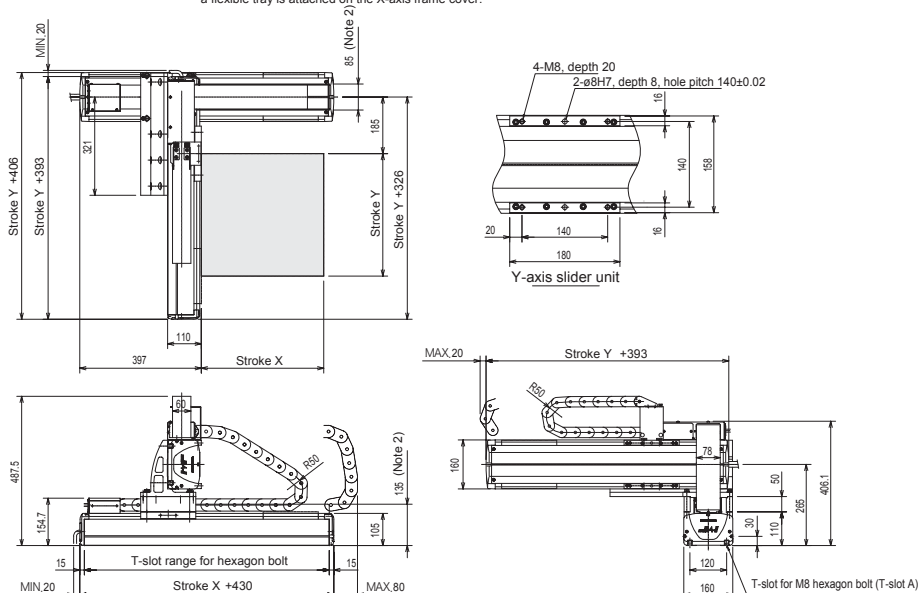
Maximum Payload (kg)	Y-axis stroke									
	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm	
	60.0 (50.0)	53.5 (50.0)	45.0	38.0	32.5	27.5	23.0	19.0	13.0	

The regenerative discharge unit ABSU-4000 is required for X-axis.
When the Y-axis speed exceeds 1,000 m/s, the values in parentheses are used for the maximum Payload.

R: Right-handed



L: Left-handed



Orthogonal Axes Specifications

[Set designation]

BA2 - A6 - A2 ERA - 40 40 00 - OF 6 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed	20 : 200mm	20 : 200mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm H0 : 1700mm	90 : 900mm A0 : 1000mm F0 : 1500mm	6 : CA20-M00-0V Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

X-axis: Ball screw driven
Motor straight

Y-axis: Ball screw driven
Motor straight

Note 1: When the stroke is as given below, the maximum speed differs.

[Specifications]

	X-axis	Y-axis
Type of axis	BB60J-ST-M20N-□ 0	BB50G-ST-M20N-□ 0
Stroke (mm) (in increments of 100 mm)	200 ~ 1700	200 ~ 1500
Maximum speed (mm/s)	900 (Note 1)	1200 (Note 1)
Positioning repeatability (mm)	± 0.01	
Lead of ball screw (mm)	20	20
Motor output	750W	400W
Resolution (mm)	0.01	

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

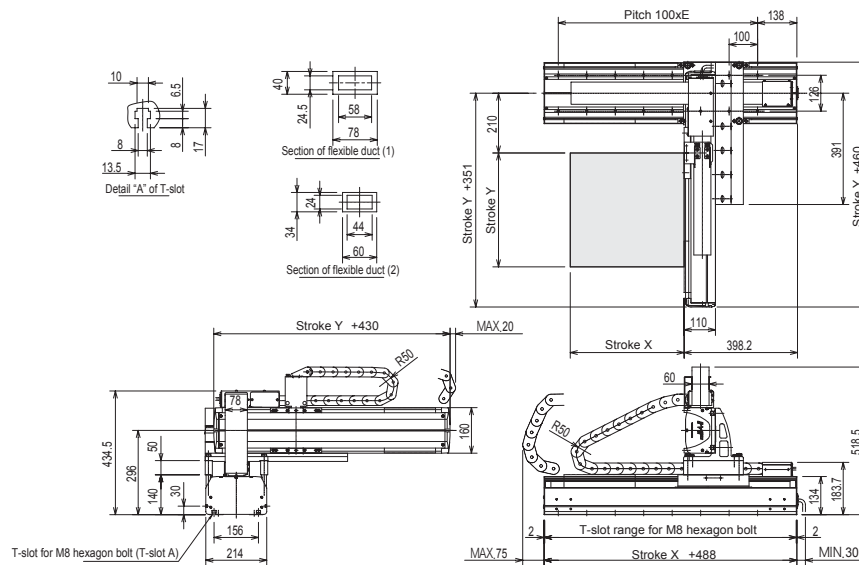
	Stroke (mm)	Maximum speed (mm/s)
X-axis	1100	700
	1200	600
	1300	500
	1400 ~ 1500	400
Y-axis	1600 ~ 1700	300
	700 ~ 800	1100
	900 ~ 1000	1000
	1100 ~ 1200	700
	1300	500
	1400	400
	1500	300

Maximum Payload (kg)	Y-axis stroke													
	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm	1100mm	1200mm	1300mm	1400mm	1500mm
	100.0	100.0	89.0	77.5	68.0	60.0	53.0	47.0	42.0	33.0	26.0	21.0	17.0	14.0

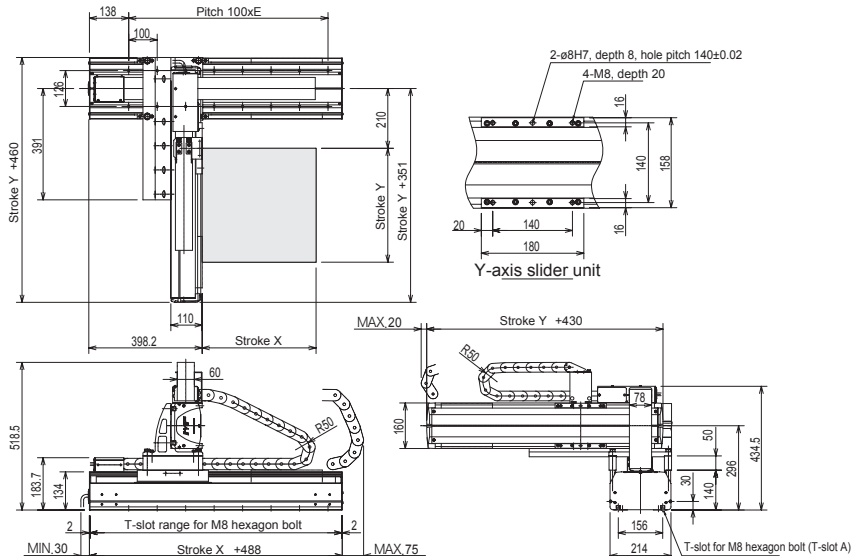
Regenerative discharge units are required for all axes.

- 1) X-axis: Regenerative discharge unit Model: RGH200A 30Q
- 2) Y-axis: Regenerative discharge unit Model: ABSU-4000

R: Right-handed



L: Left-handed



[Set designation]

BA2 - L1 - A2A RC - 40 45 00 - OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed	10 : 100mm	15 : 150mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm	65 : 650mm	1 : CA20-M10 Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m
	H0 : 1700mm J0 : 1800mm			

Timing belt type

X-axis: Ball screw driven
Motor straight

Y-axis: Ball screw driven
Motor straight

[Specifications]

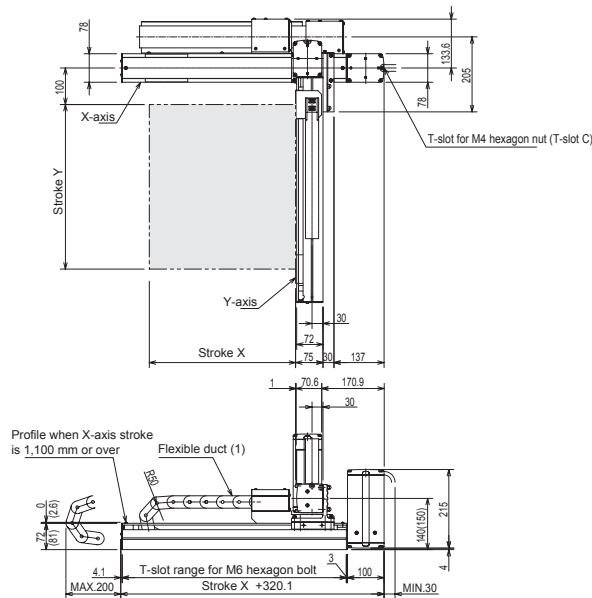
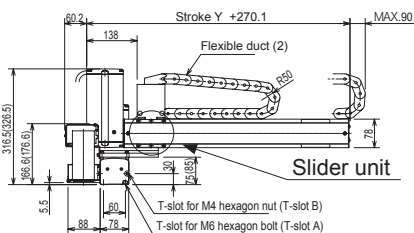
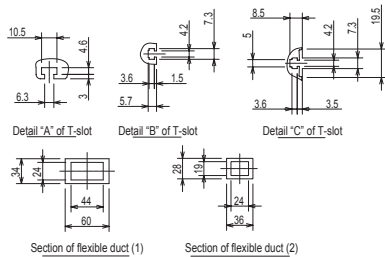
	X-axis	Y-axis
Type of axis	BB10E-BT-M21N-□ 0	BB10E-B □ -S21N-□ 5
Stroke (in increments of 100 mm)	100 ~ 1800mm	150 ~ 650mm
Maximum speed	1000mm/s	1000mm/s
Positioning repeatability	± 0.05mm	
Lead	21mm	21mm
Motor output	100W	100W
Resolution	0.01mm	

Acceleration/deceleration time when the maximum speed is set: 0.4 sec. or over

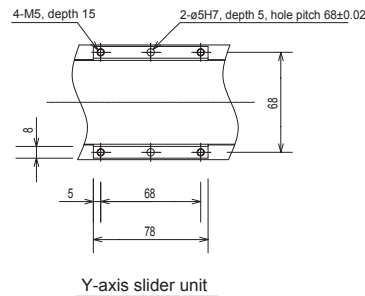
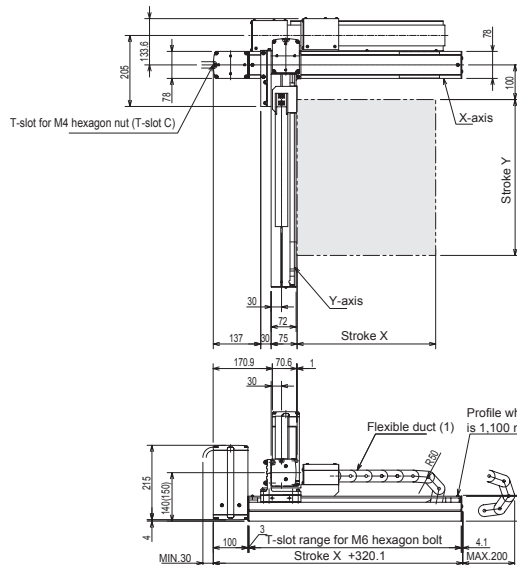
Maximum Payload (kg)	Y-axis stroke					
	150mm	250mm	350mm	450mm	550mm	650mm
	8.0	8.0	6.0	5.0	3.0	1.0

R: Right-handed

The values in parentheses are applicable when the X-axis stroke is 1,100 mm or over.



L: Left-handed



Orthogonal Axes Specifications

[Set designation]

BA2 - L1 - A2B RC - 40 45 00 - OF 1 3

Timing belt type

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed	10 : 100mm	15 : 150mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm H0 : 1700mm J0 : 1800mm	65 : 650mm	1 : CA20-M10 Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

X-axis: Ball screw driven
Motor straight

Y-axis: Ball screw driven
Motor straight

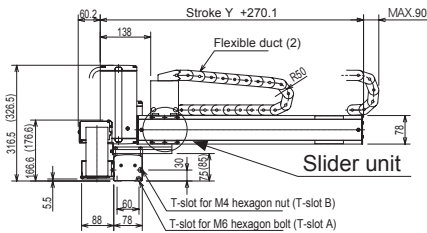
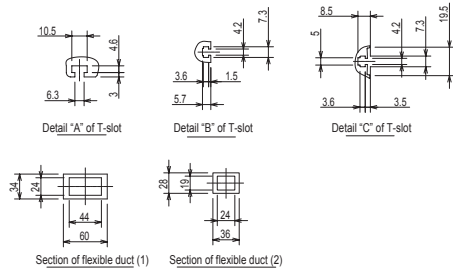
[Specifications]

	X-axis	Y-axis
Type of axis	BB10F-BT-M21N-□ 0	BB10E-B □ -S21N-□ 5
Stroke (in increments of 100 mm)	100 ~ 1800mm	150 ~ 650mm
Maximum speed	1000mm/ s	1000mm/ s
Positioning repeatability	± 0.05mm	
Lead	21 mm	21 mm
Motor output	200W	100W
Resolution	0.01mm	

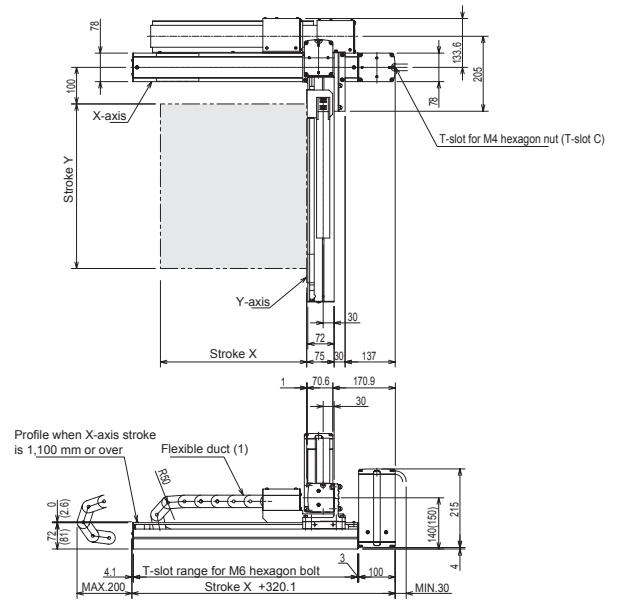
Acceleration/deceleration time when the maximum speed is set: 0.3 sec. or over

Maximum Payload (kg)	Y-axis stroke					
	150mm	250mm	350mm	450mm	550mm	650mm
	9.0	8.0	6.0	5.0	3.0	1.0

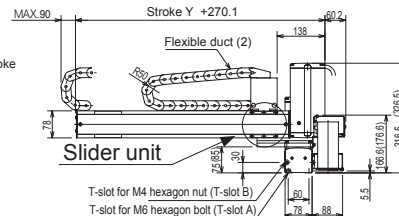
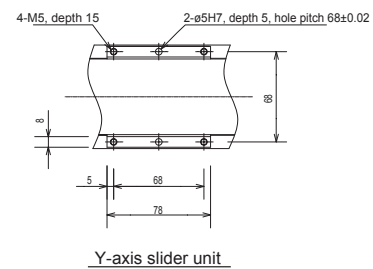
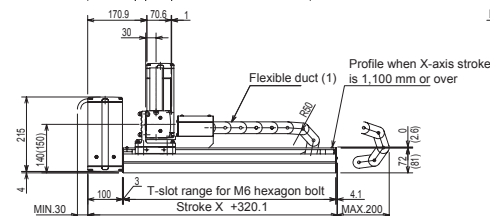
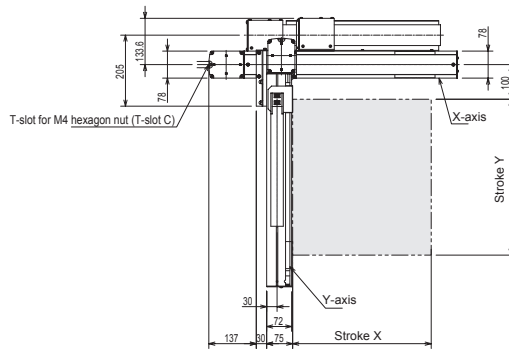
R: Right-handed



The values in parentheses are applicable when the X-axis stroke is 1,100 mm or over.



L: Left-handed



Orthogonal Axes Specifications

[Set designation]

BA2 - L3 - A2B R C - 40 40 00 - OF 1 3

Timing belt type

- X-axis: Ball screw driven
Motor straight
- Y-axis: Ball screw driven
Motor straight

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed	10 : 100mm JO : 1800mm	10 : 100mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm NO : 2200mm AO : 1000mm PO : 2300mm	80 : 800mm	1 : CA20-M10 Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m
	H0 : 1700mm R0 : 2500mm			

[Specifications]

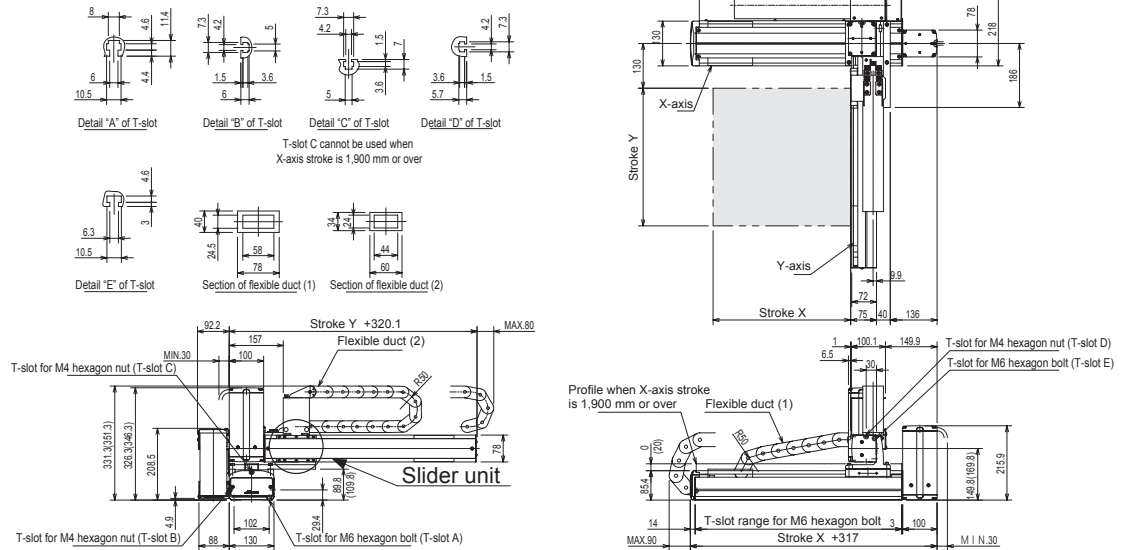
	X-axis	Y-axis
Type of axis	BB30F-BT-M21N-□ 0	BB10E-B □ -M21N-□ 0
Stroke (in increments of 100 mm)	100 ~ 2500mm	100 ~ 800mm
Maximum speed	1000mm/s	1000mm/s
Positioning repeatability	± 0.05mm	
Lead	21 mm	21 mm
Motor output	200W	100W
Resolution	0.01 mm	

Acceleration/deceleration time when the maximum speed is set: 0.3 sec. or over

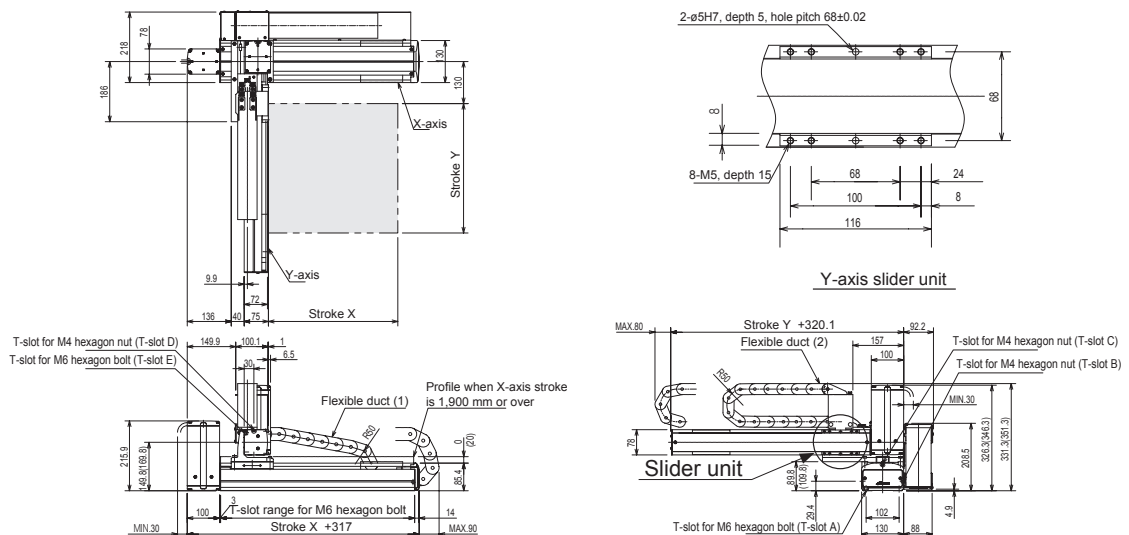
Maximum Payload (kg)	Y-axis stroke							
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm
	15.0	15.0	14.0	11.0	8.0	6.0	4.0	2.0

R: Right-handed

The values in parentheses are applicable when the X-axis stroke is 1,900 mm or over.



L: Left-handed



[Set designation]

BA2 - L3 - A2C RC - 40 40 00 - OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed	10 : 100mm JO : 1800mm	10 : 100mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm AO : 1000mm ? : ?	80 : 800mm	1 : CA20-M10 Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m
	H0 : 1700mm R0 : 2500mm			

Timing belt type

X-axis: Ball screw driven
Motor straight

Y-axis: Ball screw driven
Motor straight

[Specifications]

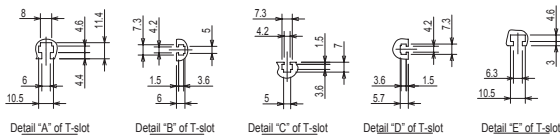
	X-axis	Y-axis
Type of axis	BB30F-BT-M21N-□ 0	BB10F-B □ -M21N-□ 0
Stroke (in increments of 100 mm)	100 ~ 2500mm	100 ~ 800mm
Maximum speed	1000mm/ s	1000mm/ s
Positioning repeatability	± 0.05mm	
Lead	21 mm	21 mm
Motor output	200W	200W
Resolution	0.01 mm	

Acceleration/deceleration time when the maximum speed is set: 0.3 sec. or over

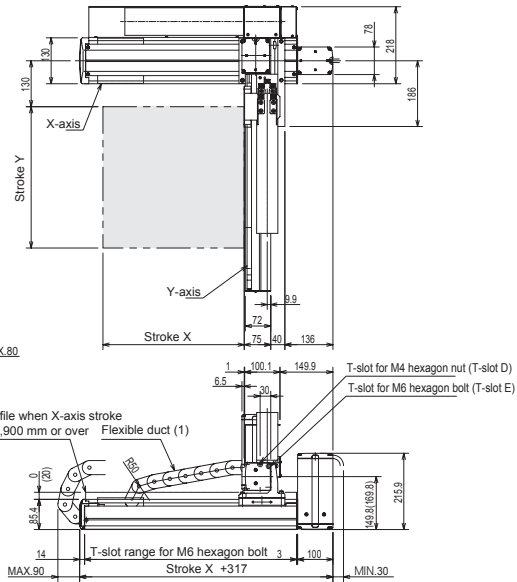
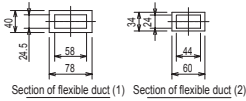
Maximum Payload (kg)	Y-axis stroke							
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm
	20.0	18.0	14.0	11.0	8.0	6.0	4.0	2.0

R: Right-handed

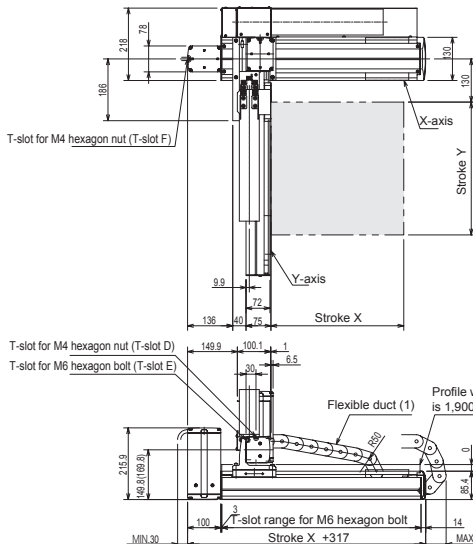
The values in parentheses are applicable when the X-axis stroke is 1,900 mm or over.



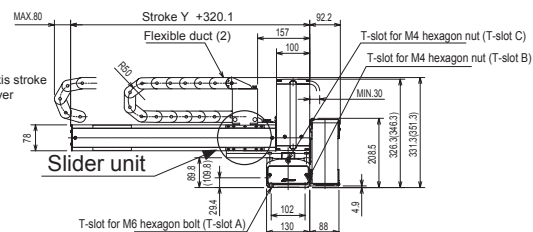
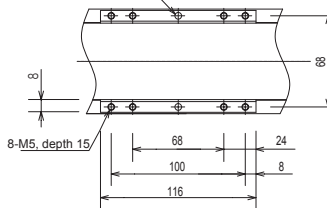
T-slot C cannot be used when X-axis stroke is 1,900 mm or over



L: Left-handed



2-øH7, depth 5, hole pitch 68±0.02



[Set designation]

BA2 - L5 - A2A R C - 40 40 00 - OF 1 3

Timing belt type

X-axis: Ball screw driven
Motor straight

Y-axis: Ball screw driven
Motor straight

Combined operation	Axis 1 stroke		Axis 2 stroke		Controller		Cable length	
R: Right-handed	20 : 200mm	J0 : 1800mm	10 : 100mm		0: None		3 : 3m	9 : 9m
L: Left-handed	90 : 900mm	N0 : 2200mm	90 : 900mm		1 : CA20-M10		5 : 5m	B : 11m
	A0 : 1000mm	P0 : 2300mm	A0 : 1000mm		Other: See page 21		7 : 7m	D : 13m
	H0 : 1700mm	RO : 2500mm						

[Specifications]

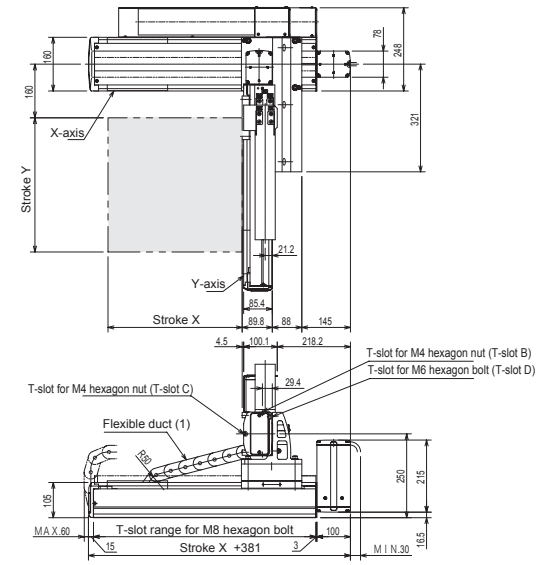
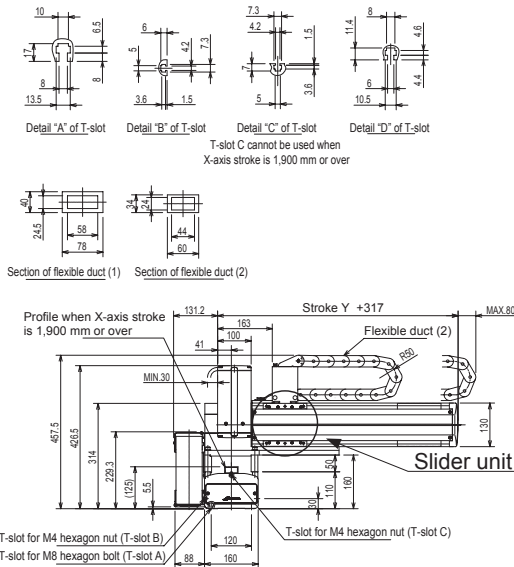
	X-axis	Y-axis
Type of axis	BB50F-BT-M21N-□ 0	BB30E-B□ -M21N-□ 0
Stroke (in increments of 100 mm)	200 ~ 2500mm	100 ~ 1000mm
Maximum speed	1000mm/s	1000mm/s
Positioning repeatability	± 0.05mm	
Lead	21mm	21mm
Motor output	200W	100W
Resolution	0.01mm	

Acceleration/deceleration time when the maximum speed is set: 0.3 sec. or over

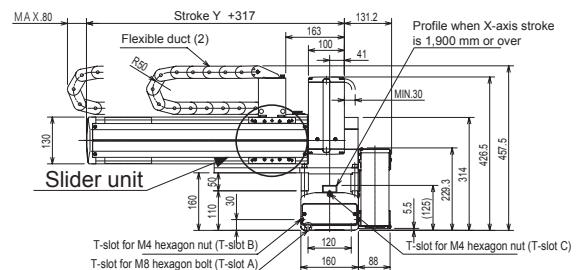
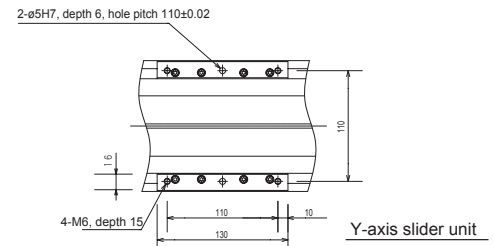
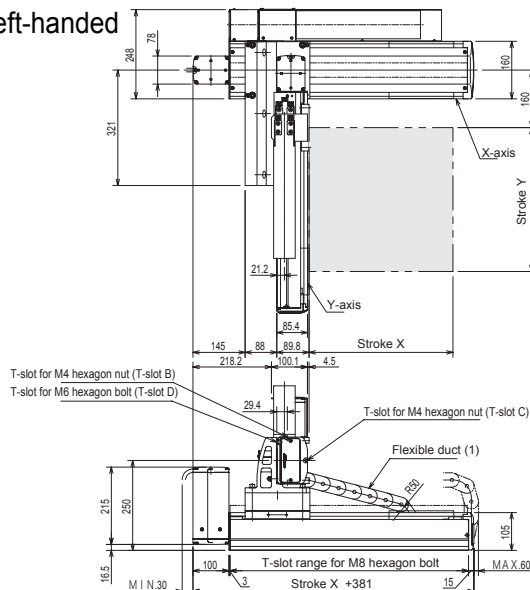
Maximum Payload (kg)	Y-axis stroke									
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm
	15.0	15.0	15.0	15.0	15.0	15.0	15.0	13.0	12.0	11.0

R: Right-handed

The values in parentheses are applicable when the X-axis stroke is 1,900 mm or over.



L: Left-handed



[Set designation]

BA2 – L5 – A2B R C – 40 40 00 – OF 1 3

Combined operation R: Right-handed L: Left-handed	Axis 1 stroke 20 : 200mm 90 : 900mm A0 : 1000mm H0 : 1700mm	Axis 2 stroke JO : 1800mm ? : 2200mm PO : 2300mm RO : 2500mm	Axis 2 stroke 10 : 100mm ? : 900mm A0 : 1000mm	Controller 0: None 1 : CA20-M10 Other: See page 21	Cable length 3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m
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Timing belt type

X-axis: Ball screw driven
Motor straight

Y-axis: Ball screw driven
Motor straight

[Specifications]

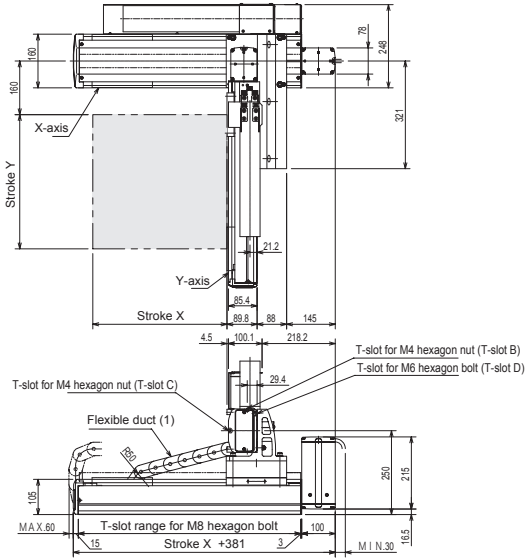
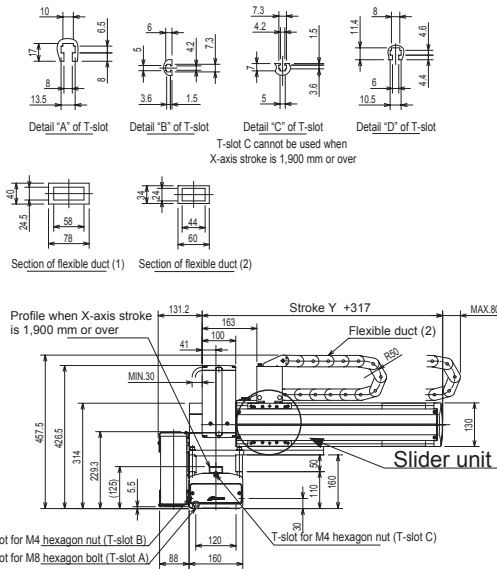
	X-axis	Y-axis
Type of axis	BB50F-BT-M21N-□ 0	BB30F-B□ -M21N-□ 0
Stroke (in increments of 100 mm)	200 ~ 2500mm	100 ~ 1000mm
Maximum speed	1000mm/s	1000mm/s
Positioning repeatability	± 0.05mm	
Lead	21mm	21mm
Motor output	200W	200W
Resolution	0.01mm	

Acceleration/deceleration time when the maximum speed is set: 0.3 sec. or over

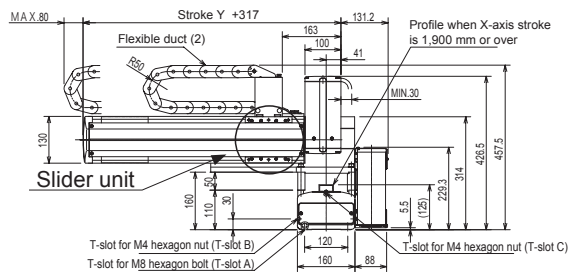
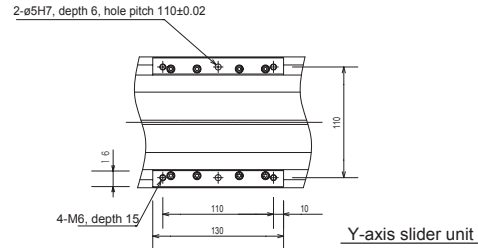
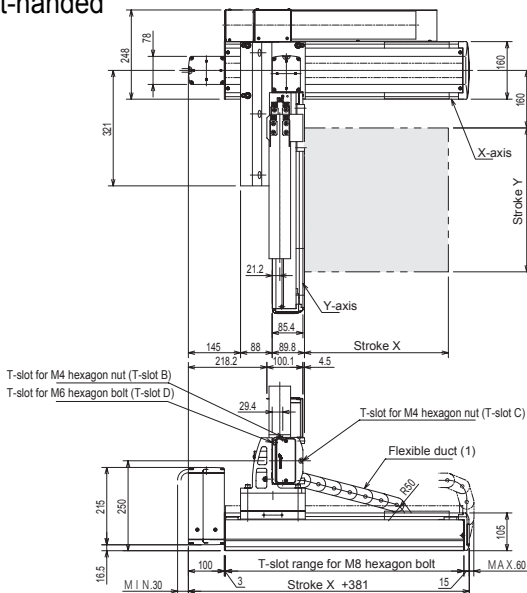
Maximum Payload (kg)	Y-axis stroke									
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm
	20.0	19.0	18.0	17.0	16.0	15.0	14.0	13.0	12.0	10.0

R: Right-handed

The values in parentheses are applicable when the X-axis stroke is 1,900 mm or over.



L: Left-handed



X-Y Flexible-duct Spec.

[Set designation]

BA2 - A1 - B2A S A - 40 45 00 - OF 1 3

Combined operation S: Right-handed M: Left-handed	Axis 1 stroke 10 : 100mm 90 : 950mm A0 : 1000mm	Axis 2 stroke 15 : 150mm 45 : 450mm	Controller 0: None 1 : CA20-M10 Other: See page 21	Cable length 3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m
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Ball screw type

- X-axis: Ball screw driven
Motor straight
- Z-axis: Ball screw driven
Motor straight

[Specifications]

	X-axis	Z-axis
Type of axis	BB10E-ST-M20N-□0	BB10E-ST-S10B-□5
Stroke (in increments of 100 mm)	100 ~ 1000mm	150 ~ 450mm
Maximum speed	1200mm/s (Note 1)	600mm/s
Positioning repeatability	±0.01mm	
Lead	20mm	10mm
Motor output	100W	100W, with brake
Resolution	0.01mm	

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

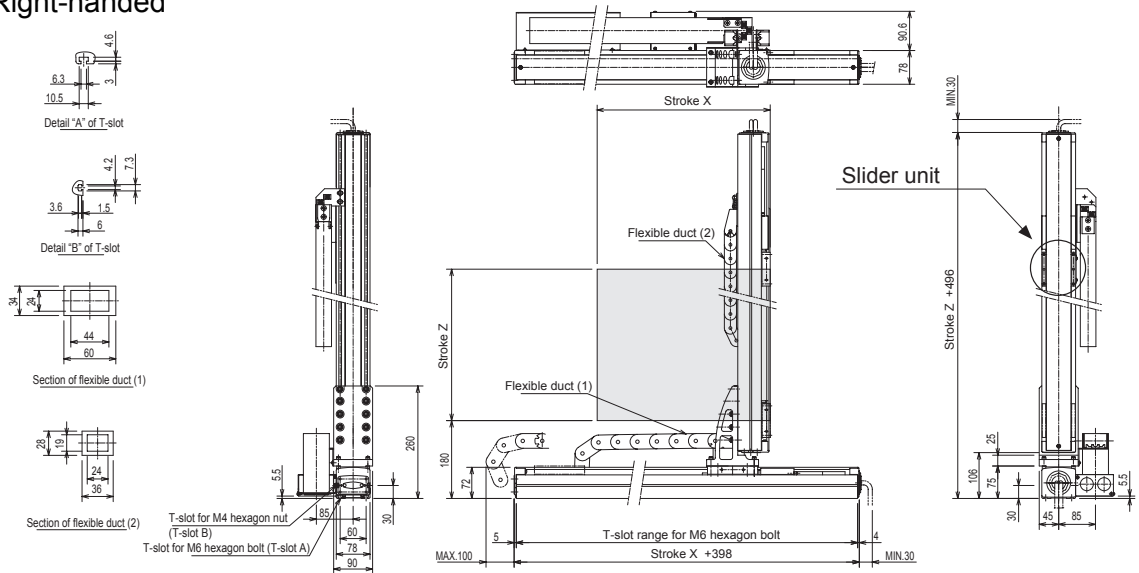
Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
X-axis	700	1000
	800	800
	900 ~ 1000	600

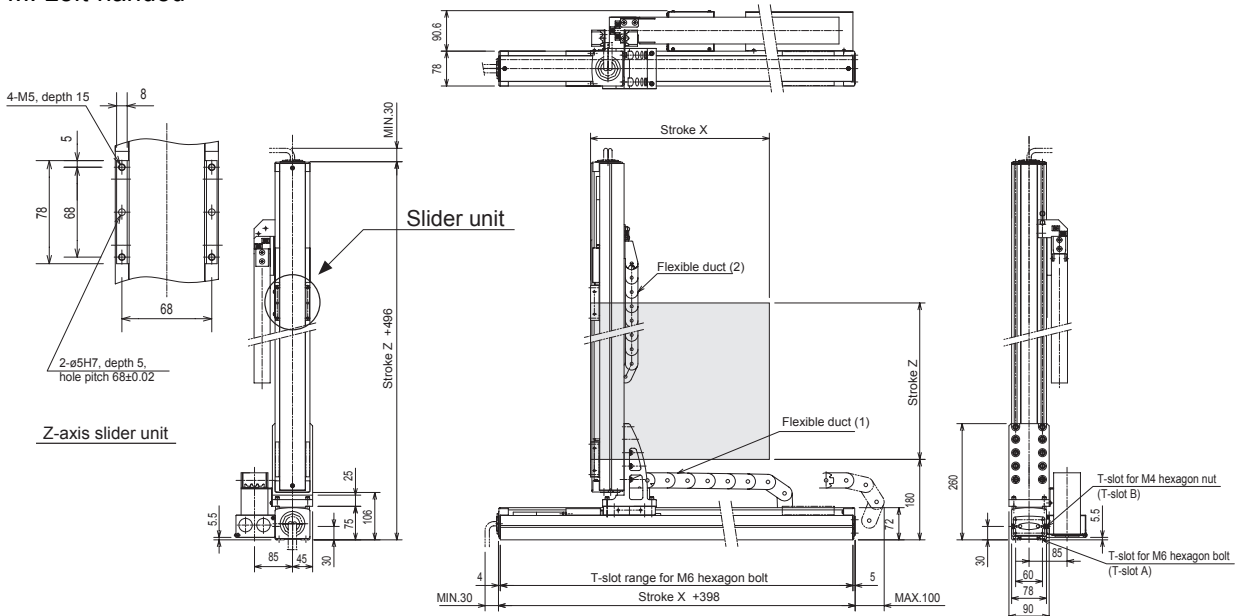
Maximum Payload (kg) (Note 2)	Z-axis stroke			
	150mm	250mm	350mm	450mm
	8.0	6.0	4.0	2.0

Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

S: Right-handed



M: Left-handed



[Set designation]

BA2 – A3 – B2A S A – 45 40 00 – OF 1 3

Combined operation S: Right-handed M: Left-handed	Axis 1 stroke 15 : 150mm 95 : 950mm A5 : 1050mm	Axis 2 stroke 10 : 100mm 70 : 700mm	Controller 0: None 1 : CA20-M10 Other: See page 21	Cable length 3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m
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Ball screw type

- X-axis: Ball screw driven
Motor straight
- Z-axis: Ball screw driven
Motor straight

[Specifications]

	X-axis	Z-axis
Type of axis	BB30E-ST-M20N-□ 5	BB10E-ST-M10B-□ 0
Stroke (in increments of 100 mm)	150 ~ 1050mm	100 ~ 700mm
Maximum speed	1200mm/s (Note 1)	600mm/s (Note 1)
Positioning repeatability	± 0.01 mm	
Lead	20mm	10mm
Motor output	100W	100W, with brake
Resolution	0.01 mm	

Acceleration/deceleration time when the maximum speed is set: 0.6 sec. or over

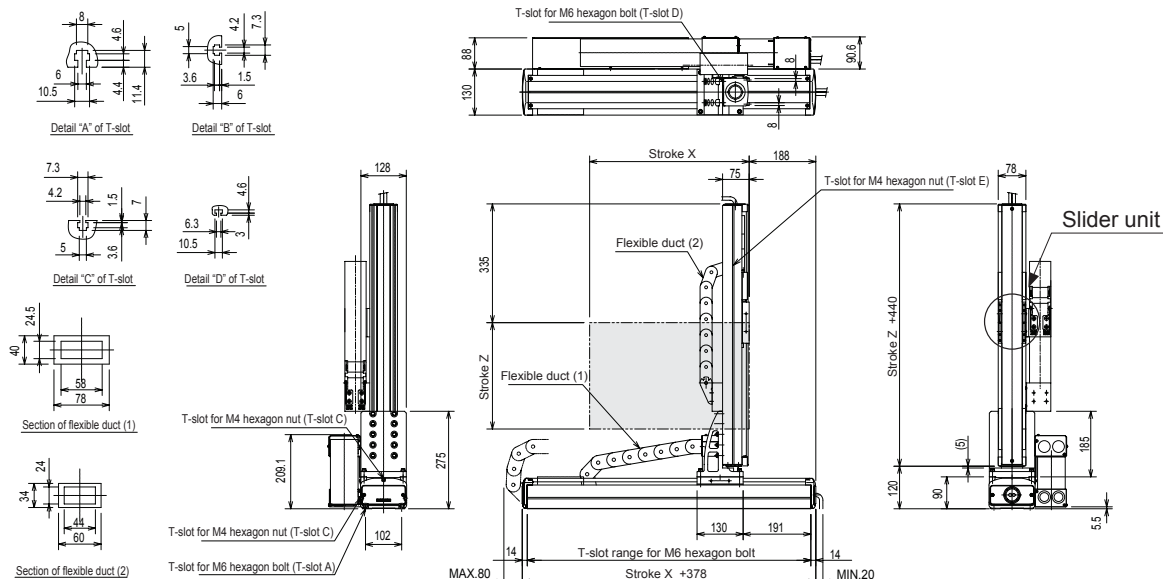
Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
X-axis	750	1000
	850	800
	950 ~ 1050	600
Z-axis	700	500

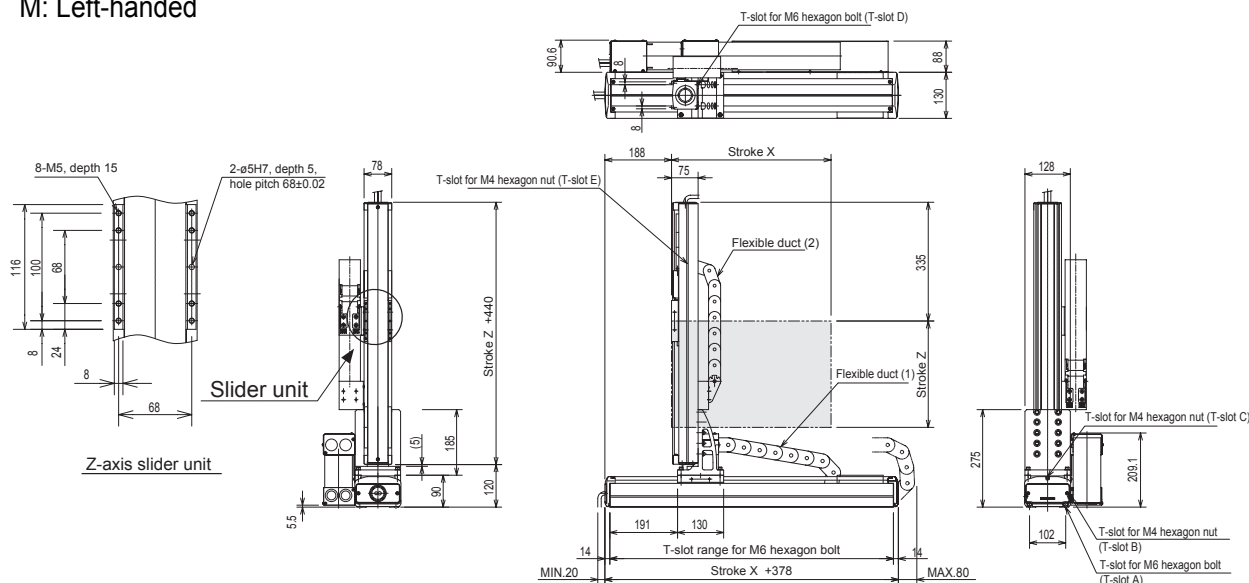
Maximum Payload (kg) (Note 2)	Z-axis stroke						
	100mm	200mm	300mm	400mm	500mm	600mm	700mm
	9.0	8.0	8.0	8.0	6.0	4.0	2.0

Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

S: Right-handed



M: Left-handed



X-Z Flexible-duct Spec.

[Set designation]

BA2 – A3 – B2B S A – 40 40 00 – OF 1 3

Combined operation S: Right-handed M: Left-handed	Axis 1 stroke 10 : 100mm 90 : 900mm A0 : 1000mm	Axis 2 stroke 10 : 100mm 90 : 900mm	Controller 0: None 1 : CA20-M10 Other: See page 21	Cable length 3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m
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Ball screw type

- X-axis: Ball screw driven
Motor straight
- Z-axis: Ball screw driven
Motor straight

[Specifications]

	X-axis	Z-axis
Type of axis	BB30F-ST-M20N-□0	BB10E-ST-M10B-□0
Stroke (in increments of 100 mm)	100 ~ 1000mm	100 ~ 900mm
Maximum speed	1200mm/s (Note 1)	600mm/s (Note 1)
Positioning repeatability	± 0.01mm	
Lead	20mm	10mm
Motor output	200W	100W, with brake
Resolution	0.01mm	

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

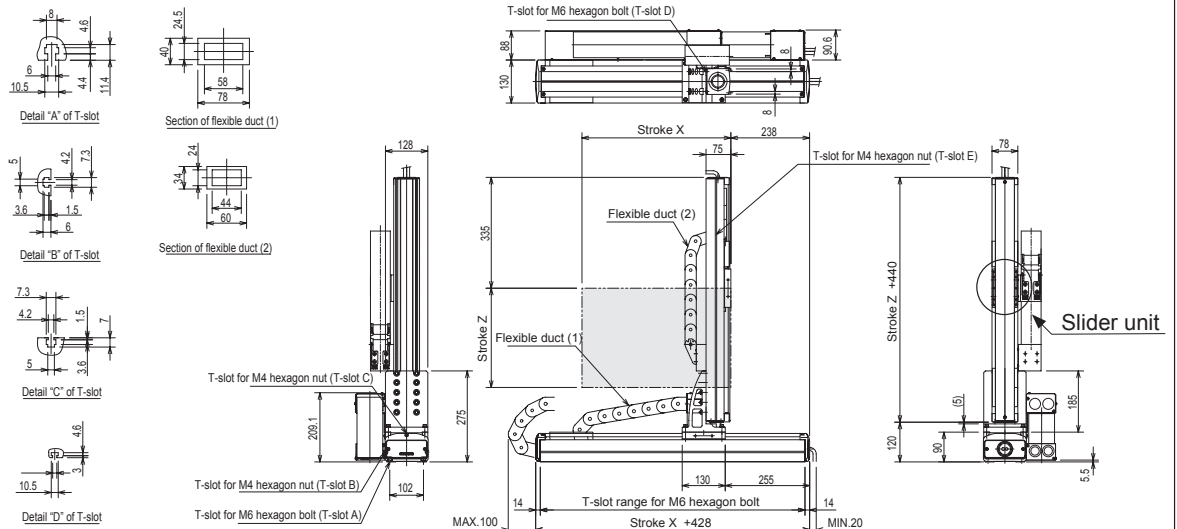
Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
X-axis	750	1000
	850	800
	950 ~ 1050	600
Z-axis	700	500
	800	400
	900	300

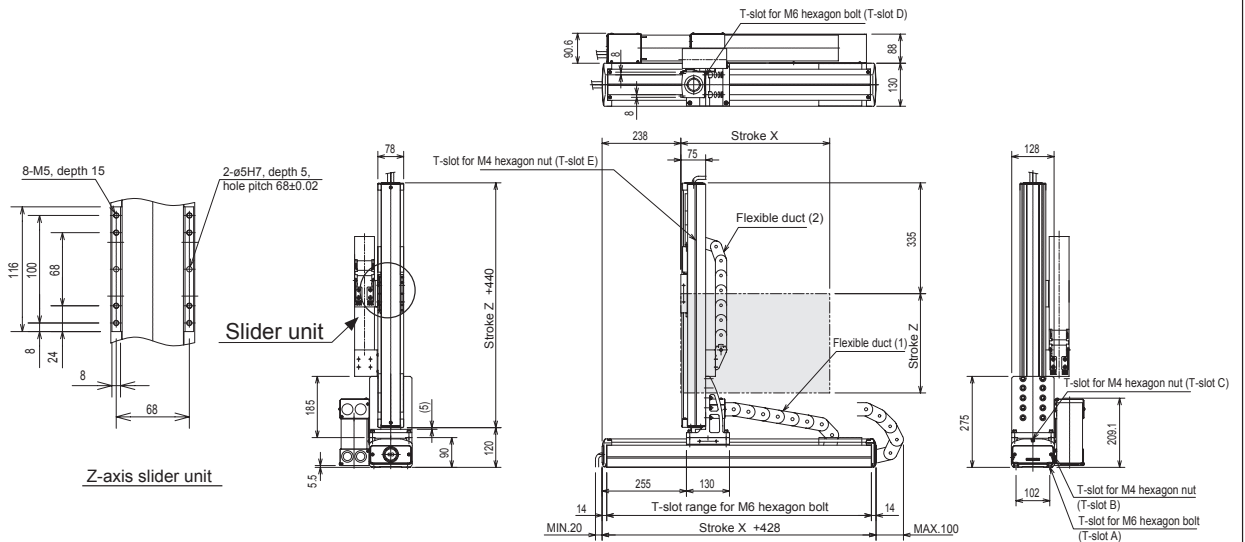
Maximum Payload (kg) (Note 2)	Z-axis stroke								
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm
	12.0	12.0	12.0	12.0	12.0	10.0	4.0	2.0	2.0

Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

S: Right-handed



M: Left-handed



X-Z Flexible-duct Spec.

[Set designation]

BA2 – A5 – B2A S A – 40 45 00 – OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
S: Right-handed	20 : 200mm	15 : 150mm	0: None	3 : 3m 9 : 9m
M: Left-handed	90 : 900mm A0 : 1000mm 7	95 : 950mm A5 : 1050mm	1 : CA20-M10 Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m
	F0 : 1500mm			

Ball screw type

X-axis: Ball screw driven
Motor straight

Z-axis: Ball screw driven
Motor straight

Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
X-axis	700 ~ 800	1100
	900 ~ 1000	1000
	1100 ~ 1200	700
	1300	500
	1400	400
Z-axis	1500	300
	750	500
	850	400
	950 ~ 1050	300

[Specifications]

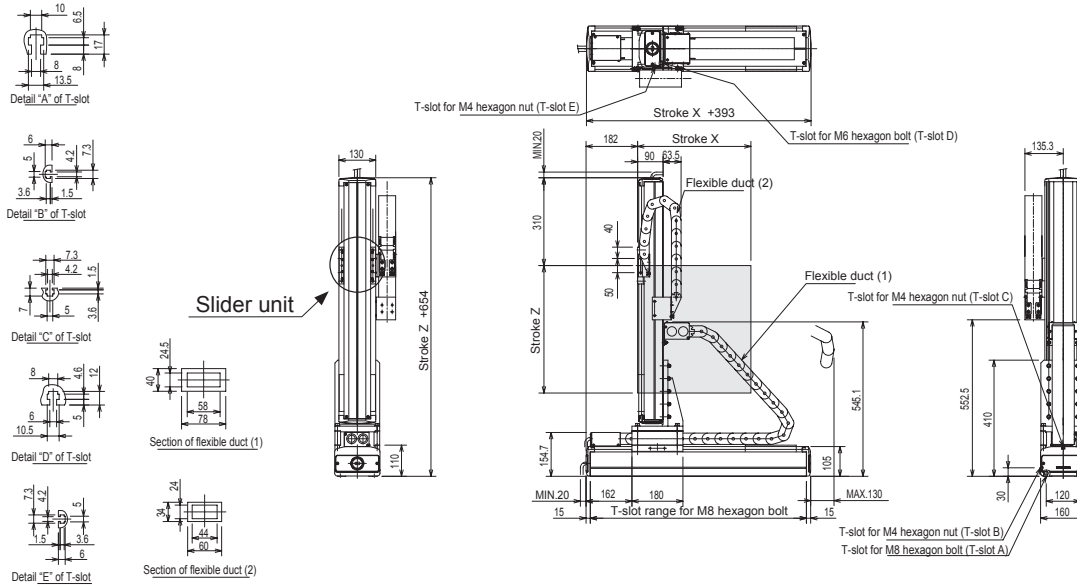
	X-axis	Z-axis
Type of axis	BB50F-ST-M20N-□ 0	BB30E-ST-M10B-□ 5
Stroke (in increments of 100 mm)	200 ~ 1500mm	150 ~ 1050mm
Maximum speed	1200mm/s (Note 1)	600mm/s (Note 1)
Positioning repeatability	± 0.01mm	
Lead of ball screw	20mm	10mm
Motor output	200W	100W, with brake
Resolution	0.01mm	

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

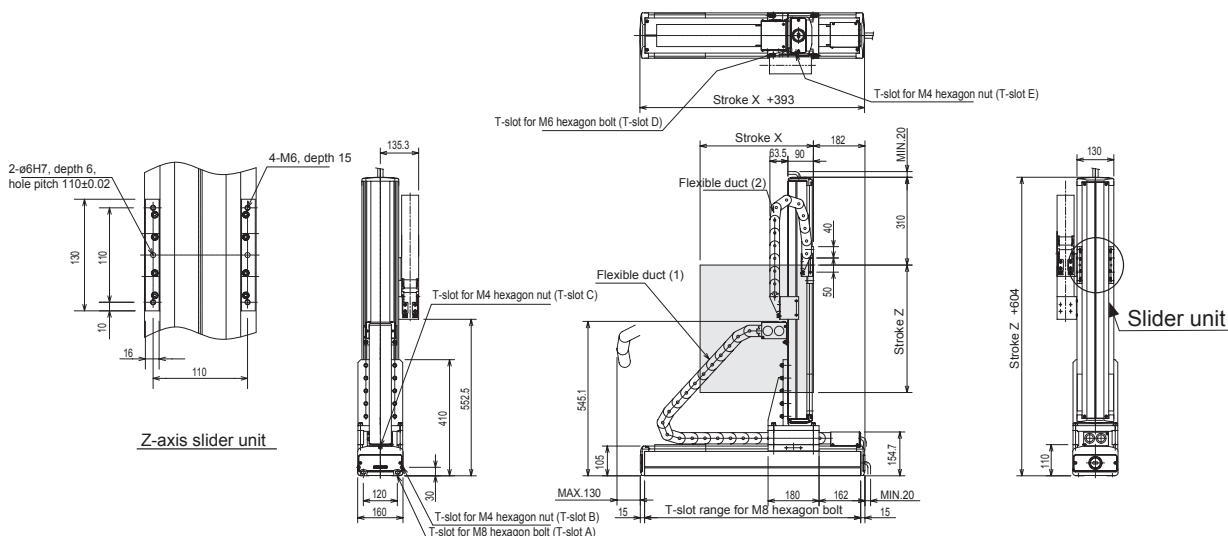
Maximum Payload (kg) (Note 2)	Z-axis stroke									
	150mm	250mm	350mm	450mm	550mm	650mm	750mm	850mm	950mm	1050mm
	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	8.0

Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

S: Right-handed



M: Left-handed



X-Z Flexible-duct Spec.

[Set designation]

BA2 – A5 – B2B S A – 40 40 00 – OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
S: Right-handed	20 : 200mm	10 : 100mm	0: None	3 : 3m 9 : 9m
M: Left-handed	90 : 900mm A0 : 1000mm Z : 1500mm	90 : 900mm A0 : 1000mm	1 : CA20-M10 Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

X-axis: Ball screw driven
Motor straight

Z-axis: Ball screw driven
Motor straight

Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
X-axis	700 ~ 800	1100
	900 ~ 1000	1000
	1100 ~ 1200	700
	1300	500
	1400	400
Z-axis	1500	300
	700	500
	800	400
	900 ~ 1000	300

[Specifications]

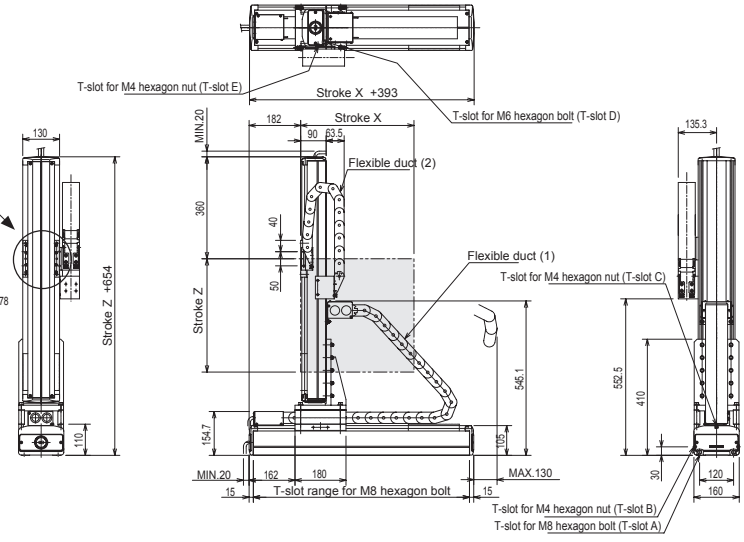
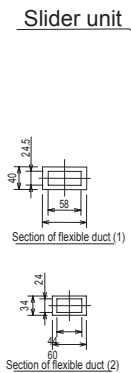
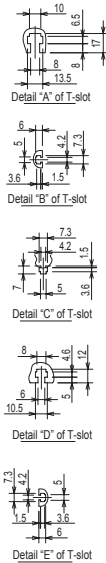
	X-axis	Z-axis
Type of axis	BB50F-ST-M20N-□ 0	BB30F-ST-M10B-□ 0
Stroke (in increments of 100 mm)	200 ~ 1500mm	100 ~ 1000mm
Maximum speed	1200mm/s (Note 1)	600mm/s (Note 1)
Positioning repeatability	± 0.01 mm	
Lead	20mm	10mm
Motor output	200W	200W , with brake
Resolution	0.01 mm	

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

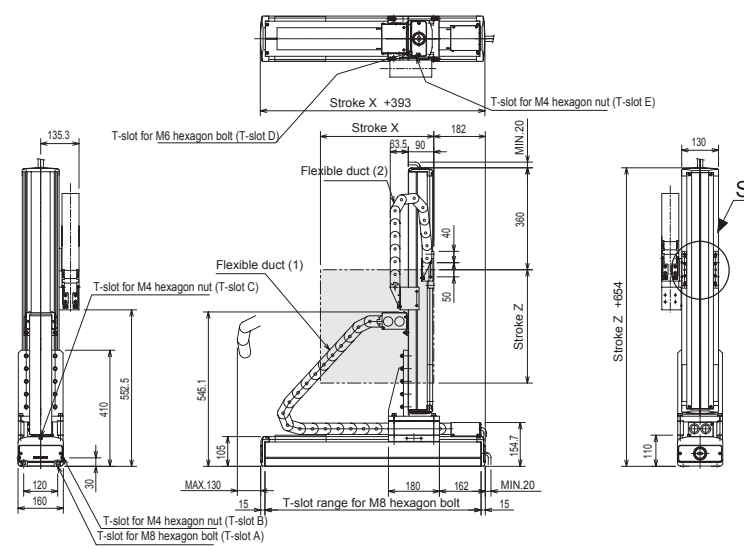
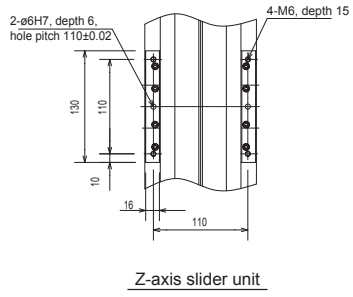
Maximum Payload (kg) (Note 2)	Z-axis stroke									
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm
	20.0	20.0	20.0	20.0	20.0	20.0	16.0	13.0	9.0	7.0

Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

S: Right-handed



M: Left-handed



X-Z Flexible-duct Spec.

[Set designation]

BA2 – A5 – B2C S A – 40 40 00 – OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
S: Right-handed	20 : 200mm	20 : 200mm	0: None	3 : 3m 9 : 9m
M: Left-handed	90 : 900mm A0 : 1000mm F0 : 1500mm	90 : 900mm A0 : 1000mm	1 : CA20-M10 Other: S ee page 21	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

- X-axis: Ball screw driven
Motor straight
- Z-axis: Ball screw driven
Motor straight

Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
X-axis	700 ~ 800	1100
	900 ~ 1000	1000
	1100 ~ 1200	700
	1300	500
	1400	400
Z-axis	1500	300
	700 ~ 800	550
	900 ~ 1000	500

[Specifications]

	X-axis	Z-axis
Type of axis	BB50F-ST-M20N-□ 0	BB50F-ST-M10B-□ 0
Stroke (in increments of 100 mm)	200 ~ 1500mm	200 ~ 1000mm
Maximum speed	1200mm/s (Note 1)	600mm/s (Note 1)
Positioning repeatability	± 0.01 mm	
Lead	20mm	10mm
Motor output	200W	200W, with brake
Resolution	0.01 mm	

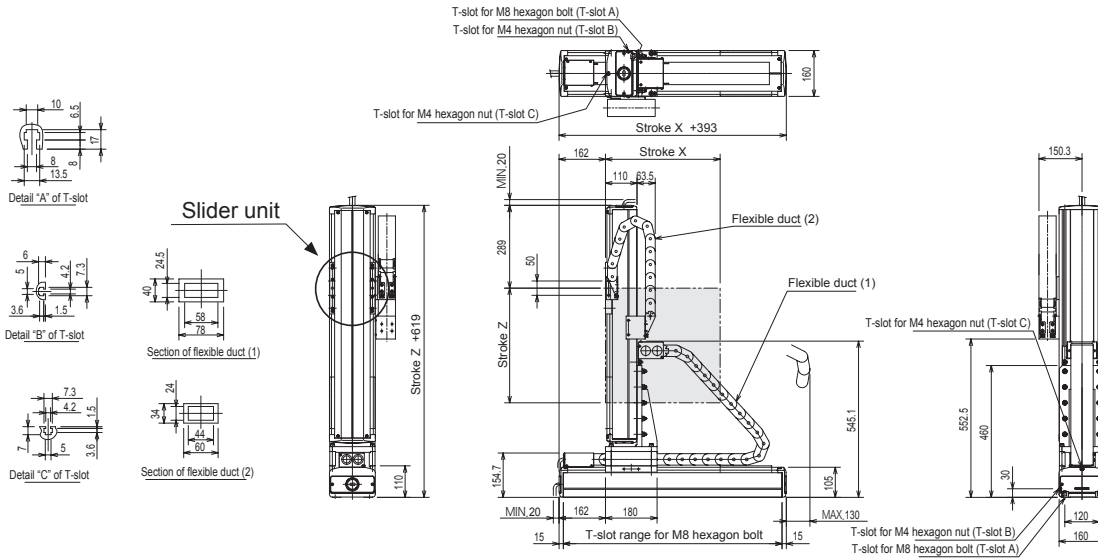
Acceleration/deceleration time when the maximum speed is set: 0.6 sec. or over

Maximum Payload (kg) (Note 2)	Z-axis stroke								
	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm
	25.0	25.0 (23.0)	25.0 (21.0)	25.0 (19.0)	23.0 (17.0)	20.0 (15.0)	19.0 (13.0)	12.0 (11.0)	10.0

Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

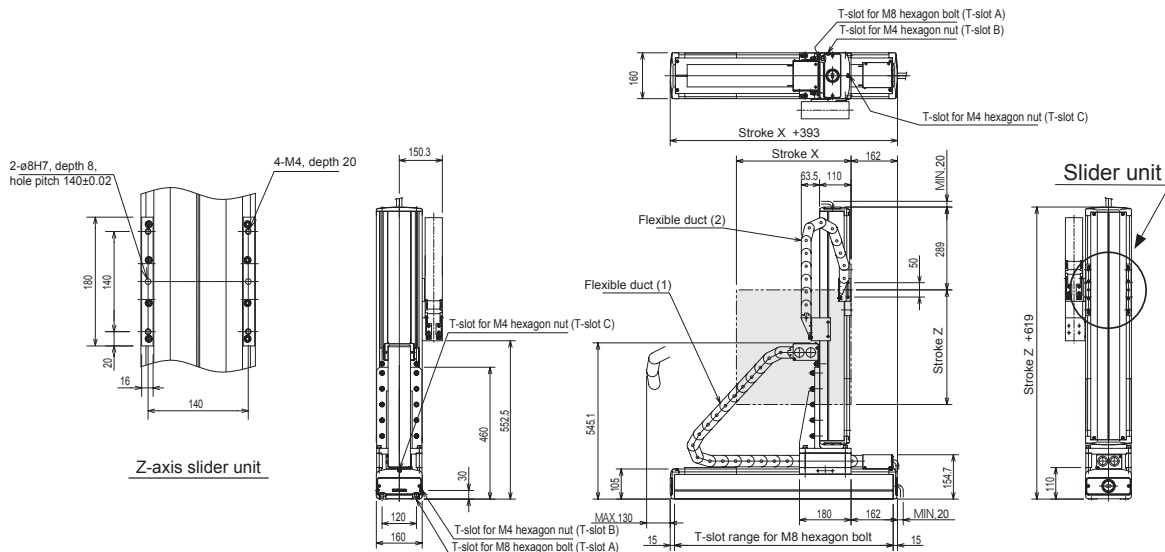
When the X-axis speed exceeds 1,000 m/s, the values in parentheses are used for the maximum Payload.

S: Right-handed



X-Z Flexible-duct Spec.

M: Left-handed



[Set designation]

BA2 - L1 - B2B S S - 40 45 00 - OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
S: Right-handed M: Left-handed	10 : 100mm 90 : 900mm A0 : 1000mm H0 : 1700mm J0 : 1800mm	15 : 150mm 45 : 450mm	0: None 1 : CA20-M10 Other: See page 21	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m

Timing belt type

- X-axis: Timing belt driven
Side mounted motor
- Z-axis: Ball screw driven
Motor straight

[Specifications]

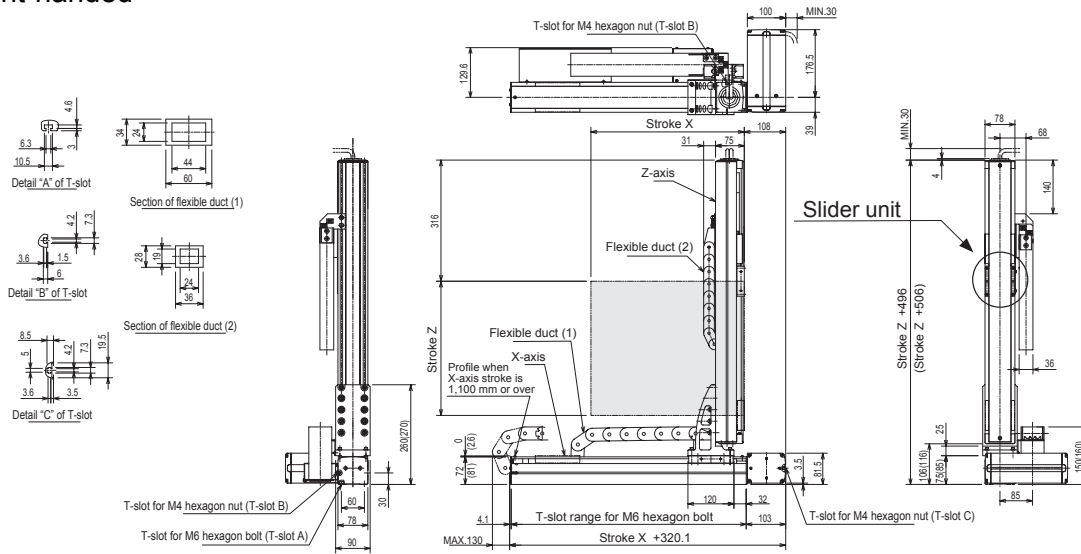
	X-axis	Z-axis
Type of axis	BB10F-B □ -M21N- □ 0	BB10E-ST-S10B- □ 5
Stroke (in increments of 100 mm)	100 ~ 1800mm	150 ~ 450mm
Maximum speed	1000mm/s	600mm/s
Positioning repeatability	±0.05mm	±0.01mm
Lead of ball screw	21 mm (lead converted into ball screw)	10mm
Motor output	200W	100W, with brake
Resolution	0.01mm	

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

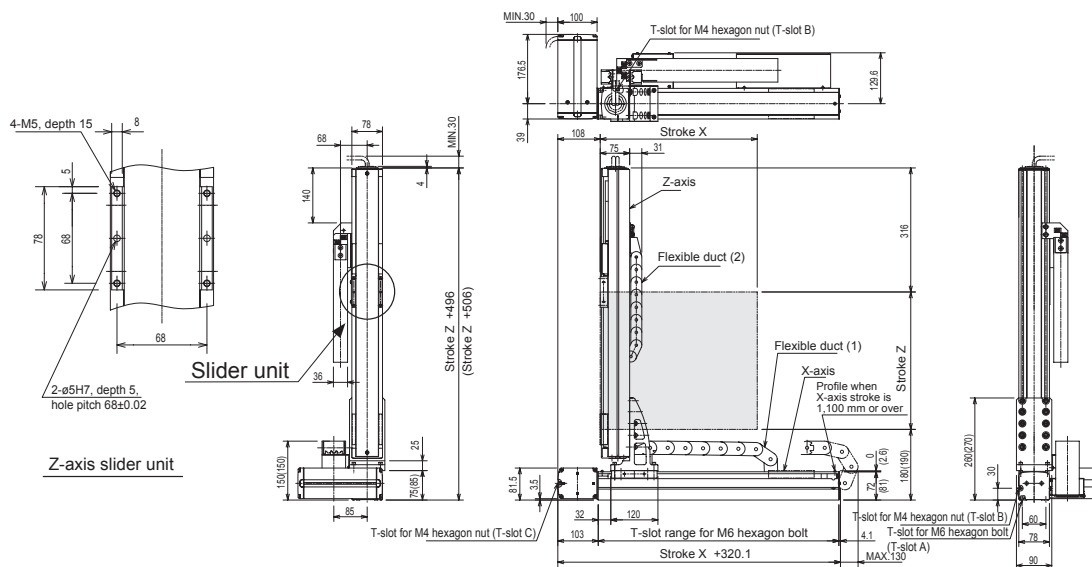
Maximum Payload (kg)	Z-axis stroke			
	150mm	250mm	350mm	450mm
	8.0	6.0	4.0	2.0

S: Right-handed

The values in parentheses are applicable when the X-axis stroke is 1,100 mm or over.



M: Left-handed



[Set designation]

BA2 - L3 - B2A S S - 40 40 00 - OF 1 3

Combined operation	Axis 1 stroke		Axis 2 stroke		Controller	Cable length		
S: Right-handed M: Left-handed	10 : 100mm ? : 900mm AD : 1000mm ? : 1700mm	JO : 1800mm ? : 2200mm PO : 2300mm ? : 2500mm	10 : 100mm ? : 700mm		0: None 1 : CA20-M10 Other: See page 21	3 : 3m 5 : 5m 7 : 7m	9 : 9m B : 11m D : 13m	

Timing belt type

X-axis: Timing belt driven
Side mounted motor

Z-axis: Ball screw driven
Motor straight

[Specifications]

	X-axis	Z-axis
Type of axis	BB30E-B □ -M21N- □ 0	BB10E-ST-M10B- □ 0
Stroke (in increments of 100 mm)	100 ~ 2500mm	100 ~ 700mm
Maximum speed	1000mm/ s	600mm/ s
Positioning repeatability	± 0.05mm	± 0.01mm (Note 1)
Lead	21 mm(lead converted into ball screw)	10mm
Motor output	100W	100W, with brake
Resolution	0.01mm	

Note 1: When the stroke is as given below, the maximum speed differs.

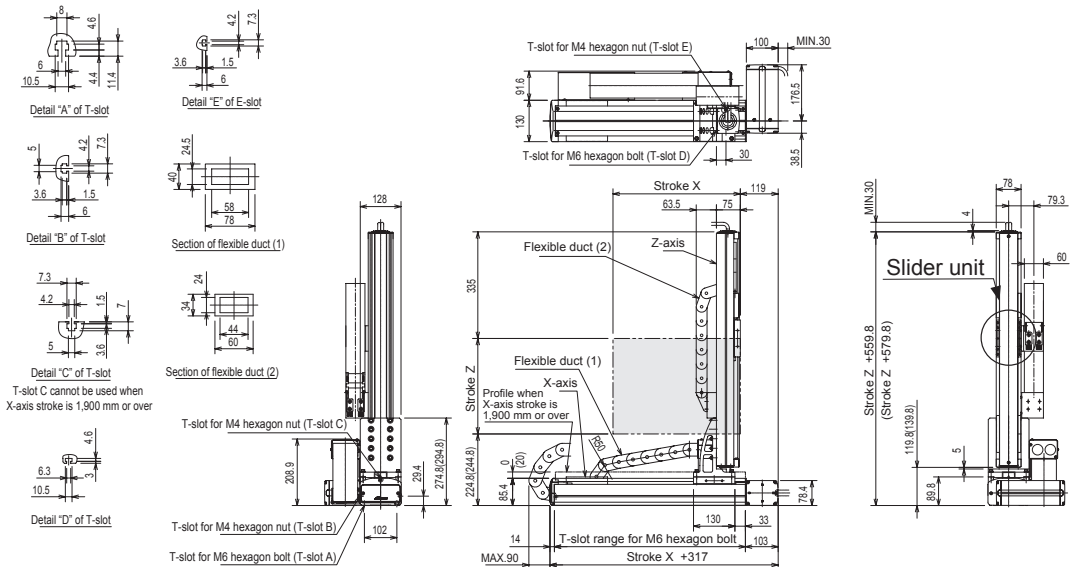
	Stroke (mm)	Maximum speed (mm/s)
Z-axis	700	500

Acceleration/deceleration time when the maximum speed is set: 0.5 sec. or over

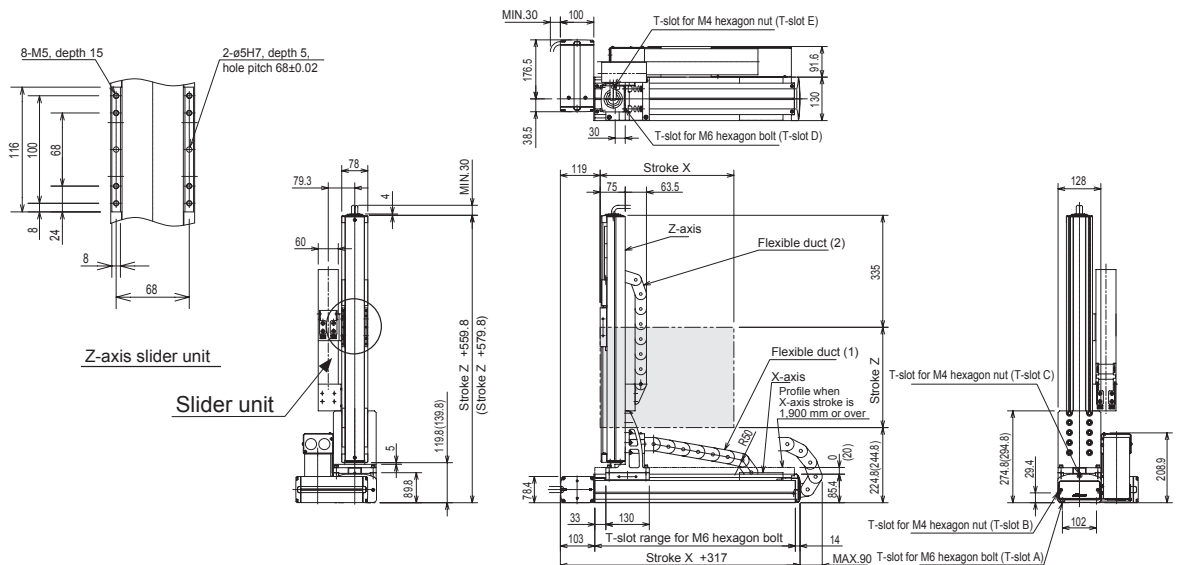
Maximum Payload (kg)	Z-axis stroke						
	100mm	200mm	300mm	400mm	500mm	600mm	700mm
	5.0	4.0	4.0	3.0	2.0	2.0	1.0

S: Right-handed

The values in parentheses are applicable when the X-axis stroke is 1,900 mm or over.



M: Left-handed



[Set designation]

BA2 – L3 – B2B S S – 40 40 00 – OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
S: Right-handed M: Left-handed	10 : 100mm ? : 1800mm 90 : 900mm A0 : 1000mm ? : 2300mm HD : 1700mm R0 : 2500mm	10 : 100mm ? : 900mm	0: None 1 : CA20-M10 Other: See page 21	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m

Timing belt type

X-axis: Timing belt driven
Side mounted motor

Z-axis: Ball screw driven
Motor straight

[Specifications]

	X-axis	Z-axis
Type of axis	BB30F-B □ -M21N- □ 0	BB10E-ST-M10B- □ 0
Stroke (in increments of 100 mm)	100 ~ 2500mm	100 ~ 900mm
Maximum speed	1000mm/s	600mm/s (Note 1)
Positioning repeatability	± 0.05mm	± 0.01mm
Lead	21mm (lead converted into ball screw)	10mm
Motor output	100W	100W, with brake
Resolution	0.01mm	

Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
Z-axis	700	500
	800	400
	900	300

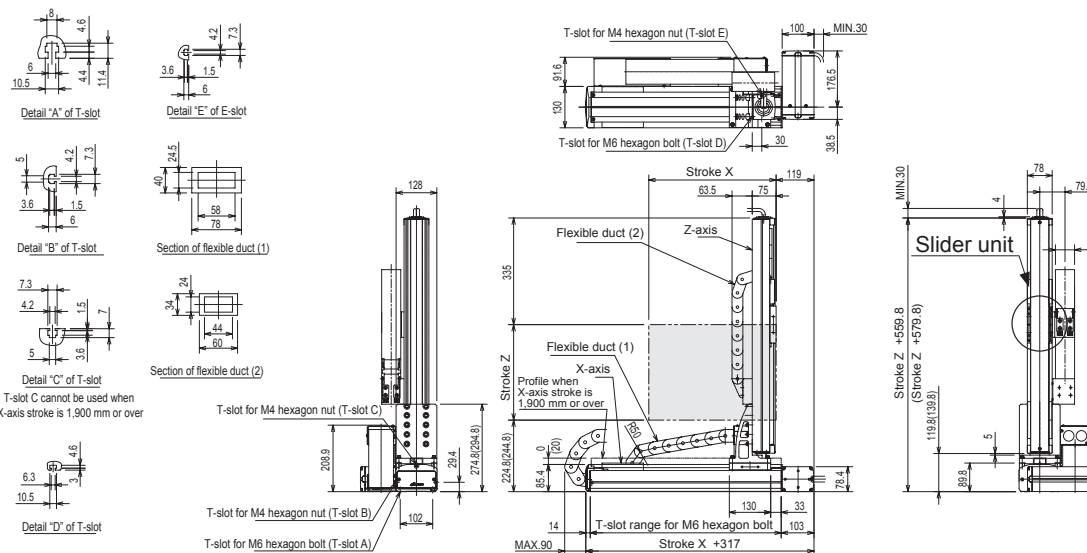
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg) (Note 2)	Z-axis stroke								
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm
	12.0	12.0	12.0	12.0	12.0	10.0	4.0	2.0	2.0

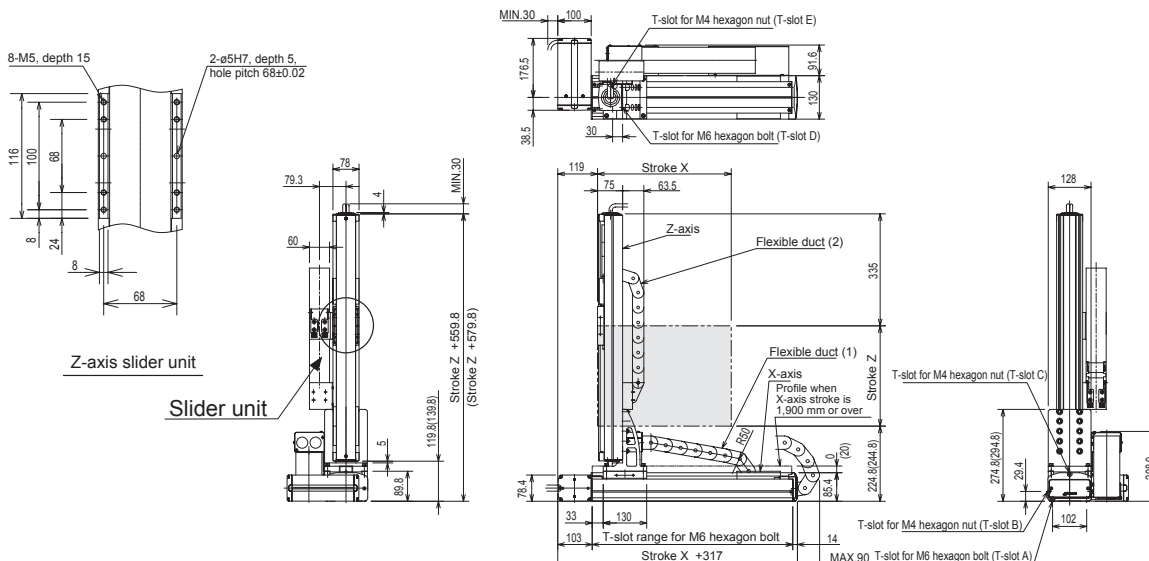
Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

S: Right-handed

The values in parentheses are applicable when the X-axis stroke is 1,900 mm or over.



M: Left-handed



[Set designation]

BA2 - L5 - B2B S S - 40 40 00 - OF 1 3

Combined operation	Axis 1 stroke		Axis 2 stroke		Controller		Cable length	
S: Right-handed	20 : 200mm	J0 : 1800mm	10 : 100mm		0: None	3 : 3m	9 : 9m	
M: Left-handed	90 : 900mm	N0 : 2200mm	90 : 900mm		1 : CA20-M10	5 : 5m	B : 11m	
	A0 : 1000mm	P0 : 2300mm	A0 : 1000mm		Other: See page 21	7 : 7m	D : 13m	
	H0 : 1700mm	R0 : 2500mm						

Timing belt type

X-axis: Timing belt driven
Side mounted motor

Z-axis: Ball screw driven
Motor straight

[Specifications]

	X-axis	Z-axis
Type of axis	BB50F-B □ -M21N- □ 0	BB30F-ST-M10B- □ 0
Stroke (in increments of 100 mm)	200 ~ 2500mm	100 ~ 1000mm
Maximum speed	1000 mm/s	600 mm/s (Note 1)
Positioning repeatability	± 0.05mm	± 0.01mm
Lead	2.1 mm (lead converted into ball screw)	10mm
Motor output	200W	200W, with brake
Resolution	0.01mm	

Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
Z-axis	700	500
	800	400
	900 ~ 1000	300

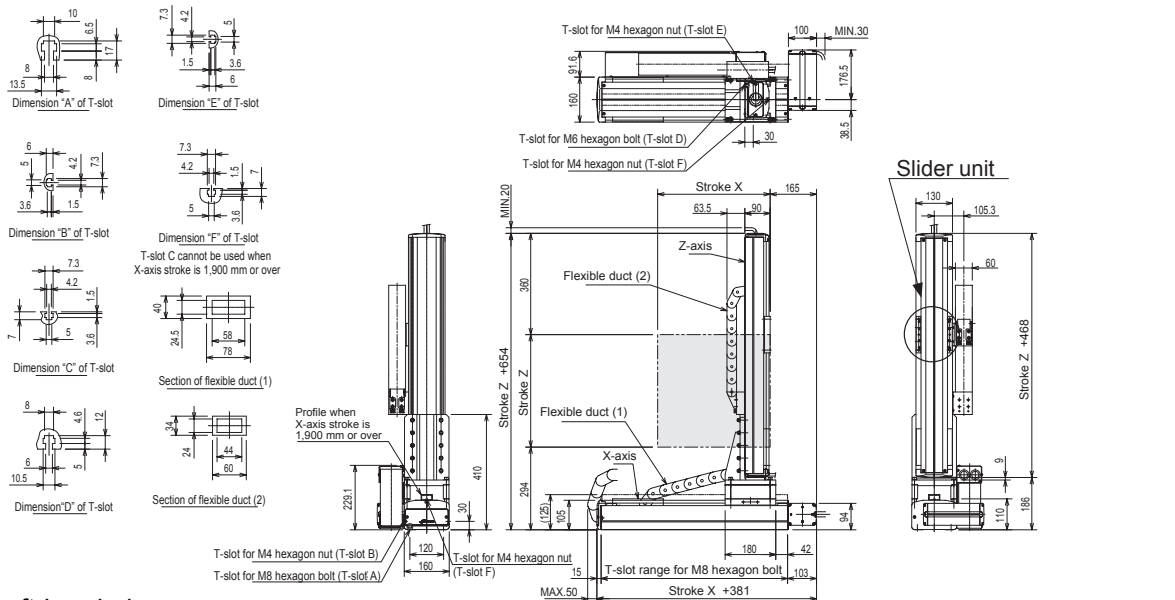
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg) (Note 2)	Z-axis stroke									
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm
	20.0	20.0	20.0	19.0	18.0	17.0	16.0	13.0	9.0	7.0

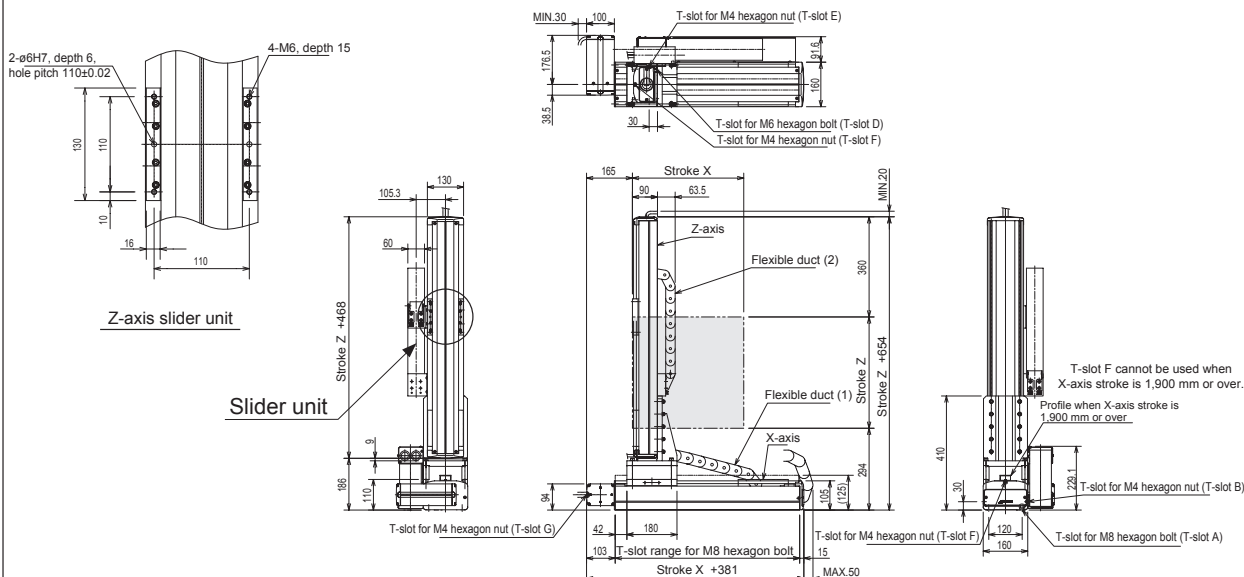
Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

S: Right-handed

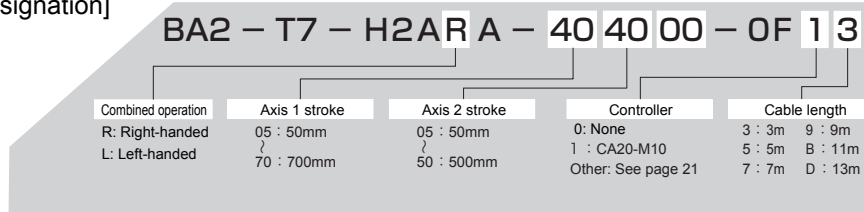
The values in parentheses are applicable when the X-axis stroke is 1,900 mm or over.



M: Left-handed



[Set designation]



Ball screw type

- Y-axis: Ball screw driven
Motor straight
- Z-axis: Ball screw driven
Motor straight

[Specifications]

	Y-axis	Z-axis
Type of axis	BBT7D-ST-M12N-□□	BBT5D-ST-M06B-□□
Stroke (mm) (in increments of 50 mm)	50 ~ 600, 700	50 ~ 500
Maximum speed (mm/s)	800 (Note 1)	400 (Note 1)
Positioning repeatability (mm)	± 0.02	
Lead of ball screw (mm)	12	6
Motor output	50W	50W, with brake
Resolution (mm)	0.01	

Note 1: When the stroke is as given below, the maximum speed differs.

