



ROBO Cylinder RCP6/RCP6S/RCP6CR/RCPSCR Actuator Wide Slider Type Instruction Manual

══════════════════ **Second Edition** ══════════════════

Motor Straight Type : RCP6/RCP6S-WSA10C, WSA12C, WSA14C,
WSA16C

Motor Reversing Type : RCP6/RCP6S-WSA10R, WSA12R,
WSA14R, WSA16R

Cleanroom Type : RCP6CR/RCP6SCR-WSA10R, WSA12R,
Motor Straight Type : WSA14C, WSA16C

Please Read Before Use

Thank you for purchasing our product.

This instruction manual explains the handling methods, structure and maintenance of this product, among others, providing the information you need to know to use the product safely.

Before using the product, be sure to read this manual and fully understand the contents explained herein to ensure safe use of the product.

The DVD that comes with the product contains instruction manuals for IAI products.

When using the product, refer to the necessary portions of the applicable instruction manual by printing them out or displaying them on a PC.

After reading the instruction manual, keep it in a convenient place so that whoever is handling this product can reference it quickly when necessary.

[Important]

- This instruction manual is original.
- This product is not to be used for any other purpose from what is noted in this instruction manual. IAI shall not be liable whatsoever for any loss or damage arising from the result of using the product for any other purpose from what is noted in the manual.
- The information contained in this instruction manual is subject to change without notice for the purpose of production improvement.
- If you have any question or finding regarding the information contained in this instruction manual, contact our customer center or our sales office near you.
- Using or copying all or a part of this instruction manual without permission is prohibited.
- The company names, names of products and trademarks of each company shown in the sentences are registered trademarks.

RC ROBO
CYLINDER

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Safety Guide

“Safety Guide” has been written to use the machine safely and so prevent personal injury or property damage beforehand. Make sure to read it 1before the operation of this product.

Safety Precautions for Our Products

The common safety precautions for the use of any of our robots in each operation.

No.	Operation Description	Description
1	Model Selection	<ul style="list-style-type: none"> ● This product has not been planned and designed for the application where high level of safety is required, so the guarantee of the protection of human life is impossible. Accordingly, do not use it in any of the following applications. <ol style="list-style-type: none"> 1) Medical equipment used to maintain, control or otherwise affect human life or physical health. 2) Mechanisms and machinery designed for the purpose of moving or transporting people (For vehicle, railway facility or air navigation facility) 3) Important safety parts of machinery (Safety device, etc.) ● Do not use the product outside the specifications. Failure to do so may considerably shorten the life of the product. ● Do not use it in any of the following environments. <ol style="list-style-type: none"> 1) Location where there is any inflammable gas, inflammable object or explosive 2) Place with potential exposure to radiation 3) Location with the ambient temperature or relative humidity exceeding the specification range 4) Location where radiant heat is added from direct sunlight or other large heat source 5) Location where condensation occurs due to abrupt temperature changes 6) Location where there is any corrosive gas (sulfuric acid or hydrochloric acid) 7) Location exposed to significant amount of dust, salt or iron powder 8) Location subject to direct vibration or impact ● For an actuator used in vertical orientation, select a model which is equipped with a brake. If selecting a model with no brake, the moving part may drop when the power is turned OFF and may cause an accident such as an injury or damage on the work piece.

No.	Operation Description	Description
2	Transportation	<ul style="list-style-type: none"> ● When carrying a heavy object, do the work with two or more persons or utilize equipment such as crane. ● When the work is carried out with 2 or more persons, make it clear who is to be the leader and who to be the follower(s) and communicate well with each other to ensure the safety of the workers. ● When in transportation, consider well about the positions to hold, weight and weight balance and pay special attention to the carried object so it would not get hit or dropped. ● Transport it using an appropriate transportation measure. The actuators available for transportation with a crane have eyebolts attached or there are tapped holes to attach bolts. Follow the instructions in the instruction manual for each model. ● Do not step or sit on the package. ● Do not put any heavy thing that can deform the package, on it. ● When using a crane capable of 1t or more of weight, have an operator who has qualifications for crane operation and sling work. ● When using a crane or equivalent equipments, make sure not to hang a load that weighs more than the equipment's capability limit. ● Use a hook that is suitable for the load. Consider the safety factor of the hook in such factors as shear strength. ● Do not get on the load that is hung on a crane. ● Do not leave a load hung up with a crane. ● Do not stand under the load that is hung up with a crane.
3	Storage and Preservation	<ul style="list-style-type: none"> ● The storage and preservation environment conforms to the installation environment. However, especially give consideration to the prevention of condensation. ● Store the products with a consideration not to fall them over or drop due to an act of God such as earthquake.
4	Installation and Start	<p>(1) Installation of Robot Main Body and Controller, etc.</p> <ul style="list-style-type: none"> ● Make sure to securely hold and fix the product (including the work part). A fall, drop or abnormal motion of the product may cause a damage or injury. Also, be equipped for a fall-over or drop due to an act of God such as earthquake. ● Do not get on or put anything on the product. Failure to do so may cause an accidental fall, injury or damage to the product due to a drop of anything, malfunction of the product, performance degradation, or shortening of its life. ● When using the product in any of the places specified below, provide a sufficient shield. <ol style="list-style-type: none"> 1) Location where electric noise is generated 2) Location where high electrical or magnetic field is present 3) Location with the mains or power lines passing nearby 4) Location where the product may come in contact with water, oil or chemical droplets

No.	Operation Description	Description
4	Installation and Start	<p>(2) Cable Wiring</p> <ul style="list-style-type: none"> ● Use our company's genuine cables for connecting between the actuator and controller, and for the teaching tool. ● Do not scratch on the cable. Do not bend it forcibly. Do not pull it. Do not coil it around. Do not insert it. Do not put any heavy thing on it. Failure to do so may cause a fire, electric shock or malfunction due to leakage or continuity error. ● Perform the wiring for the product, after turning OFF the power to the unit, so that there is no wiring error. ● When the direct current power (+24V) is connected, take the great care of the directions of positive and negative poles. If the connection direction is not correct, it might cause a fire, product breakdown or malfunction. ● Connect the cable connector securely so that there is no disconnection or looseness. Failure to do so may cause a fire, electric shock or malfunction of the product. ● Never cut and/or reconnect the cables supplied with the product for the purpose of extending or shortening the cable length. Failure to do so may cause the product to malfunction or cause fire. <p>(3) Grounding</p> <ul style="list-style-type: none"> ● The grounding operation should be performed to prevent an electric shock or electrostatic charge, enhance the noise-resistance ability and control the unnecessary electromagnetic radiation. ● For the ground terminal on the AC power cable of the controller and the grounding plate in the control panel, make sure to use a twisted pair cable with wire thickness 0.5mm² (AWG20 or equivalent) or more for grounding work. For security grounding, it is necessary to select an appropriate wire thickness suitable for the load. Perform wiring that satisfies the specifications (electrical equipment technical standards). ● Perform Class D Grounding (former Class 3 Grounding with ground resistance 100Ω or below).

No.	Operation Description	Description
4	Installation and Start	<p>(4) Safety Measures</p> <ul style="list-style-type: none"> ● When the work is carried out with 2 or more persons, make it clear who is to be the leader and who to be the follower(s) and communicate well with each other to ensure the safety of the workers. ● When the product is under operation or in the ready mode, take the safety measures (such as the installation of safety and protection fence) so that nobody can enter the area within the robot's movable range. When the robot under operation is touched, it may result in death or serious injury. ● Make sure to install the emergency stop circuit so that the unit can be stopped immediately in an emergency during the unit operation. ● Take the safety measure not to start up the unit only with the power turning ON. Failure to do so may start up the machine suddenly and cause an injury or damage to the product. ● Take the safety measure not to start up the machine only with the emergency stop cancellation or recovery after the power failure. Failure to do so may result in an electric shock or injury due to unexpected power input. ● When the installation or adjustment operation is to be performed, give clear warnings such as "Under Operation; Do not turn ON the power!" etc. Sudden power input may cause an electric shock or injury. ● Take the measure so that the work part is not dropped in power failure or emergency stop. ● Wear protection gloves, goggle or safety shoes, as necessary, to secure safety. ● Do not insert a finger or object in the openings in the product. Failure to do so may cause an injury, electric shock, damage to the product or fire. ● When releasing the brake on a vertically oriented actuator, exercise precaution not to pinch your hand or damage the work parts with the actuator dropped by gravity.
5	Teaching	<ul style="list-style-type: none"> ● When the work is carried out with 2 or more persons, make it clear who is to be the leader and who to be the follower(s) and communicate well with each other to ensure the safety of the workers. ● Perform the teaching operation from outside the safety protection fence, if possible. In the case that the operation is to be performed unavoidably inside the safety protection fence, prepare the "Stipulations for the Operation" and make sure that all the workers acknowledge and understand them well. ● When the operation is to be performed inside the safety protection fence, the worker should have an emergency stop switch at hand with him so that the unit can be stopped any time in an emergency. ● When the operation is to be performed inside the safety protection fence, in addition to the workers, arrange a watchman so that the machine can be stopped any time in an emergency. Also, keep watch on the operation so that any third person can not operate the switches carelessly. ● Place a sign "Under Operation" at the position easy to see. ● When releasing the brake on a vertically oriented actuator, exercise precaution not to pinch your hand or damage the work parts with the actuator dropped by gravity. <p>* Safety protection Fence : In the case that there is no safety protection fence, the movable range should be indicated.</p>

No.	Operation Description	Description
6	Trial Operation	<ul style="list-style-type: none"> ● When the work is carried out with 2 or more persons, make it clear who is to be the leader and who to be the follower(s) and communicate well with each other to ensure the safety of the workers. ● After the teaching or programming operation, perform the check operation one step by one step and then shift to the automatic operation. ● When the check operation is to be performed inside the safety protection fence, perform the check operation using the previously specified work procedure like the teaching operation. ● Make sure to perform the programmed operation check at the safety speed. Failure to do so may result in an accident due to unexpected motion caused by a program error, etc. ● Do not touch the terminal block or any of the various setting switches in the power ON mode. Failure to do so may result in an electric shock or malfunction.
7	Automatic Operation	<ul style="list-style-type: none"> ● Check before starting the automatic operation or rebooting after operation stop that there is nobody in the safety protection fence. ● Before starting automatic operation, make sure that all peripheral equipment is in an automatic-operation-ready state and there is no alarm indication. ● Make sure to operate automatic operation start from outside of the safety protection fence. ● In the case that there is any abnormal heating, smoke, offensive smell, or abnormal noise in the product, immediately stop the machine and turn OFF the power switch. Failure to do so may result in a fire or damage to the product. ● When a power failure occurs, turn OFF the power switch. Failure to do so may cause an injury or damage to the product, due to a sudden motion of the product in the recovery operation from the power failure.

No.	Operation Description	Description
8	Maintenance and Inspection	<ul style="list-style-type: none"> ● When the work is carried out with 2 or more persons, make it clear who is to be the leader and who to be the follower(s) and communicate well with each other to ensure the safety of the workers. ● Perform the work out of the safety protection fence, if possible. In the case that the operation is to be performed unavoidably inside the safety protection fence, prepare the “Stipulations for the Operation” and make sure that all the workers acknowledge and understand them well. ● When the work is to be performed inside the safety protection fence, basically turn OFF the power switch. ● When the operation is to be performed inside the safety protection fence, the worker should have an emergency stop switch at hand with him so that the unit can be stopped any time in an emergency. ● When the operation is to be performed inside the safety protection fence, in addition to the workers, arrange a watchman so that the machine can be stopped any time in an emergency. Also, keep watch on the operation so that any third person can not operate the switches carelessly. ● Place a sign “Under Operation” at the position easy to see. ● For the grease for the guide or ball screw, use appropriate grease according to the instruction manual for each model. ● Do not perform the dielectric strength test. Failure to do so may result in a damage to the product. ● When releasing the brake on a vertically oriented actuator, exercise precaution not to pinch your hand or damage the work parts with the actuator dropped by gravity. ● The slider or rod may get misaligned OFF the stop position if the servo is turned OFF. Be careful not to get injured or damaged due to an unnecessary operation. ● Pay attention not to lose the cover or untightened screws, and make sure to put the product back to the original condition after maintenance and inspection works. Use in incomplete condition may cause damage to the product or an injury. <p>* Safety protection Fence : In the case that there is no safety protection fence, the movable range should be indicated.</p>
9	Modification and Dismantle	<ul style="list-style-type: none"> ● Do not modify, disassemble, assemble or use of maintenance parts not specified based at your own discretion.
10	Disposal	<ul style="list-style-type: none"> ● When the product becomes no longer usable or necessary, dispose of it properly as an industrial waste. ● When removing the actuator for disposal, pay attention to drop of components when detaching screws. ● Do not put the product in a fire when disposing of it. The product may burst or generate toxic gases.
11	Other	<ul style="list-style-type: none"> ● Do not come close to the product or the harnesses if you are a person who requires a support of medical devices such as a pacemaker. Doing so may affect the performance of your medical device. ● See Overseas Specifications Compliance Manual to check whether complies if necessary. ● For the handling of actuators and controllers, follow the dedicated instruction manual of each unit to ensure the safety.

Alert Indication

The safety precautions are divided into “Danger”, “Warning”, “Caution” and “Notice” according to the warning level, as follows, and described in the instruction manual for each model.

Level	Degree of Danger and Damage	Symbol
Danger	This indicates an imminently hazardous situation which, if the product is not handled correctly, will result in death or serious injury.	 Danger
Warning	This indicates a potentially hazardous situation which, if the product is not handled correctly, could result in death or serious injury.	 Warning
Caution	This indicates a potentially hazardous situation which, if the product is not handled correctly, may result in minor injury or property damage.	 Caution
Notice	This indicates lower possibility for the injury, but should be kept to use this product properly.	 Notice

Caution in Handling

1. Do not attempt to establish the settings for the speed and acceleration/ deceleration above the allowable range.
An operation with speed and acceleration/deceleration beyond the allowable range may cause an abnormal noise, vibration, malfunction or shortened life.
2. Set the allowable moment within the allowable range.
An operation with the load beyond the allowable moment may cause an abnormal noise, vibration, malfunction or shortened life. If it is extreme, flaking may occur on the guide.
3. Set the overhang load within the allowable range.
Attaching a load with an overhang load above the allowable range may cause vibration and abnormal noise.
4. If back and forth operations are performed repeatedly in short distance, it may wear out the film of grease.
Continuous back and forth operation within a distance less than 30mm may cause wear of grease. As a reference, have approximately 5 cycles of back and forth operation in a distance more than 50mm in every 5,000 to 10,000 cycles to regenerate the oil film. Keep using the actuator with the grease worn out may cause malfunction. If it is extreme, flaking may occur on the guide, ball screw.
5. Do not attempt to hit the slider against an abstacle with high speed.
It may destroy the coupling.
6. Make sure to attach the actuator properly by following this instruction manual.
Using the product with the actuator not being certainly retained or affixed may cause abnormal noise, vibration, malfunction or shorten the product life.
7. Ensure use of the product in the specified conditions, environments and ranges.
An operation out of the specified conditions may cause a drop in performance or malfunction of the product.
8. PCON-CB and MCON Controllers (Option: T) are available for switching between valid and invalid of high output setting in the parameter settings.
(It is set to valid for the high output setting at the delivery.)
For MSEL Controller, the high output setting is effective and cannot switch it over to ineffective.
[Refer to an instruction manual for each controller for details]

The performance of weight capacity at each speed and acceleration/deceleration setting differs between the high output setting being effective and ineffective. Refer to the applicable performance when the high output setting is valid or invalid in 1.2 Specifications.

Controller	Parameter	Remarks
PCON-CB	No.152 High Output Setting [0: Ineffective, 1: Effective]	
MCON	No.152 High Output Setting [0: Ineffective, 1: Effective]	Option T: In high output setting, available to have high output setting effective.

International Standards Compliances

This actuator complies with the following overseas standard.
Refer to Overseas Standard Compliance Manual (ME0287) for more detailed information.

RoHS Directive	CE Marking
<input type="radio"/>	<input type="radio"/>

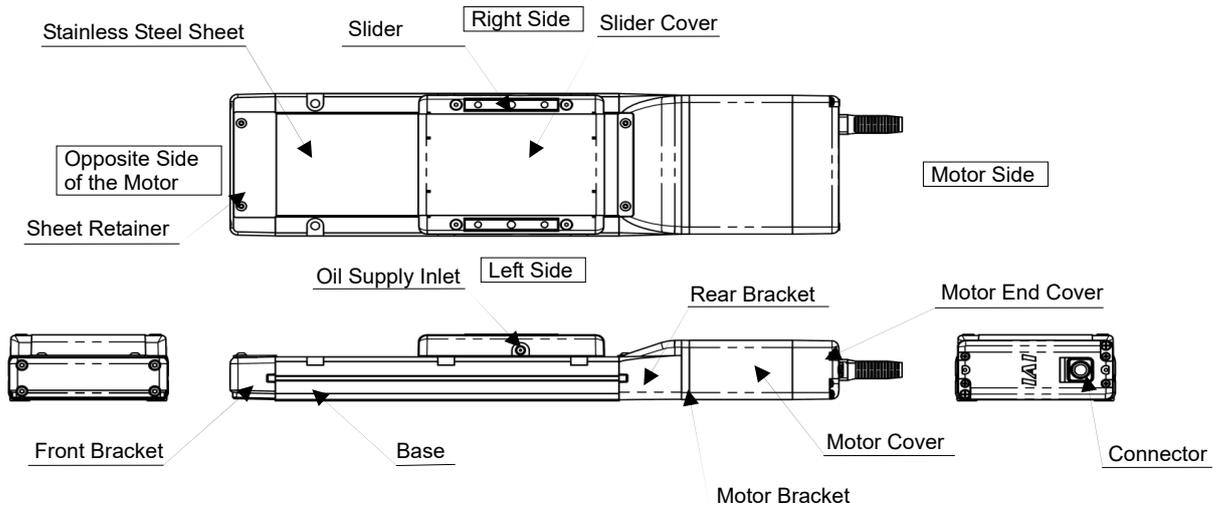
Names of the Parts

In this Instruction manual, the left and right sides are indicated by looking at the actuator from the motor end, with the actuator placed horizontally, as shown in the figure below.

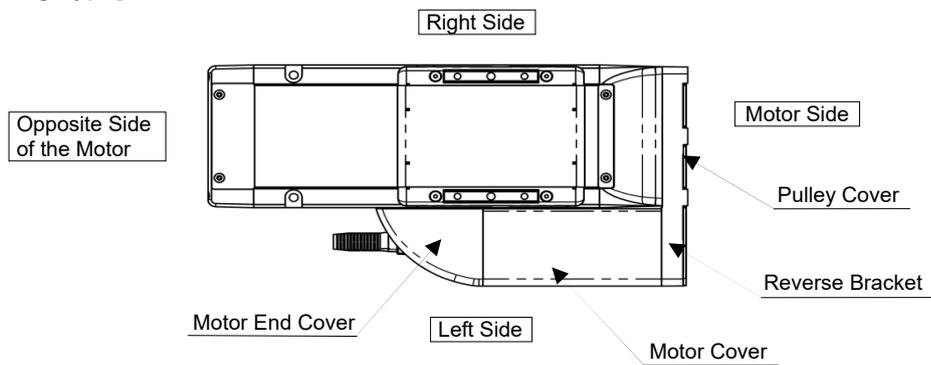
1. Standard Type

- Motor Straight Type RCP6-WSA10C, WSA12C, WSA14C, WSA16C
- Motor Reversing Type RCP6-WSA10R, WSA12R, WSA14R, WSA16R

[Motor Straight Type]



[Motor Reversing Type]



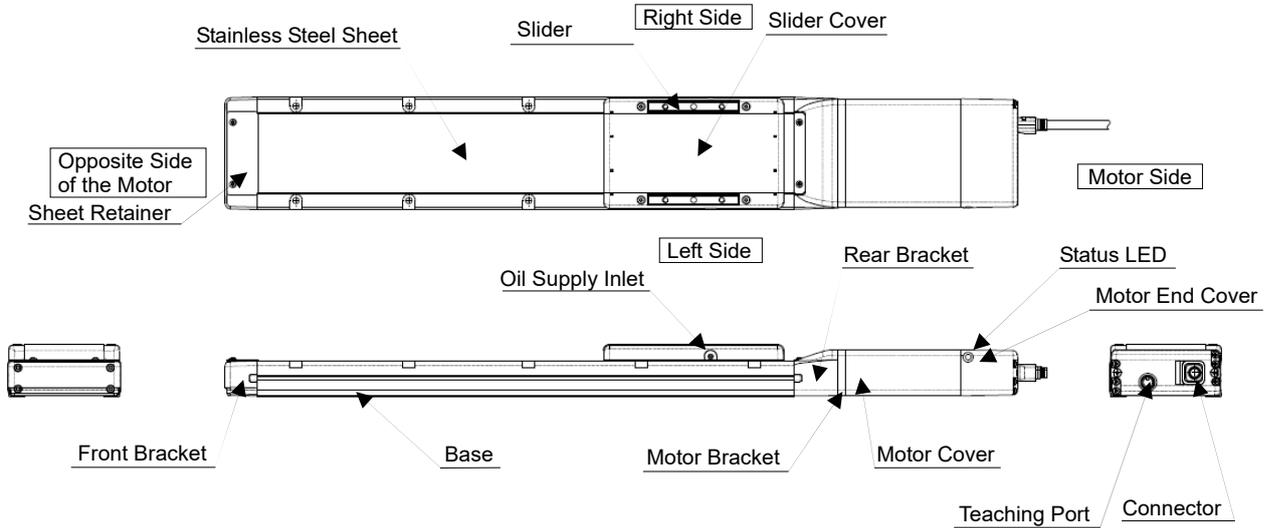
The direction of the motor is either left reversed: ML (shown in figure above), right reversed: MR.

2. Built-in Controller Specification

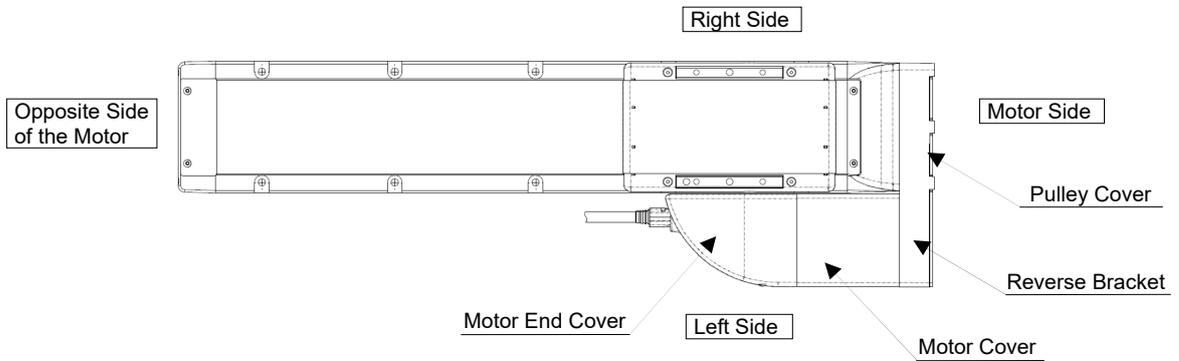
Motor Straight Type RCP6S-WSA10C, WSA12C, WSA14C, WSA16C

Motor Reversing Type RCP6S-WSA10R, WSA12R, WSA14R, WSA16R

[Motor Straight Type]



[Motor Reversing Type]

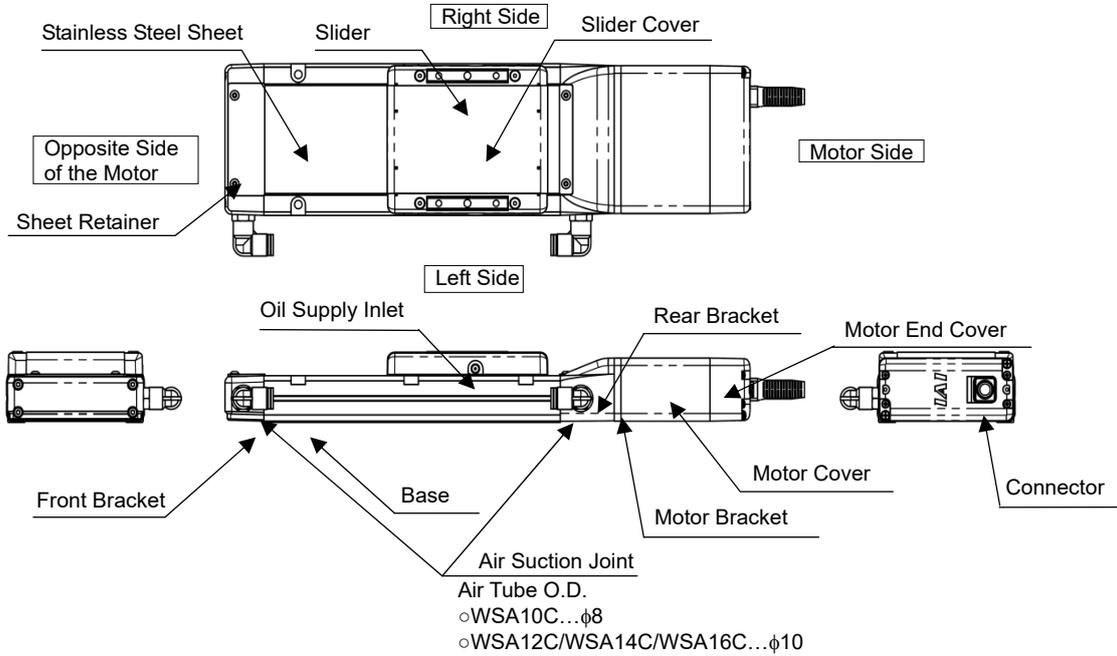


The direction of the motor is either left reversed: ML (shown in figure above), right reversed: MR.

