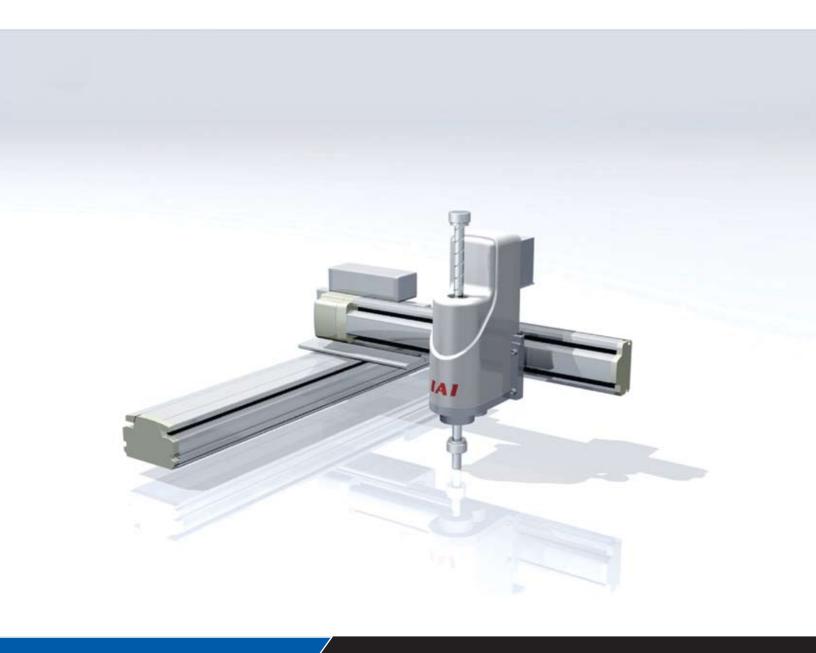


ZR-s/M





ZR Series

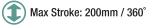
ZR-S (Small Type) - **ZR-M** (Medium Type)

High Speed Vertical/Rotation Electric Actuator

Encoder type

Absolute

Incremental



ZR Series





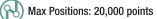


Type

(Z-Axis 100W / R-Axis 100W)

Medium Type (Z-Axis 200W / R-Axis 200W)

Small Type



Z-Axis Motor

100 100W (S Type)

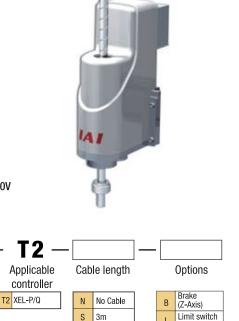
200 200W (M Type)



Stroke

150 150mm (S Type)

200 200mm (M Type)



M 5m
Specified Length

(Rotation)

1. Add the ZR Unit to a 2-axis System to Create a High Speed 4-axis System

Z-Axis Lead

16 16mm (S Type)

20 20mm (M Type)

Because of the compact construction of the ZR unit, it is possible to add the ZR unit as a standard configuration to the ICSA/ICSPA series actuators. Take your manufacturing to higher levels of efficiency and productivity.

2. High Speed Rotation

The high speed R-axis is capable of up to 2200°/s and will cut your cycle time, improving ROI.