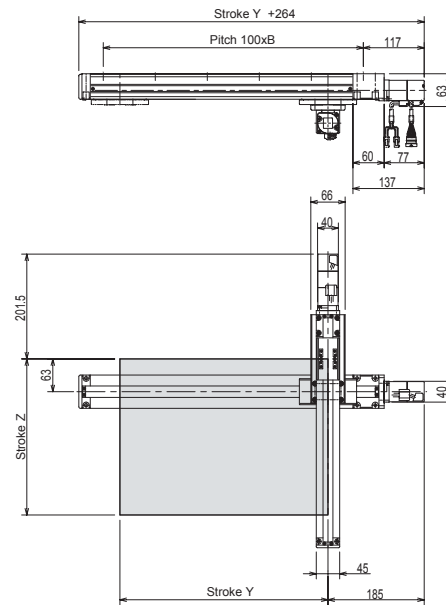
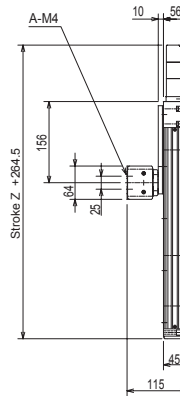
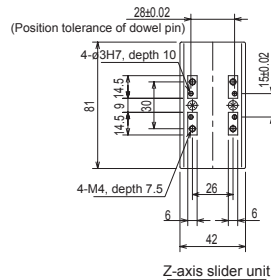
	Stroke (mm)	Maximum speed (mm/s)
Y-axis	50 ~ 550	800
	600	680
	700	500
Z-axis	500	340

Acceleration/deceleration time when the maximum speed is set: 0.3 sec. or over

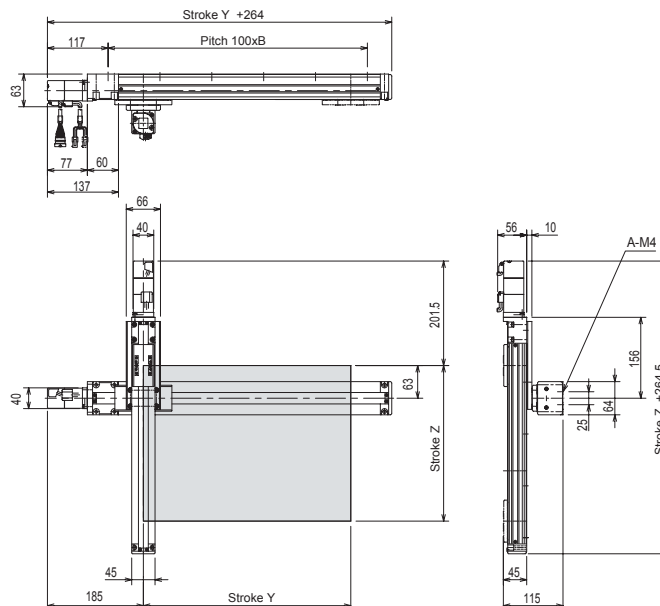
Maximum Payload (kg)	Z-axis stroke									
	50mm	100mm	150mm	200mm	250mm	300mm	350mm	400mm	450mm	500mm
	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	1.0	1.0

R: Right-handed

Stroke X (BBT7)	50	100	150	200	250	300	350	400	450	500	550	600	700
No. of holes A	4	6	6	8	8	10	10	12	12	14	14	16	18
Hole-to-hole pitch B	1	2	2	3	3	4	4	5	5	6	6	7	8



L: Left-handed



[Set designation]

BA2 – A1 – H2ER A – 45 40 00 – OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed	15 : 150mm	05 : 50mm	0: None	3 : 3m 9 : 9m
L: Left-handed	95 : 950mm A5 : 1050mm	60 : 600mm	1 : CA20-M10 Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

Y-axis: Ball screw driven
Motor straight

Z-axis: Ball screw driven
Motor straight

[Specifications]

	Y-axis	Z-axis
Type of axis	BB10E-ST-S20N-□5	BBT7D-ST-M06B-□□
Stroke (mm) (in increments of 100 mm for Y-axis, 50 mm for Z-axis)	150 ~ 1050	50 ~ 600
Maximum speed (mm/s)	1200 (Note 1)	400 (Note 1)
Positioning repeatability (mm)	±0.01	±0.02
Lead of ball screw (mm)	20	6
Motor output	100W	50W with brake
Resolution (mm)	0.01	

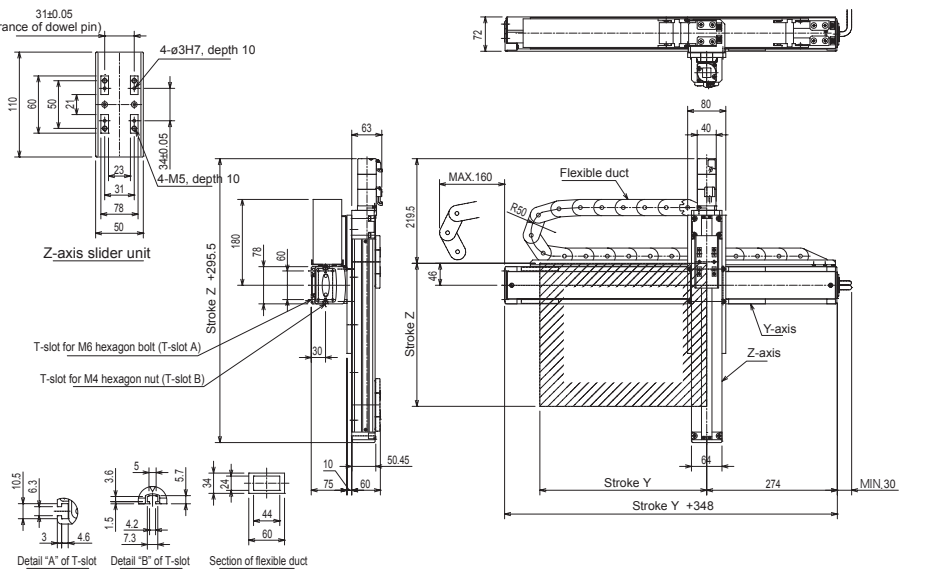
Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
Y-axis	700	1000
	850	800
	950 ~ 1050	600
Z-axis	600	340

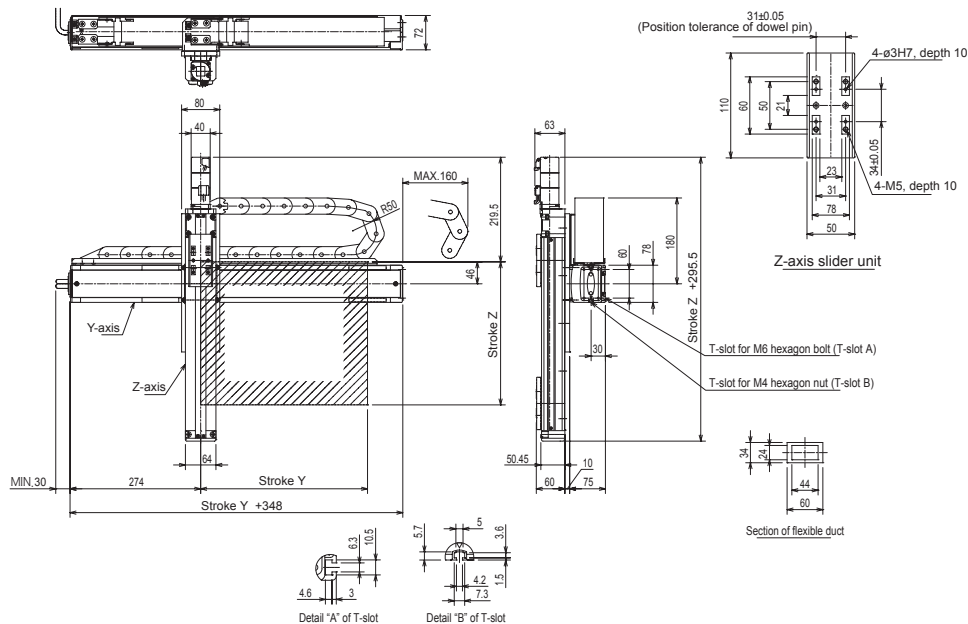
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg)	Z-axis stroke											
	50mm	100mm	150mm	200mm	250mm	300mm	350mm	400mm	450mm	500mm	550mm	600mm
	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5	2	2

R: Right-handed



L: Left-handed



[Set designation]

BA2 – A1 – H2A R C – 40 45 00 – OF 1 3

Combined operation R: Right-handed L: Left-handed	Axis 1 stroke 10 : 100mm 90 : 900mm A0 : 1000mm	Axis 2 stroke 15 : 150mm 55 : 550mm	Controller 0: None 1 : CA20-M10 Other: See page 21	Cable length 3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m
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Ball screw type

- Y-axis: Ball screw driven
Motor straight
- Z-axis: Ball screw driven
Side mounted motor

[Specifications]

	Y-axis	Z-axis
Type of axis	BB10E-ST-M20N-□ 0	BB10E-U □ -S10B-□ 5
Stroke (in increments of 100 mm)	100 ~ 1000mm	150 ~ 550mm
Maximum speed	1200mm/ s (Note 1)	600mm/ s
Positioning repeatability	± 0.01 mm	
Lead of ball screw	20mm	10mm
Motor output	100W	100W, with brake
Resolution	0.01 mm	

Note 1: When the stroke is as given below, the maximum speed differs.

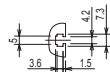
	Stroke (mm)	Maximum speed (mm/s)
Y-axis	700	1000
	800	800
	900 ~ 1000	600

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg) (Note 2)	Z-axis stroke				
	150mm	250mm	350mm	450mm	550mm
	8.0	8.0	6.5	5.0	3.0

Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

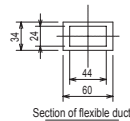
R: Right-handed



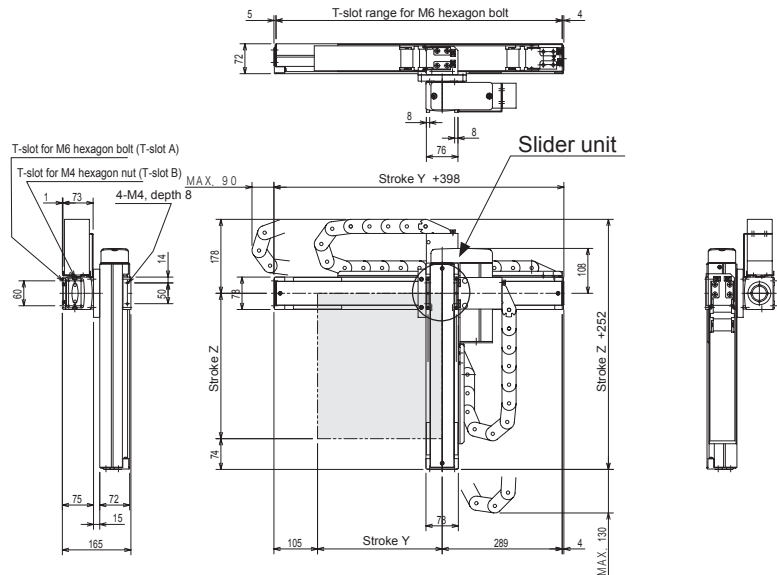
Detail "A" of T-slot



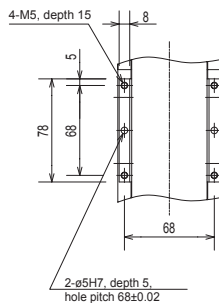
Detail "B" of T-slot



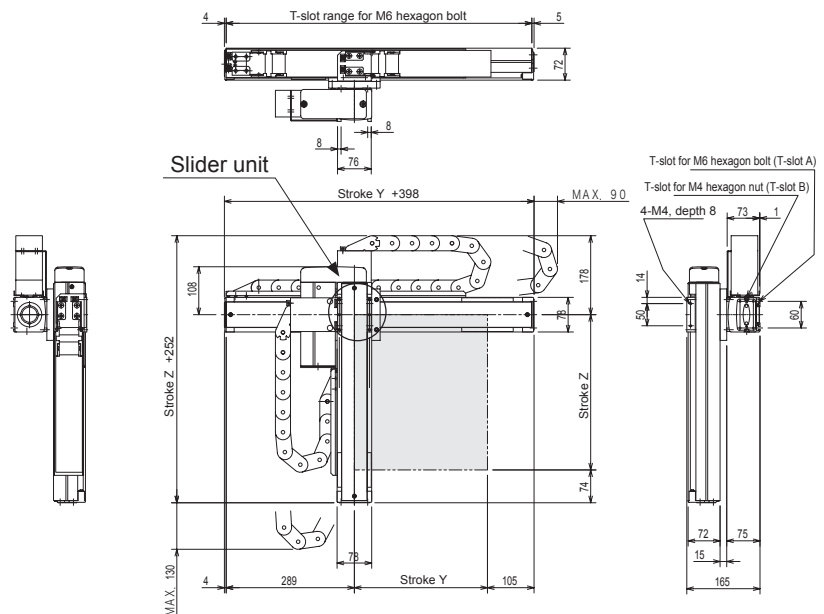
Section of flexible duct



L: Left-handed



Z-axis slider unit



[Set designation]

BA2 – A3 – H2AR C – 45 40 00 – OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed L: Left-handed	15 : 150mm 95 : 950mm A5 : 1050mm	10 : 100mm 80 : 800mm	0: None 1 : CA20-M10 Other: See page 21	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

- Y-axis: Ball screw driven
Motor straight
- Z-axis: Ball screw driven
Side mounted motor

[Specifications]

	Y-axis	Z-axis
Type of axis	BB30E-ST-M20N-□5	BB10E-U□-M10B-□0
Stroke (in increments of 100 mm)	150 ~ 1050mm	100 ~ 800mm
Maximum speed	1200mm/s (Note 1)	600mm/s (Note 1)
Positioning repeatability	±0.01mm	
Lead of ball screw	20mm	10mm
Motor output	100W	100W, with brake
Resolution	0.01mm	

Acceleration/deceleration time when the maximum speed is set: 0.48 sec. or over

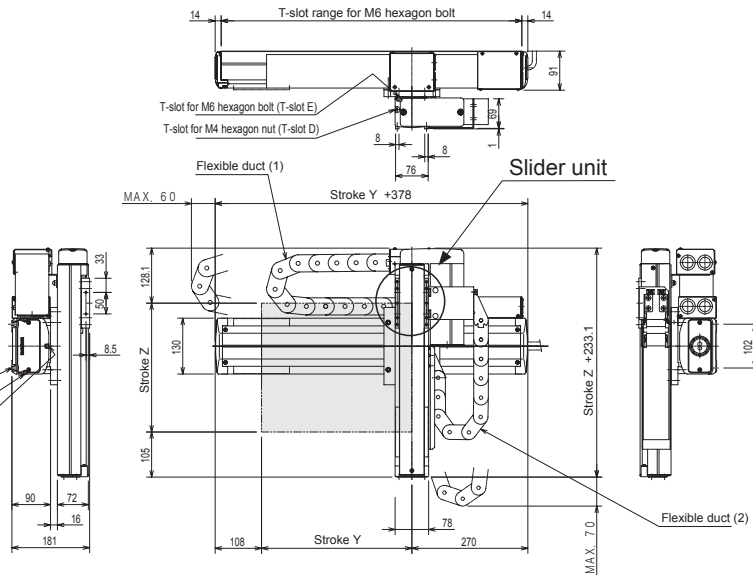
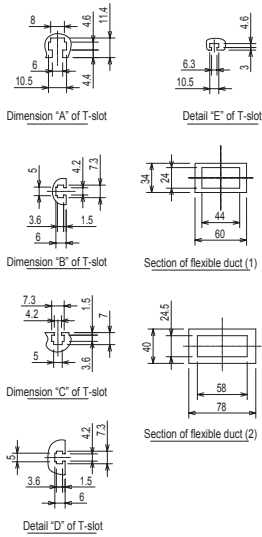
Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
Y-axis	750	1000
	850	800
	950 ~ 1050	600
Z-axis	700	500
	800	400

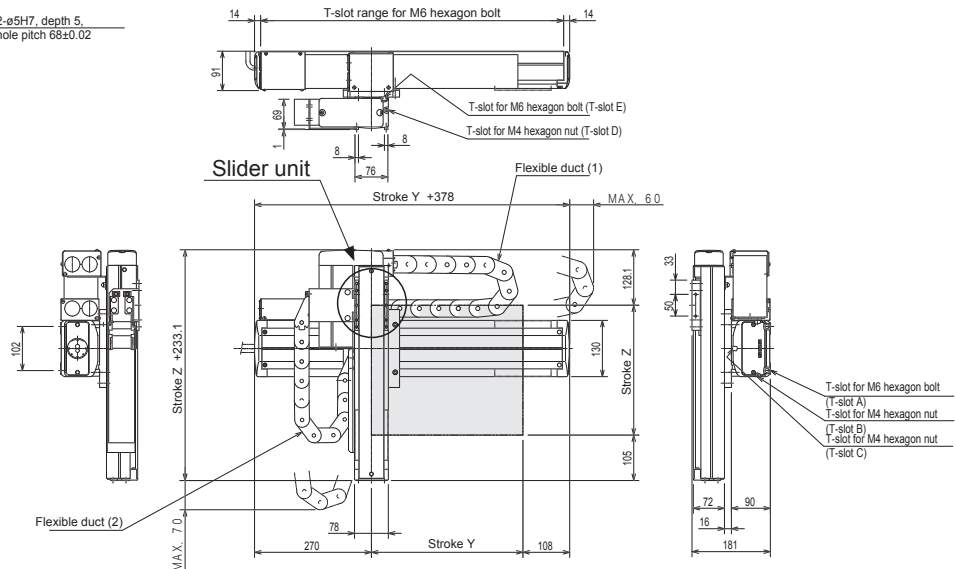
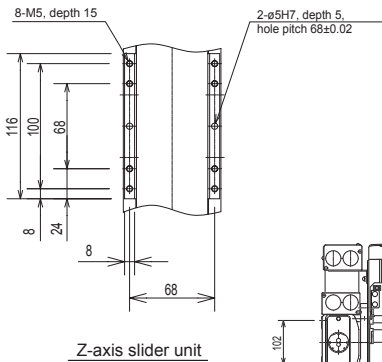
Maximum Payload (kg) (Note 2)	Z-axis stroke							
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm
	12.0	11.0	9.0	9.0	6.0	5.0	1.0	1.0

Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

R: Right-handed



L: Left-handed



Orthogonal Axes Specifications

[Set designation]

BA2 – A3 – H2BR C – 40 40 00 – OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed	10 : 100mm	10 : 100mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm	90 : 900mm A0 : 1000mm	1 : CA20-M10 Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

- Y-axis: Ball screw driven
Motor straight
- Z-axis: Ball screw driven
Side mounted motor

[Specifications]

	Y-axis	Z-axis
Type of axis	BB30F-ST-M20N-□ 0	BB10E-U □ -M10B-□ 0
Stroke (in increments of 100 mm)	100 ~ 1000mm	100 ~ 1000mm
Maximum speed	1200mm/s (Note 1)	600mm/s (Note 1)
Positioning repeatability	± 0.01mm	
Lead of ball screw	20mm	10mm
Motor output	200W	100W, with brake
Resolution	0.01mm	

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

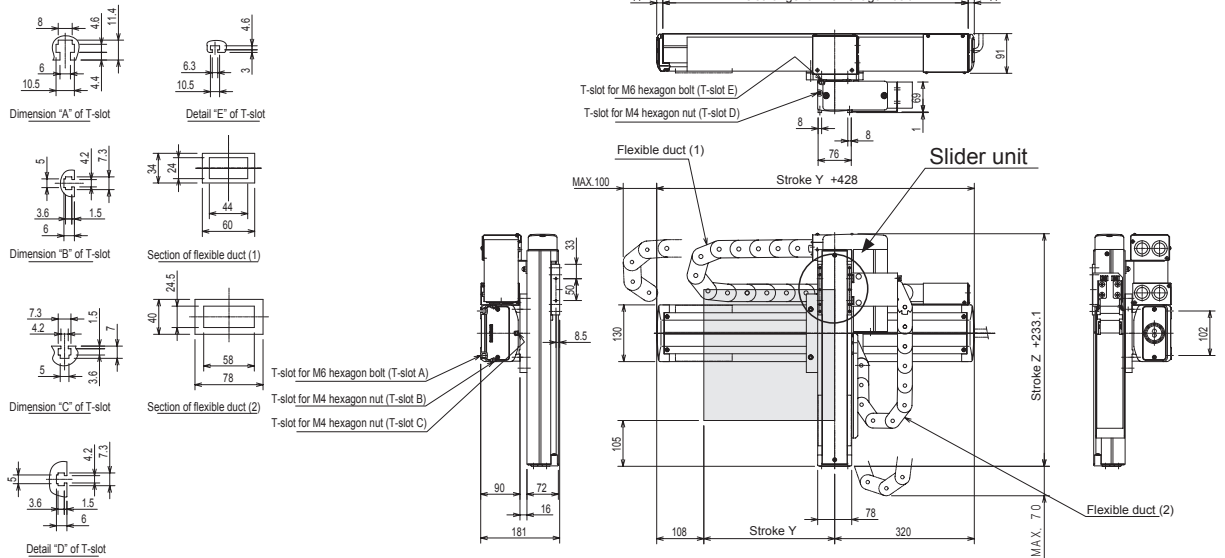
Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
Y-axis	700	1000
	800	800
	900 ~ 1000	600
Z-axis	700	500
	800	400
	900 ~ 1000	300

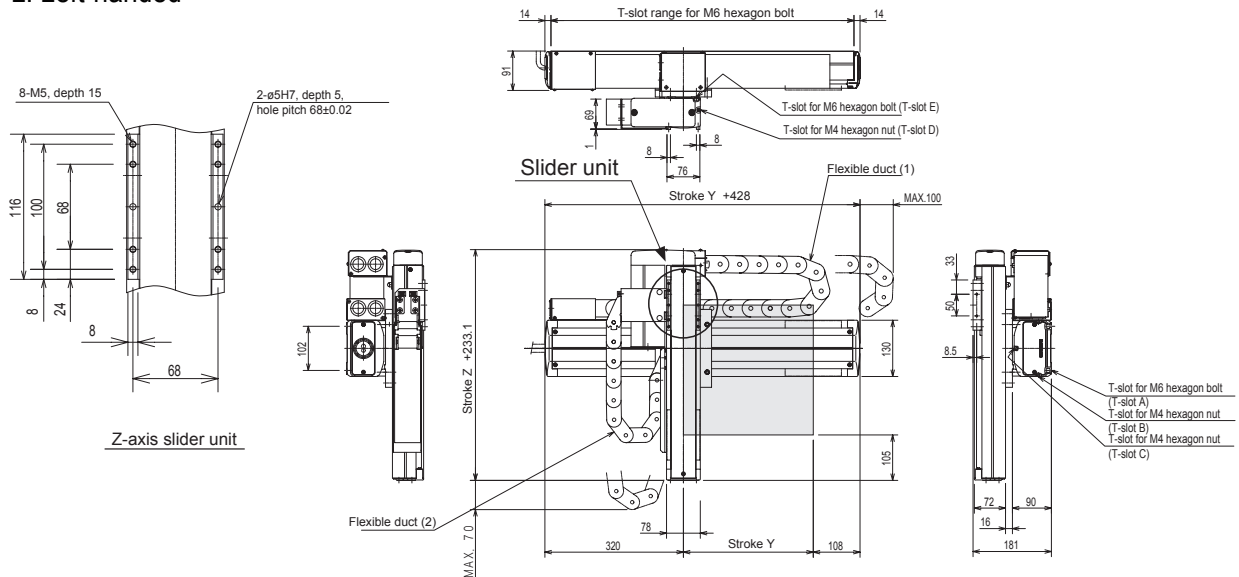
Maximum Payload (kg) (Note 2)	Z-axis stroke									
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm
	12.0	12.0	12.0	12.0	12.0	12.0	10.0	5.0	4.0	4.0

Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

R: Right-handed



L: Left-handed



[Set designation]

BA2 – A5 – H2A R C – 40 40 00 – OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed	20 : 200mm	10 : 100mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm	90 : 900mm A0 : 1000mm	1 : CA20-M10 Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m
	F0 : 1500mm			

Ball screw type

Y-axis: Ball screw driven
Motor straight

Z-axis: Ball screw driven
Side mounted motor

Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
Y-axis	700 ~ 800	1100
	900 ~ 1000	1000
	1100 ~ 1200	700
	1300	500
	1400	400
Z-axis	1500	300
	700	500
	800	400
	900 ~ 1000	300

[Specifications]

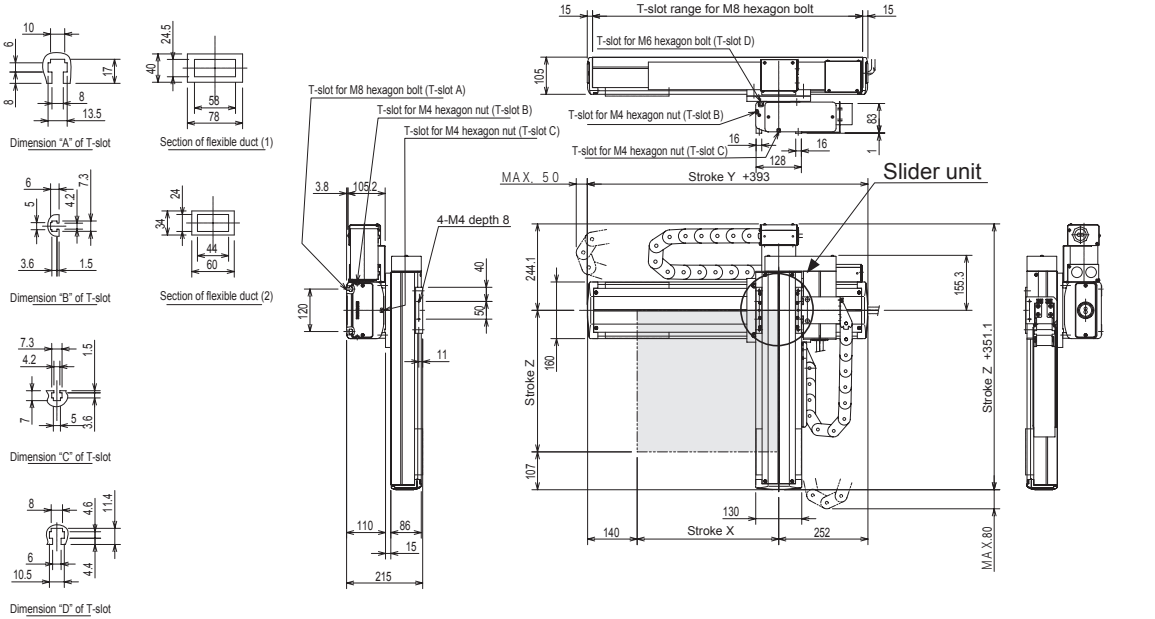
	Y-axis	Z-axis
Type of axis	BB50F-ST-M20N-□ 0	BB30E-U □ -M10B-□ 0
Stroke (in increments of 100 mm)	200 ~ 1500mm	100 ~ 1000mm
Maximum speed	1200mm/s (Note 1)	600mm/s (Note 1)
Positioning repeatability	± 0.01mm	
Lead of ball screw	20mm	10mm
Motor output	200W	100W, with brake
Resolution	0.01mm	

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

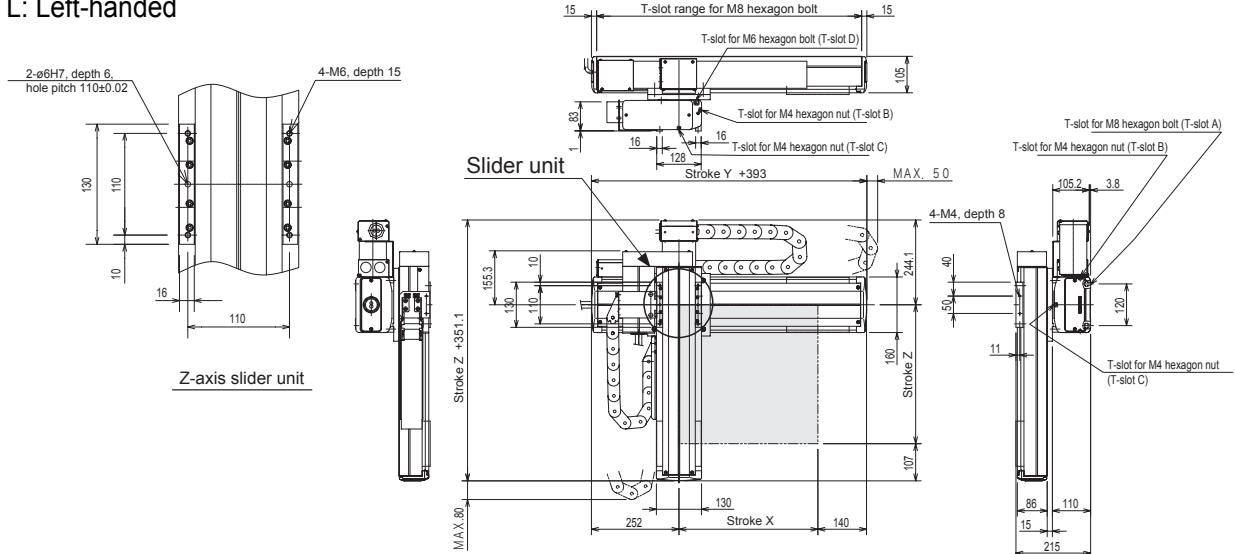
Maximum Payload (kg) (Note 2)	Z-axis stroke									
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm
	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0

Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

R: Right-handed



L: Left-handed



[Set designation]

BA2 – A5 – H2B R C – 40 40 00 – OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed	20 : 200mm	10 : 100mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm F0 : 1500mm	90 : 900mm A0 : 1000mm	1 : CA20-M10 Other: See page 20	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

Y-axis: Ball screw driven
Motor straight

Z-axis: Ball screw driven
Side mounted motor

Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
Y-axis	700 ~ 800	1100
	900 ~ 1000	1000
	1100 ~ 1200	700
	1300	500
	1400	400
Z-axis	700	500
	800	400
	900 ~ 1000	300

[Specifications]

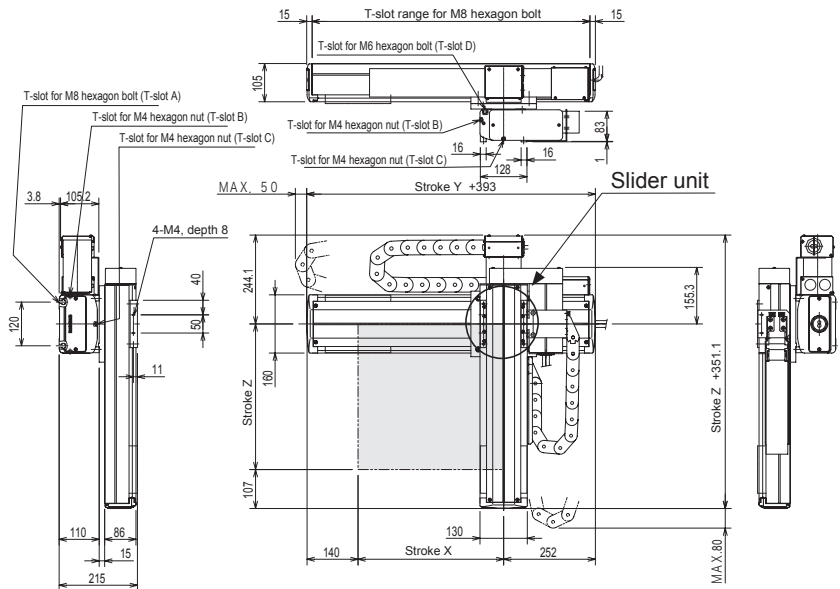
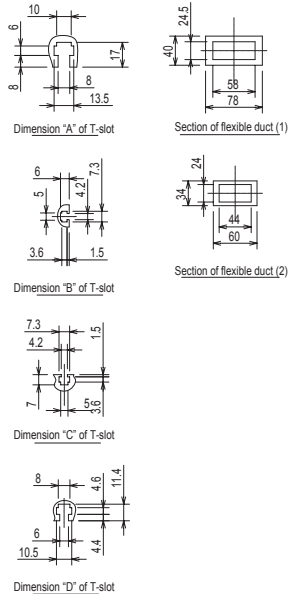
	Y-axis	Z-axis
Type of axis	BB50F-ST-M20N-□ 0	BB30F-U □ -M10B-□ 0
Stroke (in increments of 100 mm)	200 ~ 1500mm	100 ~ 1000mm
Maximum speed	1200mm/s (Note 1)	600mm/s (Note 1)
Positioning repeatability	± 0.01 mm	
Lead of ball screw	20mm	10mm
Motor output	200W	200W, with brake
Resolution	0.01 mm	

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

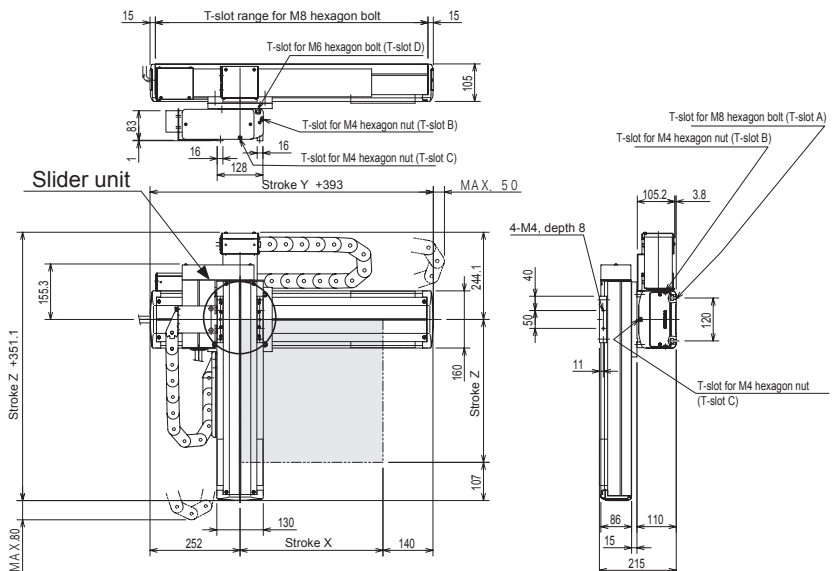
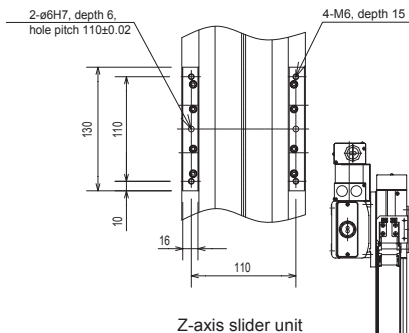
Maximum Payload (kg) (Note 2)	Z-axis stroke									
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm
	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	19.0

Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

R: Right-handed



L: Left-handed



Orthogonal Axes Specifications

[Set designation]

BA2 - L1 - H2A R W - 40 45 00 - OF 1 3

Timing belt type

Y-axis: Timing belt driven
Side mounted motor

Z-axis: Ball screw driven
Side mounted motor

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed	10 : 100mm	15 : 150mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm H0 : 1700mm J0 : 1800mm	55 : 550mm	1 : CA20-M10 Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

[Specifications]

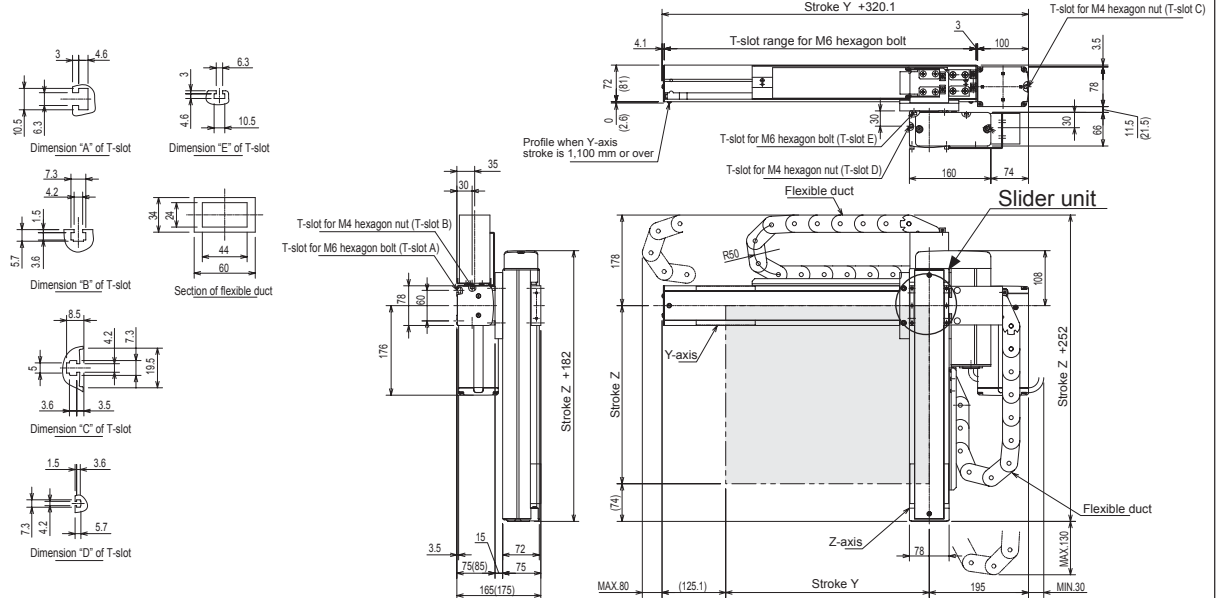
	Y-axis	Z-axis
Type of axis	BB10E-B □ -M21N- □ 0	BB10E-U □ -S10B- □ 5
Stroke (in increments of 100 mm)	100 ~ 1800mm	150 ~ 550mm
Maximum speed	1000mm/ s	600mm/ s
Positioning repeatability	± 0.05mm	± 0.01 mm
Lead of ball screw	21 mm (lead converted into ball screw)	10mm
Motor output	100W	100W, with brake
Resolution	0.01mm	

Acceleration/deceleration time when the maximum speed is set: 0.48 sec. or over

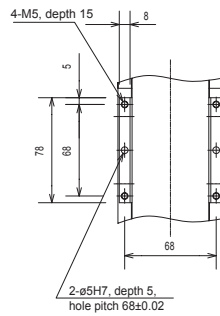
Maximum Payload (kg)	Z-axis stroke				
	150mm	250mm	350mm	450mm	550mm
	8.0	8.0	6.0	5.0	3.0

R: Right-handed

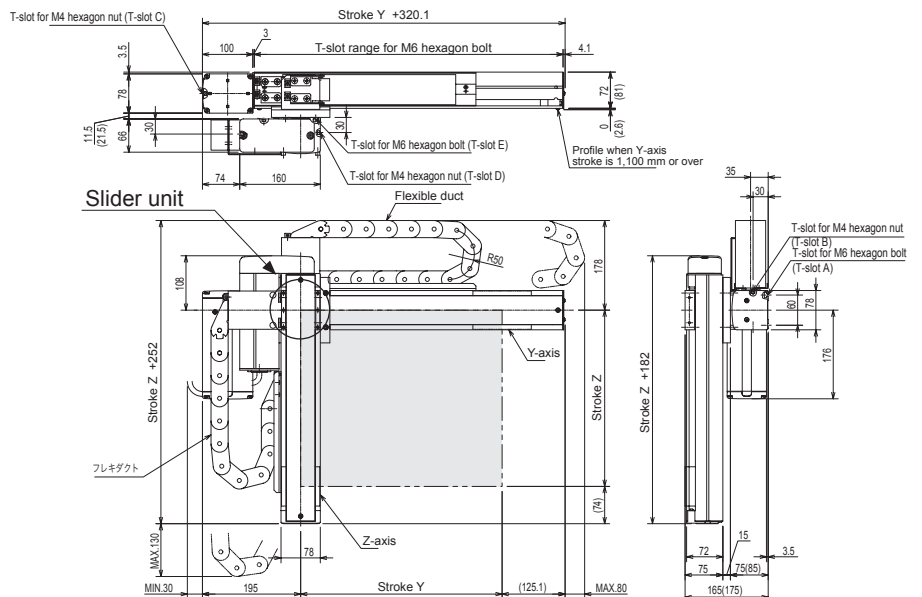
The values in parentheses are applicable when the Y-axis stroke is 1,100 mm or over.



L: Left-handed



Z-axis slider unit



[Set designation]

BA2 - L3 - H2A R W - 40 40 00 - OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed	10 : 100mm ? : 1800mm	10 : 100mm ? : 800mm	0: None 1 : CA20-M10 Other: See page 21	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m
L: Left-handed	90 : 900mm A0 : 1000mm ? : 2300mm H0 : 1700mm R0 : 2500mm			

Timing belt type

Y-axis: Timing belt driven
Side mounted motor

Z-axis: Ball screw driven
Motor straight

[Specifications]

	Y-axis	Z-axis
Type of axis	BB30E-B □ -M21N- □ 0	BB10E-U □ -M10B- □ 0
Stroke (in increments of 100 mm)	100 ~ 2500mm	100 ~ 800mm
Maximum speed	1000mm/s	600mm/s (Note 1)
Positioning repeatability	± 0.05mm	± 0.01mm
Lead	21mm (lead converted into ball screw)	10mm
Motor output	100W	100W, with brake
Resolution	0.01mm	

Note 1: When the stroke is as given below, the maximum speed differs.

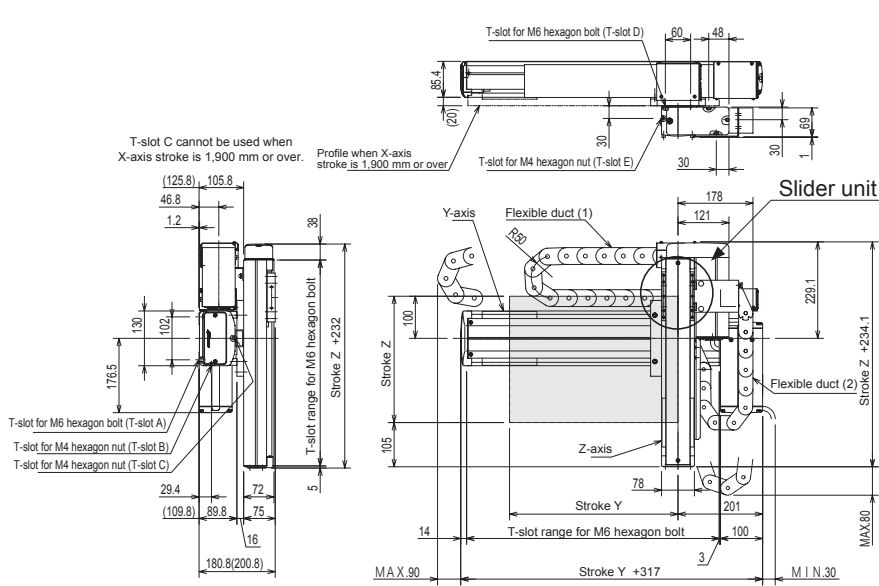
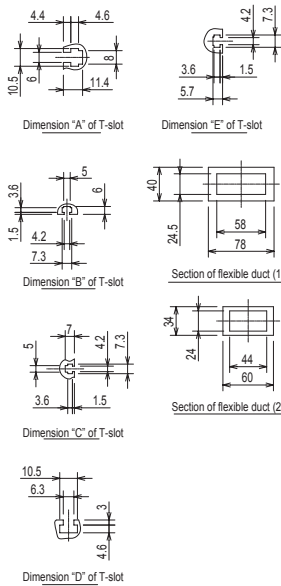
	Stroke (mm)	Maximum speed (mm/s)
Z-axis	700	500
	800	400

Acceleration/deceleration time when the maximum speed is set: 0.48 sec. or over

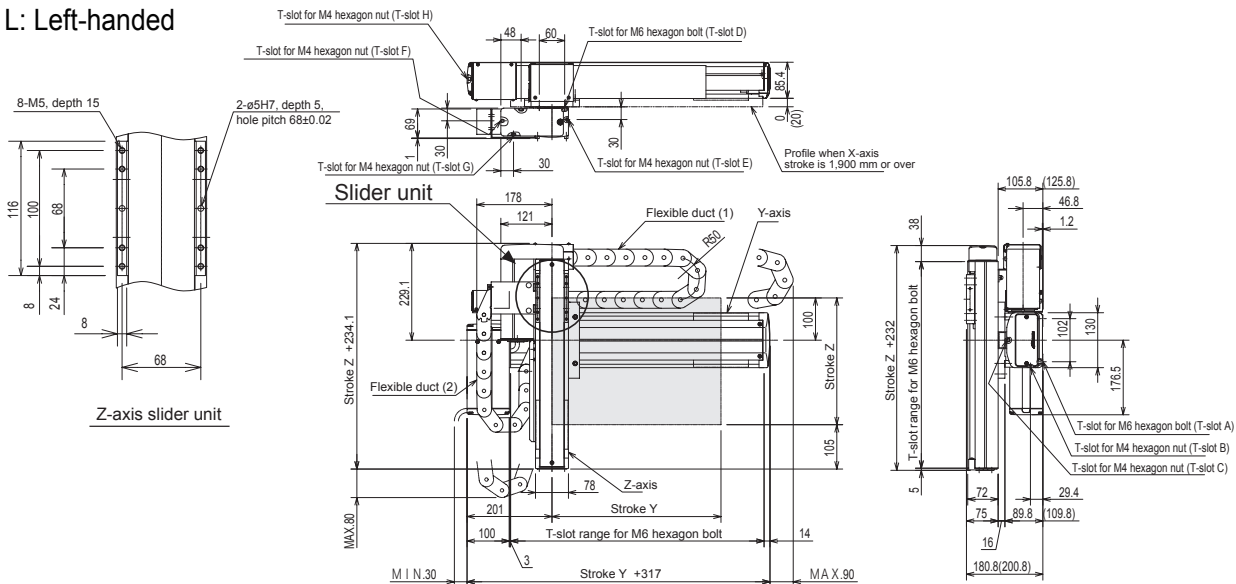
Maximum Payload (kg)	Z-axis stroke							
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm
	6.0	6.0	5.0	4.0	4.0	3.0	1.0	1.0

R: Right-handed

The values in parentheses are applicable when the Y-axis stroke is 1,900 mm or over.



L: Left-handed



Orthogonal Axes Specifications

[Set designation]

BA2 - L3 - H2B RW - 40 40 00 - OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed	10 : 100mm ? : 900mm AD : 1000mm ? : 1700mm	J0 : 1800mm ? : 900mm AO : 1000mm	0: None 1 : CA20-M10 Other: See page 21	3 : 3m 5 : 5m 7 : 7m
L: Left-handed	10 : 1800mm ? : 2200mm PO : 2300mm ? : 2500mm	10 : 100mm ? : 900mm AO : 1000mm		9 : 9m 11m

Timing belt type

Y-axis: Timing belt driven
Side mounted motor

Z-axis: Ball screw driven
Side mounted motor

[Specifications]

	Y-axis	Z-axis
Type of axis	BB30F-B □ -M21N- □ 0	BB10E-U □ -M10B- □ 0
Stroke (in increments of 100 mm)	100 ~ 2500mm	100 ~ 1000mm
Maximum speed	1000mm/s	600mm/s (Note 1)
Positioning repeatability	± 0.05mm	± 0.01mm
Lead	2.1mm (lead converted into ball screw)	10mm
Motor output	200W	100W, with brake
Resolution	0.01mm	

Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
Z-axis	700	500
	800	400
	900 ~ 1000	300

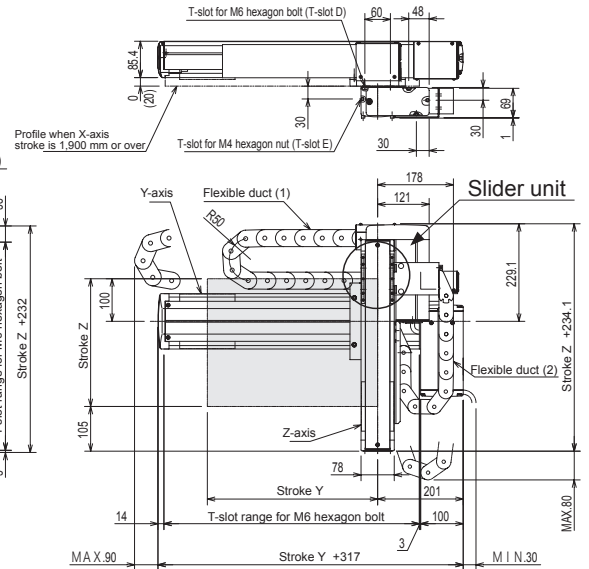
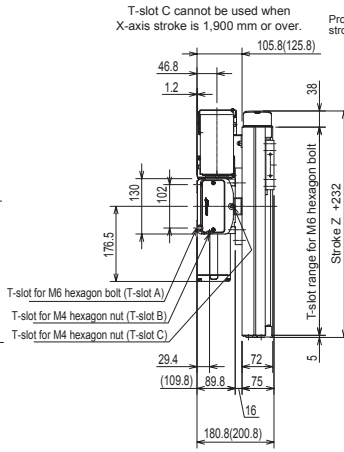
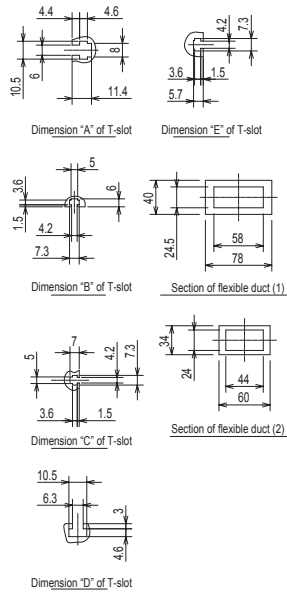
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg) (Note 2)	Z-axis stroke									
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm
	12.0	12.0	12.0	12.0	12.0	12.0	10.0	5.0	4.0	4.0

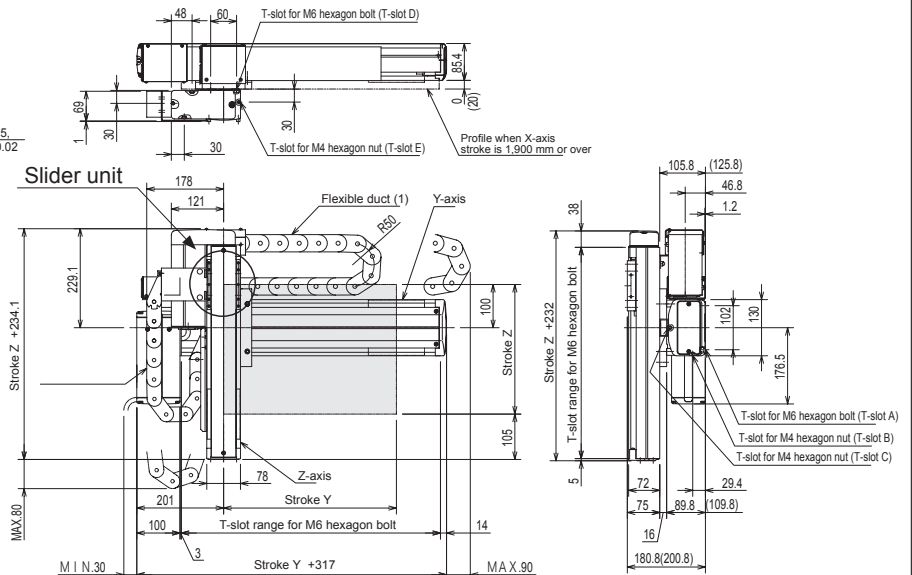
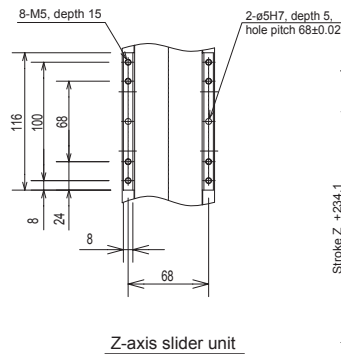
Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

R: Right-handed

The values in parentheses are applicable when the Y-axis stroke is 1,900 mm or over.



L: Left-handed



Y-Z Flexible-duct Spec.

[Set designation]

BA2 - L5 - H2A R W - 40 40 00 - OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed L: Left-handed	20 : 200mm JO : 1800mm 90 : 900mm NO : 2200mm A0 : 1000mm PO : 2300mm H0 : 1700mm RO : 2500mm	10 : 100mm 90 : 900mm A0 : 1000mm	0: None 1 : CA20-M10 Other: See page 21	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m

Timing belt type

Y-axis: Timing belt driven
Side mounted motor

Z-axis: Ball screw driven
Side mounted motor

Note 1: When the stroke is as given below, the maximum speed differs.

Z-axis	Stroke (mm)	Maximum speed (mm/s)
	700	500
	800	400
	900 ~ 1000	300

[Specifications]

	Y-axis	Z-axis
Type of axis	BB50F-B □ -M21N- □ 0	BB30E-U □ -M10B- □ 0
Stroke (in increments of 100 mm)	200 ~ 2500mm	100 ~ 1000mm
Maximum speed	1000mm/s	600mm/s (Note 1)
Positioning repeatability	± 0.05mm	± 0.01mm
Lead	2.1 mm (lead converted into ball screw)	10mm
Motor output	200W	100W, with brake
Resolution	0.01mm	

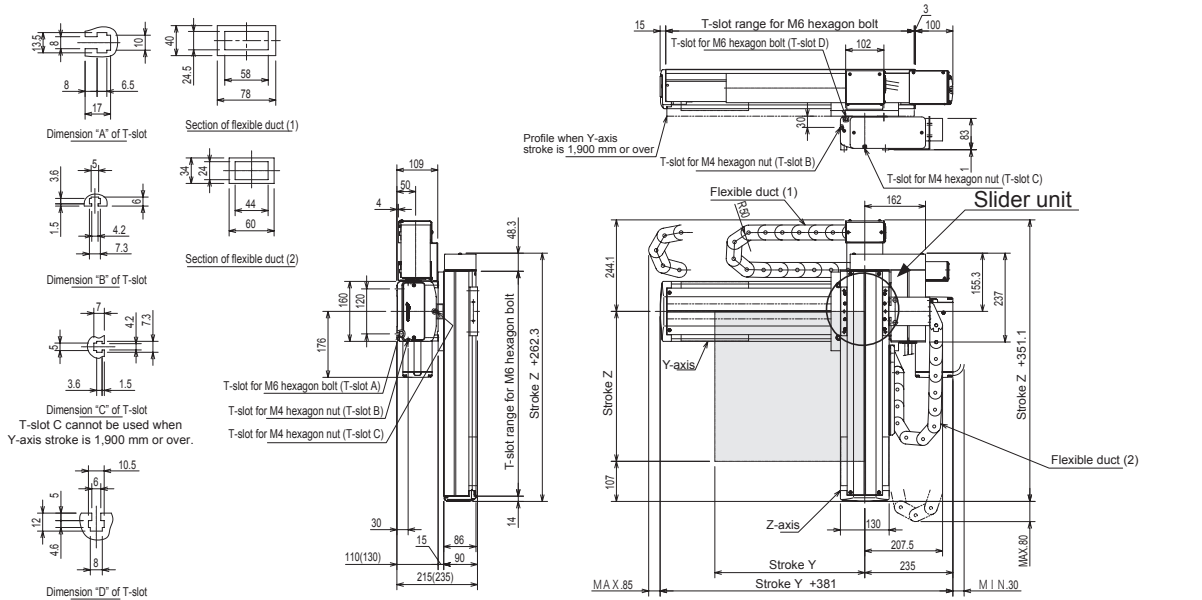
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg) (Note 2)	Z-axis stroke									
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm
	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0

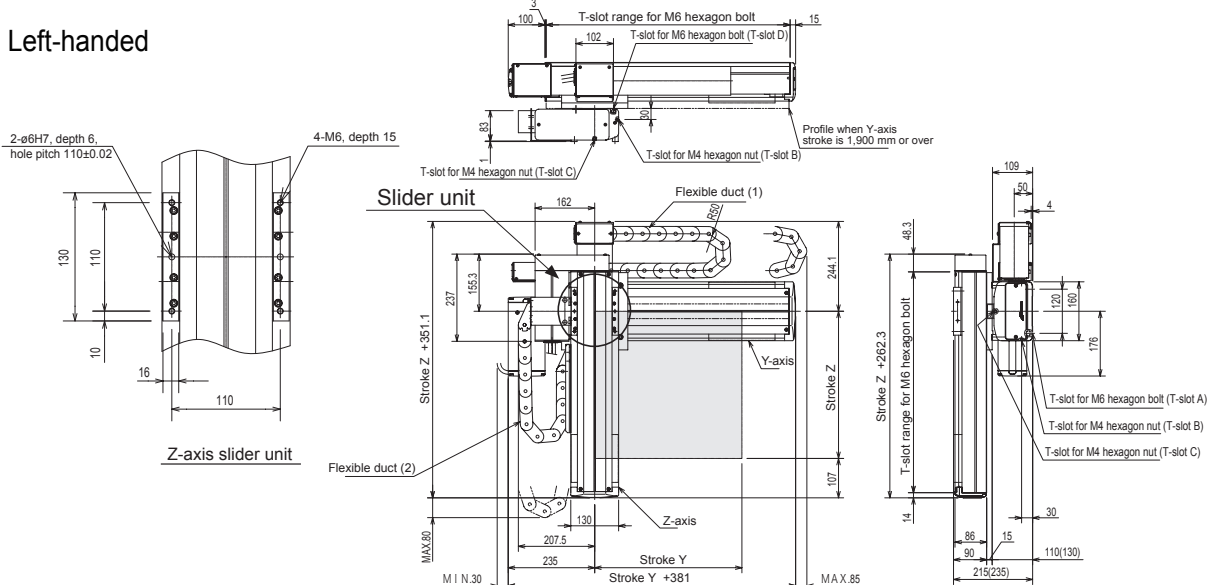
Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

R: Right-handed

The values in parentheses are applicable when the Y-axis stroke is 1,900 mm or over.



L: Left-handed



[Set designation]

BA2 - L5 - H2B R W - 40 40 00 - OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length	
R: Right-handed L: Left-handed	20 : 200mm ? : 900mm A0 : 1000mm ? : 1700mm RO : 2500mm	JO : 1800mm ? : 2200mm NO : 2300mm PO : 2300mm ? : 900mm AO : 1000mm	10 : 100mm ? : 900mm AO : 1000mm	0: None 1 : CA20-M10 Other: See page 21	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m

Timing belt type

- Y-axis: Timing belt driven
Side mounted motor
- Z-axis: Ball screw driven
Side mounted motor

[Specifications]

	Y-axis	Z-axis
Type of axis	BB50F-B □ -M21N- □ 0	BB30F-U □ -M10B- □ 0
Stroke (in increments of 100 mm)	200 ~ 2500mm	100 ~ 1000mm
Maximum speed	1000mm/ s	600mm/ s (Note 1)
Positioning repeatability	± 0.05mm	± 0.01 mm
Lead	21 mm (lead converted into ball screw)	10mm
Motor output	200W	200W, with brake
Resolution	0.01mm	

Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
Z-axis	700	500
	800	400
	900 ~ 1000	300

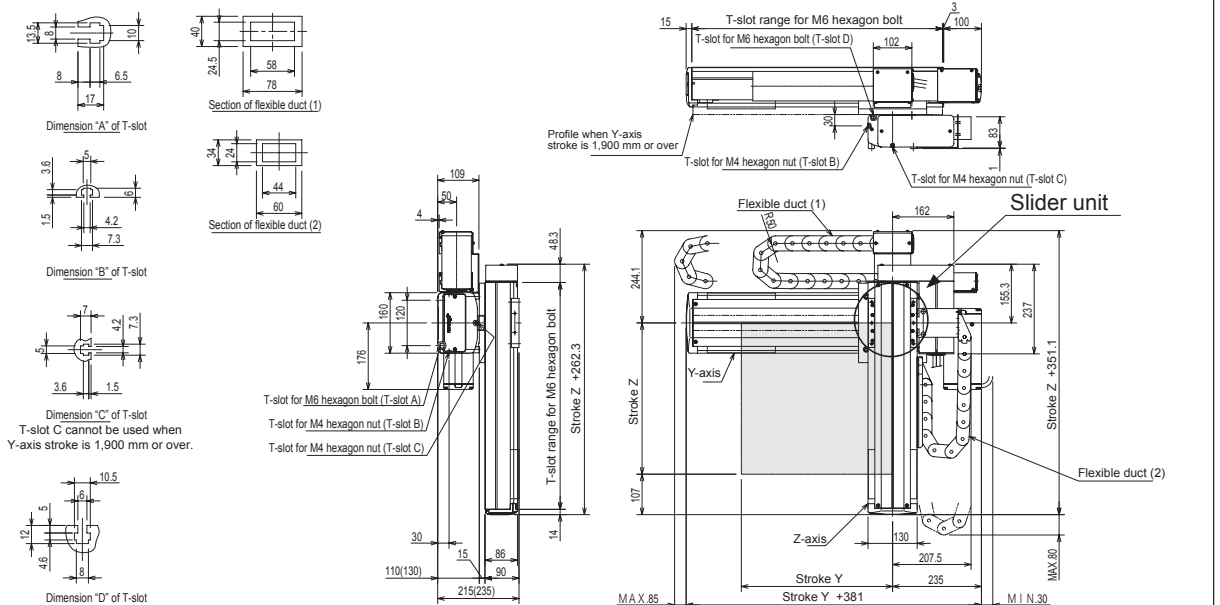
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg) (Note 2)	Z-axis stroke									
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm
	20.0	20.0	20.0	20.0	20.0	20.0	19.0	17.0	16.0	15.0

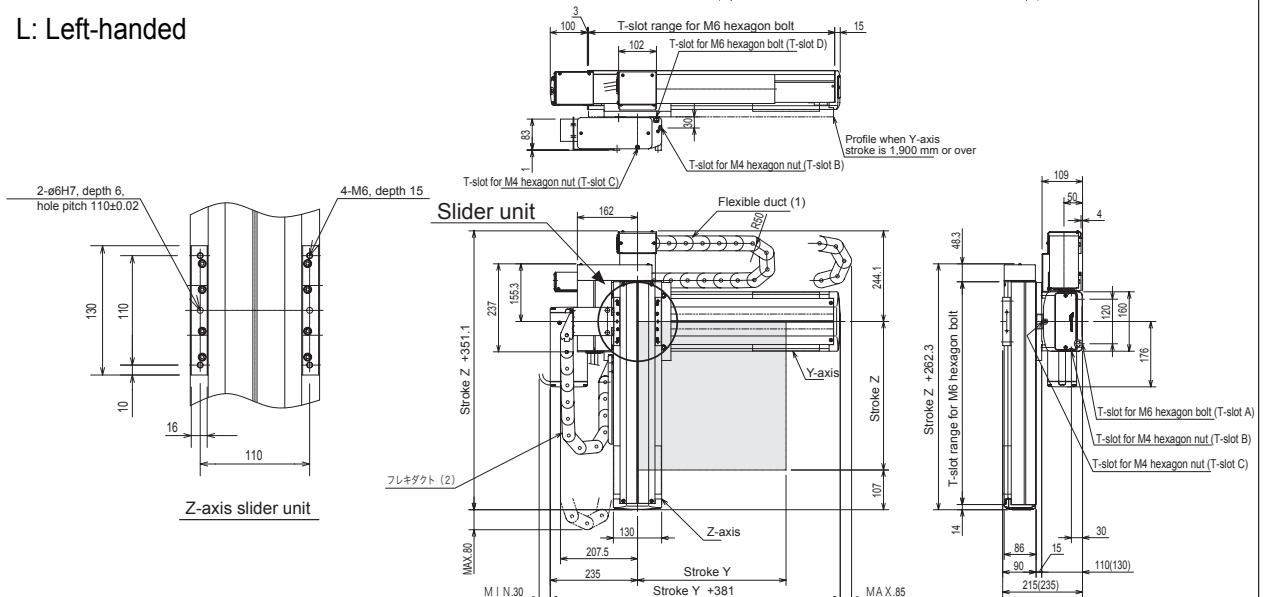
Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

R: Right-handed

The values in parentheses are applicable when the Y-axis stroke is 1,900 mm or over.



L: Left-handed



[Set designation]

BA2 – A1 – C2A RA – 40 45 00 – OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed	10 : 100mm	15 : 150mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm	65 : 650mm	1 : CA20-M10 Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

Z-axis: Ball screw driven
Motor straight

Y-axis: Ball screw driven
Motor straight

[Specifications]

	Z-axis	Y-axis
Type of axis	BB10E-ST-M05B-□ 0	BB10E-ST-S20N-□ 5
Stroke (in increments of 100 mm)	100 ~ 1000mm	150 ~ 650mm
Maximum speed	300mm/ s (Note 1)	1200mm/ s
Positioning repeatability	± 0.01 mm	
Lead of ball screw	5mm	20mm
Motor output	100W, with brake	100W
Resolution	0.01 mm	

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

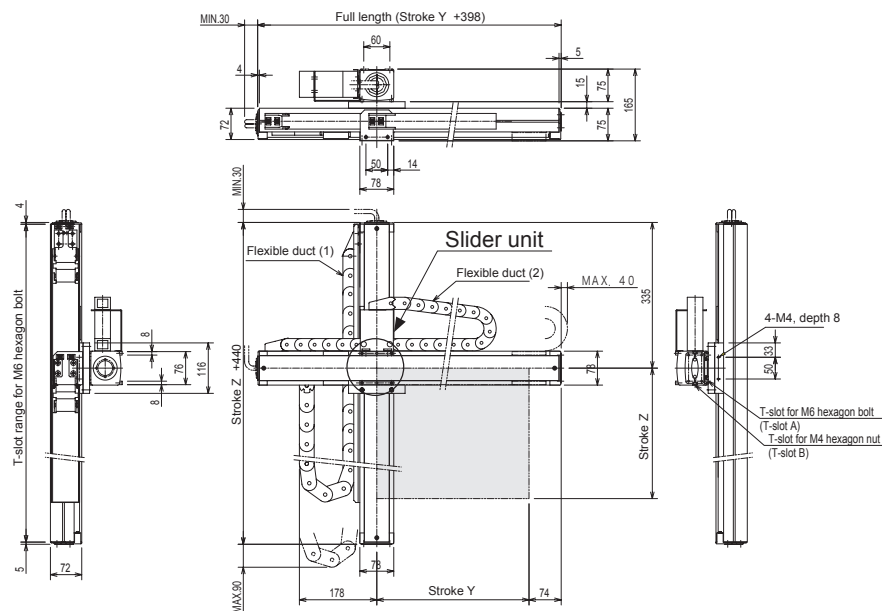
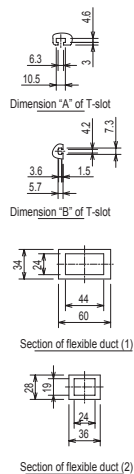
Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
Z-axis	700	250
	800	200
	900 ~ 1000	150

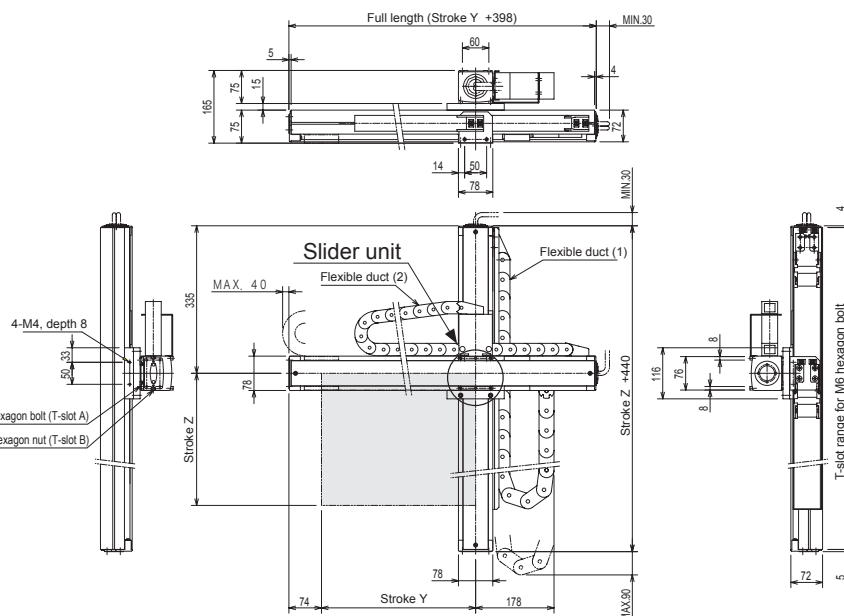
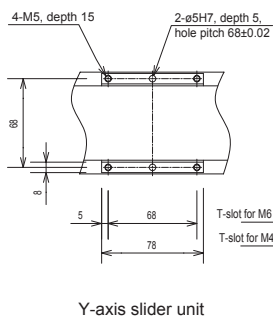
Maximum Payload (kg) (Note 2)	Y-axis stroke					
	150mm	250mm	350mm	450mm	550mm	650mm
	15.0	12.0	9.0	6.5	5.0	3.5

Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

R: Right-handed



L: Left-handed



[Set designation]

BA2 - A3 - C2A RA - 45 40 00 - OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed L: Left-handed	15 : 150mm 95 : 950mm A5 : 1050mm	10 : 100mm 90 : 900mm	0: None 1 : CA20-M10 Other: See page 21	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

- Z-axis: Ball screw driven
Motor straight
- Y-axis: Ball screw driven
Motor straight

[Specifications]

	Z-axis	Y-axis
Type of axis	BB30E-ST-M05B-□5	BB10E-ST-M20N-□0
Stroke (in increments of 100 mm)	150 ~ 1050mm	100 ~ 900mm
Maximum speed	300mm/s (Note 1)	1200mm/s (Note 1)
Positioning repeatability	± 0.01 mm	
Lead of ball screw	5mm	20mm
Motor output	100W, with brake	100W
Resolution	0.01mm	

Note 1: When the stroke is as given below, the maximum speed differs.

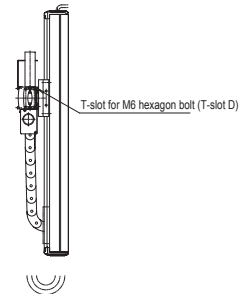
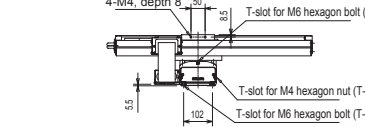
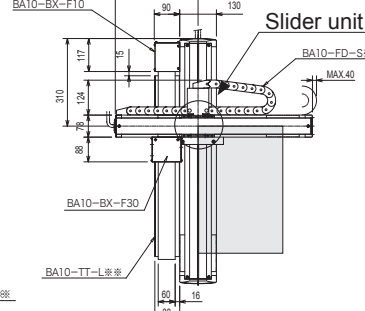
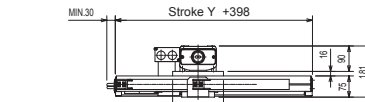
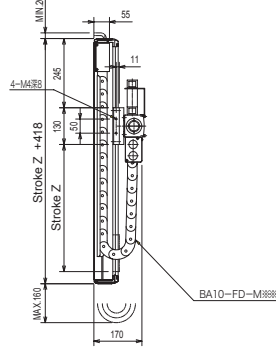
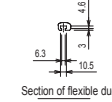
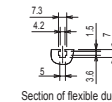
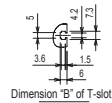
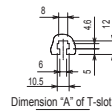
	Stroke (mm)	Maximum speed (mm/s)
Z-axis	750	250
	850	200
	950 ~ 1050	150
Y-axis	700	1000
	800	800
	900 ~ 1000	600

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

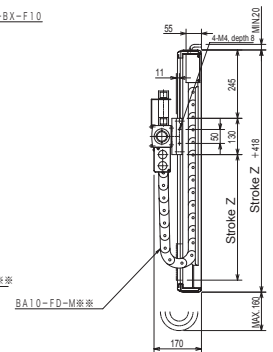
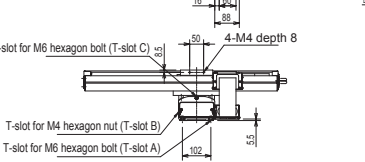
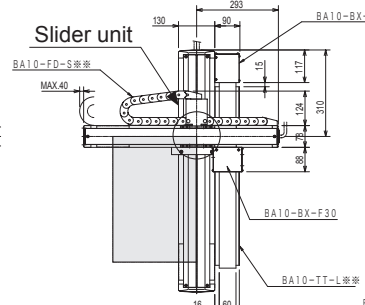
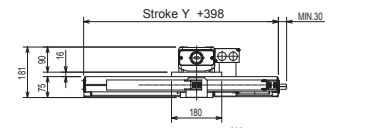
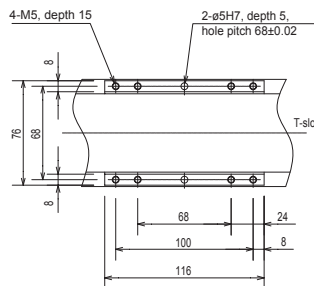
Maximum Payload (kg) (Note 2)	Y-axis stroke								
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm
	15.0	15.0	14.0	12.0	9.0	7.0	5.0	3.0	1.0

Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

R: Right-handed



L: Left-handed



[Set designation]

BA2 – A3 – C2B RA – 40 40 00 – OF 1 3

Combined operation R: Right-handed L: Left-handed	Axis 1 stroke 10 : 100mm 90 : 900mm A0 : 1000mm	Axis 2 stroke 10 : 100mm 90 : 900mm	Controller 0 : None 1 : CA20-M10 Other: See page 21	Cable length 3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m
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Ball screw type

Z-axis: Ball screw driven
Motor straight

Y-axis: Ball screw driven
Motor straight

[Specifications]

	Z-axis	Y-axis
Type of axis	BB30F-ST-M05B-□ 0	BB10E-ST-M20N-□ 0
Stroke (in increments of 100 mm)	100 ~ 1000mm	100 ~ 900mm
Maximum speed	300mm/ s (Note 1)	1200mm/ s (Note 1)
Positioning repeatability	± 0.01 mm	
Lead of ball screw	5mm	20mm
Motor output	200W, with brake	100W
Resolution	0.01 mm	

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

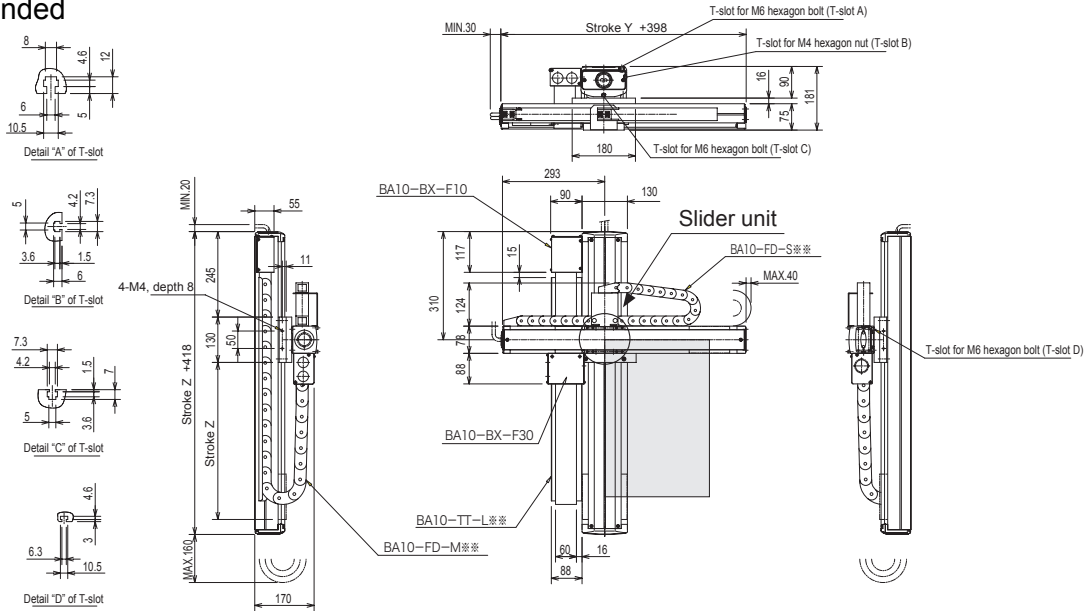
Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
Z-axis	700	250
	800	200
	900 ~ 1000	150
Y-axis	700	1000
	800	800
	900 ~ 1000	600

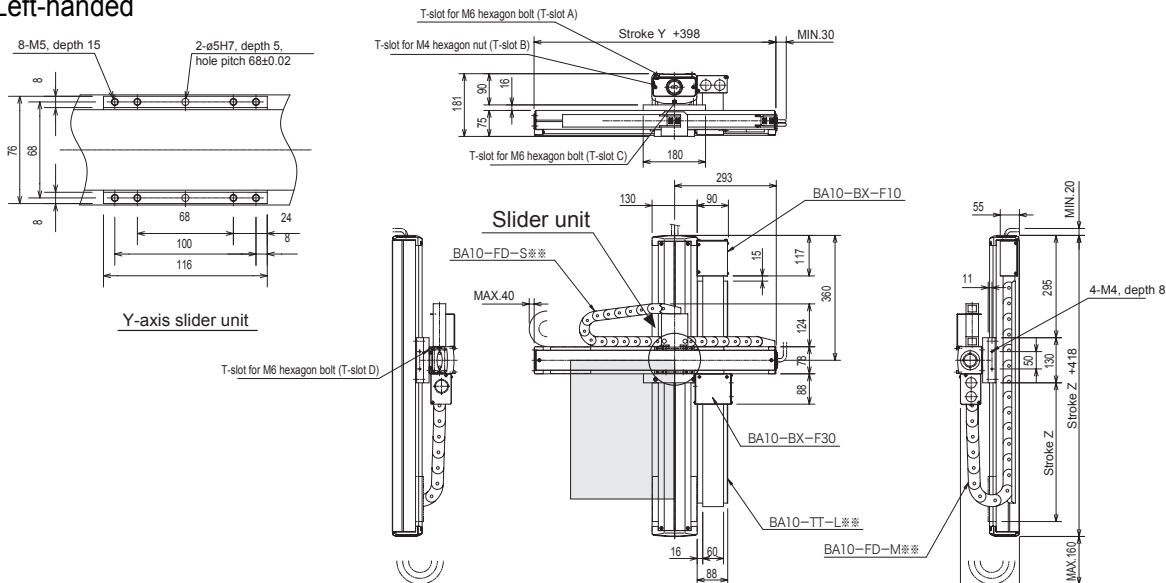
Maximum Payload (kg) (Note 2)	Y-axis stroke								
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm
	15.0	15.0	15.0	12.0	9.0	7.0	5.0	3.0	1.0

Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

R: Right-handed



L: Left-handed



Orthogonal Axes Specifications

[Set designation]

BA2 – A5 – C2A RA – 40 45 00 – OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed L: Left-handed	20 : 200mm 90 : 900mm A0 : 1000mm F0 : 1500mm	15 : 150mm 95 : 950mm A5 : 1050mm	0: None 1 : CA20-M10 Other: See page 21	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

Z-axis: Ball screw driven
Motor straight

Y-axis: Ball screw driven
Motor straight

Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
Z-axis	700 ~ 800	280
	900 ~ 1000	250
	1100 ~ 1200	180
	1300	130
	1400	100
Y-axis	1500	80
	750	1000
	850	800
	950 ~ 1050	600

[Specifications]

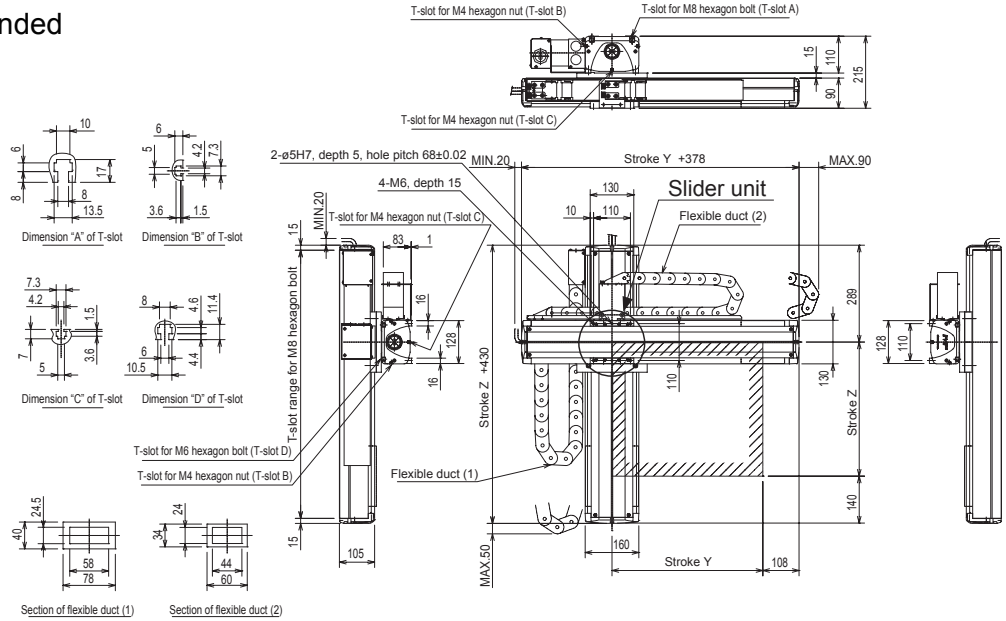
	Z-axis	Y-axis
Type of axis	BB50F-ST-M05B-□ 0	BB30E-ST-M20N-□ 5
Stroke (in increments of 100 mm)	200 ~ 1500mm	150 ~ 1050mm
Maximum speed	300mm/s (Note 1)	1200mm/s (Note 1)
Positioning repeatability	± 0.01 mm	
Lead of ball screw	5mm	20mm
Motor output	200W, with brake	100W
Resolution	0.01mm	

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

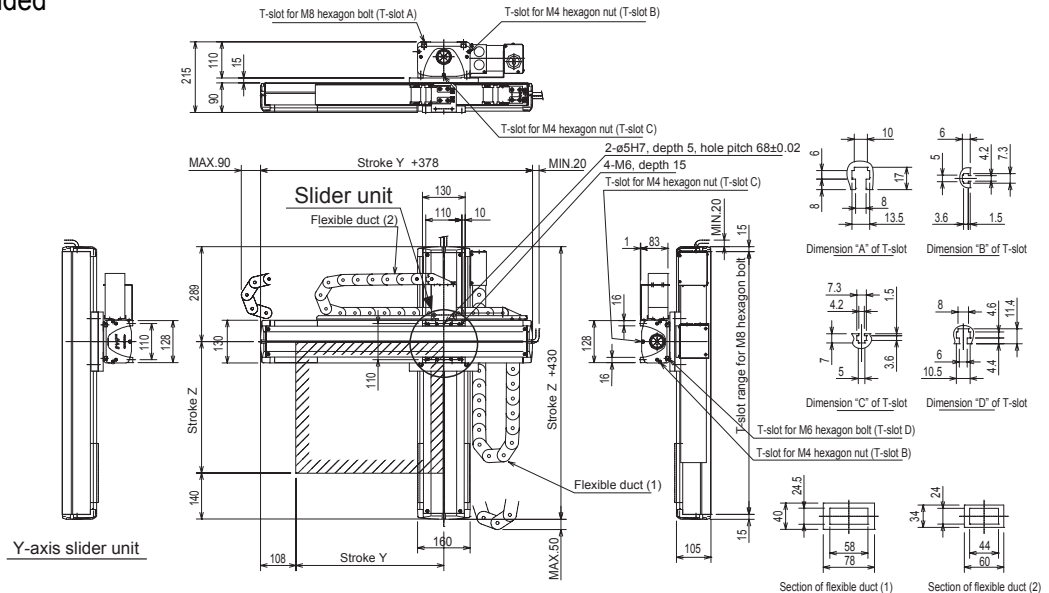
Maximum Payload (kg) (Note 2)	Y-axis stroke									
	150mm	250mm	350mm	450mm	550mm	650mm	750mm	850mm	950mm	1050mm
	20.0	20.0	20.0	20.0	20.0	20.0	18.0	14.0	11.0	7.0

Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

R: Right-handed



L: Left-handed



[Set designation]

BA2 – A5 – C2B RA – 40 40 00 – OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed	20 : 200mm	10 : 100mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm F0 : 1500mm	90 : 900mm A0 : 1000mm	1 : CA20-M10 Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

Z-axis: Ball screw driven
Motor straight

Y-axis: Ball screw driven
Motor straight

Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
Z-axis	700 ~ 800	280
	900 ~ 1000	250
	1100 ~ 1200	180
	1300	130
	1400	100
Y-axis	1500	80
	700	1000
	800	800
	900 ~ 1000	600

[Specifications]

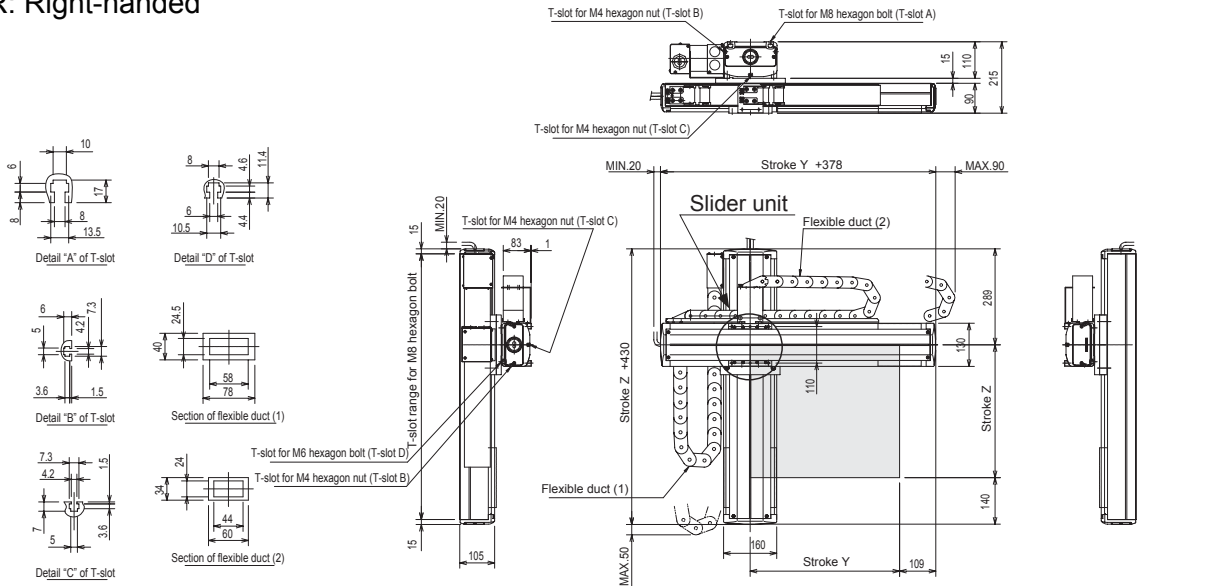
	Z-axis	Y-axis
Type of axis	BB50F-ST-M05B-□0	BB30F-ST-M20N-□0
Stroke (in increments of 100 mm)	200 ~ 1500mm	100 ~ 1000mm
Maximum speed	300mm/s (Note 1)	1200mm/s (Note 1)
Positioning repeatability	±0.01 mm	
Lead of ball screw	5mm	20mm
Motor output	200W, with brake	200W
Resolution	0.01 mm	

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

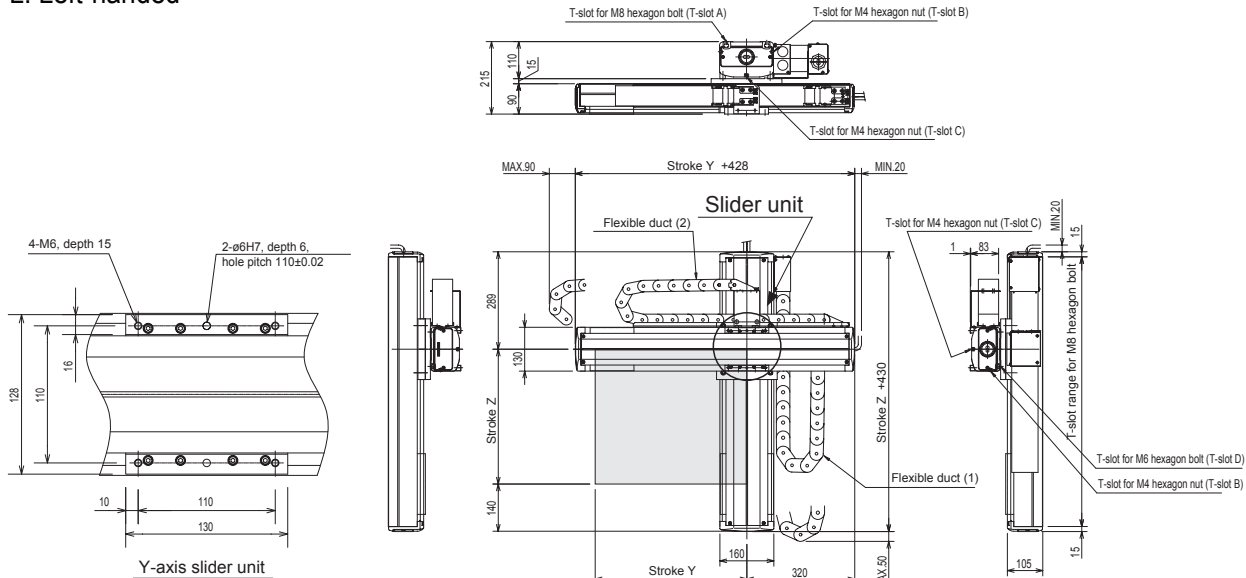
Maximum Payload (kg) (Note 2)	Y-axis stroke									
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm
	38.0	37.0	36.0	34.0	29.0	23.0	18.0	14.0	11.0	7.0

Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

R: Right-handed



L: Left-handed



Z-Y Flexible-duct Spec.

Orthogonal Axes Specifications

[Set designation]

BA2 – A1 – L2A R L – 40 45 00 – OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed	10 : 100mm	15 : 150mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm	65 : 650mm	1 : CA20-M10 Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Timing belt type

- Z-axis: Ball screw driven
Motor straight
- Y-axis: Timing belt driven
Side mounted motor

[Specifications]

	Z-axis	Y-axis
Type of axis	BB10E-ST-M05B-□ 0	BB10E-B □ -S21N-□ 5
Stroke (in increments of 100 mm)	100 ~ 1000mm	150 ~ 650mm
Maximum speed	300mm/s (Note 1)	1000mm/s
Positioning repeatability	± 0.01 mm	± 0.05 mm
Lead	5mm	21 mm (lead converted into ball screw)
Motor output	100W, with brake	100W
Resolution	0.01 mm	

Note 1: When the stroke is as given below, the maximum speed differs.