3. Cleanroom Type

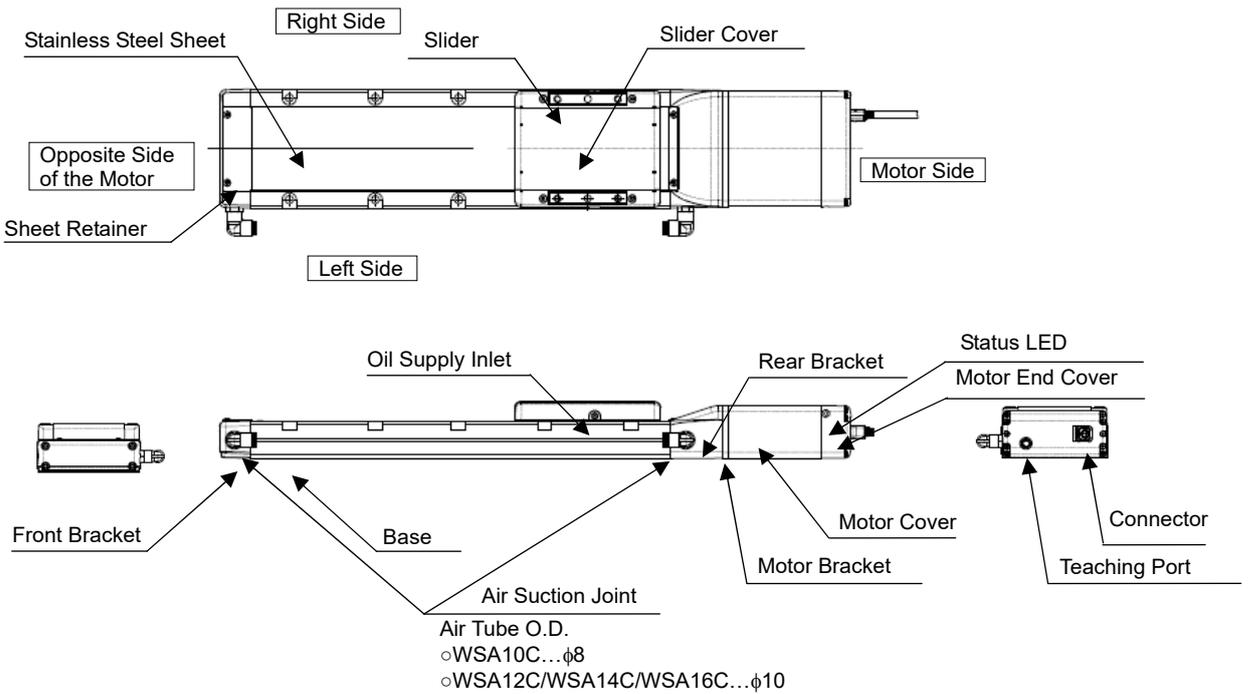
3.1 Standard Specification RCP6CR-WSA10C, WSA12C, WSA14C, WSA16C

All the construction except for the joints is the same as the standard for each size.



3.2 Built-in Controller Specification RCP6SCR-WSA10C, WSA12C, WSA14C, WSA16C

All the construction except for the joints is the same as the standard for each size.



1. Specifications Check

1.1 Checking the Product

The standard configuration of this product is comprised of the following parts. See the component list for the details of the enclosed components. If you find any fault or missing parts, contact your local IAI distributor.

1.1.1 Parts

No.	Name	Model number	Quantity	Remarks
1	Actuator	Refer to "How to Read the Model Nameplate" and "How to Read the Model Number."	1	
Accessories				
2	Motor • Encoder Cables (Note1)		1	
3	In-house Made Seals		1	
4	First Step Guide		1	
5	Instruction Manual (DVD)		1	
6	Safety Guide		1	

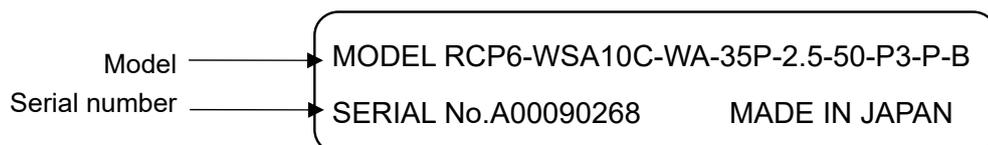
Note1 The motor • encoder cables supplied vary depending on the controller used. [Refer to 1.4, "Motor • Encoder Cables."]

1.1.2 Related Instruction Manuals for the Each Controller Supported by This Product

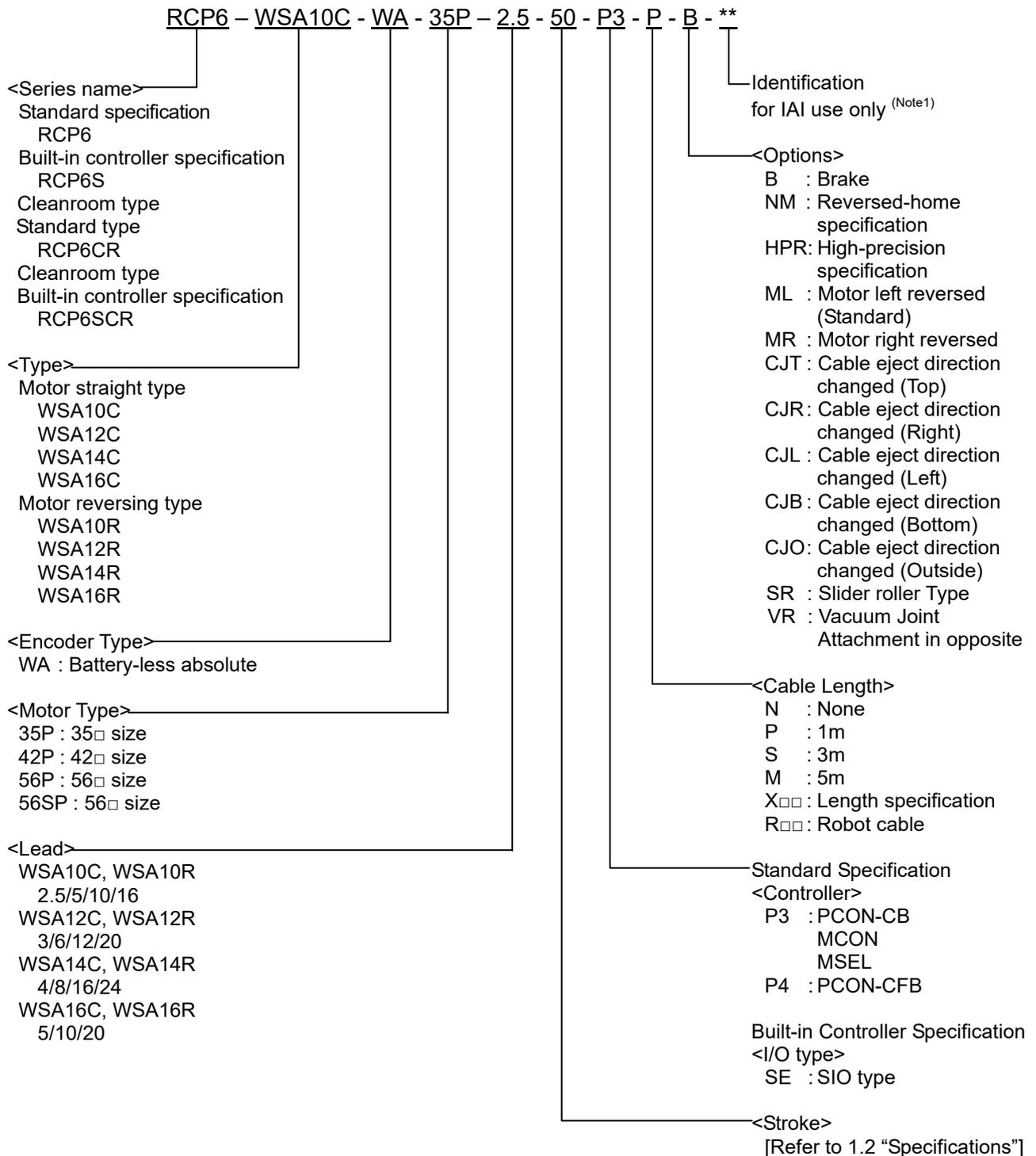
Shown below is a list of the instruction manuals for the controllers related to this product which is recorded in Instruction Manual (DVD).

No.	Name	Control No.
1	Instruction Manual for PCON-CB/CFB Controller	ME0342
2	Instruction Manual for MCON-C/CG Controller	ME0341
3	Instruction Manual for MSEL Controller	ME0336
4	Instruction Manual for RC PC Software RCM-101-MW/RCM-101-USB	ME0155
5	Instruction Manual for Touch Panel Teaching Pendant CON-PTA/PDA/PGA	ME0295
6	Instruction Manual for Touch Panel Teaching Pendant TB-01/01D/01DR Applicable for Position Controller	ME0324

1.1.3 How to Read the Model Nameplate



1.1.4 How to Read the Model Number



Note 1 Identification for IAI use only: It may be displayed for IAI use. It is not a code to show the model type.
 * The slider roller type SR is an option for the standard type RCP6 and the controller built-in type RCP6S.

1.2 Specifications

1.2.1 Speed

[1] Motor Straight Type

[When high-output setting for motor straight type is effective]

(Note) For Lead 10 and 16 of WSA10C, Lead 12 and 20 of WSA12C, Lead 16 and 24 of WSA14C and Lead 20 of WSA16C, there is no setting of the maximum payload type against the speed and acceleration to reduce the payload for vertical orientation. Use the slider type.

Speed limits [Unit: mm/s]

Type	Motor Type	Lead [mm]	Horizontal/ Vertical	Stroke [mm]															
				50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
WSA10C	35P	2.5	Horizontal	195				175	145	120	100	-	-	-	-	-	-	-	
			Vertical	175				145	120	100	-	-	-	-	-	-	-	-	
		5	Horizontal	390				355	290	245	205	-	-	-	-	-	-	-	
			Vertical	350				290	245	205	-	-	-	-	-	-	-	-	
		10	Horizontal	610				590	490	415	-	-	-	-	-	-	-	-	
			Vertical	-				-	-	-	-	-	-	-	-	-	-	-	
16	Horizontal	840				775	660	-	-	-	-	-	-	-	-	-			
	Vertical	-				-	-	-	-	-	-	-	-	-	-	-			
WSA12C	42P	3	Horizontal	225				215	180	150	130	115	100	85	75	70	-		
			Vertical	225				215	180	150	130	115	100	85	75	70	-		
		6	Horizontal	450				435	365	310	265	230	200	175	155	140	-		
			Vertical	400				365	310	265	230	200	175	155	140	-	-		
		12	Horizontal	600				535	465	405	355	315	285	-	-	-	-		
			Vertical	-				-	-	-	-	-	-	-	-	-	-	-	
20	Horizontal	800				740	650	580	520	-	-	-	-	-	-				
	Vertical	-				-	-	-	-	-	-	-	-	-	-				
WSA14C	56P	4	Horizontal	210				200	170	150	135	120	105	-	-	-	-		
			Vertical	175				170	150	135	120	105	-	-	-	-			
		8	Horizontal	420				400	350	305	270	240	215	-	-	-			
			Vertical	350				305	270	240	215	-	-	-	-				
		16	Horizontal	560				550	490	440	-	-	-	-	-				
			Vertical	-				-	-	-	-	-	-	-	-				
24	Horizontal	700				665	-	-	-	-	-	-	-						
	Vertical	-				-	-	-	-	-	-	-	-						

Type	Motor Type	Lead [mm]	Horizontal/ Vertical	Stroke [mm]																	
				50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800		
WSA16C	56SP	5	Horizontal	195												175	-	-	-	-	
			Vertical	170												-	-	-	-	-	-
		10	Horizontal	450												440	395	355	-	-	
			Vertical	240												-	-	-	-	-	-
		20	Horizontal	720												715	-	-	-	-	
			Vertical	-												-	-	-	-	-	-
						Stroke [mm]															
						850	900	950	1000	1050	1100										
		5	Horizontal	160	145	130	120	110	100												
			Vertical	160	145	130	120	110	100												
10	Horizontal	320	290	265	240	225	205														
	Vertical	240				225	205														
20	Horizontal	645	590	535	490	450	415														
	Vertical	-												-	-	-	-				

⚠ Caution: When a speed less than the min. speed, operation will not made in the set speed.
 Do not attempt to set a speed less than the min. speed.
 Figure out the minimum speed using the following formula.
 Min. Speed [mm/s] = Lead Length [mm] / 800 / 0.001 [sec]

[When high-output setting is effective of the motor reversing type]

(Note) For Lead 10 and 16 of WSA10R, Lead 12 and 20 of WSA12R, Lead 16 and 24 of WSA14R and Lead 20 of WSA16R, there is no setting of the maximum payload type against the speed and acceleration to reduce the payload for vertical orientation. Use the slider type.

Speed limits [Unit: mm/s]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Stroke [mm]															
				50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
WSA10R	35P	2.5	Horizontal	195						175	145	120	100	-	-	-	-	-	-
			Vertical	175							145	120	100	-	-	-	-	-	-
		5	Horizontal	390						355	290	245	205	-	-	-	-	-	-
			Vertical	305							290	245	205	-	-	-	-	-	-
		10	Horizontal	610							590	490	415	-	-	-	-	-	-
			Vertical	-										-	-	-	-	-	-
16	Horizontal	840							775	660		-	-	-	-	-	-		
	Vertical	-										-	-	-	-	-	-		
WSA12R	42P	3	Horizontal	225						215	180	150	130	115	100	85	75	70	
			Vertical	225							215	180	150	130	115	100	85	75	70
		6	Horizontal	450						435	365	310	265	230	200	175	155	140	
			Vertical	400							365	310	265	230	200	175	155	140	
		12	Horizontal	600									535	465	405	355	315	285	
			Vertical	-															
		20	Horizontal	800										740	650	580	520		
			Vertical	-															
WSA14R	56P	4	Horizontal	175										170	150	135	120	105	
			Vertical	175										170	150	135	120	105	
		8	Horizontal	420									400	350	305	270	240	215	
			Vertical	350										305	270	240	215		
		16	Horizontal	560											550	490	440		
			Vertical	-															
		24	Horizontal	700														665	
			Vertical	-															

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Stroke [mm]																	
				50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800		
WSA16R	56SP	5	Horizontal	170																	
			Vertical	145																	
		10	Horizontal	365																	
			Vertical	210																	
		20	Horizontal	600																	
			Vertical	-																	
						Stroke [mm]															
						850	900	950	1000	1050	1100										
		5	Horizontal	160	145	130	120	110	100												
			Vertical	145		130	120	110	100												
10	Horizontal	320	290	265	240	225	205														
	Vertical	210																			
20	Horizontal	590		535	490	450	415														
	Vertical	-																			

 **Caution:** When a speed less than the min. speed, operation will not made in the set speed. Do not attempt to set a speed less than the min. speed. Figure out the minimum speed using the following formula.
 Min. Speed [mm/s] = Lead Length [mm] / 800 / 0.001 [sec]

[When high-output setting is ineffective of the motor straight type]

(Note) For Lead 10 and 16 of WSA10C, Lead 12 and 20 of WSA12C, Lead 16 and 24 of WSA14C and Lead 20 of WSA16C, there is no setting of the maximum payload type against the speed and acceleration to reduce the payload for vertical orientation. Use the slider type.

(Note) There is no high output setting prepared for WSA16C and WSA16R which are to be operated with PCON-CFB controller.

Speed limits [Unit: mm/s]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Stroke [mm]																	
				50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800		
WSA10C	35P	2.5	Horizontal	130										120	100	-	-	-	-	-	-
			Vertical	130										120	100	-	-	-	-	-	-
		5	Horizontal	260										245	205	-	-	-	-	-	-
			Vertical	260										245	205	-	-	-	-	-	-
		10	Horizontal	525										-	-	-	-	-	-	-	-
			Vertical	-										-	-	-	-	-	-	-	-
16	Horizontal	560										-	-	-	-	-	-	-	-		
	Vertical	-										-	-	-	-	-	-	-	-		
WSA12C	42P	3	Horizontal	150										130	115	100	85	75	70		
			Vertical	150										130	115	100	85	75	70		
		6	Horizontal	290										265	230	200	175	155	140		
			Vertical	290										265	230	200	175	155	140		
		12	Horizontal	500										465	405	355	315	285			
			Vertical	-										-	-	-	-	-	-		
		20	Horizontal	640										580	520	-	-	-	-		
			Vertical	-										-	-	-	-	-	-		
WSA14C	56P	4	Horizontal	105										-	-	-	-	-	-		
			Vertical	105										-	-	-	-	-	-		
		8	Horizontal	210										-	-	-	-	-	-		
			Vertical	210										-	-	-	-	-	-		
		16	Horizontal	420										-	-	-	-	-	-		
			Vertical	-										-	-	-	-	-	-		
		24	Horizontal	560										-	-	-	-	-	-		
			Vertical	-										-	-	-	-	-	-		



Caution: When a speed less than the min. speed, operation will not made in the set speed.
Do not attempt to set a speed less than the min. speed.
Figure out the minimum speed using the following formula.
Min. Speed [mm/s] = Lead Length [mm] / 800 / 0.001 [sec]

[When high-output setting is ineffective of the motor reversing type]

(Note) For Lead 10 and 16 of WSA10R, Lead 12 and 20 of WSA12R, Lead 16 and 24 of WSA14R and Lead 20 of WSA16R, there is no setting of the maximum payload type against the speed and acceleration to reduce the payload for vertical orientation. Use the slider type.

(Note) There is no high output setting prepared for WSA16C and WSA16R which are to be operated with PCON-CFB controller.

Speed limits [Unit: mm/s]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Stroke [mm]															
				50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
WSA10R	35P	2.5	Horizontal	130								120	100	-	-	-	-	-	-
			Vertical	130								120	100	-	-	-	-	-	-
		5	Horizontal	260								245	205	-	-	-	-	-	-
			Vertical	260								245	205	-	-	-	-	-	-
		10	Horizontal	525								-	-	-	-	-	-	-	-
			Vertical	-								-	-	-	-	-	-	-	-
		16	Horizontal	560								-	-	-	-	-	-	-	-
			Vertical	-								-	-	-	-	-	-	-	-
WSA12R	42P	3	Horizontal	150								130	115	100	85	75	70		
			Vertical	150								130	115	100	85	75	70		
		6	Horizontal	290								265	230	200	175	155	140		
			Vertical	290								265	230	200	175	155	140		
		12	Horizontal	500								465	405	355	315	285			
			Vertical	-								-	-	-	-	-	-	-	-
		20	Horizontal	640								580	520						
			Vertical	-								-	-	-	-	-	-	-	-
WSA14R	56P	4	Horizontal	105															
			Vertical	105															
		8	Horizontal	210															
			Vertical	210															
		16	Horizontal	420															
			Vertical	-															
		24	Horizontal	560															
			Vertical	-															



Caution: When a speed less than the min. speed, operation will not made in the set speed.
 Do not attempt to set a speed less than the min. speed.
 Figure out the minimum speed using the following formula.
 Min. Speed [mm/s] = Lead Length [mm] / 800 / 0.001 [sec]

1.2.2 Maximum Acceleration and Transportable Mass

If the transportable mass is smaller than as specified, the acceleration/deceleration can be raised beyond the applicable level.

[When high-output setting for motor straight type is effective]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload Capacity by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
WSA10C	35P	2.5	Horizontal	0	40	40	40	35	30
				20	40	40	40	35	30
				40	40	40	40	35	30
				65	40	40	40	35	30
				85	40	40	40	35	30
				105	40	40	35	35	30
				130	40	40	35	30	30
				150	40	35	35	30	30
				175	40	35	35	30	25
			195	40	35	30	26	18	
			Vertical	0	10	10	10	-	-
				20	10	10	10	-	-
				40	10	10	10	-	-
				65	10	10	10	-	-
				85	10	10	10	-	-
				105	10	10	10	-	-
				130	10	10	9	-	-
				150	7	7	7	-	-
		175		3	3	3	-	-	
		195	-	-	-	-	-		
		5	Horizontal	0	28	25	22	20	20
				40	28	25	22	20	20
				85	28	25	22	20	20
				130	28	25	22	20	20
				175	28	25	22	20	20
				215	28	25	22	20	18
				260	28	25	22	20	14
				305	28	22	18	14	10
				350	28	18	11	7	6
			390	28	12	7	4	2	
			Vertical	0	3	3	3	-	-
				40	3	3	3	-	-
				85	3	3	3	-	-
				130	3	3	3	-	-
				175	3	3	3	-	-
				215	3	3	3	-	-
260	3			3	3	-	-		
305	2			1.5	1.5	-	-		
350	1	-		-	-	-			
390	-	-	-	-	-				

[When high-output setting for motor straight type is effective]

(Note) For Lead 10 and 16 of WSA10C, there is no setting of the maximum payload type against the speed and acceleration to reduce the payload for vertical orientation. Use the slider type.

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload Capacity by Acceleration/Deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
WSA10C	35P	10	Horizontal	0	15	15	13	13	12
				85	15	15	13	13	12
				175	15	15	13	12	10
				260	15	15	13	10	8
				350	15	15	13	8	5
				435	15	15	10	7	4
				525	15	10	5	3	2
610	15	5	2	1	-				
SA4C	35P	16	Horizontal	0	4	4	3	3	2.5
				140	4	4	3	3	2.5
				280	4	4	3	3	2.5
				420	4	4	3	3	2.5
				560	4	4	3	1.5	1.5
				700	4	4	3	0.5	0.5
				840	-	1	0.5	-	-

[When high-output setting for motor straight type is effective]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload capacity by acceleration/deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
WSA12C	42P	3	Horizontal	0	60	56	50	45	40
				25	60	56	50	45	40
				50	60	56	50	45	40
				65	60	56	46	41	40
				100	60	56	46	41	40
				125	60	56	46	40	30
				150	60	50	40	30	25
				180	60	40	35	25	20
			200	60	35	30	20	14	
			225	40	16	16	10	6	
			Vertical	0	18	18	18	-	-
				25	18	18	18	-	-
				50	18	18	18	-	-
				65	18	18	18	-	-
				100	18	18	18	-	-
				125	18	18	10	-	-
		150		14	14	6	-	-	
		180		11	11	5	-	-	
		200	7	6	4.5	-	-		
		225	5	3	2	-	-		
		6	Horizontal	0	40	40	35	30	25
				50	40	40	35	30	25
				100	40	40	35	30	25
				140	40	40	35	25	25
				200	40	40	30	25	20
				250	40	40	27.5	22.5	18
				290	40	35	25	20	14
				350	40	28	14	12	10
			400	30	18	10	6	5	
			450	25	8	3	-	-	
			Vertical	0	9	9	9	-	-
				50	9	9	9	-	-
100	9			9	9	-	-		
140	9			9	9	-	-		
200	9			9	9	-	-		
250	9			8	8	-	-		
290	5	5		4	-	-			
350	2	2		1	-	-			
400	0.5	-	-	-	-				
450	-	-	-	-	-				

[When high-output setting for motor straight type is effective]

(Note) For Lead 12 and 20 of WSA12C, there is no setting of the maximum payload type against the speed and acceleration to reduce the payload for vertical orientation. Use the slider type.