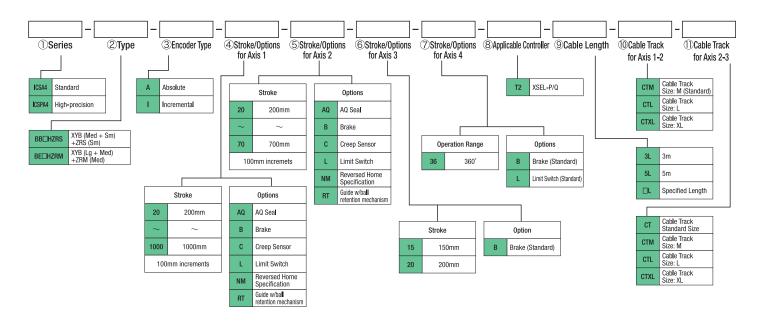
3. 2 Sizes to Fit Your Application

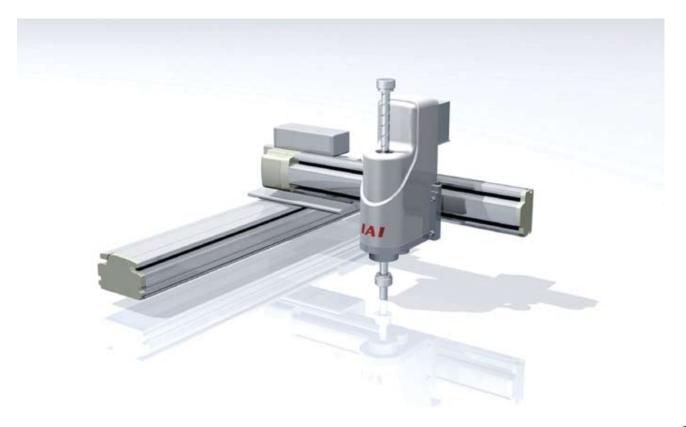
Select the small or medium type ZR unit with either the absolute or incremental encoder.

Specifications		ZR-S (Small Type)	ZR-M (Medium Type)
Motor Output	Z-Axis (Vertical) (W)	100	200
	R-Axis (Rotation) (W)	100	200
Work Envelope	Z-Axis (Vertical) (mm)	150	200
	R-Axis (Rotation) (Deg)	±360°	±360°
Maximum Operating	Z-Axis (Vertical) (mm/s)	1005	1256
Speed	R-Axis (Rotation) (Deg/s)	2200°	2200°
Load Capacity	Rated (kg)	1	2
	Max (kg)	3	6

ICSA4/ICSPA4 Series

XY 2-axis combination + ZR (Z-axis and rotation axis)







/ertical/Rotational Axis Integrated Type, Compact type, 100W

A: Absolute I: Incremental

■ Model

ZR -

S - _ - 100 - 16 - 150 - T2 - _ Series - Type - Encoder Type - Motor Type - Z-axis lead - Z-axis stroke - Applicable - Cable Length -

100:100W 16:16mm 150:150mm T2:XSEL

B: Brake (standard feature)

L: Limit switch (standard feature on rotational axis)

Models/Specifications

	Axis		Motor	Operation	Positioning	Maximum Operating	Loading Capacity (kg)		Capacity (kg)		kg) Push force (N)		Rotational Axis Allowable load	
Model	Configuration	Encoder Type	Capacity (W)	Range	Repeatability (mm)	Speed	Rated (note 2)		Push motion operation (note 3)	(note 2)	Allowable inertial moment (kg·m²)(note 4)	Allowable torque (N·m)		
ZR-S- ① -100-16-150-T2- ② -B-L	Vertical axis	Absolute	100	150mm	±0,010	1005mm/s		,	74.8	107	0,015	1,9		
Zn-3- W-100-10-150-12- Ø -B-L	Rotational axis	Incremental	100	±360°	±0,005	2200°/s	'		/4.0	107	0,015	1.9		

S: 3m M: 5m

X□□: Specified Length

Options

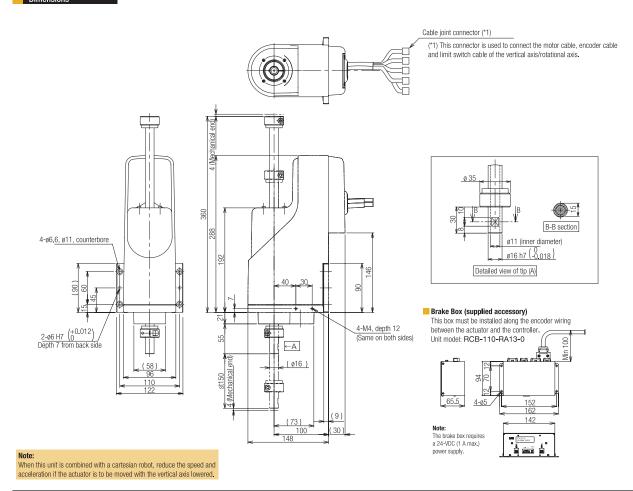
Name	Option code	Remarks
Brake	В	Standard feature on vertical axis/rotational axis
Home Limit Switch	L	Standard feature on rotational axis

* The following adjustment jig (sold separately) is required for the absolute specification. Absolute reset adjustment jig (model: JG-ZRS)

Actuator Specifications

Encoder type	Absolute / Incremental
Actuator weight	5.5kg
Applicable controller	T2 : XSEL-P/Q
Cable Length (note 5)	N : No cable, S : 3m, M : 5m, X□□ : Specified length
Ambient operating temp/humidity	Temperature 0 to 40°C, Humidity 20 to 85% RH max. (non-condensing)

Dimensions



Applicable Controller Specifications

Applicable Controller	Max number of controlled axes	Connectable encoder type	Operating method	Power-supply voltage
X-SEL-P/Q	6 axes	Absolute/incremental	Program	Single-phase/3-phase 200 VAC

(Note 1) Based on PTP command operation.