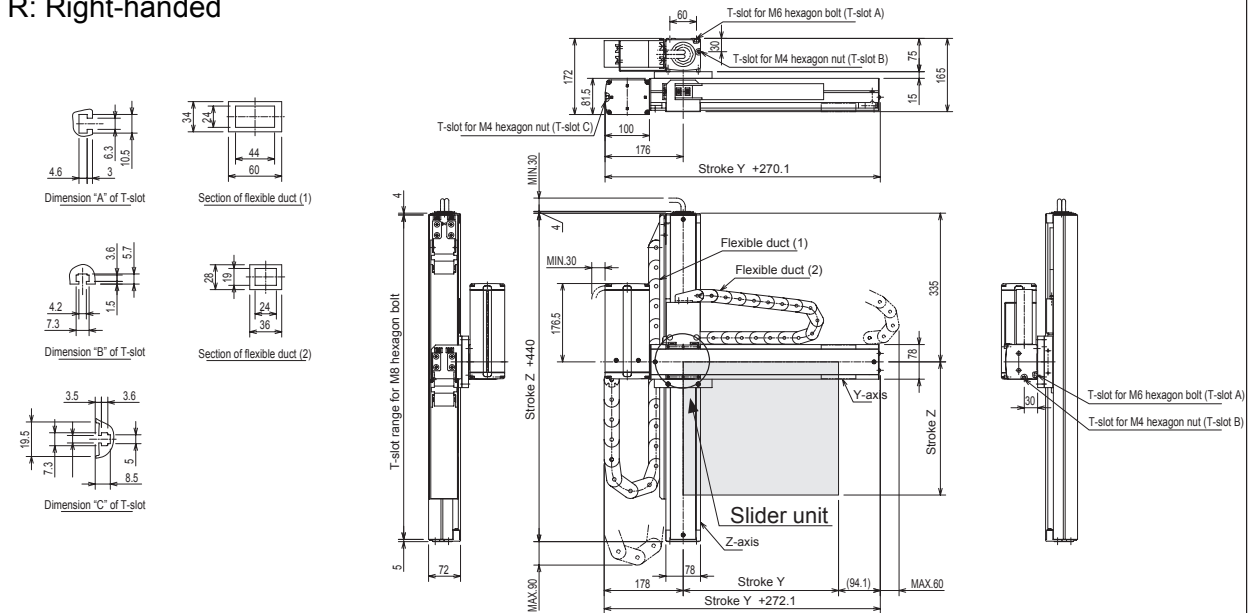
	Stroke (mm)	Maximum speed (mm/s)
Z-axis	700	250
	800	200
	900 ~ 1000	150

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

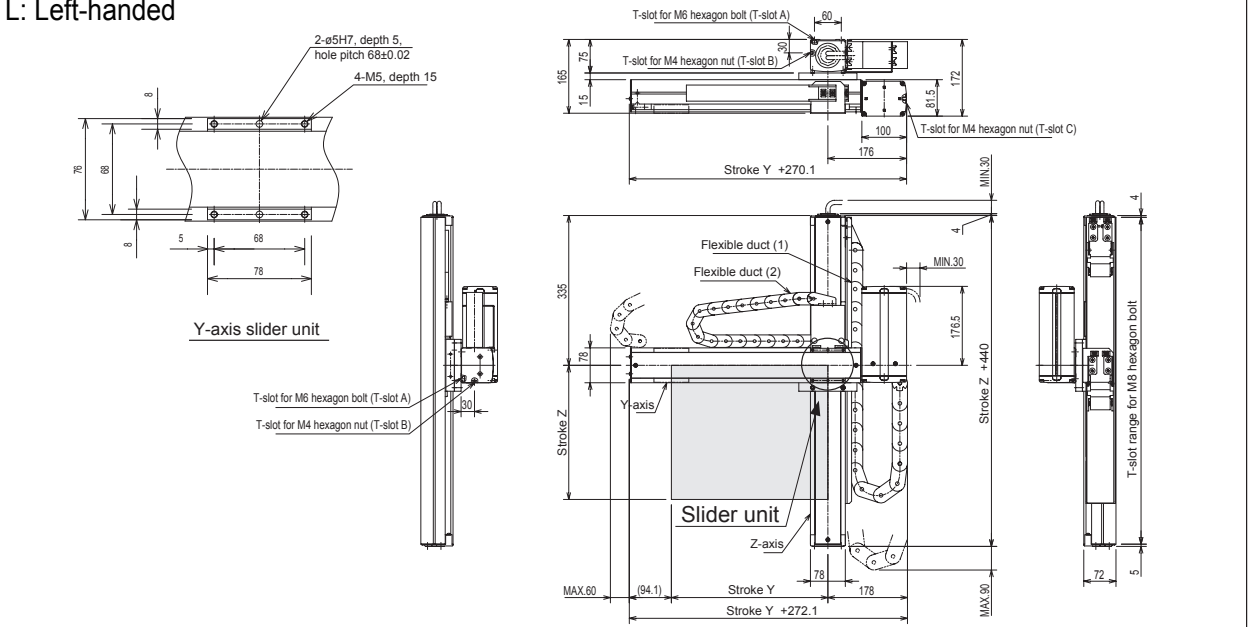
Maximum Payload (kg) (Note 2)	Y-axis stroke					
	150mm	250mm	350mm	450mm	550mm	650mm
	15.0	12.0	9.0	6.0	5.0	3.0

Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

R: Right-handed



L: Left-handed



Z-Y Flexible-duct Spec.

[Set designation]

BA2 – A3 – L2A R L – 45 40 00 – OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed L: Left-handed	15 : 150mm 95 : 950mm A5 : 1050mm	10 : 100mm 80 : 800mm	0: None 1 : CA20-M10 Other: See page 21	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m

Timing belt type

- Z-axis: Ball screw driven
Motor straight
- Y-axis: Timing belt driven
Side mounted motor

[Specifications]

	Z-axis	Y-axis
Type of axis	BB30E-ST-M05B- □ 5	BB10E-B □ -M21N- □ 0
Stroke (in increments of 100 mm)	150 ~ 1050mm	100 ~ 800mm
Maximum speed	300mm/s (Note 1)	1000mm/s
Positioning repeatability	± 0.01 mm	± 0.05mm
Lead	5mm	21mm (lead converted into ball screw)
Motor output	100W, with brake	100W
Resolution	0.01mm	

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

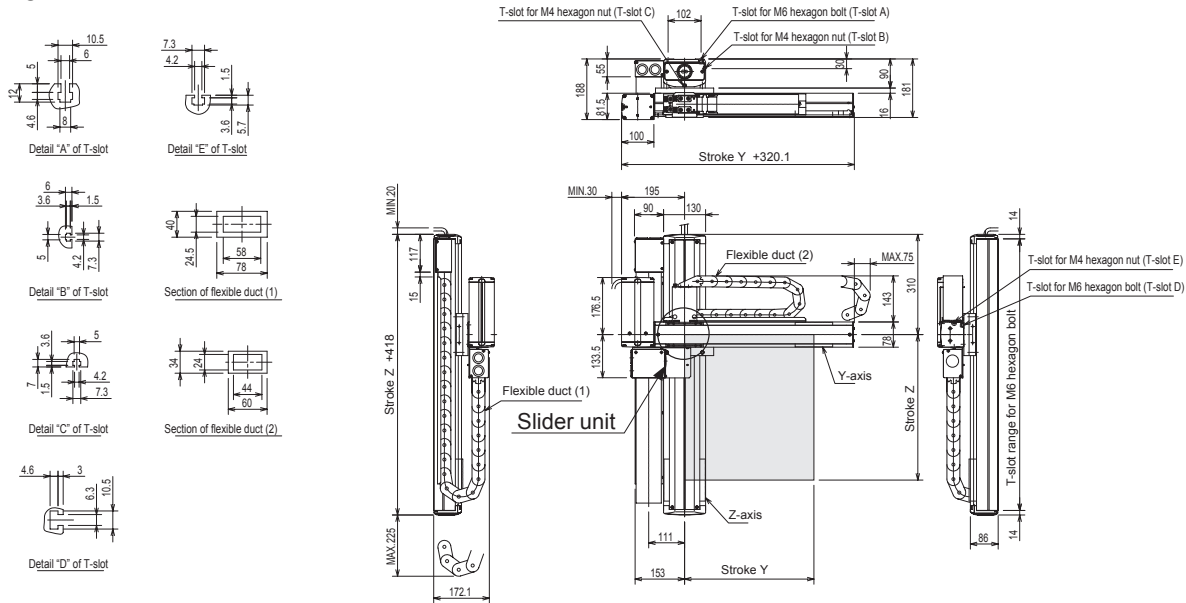
Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
Z-axis	750	250
	850	200
	950 ~ 1050	150

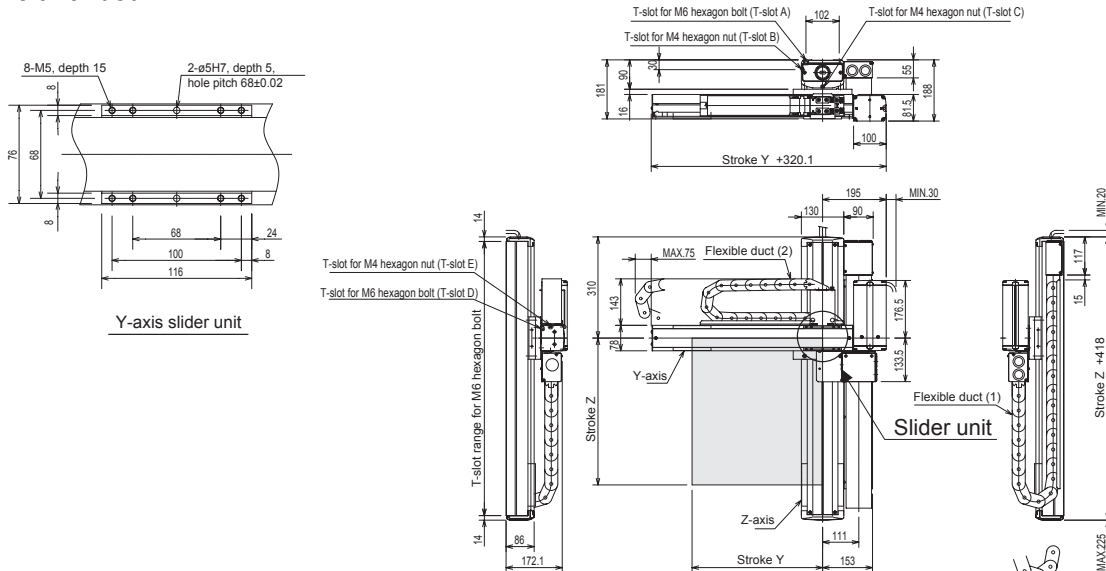
Maximum Payload (kg) (Note 2)	Y-axis stroke							
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm
	15.0	15.0	15.0	12.0	8.0	6.0	4.0	1.0

Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

R: Right-handed



L: Left-handed



Orthogonal Axes Specifications

[Set designation]

BA2 – A3 – L2B R L – 40 40 00 – OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed L: Left-handed	10 : 100mm 90 : 900mm A0 : 1000mm	10 : 100mm 90 : 900mm	0: None 1 : CA20-M10 Other: see page 21	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m

Timing belt type

- Z-axis: Ball screw driven
Motor straight
- Y-axis: Timing belt driven
Side mounted motor

[Specifications]

	Z-axis	Y-axis
Type of axis	BB30F-ST-M05B-□ 0	BB10E-B □ -M21N- □ 0
Stroke (in increments of 100 mm)	100 ~ 1000mm	100 ~ 900mm
Maximum speed	300mm/s (Note 1)	1000mm/s
Positioning repeatability	± 0.01mm	± 0.05mm
Lead	5mm	21mm (lead converted into ball screw)
Motor output	200W, with brake	100W
Resolution	0.01mm	

Note 1: When the stroke is as given below, the maximum speed differs.

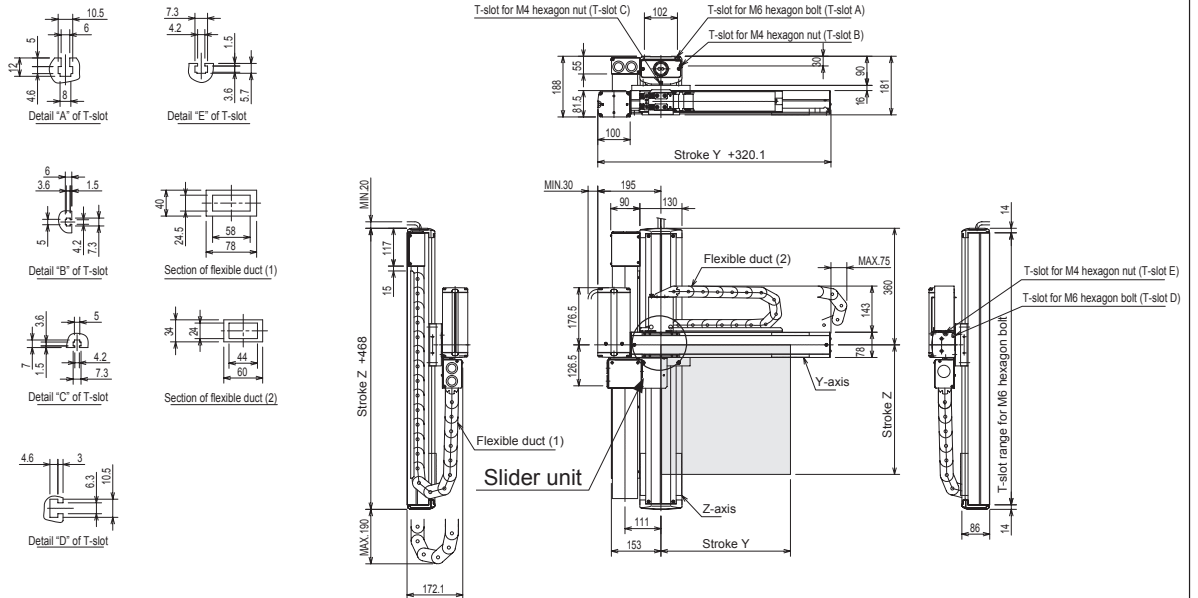
	Stroke (mm)	Maximum speed (mm/s)
Z-axis	700	250
	800	200
	900 ~ 1000	150

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

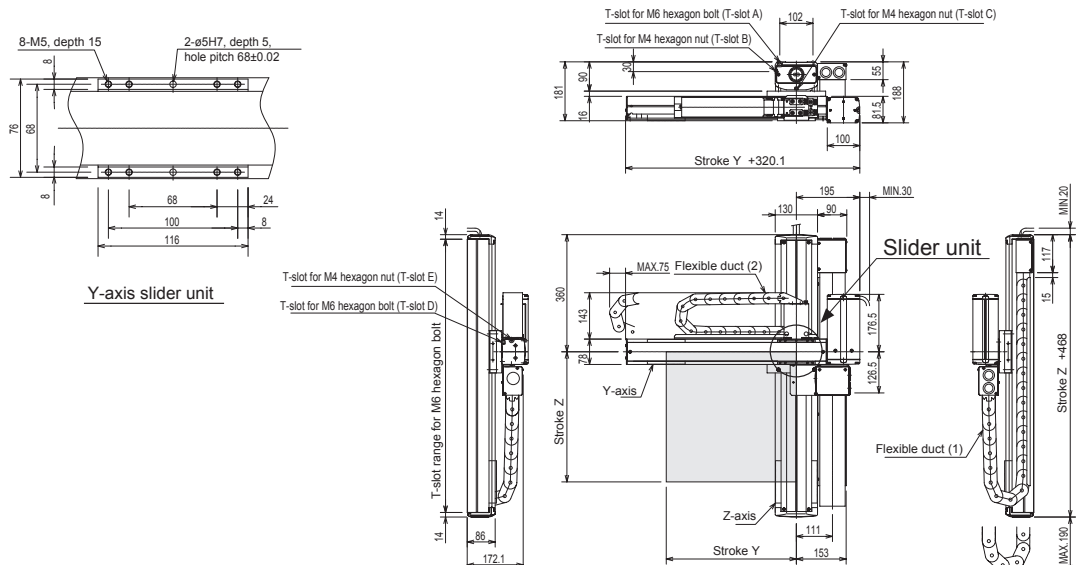
Maximum Payload (kg) (Note 2)	Y-axis stroke								
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm
	15.0	15.0	15.0	12.0	9.0	7.0	5.0	3.0	1.0

Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

R: Right-handed



L: Left-handed



Z-Y Flexible-duct Spec.

[Set designation]

BA2 – A3 – L2C R L – 40 40 00 – OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed L: Left-handed	10 : 100mm λ 90 : 900mm A0 : 1000mm	10 : 100mm 90 : 900mm	0: None 1 : CA20-M10 Other: See page 21	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m

Timing belt type

Z-axis: Ball screw driven
Motor straight
Y-axis: Timing belt driven
Side mounted motor

Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
Z-axis	700	250
	800	200
	900 ~ 1000	150

[Specifications]

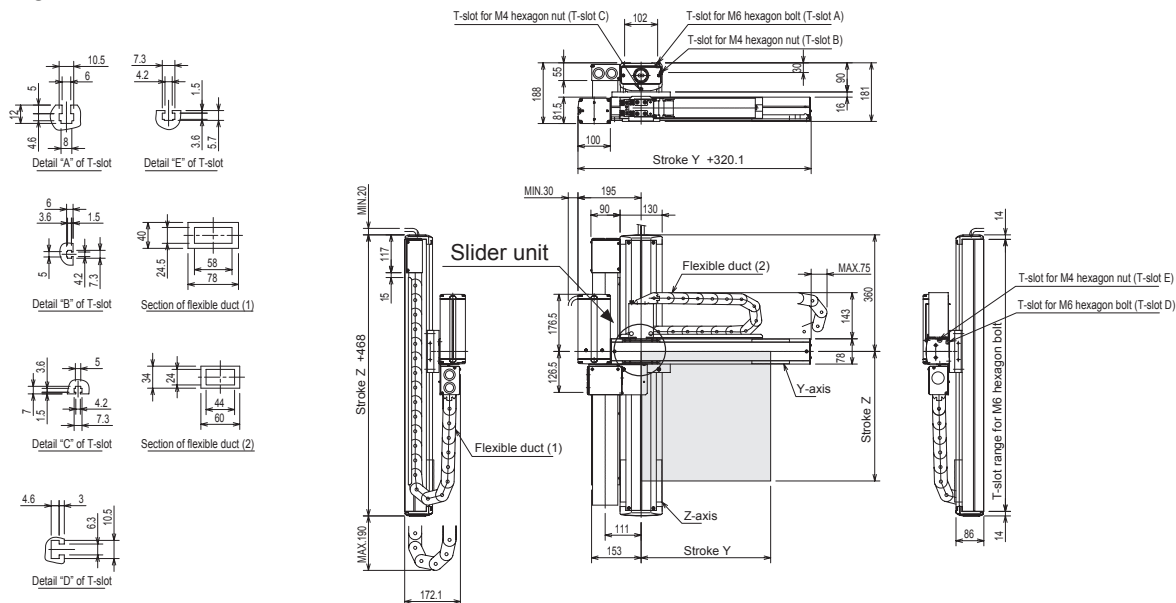
	Z-axis	Y-axis
Type of axis	BB30F-ST-M05B-□ 0	BB10F-B □ -M21N-□ 0
Stroke (in increments of 100 mm)	100 ~ 1000mm	100 ~ 900mm
Maximum speed	300mm/s (Note 1)	1000mm/s
Positioning repeatability	± 0.01 mm	± 0.05mm
Lead	5mm	21mm (lead converted into ball screw)
Motor output	200W, with brake	200W
Resolution	0.01mm	

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

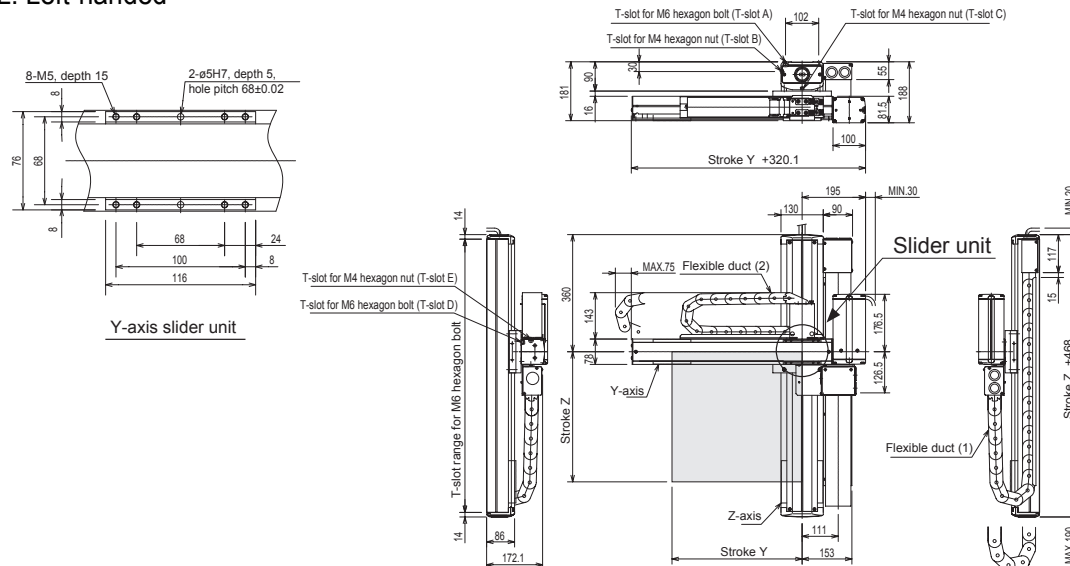
Maximum Payload (kg) (Note 2)	Y-axis stroke									
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	
	20.0	19.0	15.0	12.0	9.0	7.0	5.0	3.0	1.0	

Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

R: Right-handed



L: Left-handed



[Set designation]

BA2 - A5 - L2A RL - 40 40 00 - OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed L: Left-handed	20 : 200mm 90 : 900mm A0 : 1000mm F0 : 1500mm	10 : 100mm 90 : 900mm A0 : 1000mm	0: None 1 : CA20-M10 Other: See page 21	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m

Timing belt type

- Z-axis: Ball screw driven
Motor straight
- Y-axis: Timing belt driven
Side mounted motor

[Specifications]

	Z-axis	Y-axis
Type of axis	BB50F-ST-M05B-□ 0	BB30E-B□ -M21N-□ 0
Stroke (in increments of 100 mm)	200 ~ 1500mm	100 ~ 1000mm
Maximum speed	300mm/ s (Note 1)	1000mm/ s
Positioning repeatability	± 0.01mm	± 0.05mm
Lead of ball screw	5mm	21mm (lead converted into ball screw)
Motor output	200W, with brake	100W
Resolution	0.01mm	

Note 1: When the stroke is as given below, the maximum speed differs.

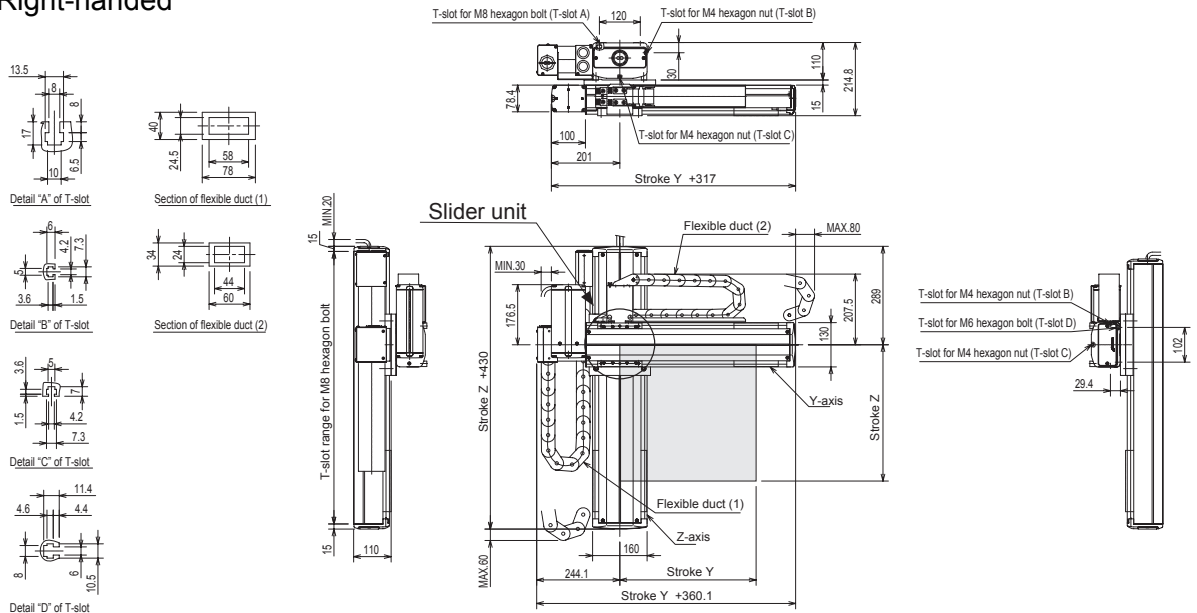
	Stroke (mm)	Maximum speed (mm/s)
Z-axis	700 ~ 800	280
	900 ~ 1000	250
	1100 ~ 1200	180
	1300	130
	1400	100
	1500	80

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

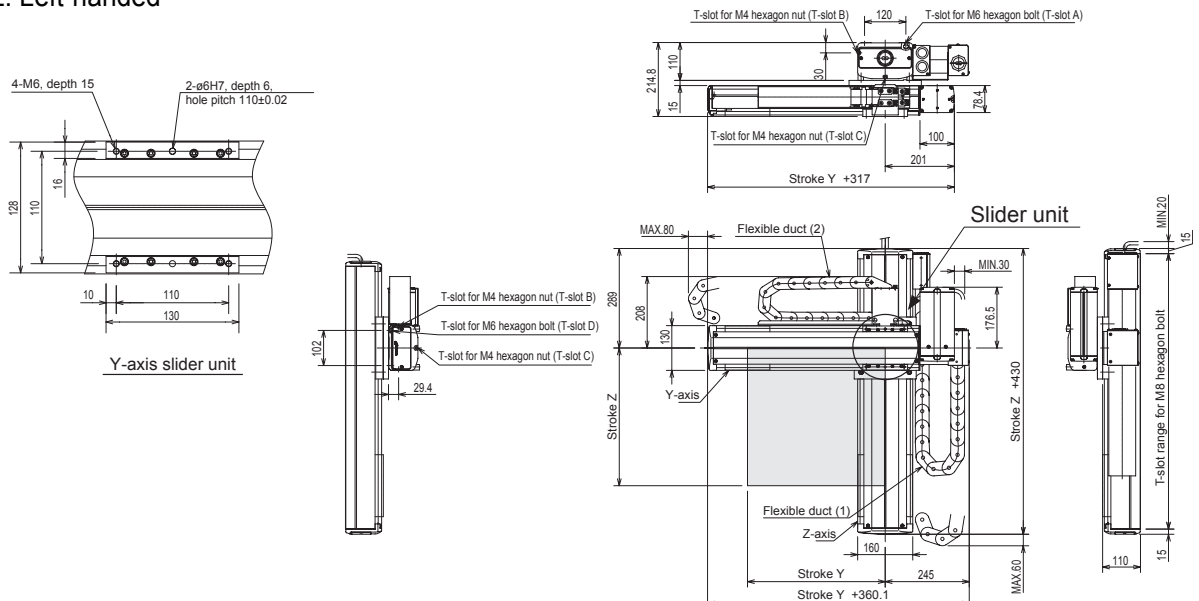
Maximum Payload (kg) (Note 2)	Y-axis stroke									
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm
	15.0	15.0	15.0	15.0	15.0	15.0	15.0	14.0	11.0	7.0

Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

R: Right-handed



L: Left-handed



[Set designation]

BA2 – A5 – L2B RL – 40 40 00 – OF 1 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Controller	Cable length
R: Right-handed L: Left-handed	20 : 200mm 90 : 900mm A0 : 1000mm F0 : 1500mm	10 : 100mm 90 : 900mm A0 : 1000mm	0: None 1 : CA20-M10 Other: See page 21	3 : 3m 9 : 9m 5 : 5m B : 11m 7 : 7m D : 13m

Timing belt type

Z-axis: Ball screw driven
Motor straight
Y-axis: Timing belt driven
Side mounted motor

[Specifications]

	Z-axis	Y-axis
Type of axis	BB50F-ST-M05B- □ 0	BB30F-B □ -M21N- □ 0
Stroke (in increments of 100 mm)	200 ~ 1500mm	100 ~ 1000mm
Maximum speed	300mm/s (Note 1)	1000mm/s
Positioning repeatability	± 0.01 mm	± 0.05 mm
Lead	5 mm	21 mm (lead converted into ball screw)
Motor output	200W, with brake	200W
Resolution	0.01 mm	

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

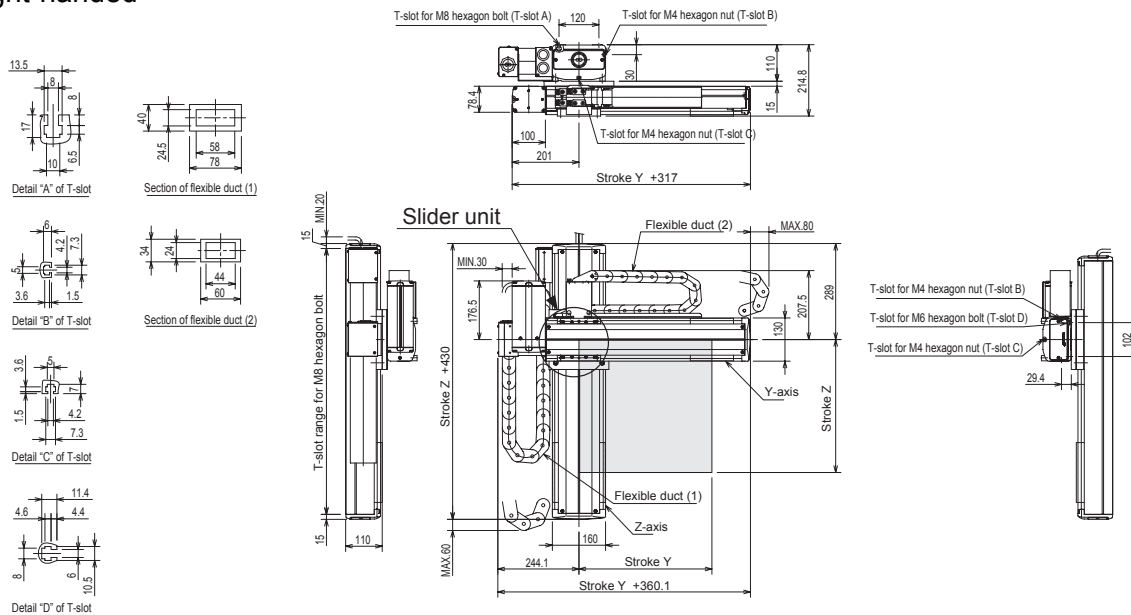
Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
Z-axis	700 ~ 800	280
	900 ~ 1000	250
	1100 ~ 1200	180
	1300	130
	1400	100
	1500	80

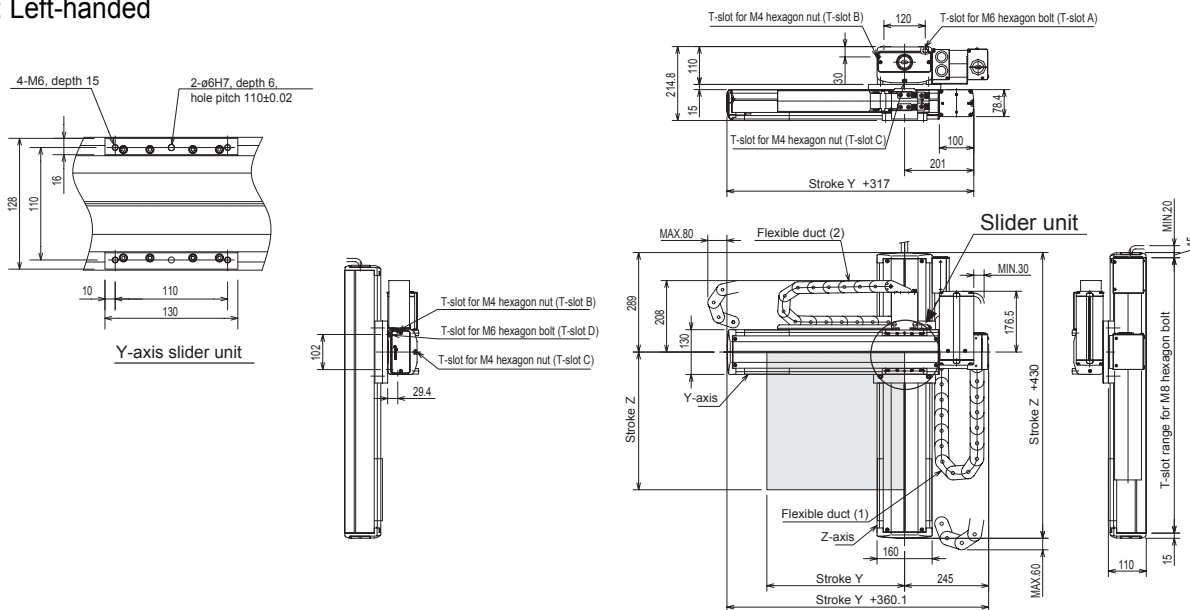
Maximum Payload (kg) (Note 2)	Y-axis stroke									
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm
	37.0	36.0	35.0	34.0	29.0	23.0	18.0	14.0	11.0	7.0

Note 2: Payload when a regenerative discharge unit (ABSU-2000) is used.

R: Right-handed



L: Left-handed



Orthogonal Axes Specifications

[Set designation]

BA2 – A1 – A3D R A – 45 30 30 – OF 2 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	15 : 150mm	05 : 50mm	05 : 50mm	0: None	3 : 3m 9 : 9m
L: Left-handed	95 : 950mm A5 : 1050mm	30 : 300mm	30 : 300mm	Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

- X-axis: Ball screw driven
Motor straight
- Y-axis: Ball screw driven
Motor straight
- Z-axis: Ball screw driven
Motor straight

[Specifications]

	X-axis	Y-axis	Z-axis
Type of axis	BB10E-ST-S20N-□5	BBT7D-ST-M12N-□□	BBT5D-ST-M06B-□□
Stroke (mm) (X-axis in increments of 100 mm, Y- and Z-axis in crements of 50mm)	150 ~ 1050	50 ~ 300	50 ~ 300
Maximum speed (mm/s)	1200 (Note 1)	800	400
Positioning repeatability (mm)	± 0.01	± 0.02	
Lead of ball screw (mm)	20	12	6
Motor output	100W	50W	50W, with brake
Resolution (mm)	0.01		

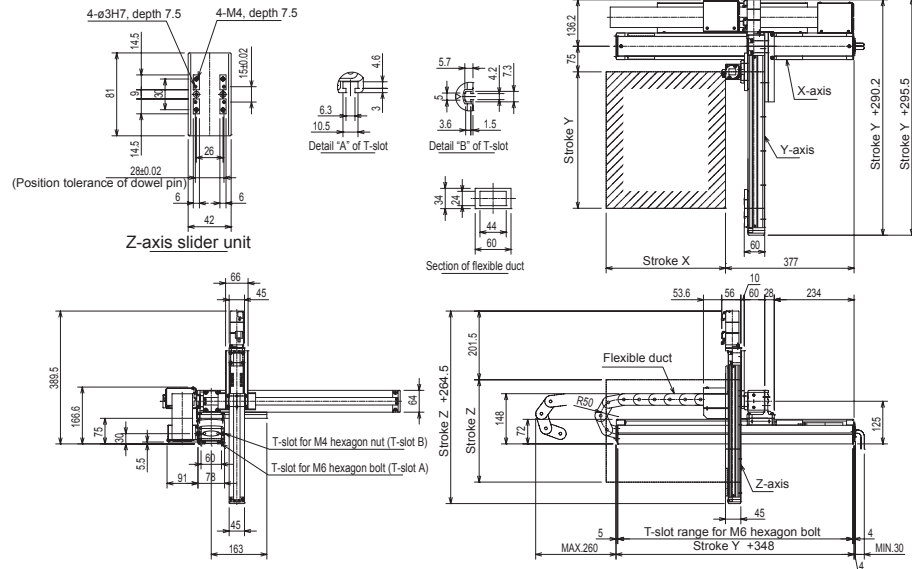
Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
X-axis	750	1000
	850	800
	950 ~ 1050	600

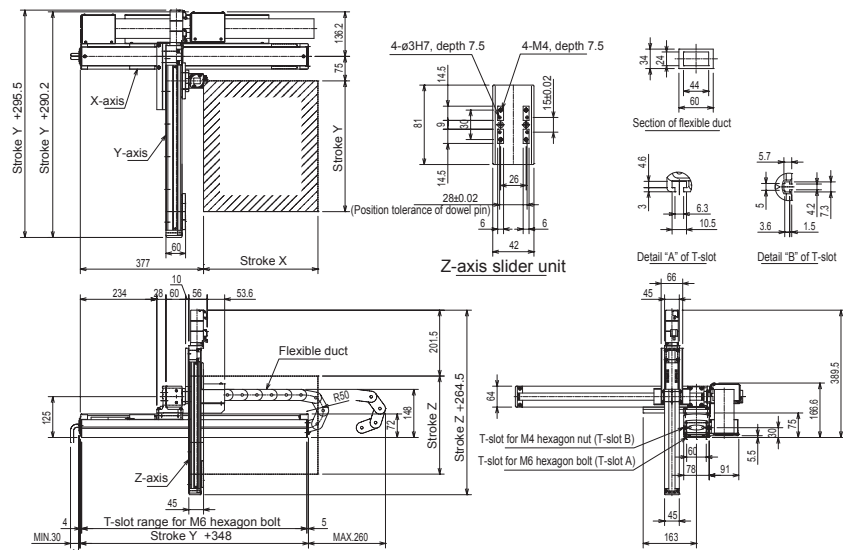
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg)	Y-axis stroke						
	50mm	100mm	150mm	200mm	250mm	300mm	
Z-axis stroke	50,100mm	3.0	3.0	2.5	2.5	0.7	0.7
	150,200mm	3.0	3.0	2.5	2.5	0.5	0.5
	250,300mm	3.0	3.0	2.5	2.5	0.3	0.3

R: Right-handed



L: Left-handed



X-Y-Z Flexible-duct Spec.

[Set designation]

BA2 - A1 - A3DRG - 45 30 30 - OF 2 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	15 : 150mm	05 : 50mm	05 : 50mm	0: None	3 : 3m 9 : 9m
L: Left-handed	95 : 950mm A5 : 1050mm	30 : 300mm	30 : 300mm	2 : CA10-M00B Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

- X-axis: Ball screw driven
Side mounted motor
- Y-axis: Ball screw driven
Motor straight
- Z-axis: Ball screw driven
Motor straight

Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
X-axis	750	1000
	850	800
	950 ~ 1050	600

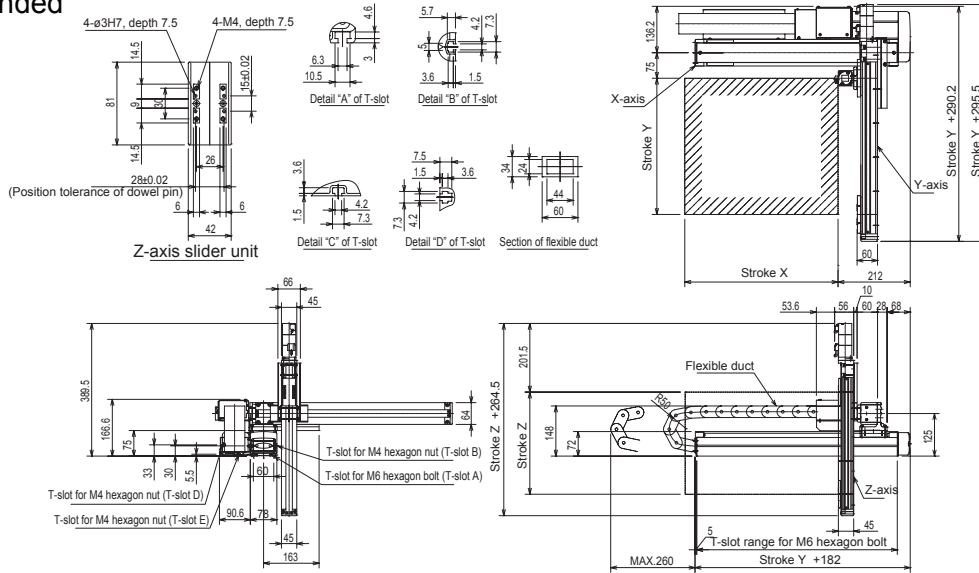
[Specifications]

	X-axis	Y-axis	Z-axis
Type of axis	BB10E-U □-S20N-□5	BBT7D-ST-M12N-□□	BBT5D-ST-M06B-□□
Stroke (mm) (X-axis in increments of 100 mm, Y- and Z-axis in increments of 50mm)	150 ~ 1050	50 ~ 300	50 ~ 300
Maximum speed (mm/s)	1200 (Note 1)	800	400
Positioning repeatability (mm)	± 0.01	± 0.02	
Lead of ball screw (mm)	20	12	6
Motor output	100W	50W	50W, with brake
Resolution (mm)	0.01		

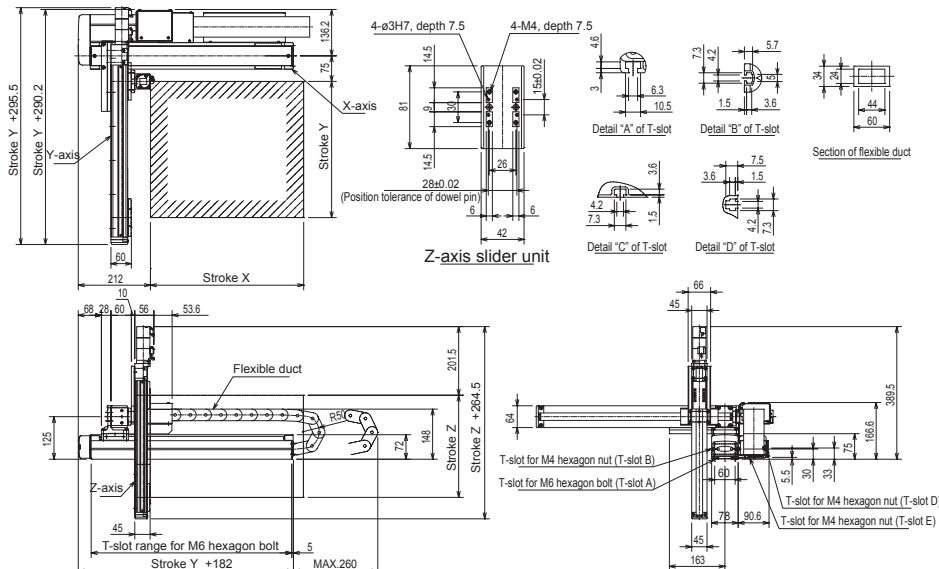
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg)	Y-axis stroke						
	50mm	100mm	150mm	200mm	250mm	300mm	
Z-axis stroke	50,100mm	3.0	3.0	2.5	2.5	0.7	0.7
	150,200mm	3.0	3.0	2.5	2.5	0.5	0.5
	250,300mm	3.0	3.0	2.5	2.5	0.3	0.3

R: Right-handed



L: Left-handed



X-Y-Z Flexible-duct Spec.

[Set designation]

BA2 – A1 – A3FR A – 40 45 30 – OF 2 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	10 : 100mm	15 : 150mm	05 : 50mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm	45 : 450mm	30 : 300mm	2 : CA10-M00B Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

- X-axis: Ball screw driven
Motor straight
- Y-axis: Ball screw driven
Motor straight
- Z-axis: Ball screw driven
Motor straight

Note 1: When the stroke is as given below, the maximum speed differs.

X-axis	Stroke (mm)	Maximum speed (mm/s)
	700	1000
	800	800
900 ~ 1000		600

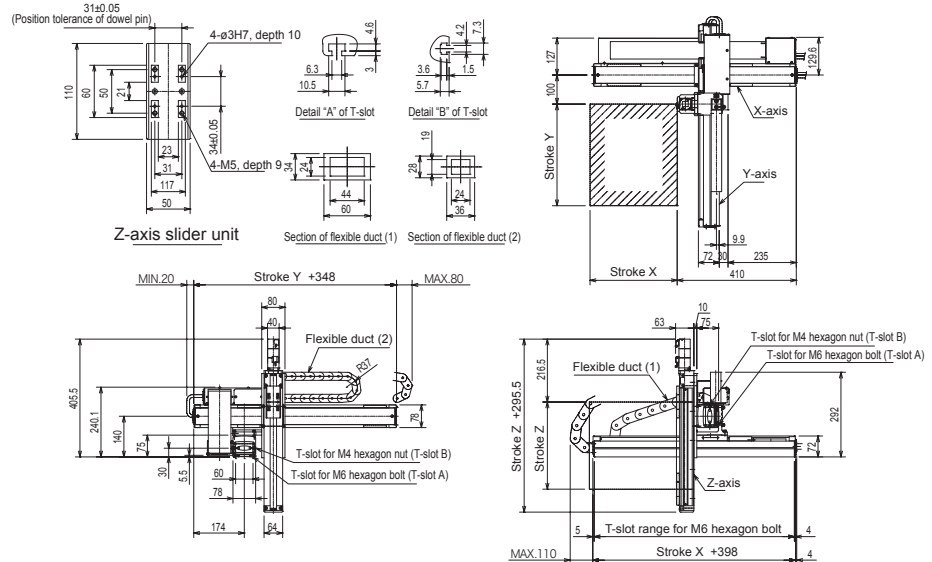
[Specifications]

	X-axis	Y-axis	Z-axis
Type of axis	BB10E-ST-M20N-□0	BB10E-ST-S20N-□5	BBT7D-ST-M06B-□□
Stroke (mm) (X- and Y-axis in increments of 100 mm, Z-axis in increments of 50mm)	100 ~ 1000	150 ~ 450	50 ~ 300
Maximum speed (mm/s)	1200 (Note 1)	1200	400
Positioning repeatability (mm)	± 0.01	± 0.01	± 0.02
Lead of ball screw (mm)	20	20	6
Motor output	100W	100W	50W, with brake
Resolution (mm)	0.01		

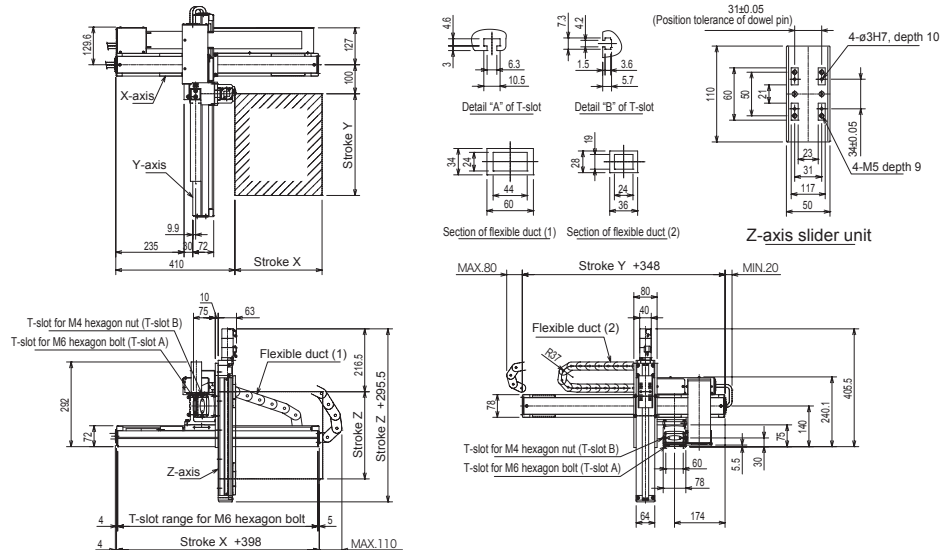
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg)	Y-axis stroke			
	150mm	250mm	350mm	450mm
Z-axis stroke				
50,100mm	4.0	3.5	2.5	1
150,200mm	4.0	2.5	2	0.6
250,300mm	3.5	2.5	1.5	0.2

R: Right-handed



L: Left-handed



[Set designation]

BA2 – A1 – A3F R F – 40 45 30 – OF 2 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	10 : 100mm	15 : 150mm	05 : 50mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm	45 : 450mm	30 : 300mm	2 : CA10-M00B Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

- X-axis: Ball screw driven
Side mounted motor
- Y-axis: Ball screw driven
Side mounted motor
- Z-axis: Ball screw driven
Motor straight

[Specifications]

	X-axis	Y-axis	Z-axis
Type of axis	BB10E-U □-M20N-□0	BB10E-U □-S20N-□5	BBT7D-ST-M06B-□□
Stroke (mm) (X- and Y-axis in increments of 100 mm, Z-axis in increments of 50mm)	100 ~ 1000	150 ~ 450	50 ~ 300
Maximum speed (mm/s)	1200 (Note 1)	1200 (Note 1)	400
Positioning repeatability (mm)	± 0.01	± 0.01	± 0.02
Lead of ball screw (mm)	20	20	6
Motor output	100W	100W	50W, with brake
Resolution (mm)	0.01		

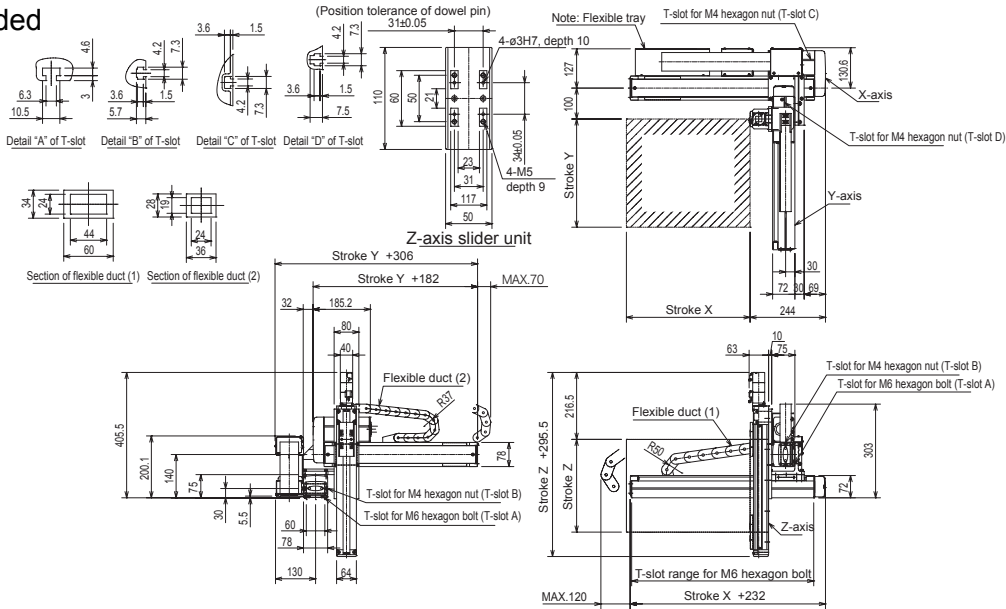
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Note 1: When the stroke is as given below, the maximum speed differs.

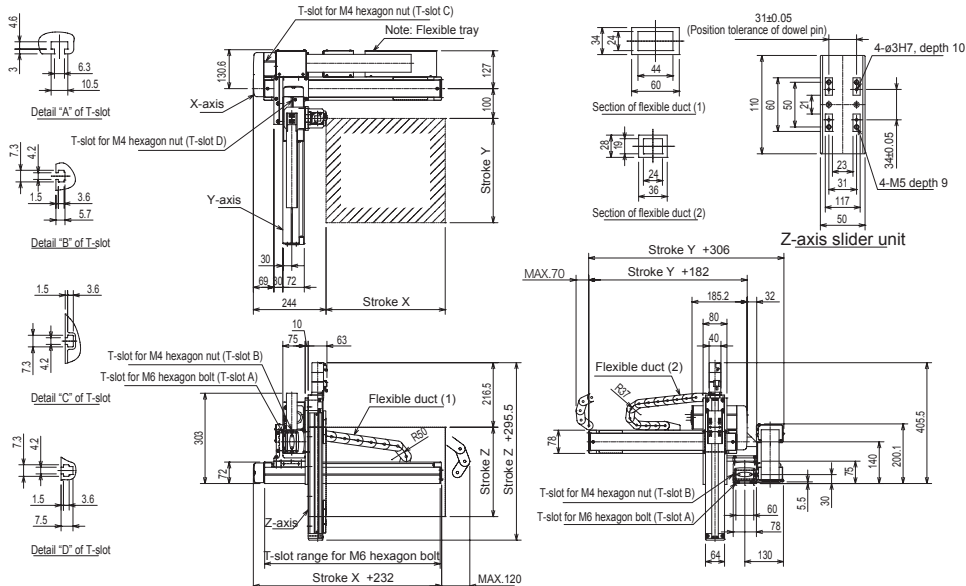
	Stroke (mm)	Maximum speed (mm/s)
X-axis	700	1000
	800	800
	900 ~ 1000	600

Maximum Payload (kg)	Y-axis stroke				
	150mm	250mm	350mm	300mm	
Z-axis stroke	50,100mm	4.0	3.5	2.5	1
	150,200mm	4.0	2.5	2	0.6
	250,300mm	3.5	2.5	1.5	0.2

R: Right-handed



L: Left-handed



[Set designation]

BA2 - A3 - A3N R F - 40 45 30 - OF 2 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	10 : 100mm	15 : 150mm	05 : 50mm	0 : None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm	75 : 750mm	30 : 300mm	2 : CA10-M00B Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

- X-axis: Ball screw driven
Side mounted motor
- Y-axis: Ball screw driven
Side mounted motor
- Z-axis: Ball screw driven
Motor straight

[Specifications]

	X-axis	Y-axis	Z-axis
Type of axis	BB30F-U □-M20N- □0	BB10E-U □-S20N- □5	BBT7D-ST-M06B- □□
Stroke (mm) (X- and Y-axis in increments of 100 mm, Z-axis in increments of 50 mm)	100 ~ 1000	150 ~ 750	50 ~ 300
Maximum speed (mm/s)	1200 (Note 1)	1200 (Note 1)	400
Positioning repeatability (mm)	± 0.01	± 0.01	± 0.02
Lead of ball screw (mm)	20	20	6
Motor output	200W	100W	50W, with brake
Resolution (mm)	0.01		

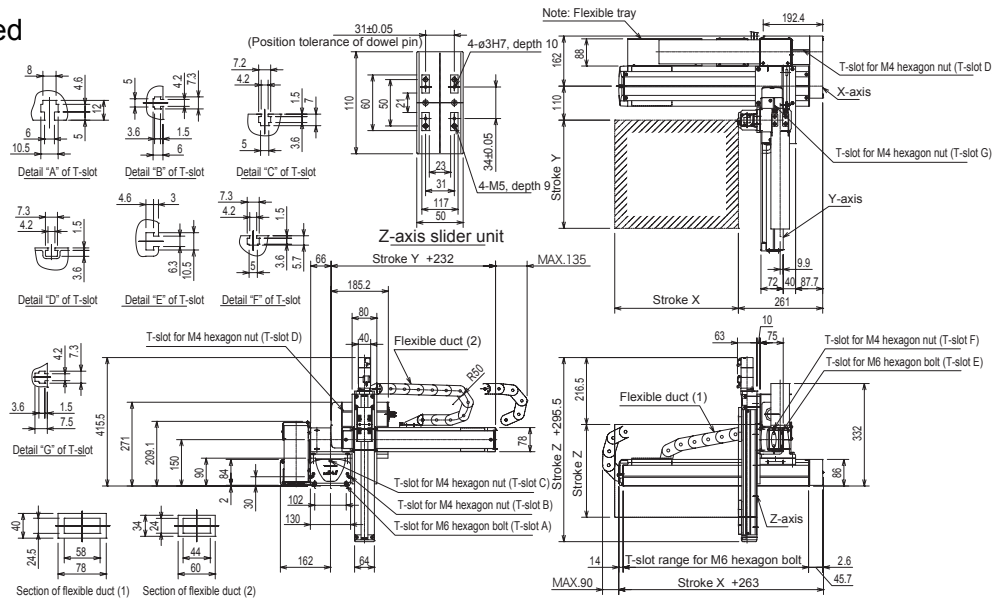
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Note 1: When the stroke is as given below, the maximum speed differs.

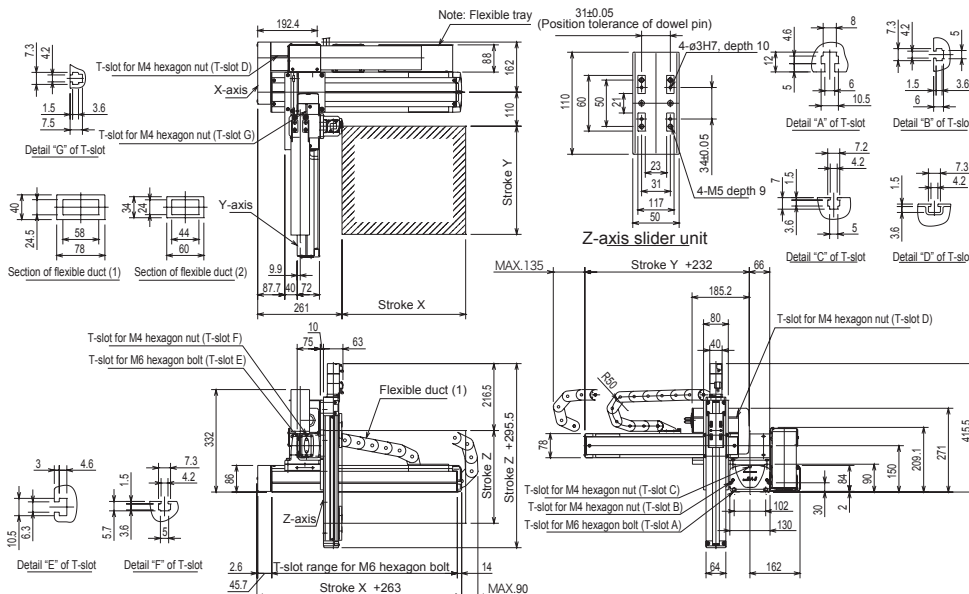
	Stroke (mm)	Maximum speed (mm/s)
X-axis	700	1000
	800	800
	900 ~ 1000	600
Y-axis	750	1000

Maximum Payload (kg)	Y-axis stroke							
	150mm	250 mm	350mm	450 mm	550mm	650mm	750mm	
Z-axis stroke	50,100mm	4.0	4.0	4.0	4.0	3.9	3.4	1.6
	150,200mm	4.0	4.0	4.0	4.0	3.7	3.1	1.3
	250,300mm	4.0	4.0	4.0	4.0	3.5	2.8	1

R: Right-handed



L: Left-handed



X-Y-Z Flexible-duct Spec.

[Set designation]

BA2 - A3 - A3A R B - 45 40 35 - OF 2 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	15 : 150mm	10 : 100mm	15 : 150mm	0: None	3 : 3m 9 : 9m
L: Left-handed	95 : 950mm A5 : 1050mm	50 : 500mm	35 : 350mm	2 : CA10-M00B Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

- X-axis: Ball screw driven
Motor straight
- Y-axis: Ball screw driven
Motor straight
- Z-axis: Ball screw driven
Side mounted motor

[Specifications]

	X-axis	Y-axis	Z-axis
Type of axis	BB30E-ST-M20N-□5	BB10E-ST-M20N-□0	BB10E-U □-S10B-□5
Stroke (in increments of 100 mm)	150 ~ 1050mm	100 ~ 500mm	150 ~ 350mm
Maximum speed	1200mm/s (Note 1)	1200mm/s	600mm/s
Positioning repeatability	± 0.01 mm		
Lead of ball screw	20mm	20mm	10mm
Motor output	100W	100W	100W, with brake
Resolution	0.01 mm		

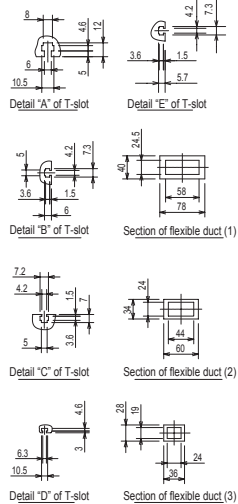
Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
X-axis	750	1000
	850	800
	950 ~ 1050	600

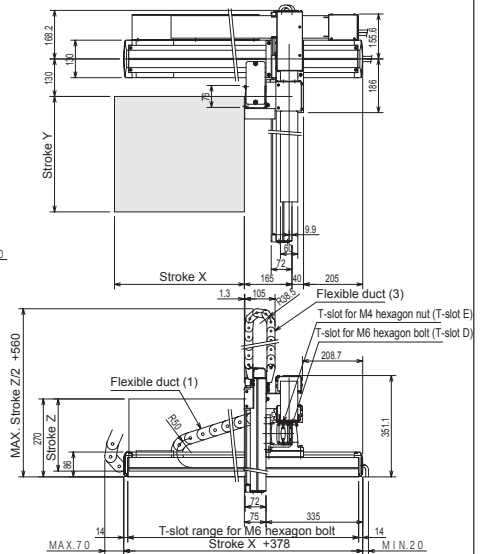
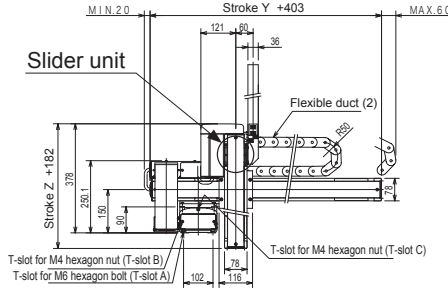
Acceleration/deceleration time when the maximum speed is set: 0.48 sec. or over

Maximum Payload (kg)	Y-axis stroke	Y-axis stroke				
		100mm	200mm	300mm	400mm	500mm
Z-axis stroke	150mm	7.0	6.0	5.0	4.0	2.0
	250mm	6.0	5.0	4.0	4.0	2.0
	350mm	5.0	5.0	3.0	3.0	1.0

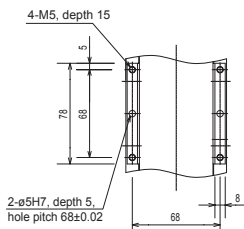
R: Right-handed



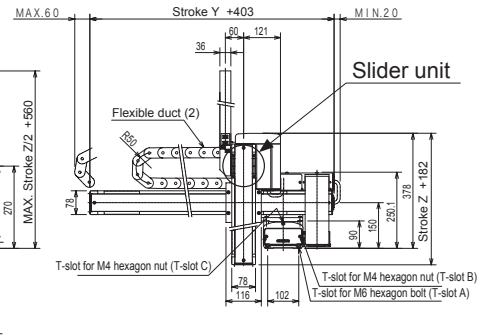
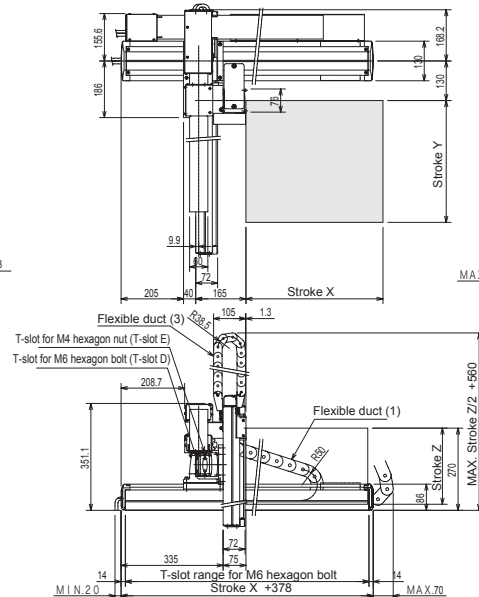
Slider unit



L: Left-handed



Z-axis slider unit



X-Y-Z Flexible-duct Spec.

[Set designation]

BA2 - A3 - A3A R E - 40 40 35 - OF 2 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	10 : 100mm	10 : 100mm	15 : 150mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm	50 : 500mm	35 : 350mm	2 : CA10-M00B Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

- X-axis: Ball screw driven
Side mounted motor
- Y-axis: Ball screw driven
Side mounted motor
- Z-axis: Ball screw driven
Side mounted motor

[Specifications]

	X-axis	Y-axis	Z-axis
Type of axis	BB30E-U □-M20N-□0	BB10E-U □-M20N-□0	BB10E-U □-S10B-□5
Stroke (in increments of 100 mm)	100 ~ 1000mm	100 ~ 500mm	150 ~ 350mm
Maximum speed	1200mm/s (Note 1)	1200mm/s	600mm/s
Positioning repeatability	± 0.01mm		
Lead of ball screw	20mm	20mm	10mm
Motor output	100W	100W	100W, with brake
Resolution	0.01mm		

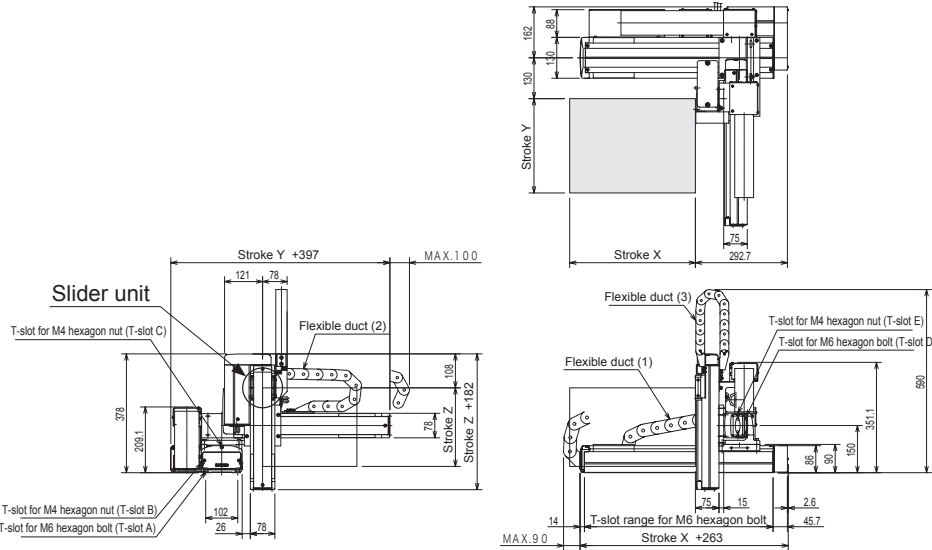
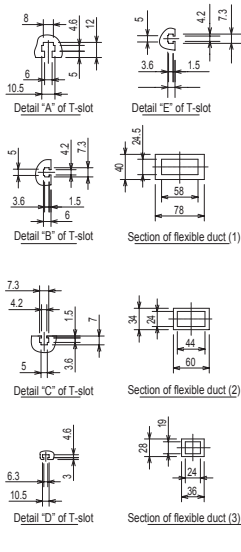
Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
X-axis	700	1000
	800	800
	900 ~ 1000	600

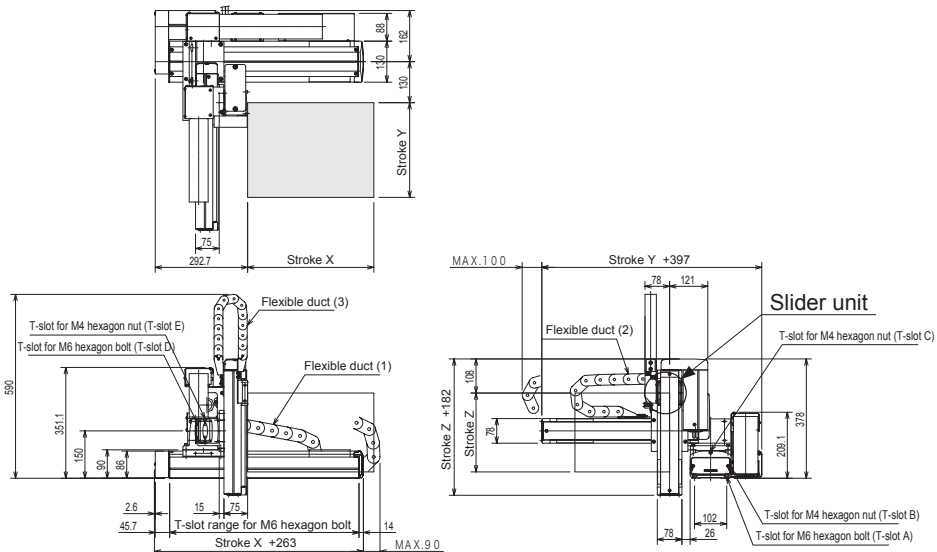
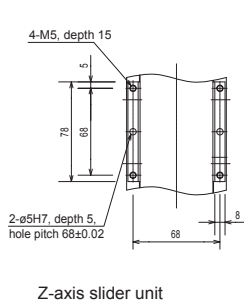
Acceleration/deceleration time when the maximum speed is set: 0.48 sec. or over

Maximum Payload (kg)	Z-axis stroke	Y-axis stroke				
		100mm	200mm	300mm	400mm	500mm
150mm		7.0	6.0	5.0	4.0	2.0
250mm		6.0	5.0	4.0	4.0	2.0
350mm		5.0	5.0	3.0	3.0	1.0

R: Right-handed



L: Left-handed



X-Y-Z Flexible-duct Spec.

Orthogonal Axes Specifications

[Set designation]

BA2 – A3 – A3R B – 40 40 35 – OF2 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	10 : 100mm	10 : 100mm	15 : 150mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm	50 : 500mm	35 : 350mm	2 : CA10-M00B Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

- X-axis: Ball screw driven
Motor straight
- Y-axis: Ball screw driven
Motor straight
- Z-axis: Ball screw driven
Side mounted motor

[Specifications]

	X-axis	Y-axis	Z-axis
Type of axis	BB30F-ST-M20N-□0	BB10E-ST-M20N-□0	BB10E-U□-S10B-□5
Stroke (in increments of 100 mm)	100 ~ 1000mm	100 ~ 500mm	150 ~ 350mm
Maximum speed	1200mm/s (Note 1)	1200mm/s	600mm/s
Positioning repeatability	± 0.01 mm		
Lead of ball screw	20mm	20mm	10mm
Motor output	200W	100W	100W, with brake
Resolution	0.01 mm		

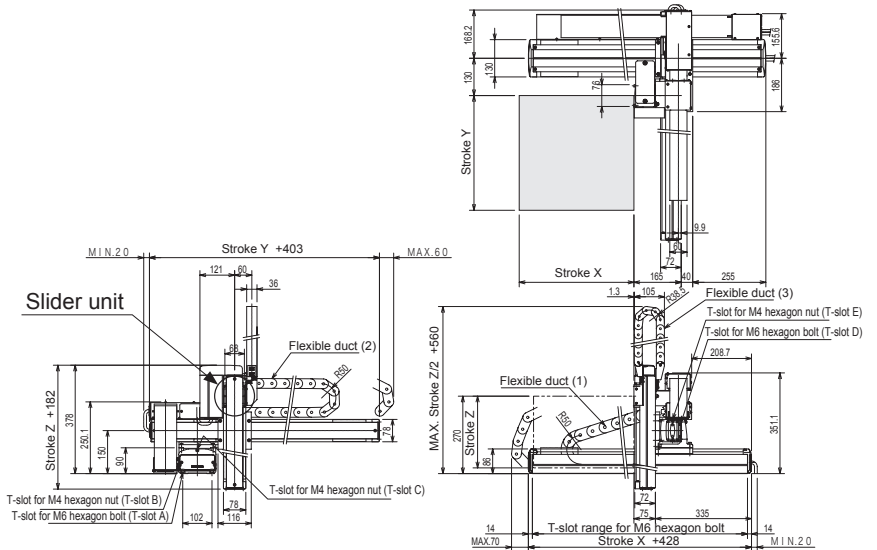
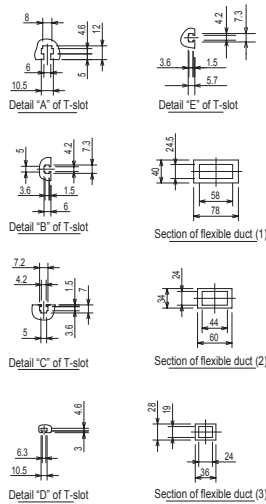
Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
X-axis	700	1000
	800	800
	900 ~ 1000	600

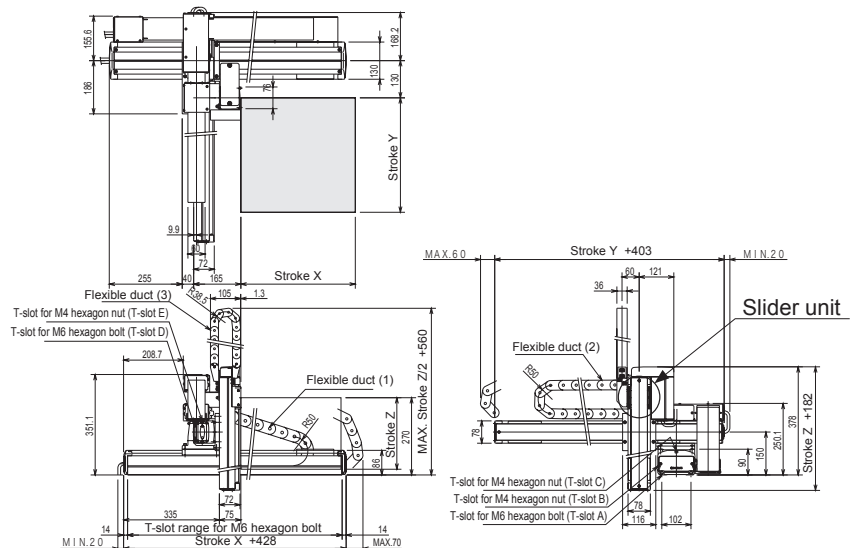
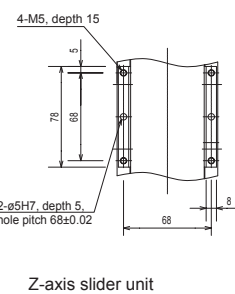
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg)	Z-axis stroke	Y-axis stroke				
		100mm	200mm	300mm	400mm	500mm
150mm	150mm	7.0	7.0	7.0	4.0	2.0
	250mm	7.0	7.0	6.0	4.0	1.0
	350mm	6.0	6.0	6.0	3.0	1.0

R: Right-handed



L: Left-handed



[Set designation]

BA2 - A3 - A3B R E - 40 40 35 - OF 2 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	10 : 100mm	10 : 100mm	15 : 150mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm	50 : 500mm	35 : 350mm	2 : CA10-M00B Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

- X-axis: Ball screw driven
Side mounted motor
- Y-axis: Ball screw driven
Side mounted motor
- Z-axis: Ball screw driven
Side mounted motor

[Specifications]

	X-axis	Y-axis	Z-axis
Type of axis	BB30F-U □-M20N-□0	BB10E-U □-M20N-□0	BB10E-U □-S10B-□5
Stroke (mm) (in increments of 100 mm)	100 ~ 1000mm	100 ~ 500mm	150 ~ 350mm
Maximum speed (mm/s)	1200mm/s (Note 1)	1200mm/s	600mm/s
Positioning repeatability (mm)	± 0.01mm		
Lead of ball screw (mm)	20mm	20mm	10mm
Motor output	200W	100W	100W, with brake
Resolution (mm)	0.01mm		

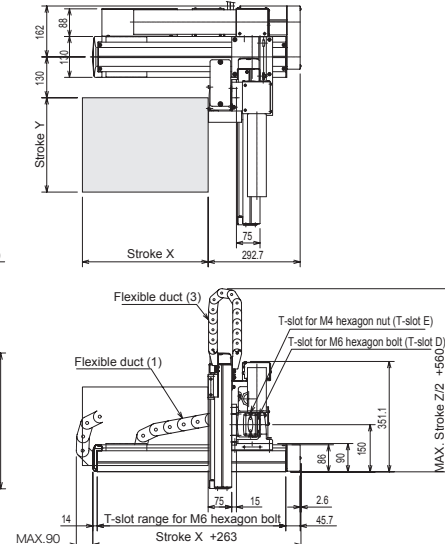
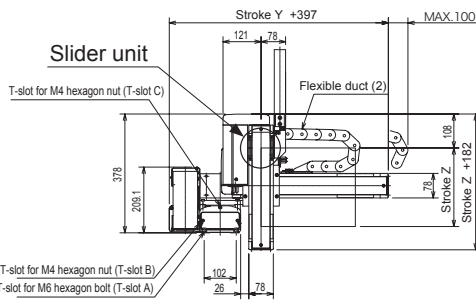
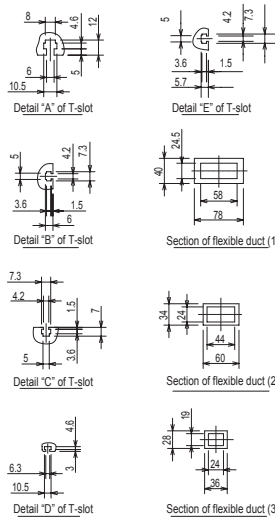
Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
X-axis	700	1000
	800	800
	900 ~ 1000	600

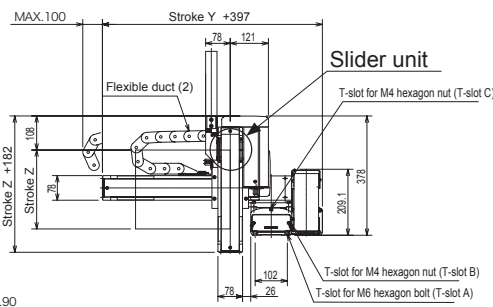
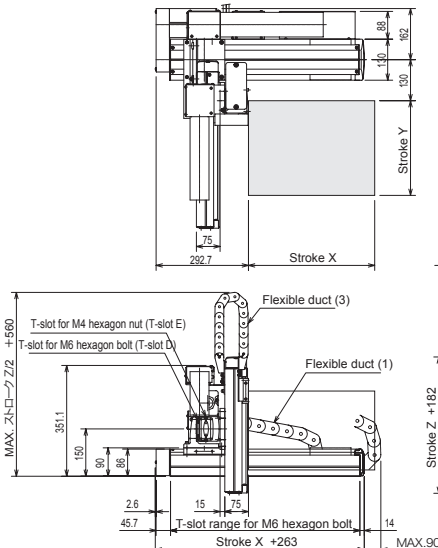
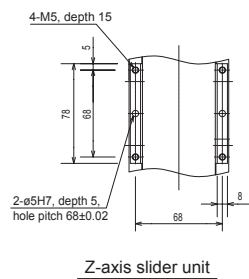
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg)	Y-axis stroke					
	100mm	200mm	300mm	400mm	500mm	
Z-axis stroke	150mm	7.0	7.0	7.0	4.0	2.0
	250mm	7.0	7.0	6.0	4.0	1.0
	350mm	6.0	6.0	6.0	3.0	1.0

R: Right-handed

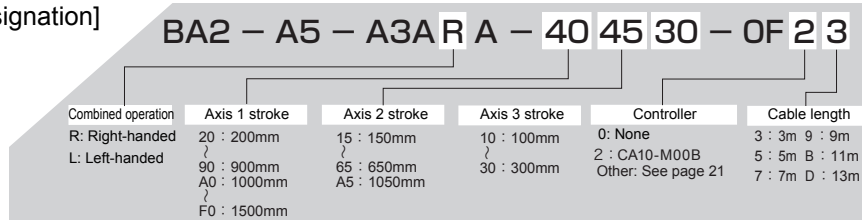


L: Left-handed



X-Y-Z Flexible-duct Spec.

[Set designation]



Ball screw type

- X-axis: Ball screw driven Motor straight
- Y-axis: Ball screw driven Motor straight
- Z-axis: Ball screw driven Motor straight

Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
X-axis	700 ~ 800	1100
	900 ~ 1000	1000
	1100 ~ 1200	700
	1300	500
	1400	400
Y-axis	1500	300
	750	1000
	850	800
	950 ~ 1050	600

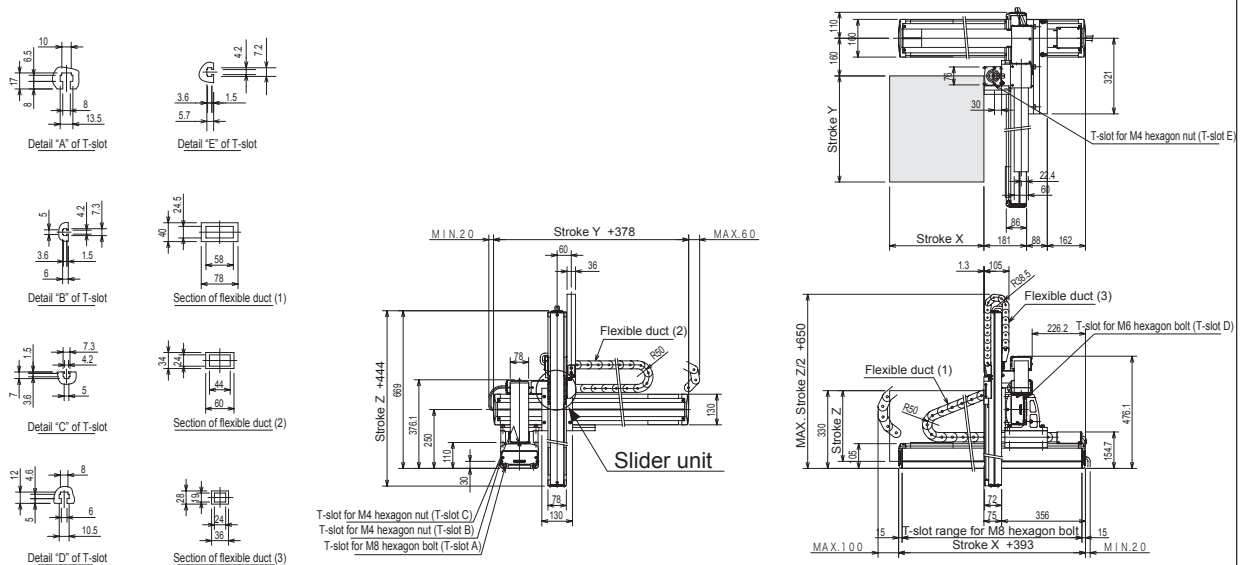
[Specifications]

	X-axis	Y-axis	Z-axis
Type of axis	BB50F-ST-M20N-□0	BB30E-ST-M20N-□5	BB10E-ST-M05B-□0
Stroke (in increments of 100 mm)	200 ~ 1500mm	150 ~ 1050mm	100 ~ 300mm
Maximum speed	1200mm/s (Note 1)	1200mm/s (Note 1)	300mm/s
Positioning repeatability	± 0.01 mm		
Lead of ball screw	20mm	20mm	5mm
Motor output	200W	100W	100W, with brake
Resolution	0.01 mm		

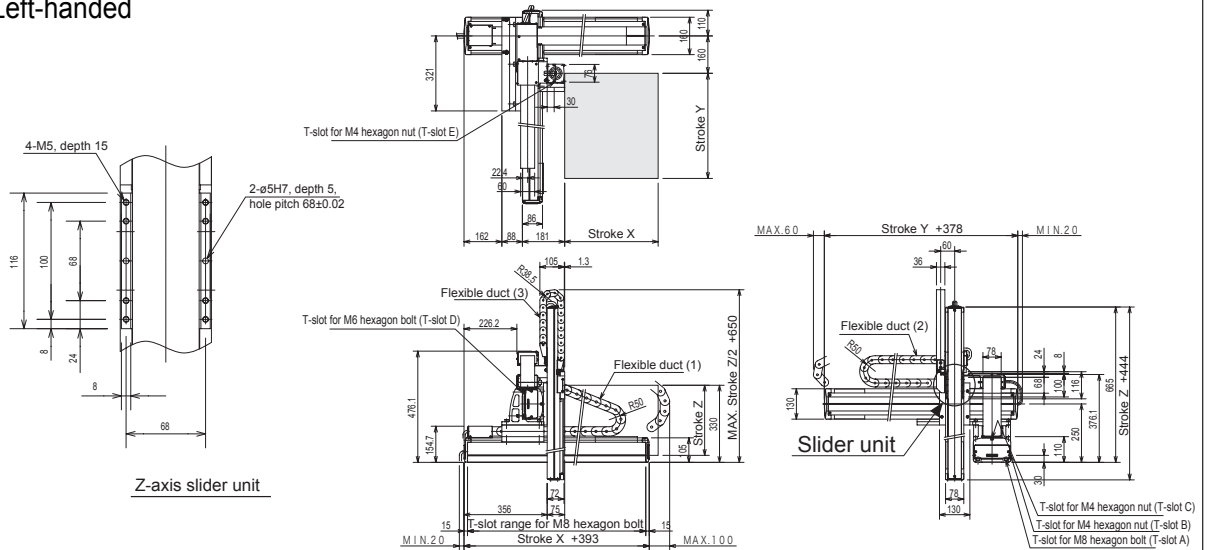
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg)	Z-axis stroke	Y-axis stroke									
		150mm	250mm	350mm	450mm	550mm	650mm	750mm	850mm	950mm	1050mm
100mm	100mm	11.0	11.0	11.0	11.0	11.0	11.0	11.0	10.0	8.0	5.0
	200mm	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	7.0	4.0
	300mm	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	6.0	4.0

R: Right-handed



L: Left-handed



X-Y-Z Flexible-duct Spec.

[Set designation]

BA2 – A5 – A3A R G – 40 45 30 – OF 2 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	20 : 200mm	15 : 150mm	10 : 100mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm F0 : 1500mm	65 : 650mm A5 : 1050mm	30 : 300mm	2 : CA10-M00B Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

- X-axis: Ball screw driven
Side mounted motor
- Y-axis: Ball screw driven
Motor straight
- Z-axis: Ball screw driven
Motor straight

Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
X-axis	700 ~ 800	1100
	900 ~ 1000	1000
	1100 ~ 1200	700
	1300	500
	1400	400
Y-axis	1500	300
	750	1000
	850	800
	950 ~ 1050	600

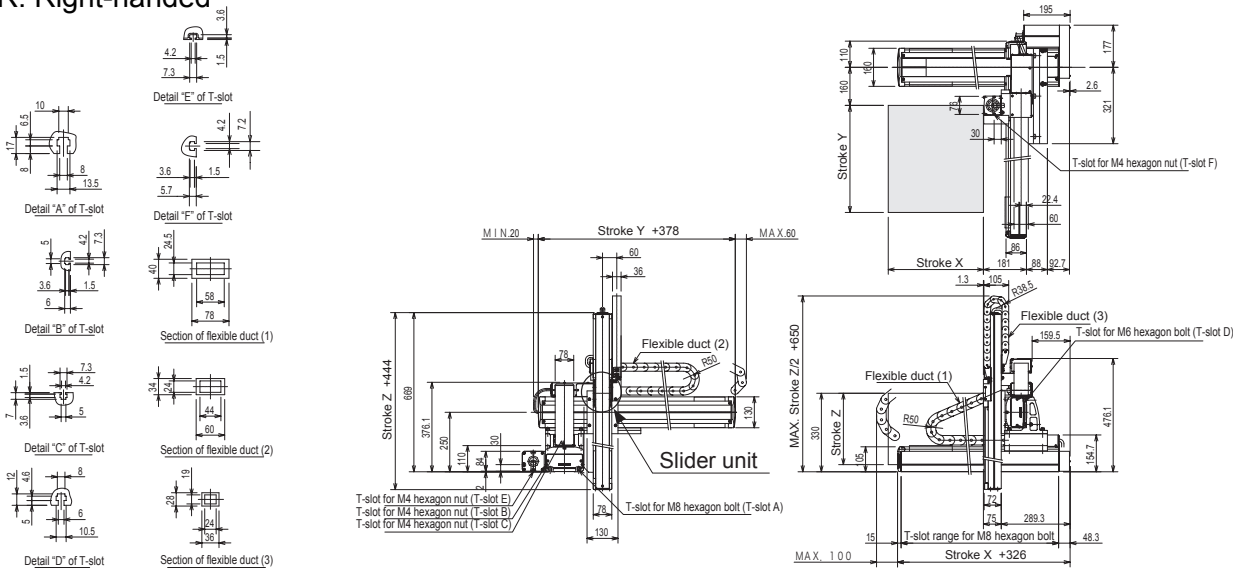
[Specifications]

	X-axis	Y-axis	Z-axis
Type of axis	BB50F-U □-M20N- □0	BB30E-ST-M20N- □5	BB10E-ST-M05B- □0
Stroke (in increments of 100 mm)	200 ~ 1500mm	150 ~ 1050mm	100 ~ 300mm
Maximum speed	1200mm/s (Note 1)	1200mm/s (Note 1)	300mm/s
Positioning repeatability	± 0.01 mm		
Lead of ball screw	20mm	20mm	5mm
Motor output	200W	100W	100W, with brake
Resolution	0.01 mm		

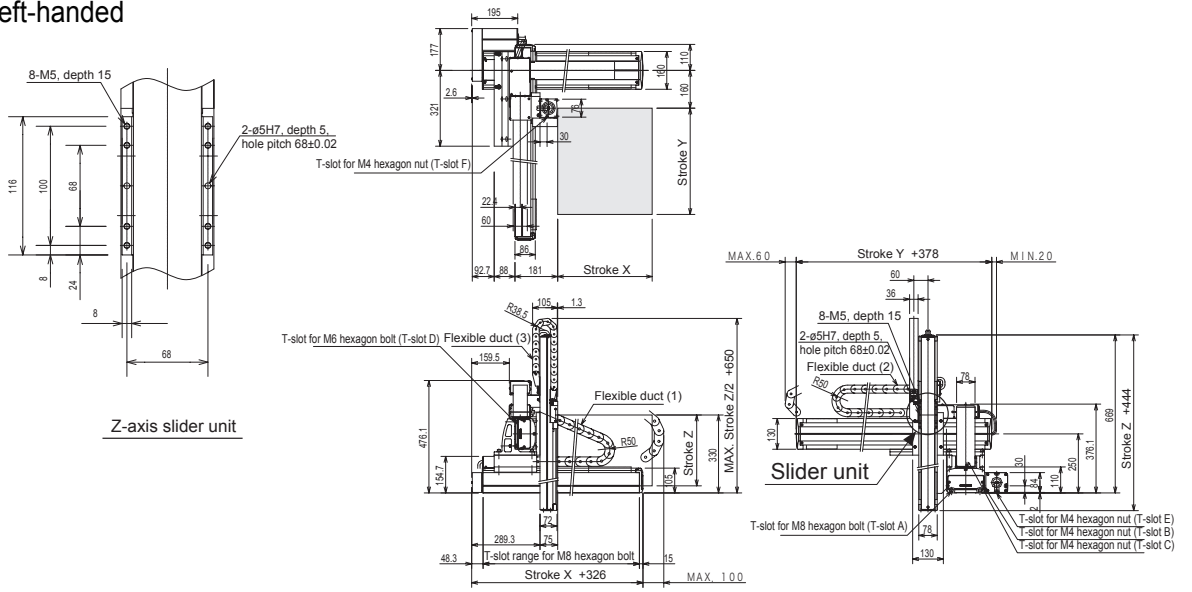
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg)	Z-axis stroke	Y-axis stroke									
		150mm	250mm	350mm	450mm	550mm	650mm	750mm	850mm	950mm	1050mm
100mm	100mm	11.0	11.0	11.0	11.0	11.0	11.0	11.0	10.0	8.0	5.0
	200mm	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	7.0	4.0
	300mm	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	6.0	4.0

R: Right-handed



L: Left-handed



X-Y-Z Flexible-duct Spec.

[Set designation]

BA2 – A5 – A3B R A – 40 40 30 – OF 2 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	20 : 200mm	10 : 100mm	10 : 100mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm F0 : 1500mm	90 : 900mm A0 : 1000mm	30 : 300mm	2 : CA10-M00B Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

- X-axis: Ball screw driven
Motor straight
- Y-axis: Ball screw driven
Motor straight
- Z-axis: Ball screw driven
Motor straight

Note 1: When the stroke is as given below, the maximum speed differs.