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload capacity by acceleration/deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
WSA12C	42P	12	Horizontal	0	25	25	18	16	12
				100	25	25	18	16	12
				200	25	25	18	16	10
				285	25	25	18	12	8
				400	20	20	14	10	6
				500	15	15	8	6	4
		600	10	10	6	3	2		
		20	Horizontal	0	12	12	12	11	11
				160	12	12	12	11	11
				320	12	12	12	11	9
				480	12	12	12	11	9
				640	-	12	10	9	8
				800	-	10	9	-	-

[When high-output setting for motor straight type is effective]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload capacity by acceleration/deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
WSA14C	56P	4	Horizontal	0	80	80	70	65	60
				35	80	80	70	65	60
				70	80	80	70	65	60
				105	80	80	60	50	40
				140	80	50	30	20	15
				175	50	15	-	-	-
			210	20	-	-	-	-	
			Vertical	0	26	26	26	-	-
				35	26	26	26	-	-
				70	26	26	26	-	-
				105	22	20	18	-	-
				140	16	12	10	-	-
		175		6	1	-	-	-	
		210	-	-	-	-	-		
		8	Horizontal	0	65	65	55	50	45
				70	65	65	55	50	45
				140	65	65	55	46	45
				210	65	65	45	36	22
				280	65	39	27	18	12
				350	61	19	10	-	-
			420	20	6	-	-	-	
			Vertical	0	14	14	14	-	-
				70	14	14	14	-	-
				140	12	12	12	-	-
210	10			10	9	-	-		
280	8			5	4	-	-		
350	2	-		-	-	-			
420	-	-	-	-	-				

[When high-output setting for motor straight type is effective]

(Note) For Lead 16 and 24 of WSA14C, there is no setting of the maximum payload type against the speed and acceleration to reduce the payload for vertical orientation. Use the slider type.

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload capacity by acceleration/deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
WSA14C	56P	16	Horizontal	0	50	42	40	32	30
				140	50	42	40	32	30
				280	50	42	35	23	17
				420	47	25	18	14	10
				560	12	10	5	3	2
		24	Horizontal	0	25	25	23	20	17
				140	25	25	23	20	17
				420	25	25	23	20	15
				560	20	19	14	12	9
				700	20	10	6	6	6

[When high-output setting for motor straight type is effective]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload capacity by acceleration/deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
WSA16C	56SP	5	Horizontal	0	100	90	90	90	90
				60	100	90	90	90	90
				95	100	90	90	80	80
				120	100	90	70	70	70
				145	100	70	45	35	30
				160	90	35	18	16	12
				170	90	2	-	-	-
			195	50	-	-	-	-	
			Vertical	0	50	50	50	-	-
				60	50	50	50	-	-
				95	30	30	30	-	-
				120	19	19	19	-	-
				145	11	7	7	-	-
				160	7	2	-	-	-
		170		4	-	-	-	-	
		195	-	-	-	-	-		
		10	Horizontal	0	70	70	60	60	60
				80	70	70	60	60	60
				160	70	70	55	50	45
				210	70	70	55	50	40
				240	70	55	50	35	30
				270	70	40	30	24	20
				330	70	14	2	-	-
				365	70	-	-	-	-
			Vertical	0	15	15	15	-	-
				80	15	15	15	-	-
				160	15	15	15	-	-
				210	5	4	4	-	-
				240	2	-	-	-	-
				270	-	-	-	-	-
330	-			-	-	-	-		
365	-			-	-	-	-		
405	-	-	-	-	-				
450	-	-	-	-	-				

[When high-output setting for motor straight type is effective]

(Note) For Lead 20 of WSA16C, there is no setting of the maximum payload type against the speed and acceleration to reduce the payload for vertical orientation. Use the slider type.

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload capacity by acceleration/deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
WSA16C	56SP	20	Horizontal	0	50	35	28	24	20
				120	50	35	28	24	20
				240	50	35	28	24	16
				365	50	35	28	20	12
				480	40	14	4	2	-
				550	40	4	-	-	-
				600	30	-	-	-	-
				665	18	-	-	-	-
				720	18	-	-	-	-

[When high-output setting is effective of the motor reversing type]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload capacity by acceleration/deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
WSA10R	35P	2.5	Horizontal	0	40	40	40	35	30
				20	40	40	40	35	30
				40	40	40	36	35	30
				65	40	40	36	35	30
				85	40	40	36	35	30
				105	40	40	35	35	30
				130	40	40	35	30	30
				150	40	35	35	30	30
			175	40	34	32	24	20	
			195	40	20	14	12	11	
			Vertical	0	10	10	10	-	-
				20	10	10	10	-	-
				40	10	10	10	-	-
				65	10	10	10	-	-
				85	10	10	10	-	-
				105	10	10	10	-	-
		130		10	10	9	-	-	
		150		7	7	7	-	-	
		175	4	4	4	-	-		
		195	1	1	1	-	-		
		5	Horizontal	0	28	25	22	20	20
				40	28	25	22	20	20
				85	28	25	22	20	20
				130	28	25	22	20	20
				175	28	25	22	20	20
				215	28	25	22	20	16
				260	28	25	20	16	12
				305	28	20	12	10	8
			350	28	14	6	4	3	
			390	28	6	1	-	-	
			Vertical	0	3	3	3	-	-
				40	3	3	3	-	-
85	3			3	3	-	-		
130	3			3	3	-	-		
175	3			3	3	-	-		
215	3			3	3	-	-		
260	2	2		2.5	-	-			
305	1	0.5		0.5	-	-			
350	-	-	-	-	-				
390	-	-	-	-	-				

[When high-output setting is effective of the motor reversing type]

(Note) For Lead 10 and 16 of WSA10R, there is no setting of the maximum payload type against the speed and acceleration to reduce the payload for vertical orientation. Use the slider type.

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload capacity by acceleration/deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
WSA10R	35P	10	Horizontal	0	15	15	13	13	12
				85	15	15	13	13	12
				175	15	15	13	12	10
				260	15	15	13	10	8
				350	15	15	13	8	5
				435	15	15	10	7	4
				525	14	10	5	3	2
		610	-	5	2	1	-		
		0	4	4	3	3	2.5		
		140	4	4	3	3	2.5		
		280	4	4	3	3	2.5		
		420	4	4	3	3	2.5		
		560	4	4	3	1.5	1.5		
		700	4	4	3	0.5	0.5		
840	-	1	0.5	-	-				

[When high-output setting is effective of the motor reversing type]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload capacity by acceleration/deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
WSA12R	42P	3	Horizontal	0	60	56	50	45	40
				25	60	56	50	45	40
				50	60	56	50	45	40
				65	60	56	46	41	40
				100	60	56	46	41	40
				125	60	56	46	40	30
				150	60	50	40	30	25
				180	60	40	35	25	20
			200	60	35	30	20	14	
			225	40	16	16	10	6	
			Vertical	0	16	16	16	-	-
				25	16	16	16	-	-
				50	16	16	16	-	-
				65	16	16	16	-	-
				100	16	16	16	-	-
				125	16	14	10	-	-
		150		12	10	6	-	-	
		180		8	6	5	-	-	
		200	5	5	4	-	-		
		225	2	-	-	-	-		
		6	Horizontal	0	40	40	35	30	25
				50	40	40	35	30	25
				100	40	40	35	30	25
				140	40	40	35	25	25
				200	40	40	30	25	20
				250	40	40	27.5	22.5	18
				290	40	35	25	20	14
				350	40	28	14	12	10
			400	30	18	10	6	5	
			450	25	8	3	-	-	
			Vertical	0	9	9	9	-	-
				50	9	9	9	-	-
100	9			9	9	-	-		
140	9			9	9	-	-		
200	9			9	8	-	-		
250	9			8	8	-	-		
290	5	5		4	-	-			
350	2	2		1	-	-			
400	1	-	-	-	-				
450	-	-	-	-	-				

[When high-output setting is effective of the motor reversing type]

(Note) For Lead 12 and 20 of WSA12R, there is no setting of the maximum payload type against the speed and acceleration to reduce the payload for vertical orientation. Use the slider type.

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload capacity by acceleration/deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
WSA12R	42P	12	Horizontal	0	25	25	18	16	10
				100	25	25	18	16	10
				200	25	25	18	16	10
				285	25	25	18	12	8
				400	20	20	14	10	6
				500	15	15	8	6	4
		600	10	6	6	3	2		
		20	Horizontal	0	12	8	6	4	3
				160	12	8	6	4	3
				320	12	8	6	4	3
				480	12	8	6	4	2
				640	-	8	6	4	1
				800	-	7	4	-	-

[When high-output setting is effective of the motor reversing type]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload capacity by acceleration/deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
WSA14R	56P	4	Horizontal	0	80	80	70	65	60
				35	80	80	70	65	60
				70	80	80	70	65	60
				105	80	80	60	50	40
				140	80	50	10	6	6
				175	40	5	-	-	-
			210	-	-	-	-	-	
			Vertical	0	26	26	26	-	-
				35	26	26	26	-	-
				70	26	26	26	-	-
				105	22	20	18	-	-
				140	13	8	3	-	-
		175		4	-	-	-	-	
		210	-	-	-	-	-		
		8	Horizontal	0	65	65	55	50	45
				70	65	65	55	50	45
				140	65	65	51	46	45
				210	65	65	45	31	22
				280	65	31	21	14	6
				350	35	8	-	-	-
			420	7	-	-	-	-	
			Vertical	0	14	14	14	-	-
				70	14	14	14	-	-
				140	12	12	12	-	-
210	8			6	6	-	-		
280	6			4	2	-	-		
350	1	-		-	-	-			
420	-	-	-	-	-				

[When high-output setting is effective of the motor reversing type]

(Note) For Lead 16 and 24 of WSA14R, there is no setting of the maximum payload type against the speed and acceleration to reduce the payload for vertical orientation. Use the slider type.

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload capacity by acceleration/deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
WSA14R	56P	16	Horizontal	0	50	42	40	32	30
				140	50	42	40	32	30
				280	50	42	35	23	17
				420	47	25	18	14	10
				560	12	10	5	3	2
		24	Horizontal	0	25	23	19	14	11
				140	25	23	19	14	11
				420	25	23	19	13	8
				560	20	19	14	10	5
				700	20	8	6	6	3

[When high-output setting is effective of the motor reversing type]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload capacity by acceleration/deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
WSA16R	56SP	5	Horizontal	0	100	90	90	90	90
				60	100	90	90	90	90
				95	100	90	90	80	80
				120	100	90	65	50	45
				145	80	-	-	-	-
				160	35	-	-	-	-
				170	8	-	-	-	-
				195	-	-	-	-	-
				0	45	45	45	-	-
			60	45	45	45	-	-	
			95	27	27	27	-	-	
			120	7	7	7	-	-	
			145	1	-	-	-	-	
			160	-	-	-	-	-	
			170	-	-	-	-	-	
			195	-	-	-	-	-	
			0	70	70	60	60	60	
			80	70	70	60	60	60	
		160	70	70	55	45	45		
		210	70	65	45	30	28		
		240	70	30	22	14	10		
		270	70	12	6	4	-		
		330	35	-	-	-	-		
		365	12	-	-	-	-		
		405	-	-	-	-	-		
		450	-	-	-	-	-		
		0	15	15	15	-	-		
		80	15	15	15	-	-		
		160	10	10	10	-	-		
		210	2	2	1	-	-		
		240	-	-	-	-	-		
		270	-	-	-	-	-		
		330	-	-	-	-	-		
		365	-	-	-	-	-		
		405	-	-	-	-	-		
		450	-	-	-	-	-		

[When high-output setting is effective of the motor reversing type]

(Note) For Lead 20 of WSA16R, there is no setting of the maximum payload type against the speed and acceleration to reduce the payload for vertical orientation. Use the slider type.

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload capacity by acceleration/deceleration [kg]					
				Speed [mm/s]	0.1G	0.3G	0.5G	0.7G	1.0G
WSA16R	56SP	20	Horizontal	0	30	30	28	24	20
				120	30	30	28	24	20
				240	30	30	28	20	16
				365	30	28	18	12	6
				480	30	6	-	-	-
				550	14	-	-	-	-
				600	2	-	-	-	-
				665	-	-	-	-	-
				720	-	-	-	-	-



Caution: Do not attempt to establish the settings for the acceleration/deceleration above the allowable range. It may cause vibration, malfunction or shortened life. Setting of acceleration/deceleration above the ratings may cause creeping or slippage of the coupling.

(Note) There is no high output setting prepared for WSA16C and WSA16R which are to be operated with PCON-CFB controller.

[When high-output setting is ineffective of the motor straight type]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload Capacity by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.3G	0.7G
WSA10C	35P	2.5	Horizontal	0	36	27
				20	36	27
				40	36	27
				65	36	27
				85	36	27
				105	36	27
				130	33	20
			Vertical	0	10	-
				20	10	-
				40	10	-
				65	10	-
				85	9	-
				105	7	-
				130	4.5	-
		5	Horizontal	0	25	20
				40	25	20
				85	25	20
				130	25	20
				175	25	19
				215	19	13
				260	10.5	7.5
			Vertical	0	3	-
				40	3	-
				85	3	-
				130	3	-
				175	3	-
				215	3	-
				260	2	-

[When high-output setting is ineffective of the motor straight type]

(Note) For Lead 10 and 16 of WSA10C, there is no setting of the maximum payload type against the speed and acceleration to reduce the payload for vertical orientation. Use the slider type.

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload Capacity by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.3G	0.7G
WSA10C	35P	10	Horizontal	0	12	9.5
				85	12	9.5
				175	12	9
				260	12	9
				350	10.5	6.5
				435	6	3.5
				525	3	1.5
		16	Horizontal	0	4	3
				140	4	3
				280	4	3
				420	4	3
				560	3.5	1

[When high-output setting is ineffective of the motor straight type]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload Capacity by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.3G	0.7G
WSA12C	42P	3	Horizontal	0	42	33
				25	42	33
				50	42	33
				65	42	33
				100	42	33
				125	42	30
			Vertical	150	30	24
				0	15	-
				25	15	-
				50	15	-
				65	13	-
				100	12	-
		6	Horizontal	125	8	-
				150	4.5	-
				0	30	30
				50	30	30
				100	30	30
				140	30	30
			Vertical	200	30	19
				250	19	16.5
				290	14	9
				0	8	-
				50	8	-
				100	8	-
Horizontal	140	8	-			
	200	5.5	-			
	250	3	-			
	290	2	-			

[When high-output setting is ineffective of the motor straight type]

(Note) For Lead 12 and 20 of WSA12C, there is no setting of the maximum payload type against the speed and acceleration to reduce the payload for vertical orientation. Use the slider type.

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload Capacity by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.3G	0.7G
WSA12C	42P	12	Horizontal	0	18	15.5
				100	18	15.5
				200	18	14
				285	18	11
				400	12	7.5
				500	6	4
		20	Horizontal	0	8	4
				160	8	4
				320	8	4
				480	8	4
				640	5	3

[When high-output setting is ineffective of the motor straight type]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload Capacity by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.3G	0.7G
WSA14C	56P	4	Horizontal	0	54	48
				35	54	48
				70	54	48
				105	36	24
			Vertical	0	18	-
				35	18	-
				70	18	-
				105	6	-
		8	Horizontal	0	45	33
				70	45	33
				140	45	27.5
				210	13.5	9
			Vertical	0	11	-
				70	11	-
				140	10.5	-
				210	3	-

[When high-output setting is ineffective of the motor straight type]

(Note) For Lead 16 and 24 of WSA14C, there is no setting of the maximum payload type against the speed and acceleration to reduce the payload for vertical orientation. Use the slider type.

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload Capacity by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.3G	0.7G
WSA14C	56P	16	Horizontal	0	33	24.5
				140	33	24.5
				280	22.5	12.5
				420	9.5	3.5
		24	Horizontal	0	15.5	12
				140	15.5	12
				420	13	8
				560	7.5	3

(Note) There is no high output setting prepared for WSA16C and WSA16R which are to be operated with PCON-CFB controller.

[When high-output setting is ineffective of the motor reversing type]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload Capacity by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.3G	0.7G
WSA10R	35P	2.5	Horizontal	0	36	27
				20	36	27
				40	36	27
				65	36	27
				85	36	27
				105	36	27
			Vertical	130	33	20
				0	10	-
				20	10	-
				40	10	-
				65	10	-
				85	9	-
		5	Horizontal	105	7	-
				130	4.5	-
				0	25	20
				40	25	20
				85	25	20
				130	25	20
			Vertical	175	25	19
				215	19	13
				260	10.5	7.5
				0	3	-
				40	3	-
				85	3	-
				130	3	-
				175	3	-
				215	3	-
				260	2	-

[When high-output setting is ineffective of the motor reversing type]

(Note) For Lead 10 and 16 of WSA10R, there is no setting of the maximum payload type against the speed and acceleration to reduce the payload for vertical orientation. Use the slider type.

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload Capacity by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.3G	0.7G
WSA10R	35P	10	Horizontal	0	12	9.5
				85	12	9.5
				175	12	9
				260	12	9
				350	10.5	6.5
				435	6	3.5
				525	3	1.5
		16	Horizontal	0	4	3
				140	4	3
				280	4	3
				420	4	3
				560	3.5	1

[When high-output setting is ineffective of the motor reversing type]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload Capacity by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.3G	0.7G
WSA12R	42P	3	Horizontal	0	42	33
				25	42	33
				50	42	33
				65	42	33
				100	42	33
				125	42	30
			Vertical	150	30	24
				0	15	-
				25	15	-
				50	15	-
				65	13	-
				100	12	-
		6	Horizontal	125	8	-
				150	4.5	-
				0	30	30
				50	30	30
				100	30	30
				140	30	30
			Vertical	200	30	19
				250	19	16.5
				290	14	9
				0	8	-
				50	8	-
				100	8	-
Horizontal	140	8	-			
	200	5.5	-			
	250	3	-			
	290	2	-			

[When high-output setting is ineffective of the motor reversing type]

(Note) For Lead 12 and 20 of WSA12R, there is no setting of the maximum payload type against the speed and acceleration to reduce the payload for vertical orientation. Use the slider type.

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload Capacity by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.3G	0.7G
WSA12R	42P	12	Horizontal	0	18	15.5
				100	18	15.5
				200	18	14
				285	18	11
				400	12	7.5
				500	6	4
		20	Horizontal	0	8	4
				160	8	4
				320	8	4
				480	8	4
				640	5	3

[When high-output setting is ineffective of the motor reversing type]

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload Capacity by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.3G	0.7G
WSA14R	56P	4	Horizontal	0	54	48
				35	54	48
				70	54	48
				105	36	24
			Vertical	0	18	-
				35	18	-
				70	18	-
				105	6	-
		8	Horizontal	0	45	33
				70	45	33
				140	45	27.5
				210	13.5	9
			Vertical	0	11	-
				70	11	-
				140	10.5	-
				210	3	-

[When high-output setting is ineffective of the motor reversing type]

(Note) For Lead 16 and 24 of WSA14R, there is no setting of the maximum payload type against the speed and acceleration to reduce the payload for vertical orientation. Use the slider type.

Type	Motor Type	Lead [mm]	Horizontal / Vertical	Payload Capacity by Acceleration/Deceleration [kg]		
				Speed [mm/s]	0.3G	0.7G
WSA14R	56P	16	Horizontal	0	33	24.5
				140	33	24.5
				280	22.5	12.5
				420	9.5	3.5
		24	Horizontal	0	15.5	12
				140	15.5	12
				420	13	8
				560	7.5	3

1.2.3 Driving System • Position Detector

Type	Motor Type	Lead	No. of Encoder Pulses	Ball Screw Type		
				Type	Diameter	Accuracy
WSA10C WSA10R	35P	2.5	8192	Rolled	φ8mm	C10
		5				
		10				
		16				
WSA12C WSA12R	42P	3		Rolled	φ10mm	C10
		6				
		12				
		20				
WSA14C WSA14R	56P	4		Rolled	φ12mm	C10
		8				
		16				
		24				
WSA16C WSA16R	56SP	5		Rolled	φ16mm	C10
		10				
		20				

1.2.4 Positioning Precision

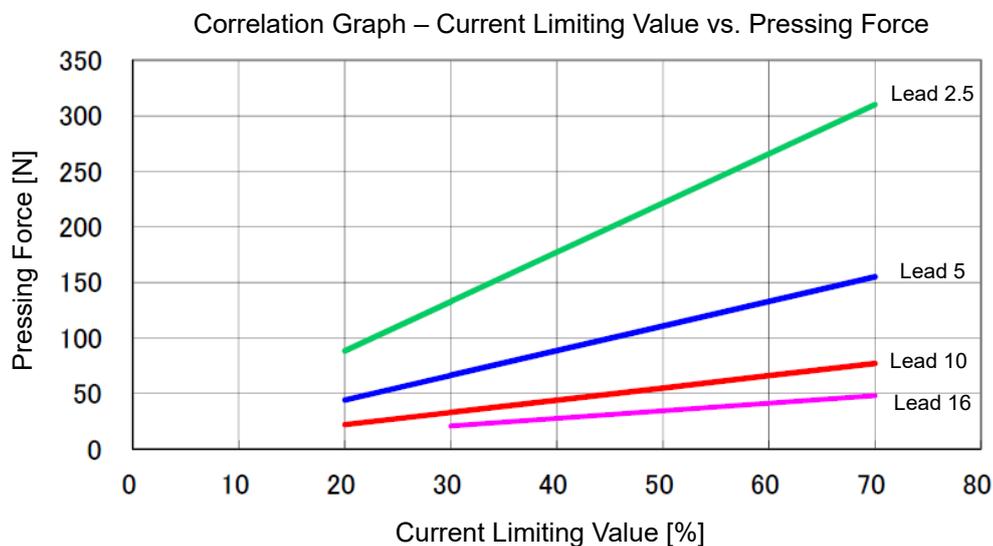
Type	Lead	Item	Tolerance	
			Standard	High-precision Specification Option Model Code: HPR
WSA10C	2.5, 5, 10	Positioning repeatability	±0.01mm	±0.005mm
		Lost motion	0.1mm or less	0.1mm or less
	16	Positioning repeatability	±0.01mm	-
		Lost motion	0.1mm or less	-
WSA10R	2.5, 5, 10, 16	Positioning repeatability	±0.01mm	-
		Lost motion	0.1mm or less	-
WSA12C	3, 6, 12	Positioning repeatability	±0.01mm	±0.005mm
		Lost motion	0.1mm or less	0.1mm or less
	20	Positioning repeatability	±0.01mm	-
		Lost motion	0.1mm or less	-
WSA12R	3, 6, 12, 20	Positioning repeatability	±0.01mm	-
		Lost motion	0.1mm or less	-
WSA14C	4, 8	Positioning repeatability	±0.01mm	±0.005mm
		Lost motion	0.1mm or less	0.1mm or less
	16, 24	Positioning repeatability	±0.01mm	-
		Lost motion	0.1mm or less	-
WSA14R	4, 8, 16, 24	Positioning repeatability	±0.01mm	-
		Lost motion	0.1mm or less	-
WSA16C	5, 10	Positioning repeatability	±0.01mm	±0.005mm
		Lost motion	0.1mm or less	0.1mm or less
	20	Positioning repeatability	±0.01mm	-
		Lost motion	0.1mm or less	-
WSA16R	5, 10, 20	Positioning repeatability	±0.01mm	-
		Lost motion	0.1mm or less	-

It is the accuracy when product is shipped out from the factory. It does not include the consideration of time-dependent change.