(Note 2) The rated loading capacity assumes operation at an acceleration/deceleration of 0.3G, while the maximum loading capacity assumes operation at an acceleration/deceleration of 0.1G.
(Note 3) The push force of the vertical axis represents the force that pushes an object at the tip of the

vertical axis. The value indicated under "Push-motion operation" corresponds to the maximum push force when a push command is executed in the program. The value indicated under "Maximum thrust" corresponds to the maximum thrust achieved during normal positioning operation. If you are performing push-motion operation, be sure to use a push command in the program.

(Note 4) Allowable inertial moment converted to an equivalent value at the center of the rotational axis.

The actual value may be lower depending on the conditions of use.
(Note 5) The maximum cable length is 30m. Specify a desired length in meters. (Example X08 = 8m)



^{*} In the above model name, (1) indicates the encoder type, while (2) indicates the cable length.

Vertical/Rotational Axis Integrated Type, Medium size type, 200W

Туре

A: Absolute I: Incremental

M - _ _ - 200 - 20 - 200 - T2 - [

- Encoder Type - Motor Type - Z-axis lead - Z-axis stroke - Applicable - Cable Length - Controller

N: None

200:200W 20:20mm 200:200mm T2:XSEL-P/0 S: 3m M: 5m X□□: Specified Length

B: Brake (standard feature) L. Limit switch (standard feature on rotational axis)



Models/Specifications

		Axis		Motor	Operation	Positioning	Maximum Operating	Loading Capacity (kg)		city (kg) Push force (N)		Rotational Axis Allowable load	
	Model	Configuration	Encoder Type	Capacity (W)	Range	Repeatability (mm)	Speed	Rated (note 2)	Max (note 2)	Push motion operation (note 3)	Max thrust (note 3)	Allowable inertial moment (kg·m²)(note 4)	Allowable torque (N·m)
Ι.	ZR-M- ① -200-20-200-T2-②-B-L	Vertical axis	Absolute	200	200mm	±0.010	1256mm/s	,	6	120	171	0.03	3.8
1	ZN-IVI- [1] -200-20-200-12-[2-B-L	Rotational axis	Incremental	200	±360°	±0.005	2200°/s		0	120	171	0,03	3,0

^{*} In the above model name, (1) indicates the encoder type, while (2) indicates the cable length.

Options

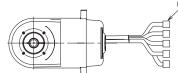
Name	Option code	Remarks
Brake	В	Standard feature on vertical axis/rotational axis
Home Limit Switch	L	Standard feature on rotational axis

* The following adjustment jig (sold separately) is required for the absolute specification. Absolute reset adjustment jig (model: JG-ZRM)

Actuator Specifications

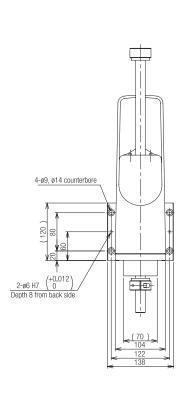
Encoder type	Absolute / Incremental
Actuator weight	8kg
Applicable controller	T2: XSEL-P/Q
Cable Length (note 5)	N : No cable, S : 3m, M : 5m, X□□ : Specified length
Ambient operating temp/humidity	Temperature 0 to 40°C, Humidity 20 to 85% RH max. (non-condensing)

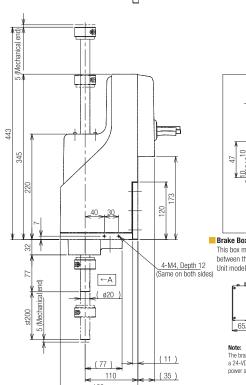
Dimensions

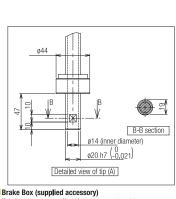


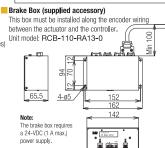
Cable joint connector (*1)

(*1) This connector is used to connect the motor cable, encoder cable and limit switch cable of the vertical axis/rotational axis.









When this unit is combined with a cartesian robot, reduce the speed and acceleration if the actuator is to be moved with the vertical axis lowered.

