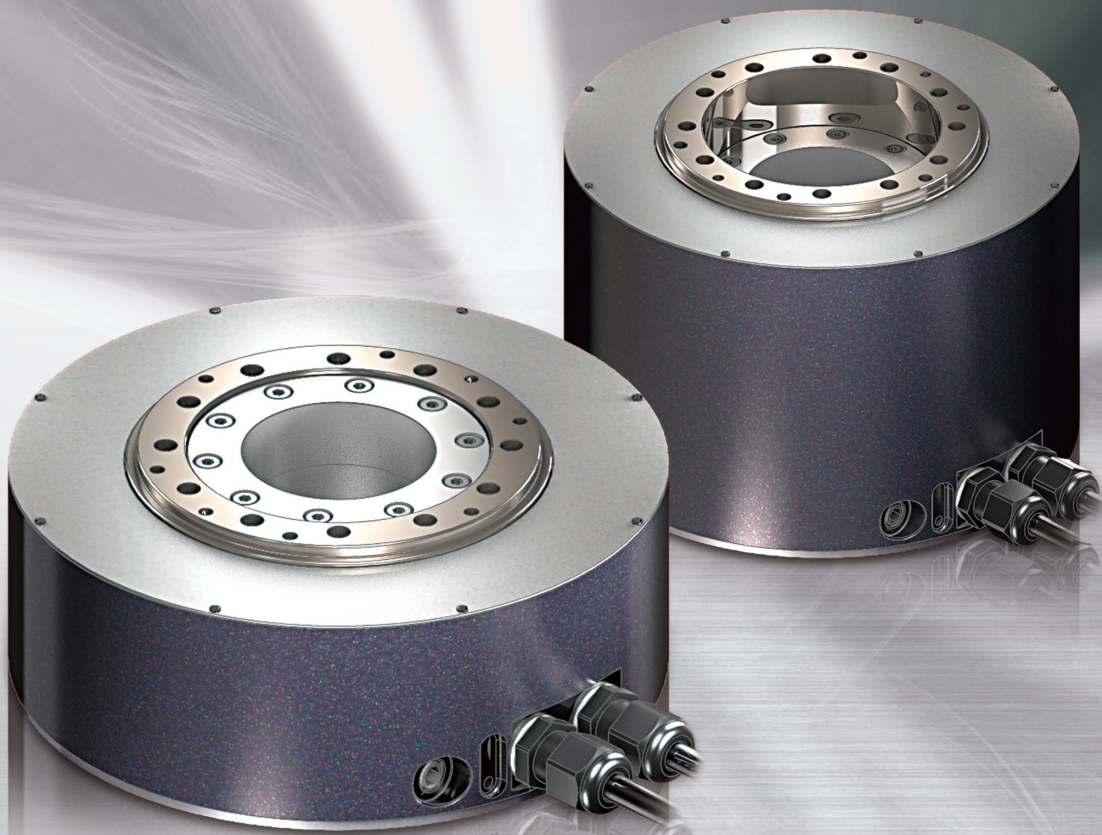


Direct Drive Motor **DDA**



High Speed, High Payload, High Accuracy, Introducing the Direct Drive Motor DDA

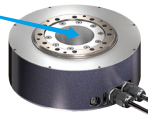
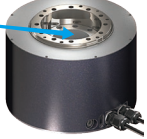
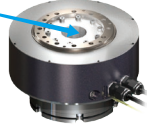
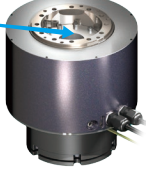
Features

The Direct Drive Motor DDA Series is:

- The motor directly drives the rotary table without a speed reducing mechanism, such as a belt or speed reducer.
- Compact, high-speed and responsive.
- More affordable than the conventional DD series.

1 Brake-equipped specifications have been added to the flange-less high torque/hollow type. Cleanroom specifications are also available.

Cleanliness Class 10	Cleanliness Class 2.5
(Fed.Std.209D)	(ISO14644-1)

		LT18CSA: Thin type (Rated torque: 8.4N·m)	LH18CSA: High torque type (Rated torque: 25N·m)
Large hollow bore type	Without brake (Standard/Cleanroom specification)	Hollow bore: $\phi 52\text{mm}$ 	Hollow bore: $\phi 52\text{mm}$ 
	With brake (Standard)	Hollow bore: $\phi 35\text{mm}$ 	Hollow bore: $\phi 35\text{mm}$ 

2 Achieves a lower price

The price has been reduced by about 33% as compared with the conventional DD series.



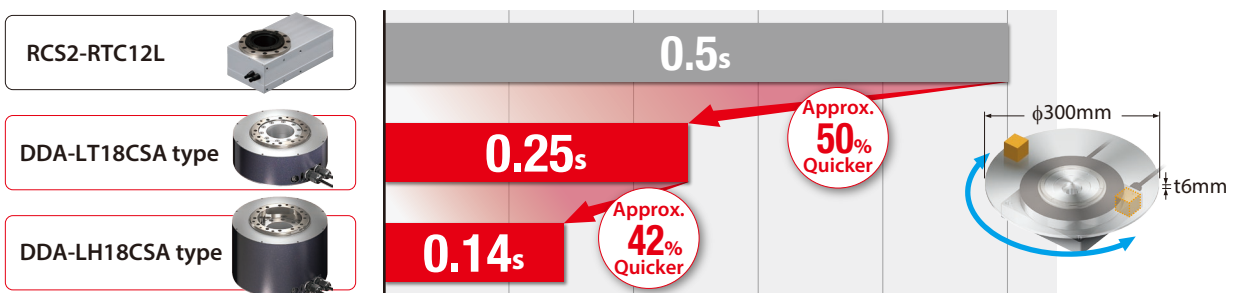
DD-LT18C **About 33% less** DDA-LT18CSA

3 High speed, high acceleration/deceleration

Shorter positioning time means shorter cycle time of your equipment, resulting in greater productivity.

<Comparison of Cycle Times>

Operating conditions: When a work part weighing 100g is placed on an aluminum disc of 300mm in diameter and 6mm in thickness and rotated by 180deg.



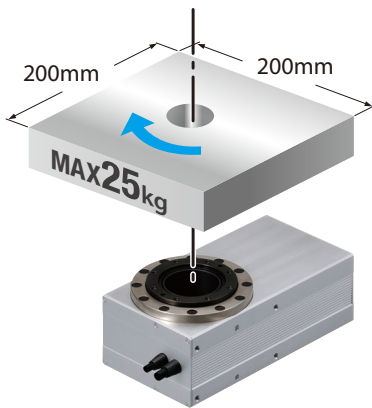
and Easy to Control!

Series Boasting Ultimate Usability!!



4 High torque, high payload

The high torque type has about three times more torque.