1.2.5 Current Limiting Value and Pressing Force

● WSA10C, WSA10R

Current Limiting Value	Lead 2.5 [N]	Lead 5 [N]	Lead 10 [N]	Lead 16 [N]
20%	89	44	22	-
30%	133	66	33	21
40%	177	89	44	27
50%	221	111	55	34
60%	266	133	66	41
70%	310	155	77	48



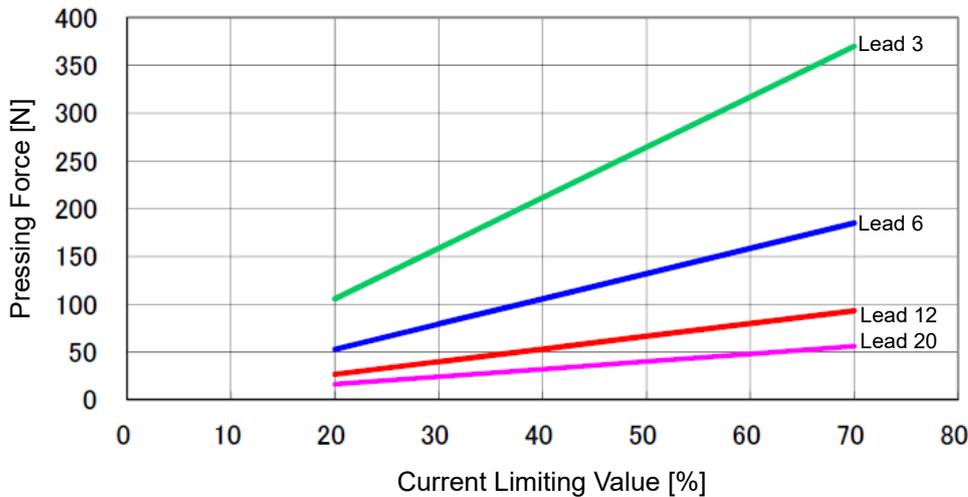
- ⚠ Caution: (1) The relation of the current limit and the pressing force is a reference when assuming the speed is 20mm/s.
- (2) There will be a little variance in the actual pressing force. The variance of the pressing force becomes large when the current limit value is low.
- (3) Use the product within the range in the graph for the current limit value. Pressing force will not be stable if used below 20%. There is even a case that it would not operate. An operation cannot be made also when it is beyond 70%. Doing so may cause degradation in the motor coil insulation by heat radiation, which results in shortening the product life.
- (4) For the CON system controllers such as PCON, when the approach speed (setting in the position table) to the pressing start position is 20mm/s or less, pressing is performed at the approach speed. In such a case also the pressing force will be unstable. In such cases, check in advance that the actuator can be used with no problem before omit using.
For the SEL system controllers such as MSEL, pressing operation is performed at the speed set in PAPER Command regardless of the approach speed to the pressing start position.

● WSA12C, WSA12R

Current Limiting Value	Lead 3 [N]	Lead 6 [N]	Lead 12 [N]	Lead 20 [N]
20%	106	53	27	16
30%	159	79	40	24
40%	211	106	53	32
50%	264	132	66	40
60%	317	159	80	48
70%	370	185	93	56

* It is a reference at 20mm/s of pressing speed.

Correlation Graph – Current Limiting Value vs. Pressing Force



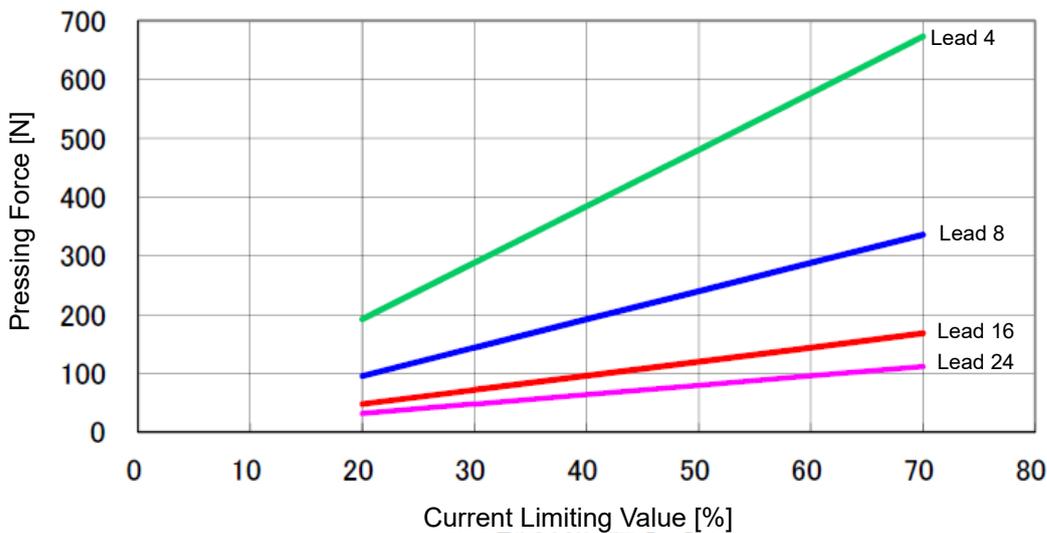
- ⚠ Caution:
- (1) The relation of the current limit and the pressing force is a reference when assuming the speed is 20mm/s.
 - (2) There will be a little variance in the actual pressing force. The variance of the pressing force becomes large when the current limit value is low.
 - (3) Use the product within the range in the graph for the current limit value. Pressing force will not be stable if used below 20%. There is even a case that it would not operate. An operation cannot be made also when it is beyond 70%. Doing so may cause degradation in the motor coil insulation by heat radiation, which results in shortening the product life.
 - (4) For the CON system controllers such as PCON, when the approach speed (setting in the position table) to the pressing start position is 20mm/s or less, pressing is performed at the approach speed. In such a case also the pressing force will be unstable. In such cases, check in advance that the actuator can be used with no problem before omit using.
For the SEL system controllers such as MSEL, pressing operation is performed at the speed set in PAPER Command regardless of the approach speed to the pressing start position.

● WSA14C, WSA14R

Current Limiting Value	Lead 4 [N]	Lead 8 [N]	Lead 16 [N]	Lead 24 [N]
20%	192	96	48	32
30%	288	144	72	48
40%	385	192	96	64
50%	481	240	120	80
60%	577	288	144	96
70%	673	336	168	112

* It is a reference at 20mm/s of pressing speed.

Correlation Graph – Current Limiting Value vs. Pressing Force



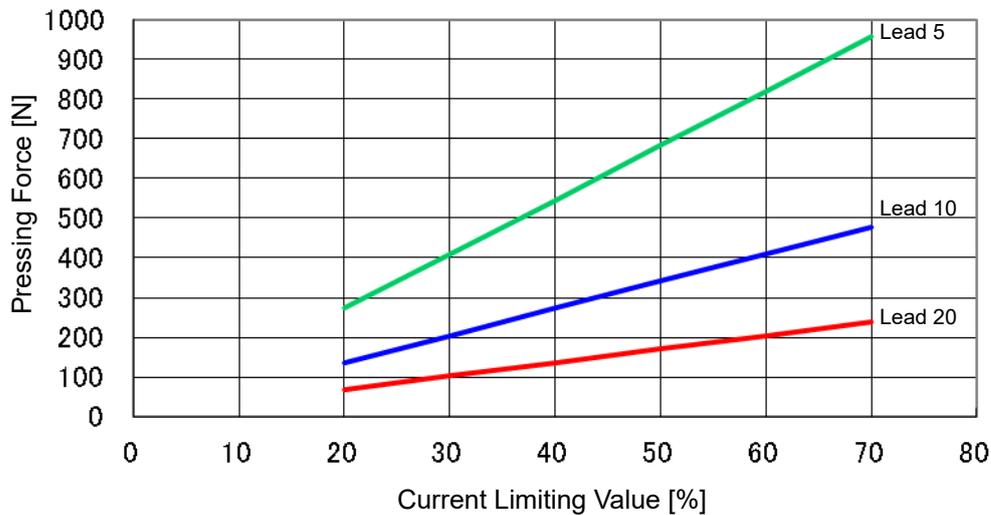
⚠ Caution: (1) The relation of the current limit and the pressing force is a reference when assuming the speed is 20mm/s.
 (2) There will be a little variance in the actual pressing force. The variance of the pressing force becomes large when the current limit value is low.
 (3) Use the product within the range in the graph for the current limit value. Pressing force will not be stable if used below 20%. There is even a case that it would not operate. An operation cannot be made also when it is beyond 70%. Doing so may cause degradation in the motor coil insulation by heat radiation, which results in shortening the product life.
 (4) For the CON system controllers such as PCON, when the approach speed (setting in the position table) to the pressing start position is 20mm/s or less, pressing is performed at the approach speed. In such a case also the pressing force will be unstable. In such cases, check in advance that the actuator can be used with no problem before omit using.
 For the SEL system controllers such as MSEL, pressing operation is performed at the speed set in PAPR Command regardless of the approach speed to the pressing start position.

● WSA16C, WSA16R

Current Limiting Value	Lead 5 [N]	Lead 10 [N]	Lead 20 [N]
20%	273	137	68
30%	410	205	102
40%	546	273	137
50%	683	341	171
60%	819	410	205
70%	956	478	239

* It is a reference at 20mm/s of pressing speed.

Correlation Graph – Current Limiting Value vs. Pressing Force



- ⚠ Caution: (1) The relation of the current limit and the pressing force is a reference when assuming the speed is 20mm/s.
 (2) There will be a little variance in the actual pressing force. The variance of the pressing force becomes large when the current limit value is low.
 (3) Use the product within the range in the graph for the current limit value. Pressing force will not be stable if used below 20%. There is even a case that it would not operate. An operation cannot be made also when it is beyond 70%. Doing so may cause degradation in the motor coil insulation by heat radiation, which results in shortening the product life.
 (4) For the CON system controllers such as PCON, when the approach speed (setting in the position table) to the pressing start position is 20mm/s or less, pressing is performed at the approach speed. In such a case also the pressing force will be unstable. In such cases, check in advance that the actuator can be used with no problem before omit using.
 For the SEL system controllers such as MSEL, pressing operation is performed at the speed set in PAPR Command regardless of the approach speed to the pressing start position.

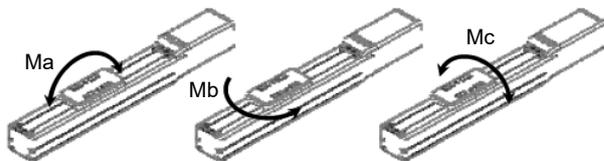
1.2.6 Allowable Moment of Actuator

Type	Allowable static moment [N•m]		
	Ma	Mb	Mc
WSA10C WSA10R	271	271	553
WSA12C WSA12R	311	311	827
WSA14C WSA14R	462	462	1170
WSA16C WSA16R	642	642	1610

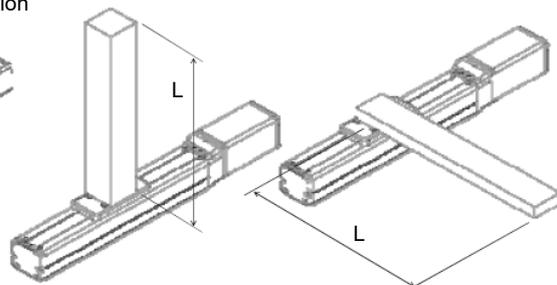
(Note) For Lead 2.5mm of WSA10C and WSA10R, Lead 3mm of WSA12C and WSA12R, Lead 4mm of WSA14C and WSA14R and Lead 5mm of WSA16C and WSA16R, the allowable dynamic moment is only for 5,000km of the driving life.

Type	Allowable static moment [N•m] 5,000km driving life			Allowable dynamic moment [N•m] 10,000km driving life			Allowable overhang load length [L]
	Ma	Mb	Mc	Ma	Mb	Mc	
WSA10C WSA10R	65.4	65.4	134	51.9	51.9	106	Ma direction: 500mm Mb, Mc direction: 500mm
WSA12C WSA12R	87.5	87.5	233	69.5	69.5	185	Ma direction: 450mm Mb, Mc direction: 450mm
WSA14C WSA14R	122	122	308	96.8	96.8	245	Ma direction: 550mm Mb, Mc direction: 550mm
WSA16C WSA16R	161	161	404	128	128	321	Ma direction: 650mm Mb, Mc direction: 650mm

Ma: Pitching Direction Mb: Yawing Direction Mc: Rolling Direction

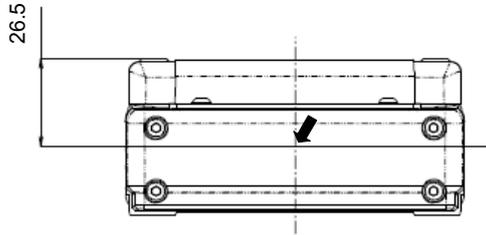


Directions of the Load Moments

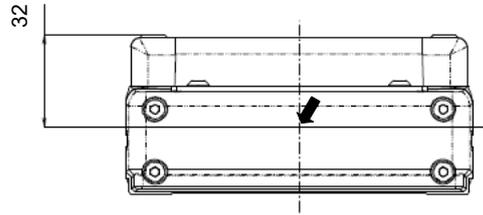


Direction of Allowable Overhang

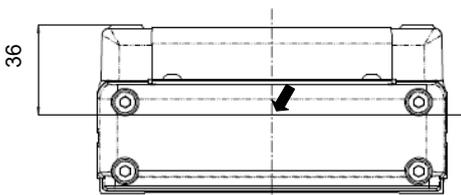
Conduct moment calculations for M_a and M_c with the point indicated with an arrow below as the reference.



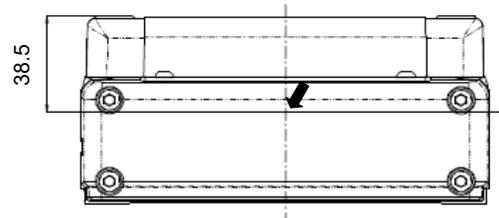
WSA10



WSA12



WSA14



WSA16



Caution: Using the product above the allowable moment or overhang load length may cause not only to generate abnormal noise or vibration, but also to shorten the product life remarkably.

1.2.7 Duty Ratio of Continuous Operation

[Standard Specification]

Continuous operation is available with the duty ratio 100%.

[Built-in Controller Specification]

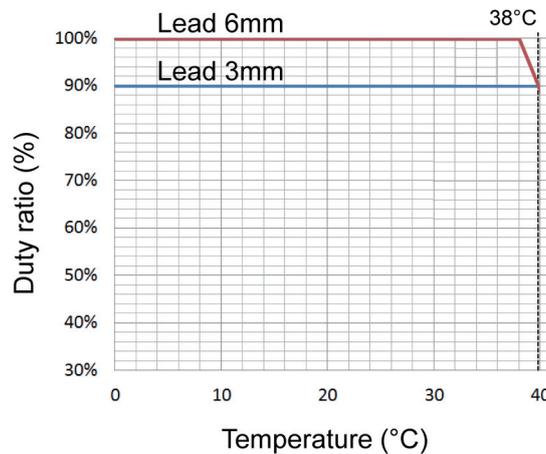
©RCP6S-WSA10C, 10R, 16C, 16R, RCP6SCR-WSA10C and 16C

Continuous operation is available with the duty ratio 100%.

©RCP6S-WSA12C, 12R and RCP6SCR-WSA12C

Lead 12mm and 20mm are available for continuous operation at 100% of the duty ratio.

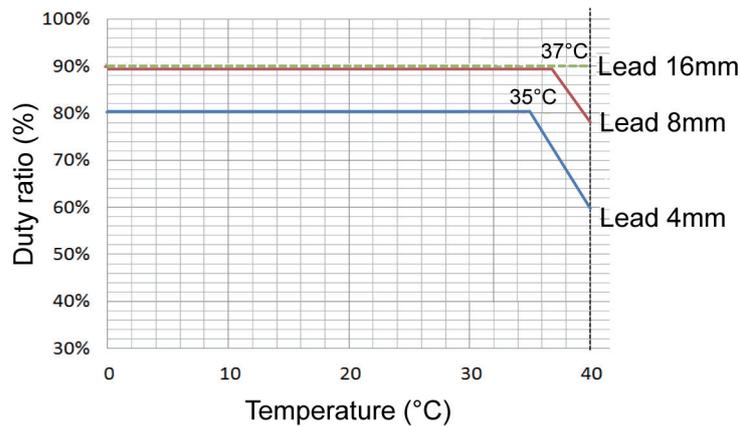
Follow the graph below for the duty ratio when operating Lead 3mm and 6mm.



©RCP6S-WSA14C, 14R and RCP6SCR-WSA14C

Lead 24mm are available for continuous operation at 100% of the duty ratio.

Follow the graph below for the duty ratio when operating Lead 4mm, 8mm and 16mm.



Duty ratio is the rate of operation expressed in % that presents the time of the actuator being operated in 1 cycle of operation.

1.3 Options

1.3.1 Brake Type (Model Code: B)

The brake is a mechanism designed to prevent the slider from dropping on a vertically installed actuator when the power or servo is turned OFF.

Use the brake to prevent the installed load, etc., from being damaged due to the falling slider.

1.3.2 Reversed-home Specification (Model Code: NM)

The standard home position is on the motor side. However, the motor position will be reversed if it is desirable in view of the layout of the system, etc.

(Note) The home position is adjusted at the factory before shipment. If you wish to change the home after the delivery of your actuator, you must return the actuator to IAI for adjustment.

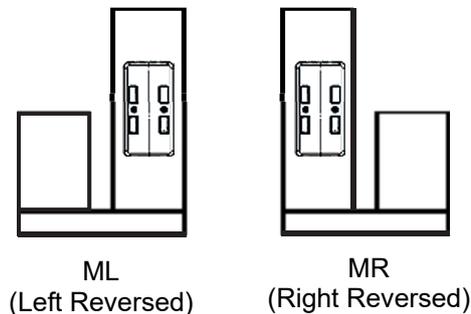
1.3.3 High-precision Specification (Model Code: HPR)

The positioning accuracy repeatability is $\pm 0.01\text{mm}$ in standard. By indicating this option, the positioning accuracy repeatability becomes $\pm 0.005\text{mm}$.

Some types of lead cannot set this option. [Refer to 1.2.4 Positioning Precision]

1.3.4 Motor Left Reversed, Motor Right Reversed (Model Code: ML, MR)

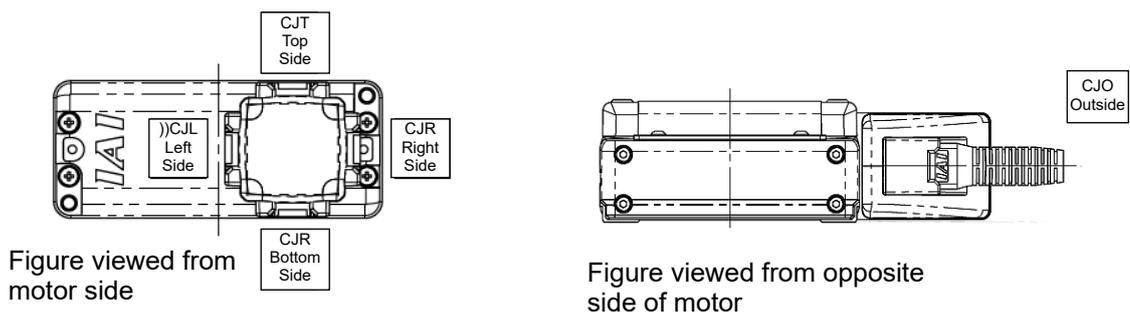
From the view of motor side, reversing to the left is ML and reversing to the right is MR.



1.3.5 Cable Eject Direction Changed (Model Code: CJT, CJR, CJL, CJB, CJO)

If a change in the cable ejection direction is made, the direction of cable ejection will be changed.

There are ejection directions, top (model code: CJT), right (model code: CJR), left (model code: CJL), bottom (model code: CJB) and outside (model code: CJO). CJL cannot be selected for the straight type RCP6S (CR)-WSA10C. CJO can be selected only for the reversed type of WSA10R, WSA12R, WSA14R and WSA16R.



1.3.6 Slider Roller Type (Model Code: SR)

It is the type that the construction of the slider has changed to the roller structure, which is the same structure as the one for the cleanroom type.

1.3.7 Vacuum Joint Opposite Type (Model Code: VR)

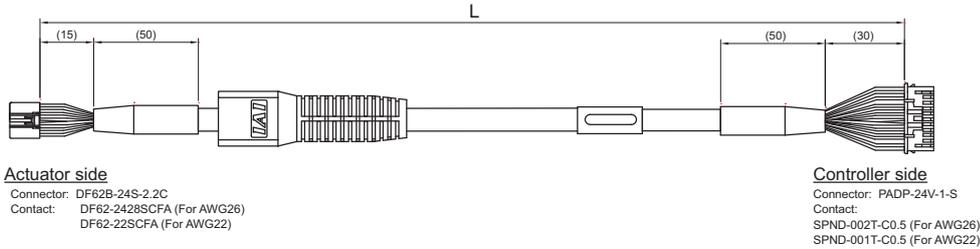
The vacuum joint on the cleanroom type is mounted on the left side of the body in the view from the motor side in standard. This type is something that this orientation of the joint is changed to the other side (opposite).

1.4 Motor • Encoder Cables

1.4.1 Motor • Encoder Integrated Cables (WSA10, WSA12, WSA14)

CB-CAN-MPA□□□

□□□ indicates the cable length (L) (Example: 030=3m), Max.20m



Connection diagram

Actuator side

Controller side

Thickness	Electric Wire Color	Symbol	Pin No.	Pin No.	Symbol	Electric Wire Color	Thickness
AWG22/19	Blue	ϕ A	3	1	ϕ A	Blue	AWG22/19
AWG22/19	Orange	VMM	5	2	VMM	Orange	AWG22/19
AWG22/19	Brown	ϕ B	10	3	ϕ B	Brown	AWG22/19
AWG22/19	Gray	VMM	9	4	VMM	Gray	AWG22/19
AWG22/19	Green	ϕ A	4	5	ϕ A	Green	AWG22/19
AWG22/19	Red	ϕ B	15	6	ϕ B	Red	AWG22/19
AWG26	Black	LS+	8	7	LS+	Black	AWG26
AWG26	Yellow	LS-	14	8	LS-	Yellow	AWG26
AWG26	Blue	SA	12	11	SA	Blue	AWG26
AWG26	Orange	SB	17	12	SB	Orange	AWG26
AWG26	Green	A+	1	13	A+	Green	AWG26
AWG26	Brown	A-	6	14	A-	Brown	AWG26
AWG26	Gray	B+	11	15	B+	Gray	AWG26
AWG26	Red	B-	16	16	B-	Red	AWG26
AWG26	Blue	BK+	20	9	BK+	Blue	AWG26
AWG26	Orange	BK-	2	10	BK-	Orange	AWG26
AWG26	Gray	VCC	21	17	VCC	Gray	AWG26
AWG26	Red	GND	7	19	GND	Red	AWG26
AWG26	Brown	VPS	18	18	VPS	Brown	AWG26
AWG26	Green	LS_GND	13	20	LS_GND	Green	AWG26
-	-	-	19	22	-	-	-
AWG26	Pink	-	22	21	-	Pink	AWG26
-	-	-	23	23	-	-	-
AWG26	Black	FG	24	24	FG	Black	AWG26

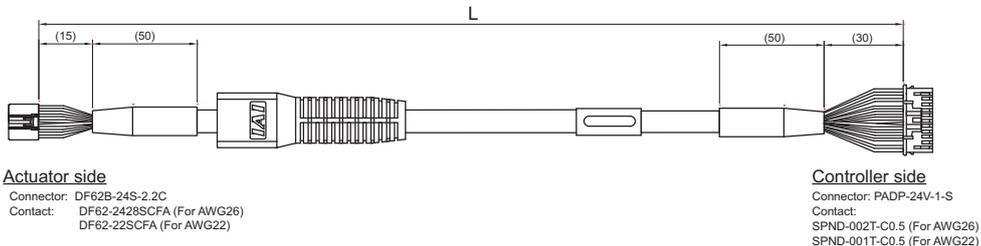
(Note) About thickness AWG22/19

The thickness is AWG22 when the cable length is 5m or less, and AWG19 when longer than 5m.