Applicable Controller Specifications

Applicable Max number of controlled axes		Connectable encoder type	Operating method	Power-supply voltage	
X-SEL-P/Q	6 axes	Absolute/incremental	Program	Single-phase/3-phase 200 VAC	

(Note 1) Based on PTP command operation.

(Note 2) The rated loading capacity assumes operation at an acceleration/deceleration of 0.3G, while the maximum loading capacity assumes operation at an acceleration/deceleration of 0.1G.



(Note 3) The push force of the vertical axis represents the force that pushes an object at the tip of the vertical axis. The value indicated under "Push-motion operation" corresponds to the maximum push force when a push command is executed in the program. The value indicated under "Maximum thrust" corresponds to the maximum thrust achieved during normal positioning operation. If you are performing push-motion operation, be sure to use a push

command in the program.
(Note 4) Allowable inertial moment converted to an equivalent value at the center of the rotational axis. The actual value may be lower depending on the conditions of use.
(Note 5) The maximum cable length is 30m. Specify a desired length in meters. (Example X08 = 8m)

Cartesian Robot 4-axis Combination of X/Y and ZR Unit Cartesian Robot 4-axis Combination of X/Y and ZR Unit

High-precision Specification

Туре

BB HZRS A : Absolute

Stroke/options for axis 2
10:100mm Refer to options table below for axis a
20:200mm Refer to
\$ options table below 80:800mm (100mm steps)

В-BL - T2 -Operation range/ Options for axis 4 36:360 Deg T Befer to options table oblow 15:150mm

Controller Cable Cable wiring Cable wiring

T2:XSEL-P/Q

31:3m Refer to Explanation of
Subble Symbols in Model Names below L: Specified Length



Model

* Models of high-precision specification are shown in [].

Encoder Model	XY combination direction (*1)	Z-axis Type	Model
	1	Н	ICSA4 [ICSPA4]-BB1HZRS-A-①-②-③B-4BL-⑤-6
Absolute	2	Н	ICSA4 [ICSPA4]-BB2HZRS-A-D-2-3 B-4 BL-3-6-0-8
Ausolute	3	Н	ICSA4 [ICSPA4]-BB3HZRS-A-D- 2- 3B-4BL-5-6-2-8
	4	Н	ICSA4 [ICSPA4]-BB4HZRS-A-D-2-3B-4BL-3-6-7-8
	1	Н	ICSA4 [ICSPA4]-BB1HZRS-I-①-②-③ B-④ BL-⑤- ⑥- ⑦-⑨
Incremental	2	Н	ICSA4 [ICSPA4]-BB2HZRS-I-①-②-③ B-4 BL-⑤-⑥-⑦-⑧
moremental	3	Н	ICSA4 [ICSPA4]-BB3HZRS-I-①-②-③B-44BL-⑤-⑥-⑦-⑧
	4	Н	ICSA4 [ICSPA4]-BB4HZRS-I-①-②-③B-4BL-⑤-6-⑦-8

^{*1} See the figure below for the XY combination directions.

Explanation of Symbols in Model Names

No.	Description	Value				
1	X-axis stroke (Note 1)	20 : 200mm				
	(Note 1)	80 : 800mm				
2	Y-axis stroke	10 : 100mm				
	(Note 1)	40 : 400mm				
3	Z-axis stroke (Note 1)	15 : 150mm				
4	R-axis Operation Range	36 : 360deg				
5	Applicable Controllers	T2 : XSEL-P/Q				
6	Cable Length (Note 2)	3L : 3m 5L : 5m				
7	Y-axis Cable Wiring	CTM: Cable track size M (Standard) CTL: Cable track size L CTXL: Cable track size XL				
8	Z-axis Cable Wiring	CT: Cable Track (Standard) CTM: Cable track size M CTL: Cable track size L CTXL: Cable track size XL				

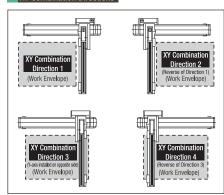
^{*}The above table describes ① to ⑧in the model names shown to the left.

Options

Enter the applicable option symbol after the stroke of each axis. If multiple options are selected, enter them in alphabetical order.

Name	Model
AQ Seal	AQ
Brake	В
Creep Sensor	С
Home Limit Switch	L
Reversed Home Specification	NM
Guide with ball retention mechanism	RT

XY Combination Directions



Axis Configuration * Models of high-precision specification are shown in [].