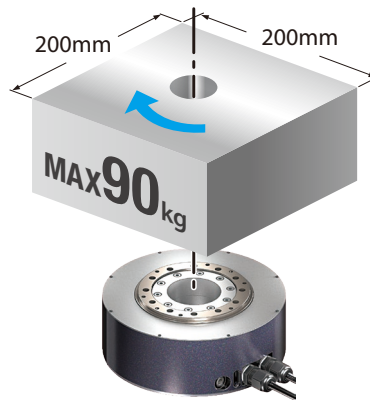


RCS2-RTC12L (Deceleration ratio: 1/30)

Allowable inertia moment

0.17kg·m²

Max. instantaneous torque: 8.6N·m

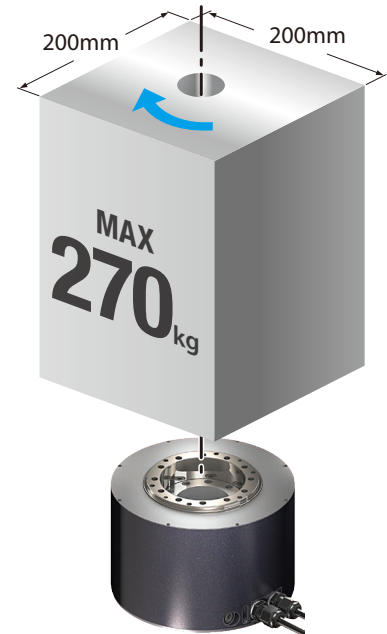


DDA-LT18CSA type

Allowable inertia moment

0.60kg·m²

Max. instantaneous torque: 25.2N·m



DDA-LH18CSA type

Allowable inertia moment

1.8kg·m²

Max. instantaneous torque: 75N·m

5 High-resolution type is available

	High resolution type	Standard type
Model number	DDA-L□18CPA	DDA-L□18CSA
Encoder resolution	20-bit 1,048,576 pulses/rev.	17-bit 131,072 pulses/rev.
Positioning repeatability	±0.00103 deg. (±3.7s)	±0.0055 deg. (±19.8s)

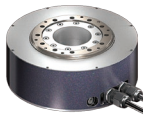

6 Corresponds to the indexing accuracy

It corresponds to the indexing accuracy when connected to SCON-CB, and allows for more accurate positioning.

	Encoder resolution	
	20-bit	17-bit
Indexing accuracy	±0.00833 deg. (±30s)	±0.01249 deg. (±45s)

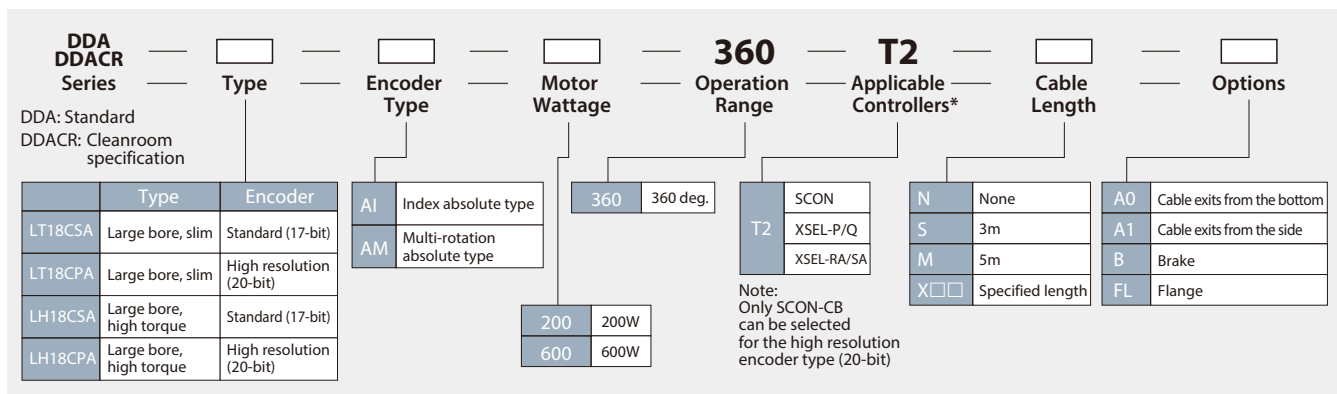


DDA Motor Series List

Type		Large bore, slim type		Large bore, high torque type	
Encoder		Standard (17-bit)	High resolution (20-bit)	Standard (17-bit)	High resolution (20-bit)
Model number	Standard	DDA-LT18CSA	DDA-LT18CPA	DDA-LH18CSA	DDA-LH18CPA
	Cleanroom spec.	DDACR-LT18CSA	DDACR-LT18CPA	DDACR-LH18CSA	DDACR-LH18CPA
External view					
Rated torque (N·m)		8.4		25	
Max. instantaneous torque (N·m)		25.2		75	
Rated speed (deg/s)		1,080		800	
Maximum speed (deg/s)		1,800		1,440	
Motor wattage (W)		200		600	
Size (φ)		φ180		φ180	
Height (mm)	w/o brake	70		122.8	
	w/ brake	115		187.3	
Hollow bore (φ)	w/o brake	φ52		φ52	
	w/ brake	φ35		φ35	
Mass (kg)	w/o brake	5.8		13	
	w/ brake	8.7		17.4	
Cleanliness *		Class 10 (Fed.Std.209D) Class 2.5 or equivalent (ISO 14644-1 Standard)		Class 10 (Fed.Std.209D) Class 2.5 or equivalent (ISO 14644-1 Standard)	
Encoder type		Index absolute/Multi-rotation absolute		Index absolute/Multi-rotation absolute	
Applicable controller		SCON-CB XSEL	SCON-CB	SCON-CB XSEL	SCON-CB
Reference page		P.5		P.9	

* Cleanroom specification only

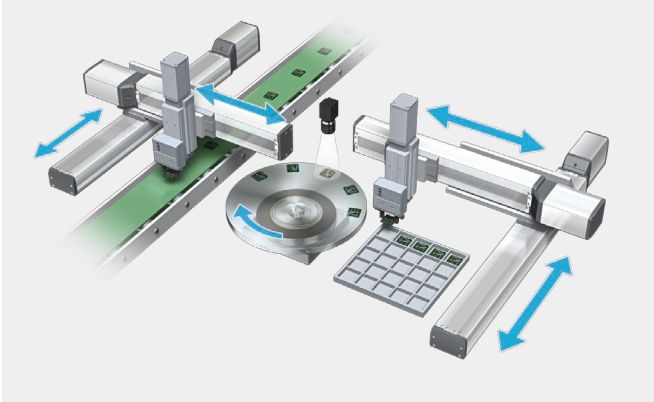
Model Specification Items



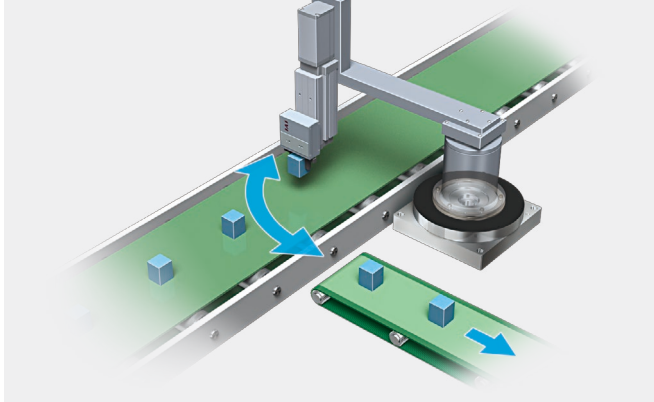
* Please check our latest controller catalog and ask IAI to confirm available latest controllers.