1.4.2 Motor • Encoder Integrated Cables Robot Type (WSA10, WSA12, WSA14)

CB-CAN-MPA□□□-RB

□□□ indicates the cable length (L) (Example: 030=3m), Max.20m



Connection diagram

Actuator side

Controller side

Thickness	Electric Wire Color	Symbol	Pin No.		Pin No.	Symbol	Electric Wire Color	Thickness
AWG22/19	Blue	ϕ A	3		1	ϕ A	Blue	AWG22/19
AWG22/19	Orange	VMM	5		2	VMM	Orange	AWG22/19
AWG22/19	Brown	ϕ B	10		3	ϕ B	Brown	AWG22/19
AWG22/19	Gray	VMM	9		4	VMM	Gray	AWG22/19
AWG22/19	Green	ϕ _A	4		5	ϕ _A	Green	AWG22/19
AWG22/19	Red	ϕ _B	15		6	ϕ _B	Red	AWG22/19
AWG26	Black	LS+	8		7	LS+	Black	AWG26
AWG26	Yellow	LS-	14		8	LS-	Yellow	AWG26
AWG26	Blue	SA	12		11	SA	Blue	AWG26
AWG26	Orange	SB	17		12	SB	Orange	AWG26
AWG26	Green	A+	1		13	A+	Green	AWG26
AWG26	Brown	A-	6		14	A-	Brown	AWG26
AWG26	Gray	B+	11		15	B+	Gray	AWG26
AWG26	Red	B-	16		16	B-	Red	AWG26
AWG26	Blue	BK+	20		9	BK+	Blue	AWG26
AWG26	Orange	BK-	2		10	BK-	Orange	AWG26
AWG26	Gray	VCC	21		17	VCC	Gray	AWG26
AWG26	Red	GND	7		19	GND	Red	AWG26
AWG26	Brown	VPS	18		18	VPS	Brown	AWG26
AWG26	Green	LS_GND	13		20	LS_GND	Green	AWG26
-	-	-	19		22	-	-	-
AWG26	Pink	-	22		21	-	Pink	AWG26
-	-	-	23		23	-	-	-
AWG26	Black	FG	24		24	FG	Black	AWG26

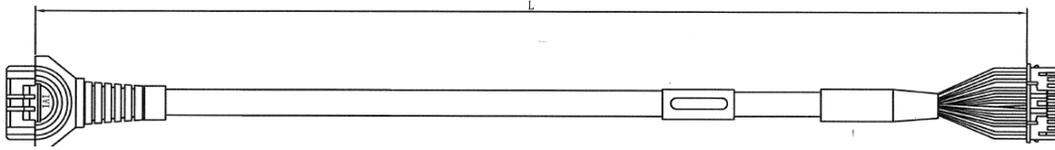
(Note) About thickness AWG22/19

The thickness is AWG22 when the cable length is 5m or less, and AWG19 when longer than 5m.

1.4.3 Motor • Encoder Integrated Cables (WSA16)

CB-CFA3-MPA□□□

□□□ indicates the cable length (L) (Example: 030=3m), Max.20m



Actuator side

Connector: 1-1827863-1
Contact: 1827570-2

Controller side

Connector: PADP-24V-1-S
Contact:
SPND-002T-C0.5(AWG26)
SPND-001T-C0.5(AWG22)

Connection diagram

Actuator side

Thickness	Electric Wire Color	Symbol	Pin No.
AWG22/19	Blue	ϕ A	A1
AWG22/19	Orange	VMM	B1
AWG22/19	Green	ϕ A	A2
AWG22/19	Brown	ϕ B	B2
AWG22/19	Gray	VMM	A3
AWG22/19	Red	ϕ B	B3
AWG26	Black	LS+	A4
AWG26	Yellow	LS-	B4
AWG26	Blue	SA	A6
AWG26	Orange	SB	B6
AWG26	Green	A+	A7
AWG26	Brown	A-	B7
AWG26	Gray	B+	A8
AWG26	Red	B-	B8
AWG26	Blue	BK+	A5
AWG26	Orange	BK-	B5
AWG26	Green	LS_GND	A9
AWG26	Brown	VPS	B9
AWG26	Gray	VCC	A10
AWG26	Red	GND	B10
-	-	-	A11
AWG26	Black	FG	B11

Controller side

Pin No.	Symbol	Electric Wire Color	Thickness
1	ϕ A	Blue	AWG22/19
2	VMM	Orange	AWG22/19
5	ϕ A	Green	AWG22/19
3	ϕ B	Brown	AWG22/19
4	VMM	Gray	AWG22/19
6	ϕ B	Red	AWG22/19
7	LS+	Black	AWG26
8	LS-	Yellow	AWG26
11	SA	Blue	AWG26
12	SB	Orange	AWG26
13	A+	Green	AWG26
14	A-	Brown	AWG26
15	B+	Gray	AWG26
16	B-	Red	AWG26
9	BK+	Blue	AWG26
10	BK-	Orange	AWG26
20	LS_GND	Green	AWG26
18	VPS	Brown	AWG26
21	VCC	Gray	AWG26
19	GND	Red	AWG26
17	-	-	-
22	-	-	AWG26
23	-	-	-
24	FG	Black	AWG26

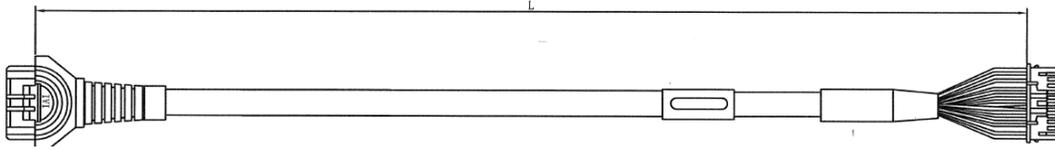
(Note) About thickness AWG22/19

The thickness is AWG22 when the cable length is 5m or less, and AWG19 when longer than 5m.

1.4.4 Motor • Encoder Integrated Cables Robot Type (WSA16)

CB-CFA3-MPA□□□-RB

□□□ indicates the cable length (L) (Example: 030=3m), Max.20m



Actuator side

Connector: 1-1827863-1
Contact: 1827570-2

Controller side

Connector: PADP-24V-1-S
Contact: SPND-002T-C0.5(AWG26)
SPND-001T-C0.5(AWG22)

Connection diagram

Actuator side

Thickness	Electric Wire Color	Symbol	Pin No.
AWG22/19	Blue	ϕ A	A1
AWG22/19	Orange	VMM	B1
AWG22/19	Green	ϕ _A	A2
AWG22/19	Brown	ϕ B	B2
AWG22/19	Gray	VMM	A3
AWG22/19	Red	ϕ _B	B3
AWG26	Black	LS+	A4
AWG26	Yellow	LS-	B4
AWG26	Blue	SA	A6
AWG26	Orange	SB	B6
AWG26	Green	A+	A7
AWG26	Brown	A-	B7
AWG26	Gray	B+	A8
AWG26	Red	B-	B8
AWG26	Blue	BK+	A5
AWG26	Orange	BK-	B5
AWG26	Green	LS_GND	A9
AWG26	Brown	VPS	B9
AWG26	Gray	VCC	A10
AWG26	Red	GND	B10
-	-	-	A11
AWG26	Black	FG	B11

Controller side

Pin No.	Symbol	Electric Wire Color	Thickness
1	ϕ A	Blue	AWG22/19
2	VMM	Orange	AWG22/19
5	ϕ _A	Green	AWG22/19
3	ϕ B	Brown	AWG22/19
4	VMM	Gray	AWG22/19
6	ϕ _B	Red	AWG22/19
7	LS+	Black	AWG26
8	LS-	Yellow	AWG26
11	SA	Blue	AWG26
12	SB	Orange	AWG26
13	A+	Green	AWG26
14	A-	Brown	AWG26
15	B+	Gray	AWG26
16	B-	Red	AWG26
9	BK+	Blue	AWG26
10	BK-	Orange	AWG26
20	LS_GND	Green	AWG26
18	VPS	Brown	AWG26
21	VCC	Gray	AWG26
19	GND	Red	AWG26
17	-	-	-
22	-	-	AWG26
23	-	-	-
24	FG	Black	AWG26

(Note) About thickness AWG22/19

The thickness is AWG22 when the cable length is 5m or less, and AWG19 when longer than 5m.

2. Installation

2.1 Transportation

[1] Handling of Robot

(1) Handling of the Packed Product

Unless otherwise specified, the actuator is shipped with each axis packaged separately.

- Do not damage or drop. The package is not applied with any special treatment that enables it to resist an impact caused by a drop or crash.
- Transport a heavy package with at least more than two operators. Consider an appropriate method for transportation.
- Keep the unit in horizontal orientation when placing it on the ground or transporting. Follow the instruction if there is any for the packaging condition.
- Do not step or sit on the package.
- Do not put any load that may cause a deformation or breakage of the package.

(2) Handling the Actuator after Unpacking

- Do not carry an actuator by motor unit and a cable or attempt to move it by pulling the cable.
- Be careful not to bump the actuator into anything when moving it.
- Hold the body base when transporting the actuator.
- Do not attempt to force any part of the actuator. Take particular care not to apply pressure to the stainless steel sheet.



Caution: Do not attempt to grab or hold the stainless steel sheet for any reason.

Supplement) For the names of each part of the actuator, refer to "Name of the Parts."

[2] Handling in the Assembled Condition

This is the case when the product is delivered from our factory under a condition that it is assembled with other actuators. The combined axes are delivered in a package that the frame is nailed on the lumber base. Fix the slider so that would not accidentally move during transportation. The actuators are also fixed so the tip of it would not shake due to the external vibration.

(1) How to Handle the Package

- Do not hit or drop the package. No special treatment is conducted on this package to endure a drop or impact on it.
- Do not attempt to carry a heavy package with only one worker. Also, have an appropriate method for transportation.
- When hanging up with ropes, support on the reinforcement frame on the bottom of the lumber base. When bringing up the package with a forklift, also support on the bottom of the lumber base.
- Handle with care when putting the package down to avoid impact or bounce.
- Do not step on the package.
- Do not put anything on the package that could deform or damage it.

(2) How to Handle after Unpackaged

- Fix the slider so they would not accidentally move during transportation.
- If the tip of an actuator is overhanging, have an appropriate way to fix it to avoid shake due to the external vibration. In the transportation without the tip being fixed, do not apply any impact with 0.3G or more.
- When hanging up with ropes, have appropriate cushioning to avoid any deformation of the actuator body. Also keep it in stable horizontal orientation. Make a fixture utilizing the attachment holes and the tapped holes on the actuator body if necessary.
- Do not attempt to apply load on the actuators or the connector box. Also pay attention not to pinch cables and bend or deform them forcefully.

[3] Handling in Condition of being assembled in Machinery Equipment (System)

These are some caution notes for when transporting the actuator being assembled in the machinery equipment (system):

- Fix the slider so that it would not move during transportation.
- If the tip of an actuator is overhanging, have an appropriate way to fix it to avoid shake due to the external vibration. In the transportation without the tip being fixed, do not apply any impact with 0.3G or more.
- When hanging up the machinery equipment (system) with ropes, do not attempt to apply load on the actuators or the connector box. Also pay attention not to pinch cables and bend or deform them forcefully.

2.2 Installation and Storage • Preservation Environment

[1] Installation Environment

The actuator should be installed in a location other than those specified below.

In general, the installation environment should be one in which an operator can work without protective gear.

Also provide sufficient work space required for maintenance inspection.

- Where the actuator receives radiant heat from strong heat sources such as heat treatment furnaces
- Where the ambient temperature exceeds the range of 0 to 40°C
- Where the temperature changes rapidly and condensation occurs
- Where the relative humidity exceeds 85% RH
- Where the actuator receives direct sunlight
- Where the actuator is exposed to corrosive or combustible gases
- Where the ambient air contains a large amount of powder dust, salt or iron (at level exceeding what is normally expected in an assembly plant)
- Where the actuator is subject to splashed water, oil (including oil mist or cutting fluid) or chemical solutions
- Where the actuator receives impact or vibration
- Where the altitude is more than 2000m

If the actuator is used in any of the following locations, provide sufficient shielding measures:

- Where noise generates due to static electricity, etc.
- Where the actuator is subject to a strong electric or magnetic field
- Where the actuator is subject to ultraviolet ray or radiation

[2] Storage • Preservation Environment

- The storage and preservation environment should comply with the same standards as those for the installation environment. In particular, when the machine is to be stored for a long time, pay close attention to environmental conditions so that no dew condensation forms.
- Unless specially specified, moisture absorbency protection is not included in the package when the machine is delivered. In the case that the machine is to be stored and preserved in an environment where dew condensation is anticipated, take the condensation preventive measures from outside of the entire package, or directly after opening the package.
- For storage and preservation temperature, the machine withstands temperatures up to 60°C for a short time, but in the case of the storage and preservation period of 1 month or more, control the temperature to 50°C or less.
- Storage and preservation should be performed in the horizontal condition. In the case it is stored in the packaged condition, follow the posture instruction if any displayed on the package.

2.3 How to Install

This chapter explains how to install the actuator on your mechanical system.

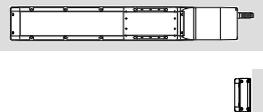
2.3.1 Installation

Follow the information below when installing the actuator, as a rule. Do pay attention to these items (except with custom-order models).

○ : Possible △ : Daily inspection is required × : Not possible

Model	Horizontal installation	Vertical installation	Sideways installation	Ceiling Mount installation
WSA10C, WSA12C, WSA14C, WSA16C, WSA10R, WSA12R, WSA14R, WSA16R	○	○	△	△

Installation Orientation

Horizontal	Vertical	Sideways	Ceiling mount
			



- Caution:
- When the unit is installed vertically oriented, Motor straight type is attempt to put the motor up unless there is a special reason. Putting the motor on the lower side would not cause a problem in an ordinary operation. However, it may rarely cause a problem, when it is not operated for a long period, depending on the surrounding environment (especially high temperature), caused by the grease being separated and the base oil flowing into the motor unit.
 - Can be installed sideways or ceiling mount, but the actuators must be checked daily. If the actuator is installed sideways or ceiling mount, the stainless steel sheet may be slacked or displaced. If the actuator is used continuously while the stainless steel sheet is slacked or displaced, the stainless steel sheet may break or other problems may occur. Check the actuator daily and if the stainless steel sheet is found slacked or displaced, make installation adjustment of the stainless steel sheet. [Refer to 5.7 Procedure for Stainless Steel Sheet Replacement and Adjustment.]

2.3.2 Installation of the Main Unit

The surface to mount the main unit should be a machined surface or a plane that possesses an equivalent accuracy and the flatness should be within 0.05mm/m. Also, the platform should have a structure stiff enough to install the unit so it would not generate vibration or other abnormality.

Also consider enough space necessary for maintenance work such as actuator replacement and inspection.

There are datum surfaces for attachment on the base.

The flatness of the slider movement is designed to be 0.05mm/m at maximum to the datum surface.

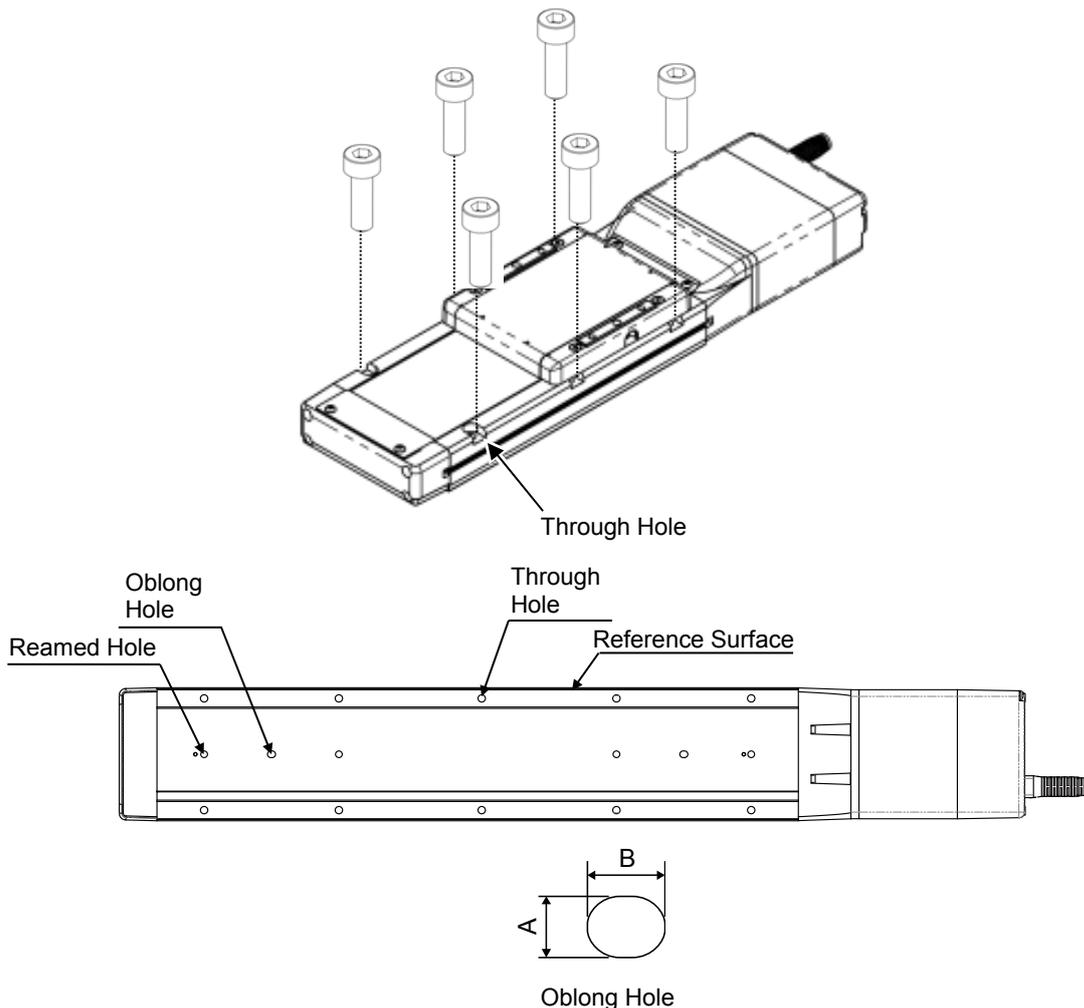
On the rear side of the actuator, there are tapped holes and through holes for attachment and reamed hole and oblong hole for positioning. (Note that there is no through hole on SA8C and SA8R.) See the appearance drawings for the details of the position and diameters. [Refer to 7. External Dimensions"]

Utilize the reamed holes when repeatability in the attachment after detaching is required. However, when small tunings such as the perpendicularity is required, consider such things like to use one reamed hole.

[1] Using the Tapped Holes on the Bottom of the Base

This actuator has the tapped holes for mounting so it can be fixed from the bottom of the base. Also, there are reamed holes and oblong holes for positioning pins.

(Note) In the case of Strokes 50 and 100, oblong holes are not provided.



Apply the socket head cap screw indicated in the table below suitable for the platform material.

Model Name	Tapped Hole Size	Through Hole	Tightening Torque	Reamed Hole [mm]	Oblong Hole
WSA10C WSA10R	M5	φ5.5 Through, φ11 counterbore	3.42N•m (0.35kgf•m)	φ5H7 Depth 5	A:5 ^{+0.012} ₀ B:6 Depth 5mm or less
WSA12C WSA12R	M6	φ6.6 Through, φ12.5 counterbore	5.36N•m (0.55kgf•m)	φ6H7 Depth 6	A:6 ^{+0.012} ₀ B:7 Depth 6mm or less
WSA14C WSA14R	M8	φ9 Through, φ16.5 counterbore	11.48N•m (1.17kgf•m)	φ8H7 Depth 9	A:8 ^{+0.015} ₀ B:9 Depth 9mm or less
WSA16C WSA16R	M8	φ9 Through, φ16.5 counterbore	11.48N•m (1.17kgf•m)	φ8H7 Depth 9	A:8 ^{+0.015} ₀ B:9 Depth 9mm or less

Tightening Screws

- Use hexagonal socket head bolts for the male threads for installing the base.
- Use of high-tension bolts meeting at least ISO 10.9 is recommended.
- Make sure to have the effective length of screw engagement described below or more for the tightening of a bolt and a female screw.

When female screw is on steel → thread length same as nominal diameter

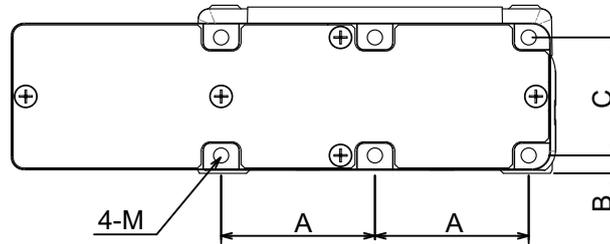
When female screw is on aluminum → thread length 1.8 times longer than nominal diameter



Caution: Be careful when selecting the bolt length. If bolts of inappropriate lengths are used, the actuator mounting strength may become insufficient, or contact with driving parts may occur, resulting in lower precision or unexpected accidents.

[2] When Using Attachment Holes on Bracket in Motor Reversing Type

There are tapped holes equipped on the reversing bracket. (Refer to the table below for detailed dimensions.)



	A	B	C
WSA10R	42.5	5	33
WSA12R	51.5	5.5	41
WSA14R	60	7	50
WSA16R	70.5	7	59

Model Name	Attachment Hole Diameter	Attachment Hole Depth	Tightening Torque
WSA10R	M5	10mm	3.42N•m (0.35 kgf•m)
WSA12R	M6	10mm	5.36m (0.55kgf•m)
WSA14R	M8	12mm	11.5N•m (1.17kgf•m)
WSA16R	M8	16mm	11.5N•m (1.17kgf•m)

Tightening Screws

- Use hexagonal socket head bolts for the male threads for installing.
- Use of high-tension bolts meeting at least ISO 10.9 is recommended.
- Make sure to have the effective length of thread engagement at least approximately 1.8 times of the nominal diameter of bolts and screws.



Caution: Be careful when selecting the bolt length. If bolts of inappropriate lengths are used, the damage of the attachment hole and actuator mounting strength may become insufficient, or contact with driving parts may occur, resulting in lower precision or unexpected accidents.

[Caution at Pressing]

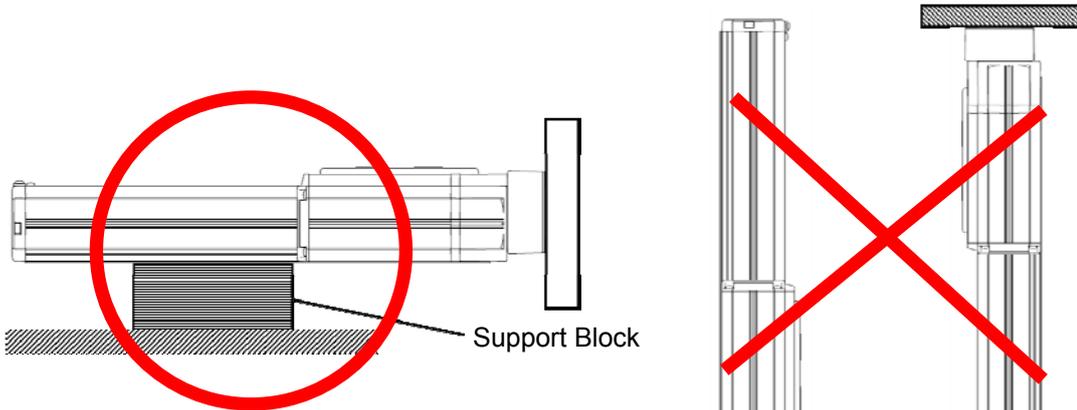
Pay attention to the following when installation is conducted with using the attachment holes on the reversing bracket.

Do not attempt to use only the attachment holes on the reversing bracket for installation.

Avoid external force to be applied on the main body.

Some operational conditions and conditions of installation environment could generate vibration, which may cause operational error or parts malfunction.