Axis Name			
ISA [ISPA]-MXM 100-20-(Stroke)			
ISA [ISPA]-SYM60-16-(Stroke)			
is ZR-S100-16-150-T2-#-B-L			

^{*} In the \square in the above model names, enter A (absolute) or I (incremental) as the applicable encoder type.

Common Specifications * Models of high-precision specification are shown in [].

Drive Method	Ball screw, rolled C10 [rolled C5 or equivalent]
Positioning Repeatability	±0.02mm [±0.01mm]
Lost Motion	0.05mm max [0.02mm max]
Guide	Base integrated type
Base	Material: Aluminum with white alumite treatment
X-axis motor output/lead	100W/20mm
Y-axis motor output/lead	60W/16mm
Z-axis motor output/lead	100W/16mm
Motor output of rotational axis	100W
Allowable inertial moment of rotational axis	0.015kg ⋅ m ²
Allowable torque of rotational axis	1.9N ⋅ m



(Note 1) Strokes are expressed in cm (centimeters) in the model names.

(Note 2) The cable length is measured from the X-axis connector box to the controller. Although the standard length is 3m or 5m, other lengths can also be specified in m (Meters). Cable lengths of up to 20 meters are supported.

(Note 3) The actual value may be lower depending on the conditions of use.

(Note 4) The rated acceleration is 0.3G. When the acceleration is increased, the loading capacity decreases.

(Note 5) Take note that the maximum speed drops when the stroke becomes longer. If the robot is to be moved with the vertical axis lowered, raise the speed and acceleration.

^{*} For the descriptions of ① to ⑧ in the above model names, refer to the table provided in the top right.

^{*} The following adjustment jig (sold separately) is required for models of absolute specification: Absolute reset adjustment jig (model: JG-ZRS)

^{# -} Cable length

ICSA4 [ICSPA4] - BE□HZRS

Loading Capacities (kg) (Note 4)

BB HZRS

			Y-axis	Stroke	
		100	200	300	400
Z-axis Stroke	150	Rated: 1.0 kg (at acceleration/deceleration of 0.3 Maximum: 3.0 kg (at acceleration /deceleration of 0.1 G)			

Maximum Speeds by Stroke (mm/s) (Note 5)

BB HZRS

				Str	oke			
	100	200	300	400	500	600	700	800
X-axis	_		1000					795
Y-axis		800				_		

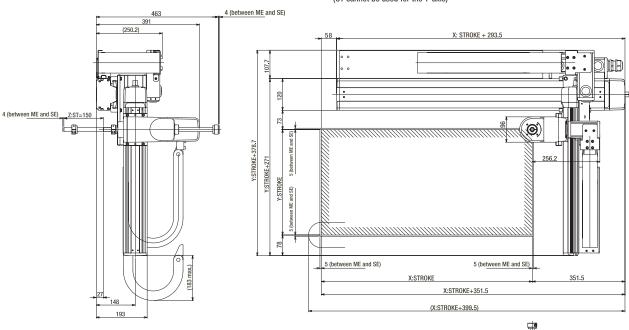
	Stroke : 150mm
Z-axis	1005mm/s

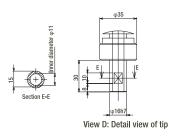
	Stroke: ±360°
Rotational Axis	2200°/s

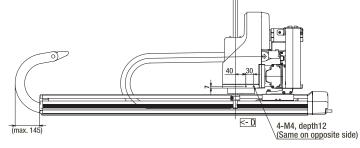
Dimensions

* The figure below is the figure for XY combination direction 1.

* In the figure below, the cable track dimensions is CTM for the Y-axis and CT for the ZR-axes. (CT cannot be used for the Y-axis)

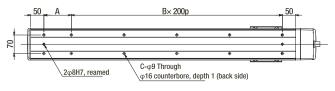






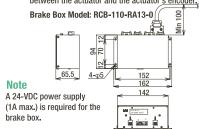
* The combination position shown in the drawing defines the home position. If you want to change the home position, specify the option "NM." Take note that to change the home position after the delivery, the robot must be returned for adjustment.

X Stroke	200	300	400	500	600	700	800
Α	104	204	104	204	104	204	104
В	1	1	2	2	3	3	4
С	6	6	8	8	10	10	12



■ Brake Box (Accessory)

This device must be installed along the cable wired between the actuator and the actuator's encoder.