[Specifications]

	X-axis	Y-axis	Z-axis
Type of axis	BB50F-ST-M20N-□0	BB30F-ST-M20N-□0	BB10E-ST-M05B-□0
Stroke (in increments of 100 mm)	200 ~ 1500mm	100 ~ 1000mm	100 ~ 300mm
Maximum speed	1200mm/s (Note 1)	1200mm/s (Note 1)	300mm/s
Positioning repeatability	± 0.01 mm		
Lead of ball screw	20mm	20mm	5mm
Motor output	200W	200W	100W, with brake
Resolution	0.01 mm		

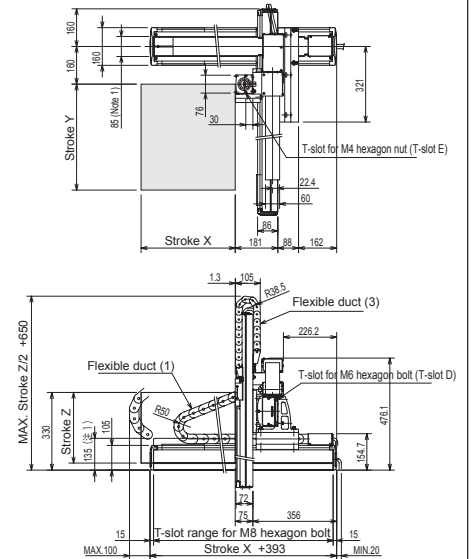
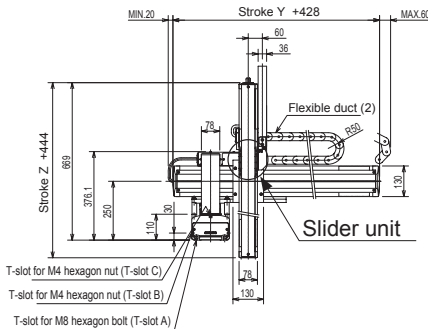
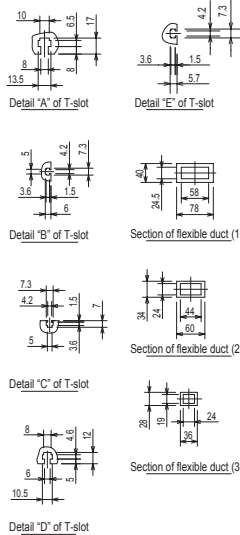
	Stroke (mm)	Maximum speed (mm/s)
X-axis	700 ~ 800	1100
	900 ~ 1000	1000
	1100 ~ 1200	700
	1300	500
	1400	400
Y-axis	1500	300
	700	1000
	800	800
	900 ~ 1000	600

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

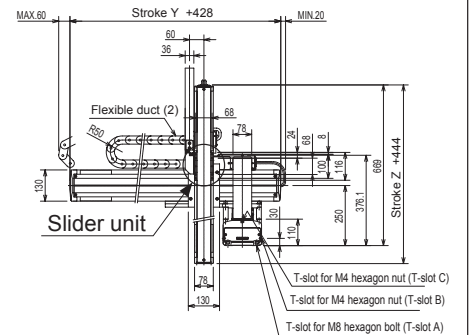
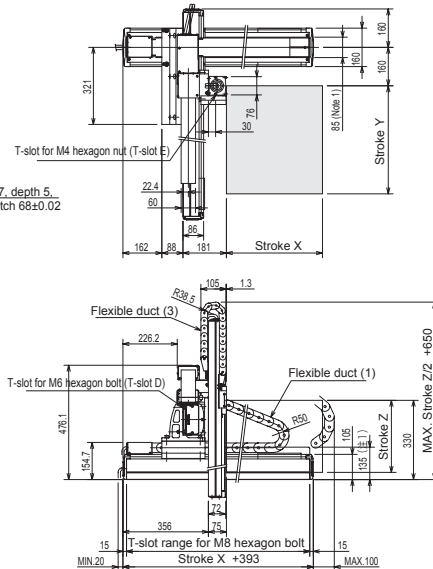
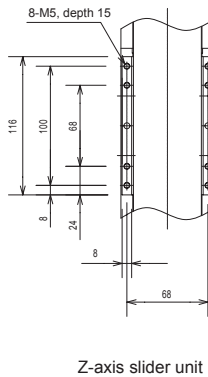
Maximum Payload (kg)	Y-axis stroke										
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm	
Z-axis stroke	100mm	15.0	15.0	15.0	15.0	15.0	15.0	14.0	11.0	8.0	5.0
	200mm	15.0	15.0	15.0	15.0	15.0	15.0	13.0	10.0	7.0	5.0
	300mm	15.0	15.0	15.0	15.0	15.0	15.0	12.0	10.0	7.0	4.0

R: Right-handed

Note 1: When X-axis stroke is 1,100 mm or over, a flexible tray is mounted on the X-axis frame cover.



L: Left-handed



[Set designation]

BA2 - A5 - A3B R G - 40 40 30 - OF 2 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	20 : 200mm	10 : 100mm	10 : 100mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm	90 : 900mm	30 : 300mm	2 : CA10-M00B	5 : 5m B : 11m
	A0 : 1000mm	A0 : 1000mm		Other: See page 21	7 : 7m D : 13m
	F0 : 1500mm				

Ball screw type

X-axis: Ball screw driven
Side mounted motor

Y-axis: Ball screw driven
Motor straight

Z-axis: Ball screw driven
Motor straight

Note 1: When the stroke is as given below, the maximum speed differs.

[Specifications]

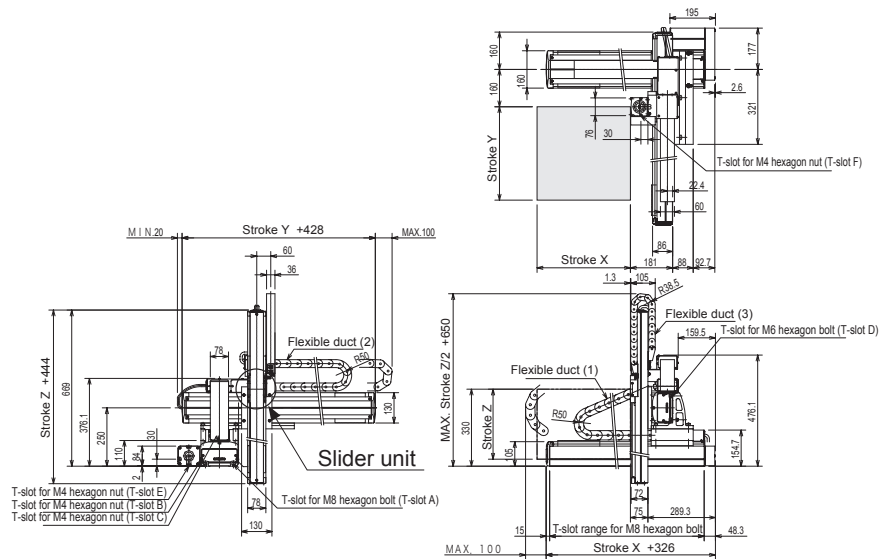
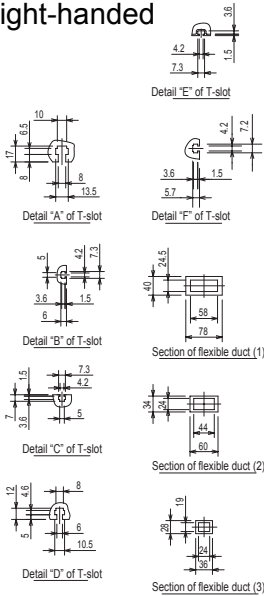
	X-axis	Y-axis	Z-axis
Type of axis	BB50F-U □-M20N- □0	BB30F-ST-M20N- □0	BB10E-ST-M05B- □0
Stroke (in increments of 100 mm)	200 ~ 1500mm	100 ~ 1000mm	100 ~ 300mm
Maximum speed	1200mm/s (Note 1)	1200mm/s (Note 1)	300mm/s
Positioning repeatability	± 0.01 mm		
Lead of ball screw	20mm	20mm	5mm
Motor output	200W	200W	100W, with brake
Resolution	0.01 mm		

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

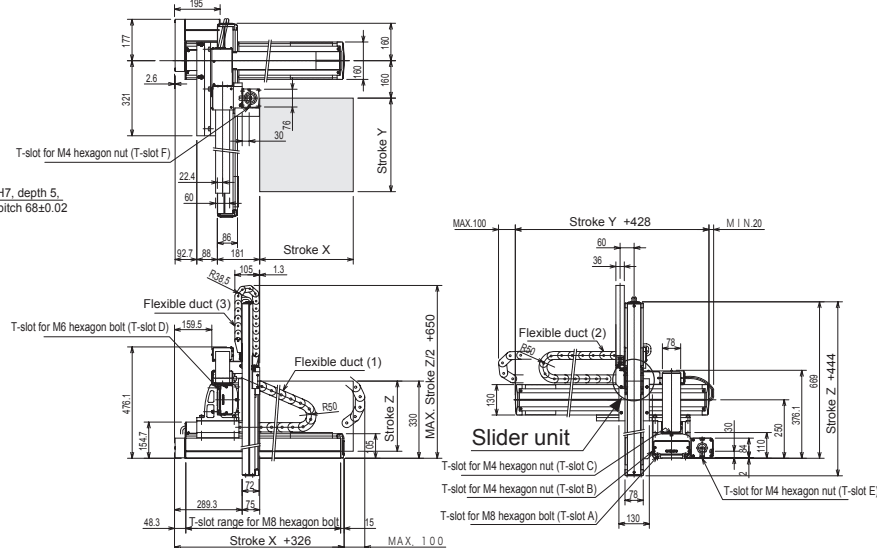
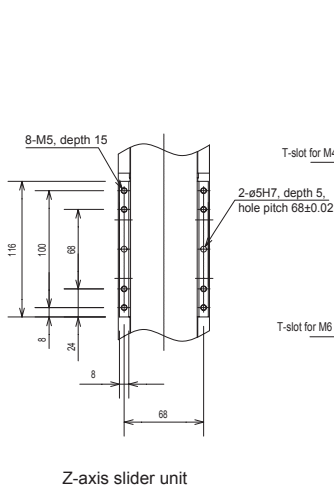
	Stroke (mm)	Maximum speed (mm/s)
X-axis	700 ~ 800	1100
	900 ~ 1000	1000
	1100 ~ 1200	700
	1300	500
	1400	400
Y-axis	1500	300
	700	1000
	800	800
	900 ~ 1000	600

Maximum Payload (kg)	Y-axis stroke									
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm
Z-axis stroke 100mm	15.0	15.0	15.0	15.0	15.0	15.0	14.0	11.0	8.0	5.0
Z-axis stroke 200mm	15.0	15.0	15.0	15.0	15.0	15.0	13.0	10.0	7.0	5.0
Z-axis stroke 300mm	15.0	15.0	15.0	15.0	15.0	15.0	12.0	10.0	7.0	4.0

R: Right-handed



L: Left-handed



X-Y-Z Flexible-duct Spec.

Orthogonal Axes Specifications

[Set designation]

BA2 - A5 - A3GRA - 40 40 20 - OF 2 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	20 : 200mm	20 : 200mm	10 : 100mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm FO : 1500mm	90 : 900mm A0 : 1000mm	30 : 300mm	2 : CA10-M00B Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

- X-axis: Ball screw driven
Motor straight
- Y-axis: Ball screw driven
Motor straight
- Z-axis: Ball screw driven
Motor straight

[Specifications]

	X-axis	Y-axis	Z-axis
Type of axis	BB50G-ST-M20N-□0	BB50F-ST-M20N-□0	BB30F-ST-M05B-□0
Stroke (mm) (in increments of 100 mm)	2200 ~ 1500	200 ~ 1000	100 ~ 300
Maximum speed (mm/s)	1200 (Note 1)	1200 (Note 1)	300
Positioning repeatability (mm)	± 0.01		
Lead of ball screw (mm)	20	20	5
Motor output	400W	200W	200W, with brake
Resolution (mm)	0.01		

Note 1: When the stroke is as given below, the maximum speed differs.

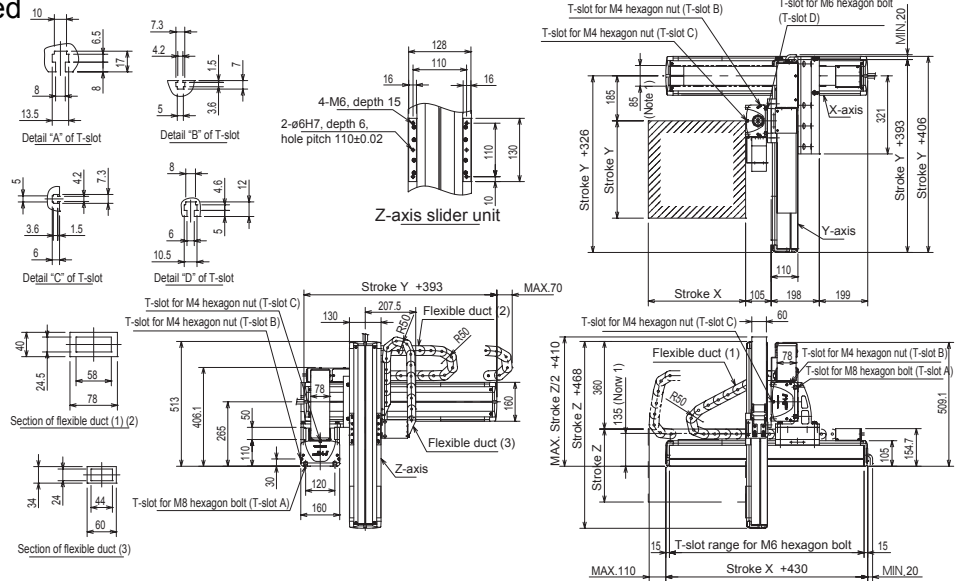
	Stroke (mm)	Maximum speed (mm/s)
X-axis	700 ~ 800	1100
	900 ~ 1000	1000
	1100 ~ 1200	700
	1300	500
	1400	400
Y-axis	1500	300
	700 ~ 800	1100
	900 ~ 1000	1000

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

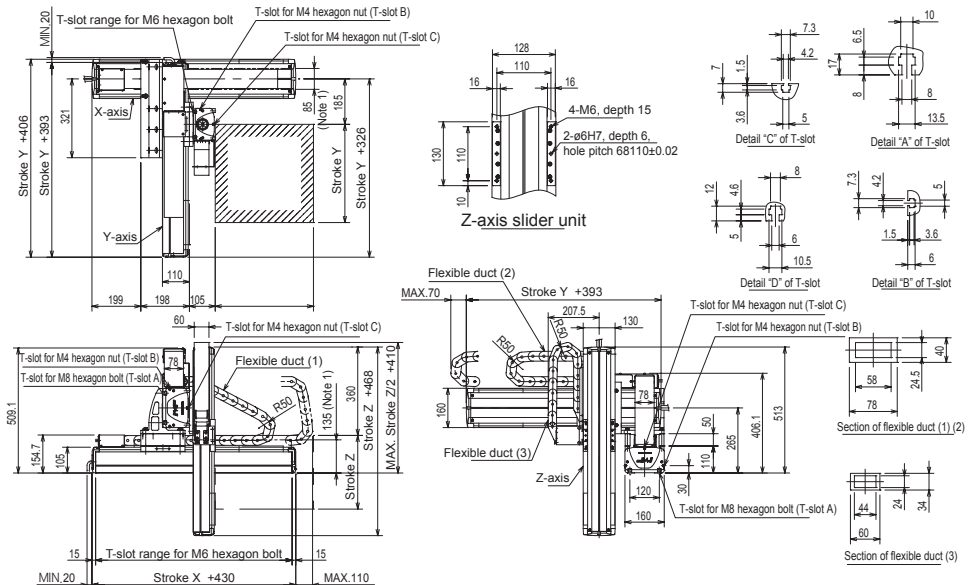
Maximum Payload (kg)	Z-axis stroke	Y-axis stroke									
		100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm
100mm	100mm	40.0	40.0	40.0	32.5	26.0	20.5	16.0	11.5	8.0	1.3
	200mm	40.0	40.0	38.5	31.0	24.5	19.5	14.5	10.5	7.0	—
	300mm	40.0	40.0	37.0	29.5	23.5	18.0	13.5	9.5	5.5	—

The regenerative discharge unit ABSU-4000 is required for the X-axis, and the regenerative discharge unit ABSU-2000 is required for the Z-axis.

R: Right-handed



L: Left-handed



[Set designation]

BA2 – A6 – A3NRA – 40 40 20 – OF 6 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	20 : 200mm	20 : 200mm	10 : 100mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm H0 : 1700mm	90 : 900mm A0 : 1000mm F0 : 1500mm	30 : 300mm	6 : CA20-M00-0V Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Ball screw type

- X-axis: Ball screw driven
Motor straight
- Y-axis: Ball screw driven
Motor straight
- Z-axis: Ball screw driven
Motor straight

Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
X-axis	1100	700
	1200	600
	1300	500
	1400 ~ 1500	400
	1600 ~ 1700	300
Y-axis	700 ~ 800	1100
	900 ~ 1000	1000
	1100 ~ 1200	700
	1300	500
	1400	400
	1500	300

[Specifications]

	X-axis	Y-axis	Z-axis
Type of axis	BB60J-ST-M20N-□0	BB50G-ST-M20N-□0	BB30F-ST-M05B-□0
Stroke (mm) (in increments of 100 mm)	200 ~ 1700	200 ~ 1500	100 ~ 300
Maximum speed (mm/s)	900 (Note 1)	1200 (Note 1)	300
Positioning repeatability (mm)	± 0.01		
Lead of ball screw (mm)	20	20	5
Motor output	750W	400W	200W, with brake
Resolution (mm)	0.01		

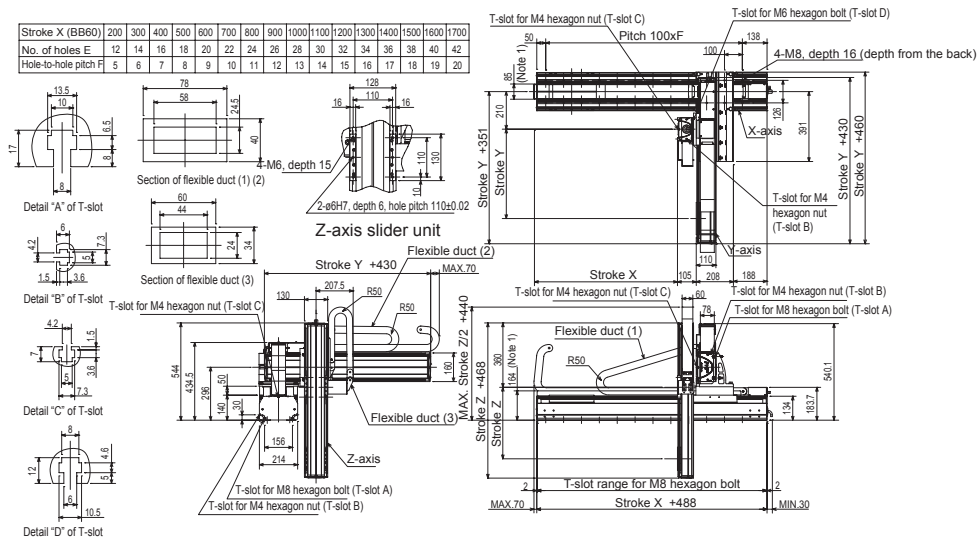
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg)	Y-axis stroke															
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm	1100mm	1200mm	1300mm	1400mm	1500mm	
Z-axis stroke	100mm	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	35.0	30.0	21.3	14.3	9.3	5.3	2.3
	200mm	40.0	40.0	40.0	40.0	40.0	40.0	40.0	39.5	34.0	28.5	20.1	13.1	8.1	4.1	1.1
	300mm	40.0	40.0	40.0	40.0	40.0	40.0	40.0	38.0	32.5	27.5	18.9	11.9	6.9	2.9	—

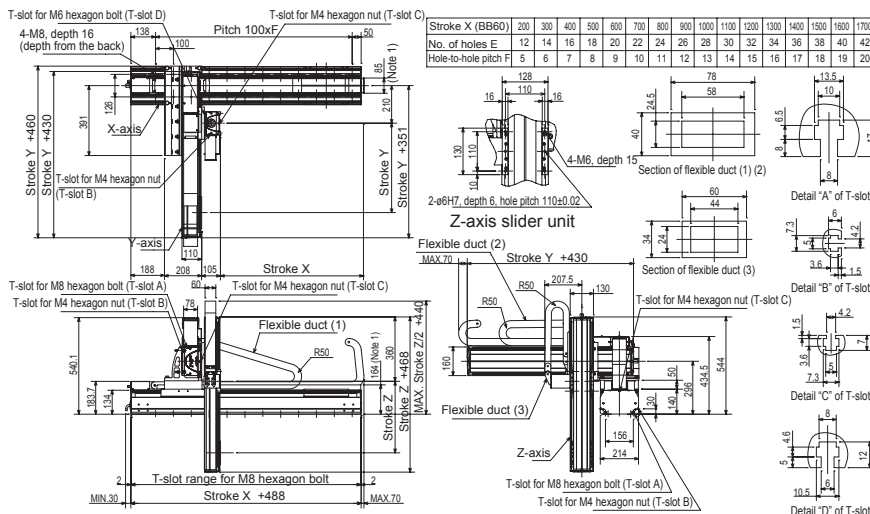
Regenerative discharge units are required for all axes.

- 1) X-axis: Regenerative discharge unit Model: RGH200A 30Q
- 2) Y-axis: Regenerative discharge unit Model: ABSU-4000
- 3) Z-axis: Regenerative discharge unit Model: ABSU-2000

R: Right-handed



L: Left-handed



X-Y-Z Flexible-duct Spec.

[Set designation]

BA2 – L1 – A3P RC – 40 45 30 – OF 2 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	10 : 100mm	15 : 150mm	05 : 50mm	0 : None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm	45 : 450mm	30 : 300mm	2 : CA10-M00B Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m
	H0 : 1700mm J0 : 1800mm				

Timing belt type

- X-axis: Timing belt driven
Side mounted motor
- Y-axis: Timing belt driven
Side mounted motor
- Z-axis: Ball screw driven
Motor straight

[Specifications]

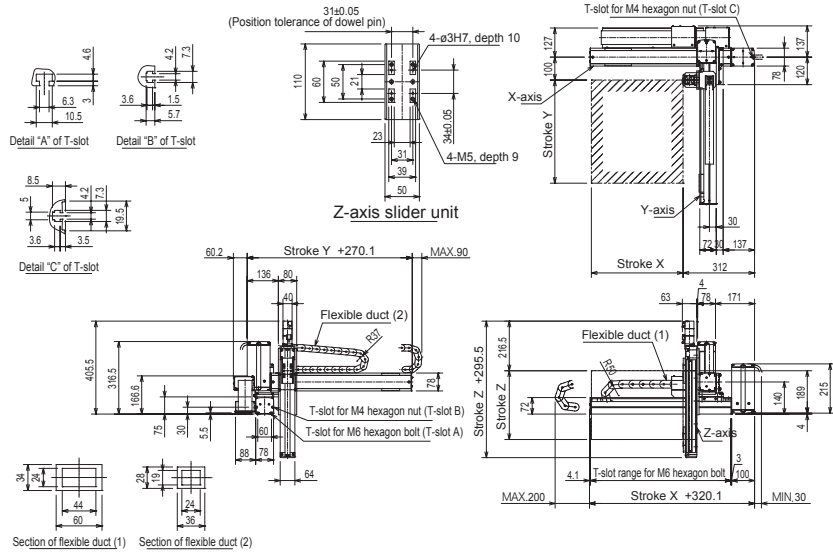
	X-axis	Y-axis	Z-axis
Type of axis	BB10F-BT-M21N-□0	BB10E-B□-S21N-□5	BBT7D-ST-M06B-□□
Stroke (mm) (X- and Y-axis in increments of 100 mm, Z-axis in increments of 50mm)	100 ~ 1800	150 ~ 450	50 ~ 300
Maximum speed (mm/s)	1000	1000	400
Positioning repeatability (mm)	± 0.05	± 0.05	± 0.02
Lead of ball screw (mm)	21 (lead converted into ball screw)	21 (lead converted into ball screw)	6
Motor output	200W	100W	50W, with brake
Resolution (mm)	0.01		

Acceleration/deceleration time when the maximum speed is set: 0.3 sec. or over

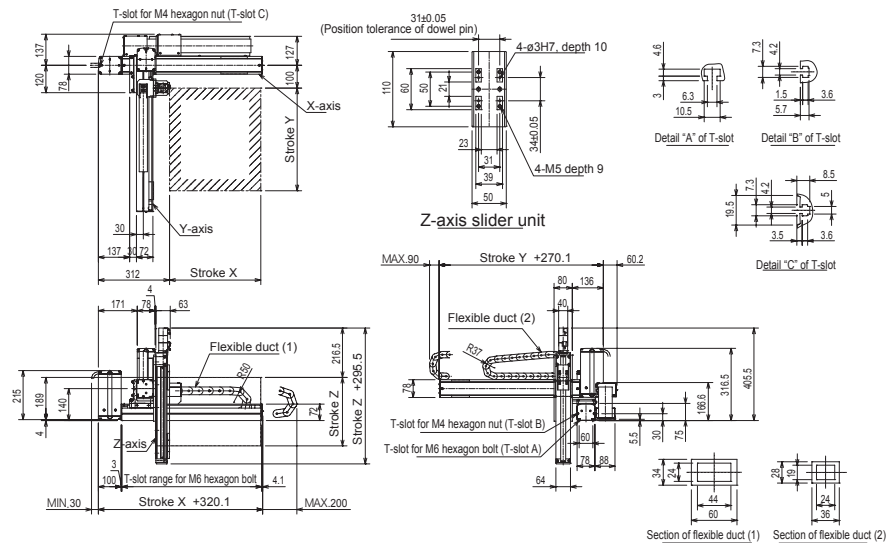
Maximum Payload (kg)	Y-axis stroke				
	150mm	250mm	350mm	450mm	
Z-axis stroke	50,100mm	4.0	3.5	2.5	1
	150,200mm	4.0	2.5	2	0.6
	250,300mm	3.5	2.5	1.5	0.2

R: Right-handed

The values in parentheses are applicable when the X-axis stroke is 1,000 mm or less.



L: Left-handed



[Set designation]

BA2 - L3 - A3N RC - 40 45 30 - OF 2 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	10 : 100mm JO : 1800mm	15 : 150mm	05 : 50mm	0: None 2 : CA10-M00B Other: See page 21	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm AO : 1000mm HO : 1700mm	NO : 2200mm PO : 2300mm RO : 2500mm	85 : 850mm 30 : 300mm		5 : 5m B : 11m 7 : 7m D : 13m

Timing belt type

- X-axis: Timing belt driven
Side mounted motor
- Y-axis: Timing belt driven
Side mounted motor
- Z-axis: Ball screw driven
Motor straight

[Specifications]

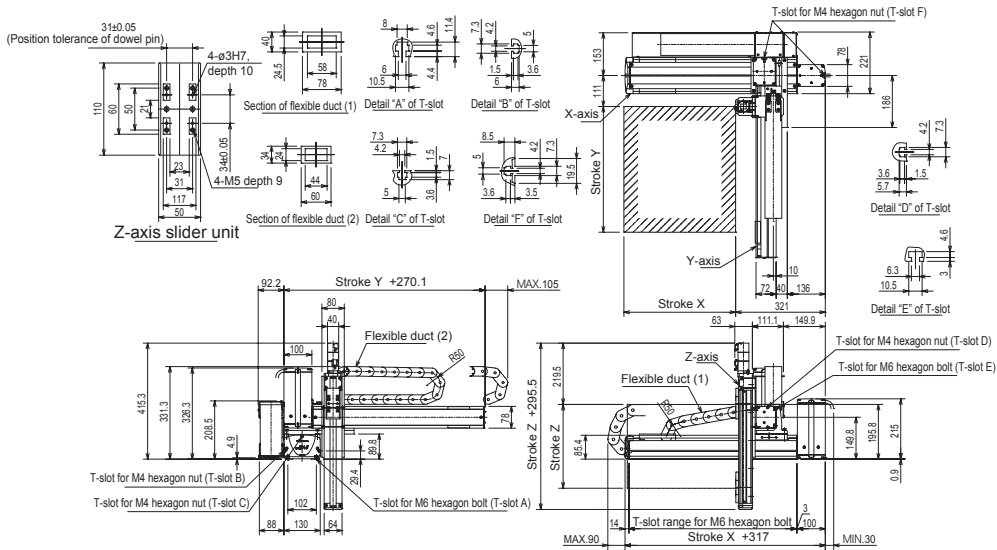
	X-axis	Y-axis	Z-axis
Type of axis	BB30F-BT-M21N-□0	BB10E-B□-S21N-□5	BBT7D-ST-M06B-□□
Stroke (mm) (X- and Y-axis in increments of 100 mm, Z-axis in increments of 50mm)	100 ~ 2500	150 ~ 850	50 ~ 300
Maximum speed (mm/s)	1000	1000	400
Positioning repeatability (mm)	± 0.05	± 0.05	± 0.02
Lead of ball screw (mm)	21 (lead converted into ball screw)	21 (lead converted into ball screw)	6
Motor output	200W	100W	50W, with brake
Resolution (mm)	0.01		

Acceleration/deceleration time when the maximum speed is set: 0.3 sec. or over

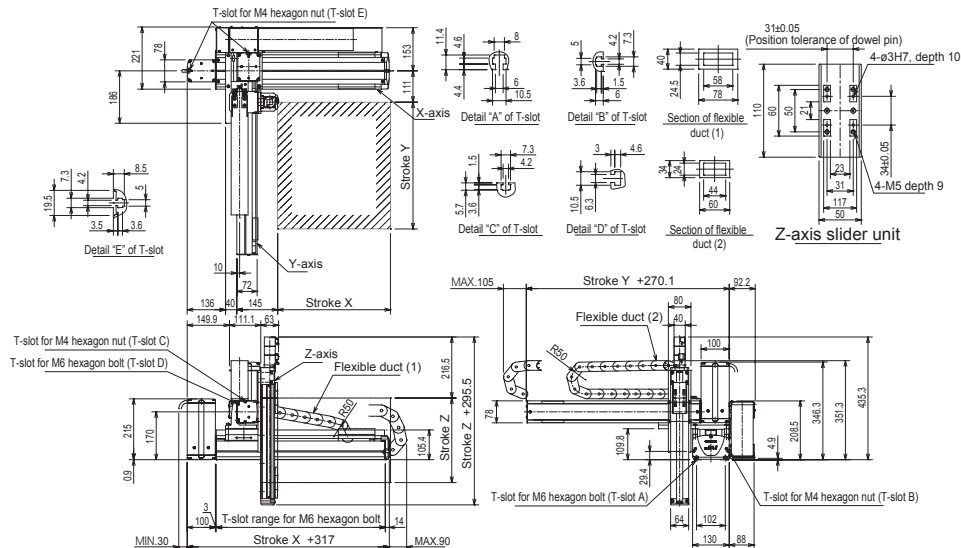
Maximum Payload (kg)	Z-axis stroke	Y-axis stroke						
		150mm	250mm	350mm	450mm	550mm	650mm	750mm
50,100mm	150,200mm	4.0	4.0	4.0	4.0	3.9	3.4	1.6
	250,300mm	4.0	4.0	4.0	4.0	3.7	3.1	1.3
		4.0	4.0	4.0	4.0	3.5	2.8	1

R: Right-handed

The values in parentheses are applicable when the X-axis stroke is 1,800 mm or less.



L: Left-handed



X-Y-Z Flexible-duct Spec.

[Set designation]

BA2 - L3 - A3B R D - 40 45 30 - OF 2 3					
Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	10 : 100mm J0 : 1800mm	10 : 100mm	15 : 150mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm N0 : 2200mm A0 : 1000mm P0 : 2300mm H0 : 1700mm R0 : 2500mm	50 : 500mm	35 : 350mm	2 : CA10-M00B Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Timing belt type

- X-axis: Timing belt driven
Side mounted motor
- Y-axis: Timing belt driven
Side mounted motor
- Z-axis: Ball screw driven
Side mounted motor

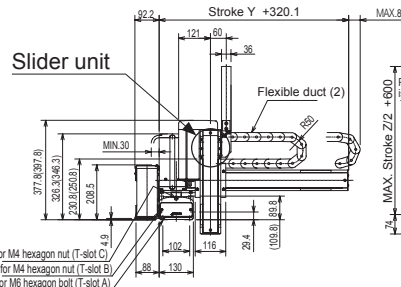
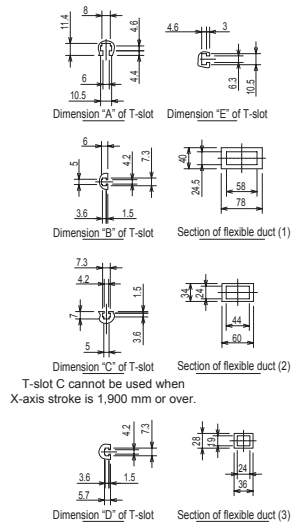
[Specifications]

	X-axis	Y-axis	Z-axis
Type of axis	BB30F-BT-M21N-□0	BB10E-B□-M21N-□0	BB10E-U□-S10B-□5
Stroke (in increments of 100 mm)	100 ~ 2500mm	100 ~ 500mm	150 ~ 350mm
Maximum speed	1000mm/ s	1000mm/ s	600mm/ s
Positioning repeatability	± 0.05mm	± 0.05mm	± 0.01mm
Lead	21mm (lead converted into ball screw)	21mm (lead converted into ball screw)	10mm
Motor output	200W	100W	100W, with brake
Resolution	0.01 mm		

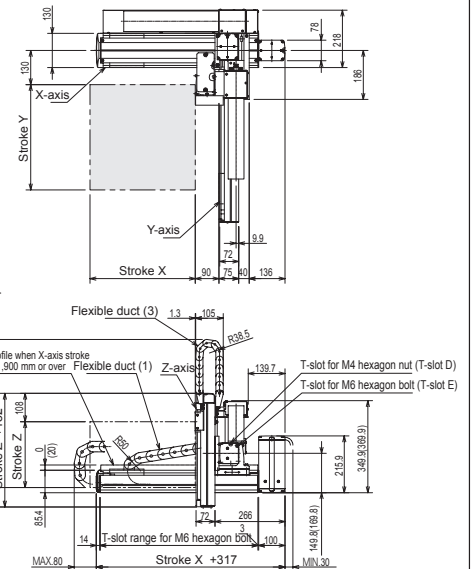
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg)	Y-axis stroke				
	100mm	200mm	300mm	400mm	500mm
Z-axis stroke					
150mm	8.0	8.0	7.0	4.0	2.0
250mm	7.0	7.0	6.0	4.0	1.0
350mm	6.0	6.0	6.0	3.0	1.0

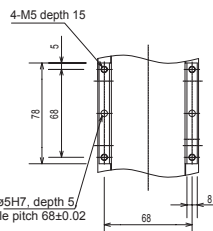
R: Right-handed



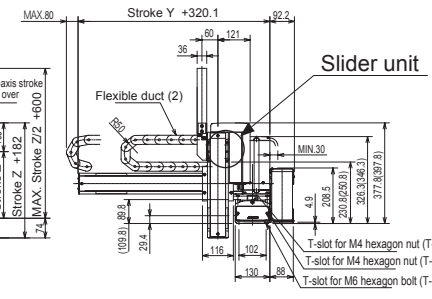
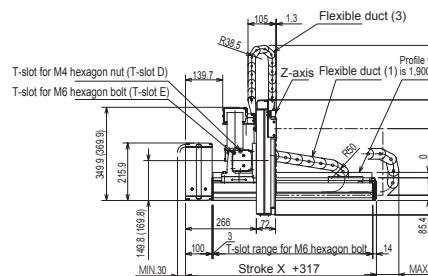
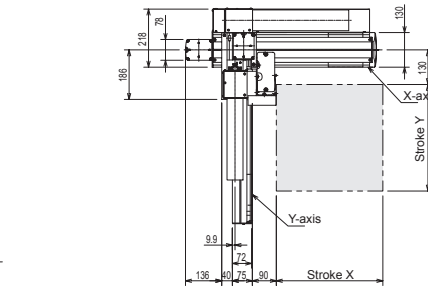
The values in parentheses are applicable when the X-axis stroke is 1,900 mm or less.



L: Left-handed



Z-axis slider unit



[Set designation]

BA2 - L5 - A3A R C - 40 40 30 - OF 2 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	20 : 200mm J0 : 1800mm	10 : 100mm	10 : 100mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm N0 : 2200mm A0 : 1000mm P0 : 2300mm H0 : 1700mm R0 : 2500mm	90 : 900mm A0 : 1000mm	30 : 300mm	2 : CA10-M00B Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Timing belt type

- X-axis: Timing belt driven
Side mounted motor
- Y-axis: Timing belt driven
Side mounted motor
- Z-axis: Ball screw driven
Motor straight

[Specifications]

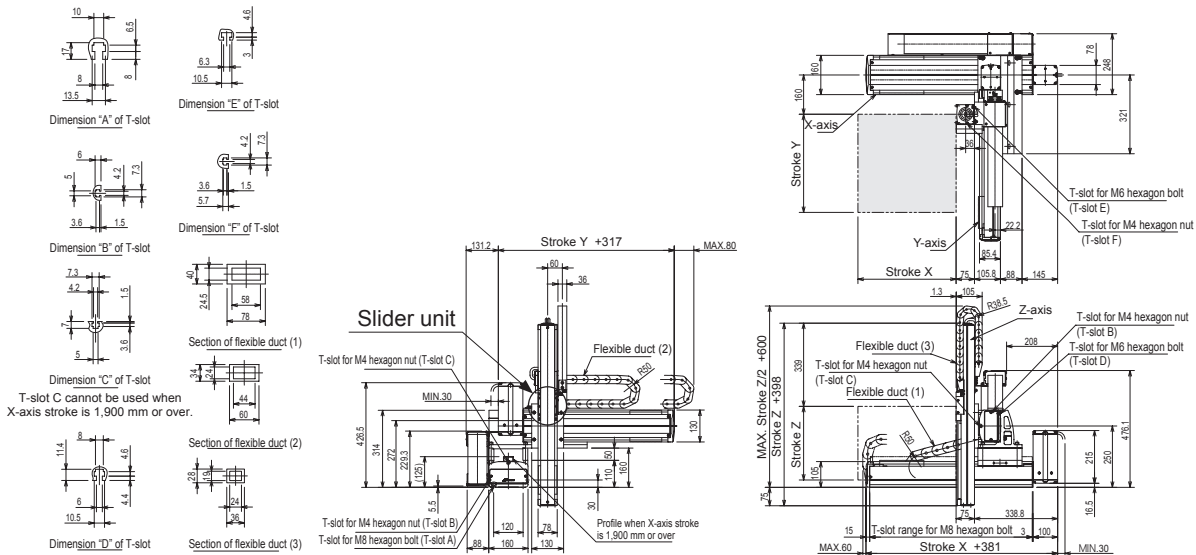
	X-axis	Y-axis	Z-axis
Type of axis	BB50F-BT-M21N-□0	BB30E-B□-M21N-□0	BB10E-ST-M05B-□0
Stroke (in increments of 100 mm)	200 ~ 2500mm	100 ~ 1000mm	100 ~ 300mm
Maximum speed	1000mm/s	1000mm/s	300mm/s
Positioning repeatability	± 0.05mm	± 0.05mm	± 0.01mm
Lead	21mm (lead converted into ball screw)	21mm (lead converted into ball screw)	5mm
Motor output	200W	100W	100W, with brake
Resolution	0.01 mm		

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

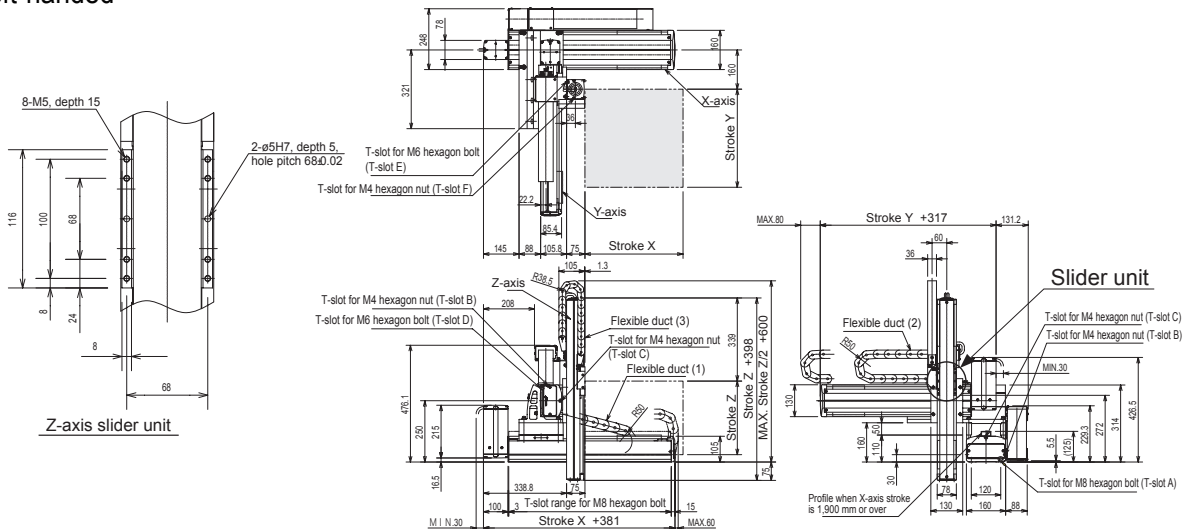
Maximum Payload (kg)	Y-axis stroke										
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm	
Z-axis stroke	100mm	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.0	5.0
	200mm	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	5.0	4.0
	300mm	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.0	4.0

R: Right-handed

The values in parentheses are applicable when the X-axis stroke is 1,900 mm or over.



L: Left-handed



X-Y-Z Flexible-duct Spec.

[Set designation]

BA2 – L5 – A3B R C – 40 40 30 – OF 2 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	20 : 200mm J0 : 1800mm	10 : 100mm	10 : 100mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm NO : 2200mm AO : 1000mm PO : 2300mm HO : 1700mm RO : 2500mm	90 : 900mm AO : 1000mm	30 : 300mm	2 : CA10-M00B Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Timing belt type

- X-axis: Timing belt driven
Side mounted motor
- Y-axis: Timing belt driven
Side mounted motor
- Z-axis: Ball screw driven
Motor straight

[Specifications]

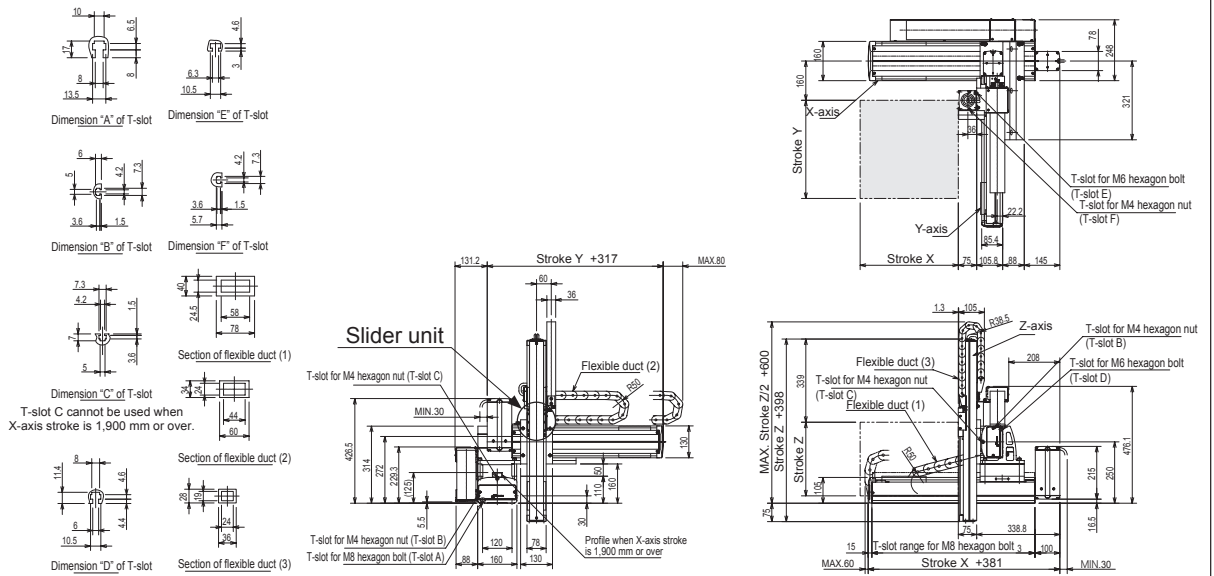
	X-axis	Y-axis	Z-axis
Type of axis	BB50F-BT-M21N- □0	BB30F-B □-M21N- □0	BB10E-ST-M05B- □0
Stroke (in increments of 100 mm)	200 ~ 2500mm	100 ~ 1000mm	100 ~ 300mm
Maximum speed	1000mm/s	1000mm/s	300mm/s
Positioning repeatability	± 0.05mm	± 0.05mm	± 0.01mm
Lead	21mm (lead converted into ball screw)	21mm (lead converted into ball screw)	5mm
Motor output	200W	200W	100W, with brake
Resolution	0.01mm		

Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

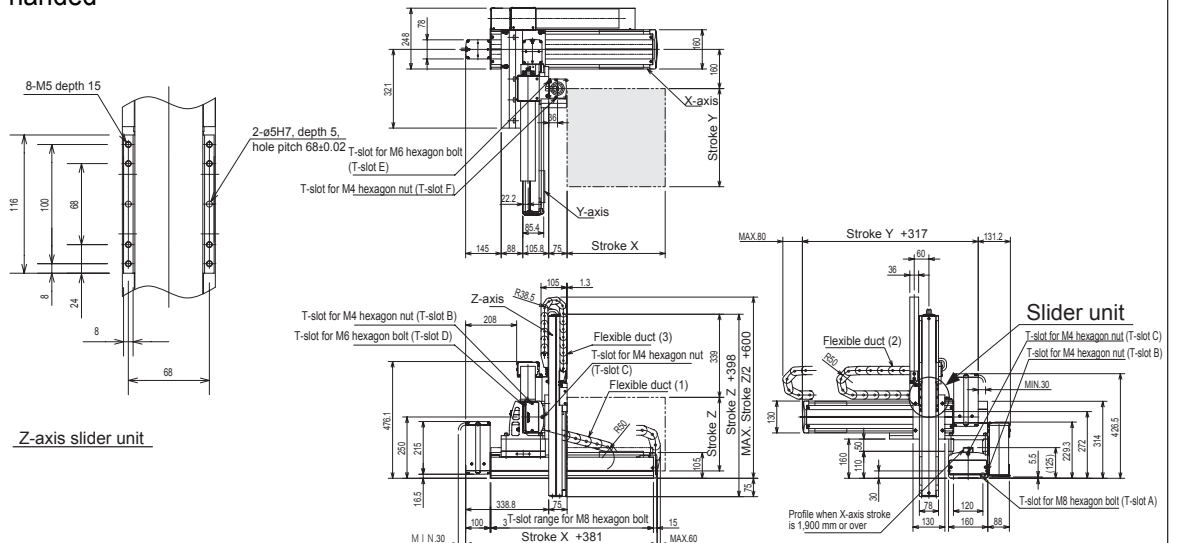
Maximum Payload (kg)	Z-axis stroke	Y-axis stroke									
		100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm
100mm	100mm	14.0	13.0	12.0	11.0	9.0	8.0	6.0	6.0	5.0	4.0
	200mm	13.0	12.0	11.0	10.0	8.0	7.0	6.0	6.0	5.0	4.0
	300mm	13.0	12.0	11.0	9.0	7.0	6.0	5.0	5.0	4.0	3.0

R: Right-handed

The values in parentheses are applicable when the X-axis stroke is 1,900 mm or over.



L: Left-handed



[Set designation]

BA2 - A5 - A4R A - 40 45 30 - RF 2 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	20 : 200mm	15 : 150mm	10 : 100mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm FO : 1500mm	95 : 950mm A5 : 1050mm	30 : 300mm	2 : CA10-M00B Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Harmonic drive type

X-axis: Ball screw driven Motor straight
 Y-axis: Ball screw driven Motor straight
 Z-axis: Ball screw driven Motor straight
 R-axis: Harmonic drive

Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
X-axis	700 ~ 800	1100
	900 ~ 1000	1000
	1100 ~ 1200	700
	1300	500
	1400	400
Y-axis	1500	300
	750	1000
	850	800
	950 ~ 1050	600

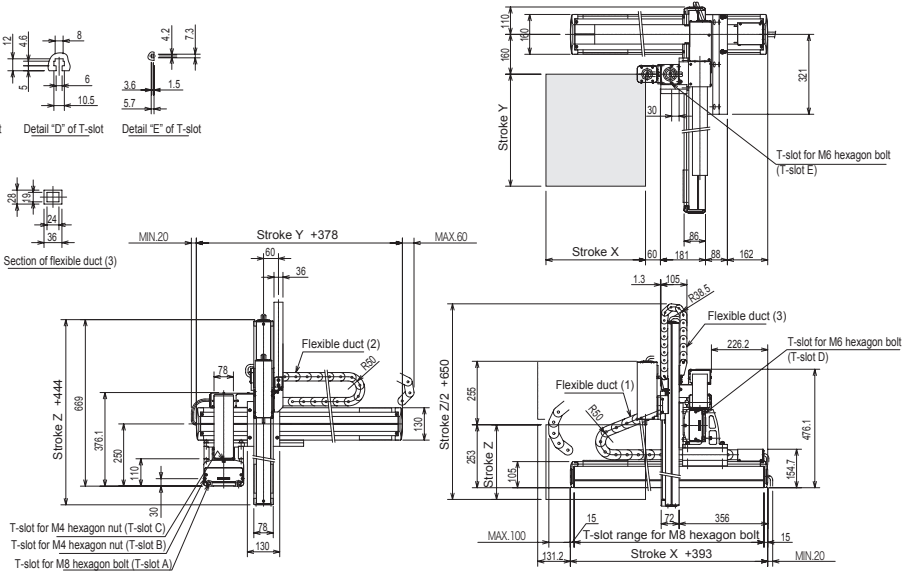
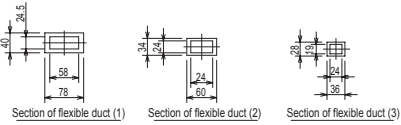
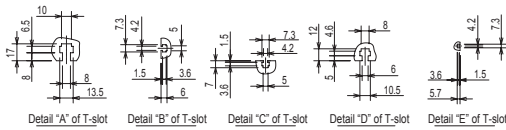
[Specifications]

	X-axis	Y-axis	Z-axis	R-axis
Type of axis	BB50F-ST-M20N-□0	BB30E-ST-M20N-□5	BB10E-ST-M05B-□0	BB00D-RH-A
Stroke (in increments of 100 mm)	200 ~ 1500mm	150 ~ 1050mm	100 ~ 300mm	360°
Maximum speed	1200mm/s (Note 1)	1200mm/s (Note 1)	300mm/s	3607s
Positioning repeatability	± 0.01mm	± 0.01mm	± 0.01mm	± 0.025°
Lead of ball screw	20mm	20mm	5mm	1/50 (Reduction ratio)
Motor output	200W	100W	100W, with brake	50W
Resolution	0.01mm (R-axis: 0.01 deg.)			

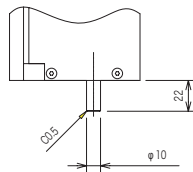
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg)	Y-axis stroke										
	150mm	250mm	350mm	450mm	550mm	650mm	750mm	850mm	950mm	1050mm	
Z-axis stroke	100mm	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	3.0
	200mm	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	2.0
	300mm	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	1.0

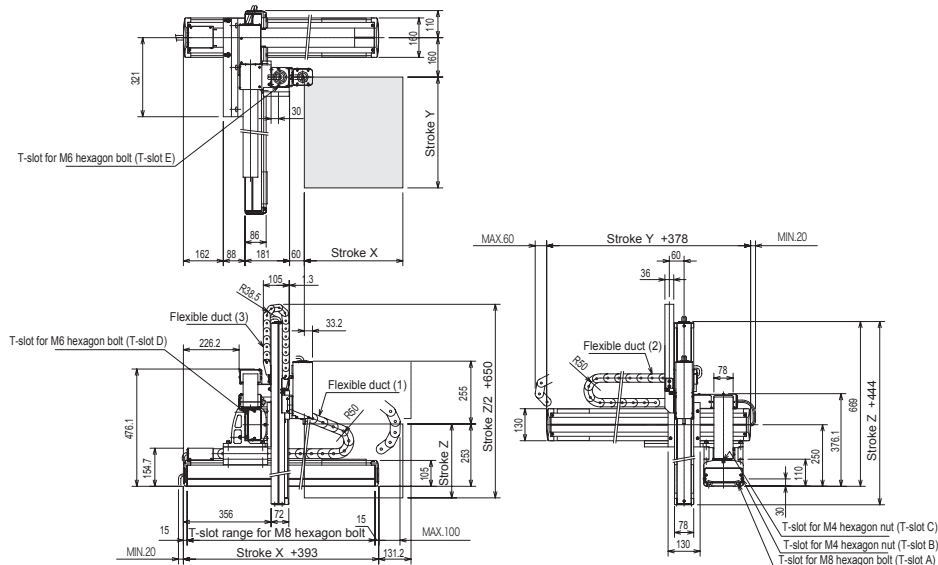
R: Right-handed



L: Left-handed



Details of R-axis



X-Y-Z-R Flexible-duct Spec.

Orthogonal Axes Specifications

[Set designation]

BA2 – A5 – A4A R G – 40 45 30 – RF 2 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	20 : 200mm	15 : 150mm	10 : 100mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm F0 : 1500mm	95 : 950mm A5 : 1050mm	30 : 300mm	2 : CA10-M00B Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Harmonic drive type

- X-axis: Ball screw driven Side mounted motor
- Y-axis: Ball screw driven Motor straight
- Z-axis: Ball screw driven Motor straight
- R-axis: Harmonic drive

Note 1: When the stroke is as given below, the maximum speed differs.

[Specifications]

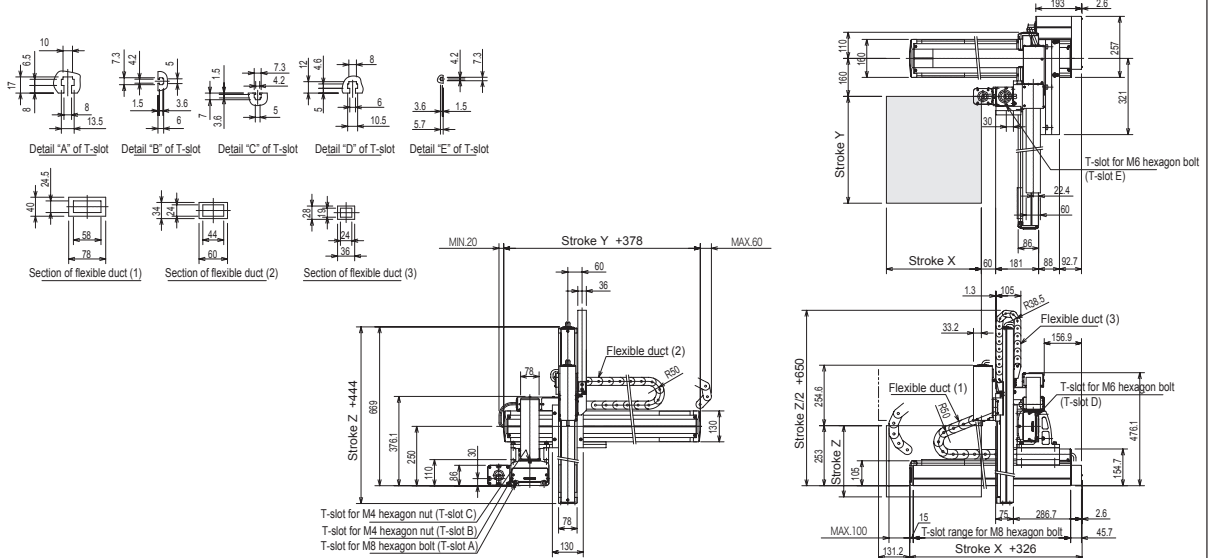
	X-axis	Y-axis	Z-axis	R-axis
Type of axis	BB50F-U □-M20N- □0	BB30E-ST-M20N- □5	BB10E-ST-M05B- □0	BA00D-RH-A
Stroke (in increments of 100 mm)	200 ~ 1500mm	150 ~ 1050mm	100 ~ 300mm	360°
Maximum speed	1200mm/s (Note 1)	1200mm/s (Note 1)	300mm/s	3607s
Positioning repeatability	± 0.01mm	± 0.01mm	± 0.01mm	± 0.025°
Lead of ball screw	20mm	20mm	5mm	1/50 (Reduction ratio)
Motor output	200W	100W	100W, with brake	50W
Resolution	0.01mm (R-axis: 0.01 deg.)			

	Stroke (mm)	Maximum speed (mm/s)
X-axis	700 ~ 800	1100
	900 ~ 1000	1000
	1100 ~ 1200	700
	1300	500
	1400	400
Y-axis	1500	300
	750	1000
	850	800
	950 ~ 1050	600

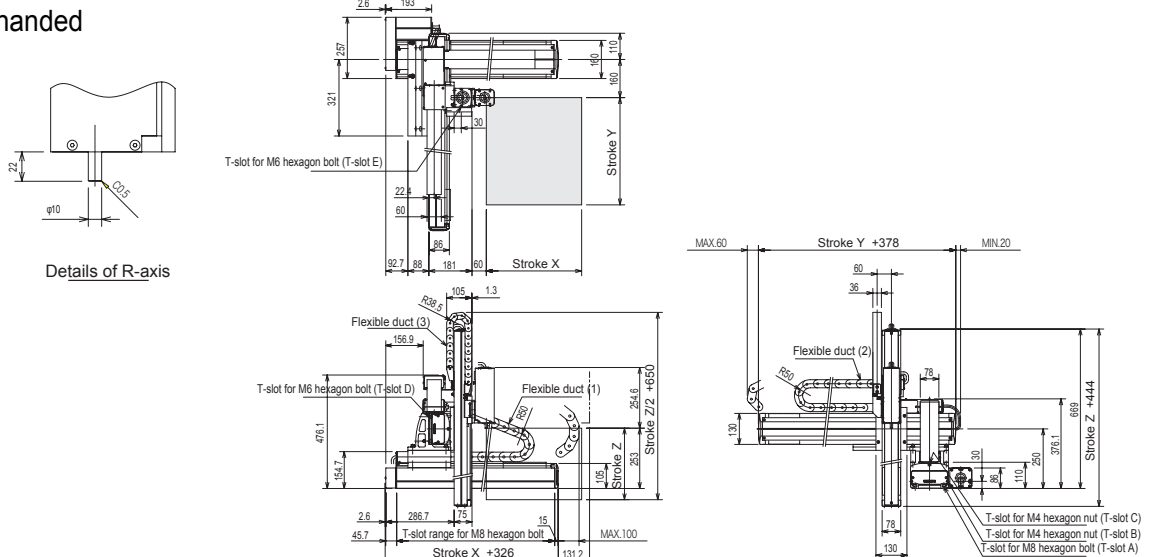
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg)	Z-axis stroke	Y-axis stroke									
		150mm	250mm	350mm	450mm	550mm	650mm	750mm	850mm	950mm	1050mm
200	100mm	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	3.0
	200mm	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	2.0
	300mm	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	1.0

R: Right-handed



L: Left-handed



[Set designation]

BA2 – A5 – A4B R A – 40 40 30 – RF 2 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	20 : 200mm	10 : 100mm	10 : 100mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm F0 : 1500mm	90 : 900mm A0 : 1000mm	30 : 300mm	2 : CA10-M00B Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Harmonic drive type

X-axis: Ball screw driven Motor straight
 Y-axis: Ball screw driven Motor straight
 Z-axis: Ball screw driven Motor straight
 R-axis: Harmonic drive

Note 1: When the stroke is as given below, the maximum speed differs.

	Stroke (mm)	Maximum speed (mm/s)
X-axis	700 ~ 800	1100
	900 ~ 1000	1000
	1100 ~ 1200	700
	1300	500
	1400	400
Y-axis	1500	300
	700	1000
	800	800
	900 ~ 1000	600

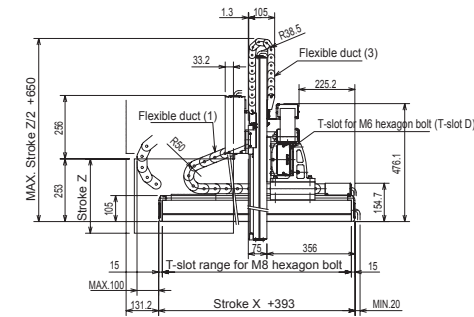
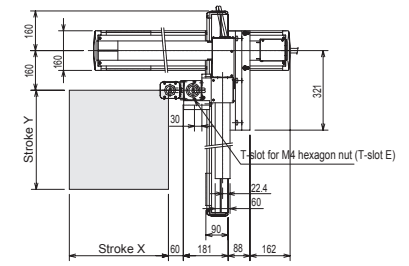
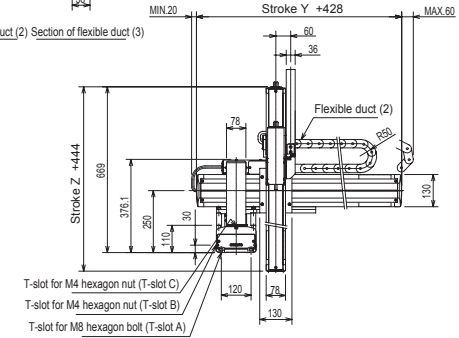
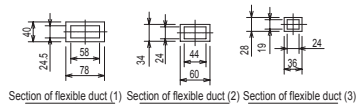
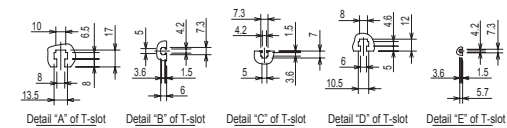
[Specifications]

	X-axis	Y-axis	Z-axis	R-axis
Type of axis	BB50F-ST-M20N-□0	BB30F-ST-M20N-□0	BB10E-ST-M05B-□0	BB00D-RH-A
Stroke (in increments of 100 mm)	200 ~ 1500mm	100 ~ 1000mm	100 ~ 300mm	360°
Maximum speed	1200mm/s (Note 1)	1200mm/s (Note 1)	300mm/s	3607s
Positioning repeatability	± 0.01mm	± 0.01mm	± 0.01mm	± 0.025°
Lead of ball screw	20mm	20mm	5mm	1/50 (Reduction ratio)
Motor output	200W	200W	100W, with brake	50W
Resolution	0.01 mm (R-axis: 0.01 deg.)			

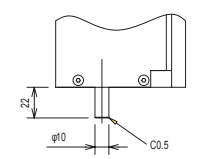
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg)	Y-axis stroke									
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm
Z-axis stroke	100mm	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	3.0
	200mm	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0
	300mm	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	1.0

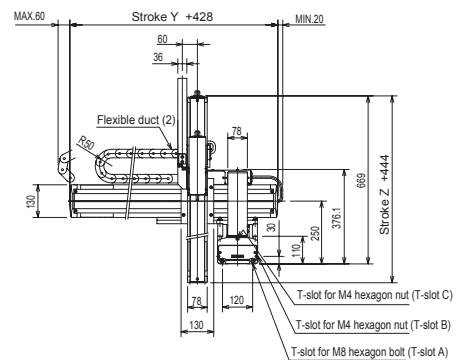
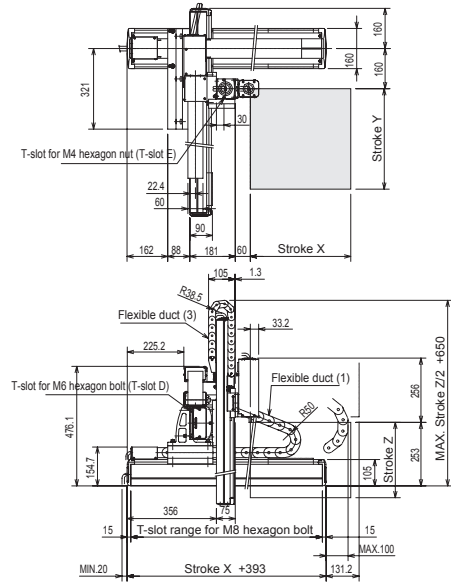
R: Right-handed



L: Left-handed



Details of R-axis



X-Y-Z-R Flexible-duct Spec.

Orthogonal Axes Specifications

[Set designation]

BA2 – A5 – A4B R G – 40 40 30 – RF 2 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	20 : 200mm	10 : 100mm	10 : 100mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm F0 : 1500mm	90 : 900mm A0 : 1000mm	30 : 300mm	2 : CA10-M00B Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Harmonic drive type

- X-axis: Ball screw driven Side mounted motor
- Y-axis: Ball screw driven Motor straight
- Z-axis: Ball screw driven Motor straight
- R-axis: Harmonic drive

Note 1: When the stroke is as given below, the maximum speed differs.

[Specifications]

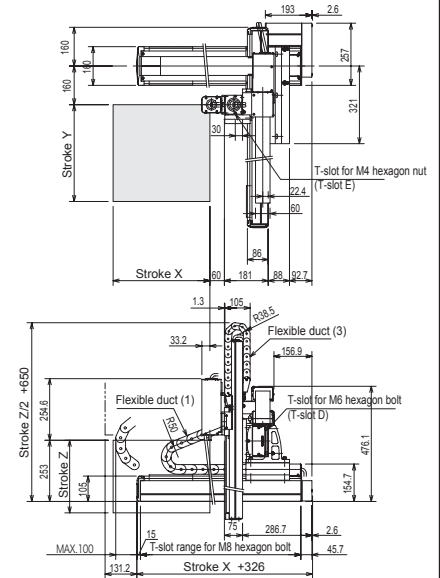
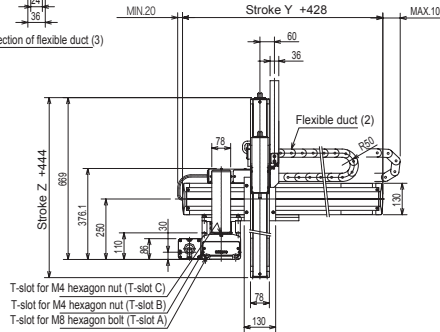
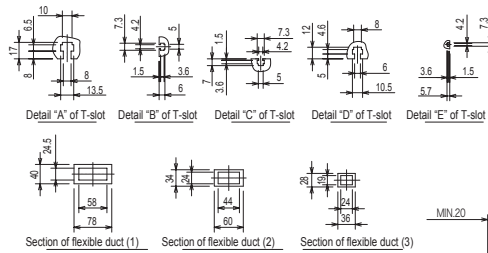
	X-axis	Y-axis	Z-axis	R-axis
Type of axis	BB50F-U □-M20N- □□	BB30F-ST-M20N- □□	BB10E-ST-M05B- □□	BB00D-RH-A
Stroke (in increments of 100 mm)	200 ~ 1500mm	100 ~ 1000mm	100 ~ 300mm	360°
Maximum speed	1200mm/s (Note 1)	1200mm/s (Note 1)	300mm/s	360°/s
Positioning repeatability	± 0.01mm	± 0.01mm	± 0.01mm	± 0.025°
Lead of ball screw	20mm	20mm	5mm	1/50 (Reduction ratio)
Motor output	200W	200W	100W, with brake	50W
Resolution	0.01 mm (R-axis: 0.01 deg.)			

	Stroke (mm)	Maximum speed (mm/s)
X-axis	700 ~ 800	1100
	900 ~ 1000	1000
	1100 ~ 1200	700
	1300	500
	1400	400
Y-axis	1500	300
	700	1000
	800	800
	900 ~ 1000	600

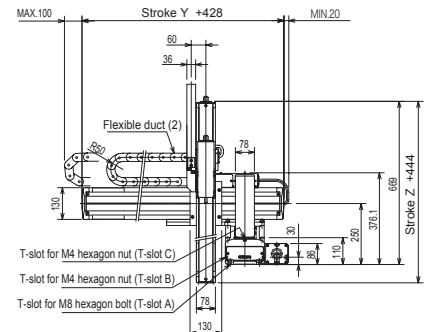
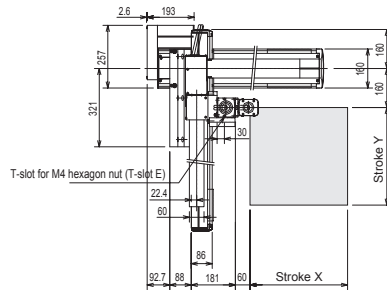
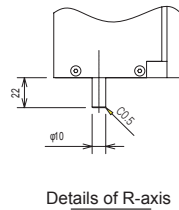
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg)	Y-axis stroke									
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm
Z-axis stroke	100mm	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	3.0
	200mm	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0
	300mm	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	1.0

R: Right-handed



L: Left-handed



X-Y-Z-R Flexible-duct Spec. Space-saving type

[Set designation]

BA2 – A5 – A4R A – 40 45 30 – UF 2 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	20 : 200mm	15 : 150mm	10 : 100mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm A0 : 1000mm F0 : 1500mm	95 : 950mm A5 : 1050mm	30 : 300mm	2 : CA10-M00B Other: See page 21	5 : 5m B : 11m 7 : 7m D : 13m

Planet gear type

X-axis: Ball screw driven Motor straight
 Y-axis: Ball screw driven Motor straight
 Z-axis: Ball screw driven Motor straight
 R-axis: Harmonic drive

Note 1: When the stroke is as given below, the maximum speed differs.

[Specifications]

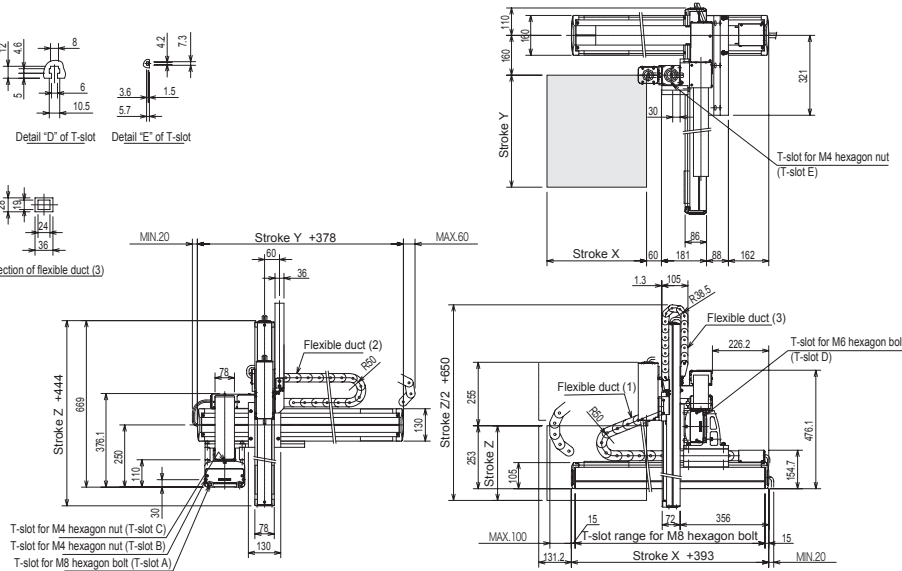
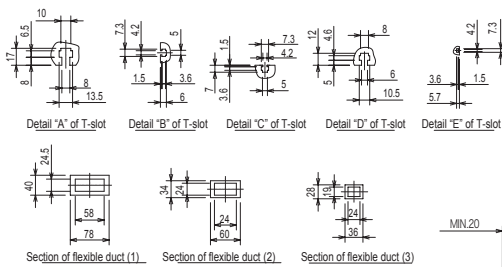
	X-axis	Y-axis	Z-axis	R-axis
Type of axis	BB50F-ST-M20N-□0	BB30E-ST-M20N-□5	BB10E-ST-M05B-□0	BB00D-RP-A
Stroke (in increments of 100 mm)	200 ~ 1500mm	150 ~ 1050mm	100 ~ 300mm	360°
Maximum speed	1200mm/s (Note 1)	1200mm/s (Note 1)	300mm/s	857°/s
Positioning repeatability	± 0.01mm	± 0.01mm	± 0.01mm	± 0.125°
Lead of ball screw	20mm	20mm	5mm	1/21 (Reduction ratio)
Motor output	200W	100W	100W, with brake	50W
Resolution	0.01 mm (R-axis: 0.01 deg.)			

	Stroke (mm)	Maximum speed (mm/s)
X-axis	700 ~ 800	1100
	900 ~ 1000	1000
	1100 ~ 1200	700
	1300	500
	1400	400
Y-axis	1500	300
	750	1000
	850	800
	950 ~ 1050	600

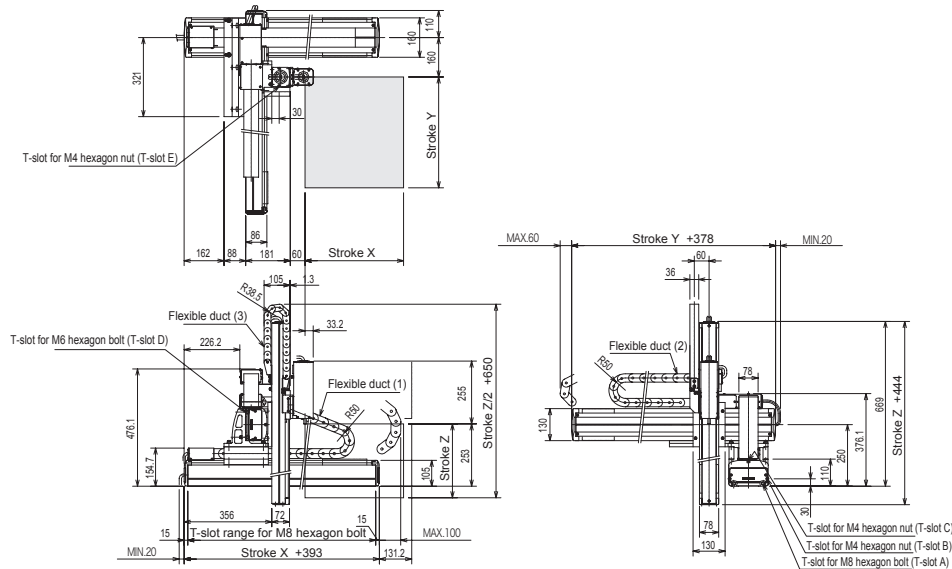
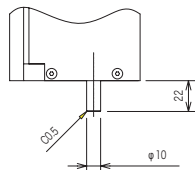
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg)	Y-axis stroke										
	150mm	250mm	350mm	450mm	550mm	650mm	750mm	850mm	950mm	1050mm	
Z-axis stroke	100mm	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.0	5.0	3.0
	200mm	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	4.0	2.0
	300mm	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	1.0

R: Right-handed



L: Left-handed



X-Y-Z-R Flexible-duct Spec.

Orthogonal Axes Specifications

[Set designation]

BA2 – A5 – A4A R G – 40 45 30 – UF 2 3

Planet gear type

X-axis: Ball screw driven Side mounted motor
 Y-axis: Ball screw driven Motor straight
 Z-axis: Ball screw driven Motor straight
 R-axis: Harmonic drive

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	20 : 200mm	15 : 150mm	10 : 100mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm	95 : 950mm	30 : 300mm	2 : CA10-M00B	5 : 5m B : 11m
	A0 : 1000mm	A5 : 1050mm		Other: See page 21	7 : 7m D : 13m
	F0 : 1500mm				

Note 1: When the stroke is as given below, the maximum speed differs.

[Specifications]

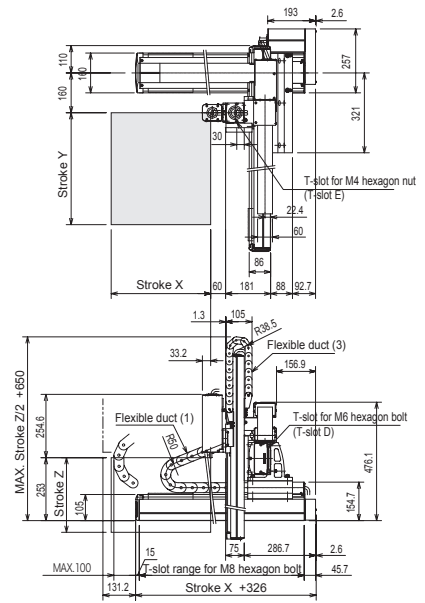
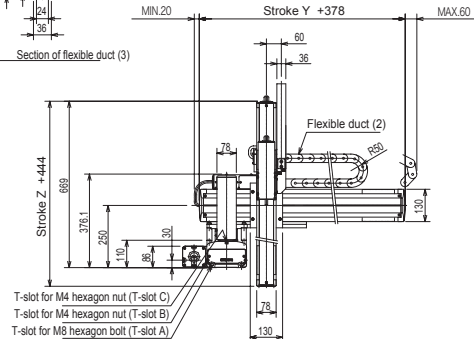
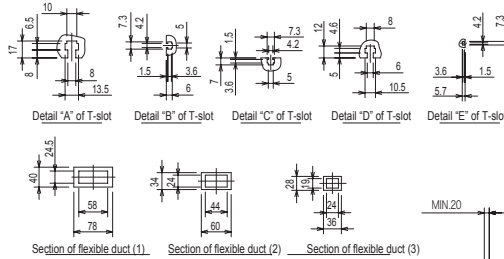
	X-axis	Y-axis	Z-axis	R-axis
Type of axis	BB50F-U □ M20N □ 0	BB30E-ST-M20N □ 5	BB10E-ST-M05B □ 0	BB00D-RP-A
Stroke (in increments of 100 mm)	200 ~ 1500mm	150 ~ 1050mm	100 ~ 300mm	360°
Maximum speed	1200mm/s (Note 1)	1200mm/s (Note 1)	300mm/s	857°/s
Positioning repeatability	± 0.01mm	± 0.01mm	± 0.01mm	± 0.125°
Lead of ball screw	20mm	20mm	5mm	1/21 (Reduction ratio)
Motor output	200W	100W	100W, with brake	50W
Resolution	0.01 mm (R-axis: 0.01 deg.)			

	Stroke (mm)	Maximum speed (mm/s)
X-axis	700 ~ 800	1100
	900 ~ 1000	1000
	1100 ~ 1200	700
	1300	500
	1400	400
Y-axis	1500	300
	750	1000
	850	800
	950 ~ 1050	600

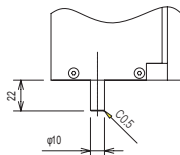
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg)	Y-axis stroke										
	150mm	250mm	350mm	450mm	550mm	650mm	750mm	850mm	950mm	1050mm	
Z-axis stroke	100mm	8.0	8.0	8.0	8.0	8.0	8.0	8.0	7.0	5.0	3.0
	200mm	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	4.0	2.0
	300mm	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.0	1.0

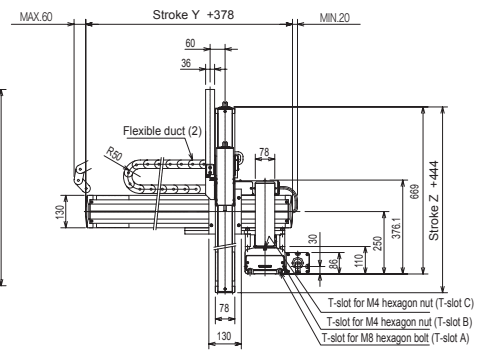
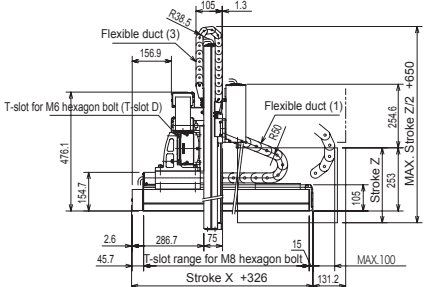
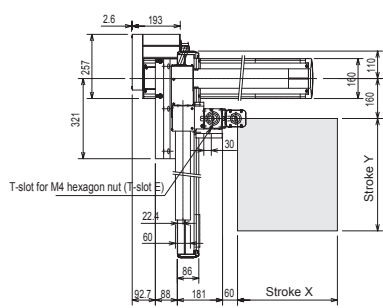
R: Right-handed



L: Left-handed



Details of R-axis



X-Y-Z-R Flexible-duct Spec. Space-saving type

[Set designation]

BA2 – A5 – A4B R A – 40 40 30 – UF2 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	20 : 200mm	10 : 100mm	10 : 100mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm	90 : 900mm	30 : 300mm	2 : CA10-M00B	5 : 5m B : 11m
	A0 : 1000mm	A0 : 1000mm		Other: See page 21	7 : 7m D : 13m
	F0 : 1500mm				

Planet gear type

X-axis: Ball screw driven Motor straight
 Y-axis: Ball screw driven Motor straight
 Z-axis: Ball screw driven Motor straight
 R-axis: Harmonic drive

Note 1: When the stroke is as given below, the maximum speed differs.

[Specifications]

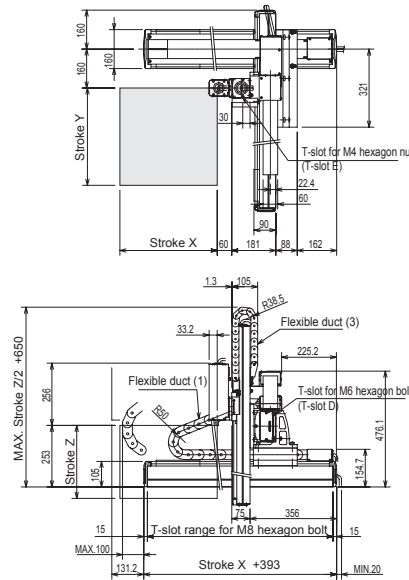
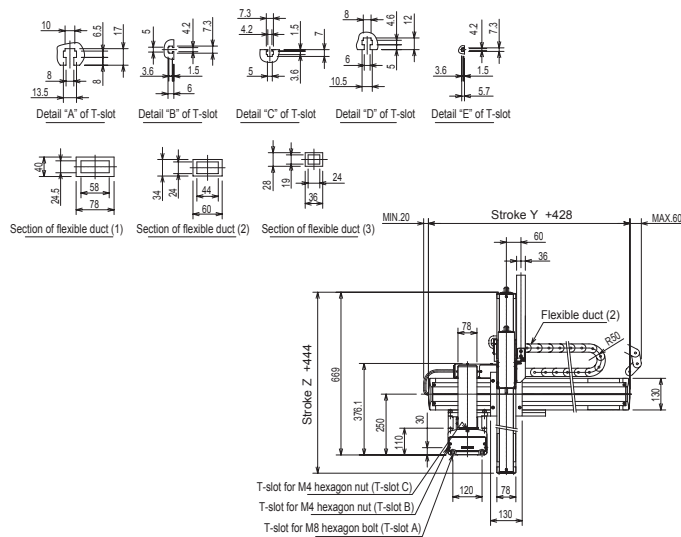
	X-axis	Y-axis	Z-axis	R-axis
Type of axis	BB50F-ST-M20N-□□	BB30F-ST-M20N-□□	BB10E-ST-M05B-□□	BB00D-RP-A
Stroke (in increments of 100 mm)	200 ~ 1500mm	100 ~ 1000mm	100 ~ 300mm	360°
Maximum speed	1200mm/s (Note 1)	1200mm/s (Note 1)	300mm/s	857°s
Positioning repeatability	± 0.01mm	± 0.01mm	± 0.01mm	± 0.125°
Lead of ball screw	20mm	20mm	5mm	1/21 (Reduction ratio)
Motor output	200W	200W	100W, with brake	50W
Resolution	0.01 mm (R-axis: 0.01 deg.)			

	Stroke (mm)	Maximum speed (mm/s)
X-axis	700 ~ 800	1100
	900 ~ 1000	1000
	1100 ~ 1200	700
	1300	500
	1400	400
Y-axis	1500	300
	700	1000
	800	800
	900 ~ 1000	600

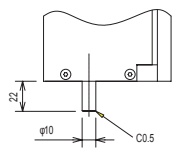
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg)	Y-axis stroke										
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm	
Z-axis stroke	100mm	10.0	10.0	10.0	10.0	10.0	10.0	10.0	8.0	5.0	3.0
	200mm	10.0	10.0	10.0	10.0	10.0	10.0	10.0	7.0	5.0	2.0
	300mm	10.0	10.0	10.0	10.0	10.0	10.0	10.0	7.0	4.0	2.0

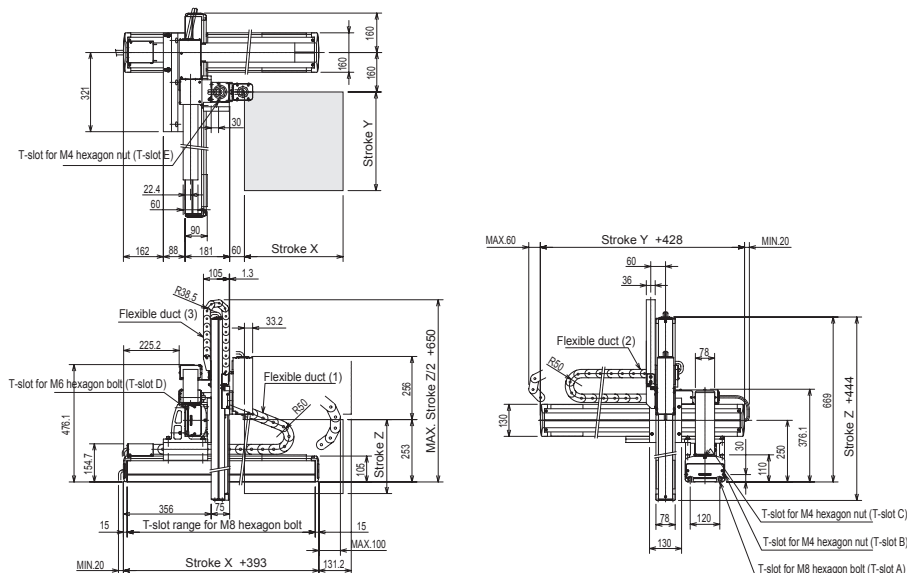
R: Right-handed



L: Left-handed



Details of R-axis



X-Y-Z-R Flexible-duct Spec.

Orthogonal Axes Specifications

[Set designation]

BA2 – A5 – A4B R G – 40 40 30 – UF 2 3

Combined operation	Axis 1 stroke	Axis 2 stroke	Axis 3 stroke	Controller	Cable length
R: Right-handed	20 : 200mm	10 : 100mm	10 : 100mm	0: None	3 : 3m 9 : 9m
L: Left-handed	90 : 900mm	90 : 900mm	30 : 300mm	2 : CA10-M00B	5 : 5m B : 11m
	A0 : 1000mm	A0 : 1000mm		Other: See page 21	7 : 7m D : 13m
	F0 : 1500mm				

Planet gear type

- X-axis: Ball screw driven Side mounted motor
- Y-axis: Ball screw driven Motor straight
- Z-axis: Ball screw driven Motor straight
- R-axis: Planet gear

Note 1: When the stroke is as given below, the maximum speed differs.

[Specifications]

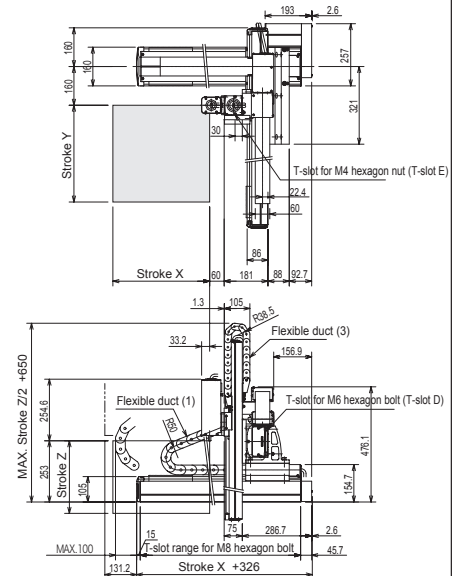
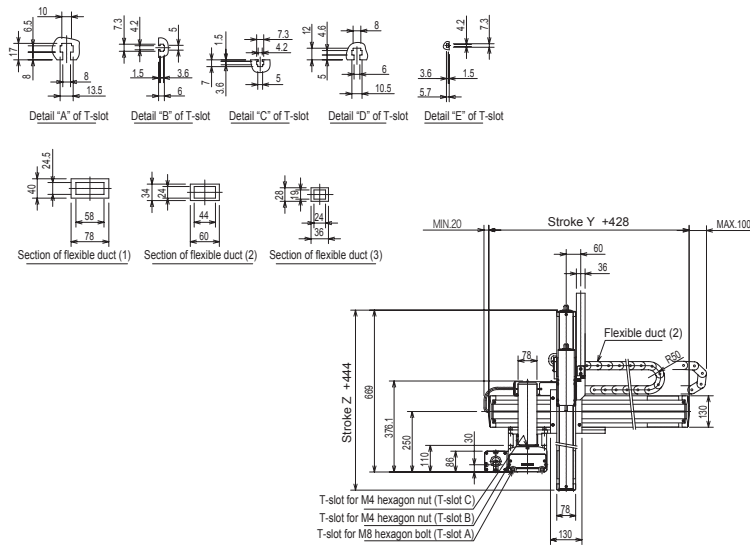
	X-axis	Y-axis	Z-axis	R-axis
Type of axis	BB50F-U □-M20N- □0	BB30F-ST-M20N- □0	BB10E-ST-M05B- □0	BB00D-RP-A
Stroke (in increments of 100 mm)	200 ~ 1500mm	100 ~ 1000mm	100 ~ 300mm	360°
Maximum speed	1200mm/s (Note 1)	1200mm/s (Note 1)	300mm/s	857/s
Positioning repeatability	± 0.01mm	± 0.01mm	± 0.01mm	± 0.125°
Lead of ball screw	20mm	20mm	5mm	1/21 (Reduction ratio)
Motor output	200W	200W	100W, with brake	50W
Resolution	0.01mm (R-axis: 0.01 deg.)			

	Stroke (mm)	Maximum speed (mm/s)
X-axis	700 ~ 800	1100
	900 ~ 1000	1000
	1100 ~ 1200	700
	1300	500
	1400	400
Y-axis	1500	300
	700	1000
	800	800
	900 ~ 1000	600

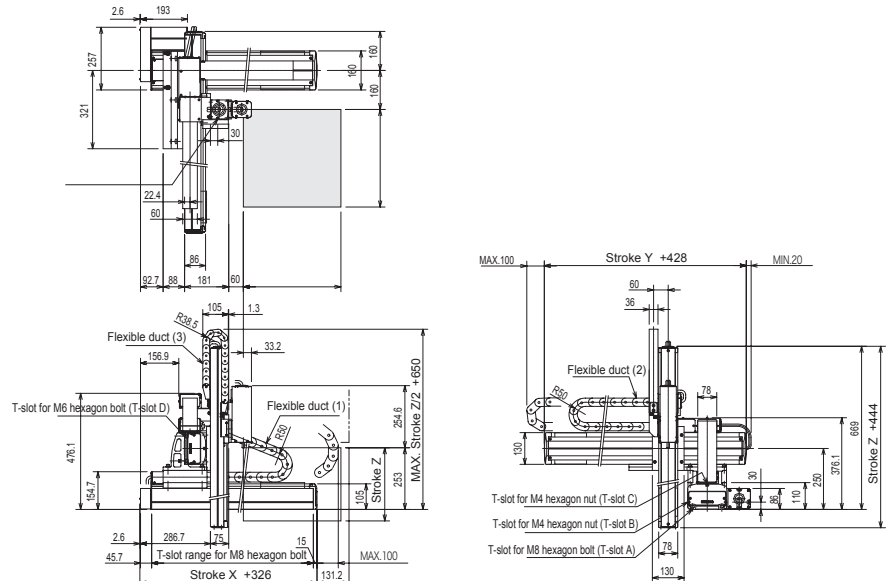
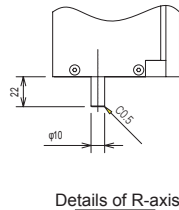
Acceleration/deceleration time when the maximum speed is set: 0.36 sec. or over

Maximum Payload (kg)	Y-axis stroke										
	100mm	200mm	300mm	400mm	500mm	600mm	700mm	800mm	900mm	1000mm	
Z-axis stroke	100mm	10.0	10.0	10.0	10.0	10.0	10.0	10.0	8.0	5.0	3.0
	200mm	10.0	10.0	10.0	10.0	10.0	10.0	10.0	7.0	5.0	2.0
	300mm	10.0	10.0	10.0	10.0	10.0	10.0	10.0	7.0	4.0	2.0

R: Right-handed



L: Left-handed



X-Y-Z-R Flexible-duct Spec. Space-saving type

Variations

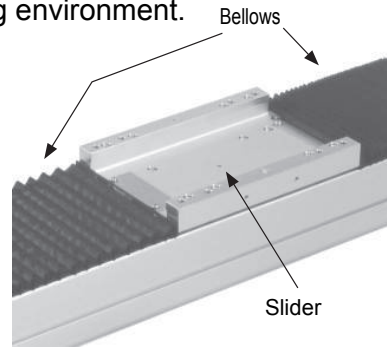
Simple Dust-Resistant Axes Specifications ...	150
Cleanroom Axis Specifications	152

Simple Dust-Resistant Axes Specifications

Simple dust-resistant axes with provisions for preventing entry of contaminant into axes. They protect the ball screws and linear guides from a dusty working environment.