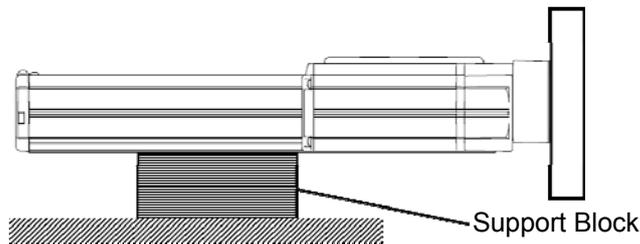
Refer below for the availability of orientations for installation.



○ : Possible × : Not possible

Installation Posture			Support
Horizontal	Vertical	Ceiling Mount	
×	×	×	No
○	×	×	Yes

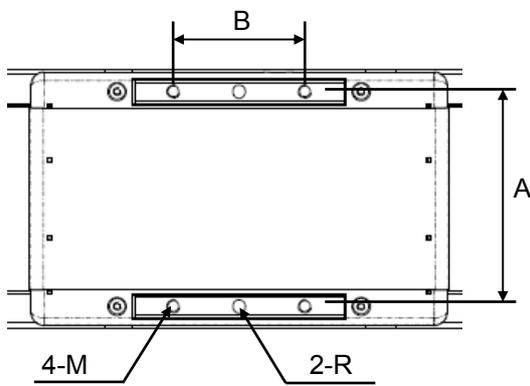
When using the product in horizontal or vertical orientation, have a support block to support the main body to avoid any external force to be applied on the body.



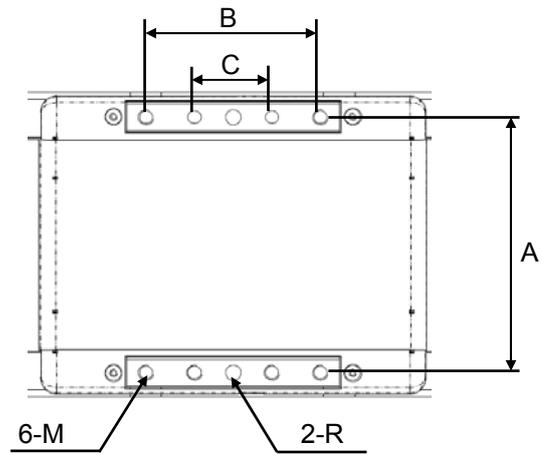
[3] Attachment of Transported Object

- There are tapped holes on the top surface of the slider. Affix the work part (transported object) here.
- The way to affix follows the installation of the main unit.
- There are two reamed holes on the top surface of the slider. Use these reamed holes if repeatability of attaching and detaching is required. Also, if small tuning such as perpendicularity is required, use one of the reamed holes for the tuning.
- Refer to the below table for the screwed depth and reamed depth. Screwing further than indicated in the table may destroy the tapped hole or lower the reinforcement of the attachment of the work part, result in the drop of the accuracy or an unexpected accident.

● WSA10C, WSA12C, WSA14C



● WSA16C



Reamer Pitch Tolerance ± 0.02

Model Name	A	B	C	Reamed Hole R	Tapped Hole M	Mounting Bolt	
						Bolt Nominal Diameter	Tightening Torque
WSA10C WSA10R	83	50	/	$\phi 5H7$ depth 5	M5 depth 14	M5	3.42N•m (0.35Kgf•m)
WSA12C WSA12R	101	50	/	$\phi 6H7$ depth 6	M6 depth 18	M6	5.36 N•m (0.55Kgf•m)
WSA14C WSA14R	117	70	/	$\phi 8H7$ depth 8	M8 depth 22	M8	11.5 N•m (1.17Kgf•m)
WSA16C WSA16R	134	90	40	$\phi 8H7$ depth 8	M8 depth 24.5	M8	11.5 N•m (1.17Kgf•m)

Tightening Screws

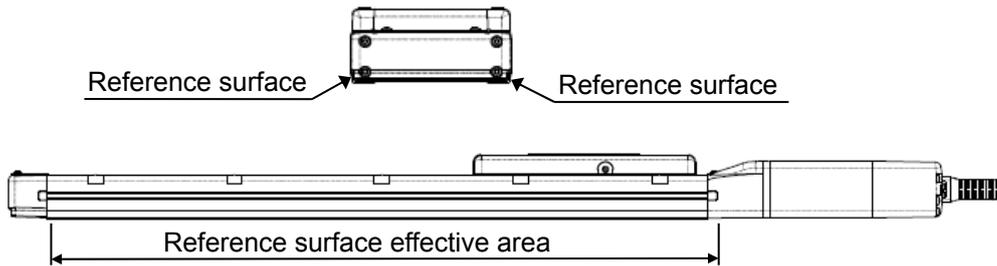
- Use hexagonal socket head bolts for the male threads for installing.
- Use of high-tension bolts meeting at least ISO 10.9 is recommended.
- Make sure to have the effective length of thread engagement at least approximately 1.8 times of the nominal diameter of bolts and screws.



Caution: Pay attention when choosing the bolt length. Use of screws with inappropriate length may cause damage on the attachment holes or not sufficient strength of attachment of a transferred work piece.

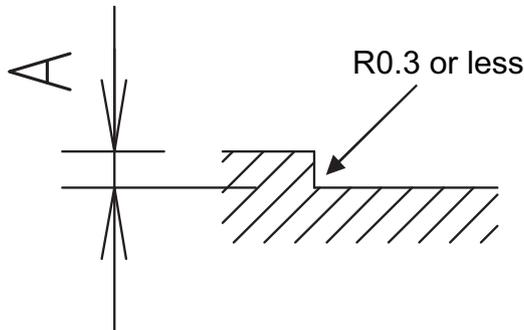
[4] Mounting Surface

- The platform to install the actuator should possess a structure that ensures enough stiffness, and should be free from vibration.
- The surface where the actuator will be mounted should be a machined surface or that with an accuracy equivalent to it, and the flatness should be 0.05mm/m or below.
- Ensure a room for maintenance work.
- The side and bottom surfaces of the base on the actuator work as the datum surfaces for the side of the rod.
- Use these surfaces as the reference surfaces for mounting.



As shown in the figure above, the base side surface is the datum surface for the slider drive. Have this surface as the datum for installation when accuracy is required.

Follow the diagram below when installing the device using the reference surface.



Model Name	A Dimensions [mm]
WSA10	3 to 5 or less
WSA12	
WSA14	
WSA16	

⚠ Caution: As there could be a case that the width dimension of the front bracket or rear bracket is wider than the datum surface dimension on the side, have them pushed towards the datum surface within the datum surface effective range. Having machining work to press the brackets towards the datum surface outside the datum surface effective range may cause interference to brackets and motors.

2.3.3 Vacuum in Cleanroom Type

The cleanroom type actuator shows the performance complied with Cleanroom Class 10 ($0.1 \mu\text{m}$, Fed. Std. 209D) and Class 2.5 (ISO 14644-1) or equivalent by pulling the air out of the vacuum joints. In the table below shows the vacuum volume at the rated velocity for each model as a reference.

- Perform air suction at two points of the vacuum joints allocated at the sides of the main body with the vacuum volume (in total of the two points) specified in the table below. Also, pay attention when lay out the piping so the vacuum volume at the two points can be about equal.
- Use the base attachment holes on the bottom of the body with all the holes being covered. If there is a through hole on the body, it will degrade the cleanliness.

[Reference for Vacuum Volume]

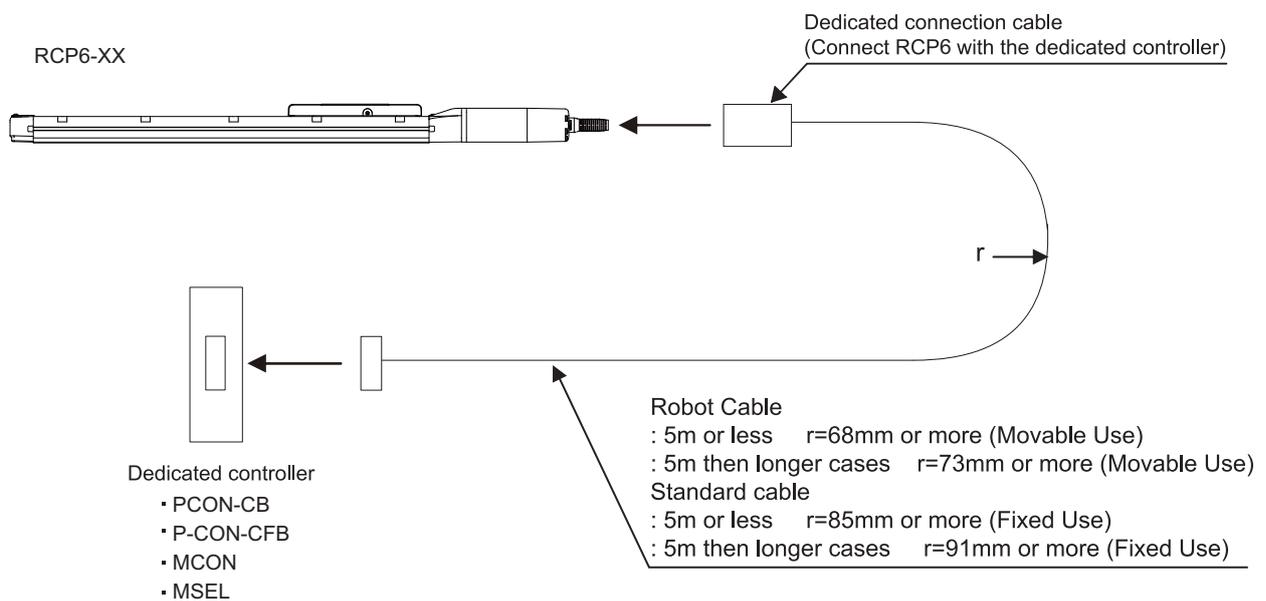
Model Code	Lead [mm]	Vacuum Volume NI/min (L/min)
RCP6 (S) CR-WSA10C	2.5	25 (27)
	5	30 (32)
	10	60 (65)
	16	105 (113)
RCP6 (S) CR-WSA12C	3	25 (27)
	6	40 (43)
	12	80 (86)
	20	130 (140)
RCP6 (S) CR-WSA14C	4	25 (27)
	8	45 (49)
	16	80 (86)
	24	105 (113)
RCP6 (S) CR-WSA16C	5	20 (22)
	10	30 (32)
	20	65 (70)

3. Connecting with the Controller

Use the IAI dedicated connection cable for the connection of the actuator to the controller.

- If the dedicated connection cable cannot be secured, reduce the load on the cable by allowing it to deflect only by the weight of the cable or wire it in a self-standing cable hose, etc., having a large radius.
- Do not cut and reconnect the dedicated connection cable for extension or shorten the cable.
- Do not pull on the dedicated connection cable or bend it forcibly.
- The actuator cable coming out of the motor unit is not meant to be bent. Fix the cable so it would not be bent repeatedly

Please consult with IAI if you require a different kind of cable than the one supplied.



Dedicated connection cable

WSA10, WSA12, WSA14

- Motor • encoder integrated cables: CB-CAN-MPA□□□
- Motor • encoder integrated cables robot type: CB-CAN-MPA□□□-RB

WSA16

- Motor • encoder integrated cables: CB-CFA3-MPA□□□
- Motor • encoder integrated cables robot type: CB-CFA3-MPA□□□-RB

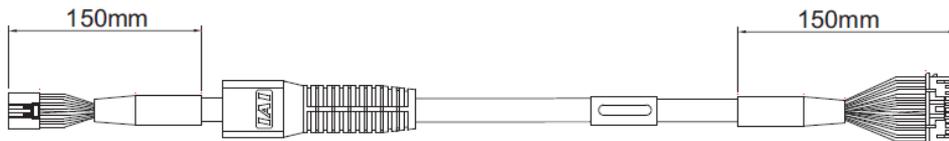
*) □□□ indicates the cable length. Up to 20m can be specified.

Example) 080 = 8m

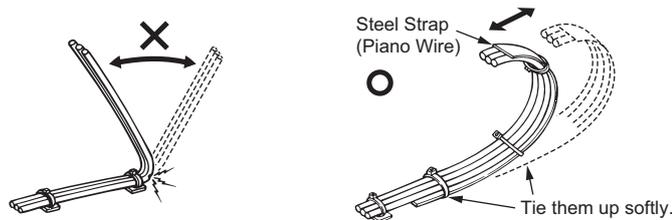


Warning: For wiring, please follow the warnings stated below. When constructing a system as the machinery equipment, pay attention to the wiring and connection of each cable so they are conducted properly. Not following them may cause not only a malfunction such as cable breakage or connection failure, or an operation error, but also electric shock or electric leakage, or may even cause a fire.

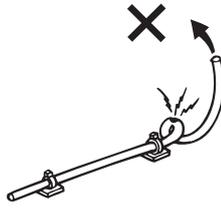
- Use dedicated cables of IAI indicated in this instruction manual. Contact us if you wish to have a change to the specifications of the dedicated cables.
- Make sure to turn the power off in the process of power line or cable connection or disconnection.
- Do not attempt to cut a dedicated cable with connectors on both ends to extend, shorten or re-joint it.
- Hold the dedicated cable to avoid mechanical force being applied to the terminals and connectors.
- Use a cable pipe or duct to have an appropriate protection when there is a possibility of mechanical damage on a dedicated cable.
- In case a dedicated cable is to be used at a moving part, make sure to lay out the cable without applying any force to pull the connector or extreme bend on the cable. Do not attempt to use the cable with a bending radius below the allowable value.
- Make certain that the connectors are plugged properly. Insufficient connection may cause an operation error, thus it is extremely risky.
- Do not lay out the cables to where the machine runs over them.
- Pay attention to the cable layout so it would not hit peripherals during an operation. In case it does, have an appropriate protection such as a cable track.
- When a cable is used hanging on the ceiling, prevent an environment that the cable swings with acceleration or wind velocity.
- Make sure there is not too much friction inside the cable storage equipment.
- Do not apply radiated heat to power line or cables.
- Do not bend the cable in the area from the connector tip inward to 150mm on both ends.
 Motor • Encoder Integrated Cables CB-CAN-MPA□□□, CB-CFA3-MPA□□□
 Motor • Encoder Integrated Cables Robot Type CB-CAN-MPA□□□-RB, CB-CFA3-MPA□□□-RB



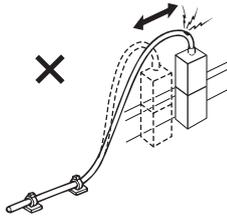
- Have a sufficient radius for bending, and avoid a bend concentrating on one point.



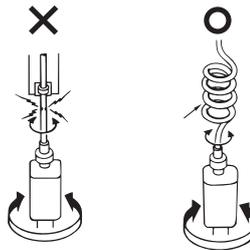
- Do not let the cable bend, kink or twist.



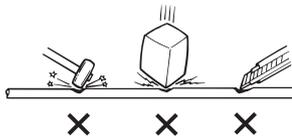
- Do not pull the cable with a strong force.



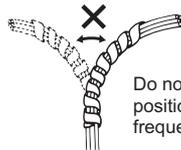
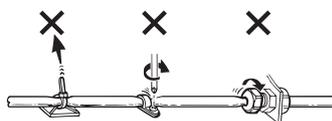
- Pay attention not to concentrate the twisting force to one point on a cable.



- Do not pinch, drop a heavy object onto or cut the cable.

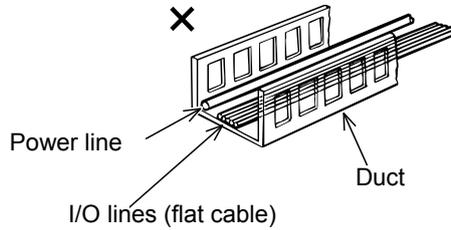


- When a cable is fastened to affix, make sure to have an appropriate force and do not tighten too much.



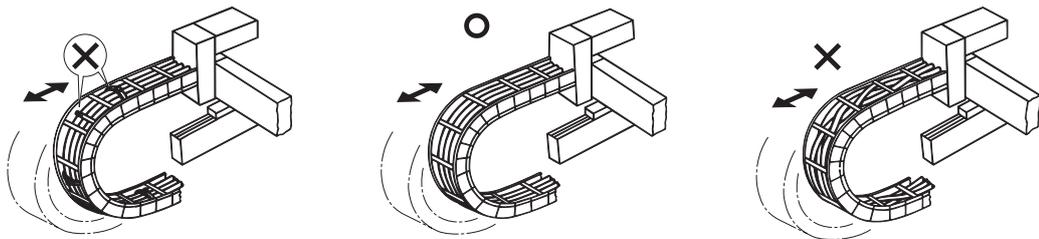
Do not use spiral tube in any position where cables are bent frequently.

- PIO line, communication line, power and driving lines are to be put separately from each other and do not tie them together. Arrange so that such lines are independently routed in the duct.



Follow the instructions below when using a cable track.

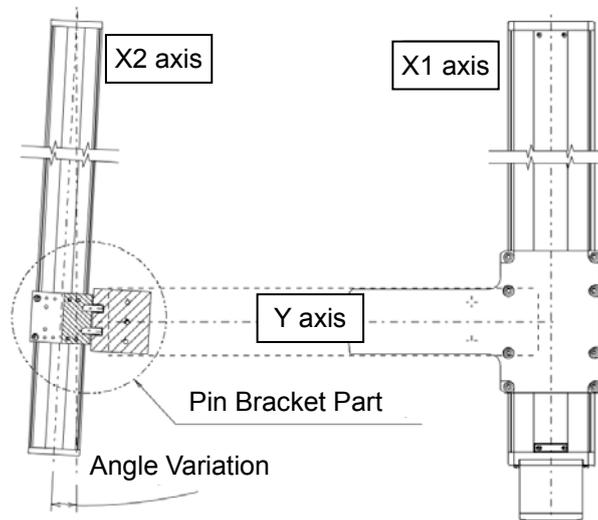
- If there is an indication to the cable for the space factor in a cable track, refer to the wiring instruction given by the supplier when storing the cable in the cable track.
- Avoid the cables to get twined or twisted in the cable track, and also to have the cables move freely and do not tie them up. (Avoid tension being applied when the cables are bent.) Do not pile up cables. It may cause faster abrasion of the sheaths or cable breakage.



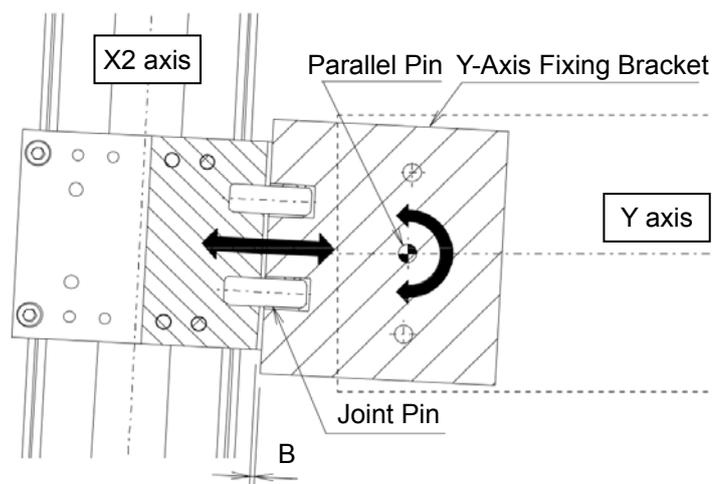
4. Caution for Operation

- (1) When performing pressing operation with the slider type, adjust the pressing current so the reaction force moment generated by the pressing force will not exceed 80% of the allowable dynamic moment.
- (2) When constructing gantry structure with using the external guide, be careful to the traveling parallelism between the external guide and the actuator. Also, for the joint to the external guide, use such item as a pin bracket which possesses degree of freedom so the assembly variation can be absorbed.
- (3) In case that excess vibration is applied to a transported object due to such reasons as the overhang of the transported object is long, have an external guide to reduce the vibration.

<<Top View for Gantry Assembly>>



<<Top View for Gantry Assembly>>



5. Maintenance and Inspection

5.1 Inspection Items and Schedule

Follow the maintenance inspection schedule below.

It is assumed that the equipment is operating 8 hours per day.

If the equipment is running continuously night and day or otherwise running at a high operating rate, inspect more often as needed.

Period of Time	External Visual Inspection	Internal Inspection	Greasing ^(Note 1)
Start of work inspection	○		
1 month inspection	○		
3 month inspection			○
3 months after starting operation			Depends on grease supply timing (reference)
6 months inspection	○	○ ^(Note 2)	
Every 6 months thereafter	○	○ ^(Note 2)	

Note 1 Grease film may run out if the actuator is moved back and forth continuously over a distance of 30mm or less. As a guide, perform a back-and-forth operation five times or so over a distance of 50mm or more after a back-and-forth operation over such short distance has been repeated 5,000 to 10,000 times. This will restore oil film.

Note 2 Check the condition of grease, and wipe off the grease before supplying new in case it is extremely dirty.

[Grease Supply Timing (Reference)]

Perform grease supply when it has reached to either the operation distance or spent months described in the table below.

Maximum Speed of Use [mm/s]	Grease Supply Timing (Reference)	
	Operated distance	Months
0 to 750 or less	1,250km	12 month
750 to 840	2,500km	



Caution:

- An actuator after 6 months of storage may have caused a degradation of the grease. Supply grease before start using. [Refer to 5.6 "Grease Supply"]
- Degradation speed of grease may differ depending on the environment of use (temperature, humidity and ambient conditions). It is recommended to shorten the grease supply period if the actuator is used under a bad condition such as in high temperature, high humidity or in dusty ambience. Also, it is recommended to improve the environment conditions in case the grease changes its color due to the bad condition of use.

5.2 External Visual Inspection

An external visual inspection should check the following things.

Main unit	Loose actuator mounting bolts, other loose items
Cables	Scratches, proper connections
Stainless steel sheet	Scratches, Deviation • Slack
Overall	Irregular noise, vibration

- If the stainless steel sheet is deviation and slacked, make adjustment as deemed necessary to remove the deviation and slacks.
- As a rule of thumb, the stainless steel sheet should last for about 5,000km of slider motion. However, under certain conditions, the stainless steel sheet may need to be replaced earlier. Generally, replacing the stainless steel sheet will require that you bring the unit to our plant or have one of our technicians come to your plant to perform the replacement.
- If the actuator is installed vertically, certain conditions may cause grease to drip from the guide. Please ensure that proper cleaning is performed and grease is replenished.

5.3 Cleaning

- Clean exterior surfaces as necessary.
- Use a soft cloth to wipe away dirt and buildup.
- Do not blow too hard with compressed air as it may cause dust to get in through the gaps.
- Do not use oil-based solvents as they can harm lacquered and painted surfaces.
- To remove severe buildup, wipe gently with a soft cloth soaked in a neutral detergent or alcohol.

5.4 Internal Inspections

Turn OFF the power, remove the side cover and have a visual inspection. When inspecting the interior, check the following items.

Main unit	Loose mounting bolts, other loose items
Guide section	Lubrication, buildup

Visually inspect the interior of the equipment. Check whether dust or other foreign matter has gotten inside and check the lubrication state.

The lubrication may have turned brown. This is not a problem as long as the travel surfaces shine as though they are wet.

If the grease is mixed with dust and does not have a shiny appearance, or if the grease has lost its efficacy due to prolonged use, then clean each section and reapply grease.

The procedure for internal inspections is outlined below.

- 1) Move the slider to the motor side.
- 2) Remove the screws on the sheet retainer with using a hex wrench.
- 3) Pick up the sheet to have an inspection and clean it up if necessary.
- 4) After finishing the inspection, build it up in the back order.



Caution: When checking inside the equipment, be careful not to forcibly bend the stainless steel sheet or scratch it. Do not tug on the stainless steel sheet or in any way attempt to reposition it. Change in the attached condition may cause the sheet to be mounted unevenly or impact the product life. In such cases, please contact IAI Sales Engineer Department. Keep in mind that the edges of the stainless steel sheet can cause injuries. Always wear gloves when working on it.

5.5 Internal Cleaning

- Use a soft cloth to wipe away dirt and buildup.
- Do not blow too hard with compressed air as it may cause dust to get in through the gaps.
- Do not use oil-based solvents, neutral detergent or alcohol.

5.6 Grease Supply

5.6.1 Grease Used for Standard Type

[1] Standard Type

IAI uses the following grease in our plant.