Cartesian Robot 4-axis Combination of X/Y and ZR Unit Cartesian Robot 4-axis Combination of X/Y and ZR Unit

High-precision Specification

BE HZRM Type Standard 4-axis Specification

Refer to model table below

troke/options for axis 2 A : Absolute 30:300mm Refer to options table for axis 1 100:1000mm (100mm steps)

Stroke/options of peration range/ for asis 3 20200mm 36.560 Deg Substitution 1 20200mm 36.560 Deg Substituti 3L:3m Refer to Explanation of 5L:5m Symbols in Model Names below L: Specified Length



Model

 * Models of high-precision specification are shown in [].

Encoder Model	XY combination direction (*1)	Z-axis Type	Model
	1	Н	ICSA4 [ICSPA4]-BE1HZRM-A①-②-③ B-④ BL-⑤ - ② ⑧
Absolute	2	Н	ICSA4 [ICSPA4]-BE2HZRM-A-0 -2 -3 B-4 BL-5 -0 -7 -8
	3	Н	ICSA4 [ICSPA4]-BE3HZRM-A-①- ②- ③B- ④ BL- ⑤- ⑥- ⑦- ⑧
	4	Н	ICSA4 [ICSPA4]-BE4HZRM-A-Q23 B4 BL5678
	1	Н	ICSA4 [ICSPA4]-BE1HZRM-I-① -② -③ B-④ BL-⑤ -⑥ -⑦ -⑧
Incremental	2	Н	ICSA4 [ICSPA4]-BE2HZRM-I-D -2 -3 B-4 BL-5 -6 -7 -8
Incremental	3	Н	ICSA4 [ICSPA4]-BE3HZRM-I-①-②-③ B-④ BL-⑤-⑥-⑦-⑧
	4	Н	ICSA4 [ICSPA4]-BE4HZRM-I-D-2-3 B-4 BL-5-6-7-8

^{*1} See the figure below for the XY combination directions.

Explanation of Symbols in Model Names

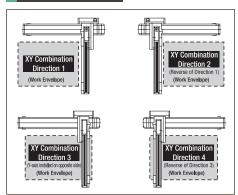
No.	Description	Indication				
1	X-axis stroke (Note 1)	30 : 300mm				
2	Y-axis stroke (Note 1)	20 : 200mm				
, ,		70 : 700mm				
3	Z-axis stroke (Note 1)	20 : 200mm				
4	R-axis Operation Range	36:360deg				
5	Applicable Controllers	T2 : XSEL-P/Q				
6	Cable Length (Note 2)	3L : 3m 5L : 5m				
7	Y-axis Cable Wiring	CTM: Cable track size M (Standard) CTL: Cable track size L CTXL: Cable track size XL				
Z-axis Cable Wiring		CT: Cable Track (Standard) CTM: Cable track size M CTL: Cable track size L CTXL: Cable track size XL				
*The above table describes to loin the model names shows to the left						

^{*}The above table describes \boxdot to $\ensuremath{\, \textcircled{\textcircled{\scriptsize 0}}}$ in the model names shown to the left.

Enter the applicable option symbol after the stroke of each axis. If multiple options are selected, enter them in alphabetical order.

Name	Model
AQ Seal	AQ
Brake	В
Creep Sensor	С
Home Limit Switch	L
Reversed Home Specification	NM
Guide with ball retention mechanism	RT

XY Combination Directions



Axis Configuration * Models of high-precision specification are shown in [].

Axis Name	Axis Name			
X-axis ISA [ISPA]-LXM- □ - 400-20-(Stroke)				
Y-axis ISA [ISPA]-MYM- □ -200-20-(Stroke)				
Z-axis/rotational-axis	ZR-M-□-200-20-200-T2-#-B-L			

^{*} In the \square in the above model names, enter A (absolute) or I (incremental) as the applicable encoder type.

Common Specifications * Models of high-precision specification are shown in [].

Drive Method	Ball screw, rolled C10 [rolled C5 or equivalent]	
Positioning Repeatability	±0.02mm [±0.01mm]	
Lost Motion	0.05mm max [0.02mm max]	
Guide	Base integrated type	
Base	Material: Aluminum with white alumite treatment	
X-axis motor output/lead	400W/20mm	
Y-axis motor output/lead	200W/20mm	
Z-axis motor output/lead	200W/20mm	
Motor output of rotational axis	200W	
Allowable inertial moment of rotational axis	0.03kg • m	
Allowable torque of rotational axis	3.8N • m	



(Note 1) Strokes are expressed in cm (centimeters) in the model names.