Application Examples

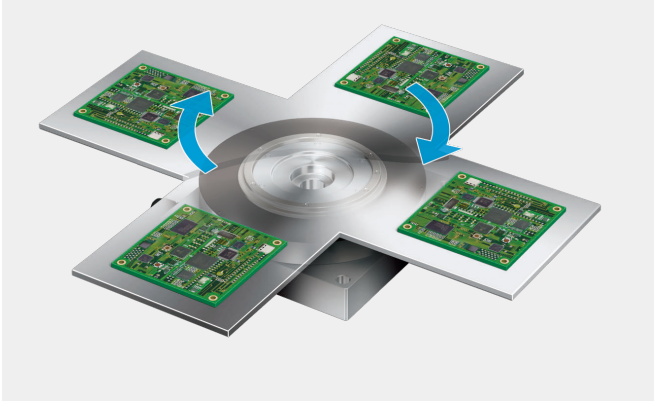
Index Table
 <Inspection device for small boards>



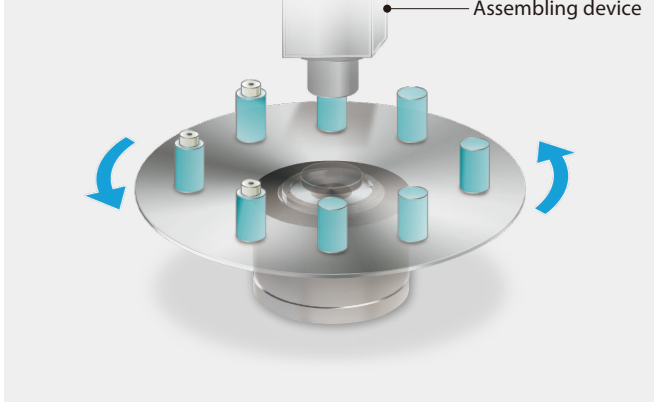
Transport of Workpieces
 <Transporting parts from a conveyor to another>



Multi-rotation Operation
 <Transporting electronic components>



Index Table
 <Parts assembly device>



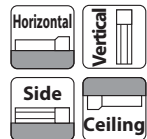
DDA-LT18C□A

DDACR-LT18C□A

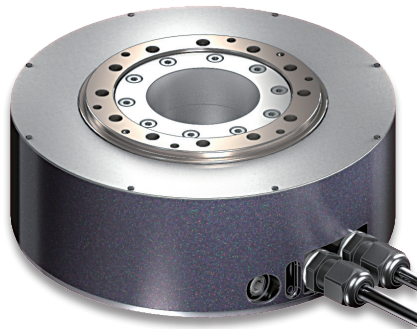
Large Bore Type Slim Type Flange-Less Type
Clean Room Type

■ Model Specification Items	DDA	DDACR	LT18C	□	A	□	200	360	T2	□	□
	Series	Type	Encoder Type	Motor Type	Operation Range	Applicable Controllers	Cable Length	Options			
	DDA : Standard DDACR : Cleanroom specification	S : Standard (17-bit) P : High resolution (20-bit)	AI : Index absolute type AM : Multi-rotation absolute type	200: 200W 360: 360 deg.	T2 : SCON XSEL-P/Q XSEL-RA/SA Note: Only SCON for LT18CP	N : None S : 3m M : 5m X□□ : Specified length	Please refer to the options table below. * Please make sure to specify either A0 or A1 for the cable exit direction.				

* Controller is not included.



* Please refer to P.16 for more information on the installation method.



* Please check our latest controller catalog and ask IAI to confirm available latest controllers.

POINT Selection Notes

(Note 1) The value in () indicates the maximum speed. The maximum speed may not be reached if the moving distance is short.
 (Note 2) Assuming that the actuator is operated 8 hours a day at the rated speed and smooth operation without shock, the actuator will reach its life in five years based on this load.
 (Note 3) The maximum cable length is 30m. Specify a desired length in meters. (Example: X08 = 8m)
 (Note 4) The index absolute type cannot be used in the pulse-train control and MECHATROLINK III control.
 (Note 5) Note that only the short-cut control is allowed when using XSEL with the index absolute type.

Model/Specifications

Encoder type	Model number	Motor wattage (W)	Operation range (deg.) (*1)	Speed (deg./s) (Note 1)	Rated torque (N·m) (*2)	Maximum instantaneous torque (N·m)	Allowable inertia moment (kg·m ²)	Rotor inertia (kg·m ²)
17-bit index absolute type	DDA (CR)-LT18CSA-AI-200-360-T2- ①-②	200	0~359.999 deg.	1~1,080 (1~1,800)	8.4	25.2	0.6	0.0043
17-bit multi-rotation absolute type	DDA (CR)-LT18CSA-AM-200-360-T2- ①-②		±9,999 deg. max.					
20-bit index absolute type	DDA (CR)-LT18CPA-AI-200-360-T2- ①-②		0~359.999 deg.					
20-bit multi-rotation absolute type	DDA (CR)-LT18CPA-AM-200-360-T2- ①-②		±2,520 deg. max.					

Legend: ① Cable length ② Option

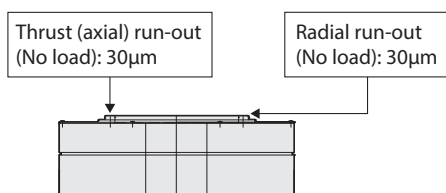
(*1) SCON and XSEL have different minimum resolutions. Please refer to the instruction manual for more information.
 (*2) The value when installed on an IAI rated heat dissipating plate. Please refer to P.16 for more information.

② Options

Name	Option code
Cable exits from the bottom	A0
Cable exits from the side	A1
Flange	FL

(Note) A0 (cable exits from the bottom) option and FL (flange) option cannot be selected together.

Run-out of Output Shaft



① Cable Length

Cable type	Cable code
Standard	S (3m)
	M (5m)
Specified length	X06 (6m) ~X10 (10m)
	X11 (11m) ~X30 (30m)

* Please refer to P.18 for more information regarding the maintenance cables.

Common Specifications

Item	Description
Drive system	Direct drive motor
Positioning repeatability	17-bit: ±0.0055deg. (±19.8s); 20-bit: ±0.00103deg. (±3.7s)
Indexing accuracy *1	17-bit: ±0.01249deg. (±45s); 20-bit: ±0.00833deg. (±30s)
Allowable load moment (Note 2)	80N·m
Encoder resolution	17-bit: 131,072 pulses/rev. 20-bit: 1,048,576 pulses/rev.
Allowable thrust load (Note 2)	Forward: 3,100N; Reverse: 250N
Base material	Aluminum
Ambient operating temp. & humidity	0~40°C, 20~85% (Non-condensing)
Cleanroom specification	Cleanliness Class 10 (Fed.Std.209D), class 2.5 or equivalent (ISO 14644-1 Standard)
	Suction amount 35Nℓ/min
Weight	5.8kg

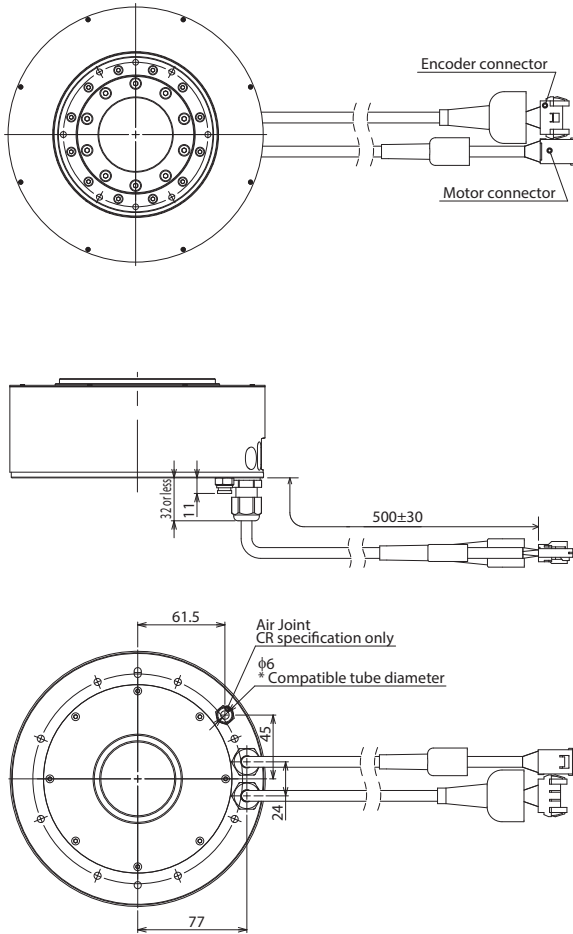
*1 Indexing accuracy is supported when connected to SCON-CB.