Guide and Ball Screw	Kyodo Yushi	Martemp PS No. 2
----------------------	-------------	------------------



Warning: Never use any fluorine-based grease. Mixing with lithium-based grease with other grease not only reduces the performance of the grease, it may even cause damage to the actuator.

[2] Cleanroom Type

Urea based grease, which has great low-particle-emission performance, stable torque characteristics, excellent lubrication, and also anti-rust performance equivalent to lithium grease, is to be applied to the cleanroom type. IAI uses the following grease in our plant.

Guide and Ball Screw	KURODA Precision Industries Ltd.	C grease
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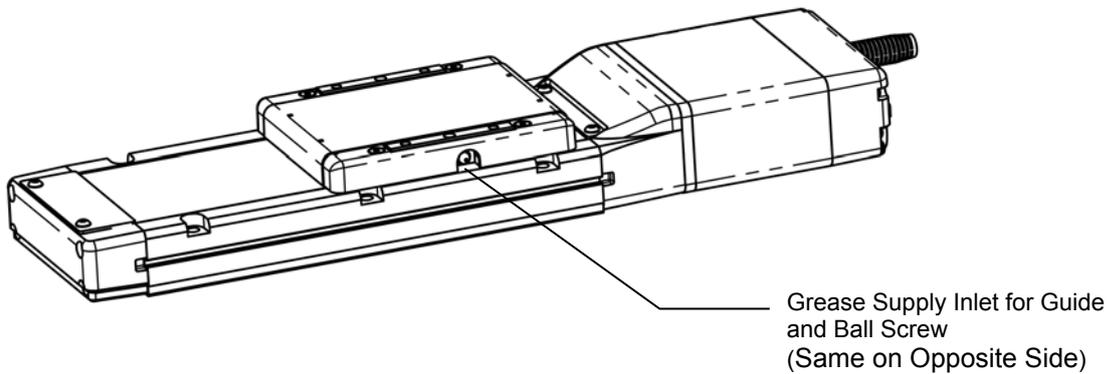
Warning:

- For the grease to be applied to the cleanroom type actuator, select the low particle-emission grease for cleanroom. Using the standard grease may cause particle emission.
- Never use any fluorine or lithium based grease. If it gets mixed with urea based grease, it could cause loss of lubricant performance or drop of cleanroom performance.

5.6.2 How to Apply Grease

- (1) Grease Supply to Guide and Ball Screw from Grease Nipple
 There are grease nipples equipped on the sides of the slider. Conduct grease supply to the guides and the ball screw on them.
 Supply grease on the right side of the motor to the guide on the right side and ball screw.
 Supply grease on the left side of the motor to the guide on the left side and ball screw.
 (Grease supply to the ball screw can be conducted on both right and left grease nipples.)

- 1) Supply grease on the right and left grease nipples with using a grease gun.
 Supply grease on one side and it can be supplied to the ball screw.
 For the guides, supply grease on one side will grease up only on one side. It is necessary to supply grease on both right and left sides.



(Note) Prepare a grease gun suitable for the diameter of the grease nipples stated below.

Model	Grease Nipple Diameter [mm]
WSA10C, WSA10R	φ3.5
WSA12C, WSA12R, WSA14C, WSA14R, WSA16C, WSA16R	φ6.0

5.7 Procedure for Stainless Steel Sheet Replacement and Adjustment

In this section, explains how to replace and adjust the stainless steel sheet.

Those parts such as screws taken off for replacement work are necessary when assembling the product back. It is recommended to prepare a storage box in advance to starting the work, so the taken off parts can be kept in it.

5.7.1 Preparation

(1) Items required for replacing the stainless steel sheet

- Replacement stainless steel sheet
- Hex wrench 2mm (WSA10C/10R), 2.5mm(WSA12C/12R, WSA14C/14R and WSA16C/16R)
- Measure

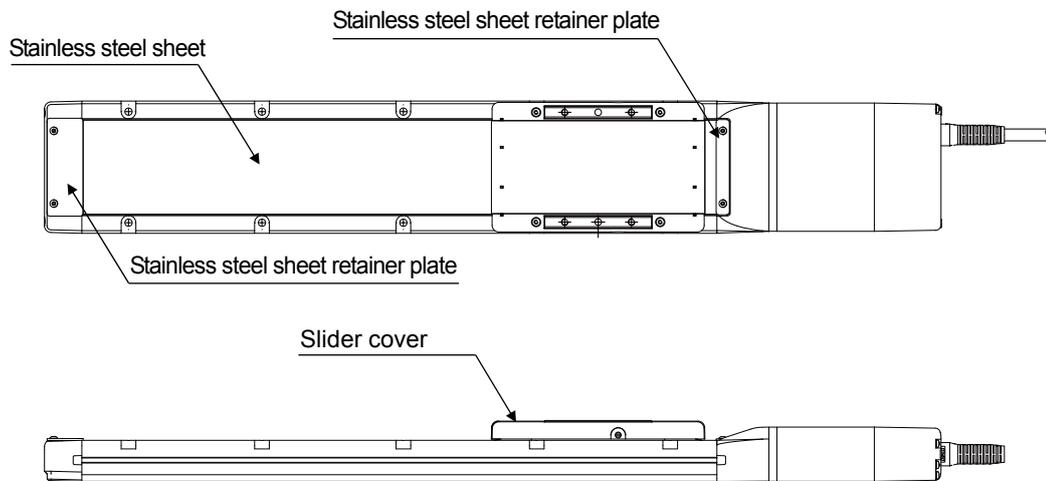
(2) Caution for the stainless steel sheet tension

Degradation and wear-out of the stainless steel sheet relies on its tension of attachment.

If the stainless steel sheet is pulled with a huge force and the gap between the sheet and the slider cover is large, there is a risk of metal fatigue.

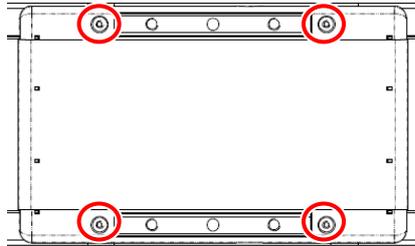
On the other hand, if the tensile strength is too low, the stainless steel sheet would interfere with the back side of the slider cover and make dust to be generated.

(3) Names of the Parts

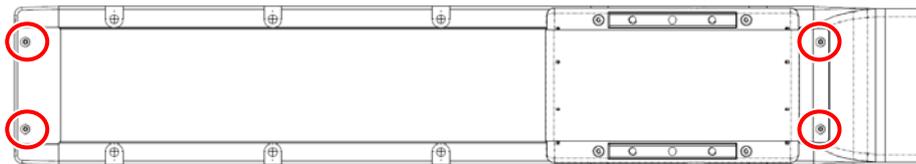


5.7.2 Procedure for Replacement and Tuning

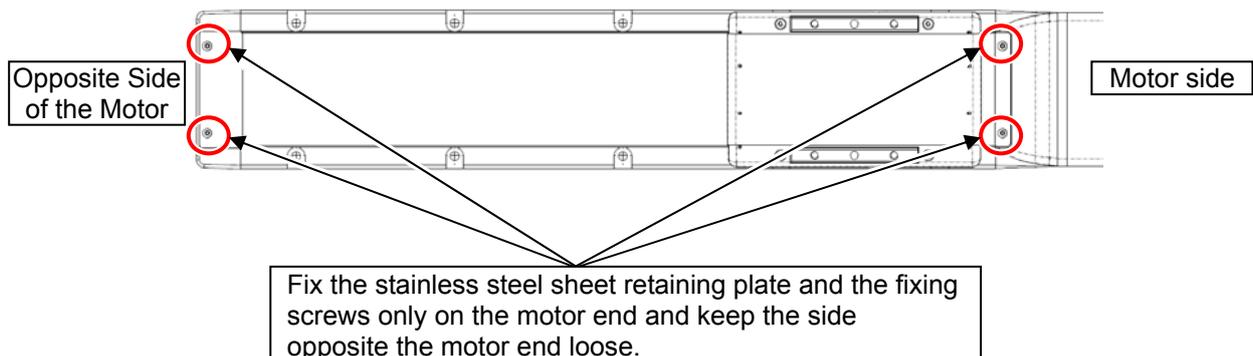
- (1) Move the slider to the middle of the actuator.
- (2) Remove the hex socket button head bolts on the slider cover with using a 2mm-sized (for WSA10C/10R) or 2.5mm-sized (for WSA12C/12R, WSA14C/14R and WSA16C/16R) hex wrench.



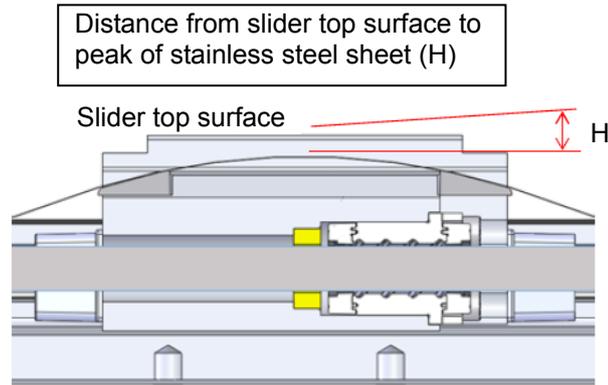
- (3) Remove the two hex socket button head bolts on each of left and right sides with using a 2mm-sized (for WSA10C/10R) or 2.5mm-sized (for WSA12C/12R, WSA14C/14R and WSA16C/16R) hex wrench, and detach the retainer plate and the old stainless steel sheet.



- (4) Affix a new stainless steel sheet and the retainer plate with hex socket button head bolts. At this time, fix only on the motor end and keep the side opposite the motor end loose.



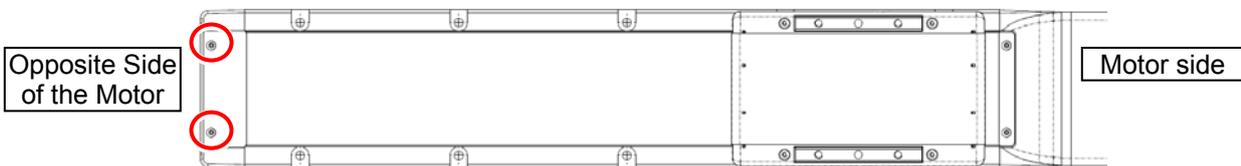
- (5) Adjust the tension of the stainless steel sheet.
- 1) Adjust the tension of the stainless steel sheet by pulling the stainless steel sheet back and forth.
 - 2) Adjust the tension of the stainless steel sheet to have the distance between the peak of the sheet and the top surface of the slider as shown in the table below, and temporarily tighten the screws on the side opposite the motor end which were still loose so the stainless steel sheet would not move.



Distance between Peak of Stainless Steel Sheet and Slider Top Surface

	Type	H [mm]
Standard type	WSA10C, WSA10R	3.7±0.3
	WSA12C, WSA12R	4.4±0.3
	WSA14C, WSA14R	4.1±0.3
	WSA16C, WSA16R	3.9±0.3

- (6) Confirm that there is no contact of the stainless steel sheet to the slider by moving the slider several times in the whole stroke range while also checking the tension of the sheet. In case the slider cannot be moved by hand for such as low lead type or brake-equipped type, turn on the power to the controller and move the slider at approximately 20mm/s of speed with using a teaching pendant or PC software.
- (7) Once it is confirmed that gap is secured and no contact to the slider, tighten the two screws on the side that they were loosened in turns, and give finish-tightening with even torque at last to affix the stainless steel sheet. Unevenness in screw tightening could make the sheet winded or popped up.



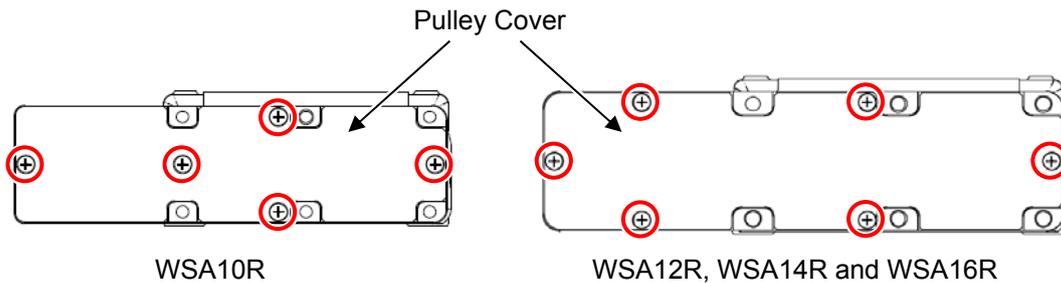
Model	Tightening Torque
WSA10C, WSA10R	73.7N•cm
WSA12C, WSA12R WSA14C, WSA14R WSA16C, WSA16R	191N•cm

5.8 Procedure for Belt Replacement and Tuning

Application: WSA10R, WSA12R, WSA14R and WSA16R

5.8.1 Inspection of the Belt

For inspection work, detach the pulley cover with phillips screwdriver and carry it out by visual. Remove the five pieces of cross recessed flat-head screws for WSA10R or six pieces for WSA12R, WSA14R and WSA16R (in areas marked with circles).



The period of replacement for the belt cannot be clearly defined as the durability of it is impacted so much by the operational conditions.

In generally speaking, it possesses bending life of several million times.

The timing belt gets worn away as the time passes, and it is necessary to have replacement at regular intervals with the following conditions as reference.

- When the gear and belt area show obvious friction.
- When swelling occurs as a result of oil adhesion.
- When damages such as a crack occurs on the belt gear and back side.

Also, for the toothed belt, it is recommended to set the interval of regular replacement cycle when in use under high wire fatigue condition in high acceleration and deceleration because it is difficult to judge the right timing for replacement by checking appearance or looseness of the wires strengthening the belt.

5.8.2 Belt to Use

IAI uses the following belt in our plant

Model	IAI Maintenance Parts Model	Supplier Parts	
WSA10R	TB-RCP6-WSRA10R	60S2M208GB	Rubber Super Torque G Bare-back type (Mitsuboshi belting Ltd.)
WSA12R	TB-RCP6-WSRA12R	60S2M250GB	Rubber Super Torque G Bare-back type (Mitsuboshi belting Ltd.)
WSA14R	TB-RCP6-WSRA14R	100S3M303GB	Rubber Super Torque G Bare-back type (Mitsuboshi belting Ltd.)
WSA16R	TB-RCP6-WSRA16R	365-EV5GT-15	Rubber EV belt (Gates Unitta Asia)

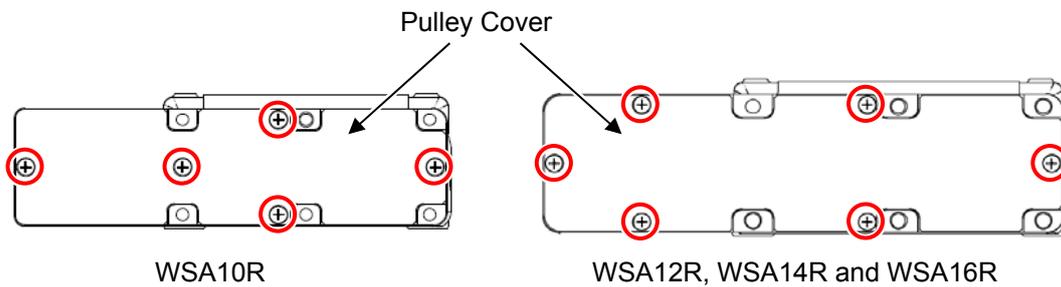
5.8.3 Replacement of the Belt

[Items Required for Replacemet Work]

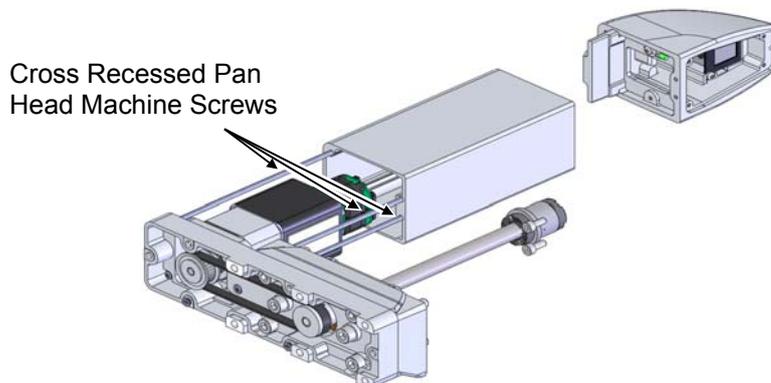
- Belt for Replacement
- Hex Wrench: 2.5mm (WSA10R), 3mm (WSA12R/WSA14R)
4mm (WSA16R) and 2mm (for hex socket flat head cap screw)
- Phillips Screwdriver
- Spring Scale (that is available for pulling with 30kgf)
- Long Tie-band (thin string)

[Procedure]

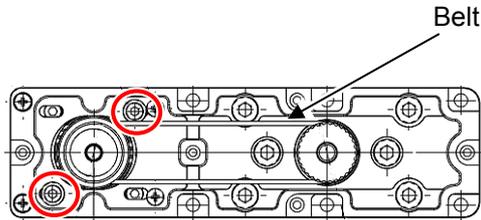
- 1) Remove the five pieces of cross recessed flat-head screws for WSA10R or six pieces for WSA12R, WSA14R and WSA16R (in areas marked with circles). Detach the pulley cover.



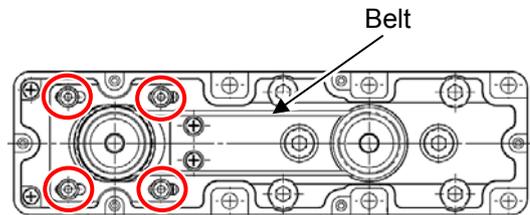
- 2) Remove the four sets of cross recessed pan head machine screws and conical spring washers holding the motor cover with using a Phillips screwdriver, and detach the motor cover.



- 3) Loosen the screws holding the motor (in marked with circles, two pieces for WSA10R and WSA12R and four pieces for WSA14R and WSA16R) with using a 2.5mm-sized (for WSA10R), 3mm-sized (for WSA12R/WSA14R) or 4mm-sized (for WSA16R) hex wrench. Replace the belt.

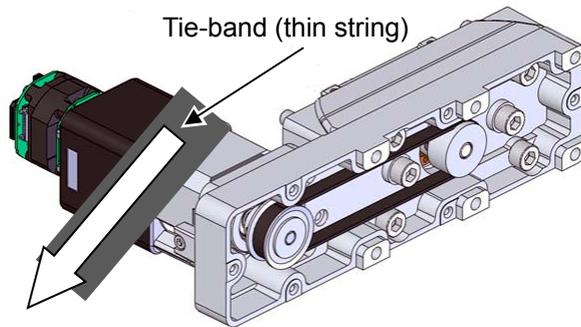


WSA10R and WSA12R

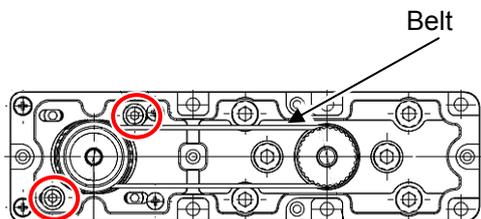


WSA14R and WSA16R

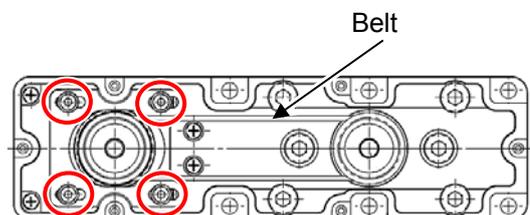
- 4) Adjust the belt tension. Hang a tie-band (thin string) on the end of the motor unit and pull it in specified load (specified tensile strength) with a spring scale. Once the load reached the specified, tighten the bolts with a 2.5mm-sized (for WSA10R), 3mm-sized (for WSA12R/WSA14R) or 4mm-sized (for WSA16R) hex wrench to affix.



Model	Tension Force
WSA10R	2 to 2.6kgf
WSA12R	2 to 2.6kgf
WSA14R	7 to 9.4kgf
WSA16R	11 to 13kgf



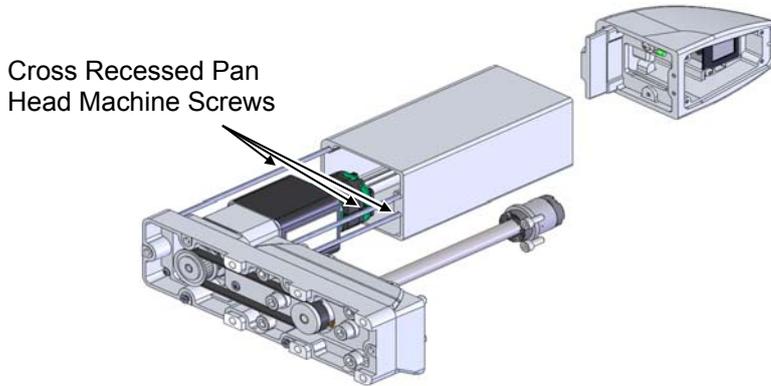
WSA10R and WSA12R



WSA14R and WSA16R

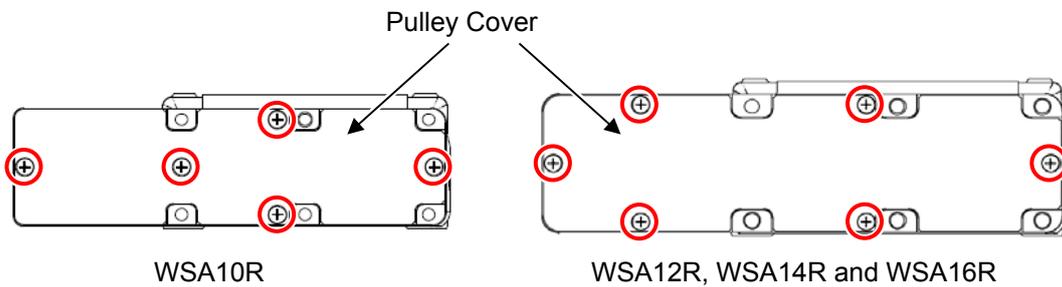
Model	Tightening Torque
WSA10R	162N•cm
WSA12R	323N•cm
WSA14R	323N•cm
WSA16R	631N•cm

- 5) Attach the motor cover with the four sets of cross recessed pan head machine screws and conical spring washers, and tighten them up with using a Phillips screwdriver.



Model	Tightening Torque
WSA10R, WSA12R	51.7N•cm
WSA14R, WSA16R	120.0N•cm

- 6) Attach the pulley cover with the five pieces of cross recessed flat-head screws for WSA10R or six pieces for WSA12R, WSA14R and WSA16R (in areas marked with circles), and tighten them up with using a Phillips screwdriver.



Tightening Torque
51.7N•cm

5.9 Motor Replacement Process



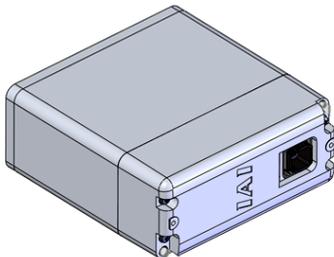
Caution : The encoder area in the motor for replacement and the control PC boards in RCP6S may get damaged by static electricity. Follow the caution notes below when having a work.

- Do not attempt to touch the encoder area in the motor for replacement directly with hand.
- Do not attempt to touch the control PC boards in RCP6S directly with hand except for replacement work.
- Touch a metal before starting the work in order to release static electricity from the body.
- Do not attempt to conduct the replacement work in a circumstance that is easy to generate static electricity (such as on a carpet).