[Features]

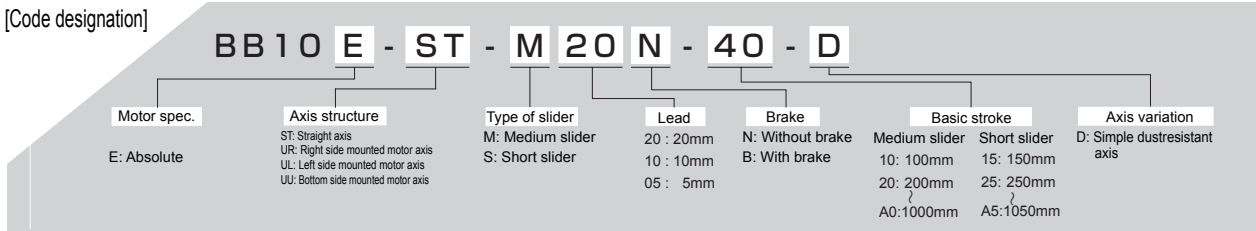
- Designed based on the standard axes. Long service life can be assured by the construction of the bellows.
- Enhanced sealing ability against dust at air-purging.
- Both straight axis and side mounted motor axis are available to serve each user's installation space.
- The side mounted motor axis comes in three types; right side mounted motor axis, left side mounted motor axis and bottom side mounted motor axis.
- Each axis can be mounted horizontally by facing up or sideways, or mounted vertically.
- Compliant to IP standard (IP30) for dust-resistance and water-proofing.



Simple dust-resistant axis BB10

The specifications other than outer dimensions are the same as those of the BB10 standard axis. See Pages 26 ~ 27.

[Code designation]

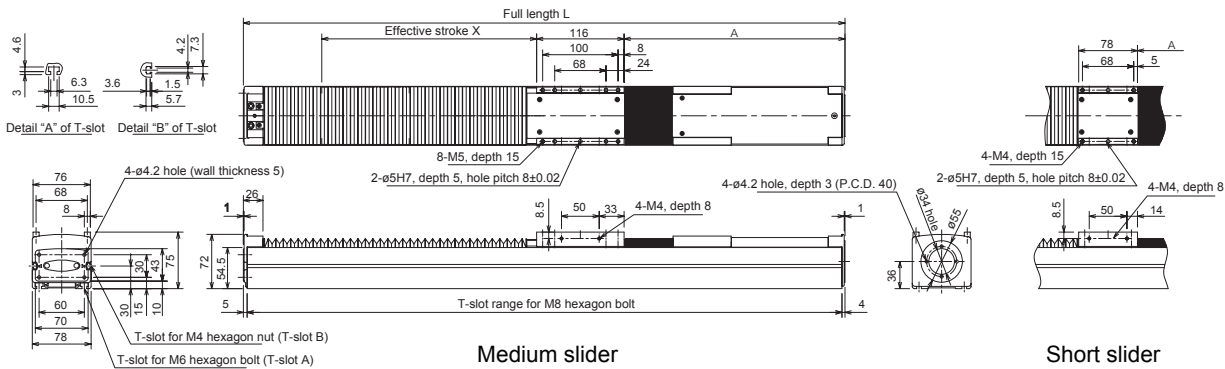


• Specify the basic stroke.

[Dimensions] Motor straight axis

★For the dimensions of other axis structures, consult with our sales office in your territory.

BB10E-ST



Medium slider

Basic stroke (mm)	100	200	300	400	500	600	700	800	900	1000
Effective stroke X (mm)	65	133	217	285	369	453	521	605	673	757
L (mm)	Without brake	498	598	698	798	898	998	1098	1198	1298
	With brake	540	640	740	840	940	1040	1140	1240	1340
A (mm)	Without brake	253	269	277	293	301	309	325	333	349
	With brake	295	311	319	335	343	351	367	375	391

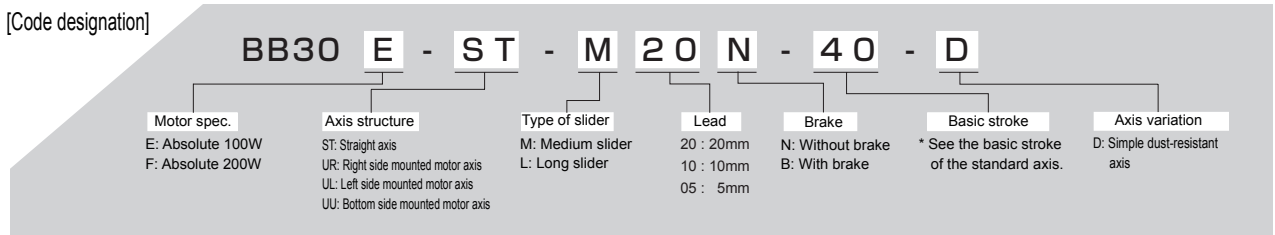
Short slider

Basic stroke (mm)	150	250	350	450	550	650	750	850	950	1050
Effective stroke X (mm)	99	183	251	335	403	487	555	639	707	791
L (mm)	Without brake	498	598	698	798	898	998	1098	1198	1298
	With brake	540	640	740	840	940	1040	1140	1240	1340
A (mm)	Without brake	261	269	285	293	309	317	333	341	357
	With brake	303	311	327	335	351	359	375	383	399

Simple dust-resistant axis BB30

The specifications other than outer dimensions are the same as those of the BB30 standard axis. See Pages 28 ~ 31.

[Code designation]



• Specify the basic stroke.

[Dimensions]

Motor straight axis

★For the dimensions of other axis structures, consult with our sales agent in your territory

BB30E-ST

Medium slider

Basic stroke (mm)	150	250	350	450	550	650	750	850	950	1050	
Effective stroke (mm)	150	250	350	450	550	650	750	850	950	1050	
L (mm)	Without brake	536	651	765	879	993	1107	1222	1336	1450	1570
	With brake	576	691	805	919	1033	1147	1262	1376	1490	1604
A (mm)	Without brake	194	194	194	194	194	194	194	194	194	200
	With brake	234	234	234	234	234	234	234	234	234	234

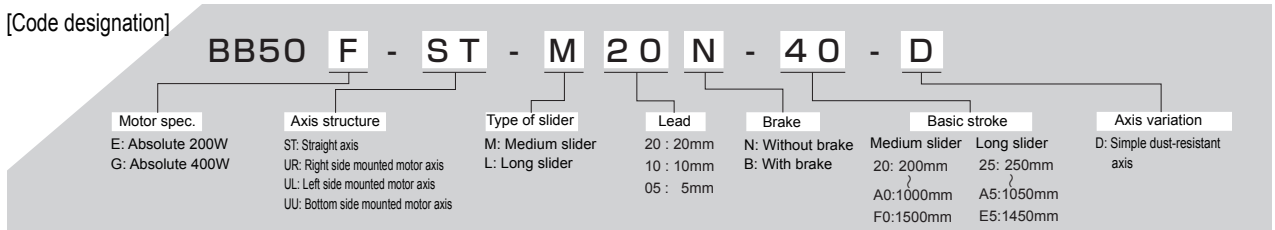
Long slider

Basic stroke (mm)	150	250	350	450	550	650	750	850	950	1050	
Effective stroke (mm)	150	250	350	450	550	650	750	850	950	1050	
L (mm)	Without brake	536	651	765	879	993	1107	1228	1356	1484	1612
	With brake	576	691	805	919	1033	1147	1262	1376	1490	1612
A (mm)	Without brake	144	144	144	144	144	144	150	164	178	192
	With brake	184	184	184	184	184	184	184	184	184	192

Simple dust-resistant axis BB50

The specifications other than outer dimensions are the same as those of the BB50 standard axis. See Pages 32 ~ 35.

[Code designation]



• Specify the basic stroke.

[Dimensions]

Motor straight axis

★For the dimensions of other axis structures, consult with our sales agent in your territory

BB50F-ST

Medium slider

Basic stroke (mm)	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	
Effective stroke (mm)	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	
L (mm)	Without brake	597	712	826	940	1054	1168	1286	1414	1542	1656	1784	1914	2042	2170
	With brake	634	749	863	977	1091	1205	1320	1434	1548	1655	1784	1914	2042	2170
A (mm)	Without brake	150	150	150	150	150	153	167	181	188	202	217	231	245	
	With brake	187	187	187	187	187	187	187	187	187	202	217	231	245	

Long slider

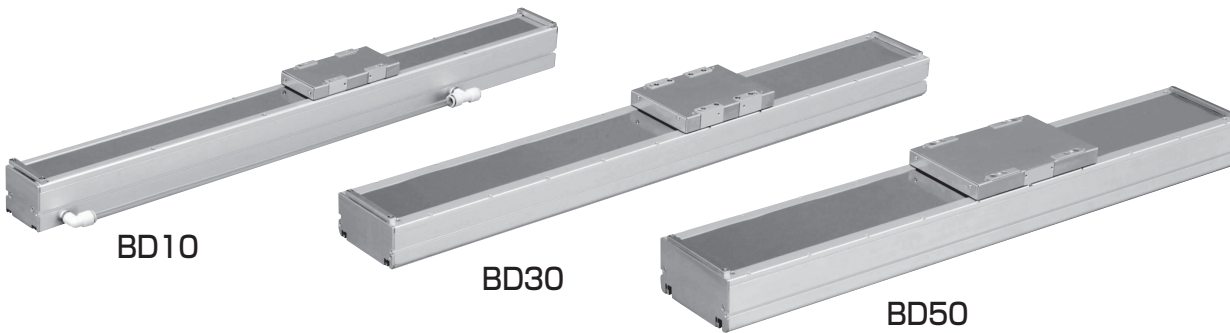
Basic stroke (mm)	250	350	450	550	650	750	850	950	1050	1150	1250	1350	1450	
Effective stroke (mm)	250	350	450	550	650	750	850	950	1050	1150	1250	1350	1450	
L (mm)	Without brake	705	819	933	1047	1161	1279	1400	1528	1656	1770	1898	2028	2156
	With brake	742	856	970	1084	1198	1313	1427	1541	1655	1770	1898	2028	2156
A (mm)	Without brake	150	150	150	150	150	153	160	174	188	195	207	224	238
	With brake	187	187	187	187	187	187	187	187	187	195	209	224	238

Cleanroom Specifications

Designed for cleanliness "Class 10" (0.1 μm-based).

[Features]

- Special cleanroom design for axis for realizing cleanliness of Class 10 (0.1μm)
- Highest available speed at Class 10! Maximum speed of 1200mm/s (at stroke of 600mm or less) is possible.
- Airtight structure using stainless steel sheets and capable of providing high cleanliness with a low air intake
- 2-axis orthogonal X-Y table shape combination is also available.



[Code designation]

BD 10 E - ST - M 20 N - AO - C

Axis structure	Motor spec.	Lead	Brake	Basic stroke
10	E : 100W	20 : 20mm	N: Without brake	10 : 100mm 15 : 150mm
30	F : 200W	10 : 10mm	B: With brake	90 : 900mm 95 : 950mm
50	G : 400W	5 : 5mm		A0 : 1000mm A5 : 105mm
				F0 : 1500mm

[Specifications]

Axis of type	BD10E	BD30E	BD30F	BD50 F	BD50 G
Cleanness (Particulate generation per 1cF)	Class 10 (0.1 μm)				
Motor (AC servo motor absolute)	100 W		200W		400W
Drive system	Ground ball screw (C7) (Major diameter of screw thread: BD10, BD30: 15mm, BD50: 20mm))				
Guide structure	Linear guide (retainer type)				
Stroke (mm) (in increments of 100 mm)	100~600	700 800 900, 1000	150~650 750 850 950, 1050	100~600 700 800 900, 1000	1100, 1200 1300 1400 1500 200~600 700, 800 900, 1000 1100, 1200 1300 1400 1500
Maximum speed (mm/s)	Lead 20mm	1200 1000 800 600	1200 1000 800 600	1200 1000 800 600	1100 1000 700 500 400 300 200 1100 1000 700 500 400 300
	Lead 10mm	600 500 400 300	600 500 400 300	600 500 400 300	550 500 350 250 200 150 600 550 500 350 250 200 150
	Lead 5mm	300 250 200 150	300 250 200 150	300 250 200 150	300 280 250 180 130 100 80 300 280 250 180 130 100 80
Maximum Payload (kg) (Note 1)	Lead 20mm	Horizontal: 20 Vertical: 3 (5)	Horizontal: 30 Vertical: 3 (5)	Horizontal: 40 Vertical: 3 (10)	Horizontal: 60 (Note 2) Vertical: 3 (12) (Note 3)
	Lead 10mm	Horizontal: 30 Vertical: 8 (12)	Horizontal: 55 Vertical: 8 (12)	Horizontal: 80 Vertical: 8 (20)	Horizontal: 100 Vertical: 8 (25)
	Lead 5mm	Horizontal: 50 Vertical: 15 (22)	Horizontal: 80 Vertical: 15 (22)	Horizontal: 100 Vertical: 15 (40)	Horizontal: 100 Vertical: 15 (50)
Positioning repeatability (mm)	±0.01				
Resolution (mm)	0.01				
Allowable static moment of inertia (N·m)	MR:59 MP:59 MY:54	MR:220 MP:122 MY:175		MR:330 MP:292 MY:345	
Vacuum air intake (normal liters/min)	60(70) Note 4		80(90) Note 4		100(110) Note 4
Frame surface plating	Extrusion material: Alumite plating				
Cover system	Stainless steel sheet				
Grease	Low-particulate generation grease (applied to ball screws, linear guide, and bearings)				
Axis combination types	Single axis or orthogonal X-Y table shape, Horizontal installation with upward-facing slider				
Compatible master units	CA20-M□□, CA20-M00, CA10-M00B, CA10-M01B				

Notes: * If using as a vertical axis, select the type with brake.

* The maximum payload is the value when a load is applied directly onto the slider.

* The value in parentheses for the maximum payload is the value when a regenerative discharge unit is installed during vertical usage.m/s.

Note 1: This is the value for an acceleration time of 0.36 seconds or longer.

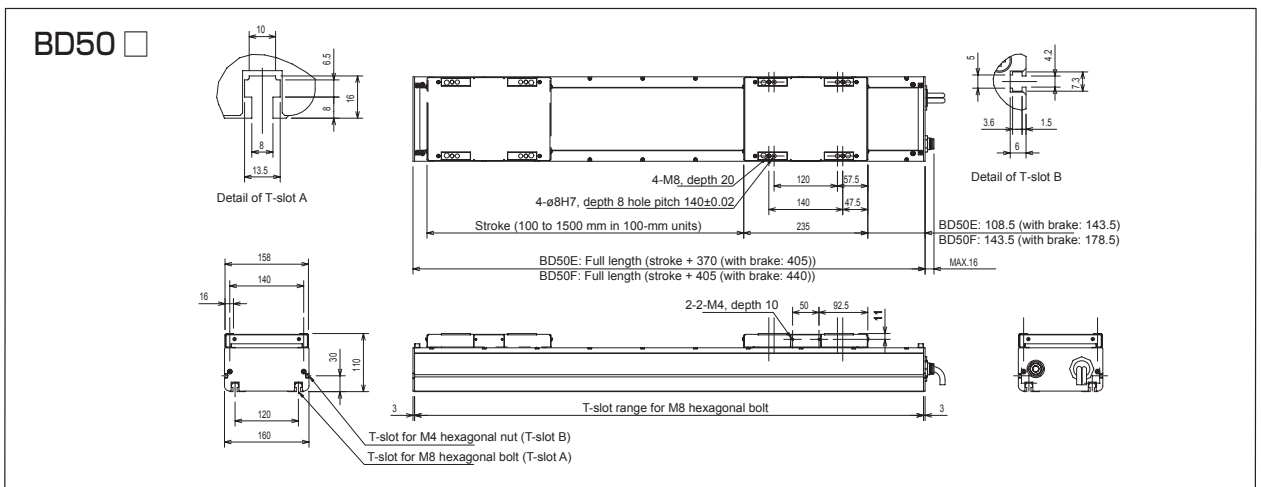
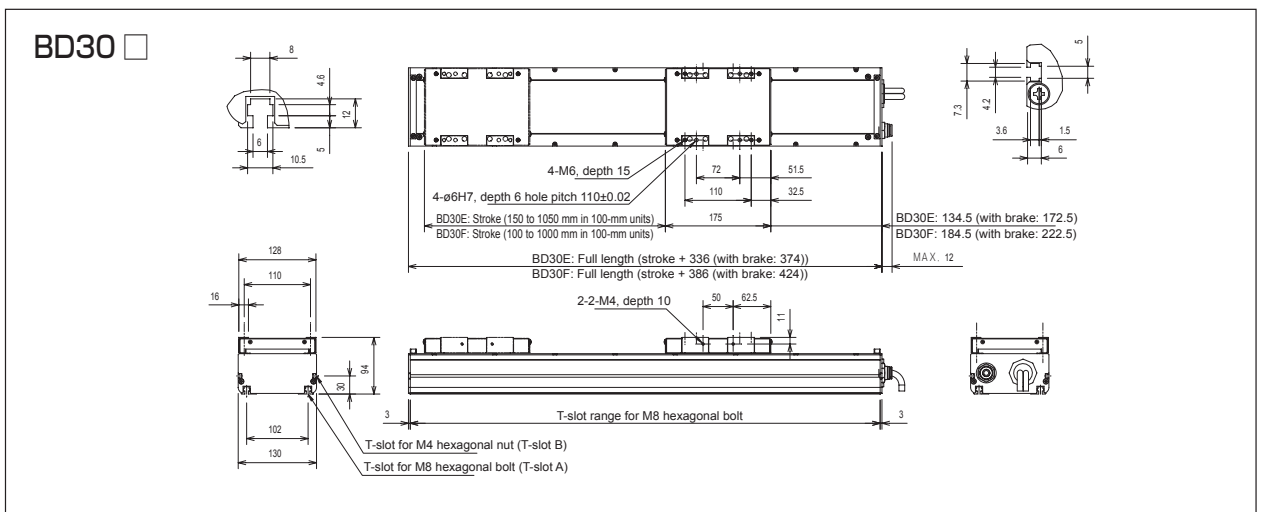
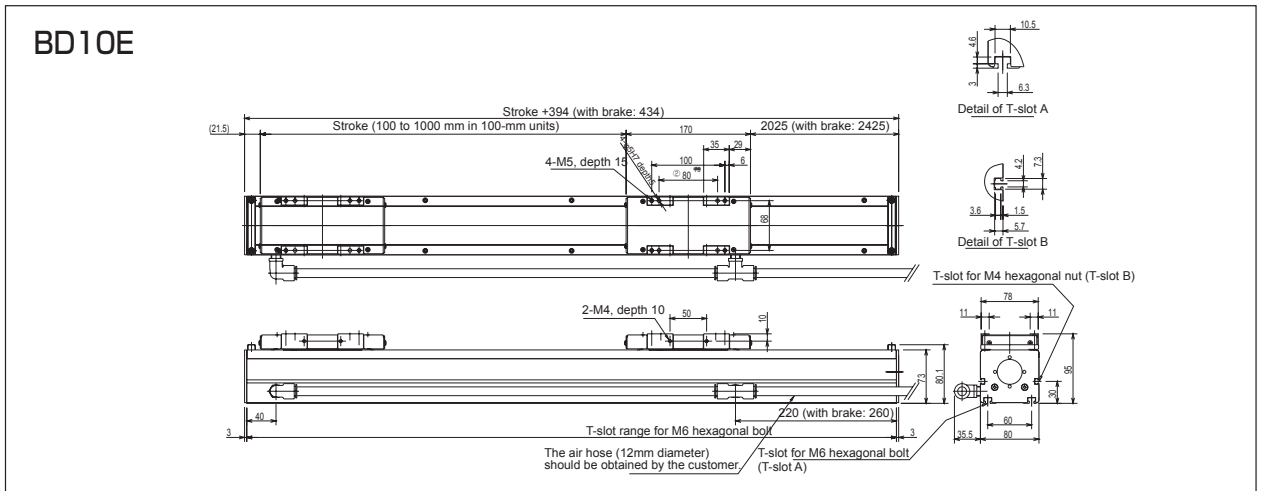
Note 2: If the payload is 50kg or more at a supply voltage of 110 to 120V or 220 to 240V, the regenerative discharge unit ABSU-2000 is required.

If using at speeds exceeding 1000mm/s, the value becomes 50kg.

Note 3: If using at speed exceeding 1000mm/s, the value is 7kg when using a regenerative discharge unit.

Note 4: The value in parentheses is the vacuum air intake when the speed exceeds 1000mm/s but is less than or equal to 1200mm/s.

[Dimensions]



Axis-Related Components

Components

Axis Combination Bracket	156
Controller Cable	164
CN Box	164
CN Box Wrench	167
Flexible Tube	168
Flexible Duct	169
Tube Tray	170
Flexible Tray	170

Options

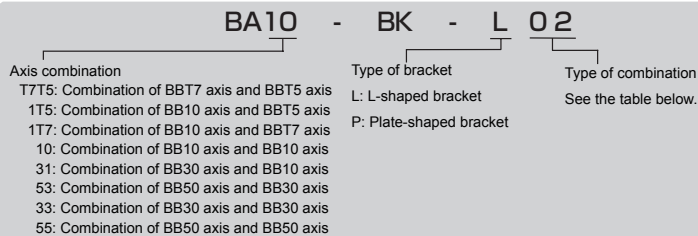
Support Guide	171
Home Position Change Sensor	173
Strain Relief	173
Cable Grip	174

Axis Combination Bracket

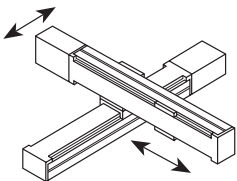
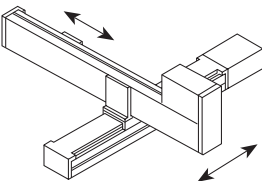
[Application]

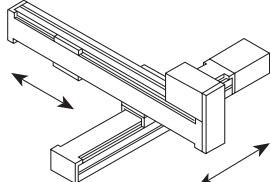
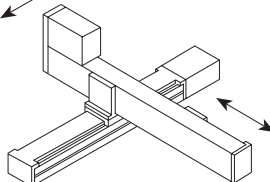
Brackets are used to combine axes (or actuators) in an orthogonal form. A large number of brackets are available to cope with various combinations. Bolts and nuts are attached.

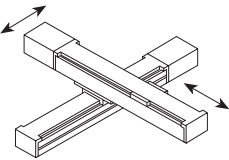
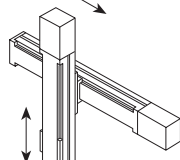
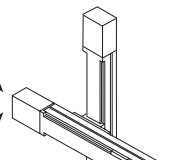
[Code designation]

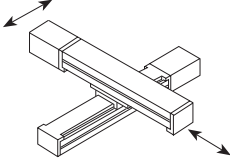
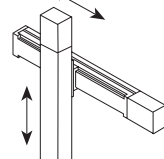
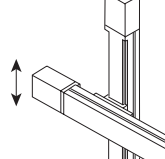


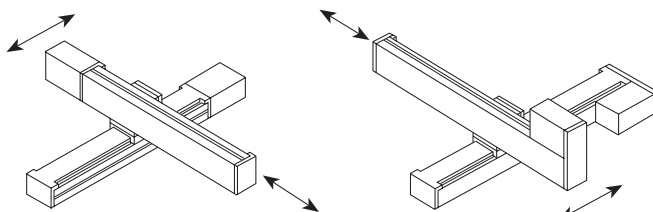
[Type of brackets by axis combination]

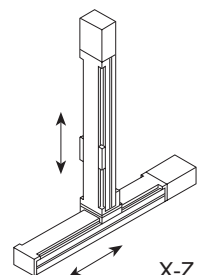
Axis combination [1]		Basic axis	Axis 2	Type of bracket	Ref. Page
 <p>X-Y Right-handed Y-axis slider opposite to motor side</p>	 <p>X-Y Left-handed Y-axis slider on motor side</p>	BBT7	BBT5	BAT7T5-BK-L02	P158
		BB10	BBT7	BA1T7-BK-L02	P158
		BB10	BBT5	BA1T5-BK-L02	P158
		BB10	BB10	BA10-BK-L02	P158
		BB30	BB10	BA31-BK-L02	P158
		BB50	BB30	BA53-BK-L02	P158
		BB30	BB30	BA33-BK-L02	P159
		BB50	BB50	BA55-BK-L02	P159
		BB60	BB50	BA65-BK-L02	P163

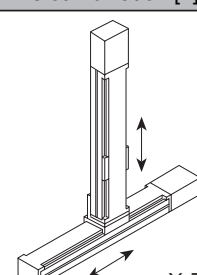
Axis combination [2]		Basic axis	Axis 2	Type of bracket	Ref. Page
 <p>X-Y Left-handed Y-axis slider opposite to motor side</p>	 <p>X-Y Right-handed Y-axis slider on motor side</p>	BBT7	BBT5	BAT7T5-BK-L03	P159
		BB10	BBT7	BA1T7-BK-L03	P159
		BB10	BBT5	BA1T5-BK-L03	P159
		BB10	BB10	BA10-BK-L03	P159
		BB30	BB10	BA31-BK-L03	P160
		BB50	BB30	BA53-BK-L03	P160
		BB30	BB30	BA33-BK-L03	P160
		BB50	BB50	BA55-BK-L03	P160
		BB60	BB50	BA65-BK-L03	P163

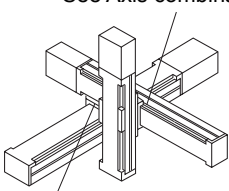
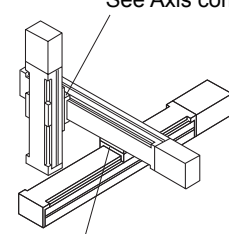
Axis combination [3]		Basic axis	Axis 2	Type of bracket	Ref. Page	
 <p>X-Y table</p>	 <p>Y-Z</p>	 <p>Z-Y</p>	BBT7	BBT5	BAT7T5-BK-P06	P160
			BB10	BBT7	BA1T7-BK-P06	P160
			BB10	BBT7	BA1T7-BK-P06S	P161
			BB10	BBT5	BA1T5-BK-P06	P161
			BB10	BB10	BA10-BK-P06	P161
			BB30	BB10	BA31-BK-P06	P161
			BB50	BB30	BA53-BK-P06	P161

Axis combination [4]		Basic axis	Axis 2	Type of bracket	Ref. Page	
 <p>X-Y table X-Y move</p>	 <p>Y-Z move</p>	 <p>Z-Y move</p>	BB10	BB10	BA10-BK-P07	P161
			BB30	BB10	BA31-BK-P07	P162
			BB50	BB30	BA53-BK-P07	P162

Axis combination [5]	Basic axis	Axis 2	Type of bracket	Ref. Page
 <p>X-Y move Right-handed</p> <p>X-Y move Left-handed</p>	BB10	BB10	BA10-BK-L04	P162

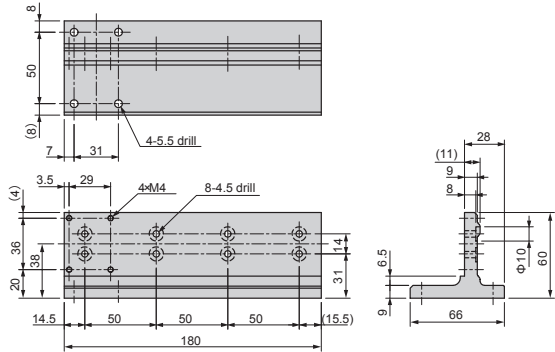
Axis combination [6]	Basic axis	Axis 2	Type of bracket	Ref. Page
 <p>X-Z</p>	BB10	BB10	BA11-BK-L01	P162
	BB30	BB10	BA31-BK-L01	P162
	BB50	BB30	BA53-BK-L01	P162
	BB30	BB30	BA33-BK-L01	P163
	BB50	BB50	BA55-BK-L01	P163

Axis combination [7]	Basic axis	Axis 2	Type of bracket	Ref. Page
 <p>X-Z Z-axis facing sideways</p>	BB10	BB10	BA10-BK-L05	P163

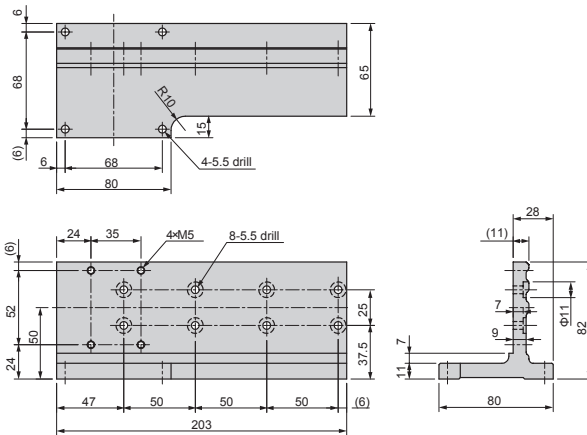
Axis combination [8]	
 <p>See Axis combination [3] Y-Z.</p> <p>See Axis combination [1] X-Y.</p> <p>X-Y-Z Right-handed Y-axis slider opposite to motor side</p>	 <p>See Axis combination [3] Y-Z.</p> <p>See Axis combination [2] X-Y.</p> <p>X-Y-Z Left-handed Y-axis slider opposite to motor side</p>

Dimensions of Axis Combination Bracket

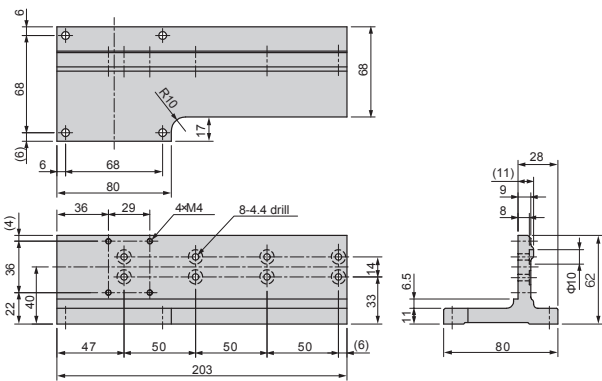
[BAT7T5-BK-L02] Material: Aluminum alloy, mass 0.5 kg



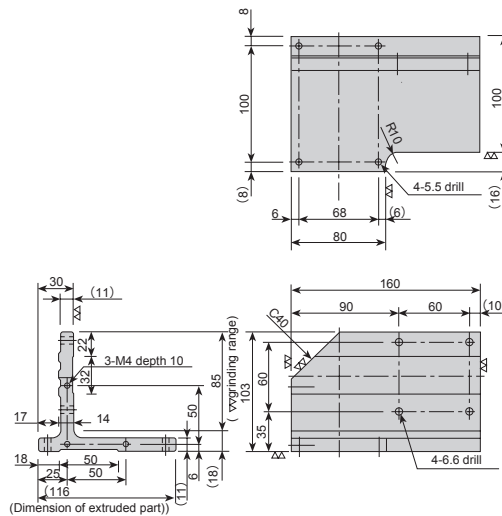
[BA1T7-BK-L02] Material: Aluminum alloy, mass 0.8 kg



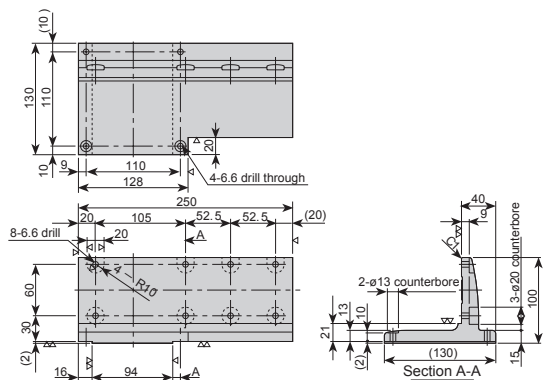
[BA1T5-BK-L02] Material: Aluminum alloy, mass 0.8 kg



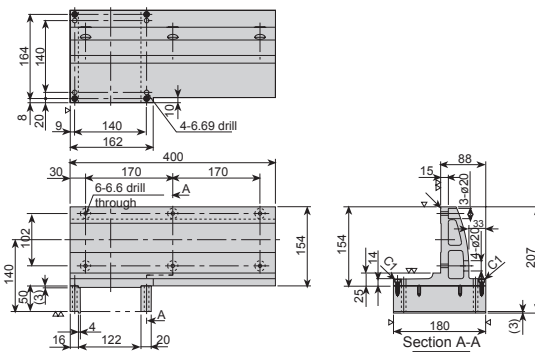
[BA10-BK-L02] Material: Aluminum alloy, mass 0.9 kg



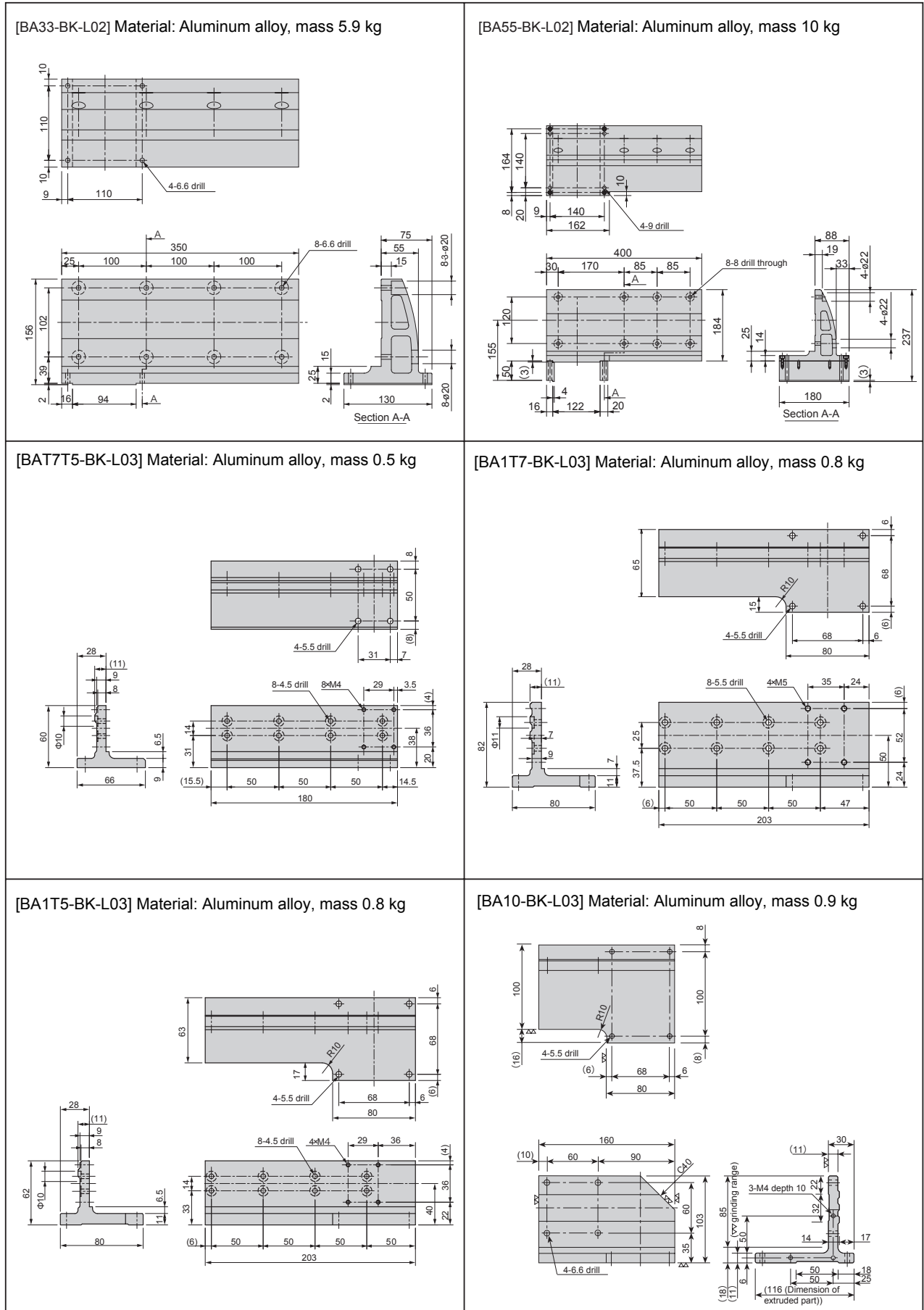
[BA31-BK-L02] Material: Aluminum alloy, mass 1.9 kg



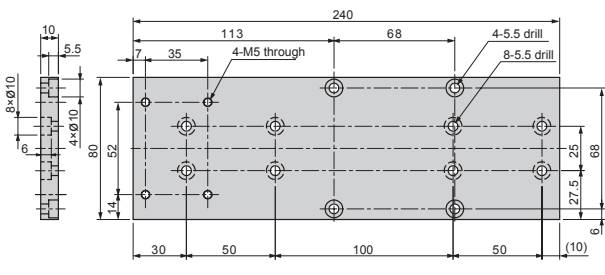
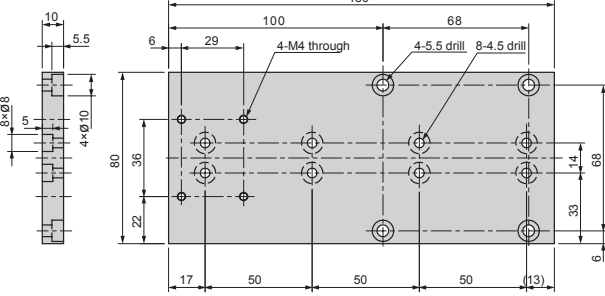
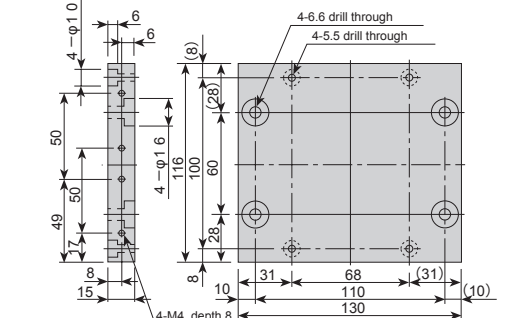
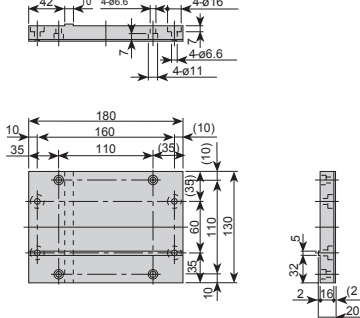
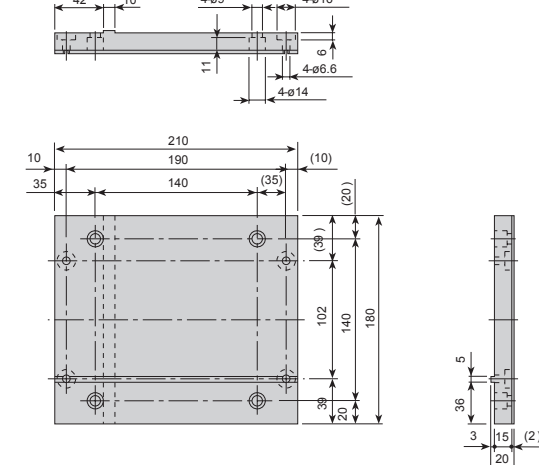
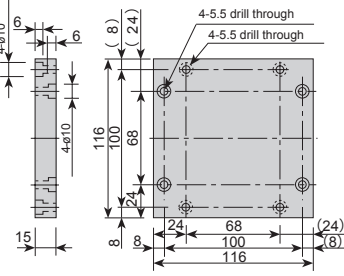
[BA53-BK-L02] Material: Aluminum alloy, mass 8.5 kg



Dimensions of Axis Combination Bracket



Dimensions of Axis Combination Bracket

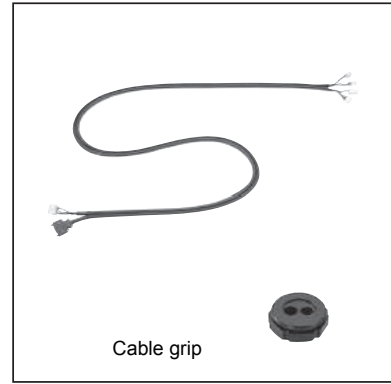
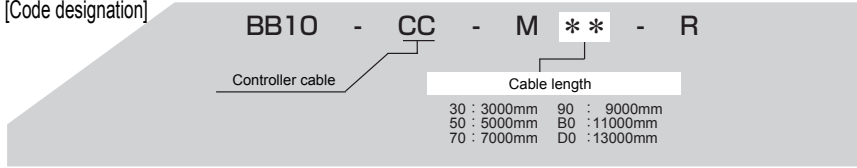
<p>[BA1T7-BK-P06S] Material: Aluminum alloy, mass 0.5 kg</p>  <p>* Stroke of axis 2: For 100 mm or less</p>	<p>[BA1T5-BK-P06] Material: Aluminum alloy, mass 0.5 kg</p> 
<p>[BA10-BK-P06] Material: Aluminum alloy, mass 0.6 kg</p> 	<p>[BA31-BK-P06] Material: Aluminum alloy, mass 0.9 kg</p> 
<p>[BA53-BK-P06] Material: Aluminum alloy, mass 1.5 kg</p> 	<p>[BA10-BK-P07] Material: Aluminum alloy, mass 0.5 kg</p> 

Controller Cable

[Application]

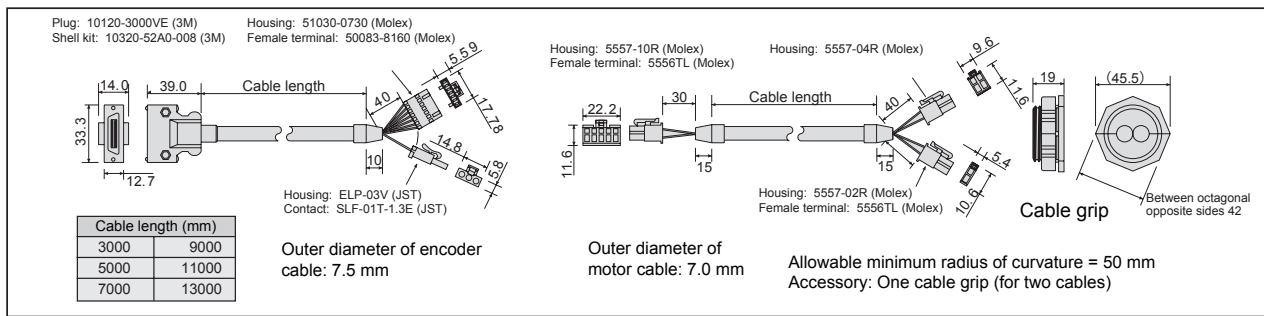
Used to connect a controller with an actuator (or axis). The controller cable consists of motor and encoder signal cables (i.e., two flexible cables).
 When used for an orthogonal (or Cartesian) two axes system, the cable for the axis 2 should be 2 m longer than that of the axis 1 generally.
 This cable is exclusively used for the actuator, and no user's cable is included.

[Code designation]



- * The controller cable is supplied as a pair of one each of motor cable and encoder signal cable. A cable grip for these two cables is attached.
- * When using the controller cable for the orthogonal two axes system, pass the cable for the axis 2 through a flexible tube or flexible duct (which is available for an extra price).
- * For the cable length of any special axis combination, consult with us each time.

[Dimensions]

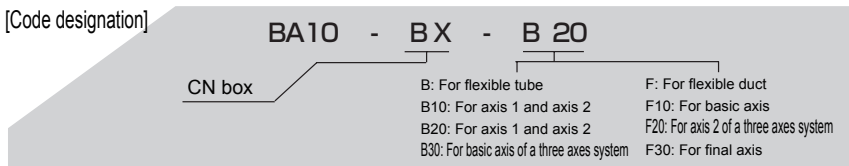


CN Box

[Application]

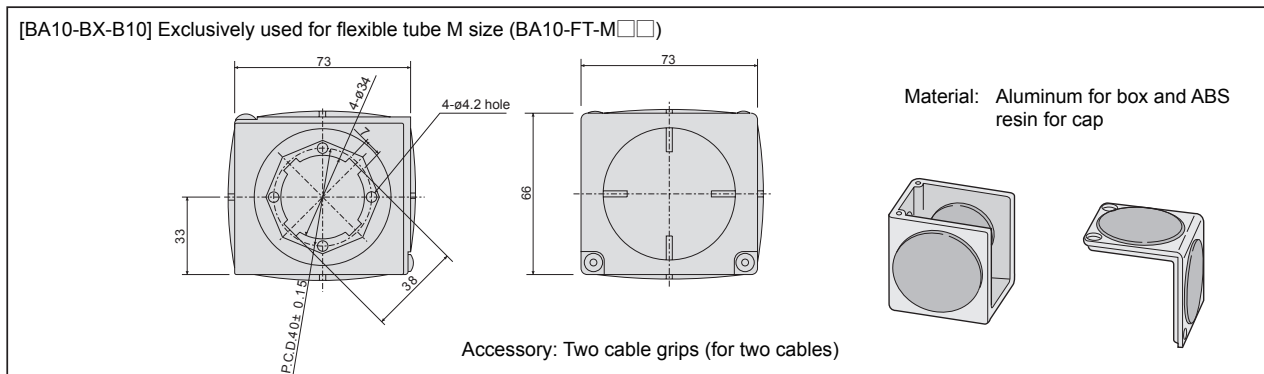
Used to secure the both ends of a flexible tube or flexible duct.
 A CN box is mounted by using a T-slot on the side of the actuator, on top of the frame cover or on the motor cover.
 The CN box can also be mounted on user's equipment.
 For a single axis system, this box may not be required.

[Code designation]

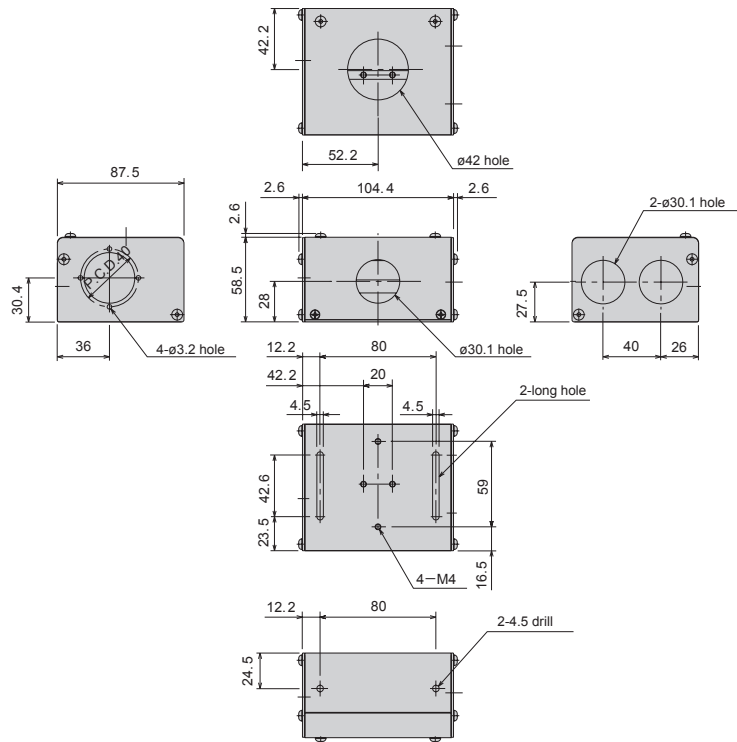


- * A CN box is supplied with a set of caps, metal fixtures, grommets, cable securing fixtures.
- * A controller cable only passes through the box and is connected by means of connectors.
- * Order CN box in quantity of 1 piece and up.

[Dimensions]

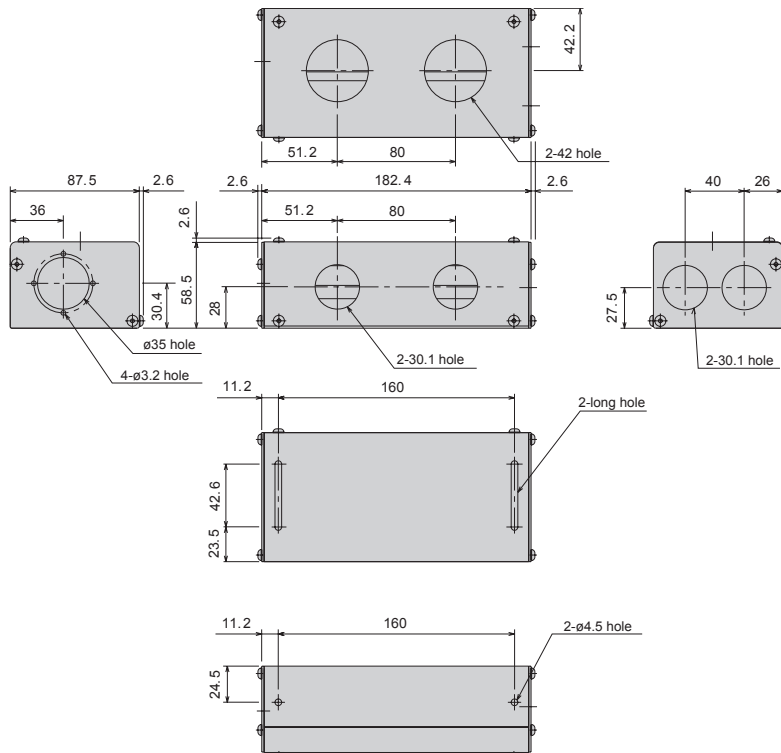


[BA10-BX-B20] Exclusively used for flexible tube L size (BA10-FT-L□□)



No.	Accessory	Qty
1	1.6 9.9 $\phi 35$	1
2	41 9 43.6 G1 (Nut thread) JIS B 0202	1
3	42 4 15 45.5 G1 (Nut thread) JIS B 0202	1 set
4	1.6 9.9 $\phi 30$	3
5	6.5 1.5 $\phi 30$ $\phi 35$	3
6	Cross-recessed pan head screw	M4×8 2
7	Hexagon nut	M4 2

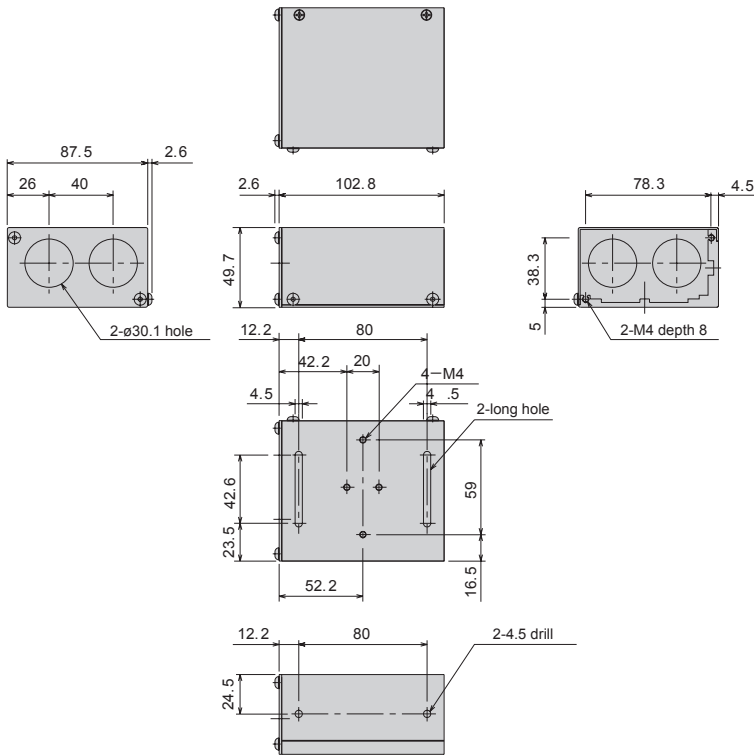
[BA10-BX-B30] Exclusively used for flexible tube L size (BA10-FT-L□□)



No.	Accessory	Qty
1	1.6 9.9 $\phi 35$	1
2	41 9 43.6 G1 (Nut thread) JIS B 0202	1
3	42 4 15 45.5 G1 (Nut thread) JIS B 0202	1 set
4	1.6 9.9 $\phi 30$	4
5	6.5 1.5 $\phi 30$ $\phi 35$	4
6	Cross-recessed pan head screw	M4×8 2
7	Hexagon nut	M4 2

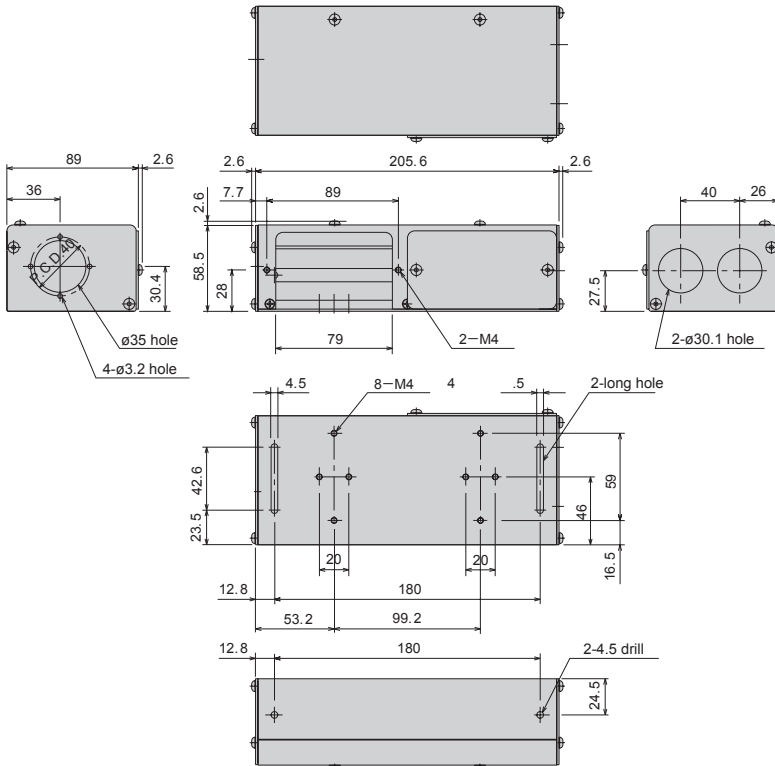
[Dimensions]

[BA10-BX-F10] Exclusively used for flexible duct (BA10-FD-□□□)



No.	Accessory	Q'ty	
1	1.6 9.9 ø30	1	
2	6.5 ø30 ø35 1.5	2	
3	Cross-recessed pan head screw	M8×8	2
4	Hexagon nut	M4	2

[BA10-BX-F20] Exclusively used for flexible duct (BA10-FD-□□□)

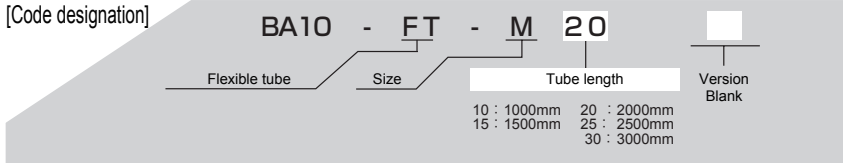
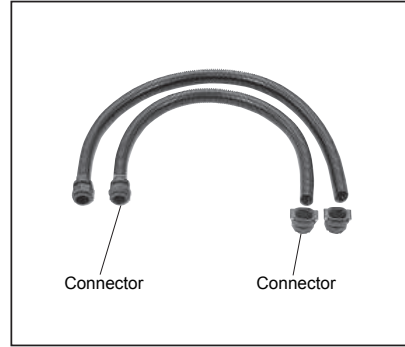


No.	Accessory	Q'ty	
1	1.6 9.9 ø35	1	
2	41 43.6 6 G1(Nut thread) JIS B 0202	1	
3	42 45.5 4 15 G1(Nut thread) JIS B 0202	1 set	
4	1.6 9.9 ø30	2	
5	6.5 ø30 ø35 1.5	2	
6	Cross-recessed pan head screw	M4×8	2
7	Hexagon nut	M4	2

Flexible Tube

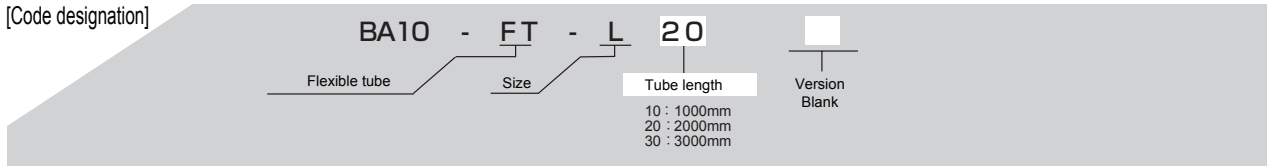
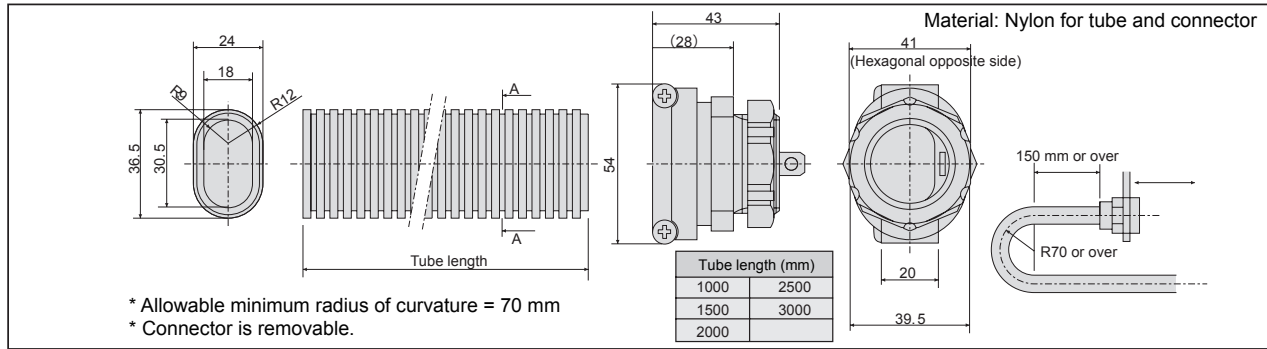
[Application]

Used to protect a controller cable which connects orthogonal two axes. It is also possible to pass a signal cable for tooling or other air tubing through this flexible tube.
 This flexible tube can be arranged vertically (cable track style) or horizontally (hoop cable style; only M size).
 To use this tube, an exclusive CN box (available for an extra price) is necessary.



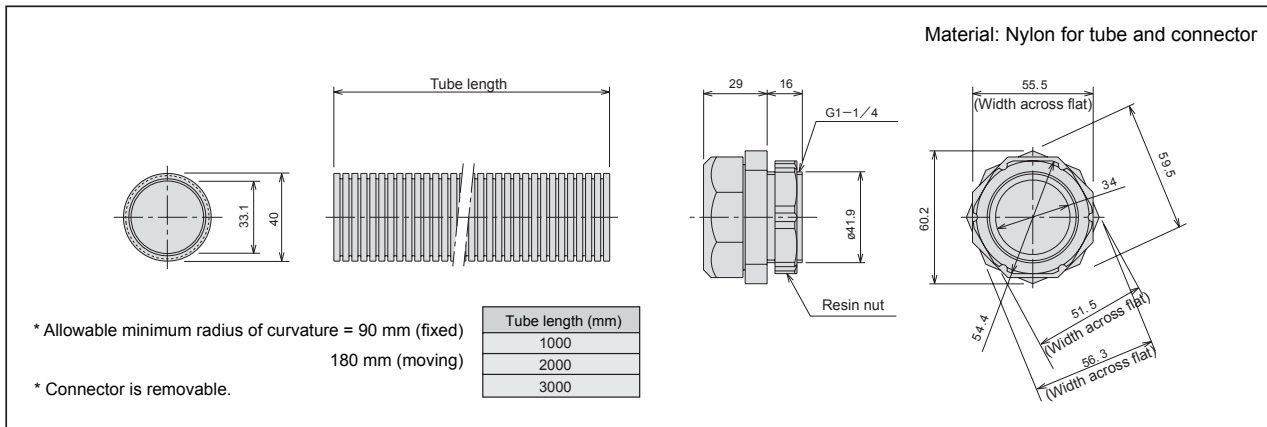
- * Two special connectors, and clamps and bands for securing each cable at the tube inlet are attached.
- * The tube section is oval and cannot be twisted between the tube and connector.
- * The flexible tube can be severed easily by using a cutter knife. When connecting the tube, allow enough radius of curvature.
- * As a yardstick, length of flexible tube which connects orthogonal two axes is three times the stroke of the axis 1.
- * Select the flexible tube which connects with the axis 2 slider (or axis end of traveling axis), according to the form of installation.

[Dimensions]



- * Two special connectors are attached.
- * The flexible tube can be severed easily by using a cutter knife. When connecting the tube, allow enough radius of curvature.
- * As a yardstick, length of flexible tube which connects orthogonal two axes is three times the stroke of the axis 1.

[Dimensions]

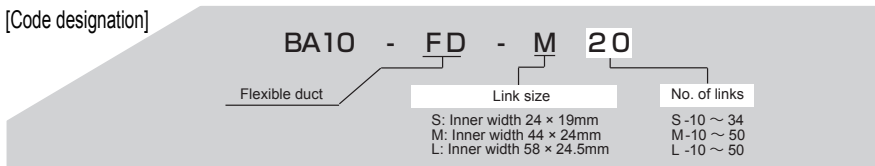


Flexible Duct

[Application]

Used to protect a controller cable which connects with the moving part. It is also possible to pass a signal cable for tooling or air tubing through this flexible duct. To use this duct, an exclusive CN box (available for an extra price) is necessary.

[Code designation]



- * Select the flexible duct which has enough clearance for cables and tubes to pass through.
- * Select the number of links with good margin, referring to the duct selection stated below.

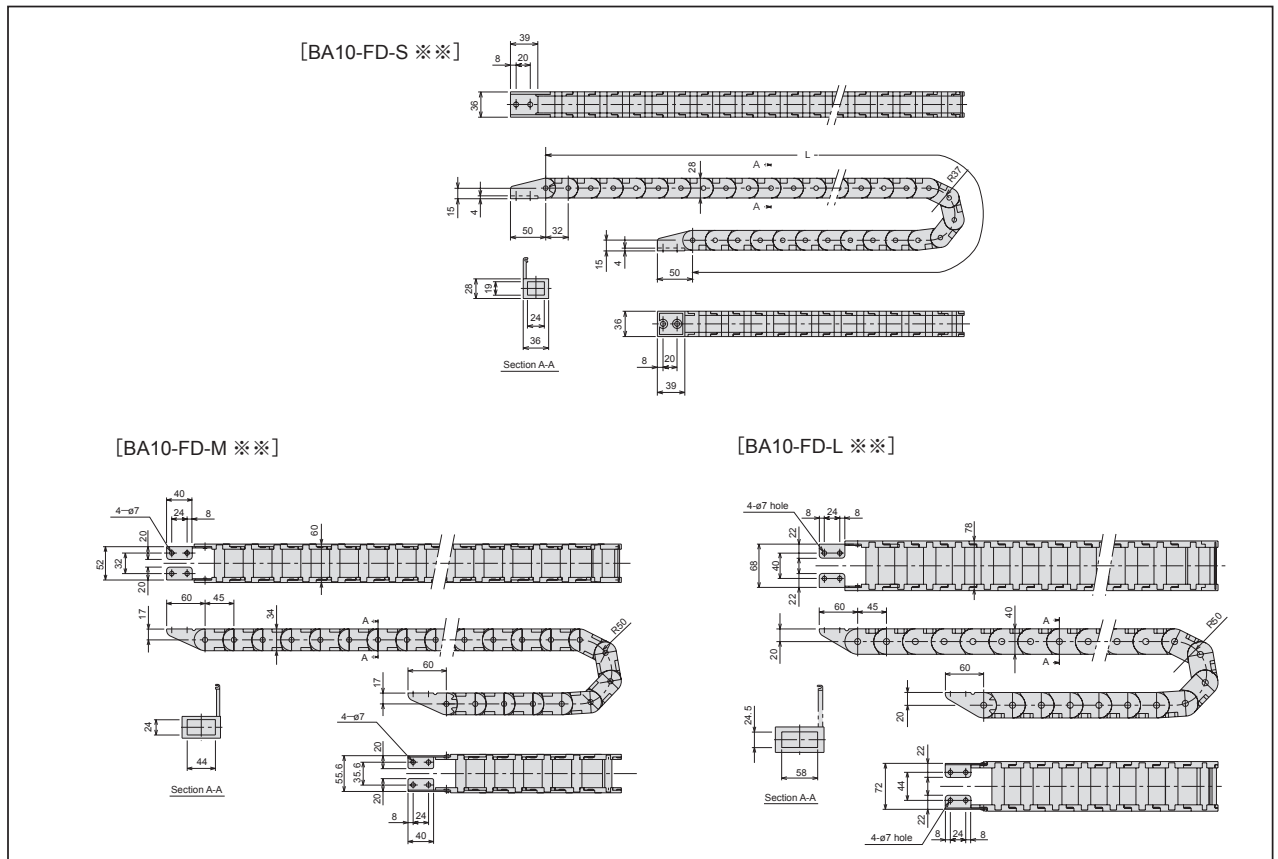
[Duct selection for connecting axis 1 and axis 2]

- Select the link size.
- Figure out the full length (L) of the duct.
Full length of duct (L) = Basic length (B) + X-axis stroke (X)
- Figure out the number of links required (A).
No. of links (A) = Full length of duct ÷ Link pitch (C)
Note: Fraction of the number of links is to be rounded up.

Combination	Axis 1	Axis 2	Link size	Basic length mm (B)	Link size	Pitch mm (C)
					S	32
X - Y	BB30-ST	BB10-ST	M (L is applicable.)	585	M	45
	BB30-UR/UL	BB10-UR/UL	M (L is applicable.)	360	M	45
	BB50-ST	BB30-ST	L (M is applicable.)	630	L	45
	BB50-UR/UL	BB30-ST	L (M is applicable.)	540	L	45
X - Z	BB30-ST	BB10-ST	M (L is applicable.)	630	M	45
	BB30-UR/UL	BB10-UR/UL	M (L is applicable.)	360	M	45
	BB50-ST	BB30-ST	L (M is applicable.)	765	L	45
	BB50-UR/UL	BB30-UR/UL	L (M is applicable.)	675	L	45

* Shown above are representative examples. For other combinations, contact us.

[Dimensions]

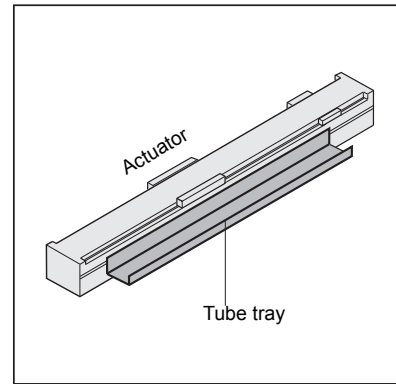
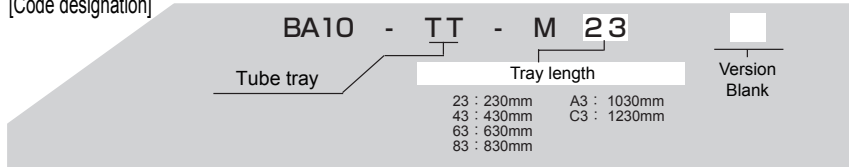


Tube Tray

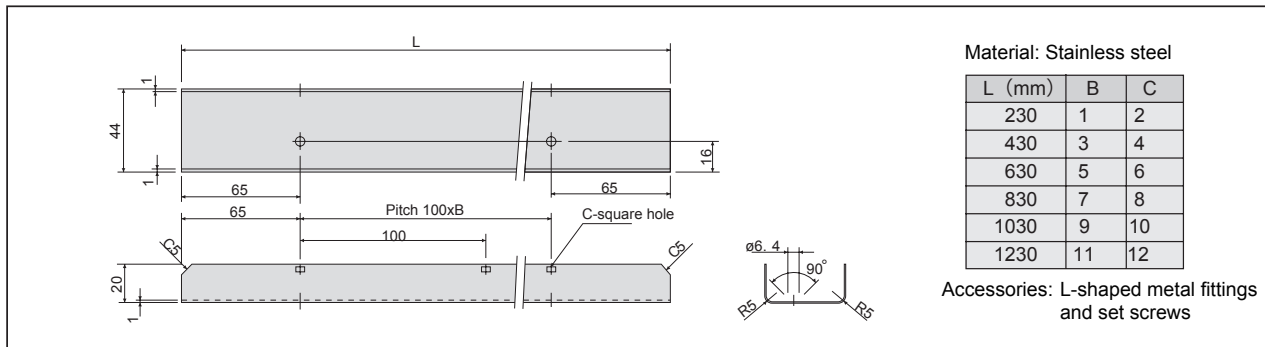
[Application]

Used to hold a flexible tube when the tube is placed horizontally.
This tray is secured to the 4 mm-wide T-slot on the side of the actuator.
It not only supports a flexible tube, but prevents lateral movement of the tube.

[Code designation]



[Dimensions]

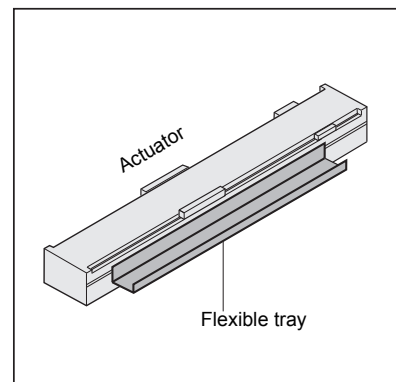
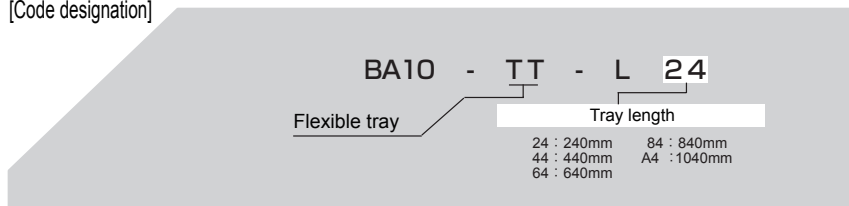


Flexible Tray

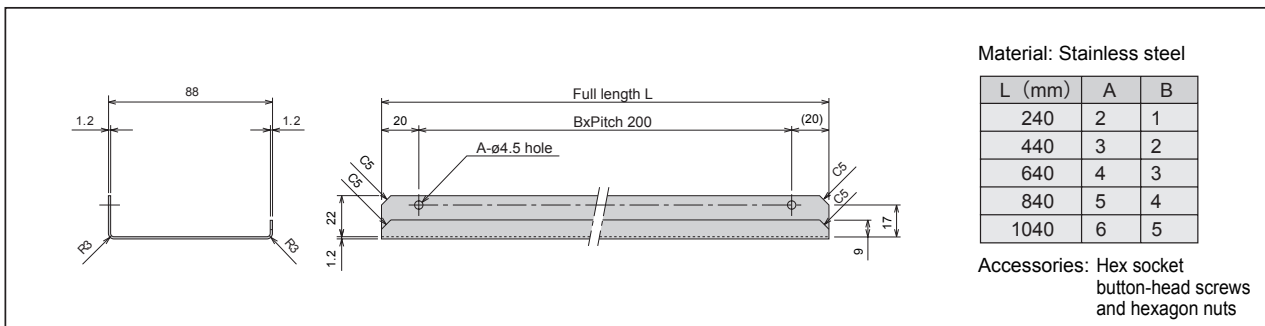
[Application]

Used to hold a flexible duct.
This tray is secured to the 4 mm-wide T-slot on the side of the actuator.
It prevents lateral movement of the duct.

[Code designation]



[Dimensions]

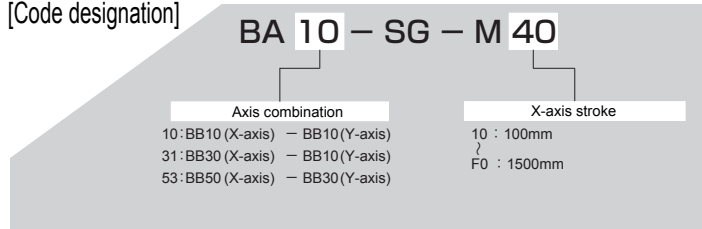


Support Guide

[Application]

This is a guide rail which is used to support the Y-axis end. When the support guide is mounted on the end of the Y-axis, moment imposed on the X-axis can be reduced with less deflection of the Y-axis. It is useful for the work requiring rigidity or long Y-axis stroke.

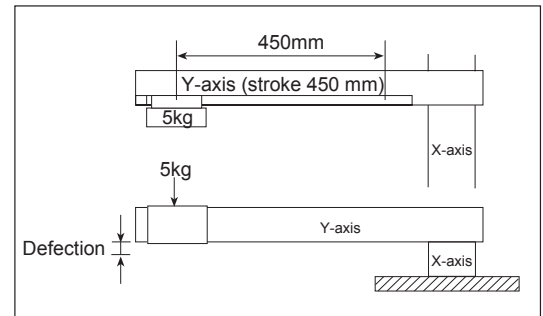
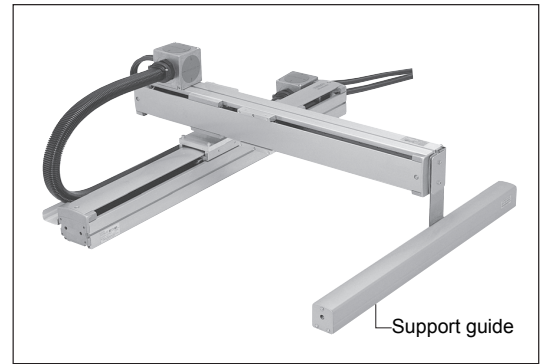
[Code designation]



■ Deflection ■

As shown in the right figure, deflection is measured by exerting 5 kg load on the slider with the Y-axis slider located on the end. (Example) X-axis : BB10E-ST-M, Y-axis : BB10E-ST-S (450mm stroke)

	Deflection
Without support guide	0.4mm
With support guide	0.07mm



[Payload]

As moment exerted on the X-axis can be reduced, payload for axis combination can be increased, which differs with the type of combination. For details, contact our sales office in your territory.

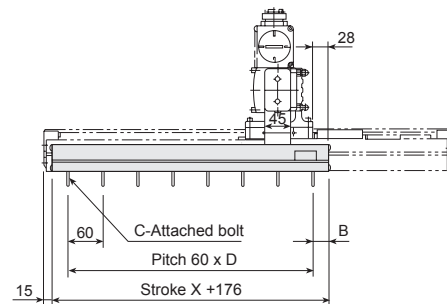
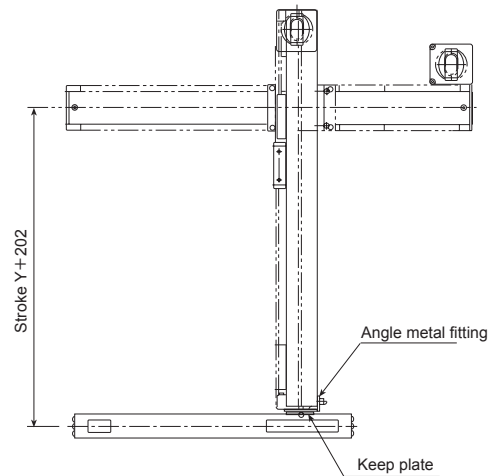
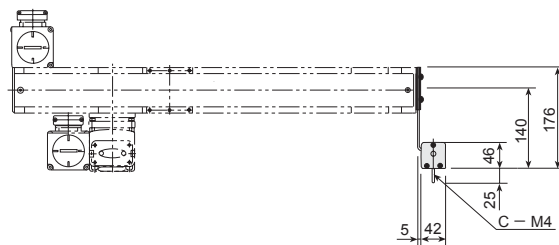
[Outer dimensions]

BA 10-SG

X-axis: BB10 □ - □□ -M □□ N- □□

Y-axis: BB10 □ - □□ -M □□ N- □□

Common to both ball screw drive type and timing belt drive type.



Stroke X (mm)	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
B (mm)	17.6	7.6	27.6	17.6	7.6	27.6	17.6	7.6	27.6	17.6	7.6	27.6	17.6	7.6	27.6
C (q'ty)	5	7	8	10	12	13	15	17	18	20	22	23	25	27	28
D	4	6	7	9	11	12	14	16	17	19	21	22	24	26	27

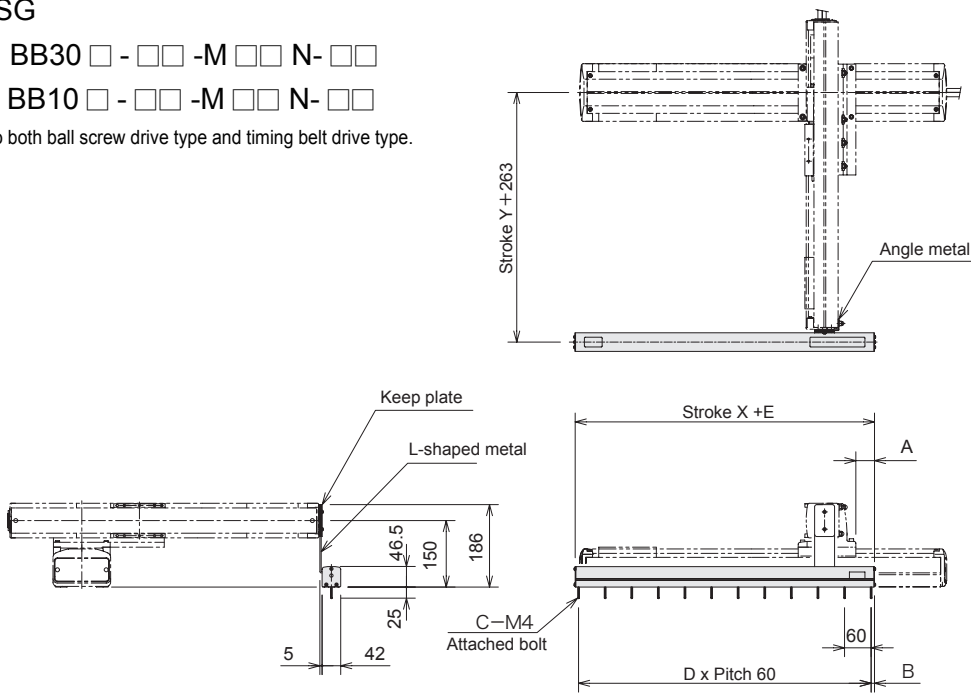
* Value "C" signifies the number of attached clamp bolts.

BA31-SG

X-axis: BB30 □ - □□ -M □□ N- □□

Y-axis: BB10 □ - □□ -M □□ N- □□

Common to both ball screw drive type and timing belt drive type.



Stroke X (mm)	100	200(150)	300(250)	400(350)	500(450)	600(550)	700(650)	800(750)	900(850)	1000(950)	1100(1050)	1200	1300	1400	1500
A (mm)	17.1 (42.1)														
B (mm)	17.6	7.6	27.6	17.6	7.6	27.6	17.6	7.6	27.6	17.6	7.6	27.6	17.6	7.6	27.6
C (q'ty)	5	7	8	10	12	13	15	17	18	20	22	23	25	27	28
D	4	6	7	9	11	12	14	16	17	19	21	22	24	26	27
E (mm)	176 (226)														

* The values in parentheses are applicable only when BB30E-ST type (ball screw drive type) is used for the X-axis.

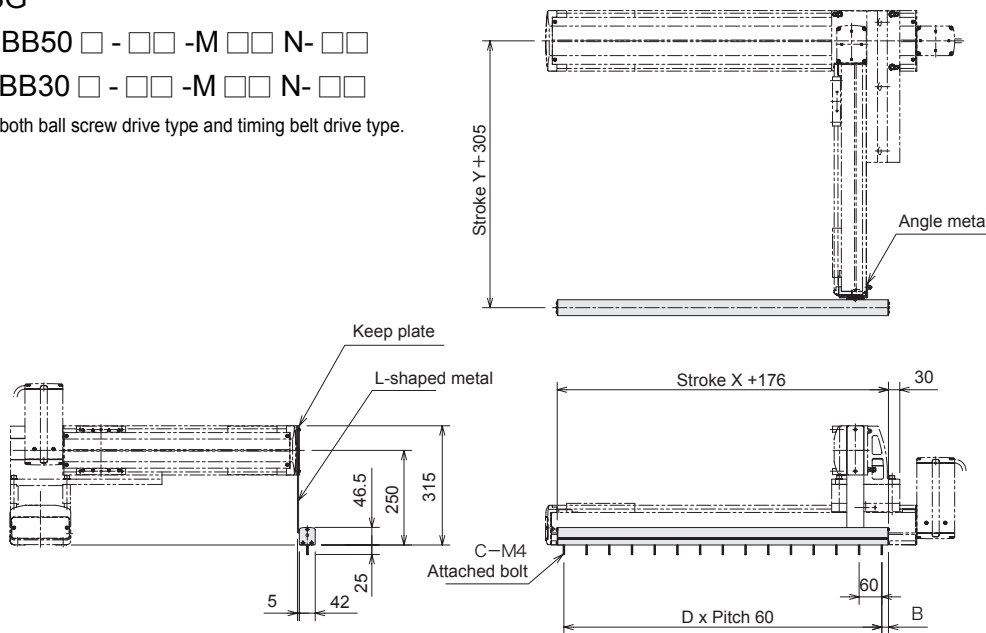
* Value "C" signifies the number of attached clamp bolts.

BA53-SG

X-axis: BB50 □ - □□ -M □□ N- □□

Y-axis: BB30 □ - □□ -M □□ N- □□

Common to both ball screw drive type and timing belt drive type.



Stroke X (mm)	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
B (mm)	17.6	7.6	27.6	17.6	7.6	27.6	17.6	7.6	27.6	17.6	7.6	27.6	17.6	7.6	27.6
C (q'ty)	5	7	8	10	12	13	15	17	18	20	22	23	25	27	28
D	4	6	7	9	11	12	14	16	17	19	21	22	24	26	27

* Value "C" signifies the number of attached clamp bolts.

Home Position Change Sensor

[Application]

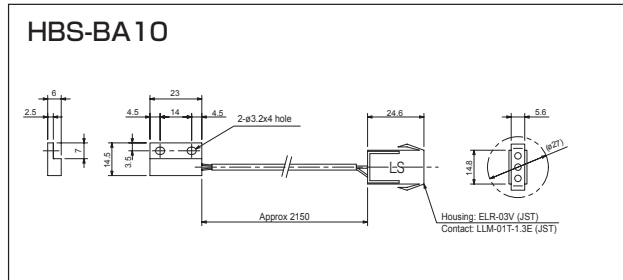
Used to change the home return position of axis slider to the opposite end to motor side or mid-point of axis stroke. This function is effective when the home position is located at opposite end to motor side. Also, when a traveling axes combination is used, this sensor is required because the home position is located opposite to the motor side.

[Code designation]

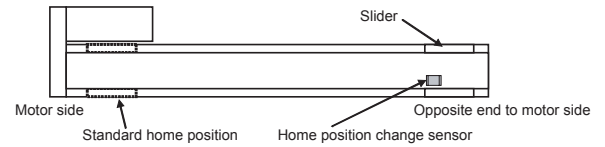
HBS-BA 10

Applied axis
 10: Ball screw driven axis
 20: Timing belt driven axis

[Dimensions]

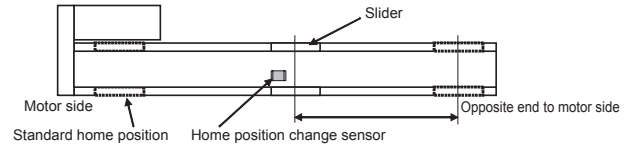


<When home position is located opposite to motor side>

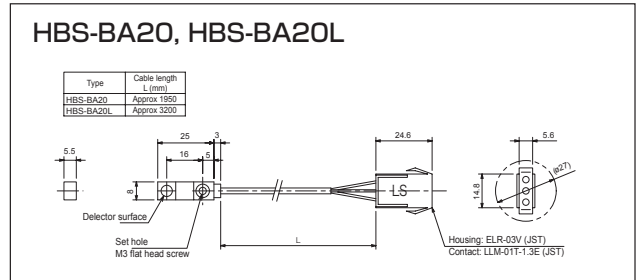


★Change of controller parameter (motor rotating direction) is required.

<When home position is located at mid-point of axis stroke>



★Be sure to mount a stopper to prevent the slider from moving by about 3 mm or over toward the motor side from the home position.



Strain Relief

[Application]

Used to set in the hole of CN box and secure the wire or tube when user's wire or tube passes through the flexible tube. To mount the strain relief on the CN box, use a hole other than the holes used for controller cable or flexible tube. User's wire and controller cable are joined or branched in the CN box.

[Code designation]

BA10 - SC - A 02

Strain relief, Version Blank

* Up to four bore sizes of the strain relief are available according to the cable size to be used.

[Dimension]

Applicable conduit size (mm)

Stage	Applicable conduit size (mm)
1st stage	ø9 ~ 11
2nd stage	ø11 ~ 14
3rd stage	ø14 ~ 17
4th stage	ø17 ~ 19

Material: Flexible PCV for body, Polycarbonate for screw, Nylon for nut

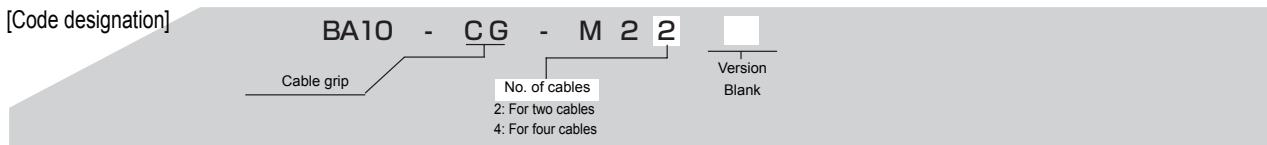
Dimensions: 36, 42, 59, 39, 15, 31, 23, 40, 7, ø4.3, CTG2B (Type for counter piping) ø37, Pan head screw (M4×30), Width across flat, 2nd stage, 1st stage, 3rd stage, 4th stage

Cable Grip

[Application]

Used to seal the entry hole of the actuator or CN box to prevent a controller cable from being disconnected or moving in the flexible tube. This grip is intended for securing the controller cable. To secure user's cable, use a strain relief. The cable grip comes in the two types; for two cables of a single axis system and for four cables of a two-axis system.

[Code designation]

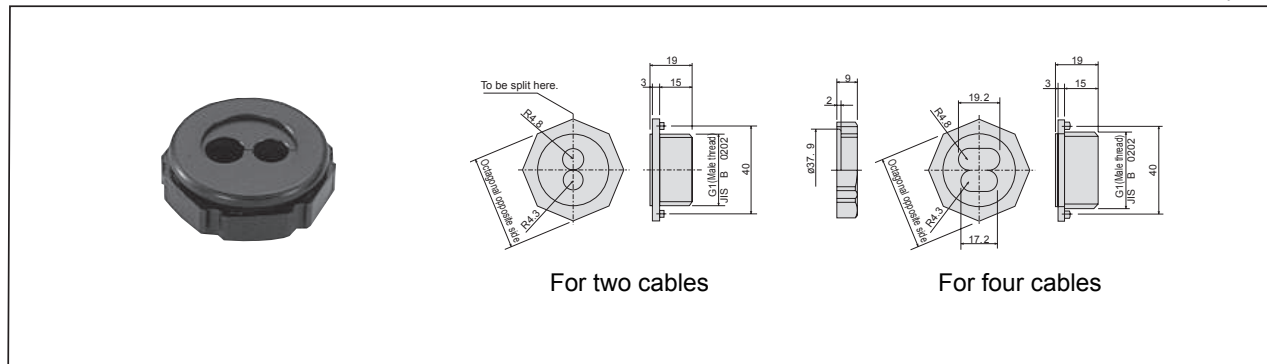


* A cable grip can be split into two to facilitate passing of a controller cable.

* The controller cable is equipped with one cable grip for two cables, and the CN box with two cable grips for two cables.

[Dimensions]

Material: Nylon



Parts for Control System

Controller

Master Unit	176
Master Unit (CC-Link, DeviceNet compatible)	179
High-Performance Master Unit (CA10-M00B)	184
High-Performance Master Unit (CA10-M01B-CC)	187
High-Performance Master Unit (CA20-M00/CA20-M01)	190
Slave Unit	197
BS Relay Module (Option)	200

Component

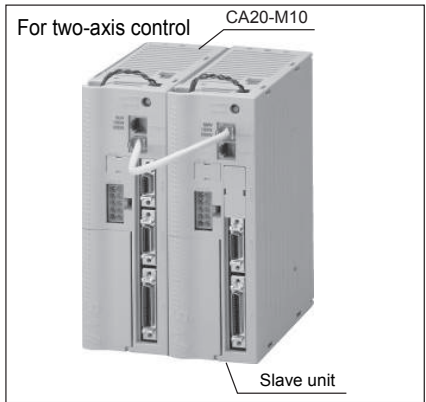
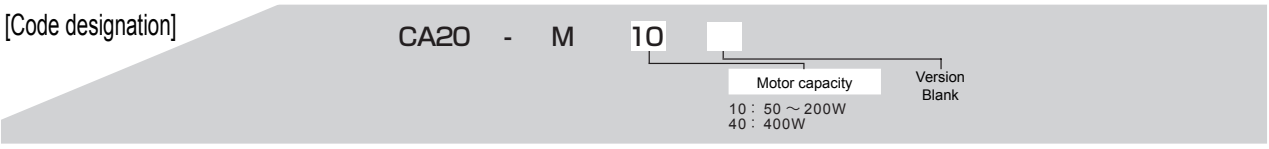
Link Cable	201
------------------	-----

Options

Regenerative Discharge Unit	201
Reverse-Current Absorption Resistor	202
Teach Pendant	203
Extension I/O Unit	204
I/O Cable	206
Software for Personal Computer	207
Communication Cable	208
Lithium Battery for Encoder Backup	209

Master Unit

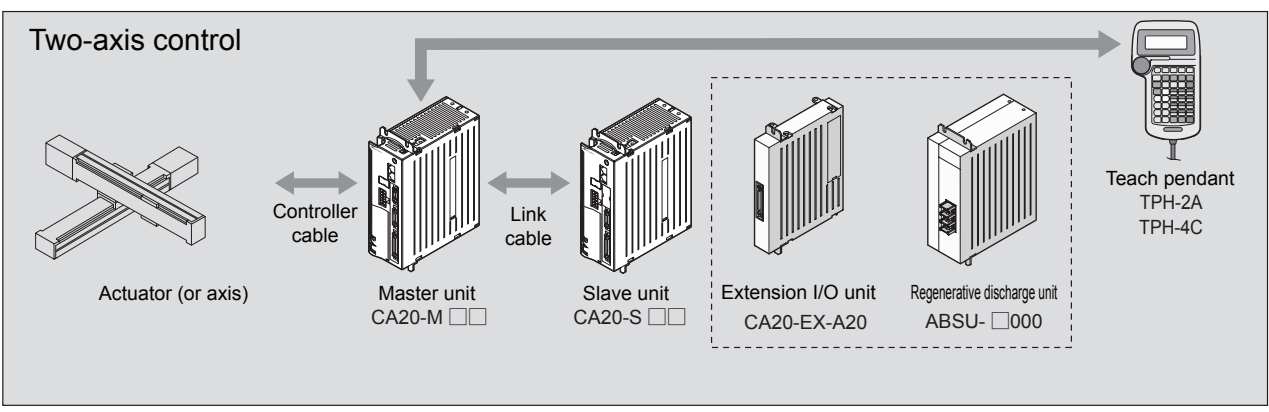
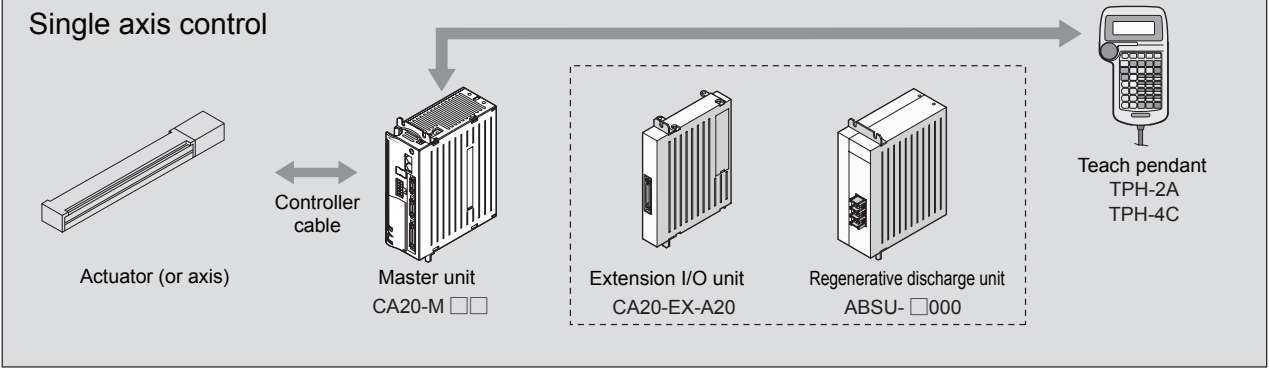
- * Used as the master unit for single-axis control and orthogonal (or cartesian) two-axis control. A driver board for a single axis control is also incorporated.
- * Easy teaching is possible by a program which is created by using the ROIbot language.
- * For the supply power, multi power (AC100 V-120 V, 200 V- 240 V) is used to cope with globalized production.
- * The pulse train input mode is provided as the special function of the master unit, which allows control of axis travel distance and speed by pulses supplied from an external pulse generator.
- * The multitask function (No. of controlled axes: 4) is also available, which allows execution of up to four tasks in the sequential mode, two or more jobs can be executed at the same time.
- * Teach pendant TPH-2A or TPH-4C is used.