(Note 2) The cable length is measured from the X-axis connector box to the controller. Although the standard length is 3m or 5m, other lengths can also be specified in m (Meters). Cable lengths of up to 20 meters are supported.

(Note 3) The actual value may be lower depending on the conditions of use.

(Note 4) The rated acceleration is 0.3G. When the acceleration is increased, the loading capacity decreases.

(Note 5) Take note that the maximum speed drops when the stroke becomes longer. If the robot is to be moved with the vertical axis lowered, raise the speed and acceleration.

^{*} For the descriptions of 🕦 to 🔞 in the above model names, refer to the table provided in the top right.

^{*} The following adjustment jig (sold separately) is required for models of absolute specification: Absolute reset adjustment jig (model: JG-ZRM)

ICSA4 [ICSPA4] - BE□HZRM

Loading Capacities (kg) (Note 4)

BB HZRM

			Y-axis Stroke						
		200	300	400	500	600	700		
Z-axis Stroke	200	Rated: 2.0 kg (at acceleration/deceleration of 0.3 G) Maximum: 6.0 kg (at acceleration /deceleration of 0.1 G)							

Maximum Speeds by Stroke (mm/s) (Note 5)

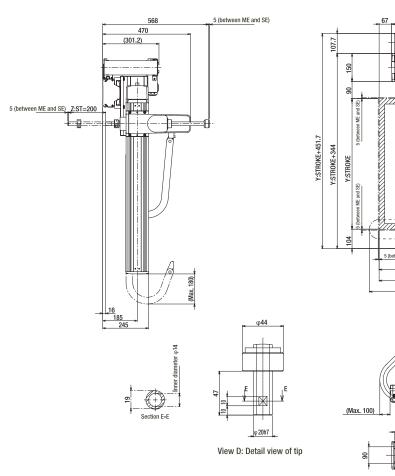
BB HZRM

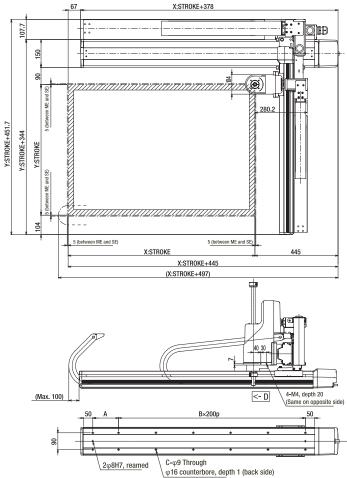
					Strok	e				
	100	200	300	400	500	600	700	800	900	1000
X-axis	_				100	0			830	690
Y-axis	-			100	00			-	_	-

	Stroke : 200mm							
Z-axis	1256mm/s							
	Stroke: ±360°							
Rotational	2200°/s							

Dimensions

* In the figure below, the cable track dimensions is CTM for the Y-axis and CT for the ZR-axes. (CT cannot be used for the Y-axis)





* The combination position shown in the drawing defines the home position. If you want to change the home position, specify the option "NM." Take note that to change the home position after the delivery, the robot must be returned for adjustment.

X Stroke	300	400	500	600	700	800	900	1000
Α	238	138	238	138	238	138	238	138
В	1	2	2	3	3	4	4	5
С	6	8	8	10	10	12	12	14

This device must be installed along the cable wired between the actuator and the actuator's encoder. Brake Box Model: RCB-110-RA13-0 Brake Box Model: RCB-110-RA13-

^{*} The figure below is the figure for XY combination direction 1.



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From our easy to use software, to complete automation solutions, we provide you with the tools necessary to scale your business. When you demand innovative and high quality robots, excellent service and support for your unique needs, demand IAI!



IAI Headquarters

On the windows of the newly constructed headquarters spell out the character for 'heart' in Japanese. This character is rich and meaningful, symbolizing the heart, spirit, attention and sincerity of IAI's commitment to the users of IAI products.

ISO 9001:2000

IAI has been certified for ISO 9001:2000 and JIS 09001:2000 by an independent auditor to be in conformance with ISO 9001:2000 and JIS 9001:2000. We at IAI are continually improving our methods to produce quality products and services that surpass customer expectations.







IAI is RoHS compliant and recognizes the responsibility in reducing hazardous substances to better serve our customers and our environment.