Dimensions

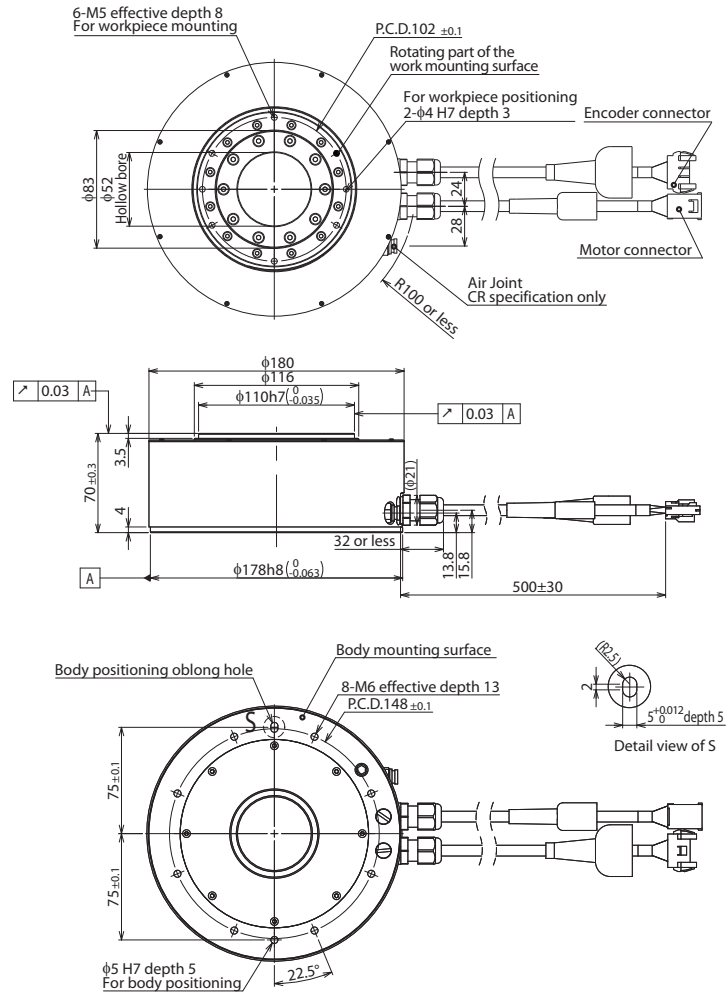
CAD drawings can be downloaded from our website.
www.iai-automation.com



Cable exits from the bottom
(Option code: A0)



Cable exits from the side
(Option code: A1)



Applicable Controllers

The DDA series actuators can be operated by the controllers indicated below. Please select the type depending on your intended use.

Name	External view	Max. number of controlled axes	Power supply voltage	Control method				Maximum number of positioning points	Reference page
				Positioner	Pulse-train	Program	Network *Option		
SCON-CB/CGB		1	Single-phase 200VAC	●	●	-	DeviceNet CC-Link PROFINET EtherCAT EtherNet/IP	512 (768 for network spec.)	P.14
SCON-LC/LCG		1	Single-phase 200VAC	-	-	●	CompoNet MECHATROLINK EtherCAT EtherNet/IP	512 (768 for network spec.)	P.14
XSEL-P/Q/RA/SA		8	Single-phase 200VAC Three-phase 200VAC	-	-	●	Note: The type of compatible networks will vary depending on the controller. Please refer to reference page for more information.	53,332 (Depending on the type)	P.15

* LT18CP can only be operated by SCON. * Please refer to P.16 for the precautions in selecting controllers.

* Please check our latest controller catalog and ask IAI to confirm available latest controllers.

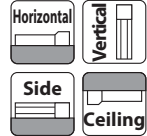
DDA-LH18C□A

DDACR-LH18C□A

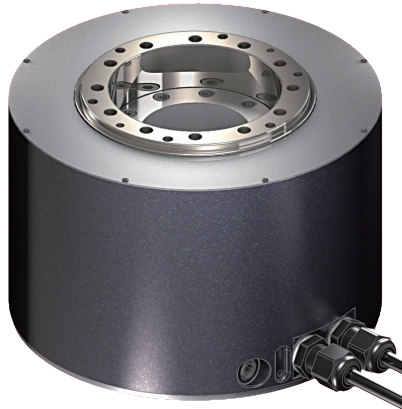
Clean Room Type
Large Bore Type
High Torque Type
Flange-Less Type

■ Model Specification Items	DDA	DDACR	LH18C	□	A	□	600	360	T2	□	□
	Series	Type	Encoder Type	Motor Type	Operation Range	Applicable Controllers	Cable Length	Options			
	DDA : Standard DDACR : Cleanroom specification	S : Standard (17-bit) P : High resolution (20-bit)	AI : Index absolute type AM : Multi-rotation absolute type	600 : 600W 360 : 360 deg.	T2 : SCON XSEL-P/Q XSEL-RA/SA Note: Only SCON for LH18CP	N : None S : 3m M : 5m X□□ : Specified length	Please refer to the options table below. * Please make sure to specify either A0 or A1 for the cable exit direction.				

* Controller is not included.



* Please refer to P.16 for more information on the installation method.



* Please check our latest controller catalog and ask IAI to confirm available latest controllers.

POINT Selection Notes

(Note 1) The value in () indicates the maximum speed. The maximum speed may not be reached if the moving distance is short.
 (Note 2) Assuming that the actuator is operated 8 hours a day at the rated speed and smooth operation without shock, the actuator will reach its life in five years based on this load.
 (Note 3) The maximum cable length is 30m. Specify a desired length in meters. (Example: X08 = 8m)
 (Note 4) The index absolute type cannot be used in the pulse-train control and MECHATROLINK III control.
 (Note 5) Note that only the short-cut control is allowed when using XSEL with the index absolute type.

Model/Specifications

Encoder type	Model number	Motor wattage (W)	Operation range (deg.) (*1)	Speed (deg./s) (Note 1)	Rated torque (N·m) (*2)	Maximum instantaneous torque (N·m)	Allowable inertia moment (kg·m ²)	Rotor inertia (kg·m ²)
17-bit index absolute type	DDA (CR)-LH18CSA-AI-600-360-T2- ①-②	600	0~359.999 deg.	1~800 (1~1,440)	25	75	1.8	0.0092
17-bit multi-rotation absolute type	DDA (CR)-LH18CSA-AM-600-360-T2- ①-②		±9,999 deg. max.					
20-bit index absolute type	DDA (CR)-LH18CPA-AI-600-360-T2- ①-②		0~359.999 deg.					
20-bit multi-rotation absolute type	DDA (CR)-LH18CPA-AM-600-360-T2- ①-②		±2,520 deg. max.					

Legend: ① Cable length ② Option

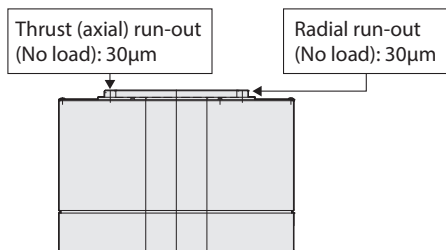
(*1) SCON and XSEL have different minimum resolutions. Please refer to the instruction manual for more information.
 (*2) The value when installed on an IAI rated heat dissipating plate. Please refer to P.16 for more information.

② Options

Name	Option code
Cable exits from the bottom	A0
Cable exits from the side	A1
Flange	FL

(Note) A0 (cable exits from the bottom) option and FL (flange) option cannot be selected together.