Applicable type of axis
 CA20-M10 : BBT3D, BBT4D, BBT5D, BBT5E, BBT7D, BB10E, BB10F, BB30E, BB30F, BB50F
 CA20-M40 : BB50G, BB60G
 Both the ball screw driven axis and timing belt driven axis of each axis can be controlled.

[System structure]

↔ Basic unit Extended function unit



[General specifications]

Type of controller	CA20-M10			CA20-M40 ^(Note 1)
No. of controlled axes	One axis control or simultaneous two-axis control by connecting a slave unit.			
Motor capacity	50W	100W	200W	400W
Drive system	AC servo motor			
Control system	PTP, semi-closed loop control			
Teaching method	Remote teaching, direct teaching or MDI			
Speed setting	10 steps (variable)			
Acceleration setting	20 steps (variable)			
Operation mode	Sequential (multitask), palletizing, external point designation, easy			
Operation method	Step, continuous, single			
CPU	32-bit, RISC SH7145			
Self-diagnosis function	CPU down, memory error, driver error, master power voltage error, program error, etc. by watchdog timers.			
No. of programs	Sequential: 8, Palletizing: 8			
No. of program steps	Max. 2,000 steps + Coordinate table (999 per each task) × 4 (Total No. of tasks) (When slave unit is connected)			
Memory	FRAM			
No. of counters	99			
No. of timers	9			
Alarm display	Error indicator lamp ON (on front panel) and teach pendant display			
External input	4 system inputs and 4 general-purpose inputs			
External output	4 system outputs and 4 general-purpose outputs			
Communication function	For teach pendant × 1 channel (RS232C)			
Power supply	AC100V ~ 120V, AC200V ~ 240V, ± 10% 50/60Hz Changeover of 100 V or 200 V circuit by short-bar on front terminal block.			AC200V ~ 230V, ± 10% 50/60Hz
Power capacity (per 1 axis)	100VA	160VA	450VA	700VA
Noise resistance	1500 Vp-p, pulse width 1 μs (by noise simulator)			
Ambient conditions	Room temperature 0 - 40°C, humidity 30 % - 90 %RH, non-condensing and no corrosive gas present.			
Dimensions	55 (W) × 160 (H) × 134 (D) (excluding metal fixtures)			85 (W) × 160 (H) × 134 (D) (excluding metal fixtures)
Mass	0.93kg			1.36kg

Note 1:When using CA20-M40, be sure to use regenerative discharge unit ABSU-4000.

[I/O specifications]

Type of: controller: CA20-M10, CA20-M40

Input specifications	
Input rating	DC24 V, 10 mA/ point
Insulation	Bilateral photo-coupler
Power supply	Externally supplied (DC24 V).

Output specifications	
Output	Transistor output (open collector)
Output capacity (DC24 V)	System output: Max. 300 mA/ point General-purpose output: Max. 300 mA/ point

[I/O pin number and signal name]

Type of: controller: CA20-M10, CA20-M40

* See Pages 224-227 of Technical Notes for I/O connections.

Connector pin arrangement on panel side	No.	I/O	Signal name	No.	I/O	Signal name
<p>(BOTTOM VIEW)</p>	1		+ COM1	19		COM3
	2	Output	General-purpose output port 1-1	20	Input	General-purpose input port 1-1
	3	Output	General-purpose output port 1-	21	Input	General-purpose input port 1-2
	4	Output	General-purpose output port 1-	22	Input	General-purpose input port 1-3
	5	Output	General-purpose output port 1-	23	Input	General-purpose input port 1-4
	6		- COM1	24		NC
	7		Emergency stop output (N.O)	25		Emergency stop input
	8		Emergency stop output (COM)	26		Emergency stop input
	9		Emergency stop output (N.C)	27		COM4
	10		NC	28	Input	Home return
	11	Output	Running	29	Input	Start
	12	Output	Error	30	Input	Stop
	13	Output	Positioning finish	31	Input	Reset
	14	Output	Home return finish	32		NC
	15	Output	Home position LS	33	Input	+ CLK / ± CLK (+)
	16	Output	Z-phase signal	34	Input	↑ (-)
	17		- COM2	35	Input	- CLK / SIGN (+)
	18		NC	36	Input	↑ (-)

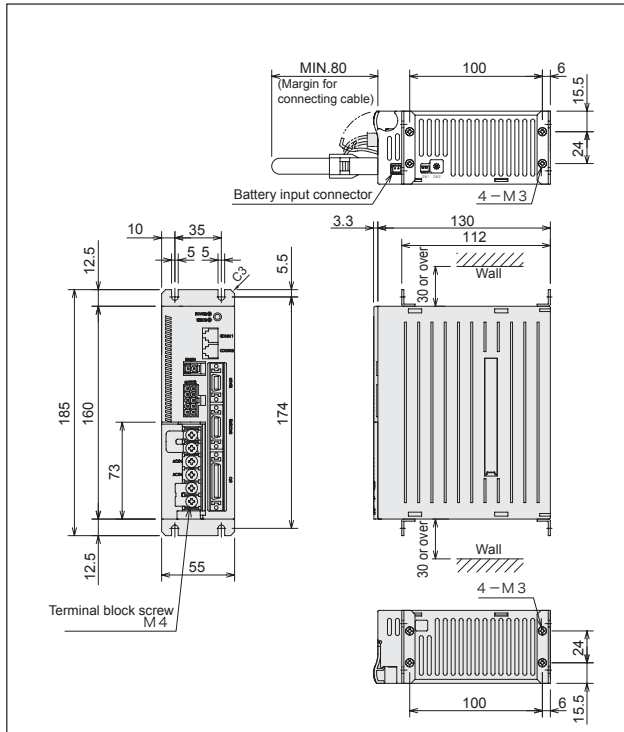
Signals when the pulse train input mode is selected.

NC: No Connection

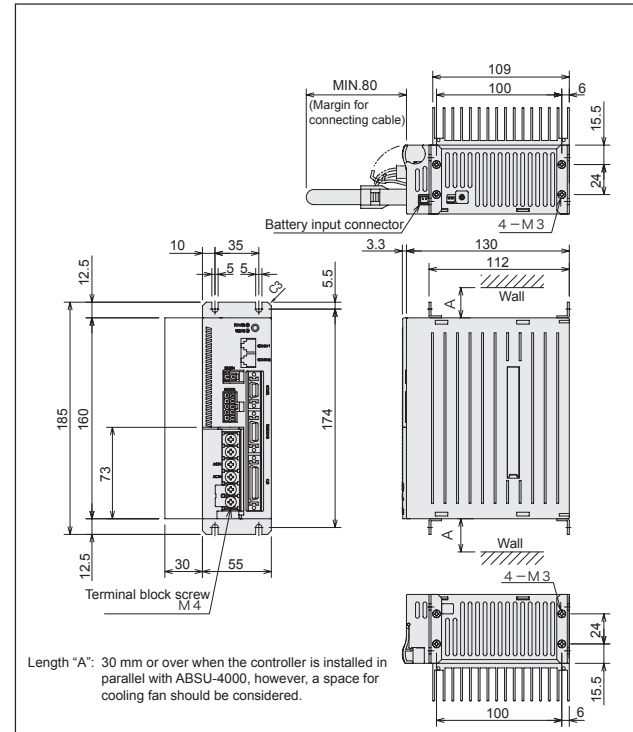
* One (1) plug is attached for I/O connector connection. An I/O cable with plug is also available optionally.

[Dimensions]

Type of controller: CA20-M10

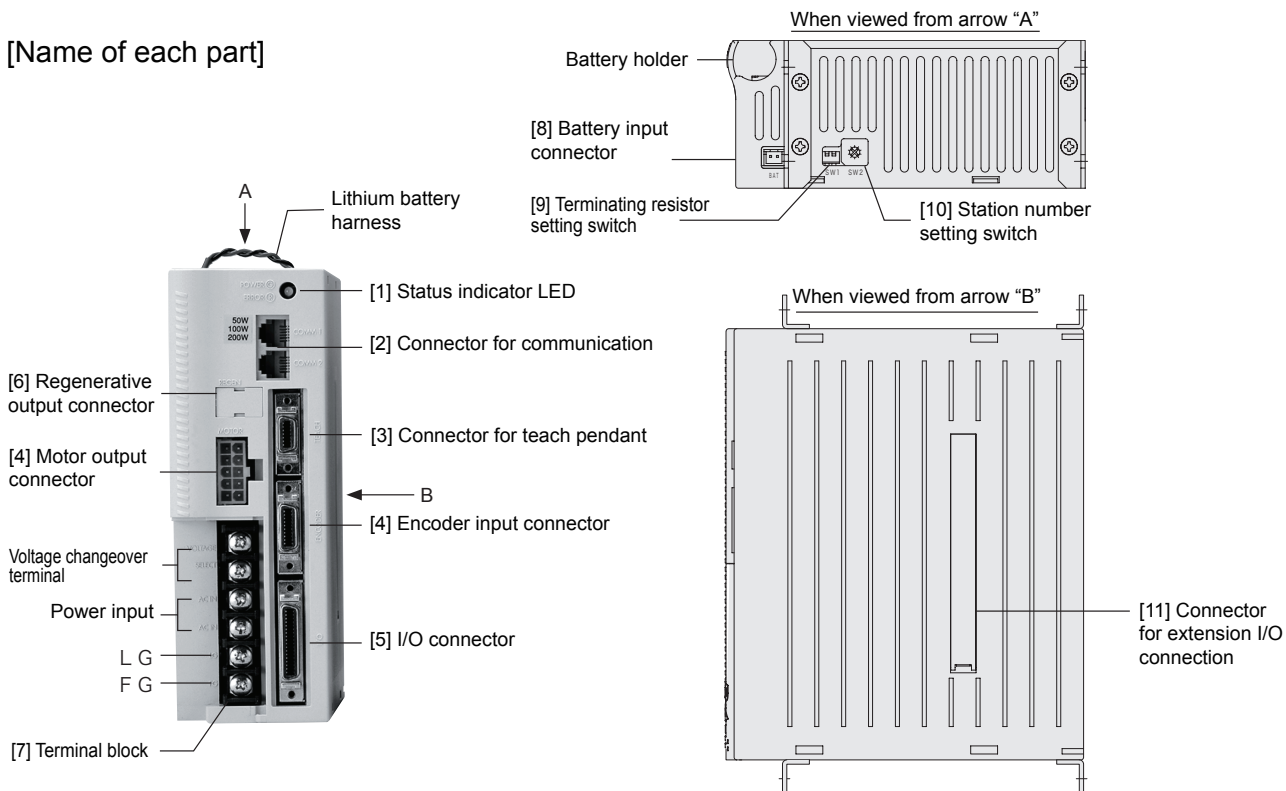


Type of controller: CA20-M40



Length "A": 30 mm or over when the controller is installed in parallel with ABSU-4000, however, a space for cooling fan should be considered.

[Name of each part]



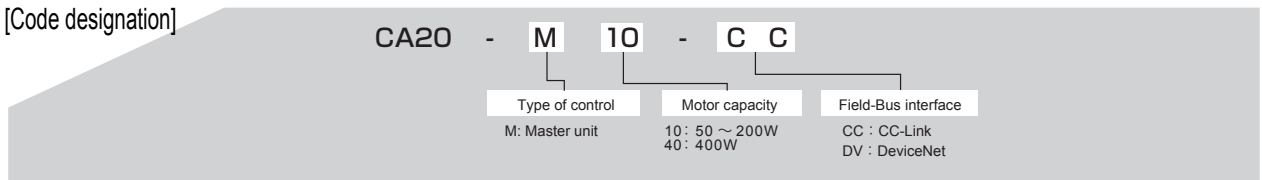
- [1] Status indicator LED
Indicates the controller status. When the power is turned on, it is illuminated in green. In case of an error, it is illuminated in red.
- [2] Connector for communication
Used to connect a link cable for connecting a slave unit.
- [3] Connector for teach pendant
Used to connect a communication cable (option) for connecting the teach pendant or personal computer.
- [4] Motor output connector and encoder input connector
Used to connect a controller cable.
- [5] I/O connector
Used to connect an external control device such as sequencer (PLC).
- [6] Regenerative output connector
Used to connect a regenerative discharge unit (option). To connect, remove the cover.

- [7] Terminal block
A power input terminal, master power voltage changeover terminal, FG (frame ground) and LG (line ground) terminals are equipped.
- [8] Battery input connector
Used to connect a lithium battery for encoder backup. This connector is used when an absolute encoder is used.
- [9] Terminating resistor setting switch
Used to set the terminating resistor for communication when a slave unit is connected.
- [10] Station number setting switch
Used to specify the station number of each slave unit when slave units are connected to control multiple axes. Specify zero (0) for the master unit.
- [11] Connector for extension I/O connection
Used to connect an extension I/O unit (option). To connect, remove the cover.

Master Unit (CC-Link and DeviceNet compatible)

- This unit is a controller that adds network functions to the master units CA20-M10 and CA20-M40.
- CC-Link and DeviceNet can be used as an interface with external devices.
- The CC-Link interface can be used to perform data communication for various input/output, coordinate tables, status, and jog operations.
- The DeviceNet interface can be used to perform data communication for various input/output and jog operations.
- The operating procedures besides the network function are identical to the CA20-M10.
- Teach pendant TPH-4C is used.

[Code designation]



CA20-M10-CC

[General specifications]

Type of controller	CA20-M10-□□			CA20-M40-□□
No. of controlled axes	One axis control or simultaneous two-axis control by connecting a slave unit.			
Motor capacity	50W	100W	200W	400W
Drive system	AC servo motor			
Control system	PTP, semi-closed loop control			
Teaching method	Remote teaching, direct teaching or MDI			
Speed setting	10 steps (variable)			
Acceleration setting	20 steps (variable)			
Operation mode	Sequential (multitask), palletizing, external point designation, easy			
Operation method	Step, continuous, single			
	32-bit, RISC SH7145			
Self-diagnosis function	CPU down, memory error, driver error, master power voltage error, program error, etc. by watchdog timers.			
No. of programs	Sequential: 8, Palletizing: 8			
No. of program steps	Max. 2,000 steps + Coordinate table (999 per each task) × 4 (Total No. of tasks) (When slave unit is connected)			
Memory	FRAM			
No. of counters	99			
No. of timers	9			
Alarm display	Error indicator lamp ON (on front panel) and teach pendant display			
External input	4 system inputs and 4 general-purpose inputs			
External output	4 system outputs and 4 general-purpose outputs			
Communication function	For teach pendant × 1 channel (RS232C)			
Power supply	AC100V~120V, AC200V~240V, ±10% 50/60Hz Changeover of 100 V or 200 V circuit by short-bar on front terminal block.			AC200V~230V ±10% 50/60Hz
Power capacity (per 1 axis)	100VA	160VA	450VA	700VA
Noise resistance	1500 Vp-p, pulse width 1 μs (by noise simulator)			
Ambient conditions	Room temperature 0 - 40°C, humidity 30 % - 90 %RH, non-condensing and no corrosive gas present.			
Dimensions	90 (W) × 160 (H) × 138 (D) (excluding metal fixtures)			120(W)×160(H)138(D) (excluding metal fixtures)
Mass	1.43 kg			1.86 kg

[I/O specifications]

Input specifications	
Input rating	DC24 V, 10 mA/ point
Insulation	Bilateral photo-coupler
Power supply	Externally supplied (DC24 V).

Output specifications	
Output	Transistor output (open collector)
Output capacity (DC24 V)	System output: Max. 300 mA/ point General-purpose output: Max. 300 mA/ point

[I/O pin number and signal name]

* See Pages 228-230 of Technical Notes for I/O connections.

Connector pin arrangement on panel side	No.	I/O	Signal name	No.	I/O	Signal name	
	1		+ COM1	19		COM3	
	2	Output	General-purpose output port 1-1	20	Input	General-purpose input port 1-1	
	3	Output	General-purpose output port 1-2	21	Input	General-purpose input port 1-2	
	4	Output	General-purpose output port 1-3	22	Input	General-purpose input port 1-3	
	5	Output	General-purpose output port 1-4	23	Input	General-purpose input port 1-4	
	6		- COM1	24		NC	
	7		Emergency stop output (N.O)	25		Emergency stop input	
	8		Emergency stop output (COM)	26		Emergency stop input	
	9		Emergency stop output (N.C)	27		COM4	
	10		NC	28	Input	Home return	COM4
	11	Output	Running	29	Input	Start	Servo ON
	12	Output	Error	30	Input	Stop	Counter clear
	13	Output	Positioning finish	31	Input	Reset	Reset
	14	Output	Home return finish	32		NC	
	15	Output	Home position LS	33	Input	+ CLK / ± CLK (+)	
	16	Output	Z-phase signal	34	Input	↑ (-)	
	17		- COM2	35	Input	- CLK / SIGN (+)	
	18		NC	36	Input	↑ (-)	

■ Signals when the pulse train input mode is selected.

NC: No Connection

* One (1) plug is attached for I/O connector connection. An I/O cable with plug is also available optionally.

* Outputs No.2 ~ 5, 11 ~ 16 and inputs No.33 ~ 36 are disabled.

* Inputs No.20 ~ 23, 28 ~ 31 are selected by parameters.

[CC-Link interface specifications]

Item	Specifications
Communication specifications	CC-Link Ver. 1.10
Baud rate	10M, 5M, 2.5M, 625k, 156kbps (set by parameters)
Station type	Remote device station
Number of occupied stations	Fixed at 4 stations (RX/RX: 128 points each, RWw/RW: 16 points each)
Station number setting	1 to 64 (set by parameters)
Number of inputs/outputs	4 system inputs, 4 system outputs
	64 general-purpose inputs, 64 general-purpose outputs
	8 jog inputs, 8 jog outputs
	1 handshake input, 2 handshake outputs
	4 data selection inputs, 4 data selection confirmation outputs
Data communication function	Coordinate table transmission, current position monitor, error code request, status request, and more

* These are the inputs and outputs as seen from the robot controller.

[I/O Signal List]

* For details on the I/O connection method, see page 228 of the Technical Notes.

Signal direction CC-Link master station ← CA20-M10 · M40-CC		Signal direction CC-Link master station ← CA20-M10 · M40-CC	
Device no. (input)	Signal name	Device no. (output)	Signal name
RXn0	Output during operation	RYn0	Home return input (*2)
RXn1	Error output	RYn1	Start input (*2)
RXn2	Positioning complete output	RYn2	Stop input (*2)
RXn3	Home return complete output	RYn3	Reset input (*2)
RXn4 ~ RXn7	Usage prohibited	RYn4~RYn7	Usage prohibited
RXn8~RXnF	General-purpose output port 1-1 to 1-8	RYn8~RYn F	General-purpose input port 1-1 to 1-8 (*2)
RX(n+1)0~RX(n+1)7	General-purpose output port 2-1 to 2-8	RY(n+1)0~RY(n+1)7	General-purpose input port 2-1 to 2-8
RX(n+1)8~RX(n+1)F	General-purpose output port 3-1 to 3-8	RY(n+1)8~RY(n+1)F	General-purpose input port 3-1 to 3-8
RX(n+2)0~RX(n+2)7	General-purpose output port 4-1 to 4-8	RY(n+2)0~RY(n+2)7	General-purpose input port 4-1 to 4-8
RX(n+2)8~RX(n+2)F	General-purpose output port 5-1 to 5-8	RY(n+2)8~RY(n+2)F	General-purpose input port 5-1 to 5-8
RX(n+3)0~RX(n+3)7	General-purpose output port 6-1 to 6-8	RY(n+3)0~RY(n+3)7	General-purpose input port 6-1 to 6-8
RX(n+3)8~RX(n+3)F	General-purpose output port 7-1 to 7-8	RY(n+3)8~RY(n+3)F	General-purpose input port 7-1 to 7-8
RX(n+4)0~RX(n+4)7	General-purpose output port 8-1 to 8-8	RY(n+4)0~RY(n+4)7	General-purpose input port 8-1 to 8-8
RX(n+4)8 ~ RX(n+4)F	Jog output	RY(n+4)8 ~ RY(n+4)F	Jog input
RX(n+5)0 ~ RX(n+5)7	Reserved	RY(n+5)0 ~ RY(n+5)7	Reserved
RX(n+5)8 ~ RX(n+5)F		RY(n+5)8 ~ RY(n+5)F	
RX(n+6)0 ~ RX(n+6)7		RY(n+6)0 ~ RY(n+6)7	
RX(n+6)8	Command processing completed (*1)	RY(n+6)8	Command processing request (*1)
RX(n+6)9	Command error (*1)	RY(n+6)9	Usage prohibited
RX(n+6)A ~ RX(n+6)B	Usage prohibited	RY(n+6)A ~ RY(n+6)B	Usage prohibited
RX(n+6)C ~ RX(n+6)F	Data selection confirmation output	RY(n+6)C ~ RY(n+6)F	Data selection input
RX(n+7)0 ~ RX(n+7)7	Usage prohibited	RY(n+7)0 ~ RY(n+7)7	Usage prohibited
RX(n+7)8 ~ RX(n+7)F	Usage prohibited	RY(n+7)8 ~ RY(n+7)F	Usage prohibited

n: Address assigned to the master unit by the station number setting

*1: Handshake signals for data communication

*2: Usage of system input and general-purpose input port 1 is selected based on the parameters.

[CC-Link Status Indicator LEDs]

LED name	Color	On/Off	Description
RD	Green	On	During data reception
		Off	When not receiving data
SD	Green	On	During data sending
		Off	When not sending data
ERR	Red	On	CRC error, abnormal speed, invalid station number setting
		Off	During normal operation
RUN	Green	On	During normal operation
		Off	During timeout or network stoppage

[DeviceNet Specifications]

Item	Specifications		
Communication protocol	Compliant with DeviceNet		
Supported connection	I/O connection (polling)		
Baud rate	125k, 250k, 500kbps (set by parameters)		
Station number setting	0 to 63 (set by parameters)		
Cable length	Baud rate	Thick cable	Thin cable
	125k	500m	100m
	250k	250m	
	500k	100m	
Number of occupied stations	Sending: 128 points Receiving: 128 points		
Number of inputs/outputs (*1)	4 system inputs, 4 system outputs		
	64 general-purpose inputs, 64 general-purpose outputs		
	8 jog inputs, 8 jog outputs		
Vendor ID	733 (TOSHIBA-MACHINE CO.,LTD.)		
Device type	0 (Generic Device)		
Product code	4 (CA20-M10-DN)		

* These are the inputs and outputs as seen from the robot controller.

[I/O Signal List]

* For details on the I/O connection method, see pages 229 to 230 of the Technical Notes.

Signal direction	DeviceNet master station ← CA20-M10•M40-DN	Signal direction	DeviceNet master station ← CA20-M10•M40-DN (*1)
Input device no. (offset *2)	Signal name	Output device no. (offset *2)	Signal name
+0	Output during operation	+0	Home return input (*3)
+1	Error output	+1	Start input (*3)
+2	Positioning complete output	+2	Stop input (*3)
+3	Home return complete output	+3	Reset input (*3)
+4 ~ +7	Usage prohibited	+4 ~ +7	Usage prohibited
+8 ~ +15	General-purpose output port 1-1 to 1-8	+8 ~ +15	General-purpose input port 1-1 to 1-8 (*3)
+16 ~ +23	General-purpose output port 2-1 to 2-8	+16 ~ +23	General-purpose input port 2-1 to 2-8
+24 ~ +31	General-purpose output port 3-1 to 3-8	+24 ~ +31	General-purpose input port 3-1 to 3-8
+32 ~ +39	General-purpose output port 4-1 to 4-8	+32 ~ +39	General-purpose input port 4-1 to 4-8
+40 ~ +47	General-purpose output port 5-1 to 5-8	+40 ~ +47	General-purpose input port 5-1 to 5-8
+48 ~ +55	General-purpose output port 6-1 to 6-8	+48 ~ +55	General-purpose input port 6-1 to 6-8
+56 ~ +63	General-purpose output port 7-1 to 7-8	+56 ~ +63	General-purpose input port 7-1 to 7-8
+64 ~ +71	General-purpose output port 8-1 to 8-8	+64 ~ +71	General-purpose input port 8-1 to 8-8
+72 ~ +79	Jog output	+72 ~ +79	Jog input
+80 ~ +127	Reserved	+80 ~ +127	Reserved

*1: If DeviceNet communication is cut off, stop input is set to 1, and all others are cleared to 0. During teach pendant operation, however, the stop input is also cleared to 0.

*2: Offset amount from the starting device (unit: bits)

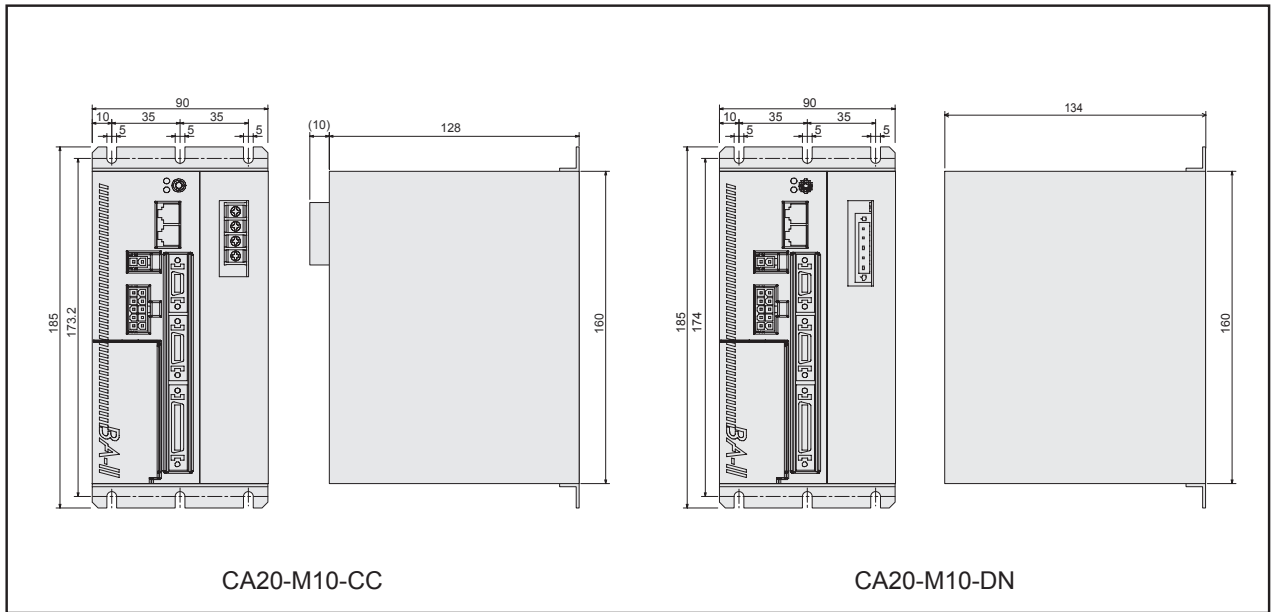
*3: Usage of system input and general-purpose input port 1 is selected based on the parameters.

[DeviceNet Status Indicator LEDs]

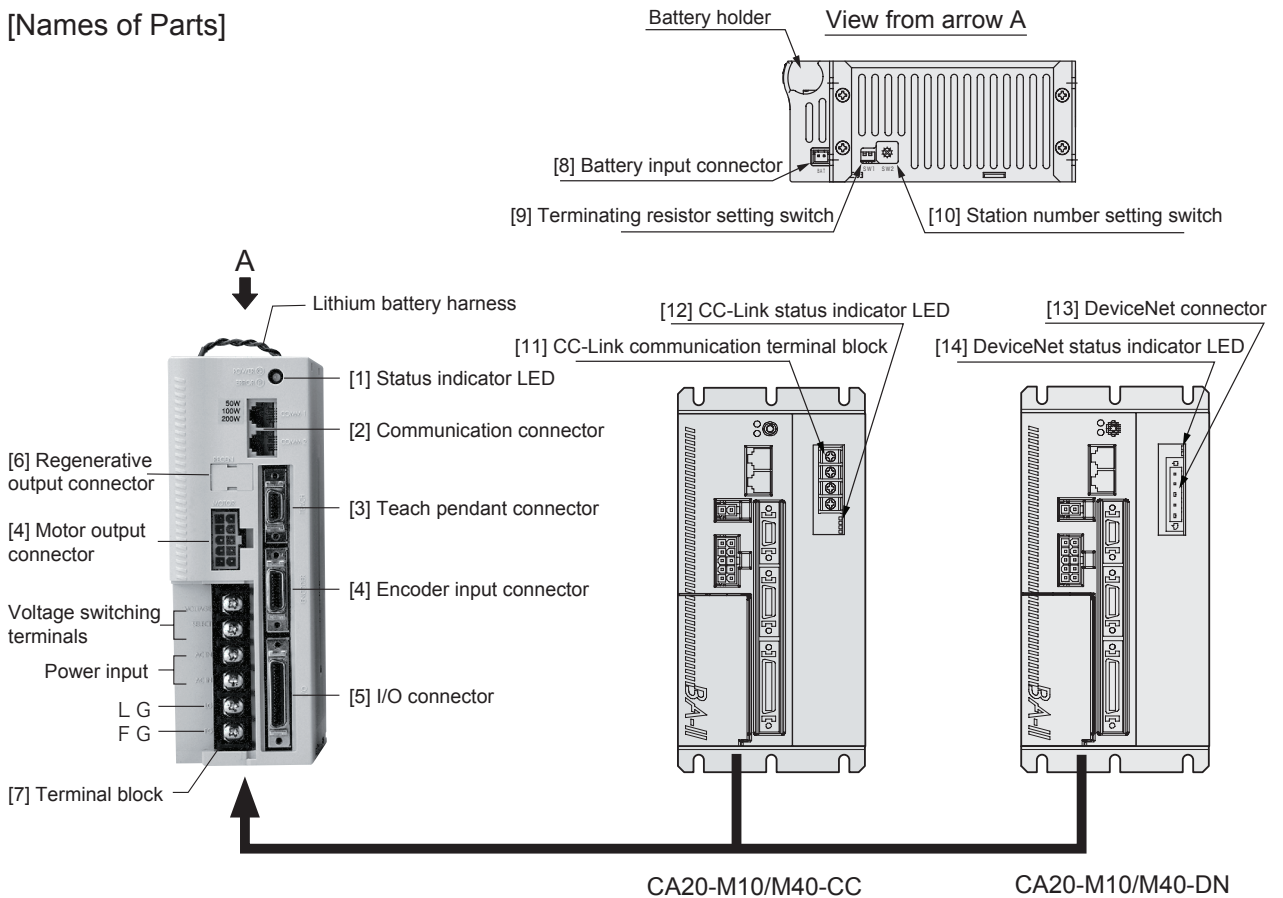
LED name	Color	On/Off	Description
MS	Green	● On	Normal Normal status
		★Flashing	Unset status This indicates an error in the master unit setting values. Check the settings and restart. This can also indicate standby mode. Check if the master unit has started normally.
	Red	● On	Critical error A hardware error has occurred (DPRAM, internal ROM, internal RAM, EEPROM, CAN error, WDT error, etc.). Restart. If the error occurs again, replace the unit.
		★Flashing	Minor error The user settings are invalid, and a user-side interrupt timeout has occurred. Check and correct the settings, and then restart.
	Green /Red	○ Off	No power supply No power is being supplied, or initialization or other process is in progress. Check the power supply.
	NS	Green	● On
★Flashing			Standing by for connection The master unit did not start normally. (This also includes a master unit I/O area configuration error.) Check whether the master unit has started normally.
Red		● On	Critical communication error A communication error has occurred (duplication of node address, busoff detection, baud rate mismatch, etc). Check the connection status, noise, node address settings, baud rate settings, and other parameters, and then restart.
		★Flashing	Minor communication error Communication with the master unit has timed out. Check the status of the master unit and the connection status, noise, node address settings, baud rate settings, and other parameters, and then restart.
Green /Red		○ Off	No power supply Either no power is being supplied, or a WDT error occurred, a baud rate check is being performed, or a node address duplication check is being performed. Check the power supply.

* The LED lighting interval is 0.5 seconds on and 0.5 seconds off.

[Dimensions]



[Names of Parts]



* Components [1] to [10] are described on page 178.

- [11] CC-Link communication terminal block
This is a terminal block for connecting a dedicated CC-Link cable for establishing a data link.
- [12] CC-Link status indicator LED
This indicates the CC-Link status.
- [13] DeviceNet connector
This is a connector for connecting a dedicated DeviceNet cable for establishing a data link.
- [14] DeviceNet status indicator LED
This indicates the DeviceNet status.

High-Performance Master Unit

- * Up to four axes can be controlled simultaneously. It is used as the master unit in a single-axis to four-axis system.
- * As driver unit for axis drive is not incorporated in this master unit, driver units (slave units) for the number of controlled axes are necessary.
- * Two-dimensional and three-dimensional linear interpolation, circular interpolation and pass functions are available. Useful for work, attaching importance to axis loci.
- * While the robot is moving, general-purpose control can be turned on and off at specified coordinates. (Instruction word: OUTS)
- * A specified coordinate can be changed to a coordinate received via RS232C communication while the axis is moving toward the former coordinate. (Instruction word: RSMV)
- * The multitask function is also available, which allows execution of up to four tasks for input/output control in the sequential mode. (For axis motion, only one task can be used.)
- * Teach pendant TPH-4C is used.

[Code designation]

CA 10 - M 00 B

Type of control Version

M: Master unit



CA10 — M00B

For four-axis control CA10-M00B



Slave units

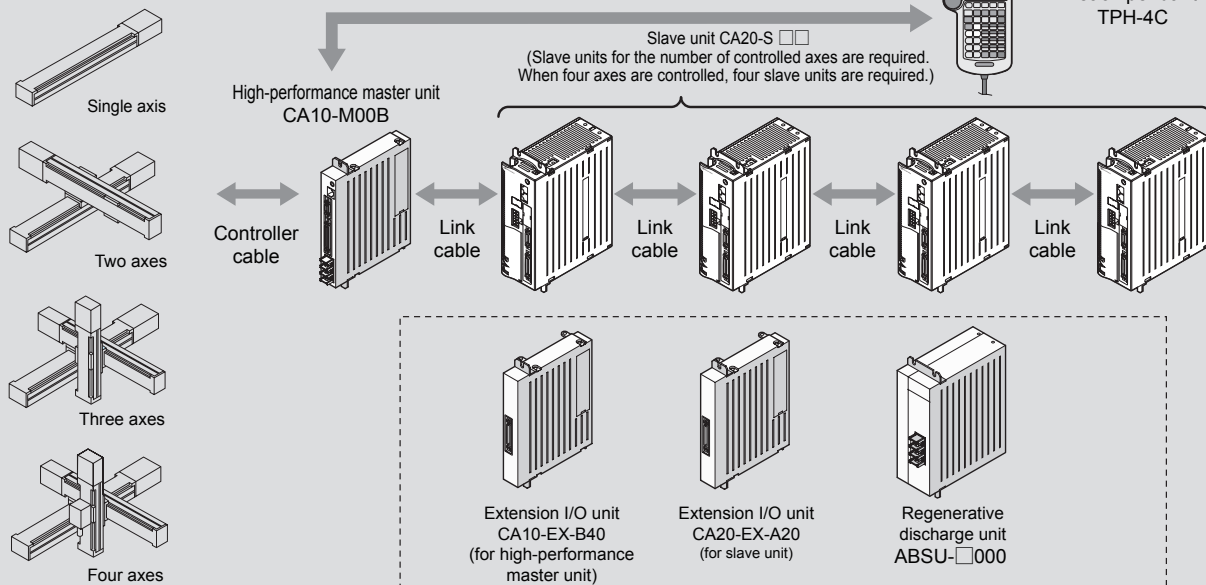
Applicable type of axis

BBT3D, BBT4D, BBT5D, BBT5E, BBT7D, BB10E, BB10F, BB30E, BB30F, BB50F, BB50G, BB60G
Both the ball screw driven axis and timing belt driven axis of each axis can be controlled.

[System structure]

↔ Basic unit [] Extended function unit

Single axis to four axes control



Controller

[General specifications]

Type of controller		CA10-M00B	
No. of controlled axes	One axis control or simultaneous control of up to four axes by connecting slave units.	Self-diagnosis function	CPU down, memory error, driver error, master power voltage error, program error, etc.
Control system	CP control, PTP control, semi-closed loop control	Alarm display	Error indicator LED and teach pendant display
Interpolation	Three-dimensional linear interpolation and circular interpolation	External input	4 system inputs and 20 general-purpose inputs
Encoder signal	Line driver communication	External output	4 system outputs and 12 general-purpose outputs
Teaching method	Remote teaching, direct teaching or MDI	Communication function	1 CH (RS232C), shared with a teach pendant
Speed and acceleration	Speed: 10 steps (variable) Acceleration: 20 steps (variable)	Extension I/O	Extension unit: 24 inputs and 16 outputs One unit can be connected with a master unit.
Operation method	Step, continuous, single	Power supply for driving external device	Output power supply is not available. (Power is supplied externally.)
Operation mode	Sequential (multitask) (Note 1) Palletizing Easy External point designation	Emergency stop I/O	No-voltage input (contact input) and relay C contact output
No. of programs	Sequential: 16, Palletizing: 16, Easy: 8	Master power voltage	DC24V±10%, 0.5 A (externally supplied)
No. of steps	Max. 2,500 steps (Note 2)	Noise resistance	1500 Vp-p, pulse width 1 μs (by noise simulator)
Coordinate table	Each task: 999	Ambient conditions	Room temperature 0 – 40°C, humidity 30% – 90%RH, non-condensing and no corrosive gas present.
No. of counters	99	Dimensions	25 (W) × 160 (H) × 134 (D) (excluding metal fixtures)
No. of timers	9	Mass	0.4 kg
Memory	EEPROM (without battery)		
CPU	32-bit (RISC CPU, SH7051)		

Note 1: Multitask: Up to four tasks (one task only for axis control) are available. Note 2: Varies with a mode to be used

[I/O specifications]

Type of: controller: CA10-M00B

Input specifications	
Input rating	DC24 V, 10 mA/1 point
Insulation	Photo-coupler
Power supply	Externally supplied (DC24 V).

Output specifications	
Output	Transistor output (open collector)
Output capacity (DC24 V)	System output: Max. 20 mA/ point General-purpose output: Max. 300 mA/ point

[I/O pin number and signal name]

Type of: controller: CA10-M00B

* See Pages 231-236 of Technical Notes for I/O connections.

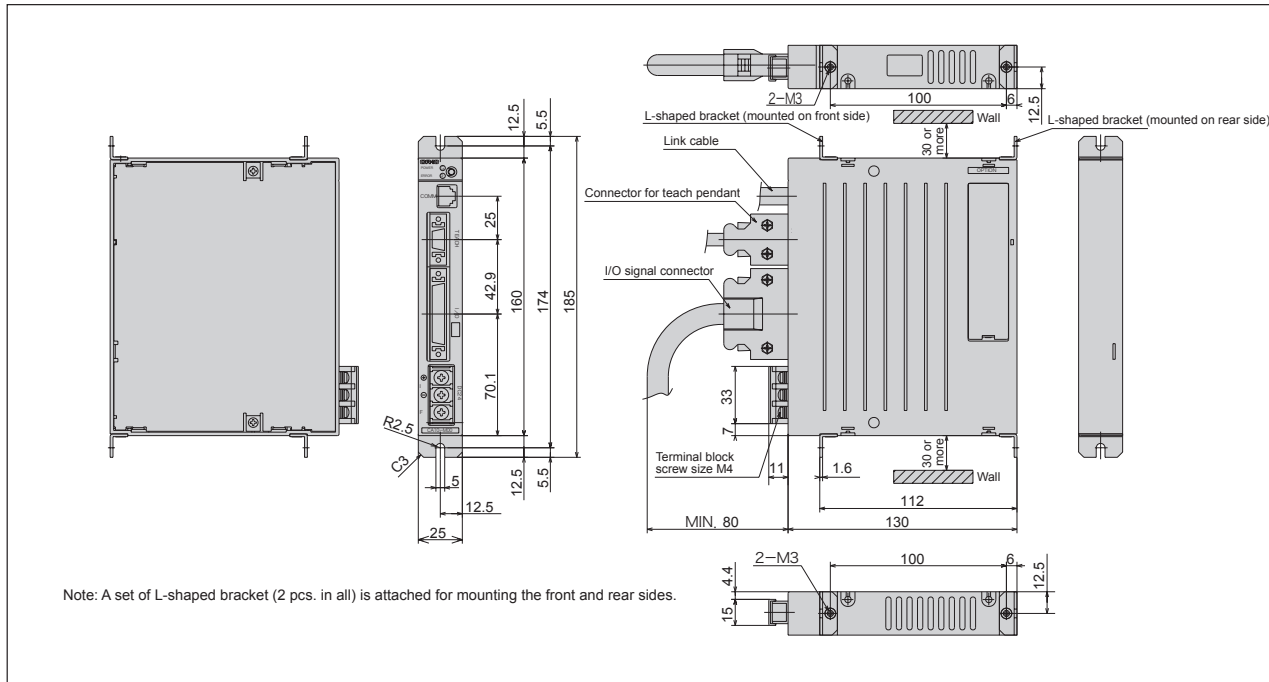
Connector pin arrangement on panel side	No.	I/O	Signal name	No.	I/O	Signal name
<p>(BOTTOM VIEW)</p>	1		+COM1	26	Input	General-purpose input port 1-1
	2	Output	General-purpose output port 1-1	27	Input	General-purpose input port 1-2
	3	Output	General-purpose output port 1-2	28	Input	General-purpose input port 1-3
	4	Output	General-purpose output port 1-3	29	Input	General-purpose input port 1-4
	5	Output	General-purpose output port 1-4	30	Input	General-purpose input port 1-5
	6	Output	General-purpose output port 1-5	31	Input	General-purpose input port 1-6
	7	Output	General-purpose output port 1-6	32	Input	General-purpose input port 1-7
	8	Output	General-purpose output port 1-7	33	Input	General-purpose input port 1-8
	9	Output	General-purpose output port 1-8	34	Input	General-purpose input port 2-1
	10	Output	General-purpose output port 2-1	35	Input	General-purpose input port 2-2
	11	Output	General-purpose output port 2-2	36	Input	General-purpose input port 2-3
	12	Output	General-purpose output port 2-3	37	Input	General-purpose input port 2-4
	13	Output	General-purpose output port 2-4	38	Input	General-purpose input port 2-5
	14		-COM1	39	Input	General-purpose input port 2-6
	15		-COM1	40	Input	General-purpose input port 2-7
	16		+COM2	41	Input	General-purpose input port 2-8
	17	Output	Running	42	Input	General-purpose input port 3-1
	18	Output	Error	43	Input	General-purpose input port 3-2
	19	Output	Positioning finish	44	Input	General-purpose input port 3-3
	20	Output	Home return finish	45	Input	General-purpose input port 3-4
	21	Input	Home return	46		Emergency stop input
	22	Input	Start	47		Emergency stop input
	23	Input	Stop	48		Emergency stop output (NO)
	24	Input	Reset	49		Emergency stop output (COM)
	25		-COM2	50		Emergency stop output (NC)

Note 1: No internal connection between +COM1 and +COM2, or between -COM1 and -COM2.

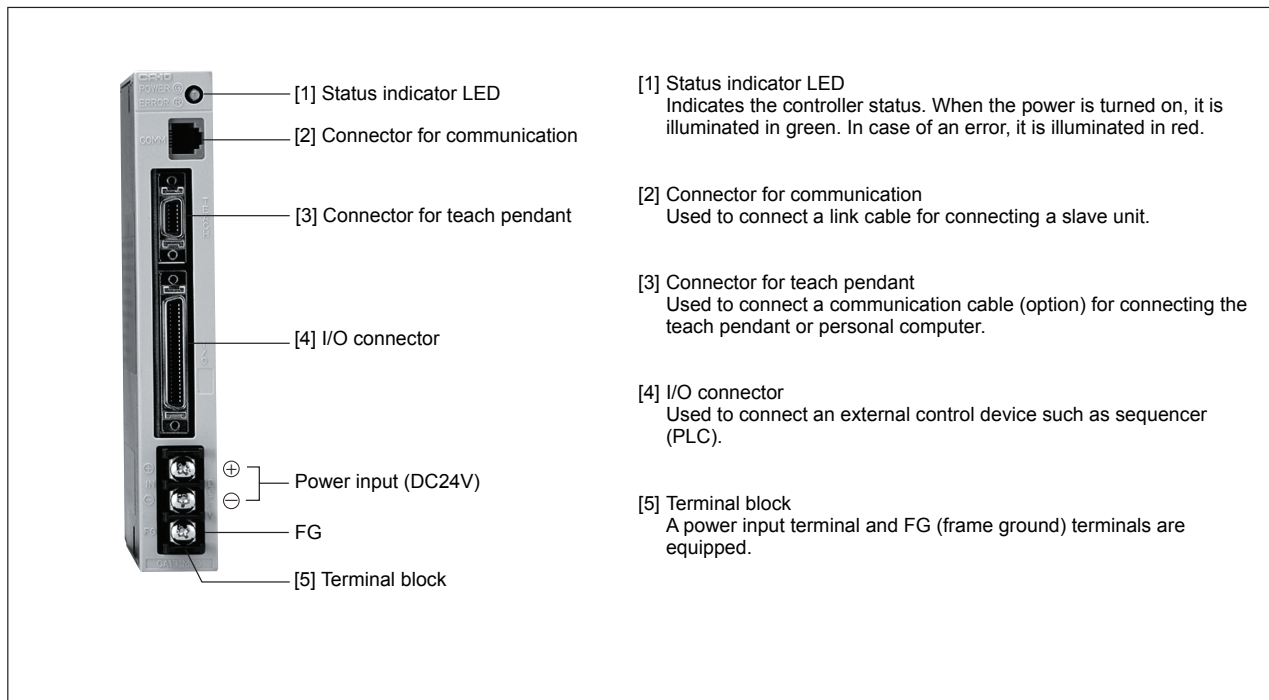
* One (1) plug is attached for I/O connector connection. An I/O cable with plug is also available optionally.

[Dimensions]

Type of controller: CA10-M00B



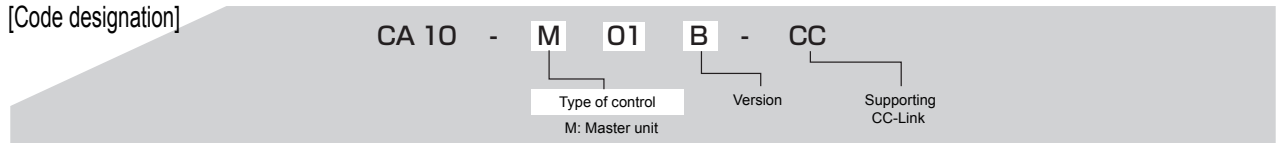
[Name of each part]



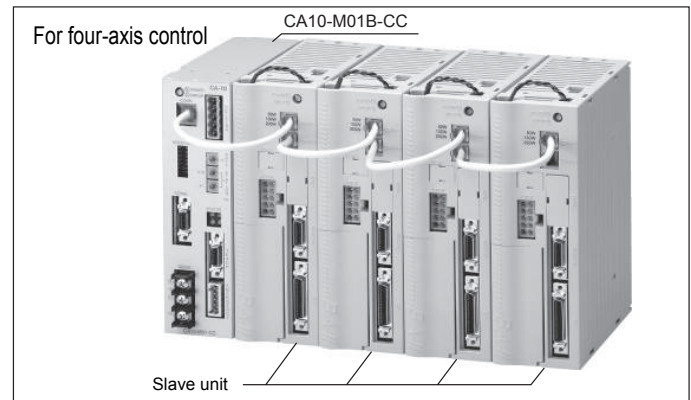
High-Performance Master Unit CA10-M01B-CC

- * This is the controller which adds the network function to high-performance master unit CA10-M00B.
- * Interface with an external device can be established via CC-Link.
The CC-Link (i.e., Control & Communication Link) is a field network interface which realizes wire-saving and high-speed data communication.
- * It is possible to perform data communication of each I/O, coordinate table, status and jog motion through the CC-Link interface.
- * For the RS232C interface, two channels are provided (one channel for the teach pendant) as standard.
- * The operation other than the network function is the same as in the CA10-M00B.
- * Teach pendant TPH-4C is used.

[Code designation]



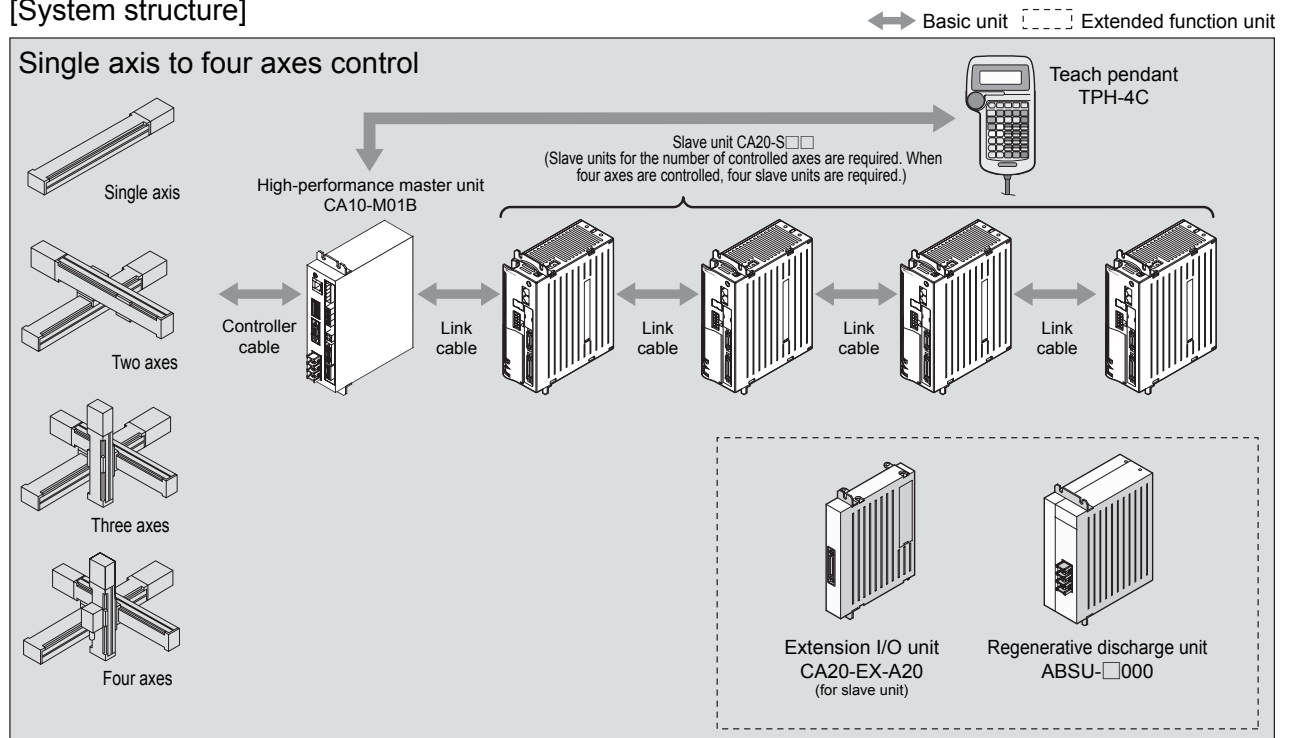
CA10-M01B-CC



Applicable type of axis

BBT3D, BBT4D, BBT5D, BBT5E, BBT7D, BB10E, BB10F, BB30E, BB30F, BB50F, BB50G, BB60G
Both the ball screw driven axis and timing belt driven axis of each axis can be controlled.

[System structure]



Controller

[General specifications]

Type of controller		CA10-M01B-CC	
No. of controlled axes	One axis control or simultaneous control of up to four axes by connecting slave units.	Self-diagnosis function	CPU down, memory error, driver error, master power voltage error, program error, etc.
Control system	CP control, PTP control, semi-closed loop control	Alarm display	Error LED ON and teach pendant display
Interpolation	Three-dimensional linear interpolation and circular interpolation	External input	See the CC-Link interface specifications.
Encoder signal	Line driver communication	External output	See the CC-Link interface specifications.
Teaching method	Remote teaching, direct teaching or MDI	Communication function	1 channel each for teach pendant and RS232C.
Speed and acceleration	Speed: 10 steps (variable) Acceleration: 20 steps (variable)	Extension I/O	Extension unit: 24 inputs and 16 outputs One unit can be connected with a master unit.
Operation method	Step, continuous, single	Power supply for driving external device	Output power supply is not available. (Power is supplied externally.)
Operation mode	Sequential (multitask) (Note 1) Palletizing Easy External point designation	Emergency stop I/O	No-voltage input (contact input) and relay C contact output
No. of programs	Sequential: 16, Palletizing: 16, Easy: 8	Master power voltage	DC24V±10 %, 0.5 A (externally supplied)
No. of steps	Max. 2,500 steps (Note 2)	Noise resistance	1500 Vp-p, pulse width 1 μs (by noise simulator)
Coordinate table	Each task: 999	Ambient conditions	Room temperature 0 – 40°C, humidity 30 % – 90 %RH, non-condensing and no corrosive gas present.
No. of counters	99	Dimensions	47 (W) × 160 (H) × 130 (D) (excluding metal fixtures)
No. of timers	9	Mass	0.8 kg
Memory	EEPROM (without battery)		
CPU	32-bit (RISC CPU, SH7051)		

Note 1: Multitask: Up to four tasks (only one task for axis control) are available. Note 2: Varies with a mode to be used.

[CC-Link interface specifications]

Item	Specification
Transmission	CC-Link Ver1.10
Baudrate	10 M/5 M/2.5 M/625 k/156 kbps (To be set by rotary switch.)
Type of station	Remote device station
No. of stations occupied	4 stations (predetermined) (RS/RY: 128 points each, RWW/RWR: 16 points each)
Station number setting	1 – 64 (To be set by rotary switch.)
No. of inputs/outputs	4 system inputs/4 system outputs 64 general-purpose inputs/64 general-purpose outputs 8 jog inputs/8 jog outputs 1 handshake input/2 handshake outputs
Data communication function	Transmission of coordinate table, current position monitor, request for error code and status, etc.

[I/O signal table]

* See Pages 233-234 of Technical Notes for I/O connections.

Signal direction: CC-Link master station ← CA10-M01-CC		Signal direction: CC-Link master station → CA10-M01-CC	
Device No. (Input)	Signal name	Device No. (Input)	Signal name
RXn0	Output during running	RYn0	Home return input
RXn1	Error output	RYn1	Start input
RXn2	Positioning finish output	RYn2	Stop input
RXn3	Home return finish output	RYn3	Reset input
RXn4 – RXn7	–	RYn4 – RYn7	–
RXn8 – RXnF	General-purpose output port 1-1 – 8	RYn8 – RYn F	General-purpose input port 1-1 – 8
RX(n+1)0 – RX(n+1)7	General-purpose output port 2-1 – 8	RY(n+1)0 – RY(n+1)7	General-purpose input port 2-1 – 8
RX(n+1)8 – RX(n+1)F	General-purpose output port 3-1 – 8	RY(n+1)8 – RY(n+1)F	General-purpose input port 3-1 – 8
RX(n+2)0 – RX(n+2)7	General-purpose output port 4-1 – 8	RY(n+2)0 – RY(n+2)7	General-purpose input port 4-1 – 8
RX(n+2)8 – RX(n+2)F	General-purpose output port 5-1 – 8	RY(n+2)8 – RY(n+2)F	General-purpose input port 5-1 – 8
RX(n+3)0 – RX(n+3)7	General-purpose output port 6-1 – 8	RY(n+3)0 – RY(n+3)7	General-purpose input port 6-1 – 8
RX(n+3)8 – RX(n+3)F	General-purpose output port 7-1 – 8	RY(n+3)8 – RY(n+3)F	General-purpose input port 7-1 – 8
RX(n+4)0 – RX(n+4)7	General-purpose output port 8-1 – 8	RY(n+4)0 – RY(n+4)7	General-purpose input port 8-1 – 8
RX(n+4)8 – RX(n+4)F	Jog output	RY(n+4)8 – RY(n+4)F	Jog input
RX(n+5)0 – RX(n+5)7	Reserved	RY(n+5)0 – RY(n+5)7	Reserved
RX(n+5)8 – RX(n+5)F		RY(n+5)8 – RY(n+5)F	
RX(n+6)0 – RX(n+6)7		RY(n+6)0 – RY(n+6)7	
RX(n+6)8	Command processing finish (*)	RY(n+6)8	Command processing request (*)
RX(n+6)9	Command error (*)	RY(n+6) 9	–
RX(n+6)A – RX(n+6)F	–	RY(n+6)A – RY(n+6)F	–
RX(n+7)0 – RX(n+7)7	–	RY(n+7)0 – RY(n+7)7	–
RX(n+7)8 – RX(n+7)F	–	RY(n+7)8 ~ RY(n+7)F	–

n: Addresses assigned to the master unit by station number setting.

(*) Handshake signals for data communication.

High-Performance Master Unit CA20-M00/CA20-M01

Common Features of the CA20-M00 and CA20-M01

Enables connection with all BA II series LINEAR COMPO ARM models

- * Enables simultaneous control of up to four axes
- * Capable of XX-Y (Gantry type) two-axis simultaneous control required for high-load transporting applications (Note 1) (Note 2)
- * Enables use of CC-Link and DeviceNet for interfaces with external devices
- * CC-Link interface can be used for data communication in various input/output, coordinate table, status, and jog operations.
- * DeviceNet interface can be used for data communication in various input/output and jog operations.
- * Includes 2D and 3D linear interpolation and circular interpolation and path functions for enabling operations where path tracking is important
- * Enables general-purpose output control ON and OFF at the coordinates specified during robot movement (command word: OUTS)
- * Enables changing of target position in coordinate data received by RS-232C communication while the axis is moving toward a specified coordinate (command word: RSMV)
- * Includes multitask function which allows execution of up to four tasks for input/output control in sequential mode (one task only during axis operation)
- * A memory card unit cannot be attached to this controller.

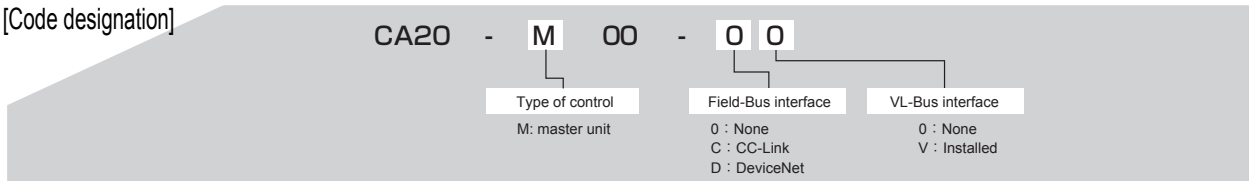
Note 1: The compatible axis types are the BB10E, BB30E, BB50F, BB50G, BB60G, and BB60J ball screw types.

Note 2: Palletizing mode and the MVM, MVC, and MVCP commands cannot be used.

CA20 - M00

- * Teach pendant TPH-4C is used.

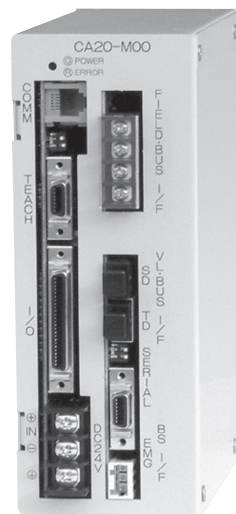
[Code designation]



CA20-M00-00



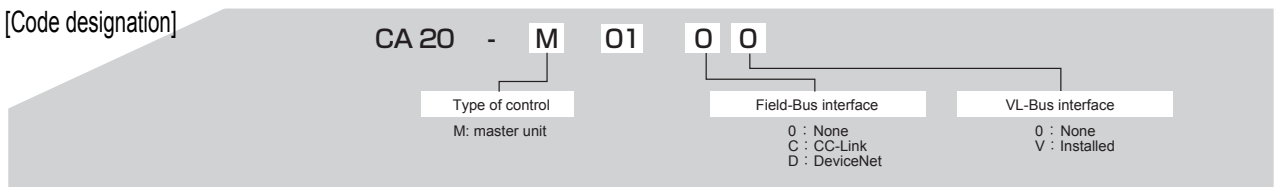
CA20-M00-CV



CA20 - M01

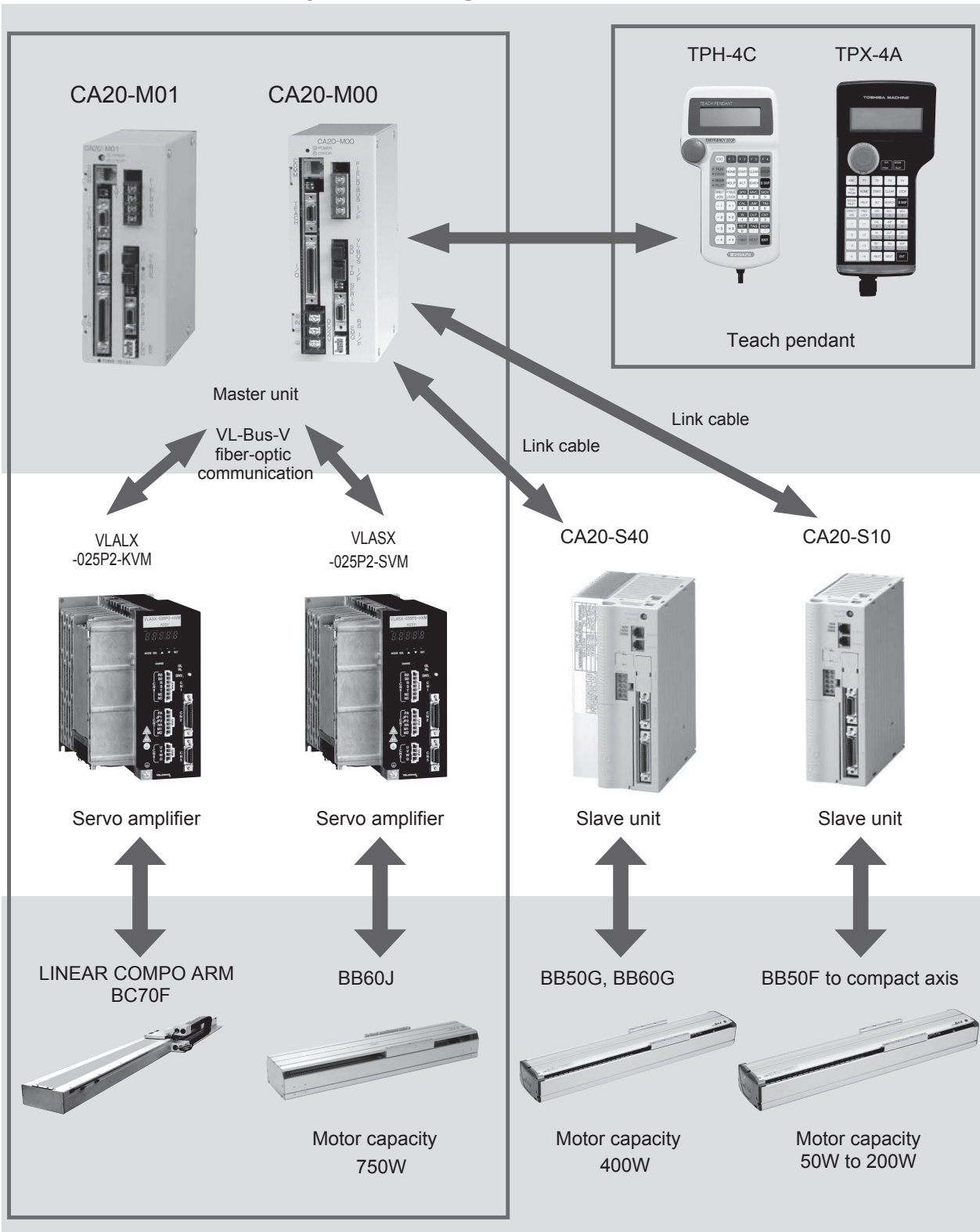
- * Allows compliance with Safety Category 3 by adding an external safety circuit
- * Teach pendant with enable switch TPX-4A is used.

[Code designation]



Controller
CA20-M01

[CA20-M00/CA20-M01 System Configuration]



[General specifications]

Type of controller		CA20-M00/CA20-M01	
No. of controlled axes	One axis control or simultaneous control of up to four axes by connecting slave units.	Self-diagnosis function	CPU down, memory error, driver error, master power voltage error, program error, etc.
Control system	CP control, PTP control, semi-closed loop control	Alarm display	Error indicator LED and teach pendant display
Interpolation	Three-dimensional linear interpolation and circular interpolation	External input	4 system inputs and 20 general-purpose inputs (Note 3)
Encoder signal	Line driver communication	External output	4 system outputs and 12 general-purpose outputs (Note 3)
Teaching method	Remote teaching, direct teaching or MDI	Communication function	Without VL-Bus interface 1 CH (RS232C), for a teach pendant With VL-Bus interface 1 CH (RS232C), for a teach pendant
Speed and acceleration	Speed: 10 steps (variable) Acceleration: 20 steps (variable)	Power supply for driving external device	Output power supply is not available. (Power is supplied externally.)
Operation method	Step, continuous, single	Emergency stop I/O	No-voltage input (contact input) and relay C contact output
Operation mode	Sequential (multitask) (Note 1) Palletizing, Easy External point designation	Noise resistance	1500 Vp-p, pulse width 1 μs (by noise simulator)
No. of programs	Sequential: 16, Palletizing: 16, Easy: 8	Ambient conditions	Room temperature 0 - 40°C, humidity 30 % - 90 %RH, non-condensing and no corrosive gas present.
No. of steps	Max. 2,500 steps (Note 2)	Dimensions	65 (W) × 170 (H) × 150 (D) (excluding metal fixtures)
Coordinate table	Each task: 999	Mass	1.2 kg (excluding the optional substrate)
No. of counters	99		
No. of timers	9		
Memory	EEPROM (without battery)		
CPU	32-bit (RISC CPU, SH7085)		
Master power voltage	DC24V±10% 0.5A (externally supplied)		

Note 1: Multitask: Up to four tasks (one task only for axis control) are available.

Note 2: Varies with a mode to be used.

Note 3: If the Field-Bus interface specification is selected, refer to the interface specifications on pages 194 and 195.

[I/O specifications]

Input specifications	
Input rating	DC24 V, 10 mA/1 point
Insulation	Photo-coupler
Power supply	Externally supplied (DC24 V).

Output specifications	
Output	Transistor output (open collector)
Output capacity (DC24 V)	System output: Max. 20 mA/ point General-purpose output: Max. 300 mA/ point

[I/O pin number and signal name]

* See Pages 231-232 of Technical Notes for I/O connections.

Connector pin arrangement on panel side	No.	I/O	Signal name	No.	I/O	Signal name
<p>(BOTTOM VIEW)</p>	1		+COM1	26	Input	General-purpose input port 1-1
	2	Output	General-purpose output port 1-1	27	Input	General-purpose input port 1-2
	3	Output	General-purpose output port 1-2	28	Input	General-purpose input port 1-3
	4	Output	General-purpose output port 1-3	29	Input	General-purpose input port 1-4
	5	Output	General-purpose output port 1-4	30	Input	General-purpose input port 1-5
	6	Output	General-purpose output port 1-5	31	Input	General-purpose input port 1-6
	7	Output	General-purpose output port 1-6	32	Input	General-purpose input port 1-7
	8	Output	General-purpose output port 1-7	33	Input	General-purpose input port 1-8
	9	Output	General-purpose output port 1-8	34	Input	General-purpose input port 2-1
	10	Output	General-purpose output port 2-1	35	Input	General-purpose input port 2-2
	11	Output	General-purpose output port 2-2	36	Input	General-purpose input port 2-3
	12	Output	General-purpose output port 2-3	37	Input	General-purpose input port 2-4
	13	Output	General-purpose output port 2-4	38	Input	General-purpose input port 2-5
	14		-COM1 (Note 1)	39	Input	General-purpose input port 2-6
	15		-COM1 (Note 1)	40	Input	General-purpose input port 2-7
	16		+COM2 (Note 1)	41	Input	General-purpose input port 2-8
	17	Output	Running	42	Input	General-purpose input port 3-1
	18	Output	Error	43	Input	General-purpose input port 3-2
	19	Output	Positioning finish	44	Input	General-purpose input port 3-3
	20	Output	Home return finish	45	Input	General-purpose input port 3-4
	21	Input	Home return	46		Emergency stop input
	22	Input	Start	47		Emergency stop input
	23	Input	Stop	48		Emergency stop output (NO)
	24	Input	Reset	49		Emergency stop output (COM)
	25		-COM2 (Note 1)	50		Emergency stop output (NC)

Note 1: No internal connection between +COM1 and +COM2, or between -COM1 and -COM2.

* One (1) plug is attached for I/O connector connection. An I/O cable with plug is also available optionally.

[CC-Link interface specifications]

Item	Specifications
Communication specifications	CC-Link Ver. 1.10
Baud rate	10M, 5M, 2.5M, 625k, 156kbps (set by parameters)
Station type	Remote device station
Number of occupied stations	Fixed at 4 stations (RX/RX: 128 points each, RWw/RWr: 16 points each)
Station number setting	1 to 64 (set by parameters)
Number of inputs/outputs	4 system inputs, 4 system outputs
	64 general-purpose inputs, 64 general-purpose outputs
	8 jog inputs, 8 jog outputs
	1 handshake input, 2 handshake outputs
	4 data selection inputs, 4 data selection confirmation outputs
Data communication function	Coordinate table transmission, current position monitor, error code request, status request, and more

* These are the inputs and outputs as seen from the robot controller.

[I/O Signal List]

* For details on the I/O connection method, see page 235 of the Technical Notes.

Signal direction CC-Link master station ← CA20-M00/M01		Signal direction CC-Link master station ← CA20-M00/M01	
Device no. (input)	Signal name	Device no. (output)	Signal name
RXn0	Output during operation	RYn0	Home return input (*2)
RXn1	Error output	RYn1	Start input (*2)
RXn2	Positioning complete output	RYn2	Stop input (*2)
RXn3	Home return complete output	RYn3	Reset input (*2)
RXn4 ~ RXn7	Usage prohibited	RYn4~RYn7	Usage prohibited
RXn8~RXnF	General-purpose output port 1-1 to 1-8	RYn8~RYn F	General-purpose input port 1-1 to 1-8 (*2)
RX(n+1)0~RX(n+1)7	General-purpose output port 2-1 to 2-8	RY(n+1)0~RY(n+1)7	General-purpose input port 2-1 to 2-8 (*2)
RX(n+1)8~RX(n+1)F	General-purpose output port 3-1 to 3-8	RY(n+1)8~RY(n+1)F	General-purpose input port 3-1 to 3-8 (*2)
RX(n+2)0~RX(n+2)7	General-purpose output port 4-1 to 4-8	RY(n+2)0~RY(n+2)7	General-purpose input port 4-1 to 4-8
RX(n+2)8~RX(n+2)F	General-purpose output port 5-1 to 5-8	RY(n+2)8~RY(n+2)F	General-purpose input port 5-1 to 5-8
RX(n+3)0~RX(n+3)7	General-purpose output port 6-1 to 6-8	RY(n+3)0~RY(n+3)7	General-purpose input port 6-1 to 6-8
RX(n+3)8~RX(n+3)F	General-purpose output port 7-1 to 7-8	RY(n+3)8~RY(n+3)F	General-purpose input port 7-1 to 7-8
RX(n+4)0~RX(n+4)7	General-purpose output port 8-1 to 8-8	RY(n+4)0~RY(n+4)7	General-purpose input port 8-1 to 8-8
RX(n+4)8 ~ RX(n+4)F	Jog output	RY(n+4)8 ~ RY(n+4)F	Jog input
RX(n+5)0 ~ RX(n+5)7	Reserved	RY(n+5)0 ~ RY(n+5)7	Reserved
RX(n+5)8 ~ RX(n+5)F		RY(n+5)8 ~ RY(n+5)F	
RX(n+6)0 ~ RX(n+6)7		RY(n+6)0 ~ RY(n+6)7	
RX(n+6)8	Command processing completed (*1)	RY(n+6)8	Command processing request (*1)
RX(n+6)9	Command error (*1)	RY(n+6)9	Usage prohibited
RX(n+6)A ~ RX(n+6)B	Usage prohibited	RY(n+6)A ~ RY(n+6)B	Usage prohibited
RX(n+6)C ~ RX(n+6)F	Data selection confirmation output	RY(n+6)C ~ RY(n+6)F	Data selection input
RX(n+7)0 ~ RX(n+7)7	Usage prohibited	RY(n+7)0 ~ RY(n+7)7	Usage prohibited
RX(n+7)8 ~ RX(n+7)F	Usage prohibited	RY(n+7)8 ~ RY(n+7)F	Usage prohibited

n: Address assigned to the master unit by the station number setting

*1: Handshake signals for data communication

*2: Usage of system input and general-purpose input port 1 is selected based on the parameters.

[CC-Link Status Indicator LEDs]

LED name	Color	On/Off	Description
RUN	Green	On	During normal operation
		Off	During timeout or network stoppage
ERR	Red	On	CRC error, abnormal speed, invalid station number setting
		Off	During normal operation
SD	Green	On	During data sending
		Off	When not receiving data
RD	Green	On	During data reception
		Off	When not receiving data

[DeviceNet Specifications]

Item	Specifications		
Communication protocol	Compliant with DeviceNet		
Supported connection	I/O connection (polling)		
Baud rate	125k, 250k, 500kbps (set by parameters)		
Station number setting	0 to 63 (set by parameters)		
Cable length	Baud rate	Thick cable	Thin cable
	125k	500m	100m
	250k	250m	
	500k	100m	
Number of occupied stations	Sending: 128 points Receiving: 128 points		
Number of inputs/outputs (*1)	4 system inputs, 4 system outputs		
	64 general-purpose inputs, 64 general-purpose outputs		
	8 jog inputs, 8 jog outputs		
Vendor ID	733 (TOSHIBA-MACHINE CO.,LTD.)		
Device type	0 (Generic Device)		
Product code	5 (CA20-M00)		

* These are the inputs and outputs as seen from the robot controller.

[I/O Signal List]

* For details on the I/O connection method, see pages 236 to 230 of the Technical Notes.

Signal direction	DeviceNet master station ← CA20-M00/M01	Signal direction	DeviceNet master station ← CA20-M00/M01 (*1)
Input device no. (offset *2)	Signal name	Output device no. (offset *2)	Signal name
+0	Output during operation	+0	Home return input (*3)
+1	Error output	+1	Start input (*3)
+2	Positioning complete output	+2	Stop input (*3)
+3	Home return complete output	+3	Reset input (*3)
+4 ~ +7	Usage prohibited	+4 ~ +7	Usage prohibited
+8 ~ +15	General-purpose output port 1-1 to 1-8	+8 ~ +15	General-purpose input port 1-1 to 1-8 (*3)
+16 ~ +23	General-purpose output port 2-1 to 2-8	+16 ~ +23	General-purpose input port 2-1 to 2-8 (*3)
+24 ~ +31	General-purpose output port 3-1 to 3-8	+24 ~ +31	General-purpose input port 3-1 to 3-8 (*3)
+32 ~ +39	General-purpose output port 4-1 to 4-8	+32 ~ +39	General-purpose input port 4-1 to 4-8
+40 ~ +47	General-purpose output port 5-1 to 5-8	+40 ~ +47	General-purpose input port 5-1 to 5-8
+48 ~ +55	General-purpose output port 6-1 to 6-8	+48 ~ +55	General-purpose input port 6-1 to 6-8
+56 ~ +63	General-purpose output port 7-1 to 7-8	+56 ~ +63	General-purpose input port 7-1 to 7-8
+64 ~ +71	General-purpose output port 8-1 to 8-8	+64 ~ +71	General-purpose input port 8-1 to 8-8
+72 ~ +79	Jog output	+72 ~ +79	Jog input
+80 ~ +127	Reserved	+80 ~ +127	Reserved

*1: If DeviceNet communication is cut off, stop input is set to 1, and all others are cleared to 0. During teach pendant operation, however, the stop input is also cleared to 0.

*2: Offset amount from the starting device (unit: bits)

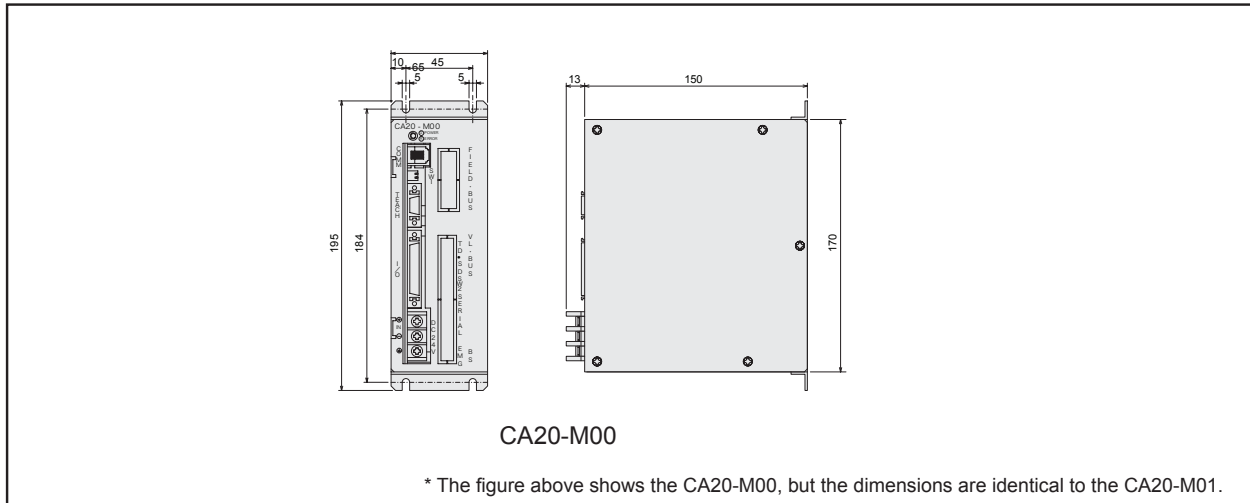
*3: Usage of system input and general-purpose input port 1 is selected based on the parameters.

[DeviceNet Status Indicator LEDs]

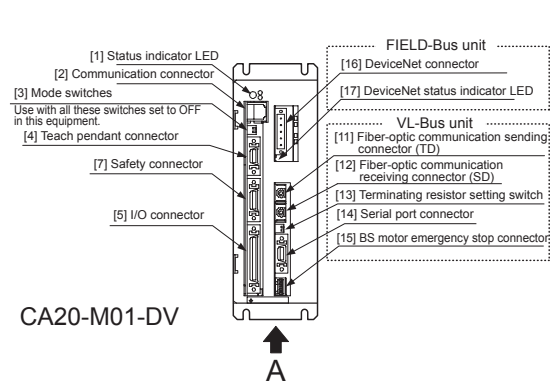
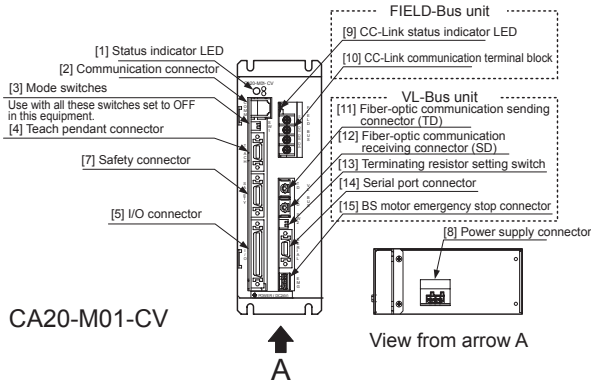
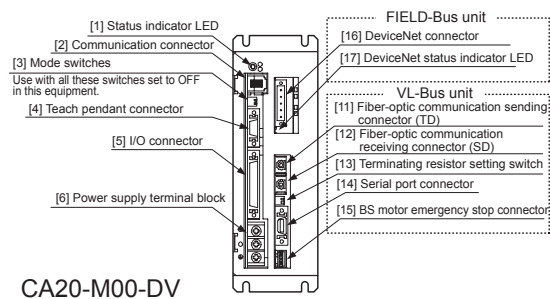
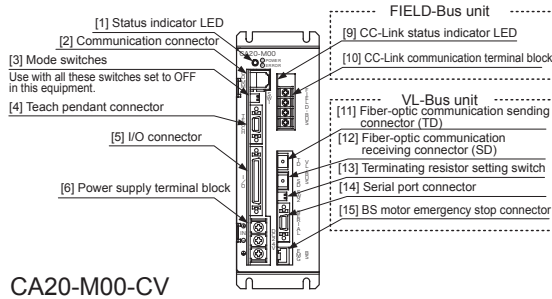
LED name	Color	On/Off	Description
MS	Green	● On	Normal Normal status
		★Flashing	Unset status This indicates an error in the master unit setting values. Check the settings and restart. This can also indicate standby mode. Check if the master unit has started normally.
	Red	● On	Critical error A hardware error has occurred (DPRAM, internal ROM, internal RAM, EEPROM, CAN error, WDT error, etc.). Restart. If the error occurs again, replace the unit.
		★Flashing	Minor error The user settings are invalid, and a user-side interrupt timeout has occurred. Check and correct the settings, and then restart.
	Green /Red	○ Off	No power supply No power is being supplied, or initialization or other process is in progress. Check the power supply.
NS	Green	● On	Normal One or more connections is established (running) in an online state.
		★Flashing	Standing by for connection The master unit did not start normally. (This also includes a master unit I/O area configuration error.) Check whether the master unit has started normally.
	Red	● On	Critical communication error A communication error has occurred (duplication of node address, busoff detection, baud rate mismatch, etc). Check the connection status, noise, node address settings, baud rate settings, and other parameters, and then restart.
		★Flashing	Minor communication error Communication with the master unit has timed out. Check the status of the master unit and the connection status, noise, node address settings, baud rate settings, and other parameters, and then restart.
	Green /Red	○ Off	No power supply Either no power is being supplied, or a WDT error occurred, a baud rate check is being performed, or a node address duplication check is being performed. Check the power supply.

* The LED lighting interval is 0.5 seconds on and 0.5 seconds off.

[Dimensions]



[Names of Parts]



- [1] Status indicator LED
This is an LED that indicates the controller status. It becomes solid green when the power is on, and it becomes solid red when an error occurs.
- [2] Communication connector
This is a connector for connecting a link cable to the slave unit.
- [3] Mode switches
These are not used in this equipment. Use with all these switches set to OFF.
- [4] Teach pendant connector
This is a connector for connecting a teach pendant or computer connection cable (option).
- [5] I/O connector
This connects external control devices (such as a sequencer).
- [6] Power supply terminal block
This provides power supply input terminals and FG (frame ground) terminals.
- [7] Safety connector
This is a connector for connecting a safety circuit. For details on safety circuits, see page 240 of the Technical Notes.
- [8] Power supply connector
This is a connector for connecting the power supply.
- [9] CC-Link status indicator LED (option)
This indicates the CC-Link status.

- [10] CC-Link communication terminal block (option)
This is a terminal block for connecting a dedicated CC-Link cable for establishing a data link.
- [11] Fiber-optic communication sending connector (TD) (option)
This is a terminal block for connecting a fiber-optic communication cable to the BS servo amplifier.
- [12] Fiber-optic communication receiving connector (SD) (option)
This is a terminal block for connecting a fiber-optic communication cable to the BS servo amplifier.
- [13] Terminating resistor setting switch (option)
This is a switch for connecting a terminating resistor for communication when using a serial port.
- [14] Serial port connector (option)
This is a connector for connecting a communication cable (option) to a computer.
- [15] BS motor emergency stop connector (option)
This is a connector for the output of emergency stop signals to the BS servo amplifier.
- [16] DeviceNet connector (option)
This is a connector for connecting a dedicated DeviceNet cable for establishing a data link.
- [17] DeviceNet status indicator LED (option)
This indicates the DeviceNet status.

Slave Unit

- * Used as an auxiliary unit when controlling the master unit or high-performance master unit.
- * A driver unit for one axis control is built in this unit.
- * For the supply power, multi power (AC100 V-120 V, 200 V-240 V) is used to cope with globalized production.



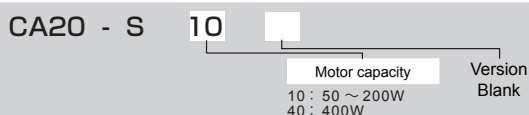
CA20-S10



CA20-S40

Applicable type of axis
 CA20-S10 : BBT3D, BBT4D, BBT5D, BBT5E, BBT7D, BB10E, BB10F, BB30E, BB30F, BB50F
 CA20-S40 : BB50G, BB60G
 Both the ball screw driven axis and timing belt driven axis of each axis can be controlled.

[Code designation]



* One (1) plug for connecting an I/O connector is attached to the slave unit. An I/O cable with plug is also available optionally.

[General specifications]

Type of controller	CA20-S10			CA20-S40 (Note 1)
No. of controlled axes	One axis control by connecting with a master unit.			
Motor capacity	50W	100W	200W	400W
Drive system	AC servo motor			
Alarm display	Error indicator lamp ON (on front panel) and teach pendant display (connected with a master unit)			
External input	8 points			
External output	8 points			
Power supply	AC100V ~ 120V, AC200V ~ 240V, ± 10% 50/60Hz Changeover of 100 V or 200 V circuit by short-bar on front terminal block.			AC200V ~ 230V, ± 10% 50/60Hz
Power capacity (per 1 axis)	100VA	160VA	450VA	700VA
Noise resistance	1500 Vp-p, pulse width 1 μs (by noise simulator)			
Ambient conditions	Room temperature 0 – 40°C, humidity 30 % – 90 %RH, non-condensing and no corrosive gas present.			
Dimensions	55 (W) × 160 (H) × 134 (D) (excluding metal fixtures)			85 (W) × 160 (H) × 134 (D) (excluding metal fixtures)
Mass	0.91kg			1.34kg

Note 1: When using CA20-S40, be sure to use regenerative discharge unit ABSU-4000.

[I/O specifications]

Type of: controller: CA20-S10, CA20-S40

Input specifications	
Input rating	DC24 V, 10 mA/1 point
Insulation	Bilateral photo-coupler
Power supply	Externally supplied (DC24 V).

Output specifications	
Output	Transistor output (open collector)
Output capacity (DC24 V)	General-purpose output 1-1 through 1-8: Max. 300 mA/ point

[I/O pin number and signal name]

Type of: controller: CA20-S10, CA20-S40

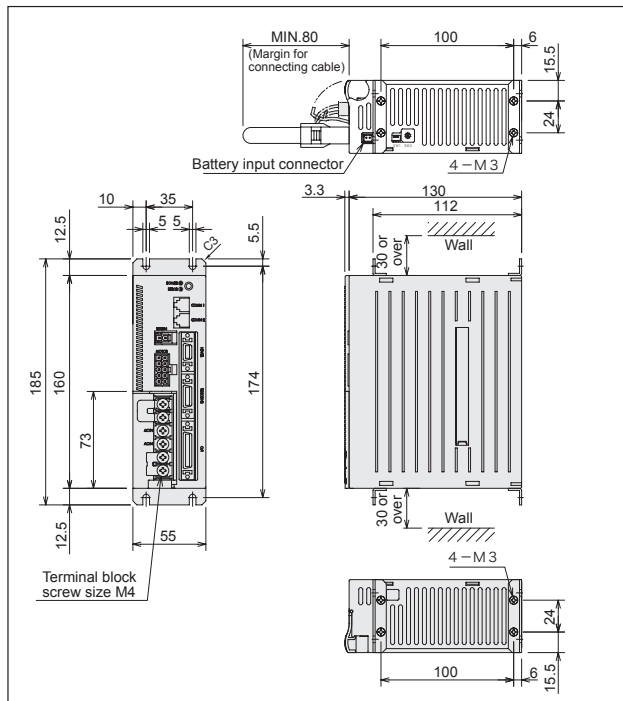
* See Page 237 of Technical Notes for I/O connections.