Run-out of Output Shaft



① Cable Length

Cable type	Cable code
Standard	S (3m)
	M (5m)
Specified length	X06 (6m) ~X10 (10m)
	X11 (11m) ~X30 (30m)

* Please refer to P.18 for more information regarding the maintenance cables.

Common Specifications

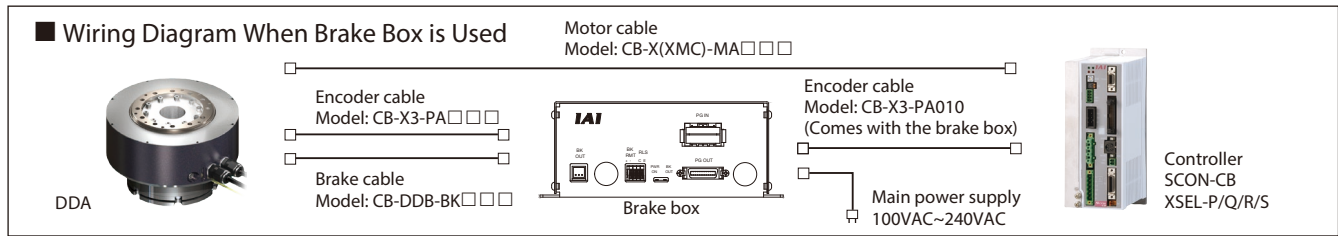
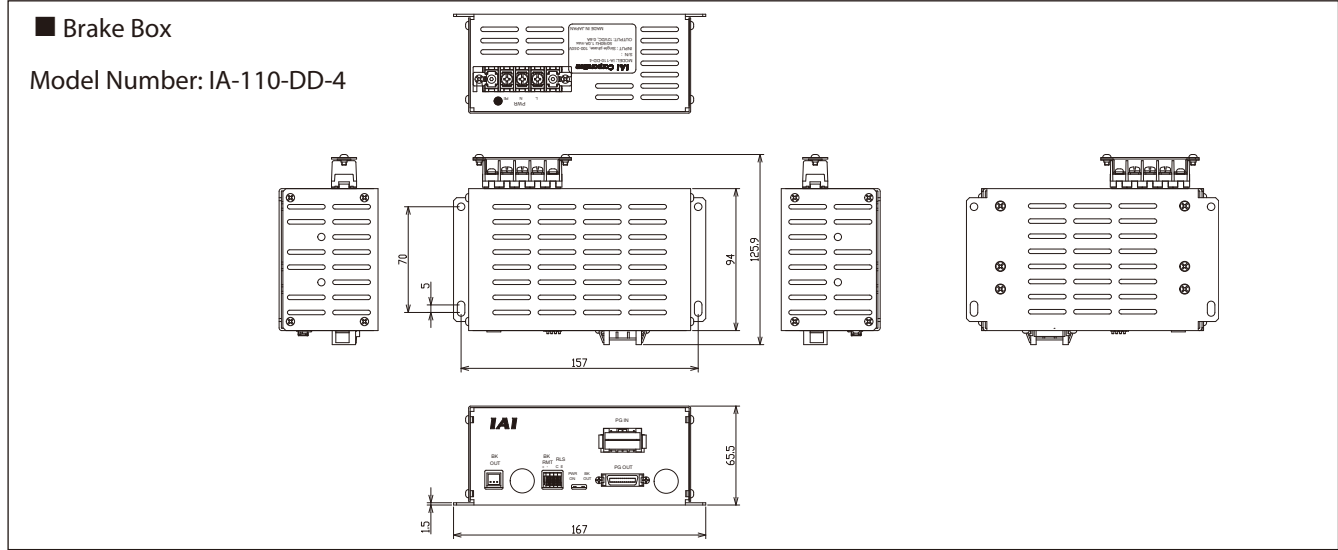
Item	Description
Drive system	Direct drive motor
Positioning repeatability	17-bit: ±0.0055deg. (±19.8s); 20-bit: ±0.00103deg. (±3.7s)
Indexing accuracy *1	17-bit: ±0.01249deg. (±45s); 20-bit: ±0.00833deg. (±30s)
Allowable load moment (Note 2)	80N·m
Encoder resolution	17-bit: 131,072 pulses/rev. 20-bit: 1,048,576 pulses/rev.
Allowable thrust load (Note 2)	Forward: 3,100N; Reverse: 250N
Base material	Aluminum
Ambient operating temp. & humidity	0~40°C, 20~85% (Non-condensing)
Cleanroom specification	Cleanliness Class 10 (Fed.Std.209D), class 2.5 or equivalent (ISO 14644-1 Standard)
	Suction amount 35Nℓ/min
Weight	13kg

*1 Indexing accuracy is supported when connected to SCON-CB.

Options

Brake Option Code: B

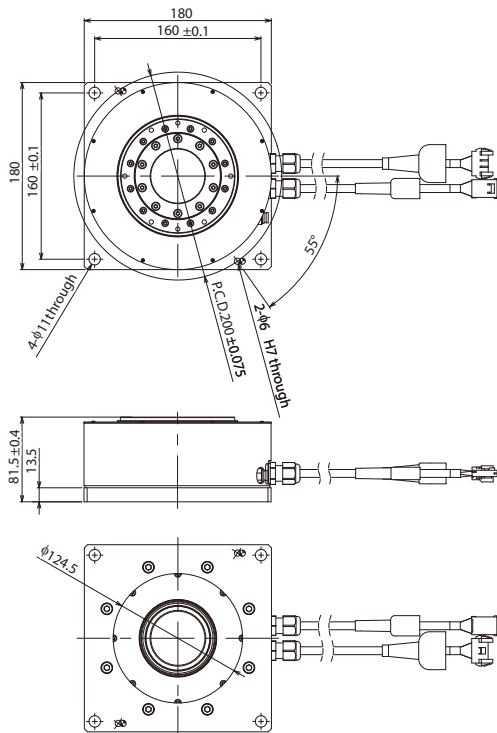
It is a retention mechanism for holding the stop position when the power or servo is OFF to prevent the workpieces and attachments from being damaged when used in side or vertical positions. Be sure to connect a brake box for models with brake.



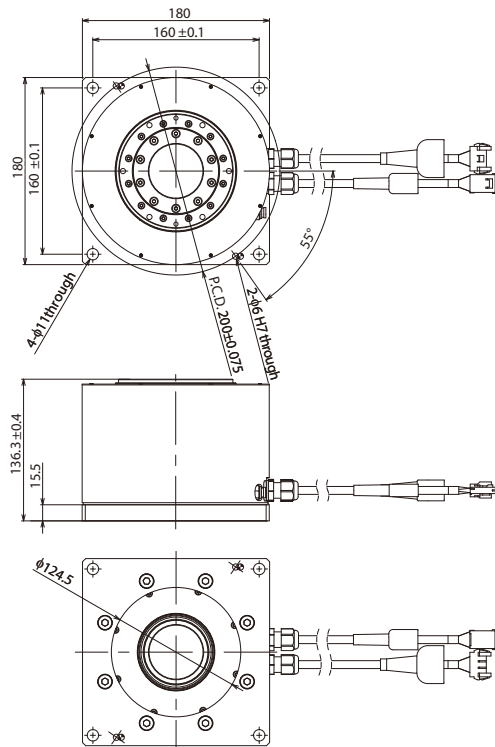
Flange Option Code: FL

A bracket that attaches to the body with bolts from the top side.

DDA-LT18C
Model Number: DDA-FL-LT18



DDA-LH18C
Model Number: DDA-FL-LH18




SCON-CB



Position Controller

List of Models

Model	SCON-CB										
External view	 <p>* Please check our latest controller catalog and ask IAI to confirm available latest controllers .</p>										
I/O type	Standard		Field network type (*1)								
	PIO connection specification (*1)		DeviceNet	CC-Link	PROFIBUS	CompoNet	MECHATROLINK	MECHATROLINK	EtherCAT	EtherNet/IP	PROFINET
I/O type code	NP/PN		DV	CC	PR	CN	ML	ML3	EC	EP	PRT
Applicable encoder type	Index absolute CB/CGB	Multi-rotation absolute CB/CGB LC/LCG	Index absolute/Multi-rotation absolute								

(Note) The index absolute type cannot be used in the pulse-train control and MECHATROLINK-III control.

(*1) Please note that the network specifications cannot be operated on the PIO or pulse-train. The PLC type (LC/LCG) cannot be connected on the pulse-train.

Controller Model

Positioner Single-axis Type <SCON> Model

* The 200W motor used by the DDA is larger than a normal 200W motor, so the motor type for the controller will be 200S and its size will be larger than the 400W motor.

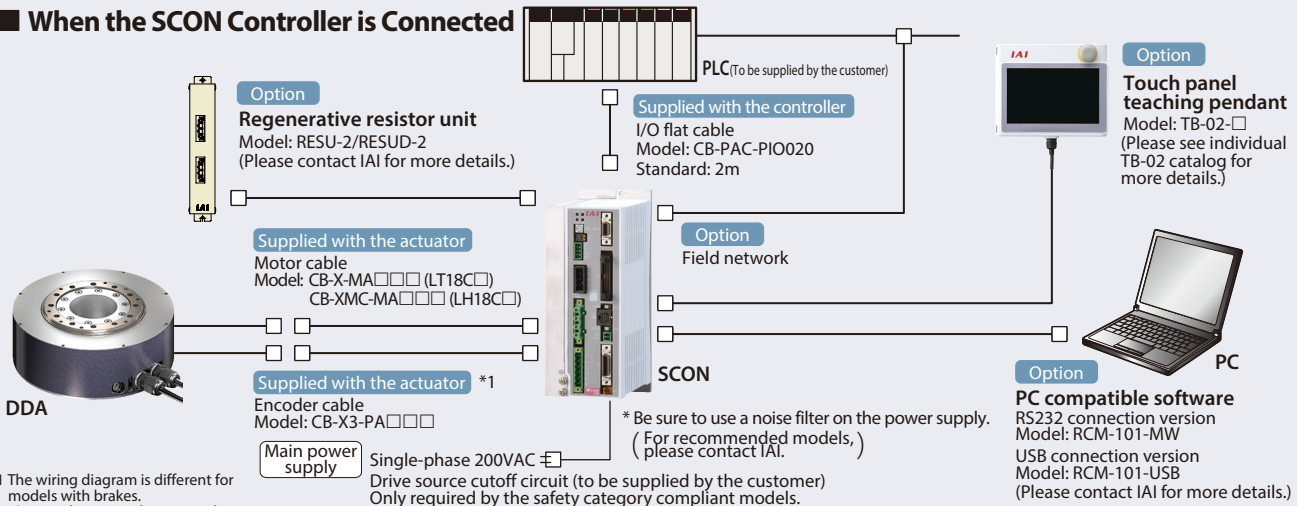
Series	Type	Motor Type	Encoder Type	I/O Type	I/O Cable Length	Power Supply Voltage
CB	High-function type	200S For 200W motor 600 For 600W motor	AI Index absolute type AM Multi-rotation abs. type	NP PIO NPN (Standard) PN PIO PNP	ML3 MECHATROLINK-III PR PROFIBUS-DP	0 No cable 3 3m 2 2m (Standard) 5 5m
CGB	Safety category compliant type		DV DeviceNet CN CompoNet CC CC-Link ML MECHATROLINK-I, II	EC EtherCAT EP EtherNet/IP PRT PROFINET IO		
LC	PLC equipped type					
LCG	Safety category PLC equipped type					

* When a field network specification is selected, the I/O cable length will be "0".

* Please check our latest controller catalog and ask IAI to confirm available latest controllers .

System Configuration

When the SCON Controller is Connected



X-SEL

Program Controller



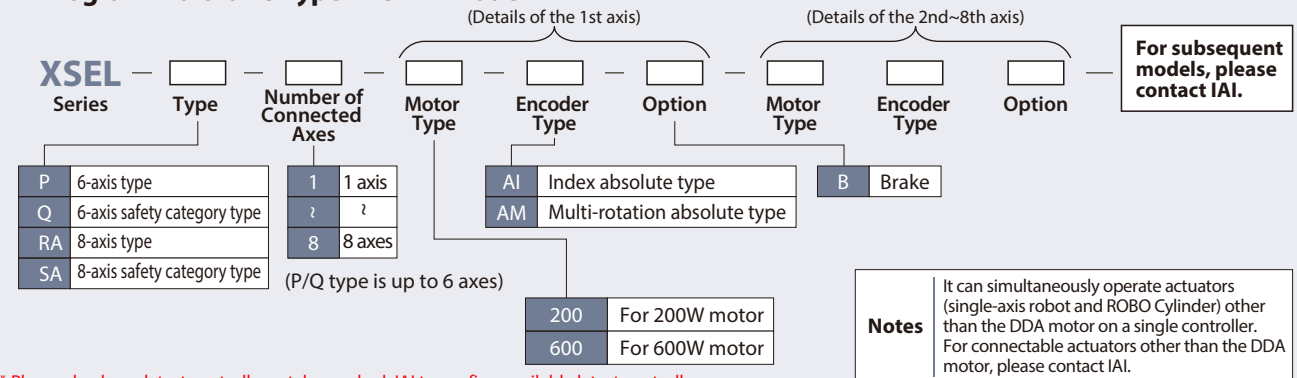
List of Models

Model	P	Q	RA	SA
Type	Large-capacity type	Large-capacity type (Safety category specification)	High-function type	High-function type (Safety category specification)
External view				
Description	Large-capacity type that can control up to 6 axes / 2,400W	Large-capacity type that's compatible with the safety category 4	High-function type that allows up to 8-axis operation	Safety category 4 compatible high-function type

* Please check our latest controller catalog and ask IAI to confirm available latest controllers.

Controller Model

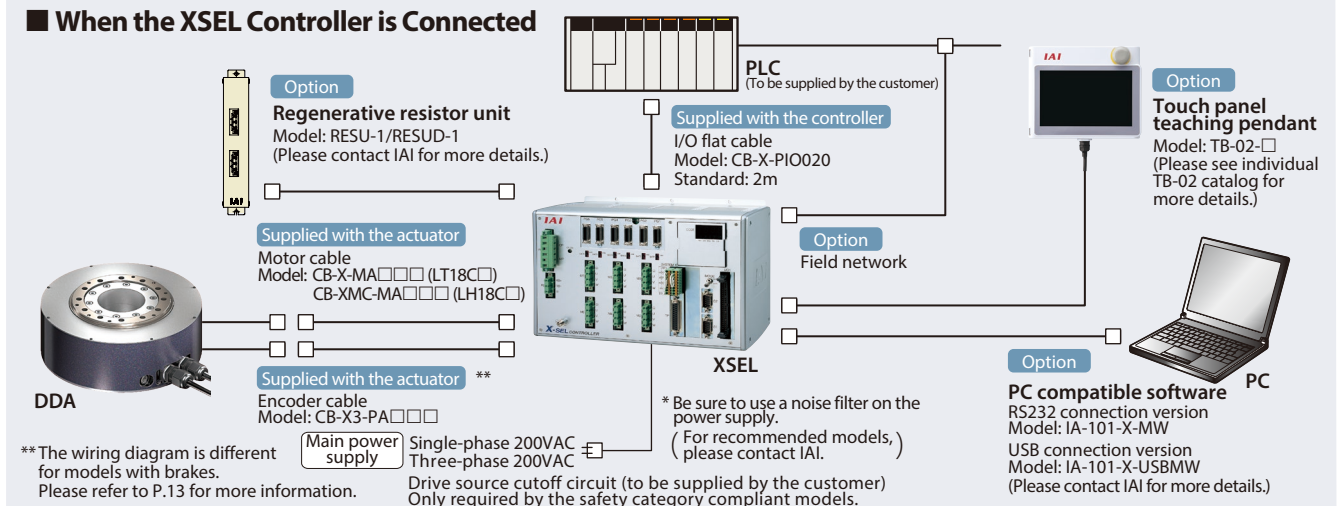
Program Multi-axis Type <XSEL> Model



* Please check our latest controller catalog and ask IAI to confirm available latest controllers.