Connector pin arrangement on panel side	No.	I/O	Signal name	No.	I/O	Signal name
<p>(Bottom view)</p>	1		+COM1	19		COM3
	2	Output	General-purpose output port 1-1	20	Input	General-purpose input port 1-1
	3	Output	General-purpose output port 1-2	21	Input	General-purpose input port 1-2
	4	Output	General-purpose output port 1-3	22	Input	General-purpose input port 1-3
	5	Output	General-purpose output port 1-4	23	Input	General-purpose input port 1-4
	6		-COM1	24		NC
	7		Emergency stop output (N.O)	25		NC
	8		Emergency stop output	26		NC
	9		Emergency stop output (N.C)	27		COM4
	10		NC	28	Input	General-purpose input port 1-5
	11	Output	General-purpose output port 1-5	29	Input	General-purpose input port 1-6
	12	Output	General-purpose output port 1-6	30	Input	General-purpose input port 1-7
	13	Output	General-purpose output port 1-7	31	Input	General-purpose input port 1-8
	14	Output	General-purpose output port 1-8	32		NC
	15		NC	33		NC
	16		NC	34		NC
	17		-COM2	35		NC
	18		NC	36		NC

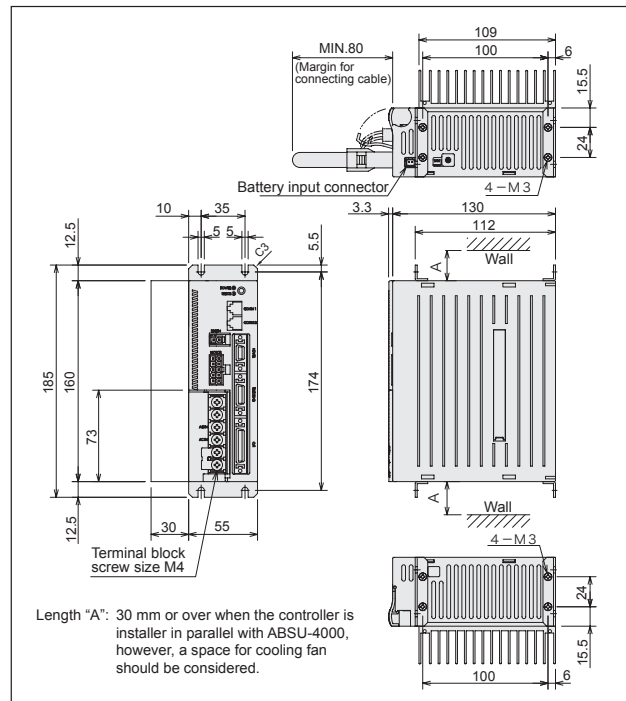
[Dimensions]

NC: No Connection

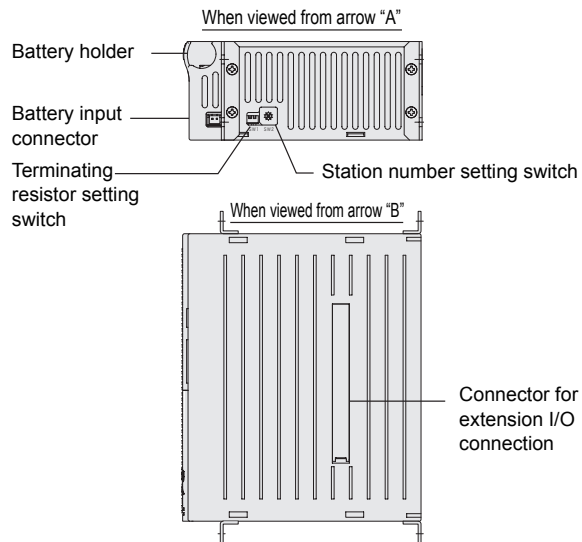
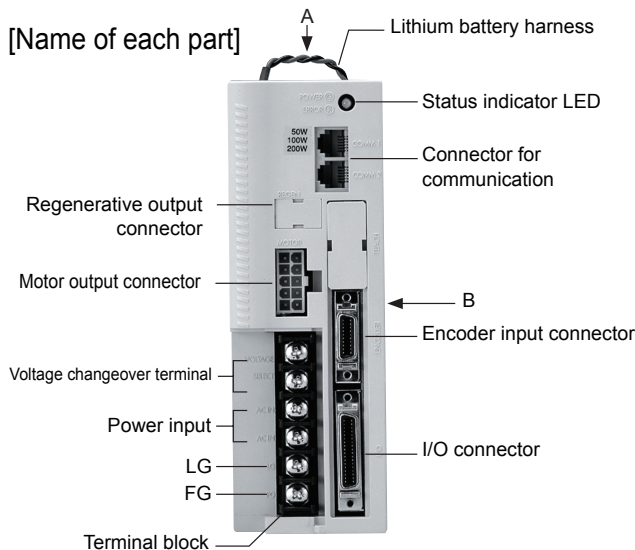
Type of controller: CA20-S10



Type of controller: CA20-S40



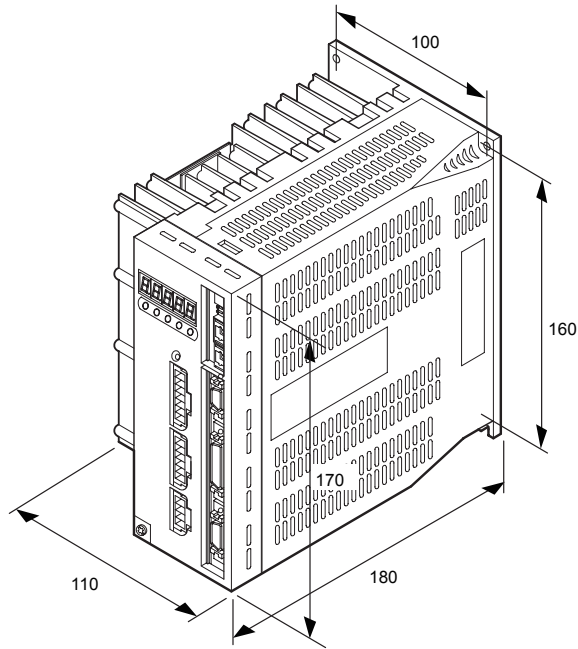
[Name of each part]



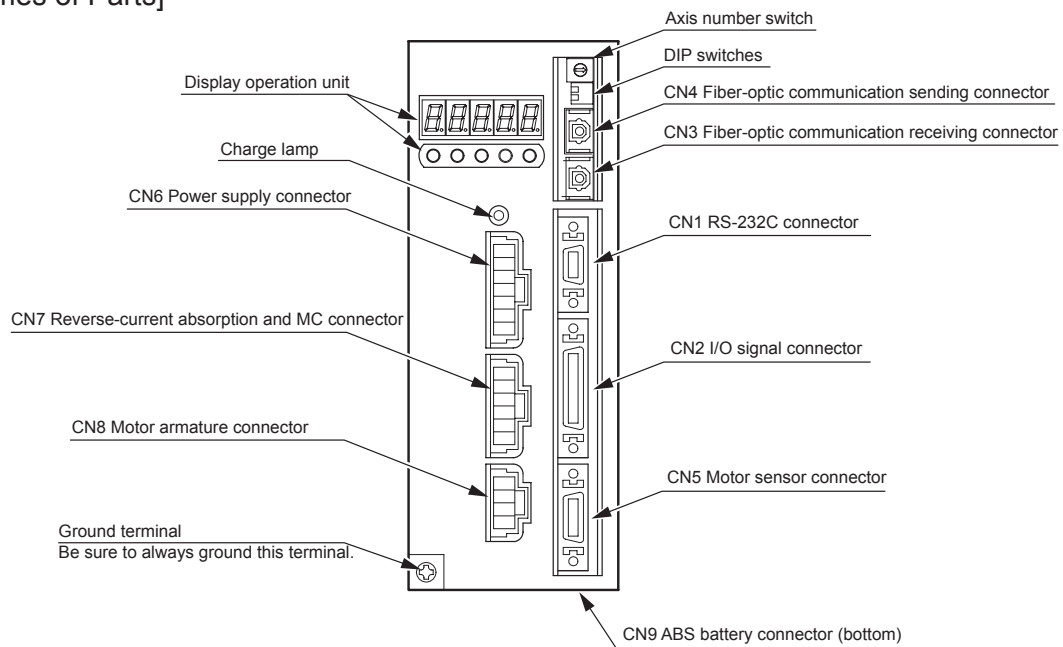
For details on each part, see the descriptions on the master unit on Page 178.

VLASX-025P2

[Dimensions]



[Names of Parts]



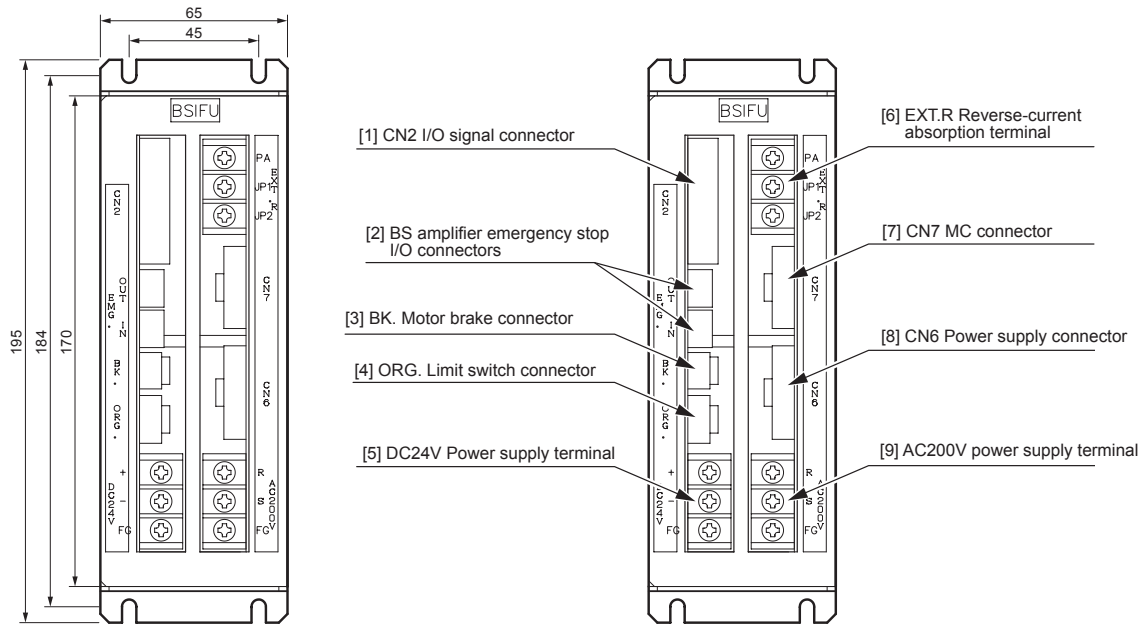
No. of controlled axes	1 axis (based on connection with master unit)
Motor capacity	750W
Drive system	AC servo motor
Error display	Error indicator lamps (front panel) Teach pendant (connected to master unit)
External input	None
External output	None
Power supply	1-phase, 200V to 230V AC
Power supply capacity	50VA (control circuit), 1.7kVA (main circuit)
Environmental conditions	Indoor, still standing, temperature of 0 to 40°C 30% to 90% RH, no condensation No corrosive gases present
Dimensions	110 x 170 x 180 mm
Weight	2.3 kg

BS Relay Module (Option)

This is a module that contains the external circuits (main conductor, brake release relay, etc.) required for the BS servo amplifier.

BSIFU unit

Dimensions and Names of parts

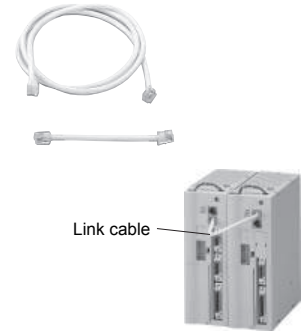


- [1] CN2 I/O signal connector
This is a connector for connecting the CN2 cable.
- [2] BS amplifier emergency stop I/O connectors
These are connectors for connecting EMG cables. The cable from the CA20-M00/M01 or front axis is connected to the IN connector, and the cable to the rear axis is connected to the OUT connector.
- [3] BK. Motor brake connector
This connects to the holding brake of the motor.
- [4] ORG. Limit switch connector
This connects to the home position sensor.
- [5] DC24V Power supply terminal
This is a terminal block for 24 V DC power supply input. An FG (frame ground) terminal is also provided.
- [6] EXT.R Reverse-current absorption terminal
This is a terminal block for connecting an external reverse-current absorption resistor.
- [7] CN7 MC connector
This is a connector for connecting a CN7 cable.
- [8] CN6 Power supply connector
This is a connector for connecting a CN6 cable.
- [9] AC200V power supply terminal
This is a terminal block for 200 V AC power supply input. An FG (frame ground) terminal is also provided.

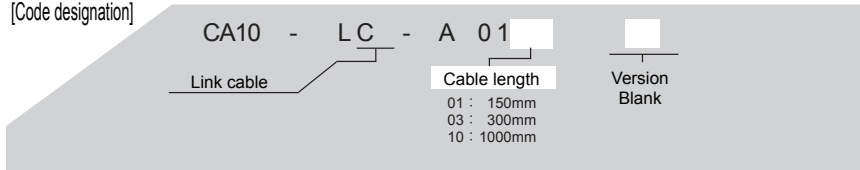
Link Cable

[Application]

Used for communication between the master unit serving as the main controller and the slave unit which operates under commands given from the main controller. This cable is not required when a signal axis is controlled and only the master unit is used. This link cable connects the master unit with each slave unit in series. The cable length differs when the master and slave units are mounted closely and when they are installed separately from each other.

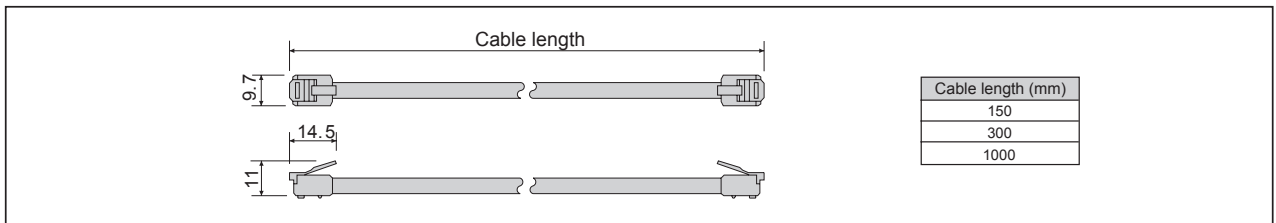


[Code designation]



- * A link cable must not be bundled together with other signal cables or must not run in the same cable (or wire) duct where other cables run.
- * A link cable is equipped with plugs on both ends. It cannot be cut or reworked.

[Dimensions]



Regenerative Discharge Unit

[Application]

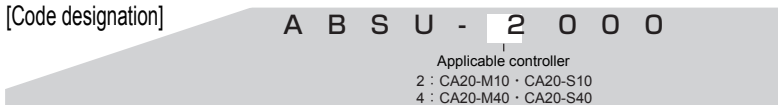
The regenerative discharge unit is designed to absorb excess energy generated in an actuator (or axis) motor during deceleration. The unit is useful when load inertia exceeds the tolerance, or when a heavy load is descended along the Z-axis over a long stroke (generating excessive electricity). (The unit prevents overvoltage generated in the controller.)

ABSU-2000

ABSU-4000

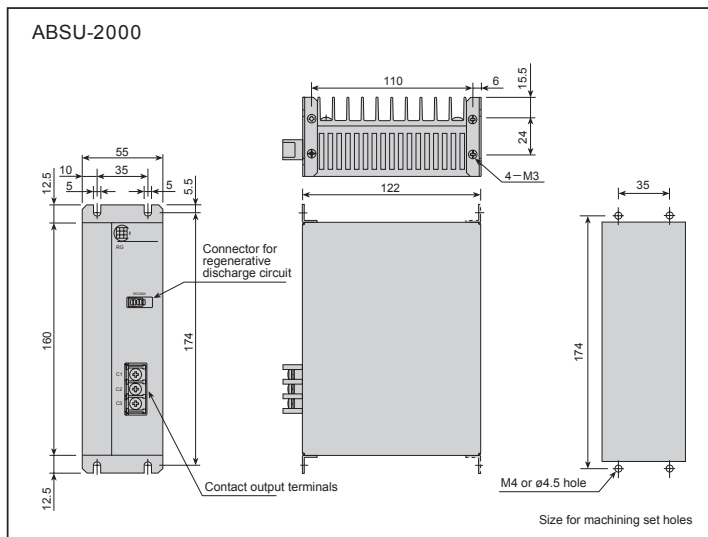


[Code designation]

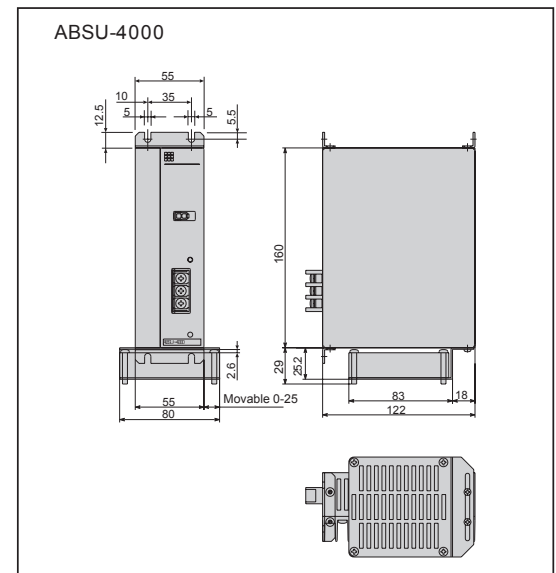


- * All discharge energy is converted into heat.
- * If the discharge circuit of the regenerative discharge unit has overheated, it is signaled by contact output (N.C).
- * One unit is needed per axis, and can be connected to the master or slave unit when necessary

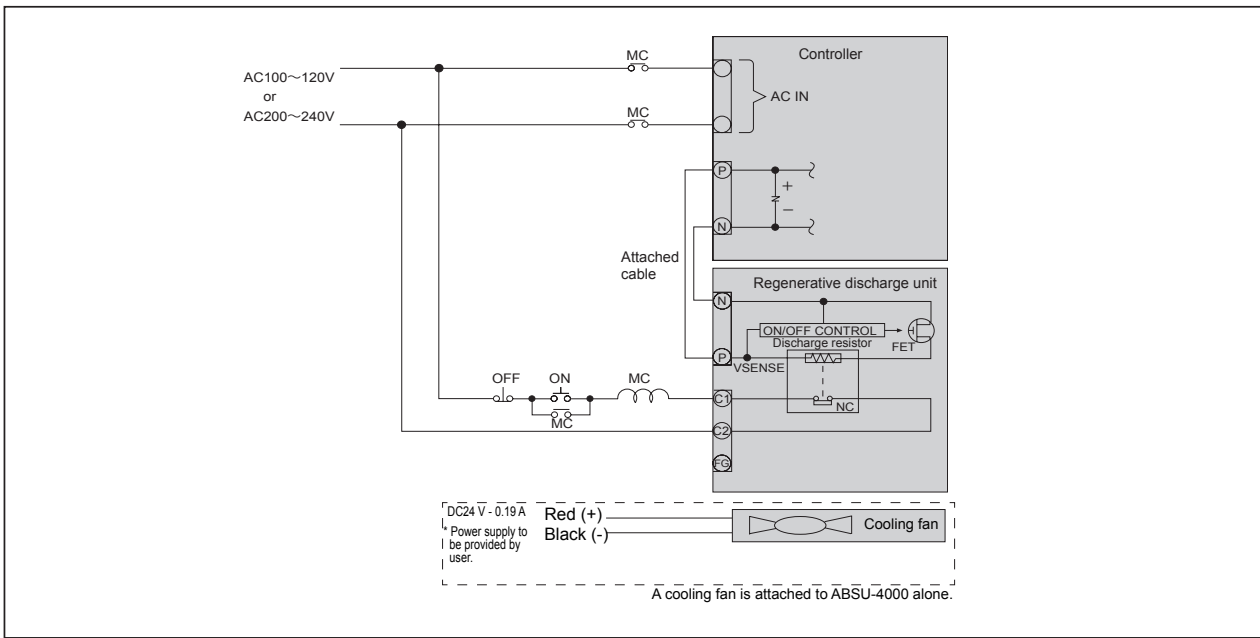
[Dimensions]



Accessories: L-shaped bracket, cable (300 mm)



[Example connection]



- A thermal relay which operates at the temperature of 150°C is incorporated in the discharge resistor of the regenerative discharge unit.
 - When this relay has operated, output terminals C1 to C2 of the regenerative discharge unit is set open.
- Program a sequence so that the controller power is always turned of

Reverse-Current Absorption Resistor

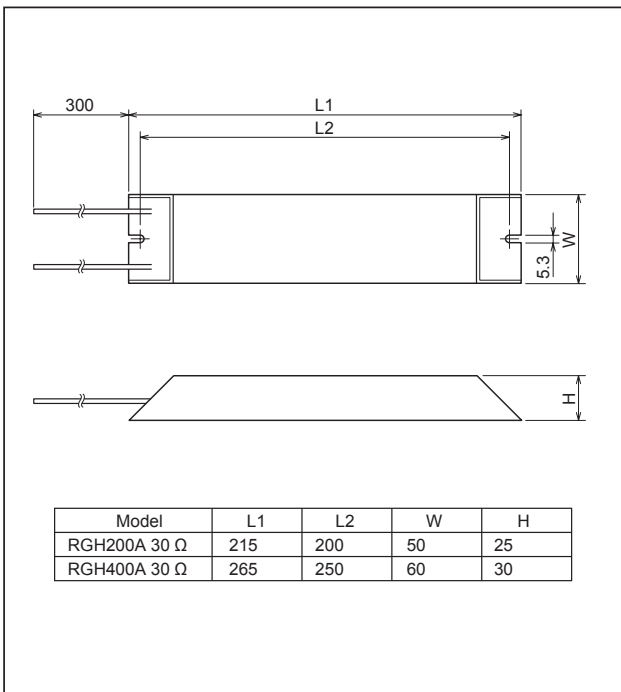
[Application]

This is a resistor used for a motor capacity of 750W.

[Models]

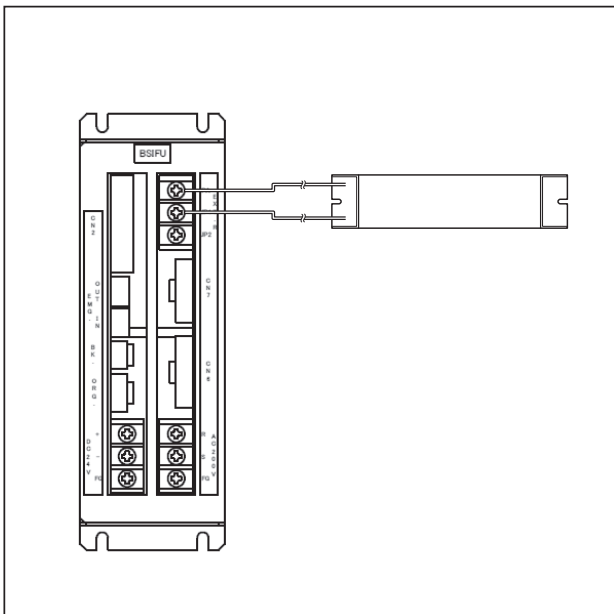
- RGH200A 30Ω (when using horizontal axis installation)
- RGH400A 30Ω (when using vertical axis installation)

[Dimensions]



[Connection example]

Remove the jumper between the BSIFU terminals JP1 and JP2 and connect to PA and JP1.



Teach Pendant

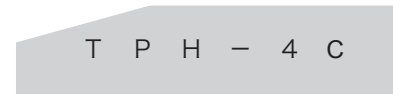
[Application]

When the teach pendant is connected with a controller, it can serve as a program and parameter input device, and can give commands for executing motions including home establishment, start, stop, jog motion and emergency stop. The teach pendant also displays and resets an error or fault when it has been generated.

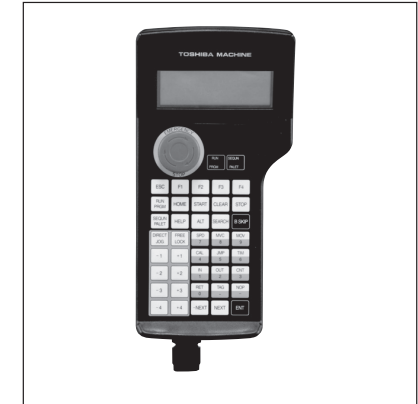
[Code designation]



[Code designation]



[Code designation]



Select either type according to a controller you wish to use.

Correspondence table of controller and teach pendant

○ -marked : Can be used.

Controller		TPH-2A (Ver.2.40 or over) *	TPH-4C	TPX-4A
Series	Type			
BA II series carried in this manual	CA 20-M10	○	○	
	CA 20-M40	○	○	
	CA 20-M10-CC		○	
	CA 10-M00B		○	
	CA 10-M01B		○	
	CA 20-M00		○	
	CA 20-M01			○

* The version number can be confirmed in the parameter by connecting the teach pendant with the controller.

Upgraded ROM

When using the teach pendant of the newest version, the following option ROM is required. The previous version may be used as it is according to the range of use. For details, contact our sales office in your territory.

No	Description	Type	Application
1	TPH-2A upgraded ROM	R-TP2-CA	When you already have TPH-2A and wish to upgrade it to the newest version.

Extension I/O Unit

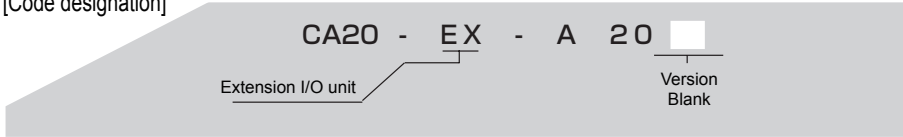
[Application]

The extension I/O unit can increase the number of general-purpose inputs and outputs when general-purpose inputs and outputs of controllers (master and slave units) alone are not enough.

The number of extension I/O units that can be connected with each controller is one.

The extension I/O unit is connected to the controller directly via a connector on its side. For the number of inputs and outputs, see the specifications.

[Code designation]



CA20-EX-A20



[Applicable controller]

CA20-M10, CA20-M40, CA20-S10, CA20-S40

[Specifications]

Input		Output	
No. of inputs	12 points	No. of outputs	8 points
Input rating	DC24 V, 10 mA/ point	Output signal	Transistor output (open collector)
Insulation	Photo-coupler	Output rating	DC24 V, max. 300 mA/ point
Common	Common to entire 1 circuit	Insulation	Photo-coupler
External connection	Connector (shared with output)	Common	Common to entire 1 circuit

* Power supply for external devices is not incorporated.

[Input pin number and signal name]

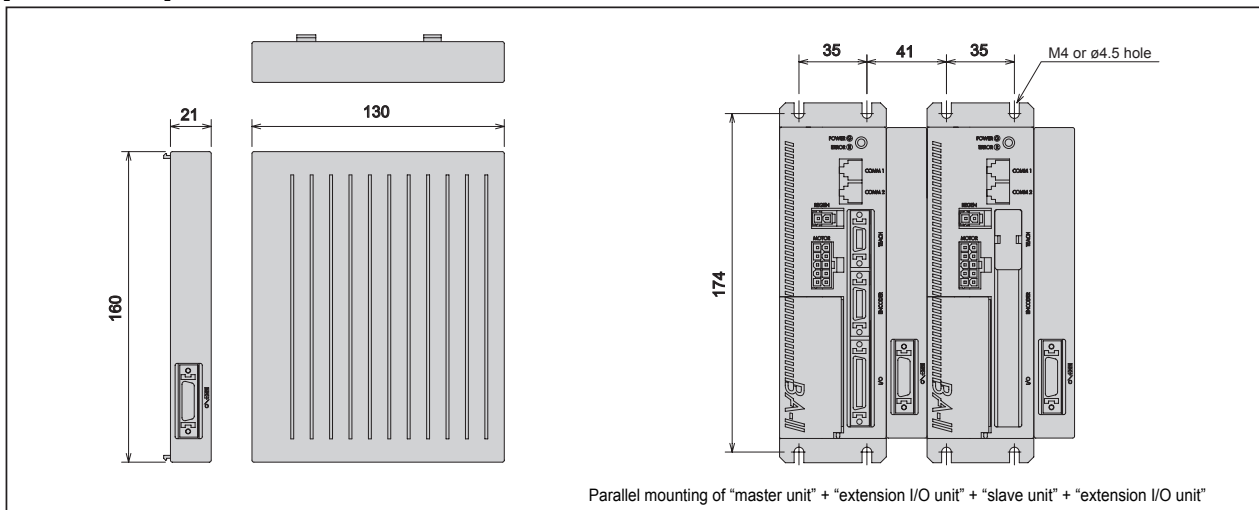
* See Page 238 of Technical Notes for I/O connections.

Connector pin arrangement on panel side	No.	I/O	Signal name	No.	I/O	Signal name
<p>(Bottom view)</p>	1		+COM5	14		COM6
	2	Output	General-purpose output port 2-1	15	Input	General-purpose input port 2-1
	3	Output	General-purpose output port 2-2	16	Input	General-purpose input port 2-2
	4	Output	General-purpose output port 2-3	17	Input	General-purpose input port 2-3
	5	Output	General-purpose output port 2-4	18	Input	General-purpose input port 2-4
	6	Output	General-purpose output port 2-5	19	Input	General-purpose input port 2-5
	7	Output	General-purpose output port 2-6	20	Input	General-purpose input port 2-6
	8	Output	General-purpose output port 2-7	21	Input	General-purpose input port 2-7
	9	Output	General-purpose output port 2-8	22	Input	General-purpose input port 2-8
	10		NC	23	Input	General-purpose input port 3-1
	11		NC	24	Input	General-purpose input port 3-2
	12		NC	25	Input	General-purpose input port 3-3
	13		-COM5	26	Input	General-purpose input port 3-4

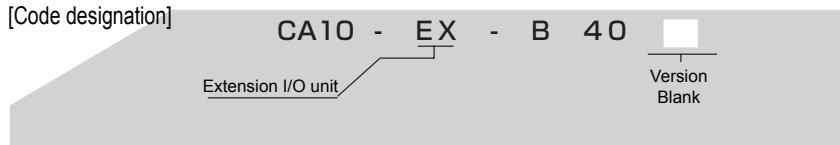
* For I/O connection, use an attached plug or separately available I/O cable unit (for extension I/O).

NC: No Connection

[Dimensions]



Parallel mounting of "master unit" + "extension I/O unit" + "slave unit" + "extension I/O unit"



[Applicable controller]

CA10-M00B

[Specifications]

Input		Output	
No. of inputs	24 points	No. of outputs	16 points
Input rating	DC24 V, 10 mA/ point	Output signal	Transistor output (open collector)
Insulation	Photo-coupler	Output rating	DC24 V, max. 300 mA/ point
Common	Common to entire 1 circuit	Insulation	Photo-coupler
External connection	Connector (shared with output)	Common	Common to entire 1 circuit

* Power supply for external devices is not incorporated.

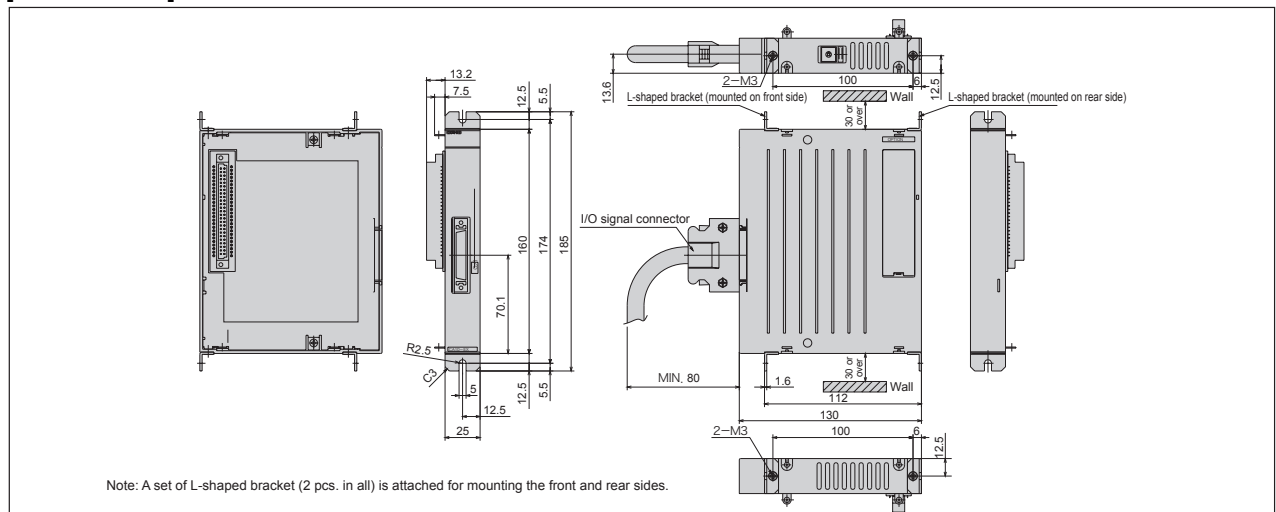
[Input pin number and signal name]

* See Page 239 of Technical Notes for I/O connections.

Connector pin arrangement on panel side	No	I/O	Signal	No.	I/O	Signal
<p>(Bottom view)</p>	1		+COM1	26	Input	General-purpose input port 1-1
	2	Output	General-purpose output port 1-1	27	Input	General-purpose input port 1-2
	3	Output	General-purpose output port 1-2	28	Input	General-purpose input port 1-3
	4	Output	General-purpose output port 1-3	29	Input	General-purpose input port 1-4
	5	Output	General-purpose output port 1-4	30	Input	General-purpose input port 1-5
	6	Output	General-purpose output port 1-5	31	Input	General-purpose input port 1-6
	7	Output	General-purpose output port 1-6	32	Input	General-purpose input port 1-7
	8	Output	General-purpose output port 1-7	33	Input	General-purpose input port 1-8
	9	Output	General-purpose output port 2-1	34	Input	General-purpose input port 2-1
	10	Output	General-purpose output port 2-2	35	Input	General-purpose input port 2-2
	11	Output	General-purpose output port 2-3	36	Input	General-purpose input port 2-3
	12	Output	General-purpose output port 2-4	37	Input	General-purpose input port 2-4
	13	Output	General-purpose output port 2-5	38	Input	General-purpose input port 2-5
	14		-COM3	39	Input	General-purpose input port 2-6
	15		-COM3	40	Input	General-purpose input port 2-7
	16		+COM3	41	Input	General-purpose input port 2-8
	17	Output	General-purpose output port 2-5	42	Input	General-purpose input port 3-1
	18	Output	General-purpose output port 2-6	43	Input	General-purpose input port 3-2
	19	Output	General-purpose output port 2-7	44	Input	General-purpose input port 3-3
	20	Output	General-purpose output port 2-8	45	Input	General-purpose input port 3-4
	21	Input	General-purpose input port 3-5	46		Spare
	22	Input	General-purpose input port 3-6	47		Spare
	23	Input	General-purpose input port 3-7	48		Spare
	24	Input	General-purpose input port 3-8	49		Spare
	25		-COM3	50		Spare

* For I/O connection, use an attached plug or separately available I/O cable unit (for extension I/O).

[Dimensions]



Component

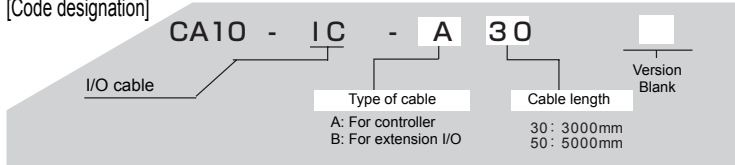
I/O Cable

[Application]

Used to connect a controller (master unit, slave unit) or an I/O port of an extension I/O unit to transmit signals with an external operation panel or control device.
 A plug is attached to one side of the cable, which can be connected directly to the controller.
 The I/O cable should be connected to an external device according to the color marking put on the cable core leads and the sign table.
 Before connecting the external device, the cable core leads should be treated with a crimp-terminal.



[Code designation]

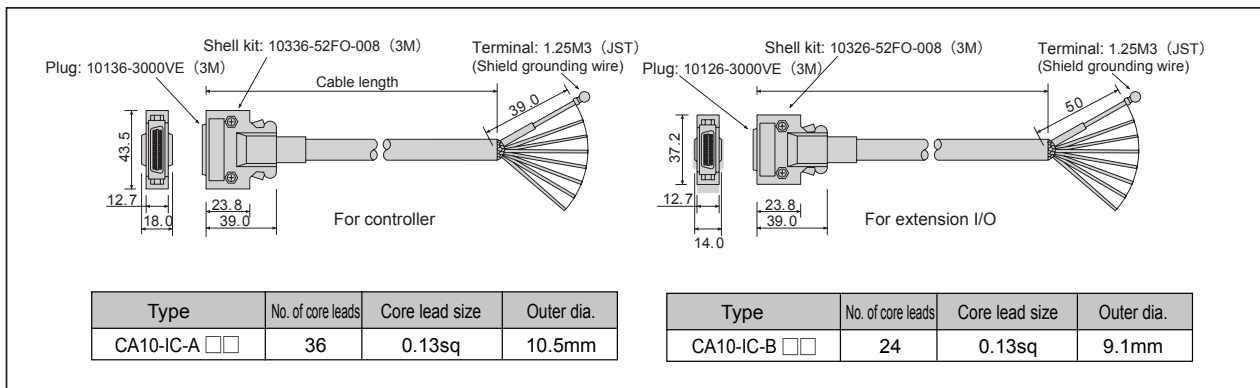


[Unit connected]

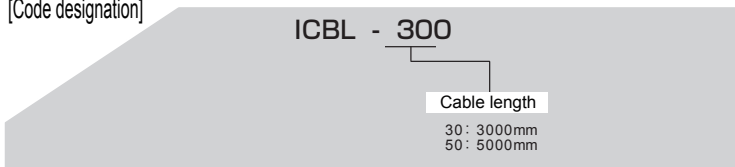
Controller: CA20-M10, CA20-M40,
 CA20-S10, CA20-S40
 Extension I/O unit: CA20-EX-A20

* The I/O cables for controller and extension I/O differ in the number of cable core leads and plug. (For controller: 36-pin, for extension I/O: 26-pin)

[Dimensions]



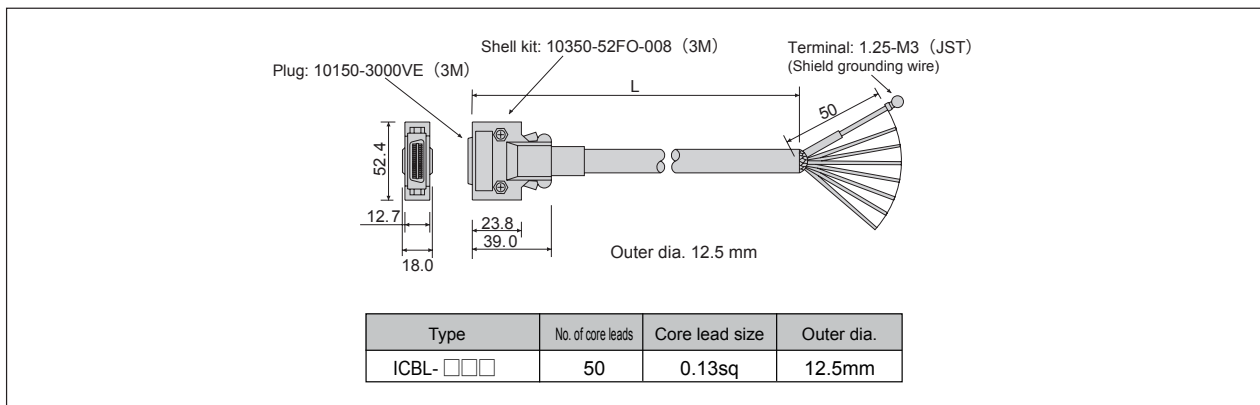
[Code designation]



[Unit connected]

Controller: CA10-M00B, CA10-M00, CA20-M01
 Extension I/O unit: CA10-EX-B40

[Dimensions]



* The I/O cable is shielded to improve noise resistance. Ground the shield wire as necessary.
 * The I/O cable is not resistant to repeated bending.

Software for Personal Computer

[Application]

Software for personal computer SF-98D has been developed to support programming of the ROiBot BAII series by using a personal computer as the host computer.

It is possible to transfer program data, etc. of the robot controller to the personal computer and vice versa, edit and save it, to monitor the I/O status and coordinate values and to execute a program, jog motion, home return, etc. This software is optimized for debugging and maintenance.

[Code designation]



[Applicable controller]

All types: CA20-M10, CA20-M40, CA10-M00B, CA10-M01B, CA20-M00, CA20-M01

[Specifications]

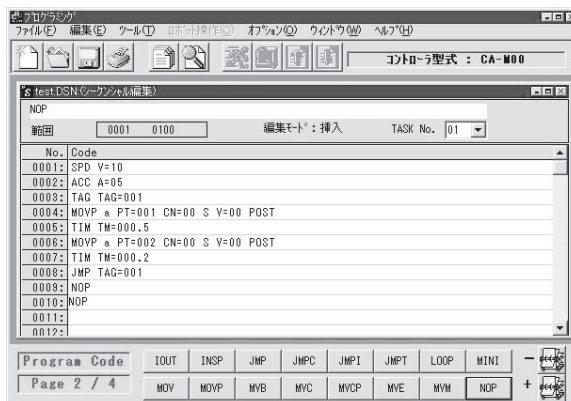
Contents of package		CD-ROM: 1 pc. Installation manual: 1 copy (Communication cable PCBL-31 is available for an extra price.)
System configuration required	Personal computer	Serial communication port (Din-sub 9-pin) IBM PC/AT compatible computer equipped with CD-ROM drive Available memory size: 12 MB or over Available hard disk size: 10 MB or over
	Operating system (OS)	Japanese version of Microsoft Windows95, Windows98, Windows Me, WindowsNT4.0, Windows2000 and Windows XP
	Display	SVGA or over (resolution 800 × 600 pixel, or over)
	Printer	Printer which can be connected with your personal computer and allows printing from Windows.
	Communication cable	Used to connect the personal computer and controller. Use PCBL-31.
Applicable controller		BA series master unit (CA20-M10, CA20-M40, CA10-M00B, CA10-M01BB, CA10-M00, CA20-M01)

* Microsoft Windows, Microsoft Windows NT and Windows logotype are the registered trademarks or trademarks of Microsoft Corporation in the United States.

[Features]

- Programs can be edited easily by using the multi-window screen editor
- Programs and table data can be sent to and received from the robot controller. Additionally, such data can be saved as a file.
- Axis motions can be controlled by teaching or program execution.
- At printing of a program (i.e., output to the printer), a title and comment can be included. Thus, this software is very convenient for debugging and confirmation of data.

- Editing screen of sequence program



- Editing screen of coordinate table

Data in CSV format as created by using the Excel, etc. can also be input.

No.	A1	A2	A3	A4	Comment
001	+0000.00	+0000.00	+0000.00	+0000.00	
002	+0000.00	+0000.00	+0000.00	+0000.00	
003	+0000.00	+0000.00	+0000.00	+0000.00	
004	+0000.00	+0000.00	+0000.00	+0000.00	
005	+0000.00	+0000.00	+0000.00	+0000.00	
006	+0000.00	+0000.00	+0000.00	+0000.00	
007	+0000.00	+0000.00	+0000.00	+0000.00	
008	+0000.00	+0000.00	+0000.00	+0000.00	
009	+0000.00	+0000.00	+0000.00	+0000.00	
010	+0000.00	+0000.00	+0000.00	+0000.00	
011	+0000.00	+0000.00	+0000.00	+0000.00	
012	+0000.00	+0000.00	+0000.00	+0000.00	
013	+0000.00	+0000.00	+0000.00	+0000.00	
014	+0000.00	+0000.00	+0000.00	+0000.00	

Component

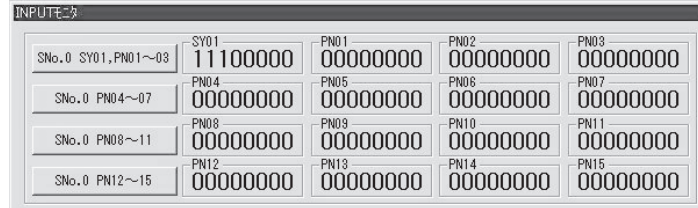
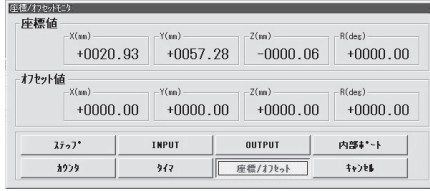
● Robot operation screen

Operations such as program execution and jog motion, which are the same as in the teach pendant, are possible.

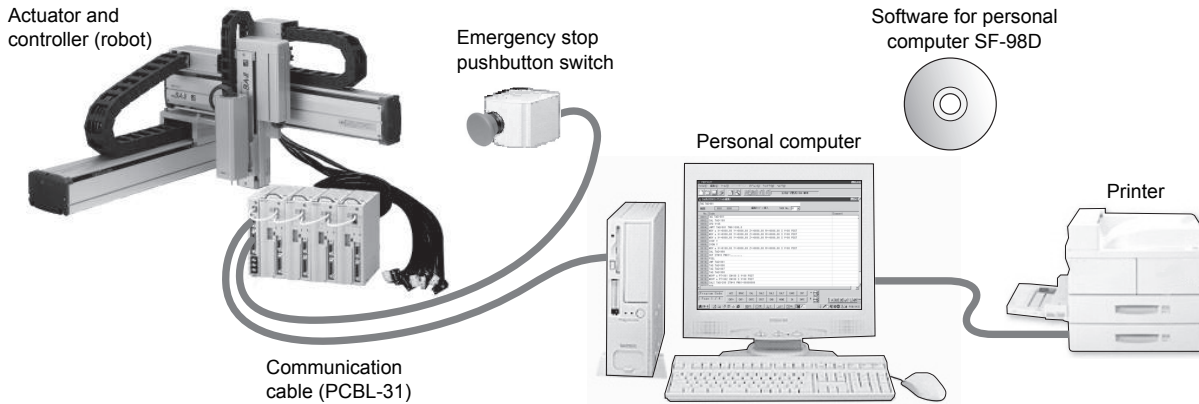


● Monitor screen

Current position coordinates, I/O port status can be monitored.



[Connections]



Communication cable (RS232C)

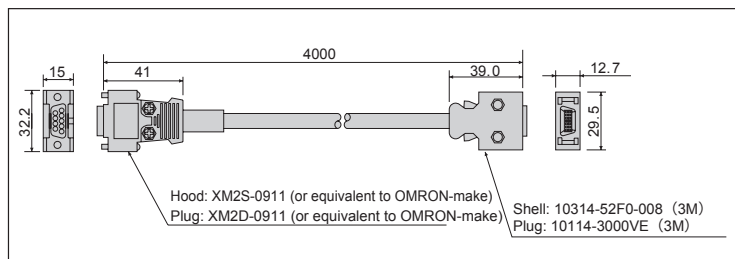
[Application]

This cable connects the controller and personal computer (IBM/PC compatible).
It is used when using the software for personal computer.

[Code designation]

PCBL - 31

[Dimensions]



Lithium Battery for Encoder Backup

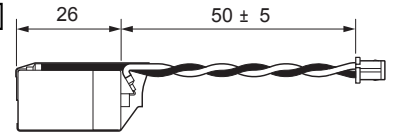
[Application]

Mounted on the controller as a backup battery for an absolute encoder
 One each of this battery is attached to master unit CA20-M10/CA20-M40 and slave unit CA20-S10/CA20-S40 as standard.
 Use this battery for the replacement or spare purpose.

[Code designation]



[Dimensions]



[Applicable controller]

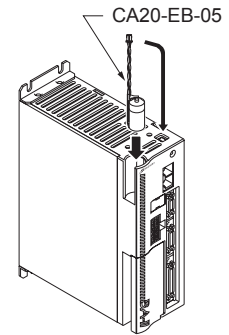
CA20-M10, CA20-M40, CA20-S10, CA20-S40

[Specifications]

Item		Description	
Specification	Nominal voltage, Ampere-hour	3.6 V, 1000 mAh	
	Outer dimensions	Battery body	∅ 14.5 × 26 mm (excluding projection)
		Harness length	50±5 mm (excluding connectors)
	Mass	Approx. 10 g	
Backup duration (Note 1)		Approx. 50,000 hours (Note 2)	

Note 1: Total time when the controller power is turned off.

Note 2: Duration of battery varies with the ambient temperature, etc. The figure only provides a yardstick.



[Application]

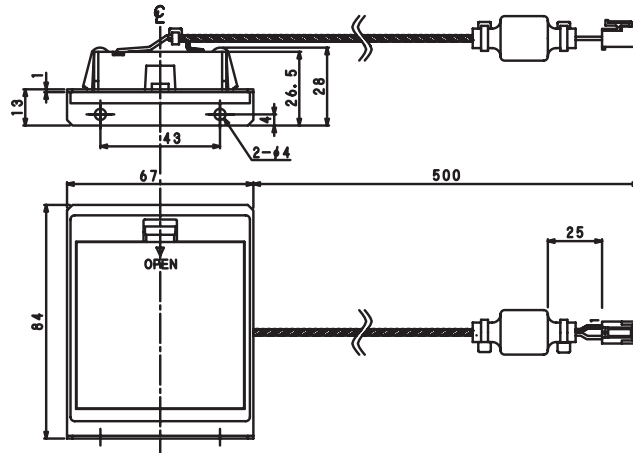
This is a battery case for connecting to the controller as a power supply for the absolute encoder.

*The controller VLASX-025P2-SVM is not included in the standard configuration. It must be purchased separately.

[Model]

LRV 03

[Dimensions]



[Compatible Controller]

VLASX-025P2-SVM

[Specifications]

Item		Description	
Specifications	Nominal voltage and capacity	4.5V 2000mAh (based on the battery used)	
	Type	Battery	Alkaline AA size battery
		Harness length	500 mm (not including connectors)
Backup retention time (Note 1)		Approx. 1.5 years (Note 2)	

Note 1: This is the cumulative time that the controller power supply is left off.

Note 2: The battery retention time varies based on the temperature and other conditions. The values provided here are intended as a general guideline only.

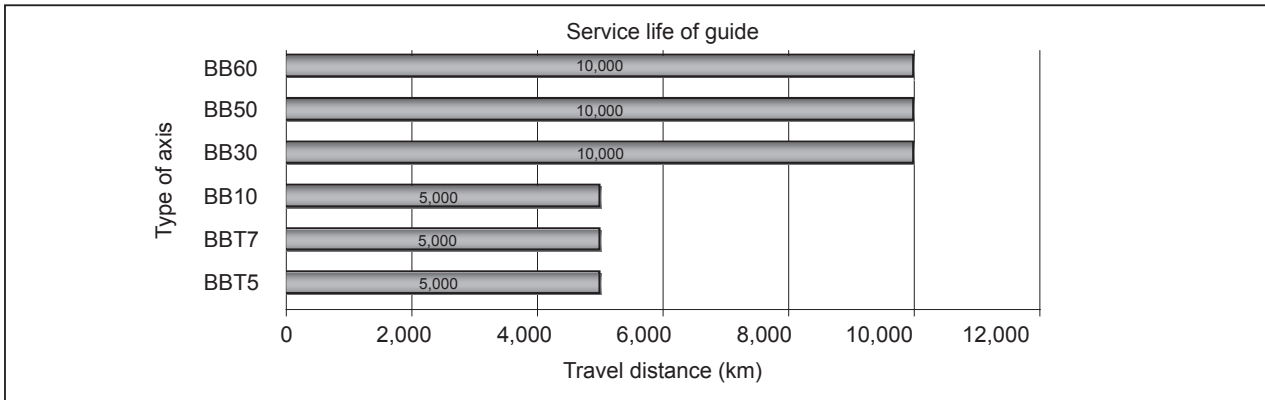
Technical Notes

Actuator	
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Service Life of Guide

Maximum payload and allowable load moment given in this manual are the values calculated based on the following service life of guide.

They are commonly used for both ball-screw driven and timing-belt driven axes of each axis type.



Allowable Load Moment

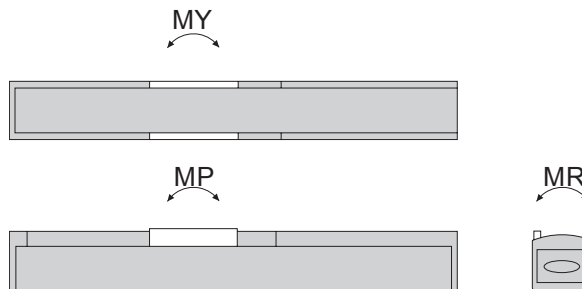
As the moment caused by a load imposed on the actuator largely affects the slider bearing unit, the following matters should be considered at use.

- ◆ A load exceeding the maximum payload should not be exerted.
This value can be determined based on the servo motor capacity and differs with the acceleration/deceleration time.
- ◆ The moment should not exceed the allowable static load moment.
This is the moment caused during stop. For the inserting work by using a cylinder attached to the slider, reaction force should be considered.
Impact load MUST NOT be exerted.
- ◆ The moment should not exceed the allowable dynamic load moment.
This is the moment caused by acceleration or deceleration.
The value varies with the load, arm length, direction, etc. Refer to the value given in the table below as a yardstick.

Both allowable static load moment and allowable dynamic load moment are described below. For the maximum payload, see the specifications of each actuator.

1. Allowable Static Load Moment

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



Allowable static load moment N·m	M R						M P						M Y								
	BBT5	BBT7	BB10	BB30	BB50	BB60G	BB60J	BBT5	BBT7	BB10	BB30	BB50	BB60G	BB60J	BBT5	BBT7	BB10	BB30	BB50	BB60G	BB60J
Short slider (S)	-	-	49	-	-	-	-	-	-	14	-	-	-	-	-	-	13	-	-	-	-
Medium slider (M)	31	58	59	510	2080	2700	3500	31	25.7	59	430	2160	3000	4000	12	25.7	54	370	1820	2250	3000
Long slider (L)	-	-	-	510	2080	2700	3500	-	-	-	750	3150	4750	6200	-	-	-	650	2640	3450	4750

2. Allowable Dynamic Load Moment

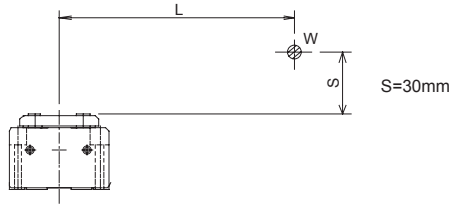
Dynamic load moment of an actuator largely influences its life and performance. Allowable dynamic load moment should be calculated, considering the acceleration/deceleration time, (acceleration), load, arm length, direction, speed, stroke, etc., based on the allowable moment of bearing.

Given in the following pages are the tables of allowable dynamic load moment tabulating the load and allowable arm length so that the allowable dynamic load moment can be obtained easily.

Load mass (W kg) and arm length up to the center of gravity of the load (L mm) are shown in each table. (They are not the values of allowable load moment.)

[Table of allowable dynamic load moment] BBT5, BBT7

Load mass (W kg) and arm length up to the center of gravity of the load (L mm) are shown in each table. (They are not the values of allowable load moment.)



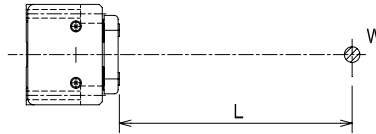
[Mounted horizontally]

BBT5	Lead 12										Lead 6				
W [kg]	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	6	7	8	9	10
L [mm]	1540	760	500	370	290	240	210	175	150	135	130	120	100	90	80

* Speed Lead 12: 800 mm/s, Lead 6: 400 mm/s (when using a stroke of 450 mm or less) Acceleration/deceleration time: 0.3 sec

BBT7	Lead 12										Lead 6										
W [kg]	1	2	3	4	5	6	7	8	9	10	11	12	14	16	18	20	22	24	26	28	30
L [mm]	2395	1180	775	575	455	370	315	270	235	210	185	170	165	160	150	130	120	105	95	85	80

★ Speed Lead 12: 800 mm/s, Lead 6: 400 mm/s (when using a stroke of 550 mm or less) Acceleration/deceleration time: 0.3 sec



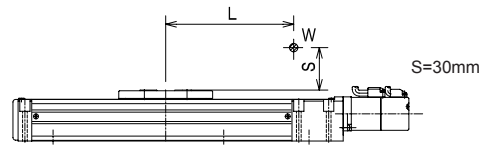
[Mounted horizontally] Wall-mounted

BBT5	Lead 12										Lead 6				
W [kg]	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	6	7	8	9	10
L [mm]	1600	780	505	365	285	230	190	160	140	120	110	85	70	55	45

★ Speed Lead 12: 800 mm/s, Lead 6: 400 mm/s (when using a stroke of 450 mm or less) Acceleration/deceleration time: 0.3 sec

BBT7	Lead 12										Lead 6										
W [kg]	1	2	3	4	5	6	7	8	9	10	11	12	14	16	18	20	22	24	26	28	30
L [mm]	2460	1200	780	570	445	360	300	255	220	195	170	150	140	130	110	90	75	65	55	45	35

★ Speed Lead 12: 800 mm/s, Lead 6: 400 mm/s (when using a stroke of 550 mm or less) Acceleration/deceleration time: 0.3 sec



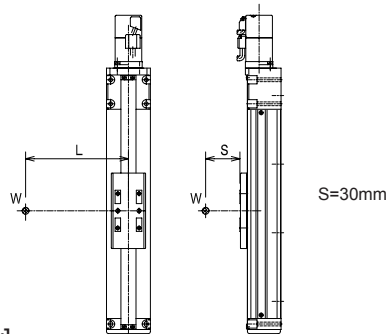
[Mounted horizontally]

BBT5	Lead 12										Lead 6				
W [kg]	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	6	7	8	9	10
L [mm]	795	395	260	195	150	125	105	90	80	70	60	50	40	35	30

★ Speed Lead 12: 800 mm/s, Lead 6: 400 mm/s (when using a stroke of 450 mm or less) Acceleration/deceleration time: 0.3 sec

BBT7	Lead 12										Lead 6										
W [kg]	1	2	3	4	5	6	7	8	9	10	11	12	14	16	18	20	22	24	26	28	30
L [mm]	990	490	325	240	190	155	135	115	100	92	82	75	65	57	49	43	39	35	31	29	27

★ Speed Lead 12: 800 mm/s, Lead 6: 400 mm/s (when using a stroke of 550 mm or less) Acceleration/deceleration time: 0.3 sec



[Mounted vertically]

BB05	Lead 12			Lead 6		
W [kg]	0.5	1	1.5	2	2.5	3
L [mm]	720	335	205	150	110	70

★ Speed Lead 12: 800 mm/s, Lead 6: 400 mm/s (when using a stroke of 450 mm or less) Acceleration/deceleration time: 0.3 sec

BB07	Lead 12				Lead 6			
W [kg]	1	2	3	4	5	6	7	8
L [mm]	915	435	275	195	160	130	105	85

★ Speed Lead 12: 800 mm/s, Lead 6: 400 mm/s (when using a stroke of 550 mm or less) Acceleration/deceleration time: 0.3 sec

[Mounted vertically]

BB05	Lead 12			Lead 6		
W [kg]	0.5	1	1.5	2	2.5	3
L [mm]	750	365	235	180	140	110

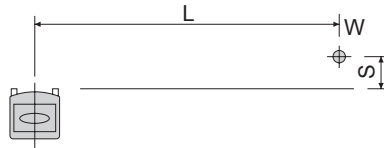
★ Speed Lead 12: 800 mm/s, Lead 6: 400 mm/s (when using a stroke of 450 mm or less) Acceleration/deceleration time: 0.3 sec

BB07	Lead 12				Lead 6			
W [kg]	1	2	3	4	5	6	7	8
L [mm]	920	440	285	205	160	130	105	85

★ Speed Lead 12: 800 mm/s, Lead 6: 400 mm/s (when using a stroke of 550 mm or less) Acceleration/deceleration time: 0.3 sec

[Table of allowable dynamic load moment] BB10, BB30, BB50, BB60

Load type I [Mounted horizontally]



When S = 50 mm:

Arm length up to the center of gravity of load: L

(mm)

Drive system	Actuator	Speed (mm/s)	Lead (mm)	Slider	Load: W																
					5kg	10kg	15kg	20kg	25kg	30kg	35kg	40kg	45kg	50kg	55kg	60kg	65kg	70kg	75kg	80kg	
Ball screw	BB10E	1200	20	S	375	175	105	—	—	—	—	—	—	—	—	—	—	—	—	—	
				M	700	355	240	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		600	10	S	560	270	180	135	110	90	—	—	—	—	—	—	—	—	—	—	—
				M	810	395	270	205	167	140	—	—	—	—	—	—	—	—	—	—	—
		300	5	S	615	320	210	160	140	110	97	85	77	70	—	—	—	—	—	—	—
				M	820	405	275	210	172	145	120	100	87	75	—	—	—	—	—	—	—
	BB30E	1200	20	M	1182	590	410	315	—	—	—	—	—	—	—	—	—	—	—	—	
				L	1342	670	467	360	—	—	—	—	—	—	—	—	—	—	—	—	
		600	10	M	1480	740	515	400	330	285	252	215	185	160	—	—	—	—	—	—	
				L	1542	775	537	415	347	300	262	225	192	165	—	—	—	—	—	—	
		(300)	(5)	M	1485	775	535	415	345	300	265	225	190	165	145	125	110	100	90	80	—
				L	1542	775	535	415	345	300	265	225	190	165	145	125	110	100	90	80	—
	BB30F	1200	20	M	1135	590	410	315	260	225	200	165	—	—	—	—	—	—	—	—	
				L	1290	670	465	360	300	260	230	195	—	—	—	—	—	—	—	—	
		600	10	M	1425	740	515	400	330	285	252	215	185	160	140	120	110	95	85	75	
				L	1485	775	535	415	345	300	265	225	190	165	145	125	110	100	90	80	
		(300)	(5)	M	1485	775	535	415	345	300	265	225	190	165	145	125	110	100	90	80	—
				L	1485	775	535	415	345	300	265	225	190	165	145	125	110	100	90	80	—
	BB50F	1200	20	M	5320	2620	1720	1270	1000	820	690	595	520	460	410	370	—	—	—	—	
				L	5545	2730	1795	1325	1040	855	720	620	540	480	430	385	—	—	—	—	
		600	10	M	5875	2895	1900	1405	1105	905	765	655	575	510	455	410	370	335	310	285	
				L	5945	2925	1920	1420	1115	915	770	665	580	515	460	415	375	340	315	290	
		(300)	(5)	M	5875	2895	1900	1405	1105	905	765	655	575	510	455	410	370	335	310	285	
				L	5945	2925	1920	1420	1115	915	770	665	580	515	460	415	375	340	315	290	
BB50G	1200	20	M	5320	2620	1720	1270	1000	820	690	595	520	460	410	370	335	305	280	255		
			L	5545	2730	1795	1325	1040	855	720	620	540	480	430	385	350	320	290	265		
	600	10	M	5875	2895	1900	1405	1105	905	765	655	575	510	455	410	370	335	310	285		
			L	5945	2925	1920	1420	1115	915	770	665	580	515	460	415	375	340	315	290		
	(300)	(5)	M	5875	2895	1900	1405	1105	905	765	655	575	510	455	410	370	335	310	285		
			L	5945	2925	1920	1420	1115	915	770	665	580	515	460	415	375	340	315	290		

★ The speed is applicable when axis stroke is 600 mm or less (acceleration/deceleration time: 0.36 sec).

(mm)

Drive system	Actuator	Speed (mm/s)	Lead (mm)	Slider	Load: W									
					85kg	90kg	95kg	100kg	110kg	120kg	130kg	140kg	150kg	
Ball screw	BB50F	600	10	M	260	245	225	210	—	—	—	—	—	—
				L	270	245	230	210	—	—	—	—	—	
	BB50G	1200	20	M	235	215	200	185	—	—	—	—	—	
				L	245	230	210	195	—	—	—	—	—	
	600	10	M	260	245	225	210	180	160	140	125	110	—	
			L	270	245	230	210	185	160	140	125	110	—	

★ The speed is applicable when axis stroke is 600 mm or less (acceleration/deceleration time: 0.36 sec).

(mm)

Drive system	Actuator	Speed (mm/s)	Lead (mm)	Slider	Load: W															
					10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	
Ball screw	BB60G	1200	20	M	7050	3450	2300	1700	1350	1100	950	800	700	650	—	—	—	—	—	
				L	7700	3800	2500	1850	1500	1200	1050	900	800	700	—	—	—	—	—	
		600	10	M	8400	4150	2750	2050	1600	1350	1150	950	850	750	700	600	550	500	500	
				L	8700	4300	2850	2100	1650	1350	1150	1000	900	800	700	650	600	550	500	

★ The speed is applicable when axis stroke is 700 mm or less (acceleration/deceleration time: 0.36 sec).

(mm)

Drive system	Actuator	Speed (mm/s)	Lead (mm)	Slider	Load: W															
					110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	
Ball screw	BB60J	900	20	M	800	700	700	600	500	500	500	400	400	400	—	—	—	—		
				L	800	800	700	600	600	500	500	500	400	400	—	—	—	—		
		450	10	M	900	800	700	700	600	600	500	500	400	400	400	400	400	300	—	
				L	900	800	800	700	600	600	600	500	500	500	400	400	400	400	300	

★ The speed is applicable when axis stroke is 1000 mm or less (acceleration/deceleration time: 0.27 sec).

Arm length up to the center of gravity of load: L

(mm)

Drive system	Actuator	Speed (mm/s)	Lead (mm)	Slider	Load: W							
					5kg	10kg	15kg	20kg	25kg	30kg	35kg	40kg
Timing belt	BB10E	1000	21	S	375	175	105	—	—	—	—	—
				M	700	355	240	—	—	—	—	—
	BB10F	1000	21	S	375	175	105	70	—	—	—	—
				M	700	355	240	180	—	—	—	—
	2000	42	S	112	52	—	—	—	—	—	—	—
			M	210	106	—	—	—	—	—	—	—
	BB30E	1000	21	M	1182	590	410	—	—	—	—	—
				L	1342	670	467	—	—	—	—	—
	BB30F	1000	21	M	1135	590	410	315	260	225	200	165
				L	1290	670	465	360	300	260	230	195
	2000	42	M	454	236	164	126	—	—	—	—	—
			L	516	268	186	144	—	—	—	—	—
	BB50F	1000	21	M	5320	2620	1720	1270	1000	850	690	595
				L	5545	2730	1795	1325	1040	855	720	620
	BB50G	2000	42	M	2128	1048	688	508	—	—	—	—
				L	2218	1092	718	530	—	—	—	—

★ The speed is applicable when the lead is 21 mm and acceleration/deceleration time is 0.3 sec, and when the lead is 42 mm and acceleration/deceleration time is 0.5 sec.

[Table of allowable dynamic load moment] BB10, BB30, BB50, BB60

When S = 200 mm:

Arm length up to the center of gravity of load: L

(mm)

Drive system	Actuator	Speed (mm/s)	Lead (mm)	Slider	Load: W															
					5kg	10kg	15kg	20kg	25kg	30kg	35kg	40kg	45kg	50kg	55kg	60kg	65kg	70kg	75kg	80kg
Ball screw	BB10E	1200	20	S	310	105	—	—	—	—	—	—	—	—	—	—	—	—	—	
				M	690	340	220	—	—	—	—	—	—	—	—	—	—	—	—	—
		600	10	S	537	245	150	105	75	50	—	—	—	—	—	—	—	—	—	—
				M	790	390	265	200	165	135	—	—	—	—	—	—	—	—	—	—
		300	5	S	622	300	200	150	120	100	87	75	67	60	—	—	—	—	—	—
				M	820	405	275	210	172	145	120	100	87	75	—	—	—	—	—	—
	BB30E	1200	20	M	1180	585	400	305	—	—	—	—	—	—	—	—	—	—	—	
				L	1342	670	462	355	—	—	—	—	—	—	—	—	—	—	—	
		600 (300)	10 (5)	M	1480	740	515	395	330	280	250	215	180	155	—	—	—	—	—	
				L	1542	770	537	415	345	295	262	225	190	165	—	—	—	—	—	
	BB30F	1200	20	M	1135	585	400	305	225	185	155	130	—	—	—	—	—	—	—	
				L	1290	670	460	355	295	250	220	190	—	—	—	—	—	—	—	
		600 (300)	10 (5)	M	1425	740	510	395	330	280	250	215	180	155	135	120	105	90	80	70
				L	1485	770	535	415	345	295	265	225	190	165	145	125	110	100	85	45
	BB50F	1200	20	M	5320	2620	1720	1265	995	815	685	590	515	450	400	360	—	—	—	
				L	5545	2730	1790	1325	1040	855	720	615	540	475	425	380	—	—	—	
		600 (300)	10 (5)	M	5875	2895	1900	1400	1105	905	765	655	575	505	455	405	370	335	310	285
				L	5945	2925	1920	1420	1115	915	770	665	580	515	460	415	375	340	310	285
	BB50G	1200	20	M	5320	2620	1720	1265	995	815	685	590	515	450	400	360	325	295	270	245
				L	5545	2730	1790	1325	1040	855	720	615	540	475	425	380	345	315	285	260
		600 (300)	10 (5)	M	5785	2895	1900	1400	1105	905	765	655	575	505	455	405	370	335	310	285
				L	5945	2925	1920	1420	1115	915	770	665	580	515	460	415	375	340	310	285

★ The speed is applicable when axis stroke is 600 mm or less (acceleration/deceleration time: 0.36 sec).

(mm)

Drive system	Actuator	Speed (mm/s)	Lead (mm)	Slider	Load: W									
					85kg	90kg	95kg	100kg	110kg	120kg	130kg	140kg	150kg	
Ball screw	BB50F	600 (300)	10 (5)	M	260	240	225	210	—	—	—	—	—	—
				L	265	245	225	210	—	—	—	—	—	
	BB50G	1200	20	M	225	205	190	175	—	—	—	—	—	
				L	240	220	205	190	—	—	—	—		
		600 (300)	10 (5)	M	260	240	225	210	180	160	140	120	105	
				L	265	245	225	210	185	160	140	125	110	

★ The speed is applicable when axis stroke is 600 mm or less (acceleration/deceleration time: 0.36 sec).

(mm)

Drive system	Actuator	Speed (mm/s)	Lead (mm)	Slider	Load: W														
					10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Ball screw	BB60G	1200	20	M	7050	3450	2300	1700	1350	1100	950	800	700	650					
				L	7700	3800	2500	1850	1500	1200	1050	900	800	700					
		600	10	M	8400	4150	2750	2050	1600	1350	1150	950	850	750	700	600	550	500	500
				L	8700	4300	2850	2100	1650	1350	1150	1000	900	800	700	650	600	550	500

★ The speed is applicable when axis stroke is 700 mm or less (acceleration/deceleration time: 0.36 sec).

(mm)

Drive system	Actuator	Speed (mm/s)	Lead (mm)	Slider	Load: W														
					110	120	130	140	150	160	170	180	190	200	210	220	230	240	250
Ball screw	BB60J	900	20	M	800	700	600	600	500	500	500	400	400						
				L	800	800	700	600	600	500	500	400	400						
		450	10	M	900	800	700	700	600	600	500	500	400	400	400	400	300		
				L	900	800	800	700	600	600	500	500	400	400	400	400	300		

★ The speed is applicable when axis stroke is 1000 mm or less (acceleration/deceleration time: 0.27 sec).

Arm length up to the center of gravity of load: L

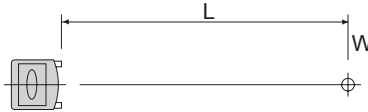
(mm)

Drive system	Actuator	Speed (mm/s)	Lead (mm)	Slider	Load: W								
					5kg	10kg	15kg	20kg	25kg	30kg	35kg	40kg	
Timing belt	BB10E	1000	21	S	310	105	—	—	—	—	—	—	—
				M	690	340	220	—	—	—	—	—	
	BB10F	1000	21	S	310	105	—	—	—	—	—	—	
				M	690	340	220	160	—	—	—	—	
	2000	42	S	93	31	—	—	—	—	—	—		
			M	207	102	66	48	—	—	—	—		
	BB30E	1000	21	M	1180	585	400	—	—	—	—		
				L	1342	670	462	—	—	—	—		
	BB30F	1000	21	M	1135	585	400	305	225	185	155	130	
				L	1290	670	460	355	295	250	220	190	
		2000	42	M	454	454	454	454	—	—	—	—	
				L	516	268	184	142	—	—	—	—	
	BB50F	1000	21	M	5320	2620	1720	1265	995	815	685	590	
				L	5545	2730	1790	1325	1040	855	720	615	
	BB50G	2000	42	M	2128	1048	688	506	—	—	—	—	
				L	2218	1092	716	530	—	—	—	—	

★ The speed is applicable when the lead is 21 mm and acceleration/deceleration time is 0.3 sec, and when the lead is 42 mm and acceleration/deceleration time is 0.5 sec.

[Table of allowable dynamic load moment] BB10, BB30, BB50, BB60

Load type II [Mounted horizontally]
Wall-mounted



Arm length up to the center of gravity of load: L

(mm)

Drive system	Actuator	Speed (mm/s)	Lead (mm)	Slider	Load: W															
					5kg	10kg	15kg	20kg	25kg	30kg	35kg	40kg	45kg	50kg	55kg	60kg	65kg	70kg	75kg	80kg
Ball screw	BB10E	1200	20	S	335	130	60	—	—	—	—	—	—	—	—	—	—	—	—	
				M	660	290	165	—	—	—	—	—	—	—	—	—	—	—	—	—
		600	10	S	440	165	85	40	12	—	—	—	—	—	—	—	—	—	—	—
				M	715	310	175	110	72	45	—	—	—	—	—	—	—	—	—	—
		300	5	S	467	180	90	45	17	0	—	—	—	—	—	—	—	—	—	—
				M	720	305	175	110	72	45	27	15	3	—	—	—	—	—	—	—
	BB30E	1200	20	M	1342	610	388	275	—	—	—	—	—	—	—	—	—	—	—	
				L	1435	855	413	2990	—	—	—	—	—	—	—	—	—	—	—	
		600 (300)	10 (5)	M	1467	670	423	300	228	175	140	115	95	80	—	—	—	—	—	
				L	1482	675	428	300	228	180	143	115	95	80	—	—	—	—	—	
	BB30F	1200	20	M	1285	610	385	275	205	160	130	105	—	—	—	—	—	—	—	
				L	1375	655	410	290	220	170	135	110	—	—	—	—	—	—	—	
600 (300)		10 (5)	M	1405	670	420	300	225	175	140	115	95	80	65	55	45	35	30	20	
			L	1420	675	425	300	230	180	140	115	95	80	65	55	45	35	30	25	
BB50F	1200	20	M	5690	2815	1855	1375	1085	895	760	655	575	510	460	415	—	—	—		
			L	5900	2915	1920	1425	1125	930	785	680	595	530	475	430	—	—	—		
	600 (300)	10 (5)	M	6055	2995	1975	1460	1155	850	805	695	610	545	490	440	405	370	340	315	
			L	6085	3010	1985	1470	1165	955	810	700	615	545	490	445	405	370	340	315	
BB50G	1200	20	M	5690	2815	1855	1375	1085	895	760	655	575	510	460	415	375	345	320	295	
			L	5900	2915	1920	1425	1125	930	785	680	595	530	475	430	390	360	330	305	
	600 (300)	10 (5)	M	6055	2995	1975	1460	1155	850	805	695	610	545	490	440	405	370	340	315	
			L	6085	3010	1985	1470	1165	955	810	700	615	545	490	445	405	370	340	315	

★ The speed is applicable when axis stroke is 600 mm or less (acceleration/deceleration time: 0.36 sec).

(mm)

Drive system	Actuator	Speed (mm/s)	Lead (mm)	Slider	Load: W								
					85kg	90kg	95kg	100kg	110kg	120kg	130kg	140kg	150kg
Ball screw	BB50F	600 (300)	10 (5)	M	290	272	255	240	—	—	—	—	—
				L	295	275	255	240	—	—	—	—	
		1200	20	M	275	255	240	220	—	—	—	—	
				L	285	265	245	230	—	—	—	—	
	BB50G	600 (300)	10 (5)	M	290	270	255	240	210	185	170	150	135
				L	295	275	255	240	210	190	170	150	135

★ The speed is applicable when axis stroke is 600 mm or less (acceleration/deceleration time: 0.36 sec).

(mm)

Drive system	Actuator	Speed (mm/s)	Lead (mm)	Slider	Load: W														
					10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Ball screw	BB60G	1200	20	M	8365	4065	2665	1965	1515	1265	1065	915	765	665					
				L	8765	4315	2815	2065	1615	1315	1115	965	815	715					
		600	10	M	8965	4365	2865	2115	1665	1365	1115	965	815	715	665	565	515	465	415
				L	9015	4415	2865	2115	1665	1365	1115	965	865	715	665	565	515	465	415

★ The speed is applicable when axis stroke is 700 mm or less (acceleration/deceleration time: 0.36 sec).

(mm)

Drive system	Actuator	Speed (mm/s)	Lead (mm)	Slider	Load: W														
					110	120	130	140	150	160	170	180	190	200	210	220	230	240	250
Ball screw	BB60J	900	20	M	815	715	615	615	515	515	415	415	415	315					
				L	815	715	715	615	615	515	515	415	415	415					
		450	10	M	815	815	715	615	615	515	515	415	415	415	315	315	315	315	215
				L	815	815	715	615	615	515	515	415	415	415	315	315	315	315	315

★ The speed is applicable when axis stroke is 1000 mm or less (acceleration/deceleration time: 0.27 sec).

Arm length up to the center of gravity of load: L

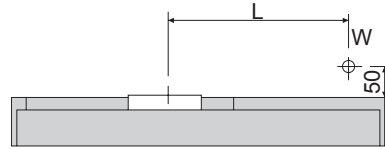
(mm)

Drive system	Actuator	Speed (mm/s)	Lead (mm)	Slider	Load: W								
					5kg	10kg	15kg	20kg	25kg	30kg	35kg	40kg	
Timing belt	BB10E	1000	21	S	335	130	60	—	—	—	—	—	
				M	660	290	165	—	—	—	—		
		BB10F	1000	21	S	335	130	60	35	—	—	—	
					M	660	290	165	105	—	—	—	
	2000	42	S	100	39	—	—	—	—	—			
			M	198	87	—	—	—	—	—			
	BB30E	1000	21	M	1342	610	388	—	—	—	—		
				L	1435	655	413	—	—	—	—		
		BB30F	1000	21	M	1285	610	385	275	205	160	130	105
					L	1375	655	410	290	220	170	135	110
	2000	42	M	514	244	154	110	—	—	—	—		
			L	550	262	164	116	—	—	—	—		
BB50F	1000	21	M	5690	2815	1855	1375	1085	895	760	655		
			L	5900	2915	1920	1425	1125	930	785	680		
BB50G	2000	42	M	2276	1126	742	550	—	—	—	—		
			L	2360	1166	768	570	—	—	—	—		

★ The speed is applicable when the lead is 21 mm and acceleration/deceleration time is 0.3 sec, and when the lead is 42 mm and acceleration/deceleration time is 0.5 sec.

[Table of allowable dynamic load moment] BB10, BB30, BB50, BB60

Load type III [Mounted horizontally]



Arm length up to the center of gravity of load: L

(mm)

Drive system	Actuator	Speed (mm/s)	Lead (mm)	Slider	Load: W																
					5kg	10kg	15kg	20kg	25kg	30kg	35kg	40kg	45kg	50kg	55kg	60kg	65kg	70kg	75kg	80kg	
Ball screw	BB10E	1200	20	S	215	105	70	50	-	-	-	-	-	-	-	-	-	-	-	-	
				M	900	415	265	210	-	-	-	-	-	-	-	-	-	-	-	-	-
		600	10	S	215	105	80	55	47	40	-	-	-	-	-	-	-	-	-	-	-
				M	837	425	265	195	153	120	-	-	-	-	-	-	-	-	-	-	-
		300	5	S	240	120	80	65	52	40	35	30	30	25	-	-	-	-	-	-	-
				M	915	465	295	205	153	120	100	85	72	65	-	-	-	-	-	-	-
	BB30E	1200	20	M	1380	690	480	370	-	-	-	-	-	-	-	-	-	-	-	-	
				L	2400	1200	835	650	-	-	-	-	-	-	-	-	-	-	-	-	
		600 (300)	10 (5)	M	1290	690	483	375	310	265	235	200	170	150	-	-	-	-	-	-	
				L	2400	1205	838	650	540	465	410	350	300	260	-	-	-	-	-	-	
	BB30F	1200	20	M	1330	690	480	370	305	265	235	200	-	-	-	-	-	-	-	-	
				L	2305	1200	835	650	540	465	410	350	-	-	-	-	-	-	-	-	
		600 (300)	10 (5)	M	1300	690	480	375	310	265	235	200	170	150	130	115	100	90	80	70	
				L	2310	1205	835	650	540	465	415	350	300	260	225	200	175	155	140	125	
	BB50F	1200	20	M	6380	3140	2060	1520	1200	980	930	710	620	550	490	440	-	-	-	-	
				L	9280	4570	3000	2215	1745	1430	1205	1040	905	800	715	645	-	-	-	-	
		600 (300)	10 (5)	M	6380	3140	2060	1125	1200	985	830	715	625	550	495	445	400	365	335	310	
				L	9280	4570	3000	2215	1745	1430	1205	1040	910	805	720	645	585	535	490	450	
	BB50G	1200	20	M	6380	3140	2060	1520	1200	980	830	710	620	550	490	440	400	365	335	305	
				L	9280	4570	3000	2215	1745	1430	1205	1040	905	800	715	645	585	55	490	450	
		600 (300)	10 (5)	M	6380	3140	2060	1125	1200	985	830	715	625	550	495	445	400	365	335	310	
				L	9280	4570	3000	2215	1745	1430	1205	1040	910	805	720	645	585	535	490	450	

★ The speed is applicable when axis stroke is 600 mm or less (acceleration/deceleration time: 0.36 sec).

(mm)

Drive system	Actuator	Speed (mm/s)	Lead (mm)	Slider	Load: W									
					85kg	90kg	95kg	100kg	110kg	120kg	130kg	140kg	150kg	
Ball screw	BB50F	600 (300)	10 (5)	M	285	265	245	230	-	-	-	-	-	-
				L	415	385	355	330	-	-	-	-	-	
	BB50G	1200	20	M	280	260	240	225	-	-	-	-	-	
				L	415	385	355	330	-	-	-	-	-	
		600 (300)	10 (5)	M	285	265	245	230	200	175	155	135	120	
				L	415	385	355	330	290	255	225	200	175	

★ The speed is applicable when axis stroke is 600 mm or less (acceleration/deceleration time: 0.36 sec).

(mm)

Drive system	Actuator	Speed (mm/s)	Lead (mm)	Slider	Load: W														
					10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Ball screw	BB60G	1200	20	M	10300	5110	3350	2500	2000	1650	1400	1200	1050	950					
				L	16800	8300	5500	4100	3250	2650	2250	1950	1750	1550					
		600	10	M	10300	5110	3350	2500	2000	1650	1400	1200	1050	950	850	750	700	650	600
				L	16800	8300	5500	4100	3250	2650	2250	1950	1750	1550	1400	1250	1150	1050	950

★ The speed is applicable when axis stroke is 700 mm or less (acceleration/deceleration time: 0.36 sec).

(mm)

Drive system	Actuator	Speed (mm/s)	Lead (mm)	Slider	Load: W														
					110	120	130	140	150	160	170	180	190	200	210	220	230	240	250
Ball screw	BB60J	900	20	M	1100	1000	900	800	800	700	700	600	600	600					
				L	1800	1700	1500	1400	1300	1200	1100	1000	1000	900					
		450	10	M	1100	1000	900	800	800	700	700	600	600	600	500	500	500	400	400
				L	1800	1700	1500	1400	1300	1200	1100	1000	1000	900	900	800	800	700	700

★ The speed is applicable when axis stroke is 1000 mm or less (acceleration/deceleration time: 0.27 sec).

Arm length up to the center of gravity of load: L

(mm)

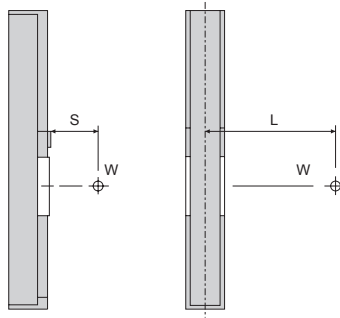
Drive system	Actuator	Speed (mm/s)	Lead (mm)	Slider	Load: W							
					5kg	10kg	15kg	20kg	25kg	30kg	35kg	40kg
Timing belt	BB10E	1000	21	S	215	105	70	-	-	-	-	-
				M	900	415	265	-	-	-	-	
	BB10F	1000	21	S	215	105	70	50	-	-	-	
				M	900	415	265	210	-	-	-	
	2000	42	S	64	31	-	-	-	-	-		
			M	270	124	-	-	-	-	-		
	BB30E	1000	21	M	1380	690	480	-	-	-	-	
				L	2400	1200	835	-	-	-	-	
	BB30F	1000	21	M	1330	690	480	370	305	265	235	200
				L	2305	1200	835	650	540	465	410	350
		2000	42	M	532	276	192	148	-	-	-	-
				L	922	480	334	260	-	-	-	-
	BB50F	1000	21	M	6380	3140	2060	1520	1200	980	830	710
				L	9280	4570	3000	2215	1745	1430	1205	1040
	BB50G	2000	42	M	2552	1256	824	608	-	-	-	-
				L	3712	1828	1200	886	-	-	-	-

★ The speed is applicable when the lead is 21 mm and acceleration/deceleration time is 0.3 sec, and when the lead is 42 mm and acceleration/deceleration time is 0.5 sec.

[Table of allowable dynamic load moment]

BB10, BB30, BB50, BB60

Load type IV [Mounted vertically]



When S = 50mm:

Arm length up to the center of gravity of load: L

(mm)

Drive system	Actuator	Speed (mm/s)	Lead (mm)	Slider	Load: W																					
					3kg	5kg	8kg	10kg	12kg	14kg	16kg	18kg	20kg	22kg	25kg	30kg	35kg	40kg	45kg	50kg	55kg	60kg				
Ball screw	BB10E	1200	20	S	245	110	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
				M	1270	730	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
		600	10	S	255	115	45	20	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
				M	1375	785	460	350	275	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		300	5	S	290	150	75	45	20	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
				M	1390	795	460	350	275	230	190	160	135	115	—	—	—	—	—	—	—	—	—	—	—	—
	BB30E	1200	20	M	1695	985	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
				L	3000	1770	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		600	10	M	1815	1060	635	490	395	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
				L	3210	1895	1155	910	745	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		300	5	M	1835	1070	640	495	400	330	280	240	210	185	—	—	—	—	—	—	—	—	—	—	—	—
				L	3240	1920	1165	920	755	635	545	475	420	375	—	—	—	—	—	—	—	—	—	—	—	—
	BB30F	1200	20	M	1915	1030	585	455	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
				L	3383	1845	1075	845	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		600	10	M	2078	1118	640	495	400	330	280	240	205	—	—	—	—	—	—	—	—	—	—	—	—	—
				L	3655	1995	1165	920	755	625	540	470	415	—	—	—	—	—	—	—	—	—	—	—	—	—
		300	5	M	2073	1118	640	495	400	330	280	240	210	185	145	100	72	60	—	—	—	—	—	—	—	—
				L	3655	1995	1165	920	755	635	545	475	420	375	305	235	193	170	—	—	—	—	—	—	—	—
	BB50F	1200	20	M	9848	5450	3255	2595	2155	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
				L	14343	8037	4750	3795	3155	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		600	10	M	10528	5830	3480	2775	2305	1970	1720	1520	1365	1240	1085	—	—	—	—	—	—	—	—	—	—	—
				L	15330	8497	5080	4055	3375	2885	2520	2235	2005	1820	1595	—	—	—	—	—	—	—	—	—	—	—
		300	5	M	10625	5885	3515	2800	2325	1990	1735	1535	1380	1250	1095	905	770	670	590	525	—	—	—	—	—	—
				L	10838	3942	5130	4095	3405	2910	2545	2255	2025	1840	1610	1335	1140	990	875	785	—	—	—	—	—	—
BB50G	1200	20	M	9848	5450	3255	2595	2155	1840	1605	1420	1275	1155	1010	—	—	—	—	—	—	—	—	—	—		
			L	14343	8037	4750	3795	3155	2695	2355	2090	1875	1700	1490	—	—	—	—	—	—	—	—	—	—	—	
	600	10	M	10528	5830	3480	2775	2305	1970	1720	1520	1365	1240	1085	895	762	660	582	520	—	—	—	—	—		
			L	15330	8497	5080	4055	3375	2885	2520	2235	2005	1820	1595	1325	1127	980	875	775	—	—	—	—	—		
	300	5	M	10625	5885	3515	2800	2325	1990	1735	1535	1380	1250	1095	905	770	670	590	525	475	430	—	—	—		
			L	10838	3942	5130	4095	3405	2910	2545	2255	2025	1840	1610	1335	1140	990	875	785	710	645	—	—	—		

★ The speed is applicable when axis stroke is 600 mm or less (acceleration/deceleration time: 0.36 sec).

(mm)

Drive system	Actuator	Speed (mm/s)	Lead (mm)	Slider	Load: W				
					10	20	30	40	50
Ball screw	BB60G	1200	20	M	9300	4550	3000		
				L	15200	7500	4950		
	600	10	M	10100	5000	3250	2400	1900	
			L	16550	8200	5400	4000	3200	

★ The speed is applicable when axis stroke is 700 mm or less (acceleration/deceleration time: 0.36 sec).

(mm)

Drive system	Actuator	Speed (mm/s)	Lead (mm)	Slider	Load: W										
					10	20	30	40	50	60	70	80	90	100	
Ball screw	BB60J	900	20	M	12600	6200	4100	3000	2400						
				L	20700	10200	6800	5000	4000						
	450	10	M	13400	6600	4300	3200	2500	2100	1800	1500	1300	1200		
			L	21800	10800	7200	5300	4200	3500	3000	2600	2300	2000		

★ The speed is applicable when axis stroke is 1000 mm or less (acceleration/deceleration time: 0.27 sec).

Operation Mode

[Sequential mode]

Mode in which a program created, using instruction words, is executed in the order of steps.

Type of master unit		CA20-M10, CA20-M40	CA10-M00B, CA10-M01B, CA20-M00/CA20-M01
No. of program steps		2,000 steps (Note 1)	2,500 steps (Note 1)
Coordinate table		999 points × 4 tasks	999 points × 1 task
Speed setting		10 steps (variable)	10 steps (variable)
Acceleration/deceleration setting		20 steps (variable)	20 steps (variable)
No. of counters		99	99
No. of timers		9	9
Multitask	Maximum number. of tasks	4 tasks	4 tasks (For axis motion, only one task can be used.)
	Maximum number of controlled axes	4 axes	4 axes
	Maximum number of controlled axes per task	2 axes	4 axes

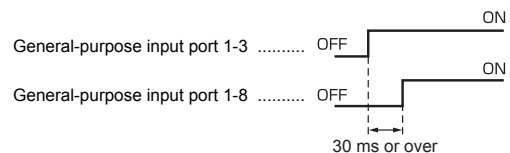
Note 1: Total number of steps of 4 tasks. In the easy mode, the maximum number of steps is 1,000.

Example programming in sequential mode	
<p>[Motion] When general-purpose input port 1-3 is ON after the axes reach point B via point A from the origin, they move to point C (good product). When it is OFF, they move to point D (rejected product).</p> <p style="text-align: center;">X Y</p> <p>Coordinates of point A (100, 0) Coordinates of point B (200, 200) Coordinates of point C (200, 300) Coordinates of point D (300, 200)</p> <p>[Example of using general-purpose input signals] Signal for good product: Port 1-3 ON Signal for rejected product: Port 1-3 OFF For input signal timing: Use of port 1-8</p>	

Flow chart	Example program			
	Step	Command	Data	Comment
	0001	SPD	V=05	
	0002	MOV	a S V=00 X=100 POST Y=0	Point (A)
	0003	MOV	a S V=00 X=200 POST Y=200	Point (B)
	0004	IN	PORT [1] 1	Waiting for input of good or rejected product judgment signal.
	0005	JMP I	10 PORT [1] 1 . .	When general-purpose input port 1-3 is ON, jump to tag No. 10.
	0006	MOV	a S V=00 X=300 POST Y=200	Point (D) (when rejected product judgment signal has reached)
	0007	END		
	0008	TAG	10	
	0009	MOV	a S V=00 X=200 POST Y=300	Point (C) (when good product judgment signal has reached)
	0010	END		

Note: The CA20-M10 (40) controller uses MOVVP command in lieu of MOV command.

[Input timing of general-purpose input signals]
After the good product or rejected product judgment signal (general-purpose input port 1-3) is ON, the timing signal (general-purpose input port 1-8) is input.



List of commands (instruction words) for sequential mode

Controller: CA20-M10, CA20-M40
Teach pendant: TPH-2A, THP-4C

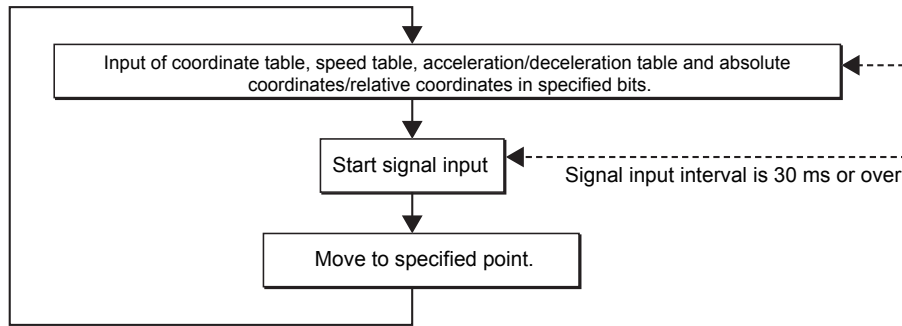
Command	Description
Command for axis movement	
MOVP	Execution of move data value in specified coordinate table.
MVB	Return from current position to just preceding teaching position.
MVE	Escape movement
HOME	Home return command
Command for parameter setting	
SPD	Speed setting
ACC	Acceleration/deceleration setting
OFS	Offset setting
Command for I/O port control	
OUT	Output to general-purpose port.
OUTP	Pulse output to general-purpose port.
OUTC	Counter value output to general-purpose port.
IN	Waiting for input.
INPC	Setting of input status of general-purpose port to counter.
Command for timer/counter control	
TIM	Waiting for time.
TIMP	Preset of timer number and time.
CNT	Preset of counter number and count value.
CNT+	Addition of counter value.
CNT-	Subtraction of counter value.
CNTC	Clear of all counters.
Command for program control	
NOP	Non-operation
RET	Return (declaration of ending a subroutine).
STOP	Stop
END	Program end
TAG	Jump to a tag (destination label)
PSEL	Program selection
Command for servo control	
SVON	Servo ON
SVOF	Servo OFF
Command for matrix operation	
MVM	Matrix movement
LOOP	MVM loop
MINI	Initialization of MVM counter.
Command for jump	
JMP	Unconditional jump.
JMPI	Jump with input condition.
JMPC	Jump with counter condition.
JMPT	Jump with timer condition.
BRAC	Jump to a tag of counter value.
Command for subroutine call	
CAL	Unconditional call (unconditional jump to specified subroutine).
CALI	Call with input condition (call of specified subroutine with input condition).
CALC	Call with counter condition.
CALT	Call with timer condition.
Command for task control	
TSTR	Task start
TSTO	Temporary stop of task.
TRSA	Task restart
TCAN	Compulsive finish of task.