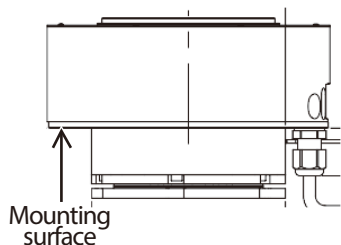
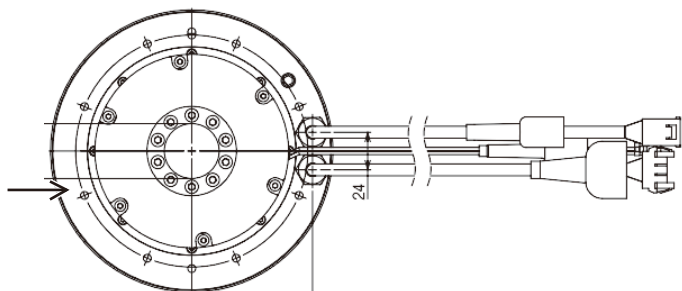
System Configuration

When the XSEL Controller is Connected



Precautions

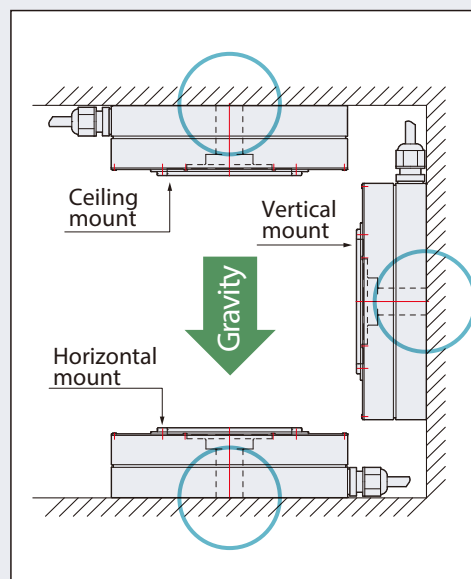
Installation



(Note) Use this product by installing it on a mounting surface having heat dissipating characteristics equivalent to those of an aluminum plate of w450mm × d450mm × t12mm in size. If the installation conditions necessitate lower heat dissipating characteristics, please consult IAI.

* For models with brake and cable exit direction to the bottom, a clearance hole is required.

Installation Orientation



Operation Type

This product is available in 2 operation types depending on the operation conditions. Please check the features and precautions on each type before use.

Operation type	Index absolute type		Multi-rotation absolute type	
	SCON-CB	XSEL(*1)	SCON-CB	XSEL(*1)
Operation range	0~359.999°		±9,999° (±2,520°) max. * () is for 20-bit	
Maximum amount of movement in a single movement command	360°	180°(*2)	Above operation range	
Limitless rotation	Yes (*3)		No	
Home return operation	Not required		Not required (*4)	
Absolute battery	Not required		Required	

(*1) The high resolution specification can be connected only to the SCON-CB

(*2) When the XSEL index type travels more than 180° from the current position, it rotates in a direction that requires a shorter travel distance to reach the target position. Therefore, please note that the direction of rotation changes according to the current position and travel distance. If you want to specify the direction of travel, use the SCON-CB.

(*3) The index type can be rotated in a given direction infinitely, but it actually cannot continue to rotate in the same direction without stopping, like a regular motor does, because the maximum travel distance per command from the XSEL controller is 180°. If you want to allow the motor to rotate continuously, use the SCON-CB.

(*4) Home return is required for the multi-rotation absolute encoder during the initial setting and replacement of the absolute battery.

Controllers

- For the DDA with 200W motor, the outside dimensions of the SCON-CB controller will be the same as the size of the 400W motor. (Please contact IAI for the details of the SCON-CB controller.)
- One and two regenerative resistor unit(s) are required for LT18C□ and LH18C□ respectively to operate a DDA motor with the SCON-CB.
- When operating DDA motor(s) with the XSEL controller, regenerative resistor units are required as shown below.

Number of DD motor(s)		1	2	3	4	5	6	7	8
Number of regenerative resistor units	LT18C□	1		2		3		4	
	LH18C□	2	4	(Cannot be connected)					

- The number of DDA motor(s) connectable to the XSEL controller is a max. of 8 units for the LT18C type, and a max. of 2 units for the LH18C type.
- Please note that, when the DDA motor is operated with the SCON-CB, the motor cannot be connected to the ROBO Cylinder gateway function of the XSEL controller.
- Calculation for the power supply value: LT18C type: single-phase 600W, three-phase 200W. LH18C type: single-phase 1,200W, three-phase 600W.

Selecting the DD Motor

Conditions for Selection

The followings should be checked to determine whether the DDA motor can be used to suit the specific conditions required by the customer:

1 Check Load Conditions

The customer should confirm that the following three points under actual use do not exceed their maximum allowable levels as specified for the DDA motor.

[1] Thrust load	The total load of device(s) mounted on the actuator
[2] Load moment applied	The total load moment of device(s) mounted on the actuator
[3] Load inertia	The load inertia of device(s) mounted on the actuator

$J = 1/8 \times M \times D^2$ [kg·m²]

Center of rotation
Mass: M [kg]

$J = M \times R^2 + 1/8 \times M \times D^2$ [kg·m²]

Center of rotation
Mass: M [kg]

$J = 1/12 \times M \times (a^2 + b^2)$ [kg·m²]

Center of rotation
Mass: M [kg]

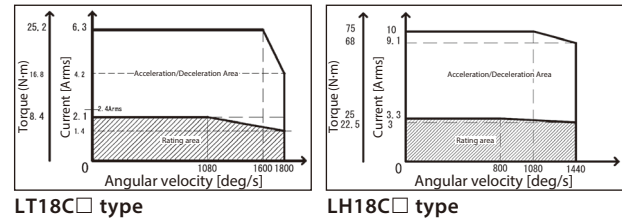
$J = M \times R^2 + 1/12 \times M \times (a^2 + b^2)$ [kg·m²]

Center of rotation
Mass: M [kg]

2 Check Operating Conditions

Check the distance, speed, acceleration, deceleration, stop time and other conditions in actual operation against the DDA motor specifications to determine whether the DDA motor can be used under the applicable operating conditions. Please contact IAI for assistance.

Continuous Operation Area



3 Travel Time Guide

The travel time changes according to the load inertia. See the tables below to check the travel time data.

* The data in the tables are for a reference only and do not guarantee the actual travel times.

LT18C □

Load inertia lower limit [kg·m ²]	0	0.005	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.1	0.2	0.3	0.4	0.5
Load inertia upper limit [kg·m ²]	0.005	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.1	0.2	0.3	0.4	0.5	0.6
45° travel time [sec.]	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.17	0.19	0.21	0.23	0.39	0.62	0.70	0.87	1.11
90° travel time [sec.]	0.12	0.12	0.14	0.16	0.17	0.18	0.20	0.22	0.24	0.26	0.29	0.48	0.73	0.83	1.02	1.23
180° travel time [sec.]	0.17	0.17	0.19	0.21	0.23	0.24	0.27	0.29	0.32	0.35	0.37	0.60	0.89	1.01	1.22	1.42
270° travel time [sec.]	0.22	0.22	0.24	0.26	0.27	0.29	0.32	0.35	0.38	0.41	0.44	0.69	1.00	1.14	1.36	1.68

(Note) The time listed in the above table is the duration from the reception of a travel command until convergence within the positioning band of 0.028 degrees (approximately 100 arcseconds).

LH18C □

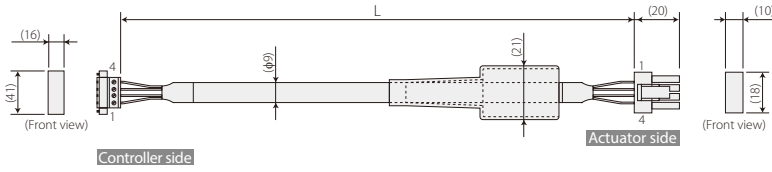
Load inertia lower limit [kg·m ²]	0	0.005	0.01	0.02	0.02	0.03	0.04	0.06	0.08	0.10	0.15	0.2	0.3	0.4	0.6	0.8	1.0	1.2	1.4
Load inertia upper limit [kg·m ²]	0.005	0.01	0.015	0.02	0.03	0.04	0.06	0.08	0.1	0.15	0.2	0.3	0.4	0.6	0.8	1	1.2	1.4	1.8
45° travel time [sec.]	0.098	0.096	0.096	0.097	0.099	0.104	0.113	0.12	0.126	0.14	0.157	0.207	0.257	0.352	0.447	0.53	0.629	0.795	0.875
90° travel time [sec.]	0.129	0.128	0.127	0.128	0.131	0.136	0.144	0.153	0.163	0.184	0.208	0.268	0.329	0.44	0.549	0.646	0.758	0.941	1.035
180° travel time [sec.]	0.192	0.19	0.19	0.191	0.193	0.199	0.207	0.215	0.225	0.249	0.279	0.354	0.428	0.562	0.692	0.806	0.933	1.133	1.257
270° travel time [sec.]	0.254	0.252	0.252	0.253	0.256	0.262	0.27	0.278	0.288	0.312	0.341	0.42	0.504	0.655	0.8	0.925	1.064	1.274	1.415

(Note) The time listed in the above table is the duration from the reception of a travel command until convergence within the positioning band of 0.028 degrees (approximately 100 arcseconds).

Cables

Model Number **CB-X-MA** □ □ □

* Please indicate the cable length (L) in □□□, maximum 30m, e.g.) 080 = 8m

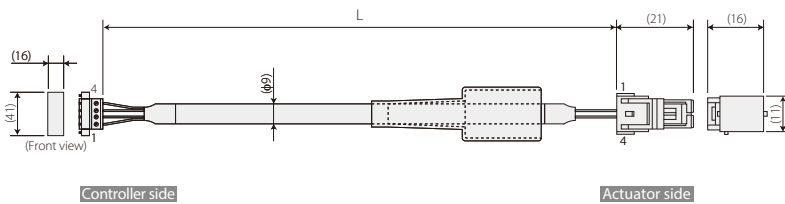


Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
0.75sq	Green	PE	1	1	U	Red	0.75sq (crimped)
	Red	U	2	2	V	White	
	White	V	3	3	W	Black	
	Black	W	4	4	PE	Green	

Minimum bending radius $r = 51\text{mm}$ or more (Dynamic bending condition)
* Only robot cable is available for this model.

Model Number **CB-XMC-MA** □ □ □

* Please indicate the cable length (L) in □□□, maximum 30m, e.g.) 080 = 8m

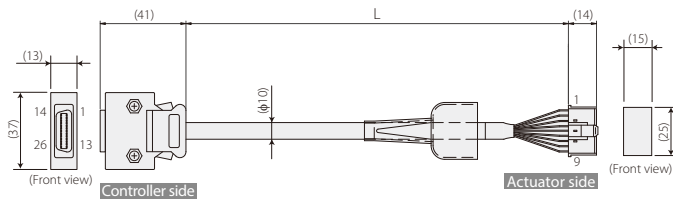


Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
1.25sq	Green	PE	1	1	U	Red	1.25sq (crimped)
	Red	U	2	2	V	White	
	White	V	3	3	W	Black	
	Black	W	4	4	PE	Green	

Minimum bending radius $r = 55\text{mm}$ or more (Dynamic bending condition)
* Only robot cable is available for this model.

Model Number **CB-X3-PA** □ □ □

* Please indicate the cable length (L) in □□□, maximum 30m, e.g.) 080 = 8m



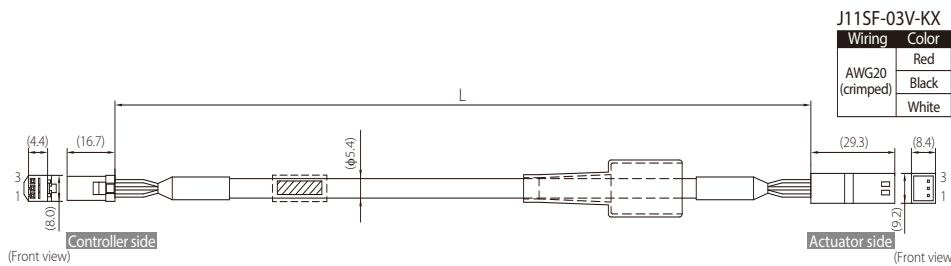
Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
-	-	-	10	2	A	White/Blue	AWG26 (crimped)
-	-	-	11	3	B	White/Red	
-	-	E24V	12	4	B	White/Black	
White/Green	OV	-	13	5	Z	White/Blue	
White/Orange	LS	26	26	6	Z	White/Gray	
-	CHLEP	25	25	7	LS+	White/Orange	
-	OT	24	24	8	-	-	
-	RSV	23	23	9	FG	Drain	
-	-	9	9	10	SD	Orange	
-	-	18	18	11	SD	Green	
-	-	19	19	12	B A 1 +	Purple	
White/Blue	A+	-	1	13	B A 1 -	Gray	
White/Red	A-	-	2	14	V C C	Red	
White/Black	B+	-	3	15	GND	Black	
White/Gray	B-	-	4	16	LS-	White/Green	
White/Orange	Z+	-	5	17	B K -	Blue	
White/Gray	Z-	-	6	18	B K +	Yellow	
Orange	SRD+	-	7	-	-	-	
Green	SRD-	-	8	-	-	-	
Purple	BAT+	-	14	-	-	-	
Gray	BAT-	-	15	-	-	-	
Red	VCC	-	16	-	-	-	
Black	GND	-	17	-	-	-	
Blue	BKR-	-	20	-	-	-	
Yellow	BKFR+	-	21	-	-	-	
-	-	-	22	-	-	-	

Shield is clamp connected to the hood
Drain Wire and Braided Shield

Minimum bending radius $r = 58\text{mm}$ or more (Dynamic bending condition)
* Only robot cable is available for this model.

Model Number **CB-DDB-BK** □ □ □

** Please indicate the cable length (L) in □□□, maximum 20m, e.g.) 080 = 8m



J11SF-03V-KX				J11SFM-03V-KX			
Wiring	Color	Signal	No.	No.	Signal	Color	Wiring
AWG20 (crimped)	Red	+	3	3	+	Red	AWG20 (crimped)
	Black	-	2	2	-	Black	
	White	FG	1	1	FG	White	

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