Controller: CA10-M00B, CA10-M01B
CA20-M00, CA20-M01
Teach pendant: TPH-4C, TPX-4A

Command	Description
Command for axis movement	
MOV	Axis travel
MOVP	Axis travel (coordinate table indirect)
MVC	Circular interpolation
MVCP	Circular interpolation (coordinate table indirect)
MVB	Move to just preceding position (return to just preceding position).
MVE	Escape movement
RSMV	Axis travel via RS232C.
HOME	Home return command
Command for parameter setting	
SPD	Speed setting
ACC	Acceleration/deceleration setting
OFS	Offset setting
Command for I/O port control	
OUT	Output to general-purpose port.
OUTP	Pulse output to general-purpose port.
OUTC	Counter value output to general-purpose port.
OUTS	Specified coordinate output to general-purpose port.
IOUT	Output to internal port.
CANS	Cancel of specified coordinate output to general-purpose port.
IN	Waiting for input.
INPC	Setting of input status of general-purpose port to counter.
INSP	Waiting for internal port input.
Command for timer/counter control	
CWIT	Waiting for counter.
TIM	Waiting for time.
TIMP	Preset of timer.
CNT	Preset of counter.
CNT+	Addition of counter value.
CNT-	Subtraction of counter value.
CNTC	Clear of all counters.
Command for program control	
NOP	Non-operation
RET	Return (declaration of ending a subroutine).
STOP	Stop
END	Program end
TAG	Jump to a tag (destination label)
PSEL	Program selection
Command for servo control	
SVON	Servo ON
SVOF	Servo OFF
Command for matrix operation	
MVM	Matrix movement
LOOP	MVM loop
MINI	Initialization of MVM counter.
Command for jump	
JMP	Unconditional jump.
JMPI	Jump with input condition.
JMPC	Jump with counter condition.
JMPT	Jump with timer condition.
BRAC	Jump to a tag of counter value.
Command for subroutine call	
CAL	Unconditional call (unconditional jump to specified subroutine).
CALI	Call with input condition (call of specified subroutine with input condition).
CALC	Call with counter condition.
CALT	Call with timer condition.
Command for task control	
TSTR	Task start
TSTO	Temporary stop of task.
TRSA	Task restart
TCAN	Compulsive finish of task.

[External point designation mode]

Mode in which an axis is positioned by a signal output from the sequencer (PLC) or digital switch, without using a command of the controller. Coordinates of a specified point, speed and acceleration/deceleration should be registered beforehand in the table of the controller.



No. of tables that can be used:

Type of master unit: CA20-M10, CA20-M40

	Without extension I/O unit	With extension I/O unit	With Field-Bus interface
Coordinate table	16 points (4 bits) (Note 1)	999 points (10 bits)	
Speed table	1 table (1 bit)	3 tables (2 bits)	10 tables (up to 4 bits)
Acceleration/deceleration table	1 table (1 bit)	2 tables (1 bit)	20 tables (5 bits)
Coordinate system	Predetermined to absolute coordinate system (Bit designation is not permitted.)	Absolute coordinate system/relative coordinate system (1 bit)	

Note 1: Eight (8) points (3 bits) when the pause input is made valid in a single axis control system.

Type of maser unit: CA10-M00B, CA10-M01B, CA20-M00, CA20-M01

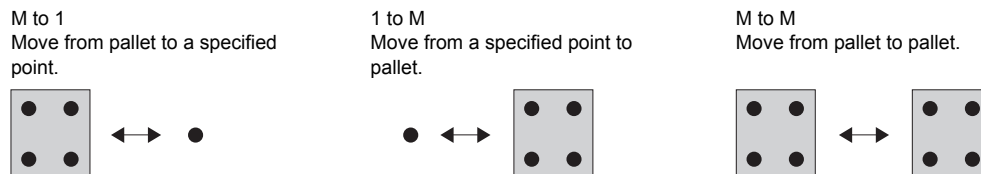
Coordinate table	999 points (10 bits)
Speed table	10 tables (4 bits) (Note 2)
Acceleration/deceleration table	20 tables (5 bits)
Coordinate system	Absolute coordinate system/relative coordinate system (1 bit)

Note 2: The number of points and the number of bits that can be used varies with the assigned bit position.

[Palletizing mode]

Mode in which operations of traveling and loading to pallets can be programmed easily only by specifying the number of workpieces, coordinates of locations, etc., without creating a program by combining instruction words.

A total of three patterns are provided.



[Pulse train input mode]

Mode in which an axis is moved by means of a pulse generator. This mode is available only for the CA20-M10 and CA20-M40.

Input pulse	[CW pulse + CCW pulse] (2-clock pulse system) or [Pulse + "+/-" sign] (1-clock system)	
Maximum input pulse frequency	500 kHz (line driver), 200 kHz (open collector)	
Input	Signal	Servo ON, reset, counter clear
	Specification	DC24 V, 10 mA
Output	Signal	Positioning finish, error, home position LS, Z-phase signals
	Specification	DC24 V, 20 mA (max.)
Applicable encoder	Line driver output (wire-saving type)	
Display	Error LED indication (on front of unit) and display on teach pendant.	
Protective function	Encoder error, overload, overvoltage, overflow, overcurrent	
Power supply, ambient conditions	Pursuant to the master unit specifications.	

* See Page 233 for I/O connections.

Details of Input and Output, and Example Connection

Master unit: CA20-M10/M40, CA20-M10/M40-CC, CA20-M10/M40-DN

[Details of system input and output] * For the table of I/O pin numbers, see Pages 177 and 180.

[System input] * The CA20-M10/M40-CC and CA20-M10/M40-DN are used based on the parameter settings.

Pin No.	Signal name	◇Sequential mode ◇Palletizing mode	◇External point designation mode	Remarks
28	Home return	ON: Start of home position return motion	Same as left.	ON
29	Start	ON: Restart from currently stopped step or from temporary halt status.	ON: Start of axis feed as per currently specified table information.	Detection of rising edge. ON ON
30	Stop	ON: Stop after current step has been executed.	Invalid	When this input is ON, home return and start input are inoperative.
31	Reset	ON: Reset of error condition. (Effective while program execution is stopped.)	ON: Reset of error condition.	

Home return input is also possible from the general-purpose input port by mode setting of the controller.

[System output] * Used for CA20-M10/M40

Pin No.	Signal name	◇Sequential mode ◇Palletizing mode	◇External point designation mode	Remarks
11	Running	ON during controller running and home return motion.	ON during robot operation.	
12	Error	ON at error generation.	Same as left.	
13	Positioning finish	ON when the robot has been positioned at a predetermined position. OFF while the robot is moving. (OFF while the robot is paused.)	Same as left.	
14	Home return finish	ON when home return is unnecessary at execution of move command. OFF when home return is necessary.	ON when home return is unnecessary at execution of move command. OFF when home return is necessary.	
15	Home position LS	Output of home position limit switch status of axis.	Same as left.	
16	Z-phase	Output of Z-phase signal which is output from axis motor encoder.	Same as left.	

(Applicable to master unit, slave unit and extension I/O unit.)

* The setting function varies with the system setting operation of controller.

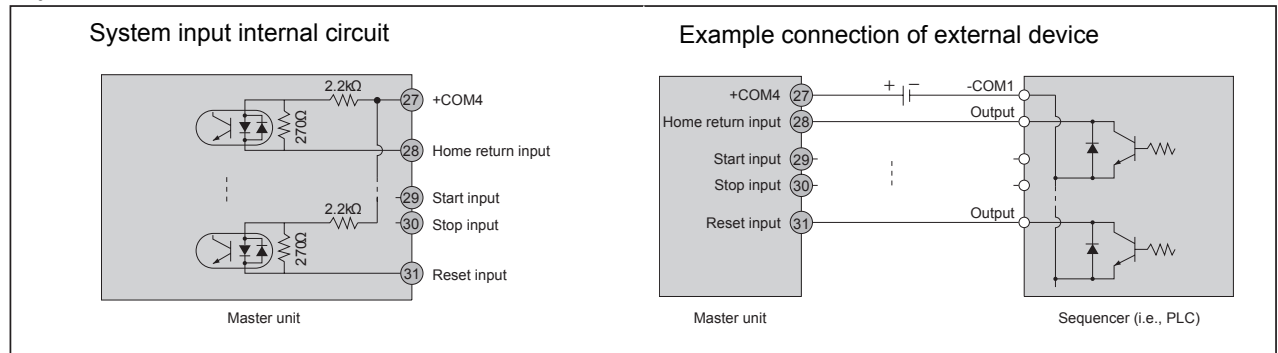
[Input and output that can be assigned to general-purpose I/O port]

Signal name	* Setting function	◇Sequential mode ◇Palletizing mode	◇External point designation mode
	Input/output		
Robot single operation	Input	The single operation mode is operative when this input is ON with the start input or start key set ON. In this mode, axis feed command and output command are inhibited.	Inoperative.
Restart	Input	Even if the power is turned off or reset while this input is ON, contents of counter, etc., are not cleared.	Inoperative.
Escape	Input	When this input is ON during execution of MVE command, an axis slows down and stops, and the system interprets that the relevant step has finished.	Inoperative.
Pause (feed hold)	Input	ON: Feed hold (slowdown and stop). To restart, set ON the start input. To cancel, set ON the reset input.	
Program selection 2 ⁰ Program selection 2 ¹ Program selection 2 ²	Input	Input signal for specifying a program number (No.1 - No.8) at program selection.	Inoperative.
Home return	Input	ON: Start of home return motion. (Initial setting is assigned to Pin 28.)	
Palletizing	Input	ON: Palletizing mode OFF: Sequential mode (While the easy, external point designation or pulse train input mode is selected, this input is invalid.)	Inoperative.
Wait for input	Output	ON when the system is waiting for an input during program execution.	Inoperative.
Pausing	Output	ON when an axis has slowed down and stopped after recognizing pause input. (OFF when the pause mode is canceled.)	
Ready	Output	ON when the teach pendant and RS232C are inoperative and no error is generated.	

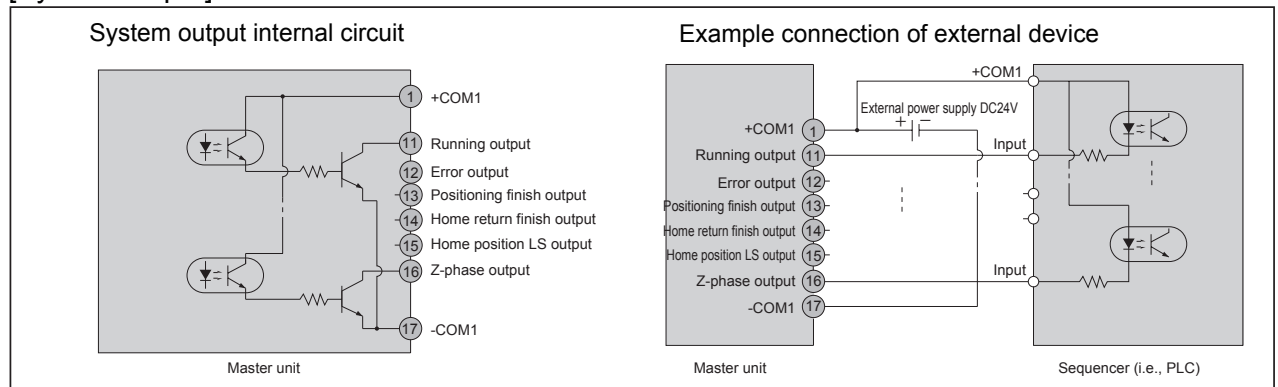
Master unit: CA20-M10/M40, CA20-M10/M40-CC, CA20-M10/M40-DN [Example connection of input and output]

* For the table of I/O pin numbers, see Pages 177 and 180.

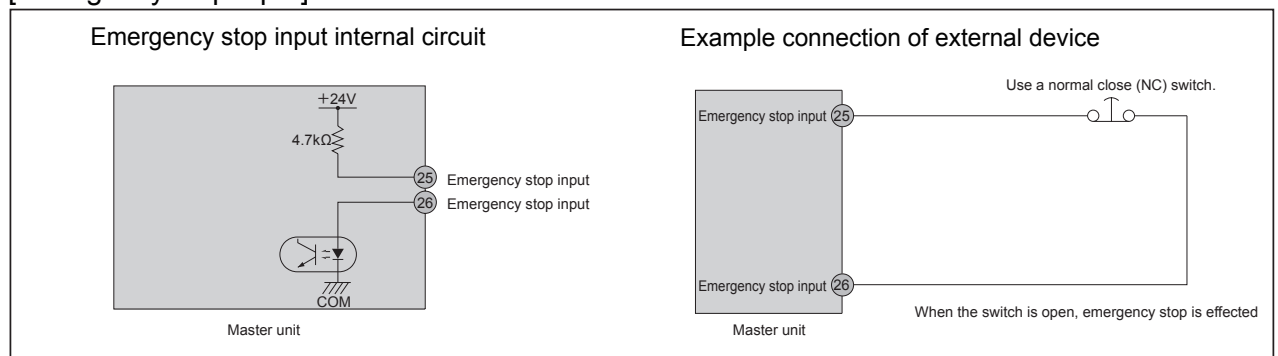
[System input] * The CA20-M10/M40-CC and CA20-M10/M40-DN are used based on the parameter settings.



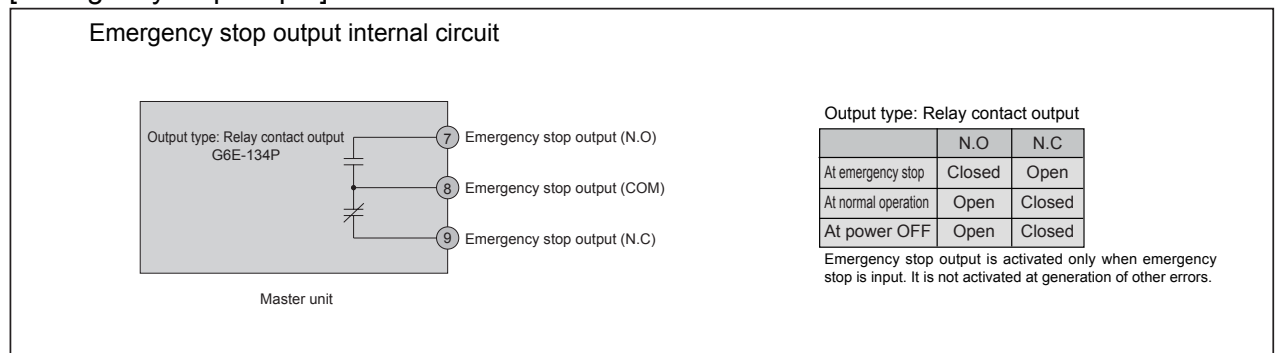
[System output] * Used for CA20-M10/M40



[Emergency stop input]



[Emergency stop output]



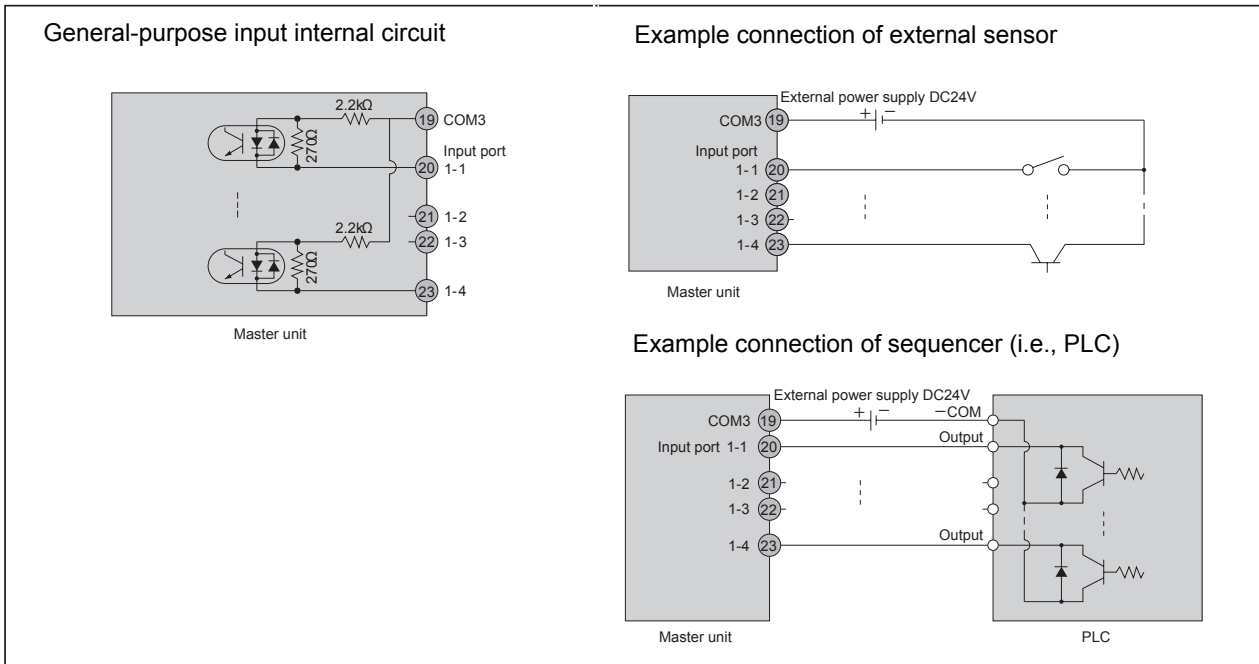
Master unit: CA20-M10/M40, CA20-M10/M40-CC, CA20-M10/M40-DN

[Example connection of input and output]

For the table of I/O pin numbers, see Pages 177 and 180.

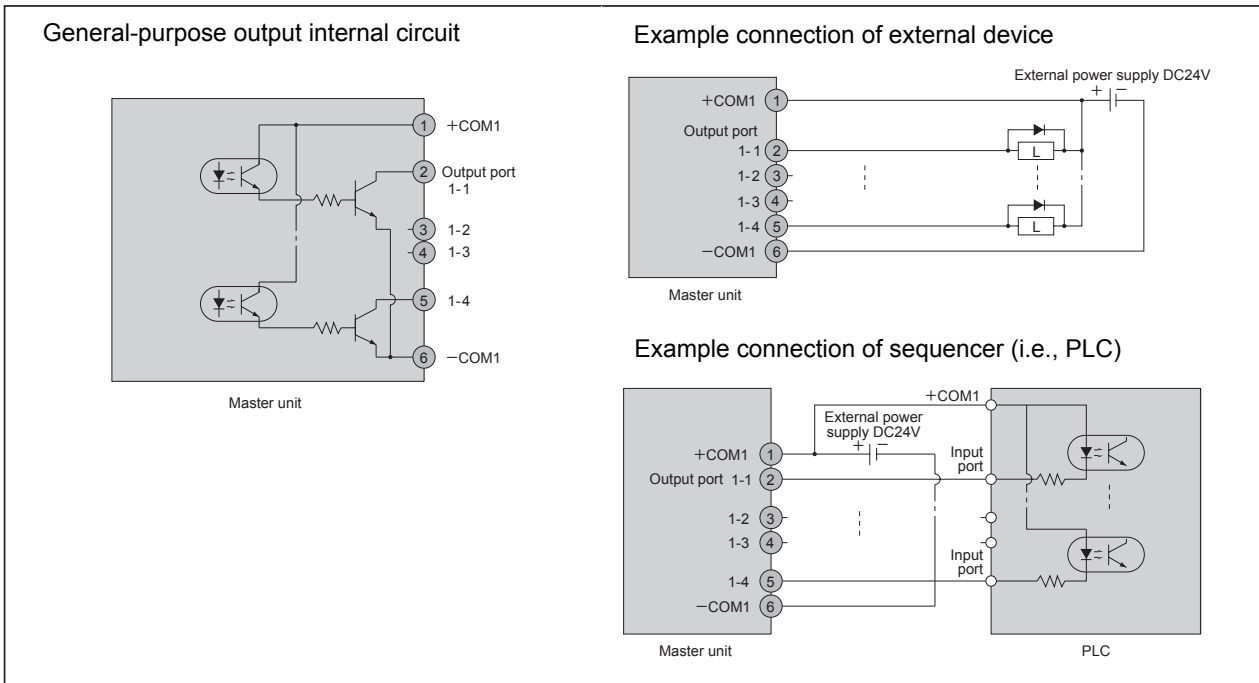
[General-purpose input]

* The CA20-M10/M40-CC and CA20-M10/M40-DN are used based on the parameter settings.



[General-purpose output]

* Used for CA20-M10/M40



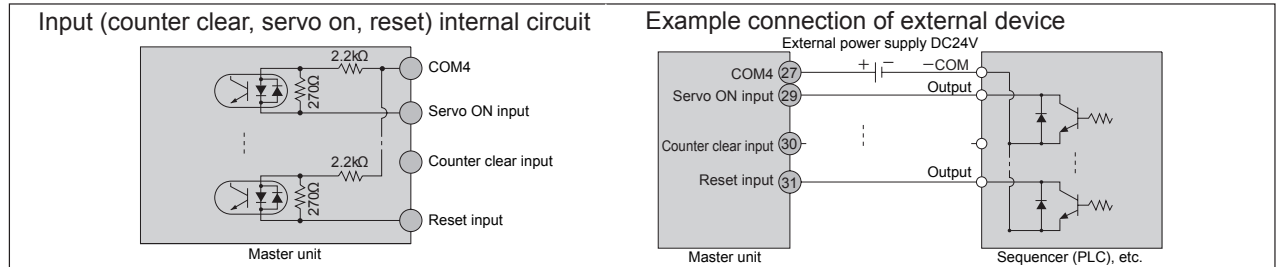
Master unit: CA20-M10, CA20-M40 [Input and output of pulse train input mode]

* For the table of I/O pin numbers, see Page 177.

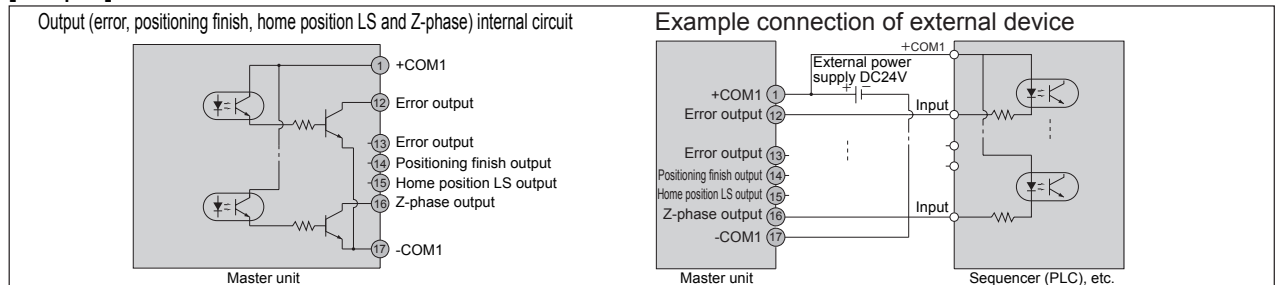
[System input] (when master unit (CA20-M10, M40) is set to pulse train input mode)

Pin No.	Input/output	Signal name	Description
12	Output	Error	ON when an error has occurred in the controller.
13	Output	Positioning finish	ON when the difference between the total value of command pulses (i.e., pulses from external controller) and the total value of feedback pulses (i.e., axis motor encoder pulses) becomes smaller than the in-position length set in the parameter. (OFF when the servo is OFF.)
15	Output	Home position LS	Output of home position limit switch status of axis.
16	Output	Z-phase	Output of one Z-phase signal from axis motor encoder per motor revolution.
29	Input	Servo ON	Control of energized or de-energized state of axis servo motor. ON: Servo ON (servo lock) OFF: Servo OFF (servo free) This is the servo-free state controlled by software, different from the servo-free state controlled by hardware as in emergency stop.
30	Input	Counter clear	ON: Clears the software counter in the controller, which accumulates command pulses.
31	Input	Reset	ON: Resets errors generated in the controller.
33 34 35 36	Input	+CLK/±CLK -CLK/SIGN	Command pulses can be input from the teach pendant in either of the two methods; 2-clock method and 1-clock method.

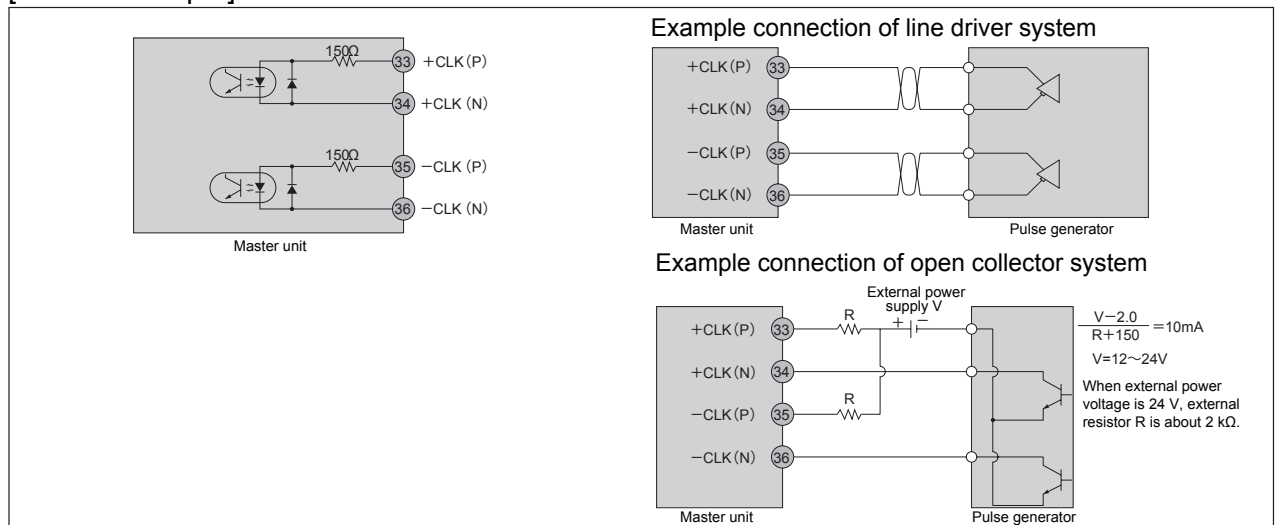
[Input]



[Output]



[Pulse train input]

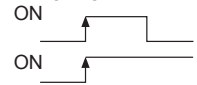


The pulse train input comes in the two systems; line driver system and open collector system. To improve reliability such as noise resistance, however, use of the line driver system is recommended.

Master unit: CA20-M10-CC, CA20-M40-CC

[Details of system input and output] * For the I/O signal list, see page 181.

[System Input] (CC-Link master station → CA20-M10-CC, CA20-M40-CC)

Signal name	Remote output	Normal mode	External point specifying mode	Remarks
Home return (*1)	RYn0	ON: Home return operation start	Home return	Rising edge detection ON 
Start (*1)	RYn1	ON: Restart from currently-stopped step and paused state	ON: Movement is started based on the information of the currently-specified table	
Stop (*1)	RYn2	ON: Stopped after current step is completed	Disabled	Home return and start input are disabled when this input is ON.
Reset (*1)	RYn3	ON: Clearing of error state (enabled while program execution is stopped)	ON: Clearing of error state	
Jog input (*1)	RY(n+4)8 to RY(n+4)F	Three types of operation modes (inching, low-speed movement, high-speed movement) and the movement direction are specified, and jog movement is performed for the selected axis.		

Note 1: Home return, start, stop, and reset are used based on the parameter settings.

[System Output] (CA20-M10-CC, CA20-M40-CC → CC-Link master station)

Signal name	Remote input	Normal mode	External point specifying mode
During operation	RXn0	ON during controller execution and during home return operation	ON during robot operation
Error	RXn1	ON when error occurs	Same as left
Positioning complete	RXn2	ON when robot completes positioning OFF when movement of the robot is in progress (remains at OFF when stopped by pause)	Same as left
Home return complete	RXn3	ON when the home return and HOME command execution are completed, and the axis is at the home position	ON when the home return operation is completed, and the axis is at the home position
Jog output	RX(n+4)8 to RX(n+4)F	This indicates a status where jog command cannot be received, operation is in progress, or similar condition.	

[Connection of Dedicated CC-Link Cable]

The order of cable connection is unrelated to the station number.

Be sure to always connect the terminating resistor to the units on both ends of the CC-Link system.

Connect the terminating resistor between DA and DB.

In the CC-Link system, the terminating resistor that is connected varies depending on the cable.

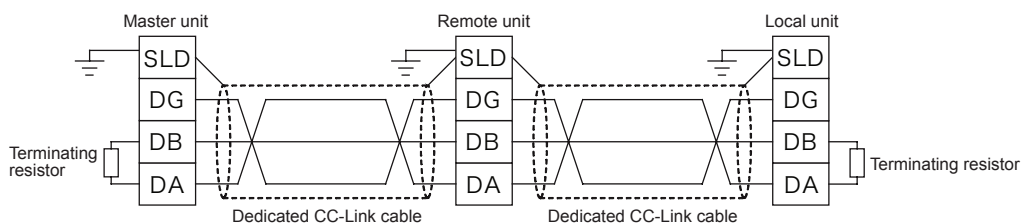
Cable type	Terminating resistor
Dedicated CC-Link Cable	110Ω 1/2W (brown-brown-brown)
Ver. 1.10 compliant dedicated CC-Link cable	
Dedicated CC-Link high-performance cable	130Ω 1/2W (brown-orange-brown)

This controller does not include a terminating resistor.

The master unit can also be connected to a location other than both ends.

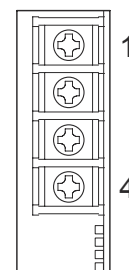
A star connection is not possible.

The connection method is shown below.



[CC-Link Communication Terminal Block]

Pin no.	Signal name	Wire color
1	Communication line (DA)	Blue
2	Communication line (DB)	White
3	Digital GND (DG)	Yellow
4	Shield (SLD)	Shield



For details on the cable connections, see the master station instruction manual and CC-Link Cable Wiring Manual (available from the CC-Link Partner Association).

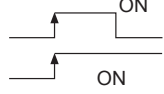
* If a communication malfunction occurs due to noise, recheck the installation state of the ground for the controller.

If this still does not resolve the problem, attach a ferrite core accessory (ZCAT2035-0930* by TDK) to the appropriate location on the CC-Link cable.

Master unit: CA20-M10-DN, CA20-M40-DN

[Details of system input and output] * For the I/O signal list, see page 182.

[System Input] (DeviceNet master station → CA20-M10-DN, CA20-M40-DN)

Signal name	Output device (*1)	Normal mode	External point specifying mode	Remarks
Home return (*2)	+0	ON: Home return operation start	Home return	Rising edge detection
Start (*2)	+1	ON: Restart from currently-stopped step and paused state	ON: Movement is started based on the information of the currently-specified table	
Stop (*2)	+2	ON: Stop after current step is completed	Disabled	Home return and start input are disabled when this input is ON.
Reset (*2)	+3	ON: Clearing of error state (enabled while program execution is stopped)	ON: Clearing of error state	
Jog input (*2)	+72 to +79	Three types of operation modes (inching, low-speed movement, high-speed movement) and the movement direction are specified, and jog movement is performed for the selected axis.		

*1: Offset amount from the starting device (unit: bits)

*2: Home return, start, stop, and reset are used based on the parameter settings.

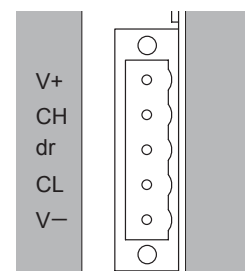
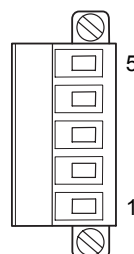
[System Output] (CA20-M10-DN, CA20-M40-DN → CC-Link master station)

Signal name	Input device (*1)	Normal mode	External point specifying mode
During operation	+0	ON during controller execution and during home return operation	ON during robot operation
Error	+1	ON when error occurs	Same as left
Positioning complete	+2	ON when robot completes positioning OFF when movement of the robot is in progress (remains at OFF when stopped by pause)	Same as left
Home return complete	+3	ON when the home return operation is completed	Same as left
Jog output	+72 to +79	This indicates a status where jog command cannot be received, operation is in progress, or similar condition.	

*1: Offset amount from the starting device (unit: bits)

[DeviceNet Connector]

Pin No.	Signal name	Wire color
5	V+	Red
4	CANH	White
3	Shield	Shield
2	CANL	Blue
1	V-	Black



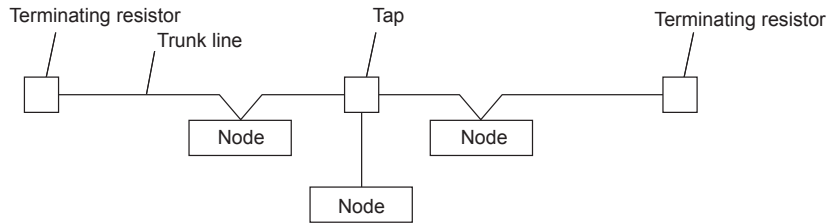
[Connection of Dedicated DeviceNet Cable]

The order of cable connection is unrelated to the station number (MAC ID).

Be sure to always connect the terminating resistor to the both ends of the trunk line (121Ω, 1% metal coating, 1/4W).

Connect the terminating resistor between CANH and CANL.

This controller does not include a terminating resistor.

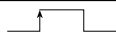




For details on the cable connections, see the master station instruction manual, or refer to the document issued by the ODVA.

High-performance master unit: CA10-M00B, CA20-M00/M01

[Details of system input and output] * For the table of I/O pin numbers, see Page 185 and 193.

[System input]

Pin No.	* Setting function	Sequential mode Palletizing mode	External point designation mode	Remarks
	Signal name			
21	Home return	ON: Start of home position return motion	Same as left.	ON 
22	Start	ON: Restart from currently stopped step or from hold feed status.	ON: Start of axis feed as per currently specified table information.	Detection of rising edge. ON  ON 
23	Stop	ON: Stop after current step has been executed.	Invalid	When this input is ON, home return and start input are inoperative.
24	Reset	ON: Reset of error condition. (Effective while program execution is stopped.)	ON: Reset of error condition.	

[System output]

Pin No.	* Setting function	Sequential mode Palletizing mode	External point designation mode	Remarks
	Signal name			
17	Running	ON during controller running and home return motion.	ON during robot operation.	
18	Error	ON at error generation.	Same as left.	
19	Positioning finish	ON when the robot has been positioned at a predetermined position. OFF while the robot is moving. (OFF while the robot is paused.)	Same as left.	
20	Home return finish	ON when home return is unnecessary at execution of move command. OFF when home return is necessary.	ON when home return is unnecessary at execution of move command. OFF when home return is necessary.	

[Input and output that can be assigned to general-purpose I/O port]

(Applicable to high-performance master unit, slave unit and extension I/O unit.)

* The setting function varies with the system setting operation of controller.

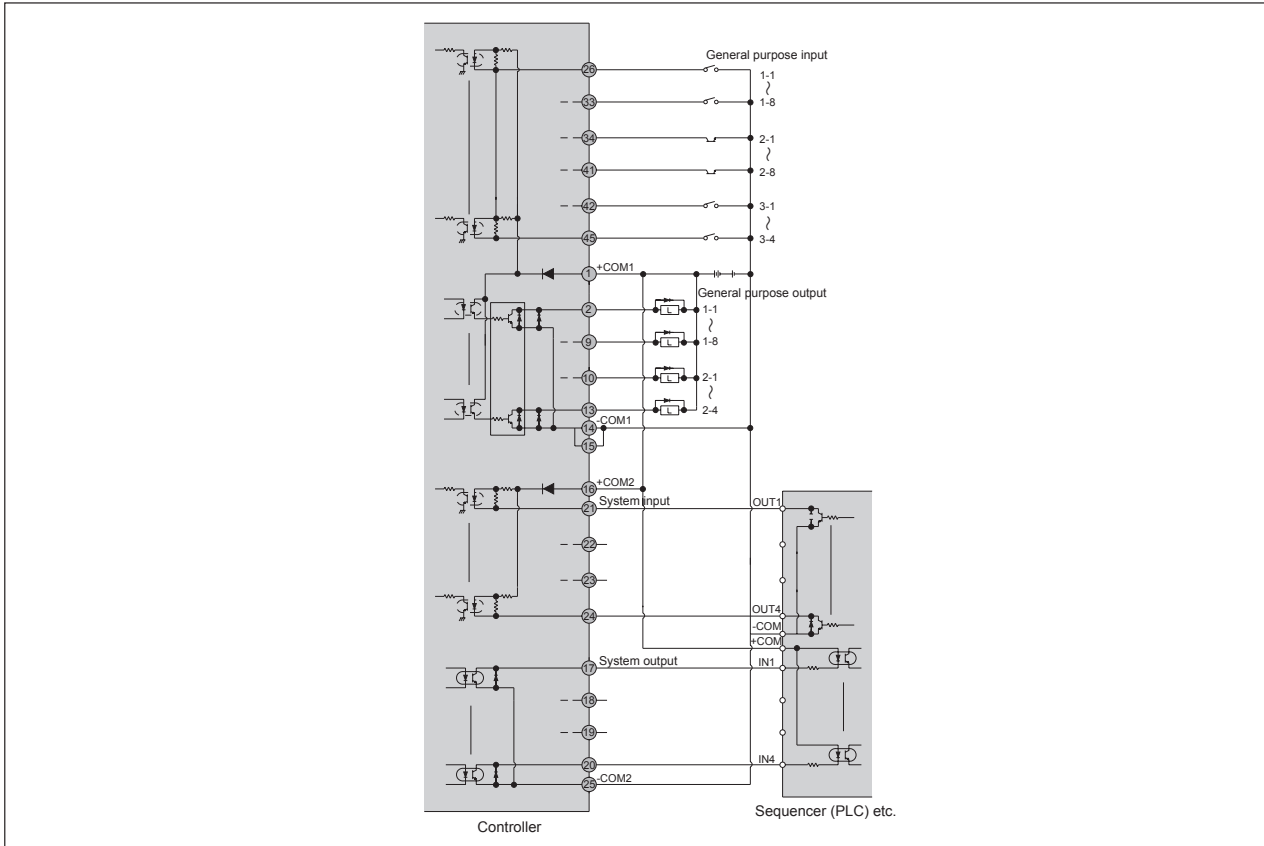
Signal name	* Setting function	Sequential mode Palletizing mode	External point designation mode
	Input/output		
Robot single operation	Input	The single operation mode is operative when this input is ON with the start input or start key set ON. In this mode, axis feed command and output command are inhibited.	Inoperative.
Restart	Input	Even if the power is turned off or reset while this input is ON, contents of counter, etc., are not cleared.	Inoperative.
Escape	Input	When this input is ON during execution of MVE command, an axis slows down and stops, and the system interprets that the relevant step has finished.	Inoperative.
Pause (feed hold)	Input	ON: Feed hold (slowdown and stop). To restart, set ON the start input. To cancel, set ON the reset input.	
Program selection 2 ⁰ Program selection 2 ¹ Program selection 2 ² Program selection 2 ³	Input	Input signal for specifying a program number (No.1 - No.16) at program selection.	Inoperative.
Palletizing	Input	ON: Palletizing mode OFF: Sequential mode (While the easy, external point designation or pulse train input mode is selected, this input is invalid.)	Inoperative.
Wait for input	Output	ON when the system is waiting for an input during program execution.	Inoperative.
Pausing	Output	ON when an axis has slowed down and stopped after recognizing pause input. (OFF when the pause mode is canceled.)	
Ready	Output	ON when the teach pendant and RS232C are inoperative and no error is generated.	

High-performance master unit: CA10-M00B, CA20-M00/M01

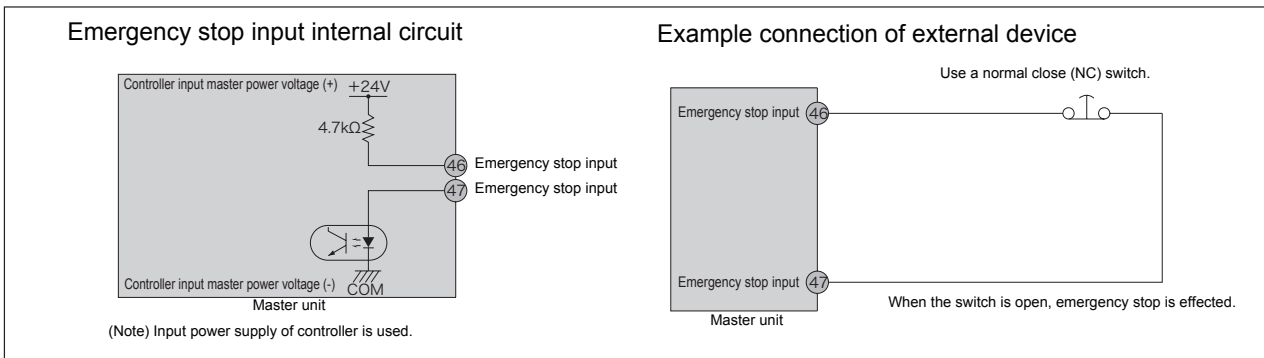
[Example connection of input and output]

* For the table of I/O pin numbers, see Pages 185 and 193.

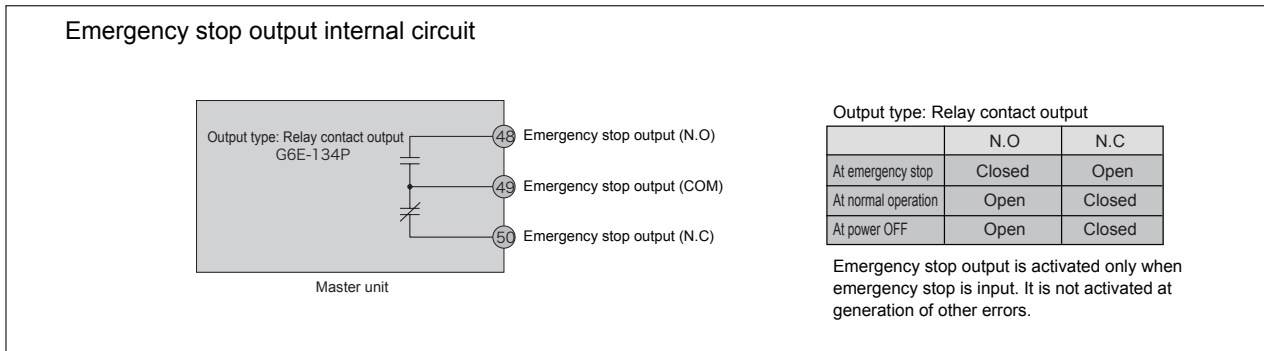
[System and general-purpose input/output]



[Emergency stop input]



[Emergency stop output]

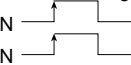
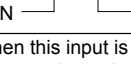


High-performance master unit: (designed for CC-Link) CA10-M01B-CC

[Details of input and output]

* For the table of I/O pin numbers, see Page 188.

[System input]

Remote output	Signal name	◇Sequential mode ◇Palletizing mode	External point designation mode	Remarks
RYn0	Home return	ON: Start of home position return motion	Home return	Detection of rising edge. ON  ON 
RYn1	Start	ON: Restart from currently stopped step or from hold feed status.	ON: Start of axis feed as per currently specified table information.	
RYn2	Stop	ON: Stop after current step has been executed.	Invalid	When this input is ON, home return and start input are inoperative.
RYn3	Reset	ON: Reset of error condition. (Effective while program execution is stopped.)	ON: Reset of error condition.	
RY(n+4)8 — RY(n+4)F	Jog input	Jogging of a selected axis by specifying one of the three modes (inching, low-speed move, high-speed move) and move direction.		

[System output]

Remote input	Signal name	◇Sequential mode ◇Palletizing mode	External point designation mode	Remarks
RXn0	Running	ON during controller running and home return motion.	ON during robot operation.	
RXn1	Error	ON at error generation.	Same as left.	
RXn2	Positioning finish	ON when the robot has been positioned at a predetermined position. OFF while the robot is moving. (OFF while the robot is paused.)	Same as left.	
RXn3	Home return finish	ON when home return is unnecessary at execution of move command. OFF when home return is necessary.	ON when home return is unnecessary at execution of move command. OFF when home return is necessary.	
RX(n+4)8 — RX(n+4)F	Jog output	Indication of jog acceptance or rejection, status during axis motion, etc.		

[Input and output that can be assigned to general-purpose I/O port]

(Applicable to high-performance master unit, slave unit and extension I/O unit.)

* The setting function changes with the system setting operation of controller.

Signal name	* Setting function	◇Sequential mode ◇Palletizing mode	◇External point designation mode
	Input/output		
Robot single operation	Input	The single operation mode is operative when this input is ON with the start input or start key set ON. In this mode, axis feed command and output command are inhibited.	Inoperative.
Restart	Input	Even if the power is turned off or reset while this input is ON, contents of counter, etc., are not cleared.	Inoperative.
Escape	Input	When this input is ON during execution of MVE command, an axis slows down and stops, and the system interprets that the relevant step has finished.	Inoperative.
Pause (feed hold)	Input	ON: Feed hold (slowdown and stop). To restart, set ON the start input. To cancel, set ON the reset input.	
Program selection 2 ⁰ Program selection 2 ¹ Program selection 2 ² Program selection 2 ³	Input	Input signal for specifying a program number (No.1 – No.16) at program selection.	Inoperative.
Palletizing	Input	ON: Palletizing mode OFF: Sequential mode (While the easy, external point designation or pulse train input mode is selected, this input is invalid.)	Inoperative.
Wait for input	Output	ON when the system is waiting for an input during program execution.	Inoperative.
Pausing	Output	ON when an axis has slowed down and stopped after recognizing pause input. (OFF when the pause mode is canceled.)	
Ready	Output	ON when the teach pendant and RS232C are inoperative and no error is generated.	

High-performance master unit: (designed for CC-Link) CA10-M01B-CC

[Connection method of CC-Link cables and example connection of emergency stop input and output]

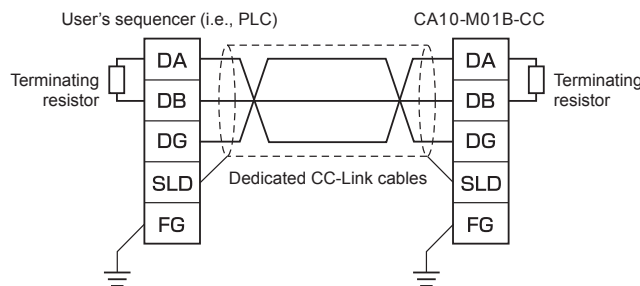
[Connection method of dedicated CC-Link cables]

- [1] Be sure to connect terminating resistors with units on both ends of the CC-Link system.
Connect each terminating resistor between DA and DB.
- [2] In the CC-Link system, terminating resistors to be connected differ with cables to be used.

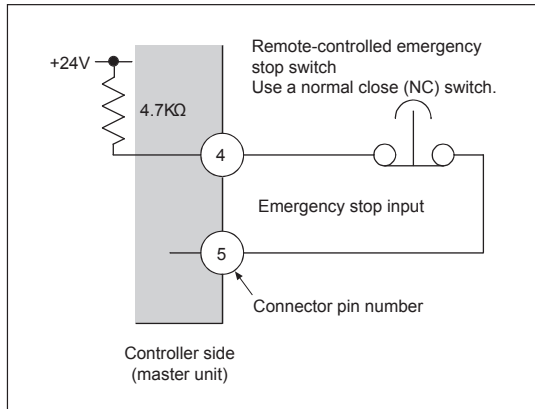
Type of cable	Terminating resistor
Dedicated CC-Link Cable	110 Ω, 1/2 W (brown, brown, brown)
Ver. 1.10 compliant dedicated CC-Link cable	
Dedicated CC-Link high-performance cable	130 Ω, 1/2 W (brown, orange, brown)

No terminating resistors are attached to this controller.

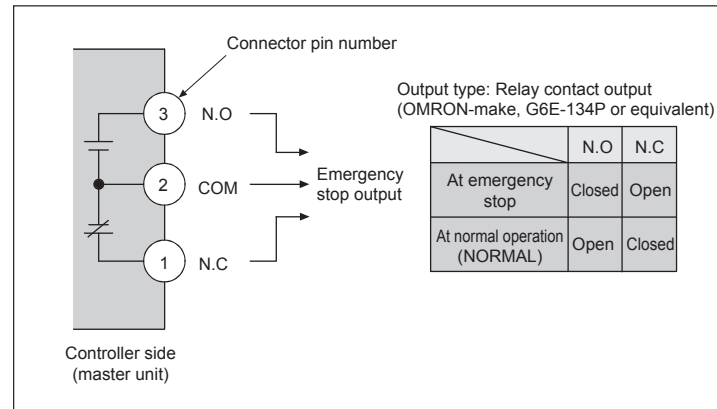
- [3] The connection method is shown below.



[Emergency stop input]



[Emergency stop output]



CC-Link connector (accessory)

Used to connect a CC-Link exclusive cable for data linkage.
Perform wiring to this connector, which should be inserted then to the CA10-M01B controller.

Connector pin array	Pin No.	Signal name	Cable color
	1	Communication cable (DA)	Blue
	2	Communication cable (DB)	White
	3	Digital GND (DG)	Yellow
	4	Shield (SLD)	Shield
	5	Frame ground (FG)	

Connector made by Phoenix Contact
Type: MSTB2.5/S-ST-5.08AU

Emergency stop connector (accessory)

Used for input and output of emergency stop signal.
Perform wiring to this connector, which should be inserted then to the CA10-M01B controller.

Connector pin array	Pin No.	Signal name	Cable color	Description
	1	EMONC	Output	Emergency stop output (N.C)
	2	EMOCOM	Output	Emergency stop output (COM)
	3	EMONO	Output	Emergency stop output (N.O)
	4	EMIN	Input	Emergency stop input
	5	EMIN	Input	Emergency stop input

Connector made by Wago Japan
Type: 734-105

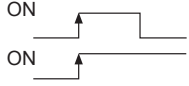
SLD and FG are connected in the unit.

High-performance master unit: (designed for CC-Link) CA20-M00/M01

[System Input/Output]

* For the I/O signal list, see page 194.

[System Input] (CC-Link master station → CA20-M00, CA20-M01)

Signal name	Remote output	Normal mode	External point specifying mode	Remarks
Home return (*1)	RYn0	ON: Home return operation start	Home return	Rising edge detection ON 
Start (*1)	RYn1	ON: Restart from currently-stopped step and paused state	ON: Movement is started based on the information of the currently-specified table	
Stop (*1)	RYn2	ON: Current step is stopped after is completed	Disabled	Home return and start input are disabled when this input is ON.
Reset (*1)	RYn3	ON: Clearing of error state (enabled while program execution is stopped)	ON: Clearing of error state	
Jog input (*1)	RY(n+4)8 to RY(n+4)F	Three types of operation modes (inching, low-speed movement, high-speed movement) and the movement direction are specified, and jog movement is performed for the selected axis.		

Note 1: Home return, start, stop, and reset are used based on the parameter settings.

[System Output] (CA20-M00, CA20-M01 → CC-Link master station)

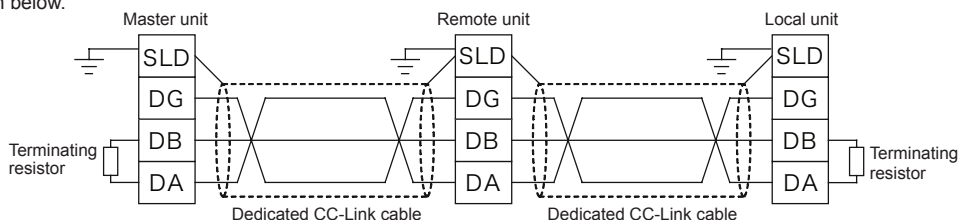
Signal name	Remote input	Normal mode	External point specifying mode
During operation	RXn0	ON during controller execution and during home return operation	ON during robot operation
Error	RXn1	ON when error occurs	Same as left
Positioning complete	RXn2	ON when robot completes positioning OFF when movement of the robot is in progress (remains at OFF when stopped by pause)	Same as left
Home return complete	RXn3	ON when the home return and HOME command execution are completed, and the axis is at the home position	ON when the home return operation is completed, and the axis is at the home position
Jog output	RX(n+4)8 to RX(n+4)F	This indicates a status where jog command cannot be received, operation is in progress, or similar condition.	

[Connection of Dedicated CC-Link Cable]

The order of cable connection is unrelated to the station number.
Be sure to always connect the terminating resistor to the units on both ends of the CC-Link system.
Connect the terminating resistor between DA and DB.
In the CC-Link system, the terminating resistor that is connected varies depending on the cable.

Cable type	Terminating resistor
Dedicated CC-Link Cable	110Ω 1/2W (brown-brown-brown)
Ver. 1.10 compliant dedicated CC-Link cable	
Dedicated CC-Link high-performance cable	130Ω 1/2W (brown-orange-brown)

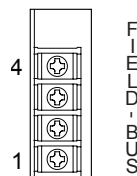
This controller does not include a terminating resistor.
The master unit can also be connected to a location other than both ends.
A star connection is not possible.
The connection method is shown below.



For details on the cable connections, see the master station instruction manual and CC-Link Cable Wiring Manual (available from the CC-Link Partner Association).

[DeviceNet Connector]

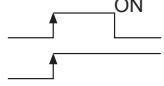
Pin No.	Signal name	Wire color
4	Shield (SLD)	Shield
3	Digital GND (DG)	Yellow
2	Communication cable (DB)	White
1	Communication cable (DA)	Blue



High-performance master unit: (designed for DeviceNet) CA20-M00/M01

[System Input/Output] * For the I/O signal list, see page 195.

[System Input] (DeviceNet master station → CA20-M00/M01)

Signal name	Output device (*1)	Normal mode	External point specifying mode	Remarks
Home return (*2)	+0	ON: Home return operation start	Home return	Rising edge detection 
Start (*2)	+1	ON: Restart from currently-stopped step and paused state	ON: Movement is started based on the information of the currently-specified table	
Stop (*2)	+2	ON: Stop after current step is completed	Disabled	Home return and start input are disabled when this input is ON.
Reset (*2)	+3	ON: Clearing of error state (enabled while program execution is stopped)	ON: Clearing of error state	
Jog input (*2)	+72 to +79	Three types of operation modes (inching, low-speed movement, high-speed movement) and the movement direction are specified, and jog movement is performed for the selected axis.		

*1: Offset amount from the starting device (unit: bits)

*2: Home return, start, stop, and reset are used based on the parameter settings.

[System Output] (CA20-M00, CA20-M01 → DeviceNet master station)

Signal name	Input device (*1)	Normal mode	External point specifying mode
During operation	+0	ON during controller execution and during home return operation	ON during robot operation
Error	+1	ON when error occurs	Same as left
Positioning complete	+2	ON when robot completes positioning OFF when movement of the robot is in progress (remains at OFF when stopped by pause)	Same as left
Home return complete	+3	ON when the home return operation is completed	Same as left
Jog output	+72 to +79	This indicates a status where jog command cannot be received, operation is in progress, or similar condition.	

*1: Offset amount from the starting device (unit: bits)

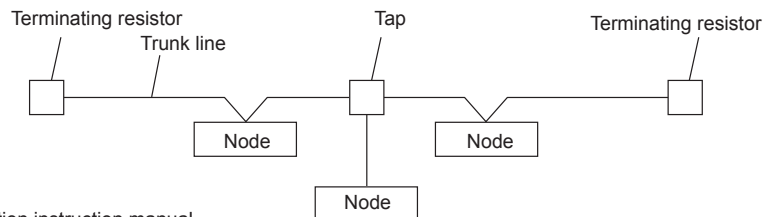
[Connection of Dedicated DeviceNet Cable]

The order of cable connection is unrelated to the station number (MAC ID).

Be sure to always connect the terminating resistor to the both ends of the trunk line (121Ω, 1% metal coating, 1/4W).

Connect the terminating resistor between CANH and CANL.

This controller does not include a terminating resistor.



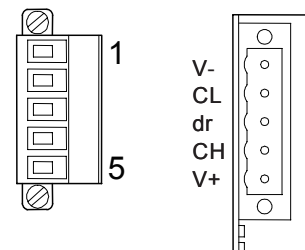
For details on the cable connections, see the master station instruction manual, or refer to the document issued by the ODVA.

[DeviceNet Connector]

This is a connector for connecting a dedicated DeviceNet cable for establishing a data link.

It is included with this controller.

Pin No.	Signal name	Wire color
1	V-	Black
2	CANL	Blue
3	Shield	Shield
4	CANH	White
5	V+	Red

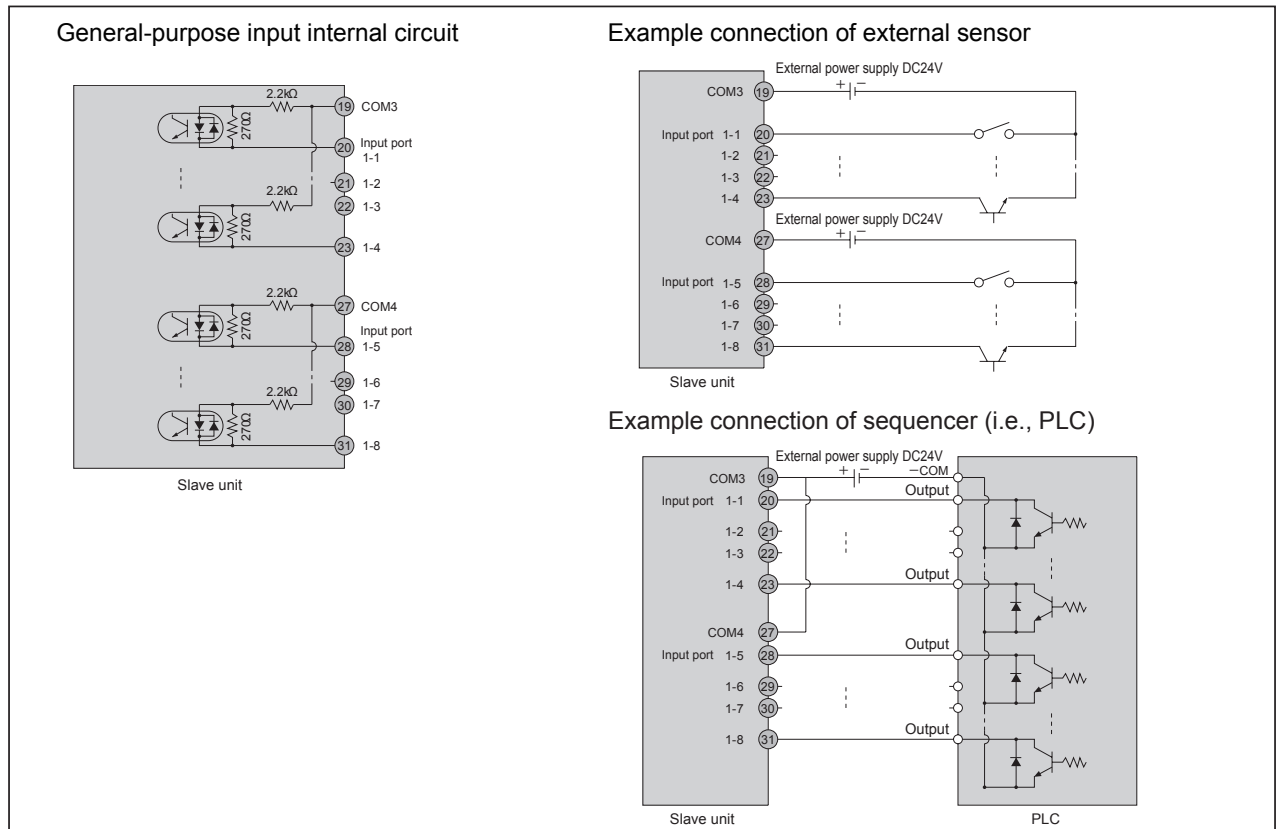


Slave unit: CA20-S10, CA20-S40

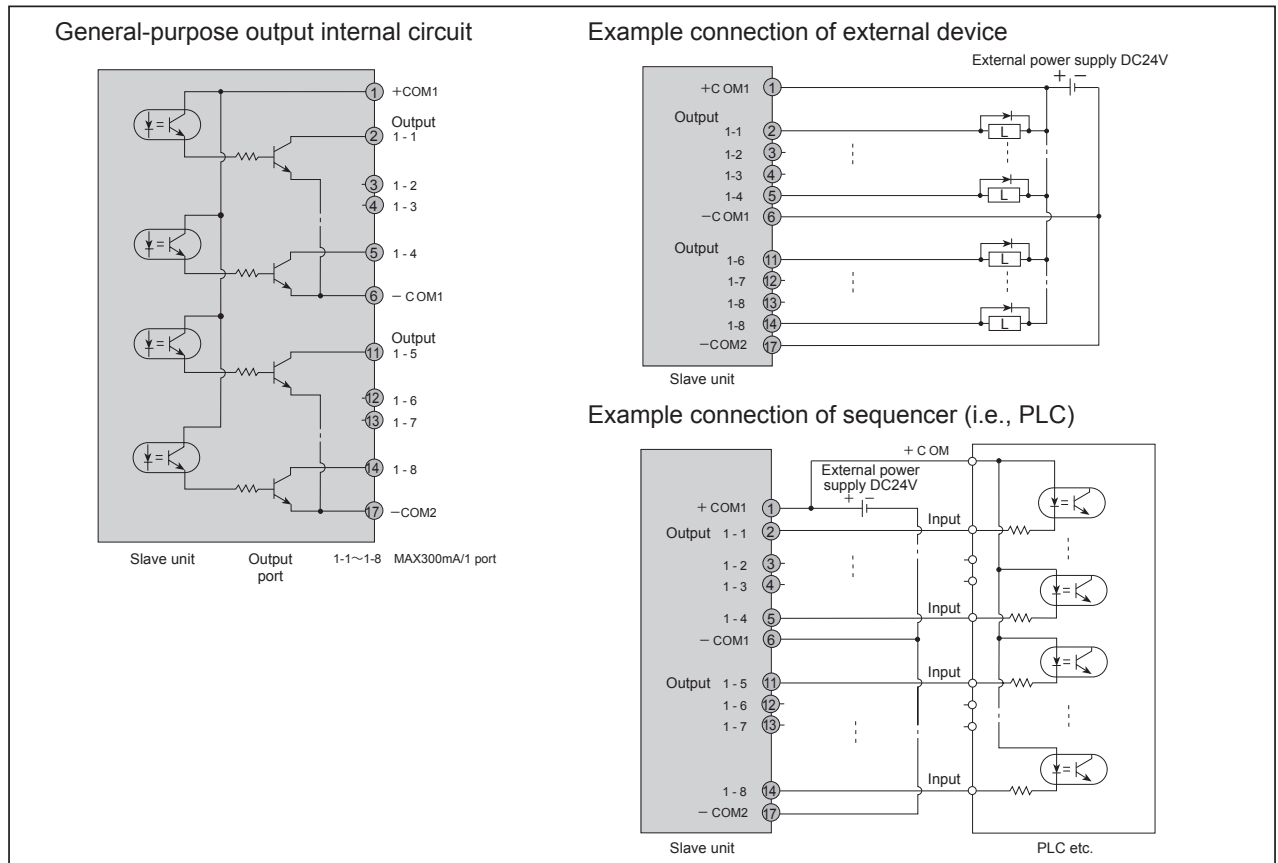
[Example connection of input and output]

* For the table of I/O pin numbers, see Page 198.

[General-purpose input]



[General-purpose output]

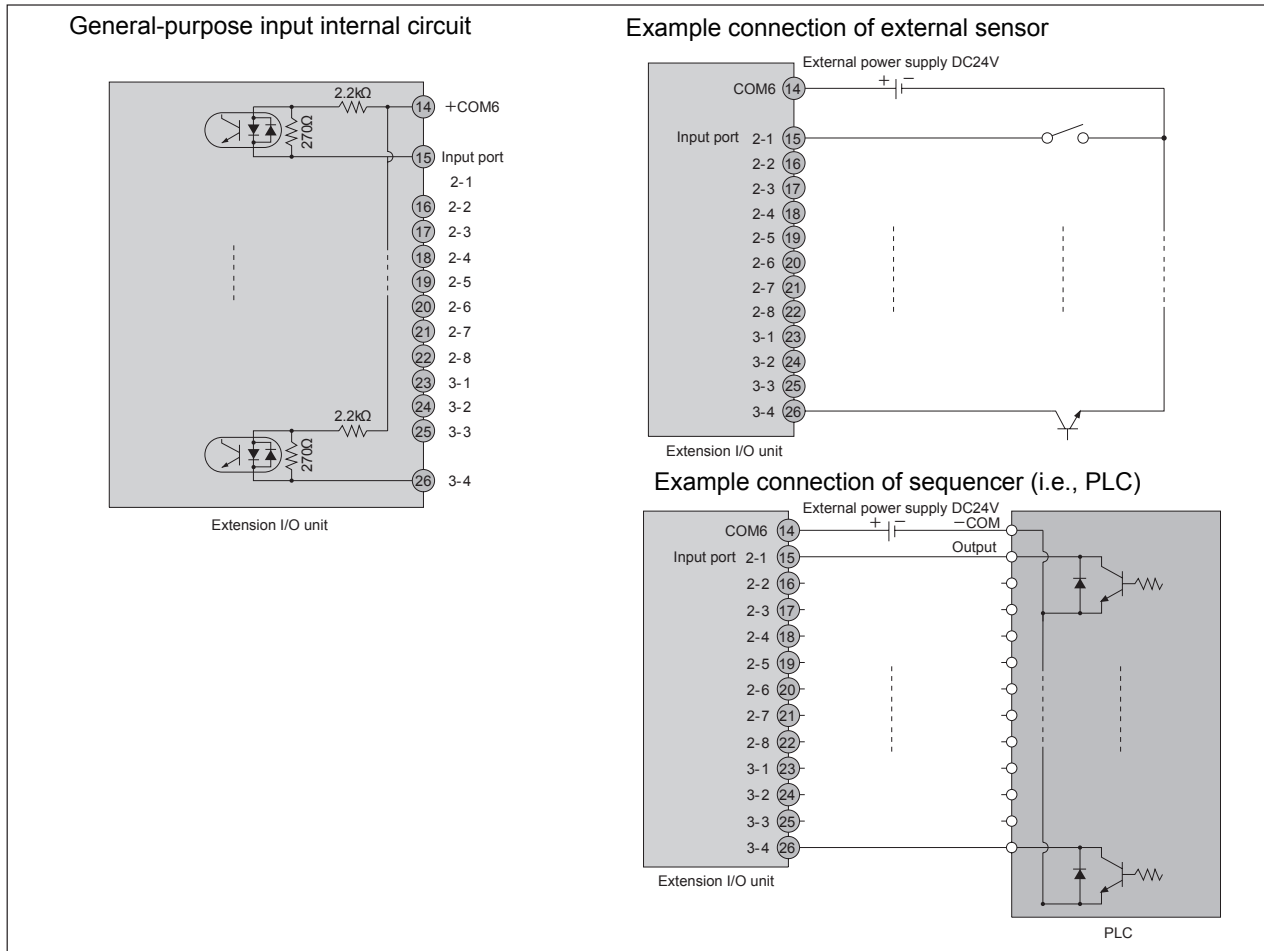


Extension I/O unit: CA20-EX-A20

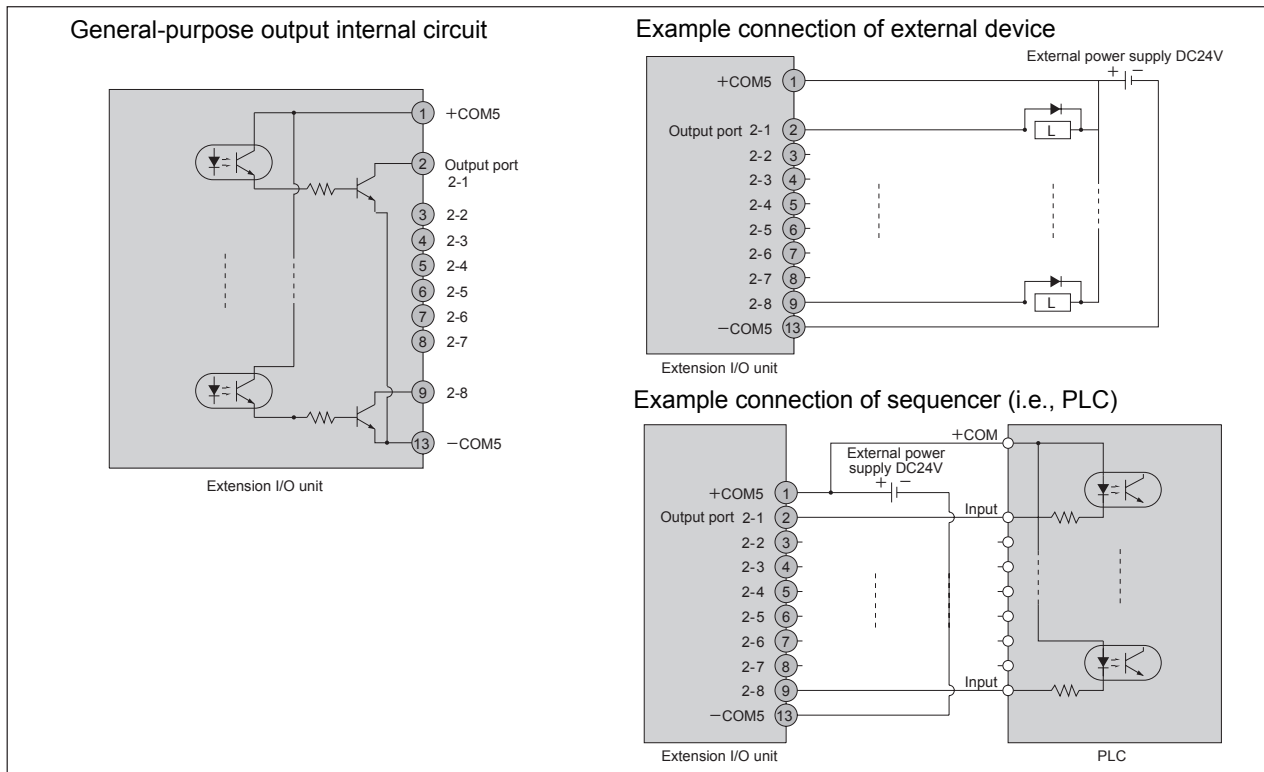
[Example connection of input and output]

* For the table of I/O pin numbers, see Page 204.

[General-purpose input]



[General-purpose output]

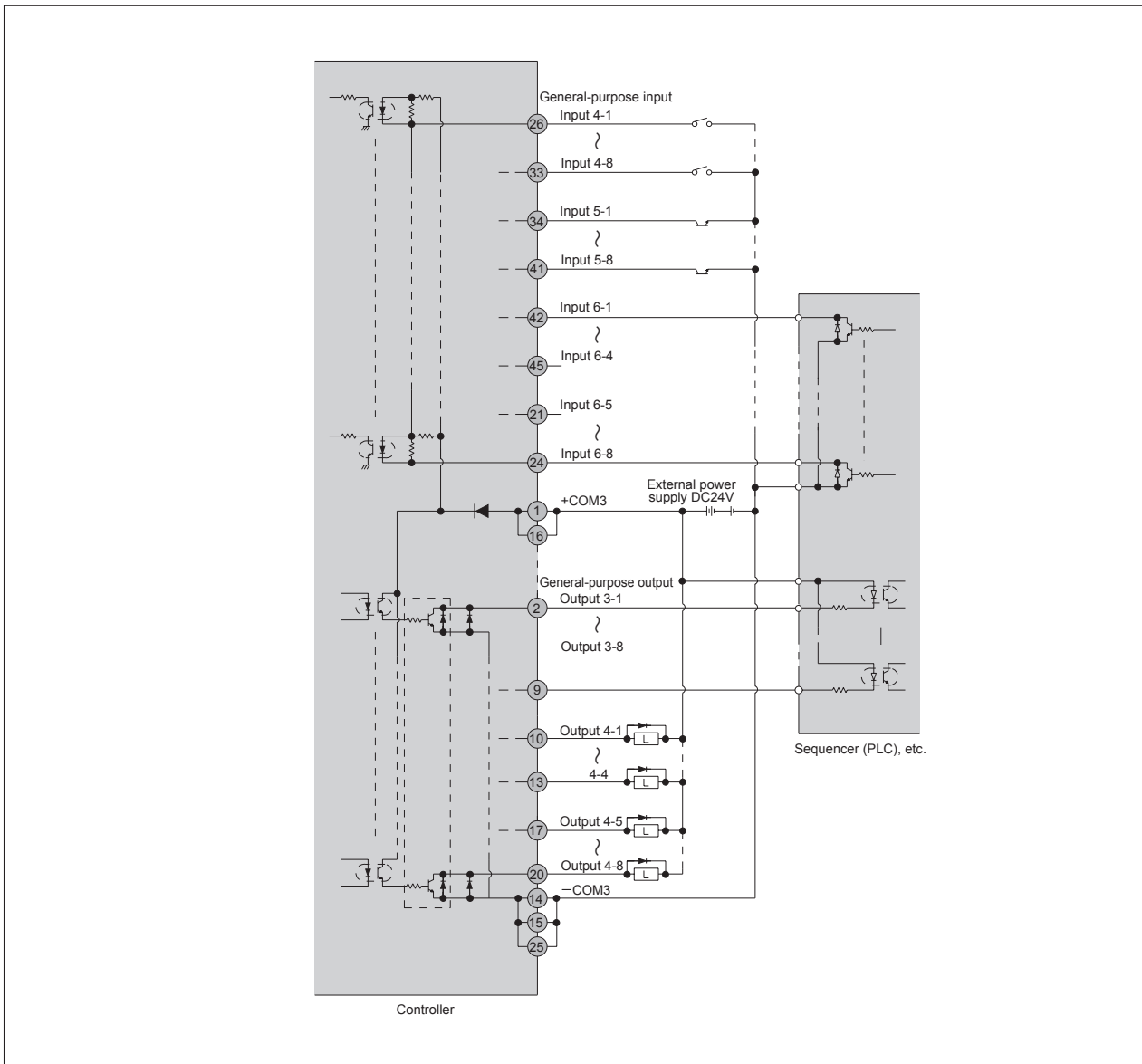


Extension I/O unit: CA10-EX-B40

[Example connection of input and output]

* For the table of I/O pin numbers, see Page 205.

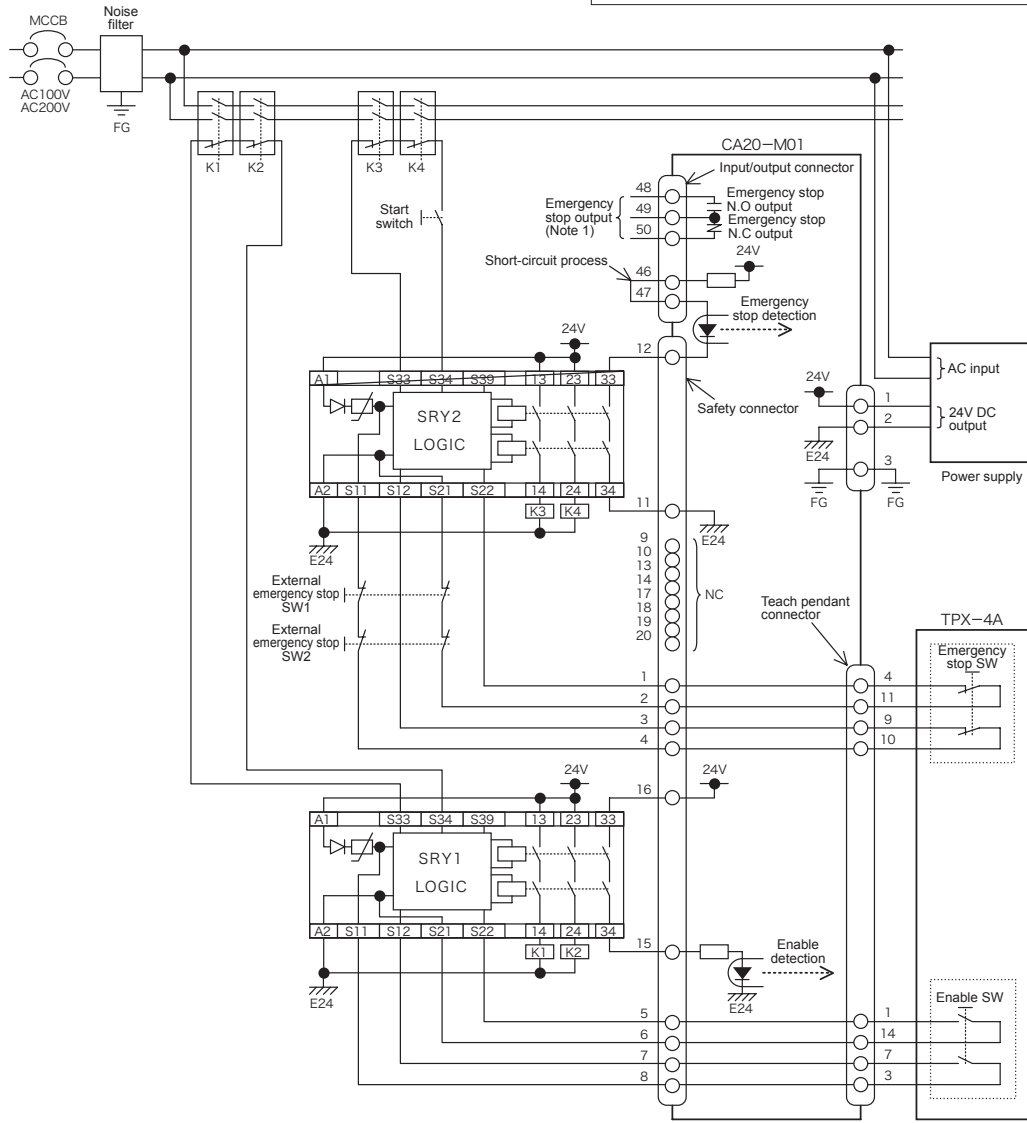
[General-purpose input and output]



Connection Example of Safety Category 3 Compliant Circuit

High-performance master unit CA20-M01

★Note
Because the safety category is determined based on the entire system, careful attention must be paid to the safety devices and cable wiring that is used.



SRY1: Safety relay module (For teach pendant enable) (*1)
 SRY2: Safety relay module (For teach pendant and external emergency stop) (*1)
 K1, K2: Safety-compliant connector (For teach pendant enable)
 K3, K4: Safety-compliant connector (For teach pendant and external emergency stop)
 *1: HR1S-AF5130B (IDEC)
 Note 1: This is not a safety-related circuit.
 Do not use for input of the safety relay module.

★When using a delay-type safety relay module
 Usage of a delay-type safety relay module can enable more reliable stoppage.
 • Set the delay time in the range from 0.5 sec to 1.0 sec.
 • Set the circuit to be delayed as the safety-compliant connector only.
 (Do not delay the circuits for pins 11, 12, 15, or 16 of the safety connector.)
 *: The circuit shown in the example above is not a delay-type safety relay module.

How to Calculate Tact (Cycle) Time

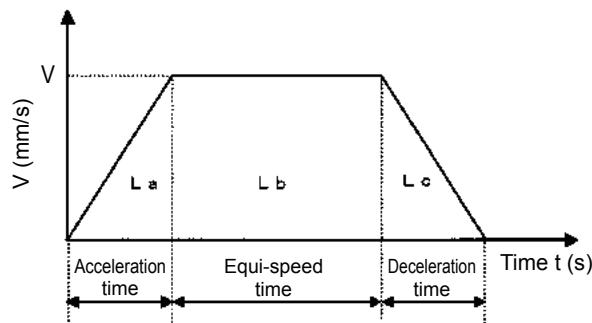
The tact time (cycle time) of a single robot can be figured out from the following calculations. It provides only a yardstick, however, because the time thus calculated differs more or less from actual time.

The calculation comes in the two methods; Example calculation 1 (when equi-speed interval is included) and Example calculation 2 (when an axis starts decelerating during acceleration). Either calculation method is selectable according to the relationship between travel distance, specified speed and specified acceleration/deceleration time.

- [1] When "travel distance > specified speed (V) × specified acceleration/deceleration time (ACC)" ⇒ Example calculation 1
- [2] When "travel distance ≤ specified speed (V) × specified acceleration/deceleration time (ACC)" ⇒ Example calculation 2

- For the acceleration/deceleration time, refer to the relationship between acceleration/deceleration and load as shown in the next page.
- For the acceleration/deceleration time and maximum speed under maximum payload, refer to the specifications of each axis type.

Example calculation 1



L_a = Travel distance at acceleration (mm)
 L_b = Travel distance at equi-speed
 L_c = Travel distance at deceleration (mm)
 L_t = Equi-speed time (s)
 L = Travel distance (mm) = $L_a + L_b + L_c$
 V = Specified speed (mm/s)
 t = Time (s)
 Acc = Specified acceleration/deceleration time (s)

<Operating conditions>
 Specified speed : $V = 1,000$ mm/s
 Specified acceleration/deceleration time : $ACC = 0.3$ s
 Travel distance: $L = 400$ mm

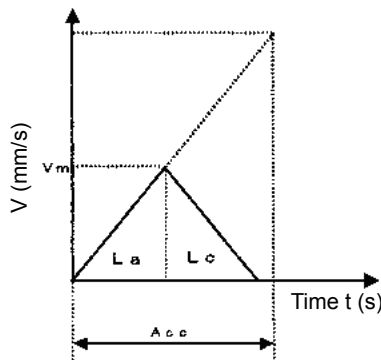
$$L_a = \frac{1}{2} \times V \times Acc = \frac{1}{2} \times 1000 \times 0.3 = 150 \text{ mm}$$

$$L_c = \frac{1}{2} \times V \times Acc = \frac{1}{2} \times 1000 \times 0.3 = 150 \text{ mm}$$

$$L_t = \frac{L - (L_a + L_c)}{V} = \frac{400 - (150 + 150)}{1000} = 0.1 \text{ s}$$

$$\begin{aligned} \text{Tact time} &= \text{Acceleration time} + \text{Equi-speed time} + \text{Deceleration time} \\ &= 0.3 + 0.1 + 0.3 \\ &= \underline{0.7 \text{ sec}} \end{aligned}$$

Example calculation 2



V = Specified speed (mm/s)
 V_m = Real maximum speed (mm/s)
 L = Travel distance (mm)
 L_a = Travel distance at acceleration (mm)
 L_c = Travel distance at deceleration (mm)
 Acc = Specified acceleration/deceleration time (s)
 t = Time (s)

$$L_a = \frac{L}{2} = \frac{200}{2} = 100 \text{ mm}$$

$$L_c = \frac{L}{2} = \frac{200}{2} = 100 \text{ mm}$$

$$\begin{aligned} \text{Tact time} &= 2 \sqrt{\frac{L \times ACC}{V}} = 2 \sqrt{\frac{200 \times 0.3}{1000}} \\ &= \underline{0.49 \text{ sec}} \end{aligned}$$

<Operating conditions>
 Specified speed : $V = 1,000$ mm/s
 Specified acceleration/deceleration time : $ACC = 0.3$ s
 Travel distance: $L = 200$ mm

Relationship between acceleration/deceleration and load

- For the pause time after travel, 1.0 s or over is necessary.
- Vibration may be caused under some installation conditions.
- The payload given above is exerted just above the slider.
- The lower row of the acceleration/deceleration time applies to the models marked by *1.

Payload (kg)

Drive system	Installation direction	Type	Set speed (mm/s)	Lead (mm)	Acceleration/deceleration time(s) (Note 1)					
					0.12 (0.09)	0.24 (0.18)	0.36 (0.27)	0.48 (0.36)	0.6 (0.45)	0.72 (0.54)
Ball screw type	Horizontal	BB10E	1200	20	7	11	15	15	15	15
			600	10	20	25	30	30	30	30
			300	5	25	35	50	50	50	50
		BB30E	1200	20	12	18	20	20	20	20
			600, 300	10, 5	25	35	50	50	50	50
			1200	20	25	35	40	40	40	40
		BB30F	1200	20	25	35	40	40	40	40
			600, 300	10, 5	50	65	80	80	80	80
			1200	20	25	40	60	60	60	60
		BB50F	1200	20	25	40	60	60	60	60
			600, 300	10, 5	50	75	100	100	100	100
			1200	20	40	70	100	100	100	100
		BB50G	1200	20	40	70	100	100	100	100
			600, 300	10, 5	60	100	150	150	150	150
			2400	40	7	14	25	25	25	25
		BB60G	1200	20	40	70	100	100	100	100
			600	10	60	100	150	150	150	150
			1800	40	12	28	50	50	50	50
	BB60J (*1)	900	20	60	130	200	200	200	200	
		450	10	100	180	250	250	250	250	
		1200	20	3	4	5	5	5	5	
	Vertical	BB10E	1200	20	3	4	5	5	5	5
			600	10	6	9	12	12	12	12
			300	5	17	20	22	22	22	22
		BB30E	1200	20	3	4	5	5	5	5
			600	10	6	9	12	12	12	12
			300	5	17	20	22	22	22	22
		BB30F	1200	20	6	7	10	10	10	10
			600	10	14	16	20	20	20	20
			300	5	30	35	40	40	40	40
		BB50F	1200	20	8	10	12	12	12	12
			600	10	15	20	25	25	25	25
			300	5	30	40	50	50	50	50
		BB50G	1200	20	20	22	25	25	25	25
			600	10	30	40	50	50	50	50
			300	5	40	50	60	60	60	60
BB60G		1200	20	20	22	25	25	25	25	
		600	10	30	40	50	50	50	50	
		900	20	30	40	50	50	50	50	
BB60J (*1)	900	20	30	40	50	50	50	50		
	450	10	40	70	100	100	100	100		

Payload (kg)

Drive system	Installation direction	Type	Set speed (mm/s)	Lead (mm)	Acceleration/deceleration time(s) (Note 1)					
					0.1	0.2	0.3	0.4	0.5	0.6
Ball screw type (small)	Horizontal	BBT5D	800	12	4	5	6	6	6	6
			400	6	8	10	15	15	15	15
		BBT7D	800	12	4	5	12	12	12	12
	Vertical	BBT5D	800	12	1	2	3	3	3	3
			400	6	2	3	4	4	4	4
		BBT7D	800	12	1	2	4	4	4	4
Timing belt type	Horizontal	BB10E	1000	21	5	10	15	15	15	15
			2000	42	2	4	6	8	10	10
		BB30E	1000	21	5	10	15	15	15	15
			2000	42	6	10	12	14	20	20
		BB50F	1000	21	10	20	40	40	40	40
			2000	42	7	10	12	14	20	20

Note 1: The acceleration/deceleration time is the time until an axis reaches the set speed as given in the table.

[BA-II Series] Component List per Unit Single axis control system

(For details, see the pages for each unit and fill in this sheet.)

Guide No.	Unit name	Code designation	Q'ty	Guide No.		Code designation	Q'ty
				Unit name	Unit name		
1	Actuator (axis) BB	BB - CC - M - R					
2	Controller cable	CA20 - M					
3	Controller (master unit)	CA20 - EX - A 2 0					
4	Extension I/O unit	CA10 - IC - A					
5	I/O cable (for master unit)	CA10 - IC - B					
	I/O cable (for extension unit)	ABSU - 000					
6	Regenerative discharge unit	TPH -					
7	Teach pendant						

Notes on filling this sheet:

- * Fill in necessary numbers and alphabets in the boxes together with required quantities.
- * Packing charge, transportation fee and excise tax shall be quoted separately.
- * This component list may not be adequate, depending on user's requirements.

[BA-II Series] Component List per Unit

2-axis, 3-axis or 4-axis control system

(For details, see the pages for each unit and fill in this sheet.)

Guide No.	Unit name	Code designation	Q'ty	Guide No.	Unit name	Code designation	Q'ty	
1	Actuator (axis 1)	BB <input type="text"/> - <input type="text"/> - <input type="text"/> - <input type="text"/> - <input type="text"/> - <input type="text"/>		6	Tube tray, flexible tray	BA10-TT- <input type="text"/> - <input type="text"/>		
	Actuator (axis 2)	BB <input type="text"/> - <input type="text"/> - <input type="text"/> - <input type="text"/> - <input type="text"/> - <input type="text"/>		7	Cable grip	BA10-CG-M2 <input type="text"/>		
	Actuator (axis 3)	BB <input type="text"/> - <input type="text"/> - <input type="text"/> - <input type="text"/> - <input type="text"/> - <input type="text"/>		8	Strain relief	BA10-SC-A02		
2	Actuator (axis 4: R-axis)	BB00D <input type="text"/> - <input type="text"/>		9	Controller (master)	CA <input type="text"/> 0-M <input type="text"/>		
	Axis combination bracket	BA <input type="text"/> - BK - <input type="text"/>			10	Controller (slave)		CA20-S <input type="text"/>
		BA <input type="text"/> - BK - <input type="text"/>				Link cable		CA10-LC-A <input type="text"/>
3	Controller cable	BB10-CC-M <input type="text"/> -R		11	Extension I/O unit	CA20-EX-A20		
		BB10-CC-M <input type="text"/> -R			CA10-EX-B40			
	Controller cable	BB10-CC-M <input type="text"/> -R		12	I/O cable (for CA20-M10, M40) (for CA20-S10, S40)	CA10-IC-A <input type="text"/>		
		BB10-CC-M <input type="text"/> -R			I/O cable (for CA20EX-A20)	CA10-IC-B <input type="text"/>		
4	CN box	BA10-BX- <input type="text"/>		13	I/O cable (for CA10-M00) (for CA10-EX-B40)	ICBL - <input type="text"/> 00		
		BA10-BX- <input type="text"/>			Regenerative discharge unit	ABSU - <input type="text"/> 000		
		BA10-BX- <input type="text"/>			Teach pendant (for CA20-M10/M40/M00, CA10-M00B/M01B)	TPH- <input type="text"/>		
		BA10- <input type="text"/> - <input type="text"/> - <input type="text"/> - <input type="text"/>			Teach pendant (for CA20-M01)	TPX - 4 A		
5	Flexible tube, Flexible duct	BA10- <input type="text"/> - <input type="text"/> - <input type="text"/> - <input type="text"/>						
		BA10- <input type="text"/> - <input type="text"/> - <input type="text"/> - <input type="text"/>						
		BA10- <input type="text"/> - <input type="text"/> - <input type="text"/> - <input type="text"/>						

Notes on filling this sheet:

* Fill in necessary numbers and alphabets in the boxes together with required quantities.

* Packing charge, transportation fee and excise tax shall be quoted separately.
 * This component list may not be adequate, depending on user's requirements.

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http://www.toshiba-machine.com/robotics/SR_homepagef.htm
<http://www.tmrobotics.co.uk>



Before operating the industrial robot, read through and completely understand the instruction manuals.

■The contents included in this catalog are subject to change without prior notice to reflect improvements.