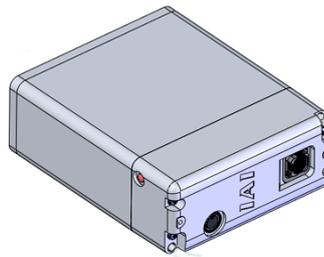
5.9.1 WSA10C, WSA12C, WSA14C and WSA16C

[Items required for replacing the motor]

- Motor Unit for Replacement



RCP6

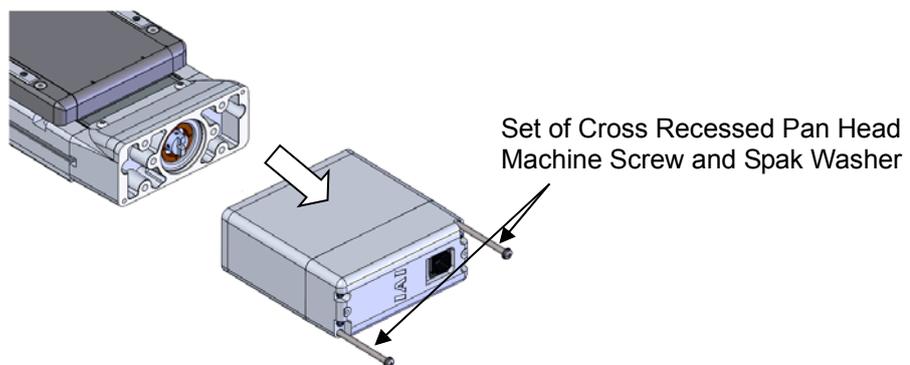


RCP6S

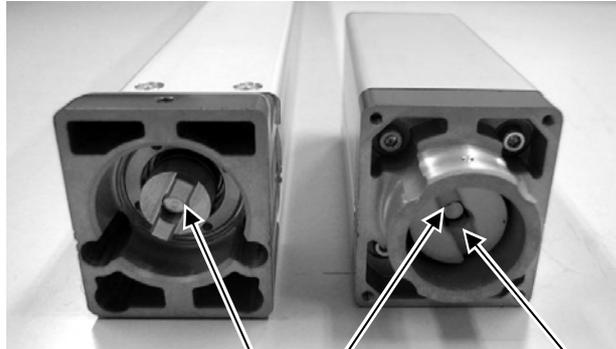
- Phillips screwdriver

[Procedure]

- 1) Remove the cross recessed pan head machine screws and spak washers (two sets for WSA10C and WSA12C and four sets for WSA14C and WSA16C) holding the actuator and the motor unit with using a Phillips screwdriver.
- 2) Detach the motor unit.



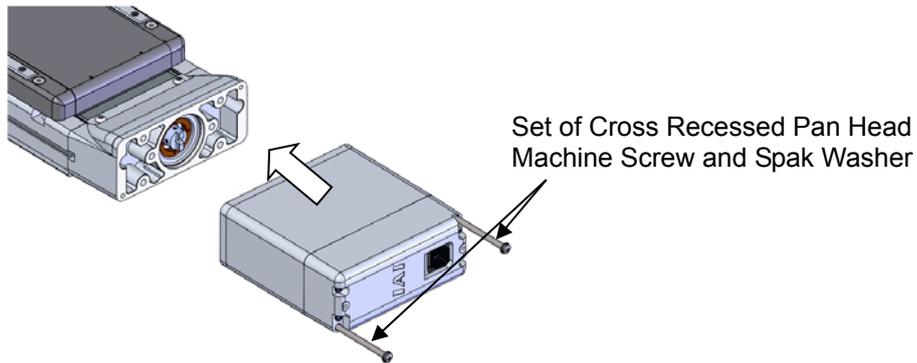
- 3) Make the profiles on the actuator side and motor unit side aligned so the projection matches to the slit.



Make the projection and slit matched with each other.

Apply grease to the coupling part.
NOXLUB TL1010 grease made by NOK

- 4) Attach the motor unit for replacement with the projection being matched with the slit.
- 5) Tighten the cross recessed pan head machine screws and spak washers (two sets for WSA10C and WSA12C and four sets for WSA14C and WSA16C) holding the actuator and the motor unit with using a Phillips screwdriver.



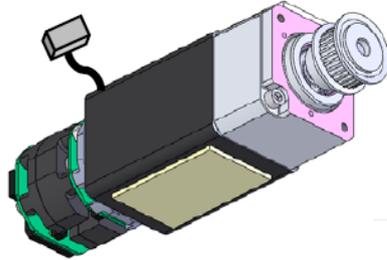
Model	Tightening Torque
WSA10C	41.4N•cm
WSA12C, WSA14C, WSA16C	96.4N•cm

- 6) Do not fail to conduct home-return operation on the PC or touch panel teaching after replacing the motor.

5.9.2 WSA10R, WSA12R, WSA14R and WSA16R

[Items required for replacing the motor]

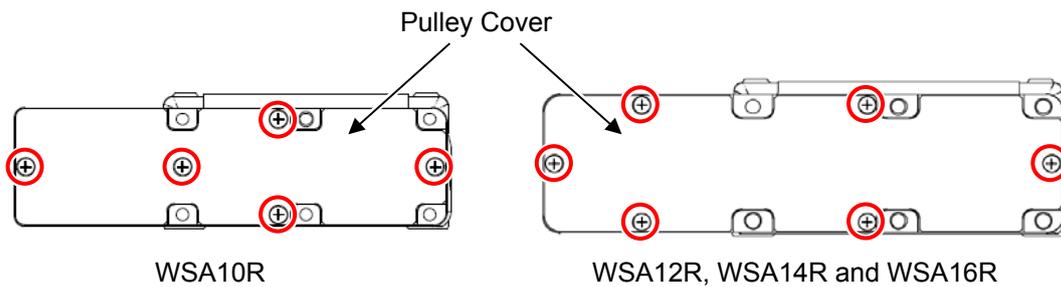
- Motor Unit for Replacement



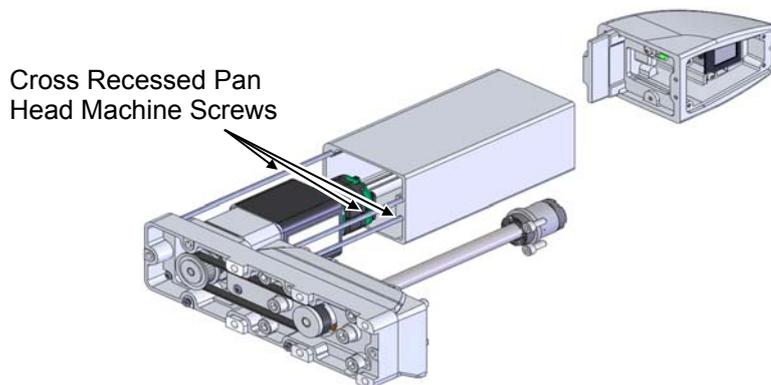
- Hex Wrench: 2.5mm (WSA10R), 3mm (WSA12R/WSA14R)
4mm (WSA16R) and 2mm (for hex socket flat head cap screw)
- Phillips Screwdriver
- Spring Scale (that is available for pulling with 30kgf)
- Long Tie-band (thin string)

[Procedure]

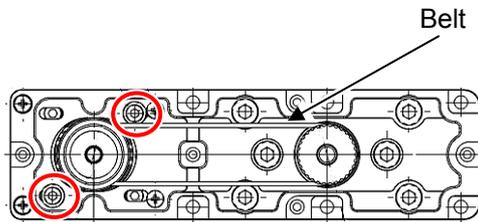
- 1) Remove the five pieces of cross recessed flat-head screws for WSA10R or six pieces for WSA12R, WSA14R and WSA16R (in areas marked with circles). Detach the pulley cover.



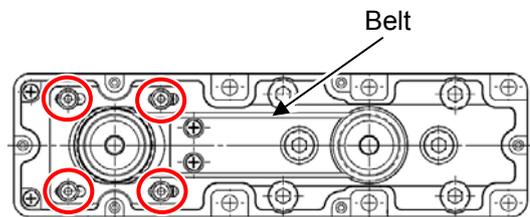
- 2) Remove the four sets of cross recessed pan head machine screws and conical spring washers holding the motor cover with using a Phillips screwdriver, and detach the motor cover.



- 3) Loosen the screws holding the motor (in marked with circles, two pieces for WSA10R and WSA12R and four pieces for WSA14R and WSA16R) with using a 2.5mm-sized (for WSA10R), 3mm-sized (for WSA12R/WSA14R) or 4mm-sized (for WSA16R) hex wrench. Replace the belt if it is necessary to replace.

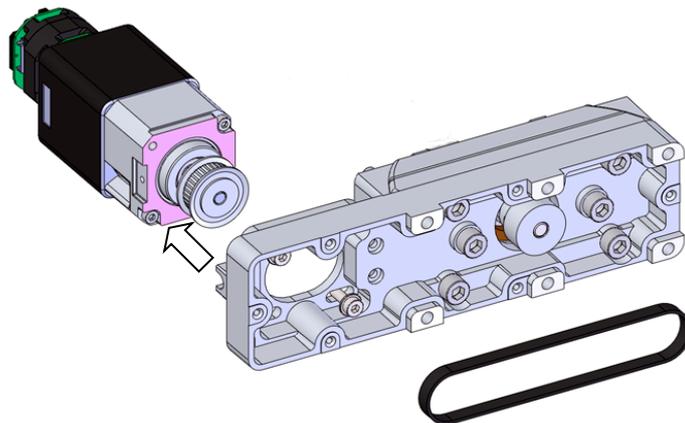


WSA10R and WSA12R

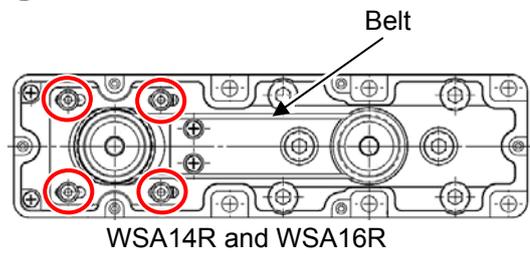
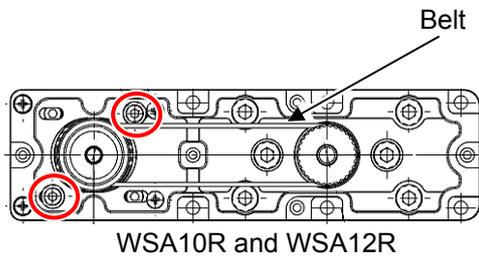
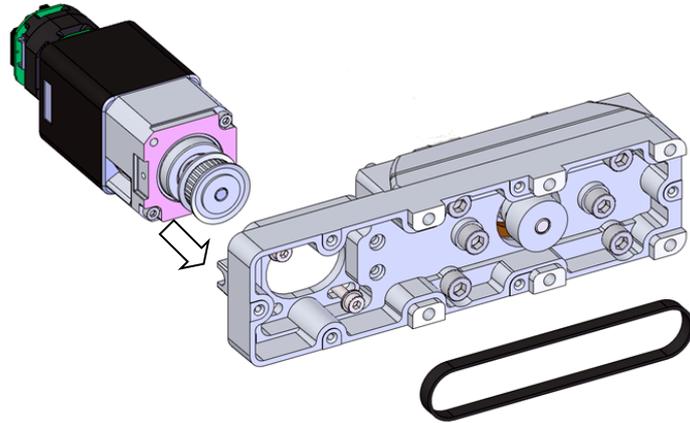


WSA14R and WSA16R

- 4) Take out the belt off the pulleys.
- 5) Take out the two bolts for WSA10R and WSA12R and four bolts for WSA14R and WSA16R, and pull out the motor unit.



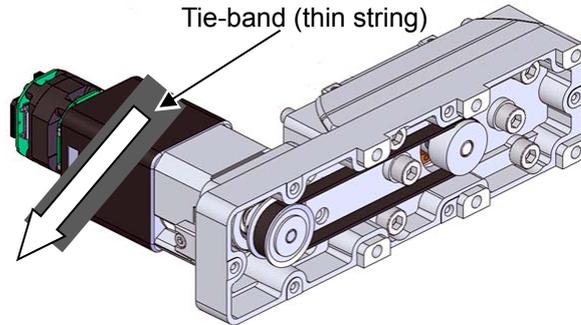
- 6) Attach a new motor and tighten the tension adjustment screw (in area marked with a circle) temporarily.
Hang over the timing belt.



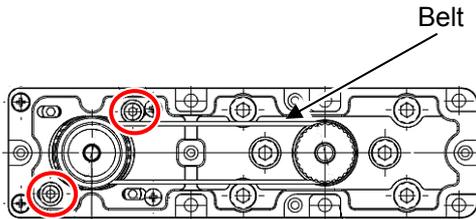
7) Adjust the belt tension.

Hang a tie-band (or thin string) at the edge of the motor unit and pull it to the specified load (specified amount of the belt tension) with a spring scale.

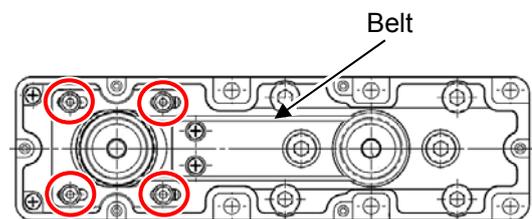
Once the tension reaches the specified load, tighten the bolts with using a 2.5mm-sized (for WSA10R), 3mm-sized (for WSA12R/WSA14R) or 4mm-sized (for WSA16R) hex wrench to fix.



Model	Tension Force
WSA10R	2 to 2.6kgf
WSA12R	2 to 2.6kgf
WSA14R	7 to 9.4kgf
WSA16R	11 to 13kgf



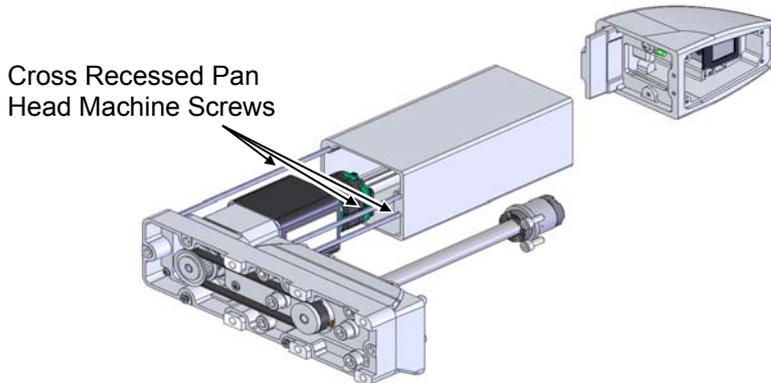
WSA10R and WSA12R



WSA14R and WSA16R

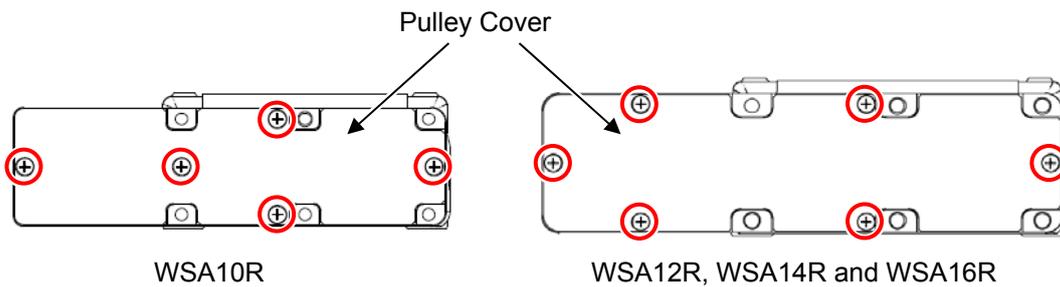
Model	Tightening Torque
WSA10R	162N•cm
WSA12R	323N•cm
WSA14R	323N•cm
WSA16R	631N•cm

- 8) Attach the motor cover with the four sets of cross recessed pan head machine screws and conical spring washers, and tighten them up with using a Phillips screwdriver.



Model	Tightening Torque
WSA10R, WSA12R	51.7N•cm
WSA14R, WSA16R	120.0N•cm

- 9) Attach the pulley cover with the five pieces of cross recessed flat-head screws for WSA10R or six pieces for WSA12R, WSA14R and WSA16R (in areas marked with circles), and tighten them up with using a Phillips screwdriver.

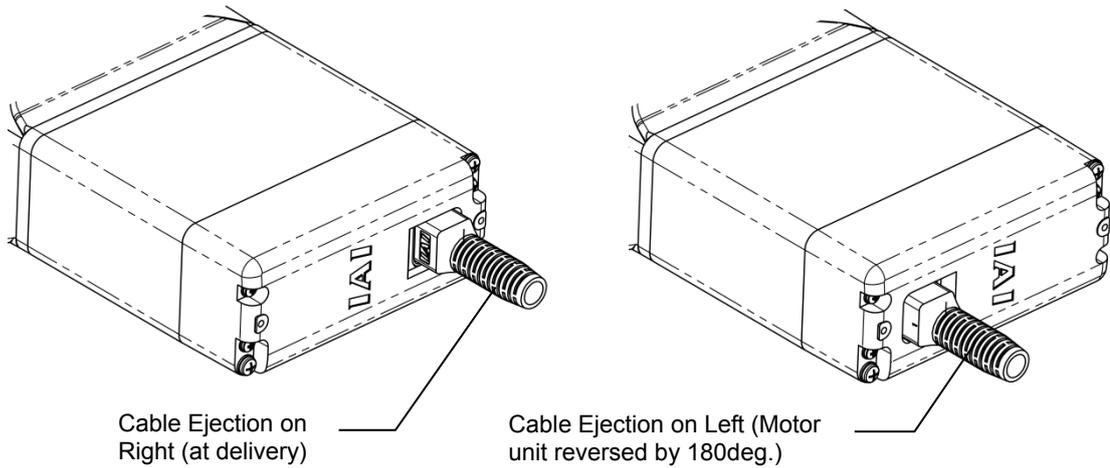


Tightening Torque
51.7N•cm

- 10) Do not fail to conduct home-return operation on the PC or touch panel teaching after replacing the motor.

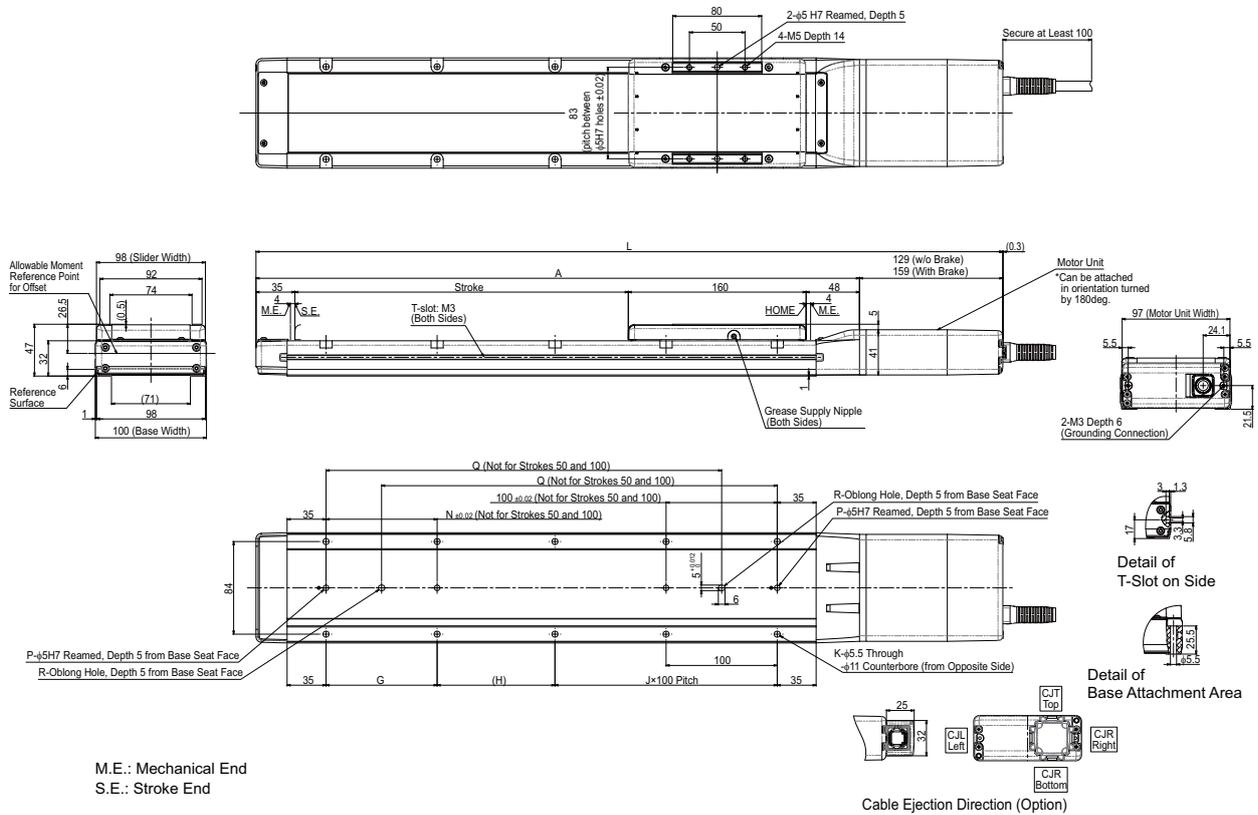
6. Cable Ejecting Position Change

For the motor straight type WSA10C, WSA12C, WSA14C and WSA16C, the cable ejection position at the delivery is on the right hand side when you put the unit horizontally and view it from the motor side. By turning the motor unit by 180deg to install, the cable ejection position can be reversed from right to left. To detach and attach the motor unit, refer to “5.9 Motor Replacement Process”



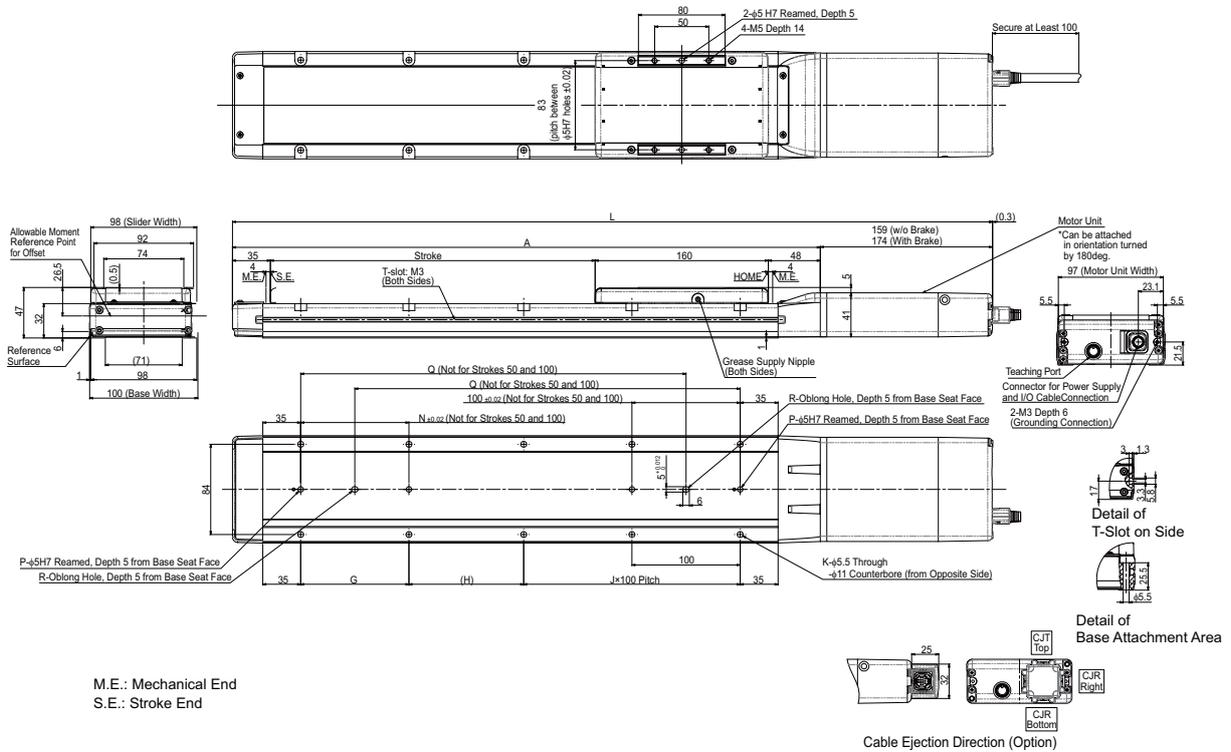
7. External Dimensions

7.1 Standard Specification RCP6-WSA10C



(Note) L dimensions described in the table are those with no cable ejection direction (option).
For cable ejection direction types (option), the dimensions are longer in 25mm.

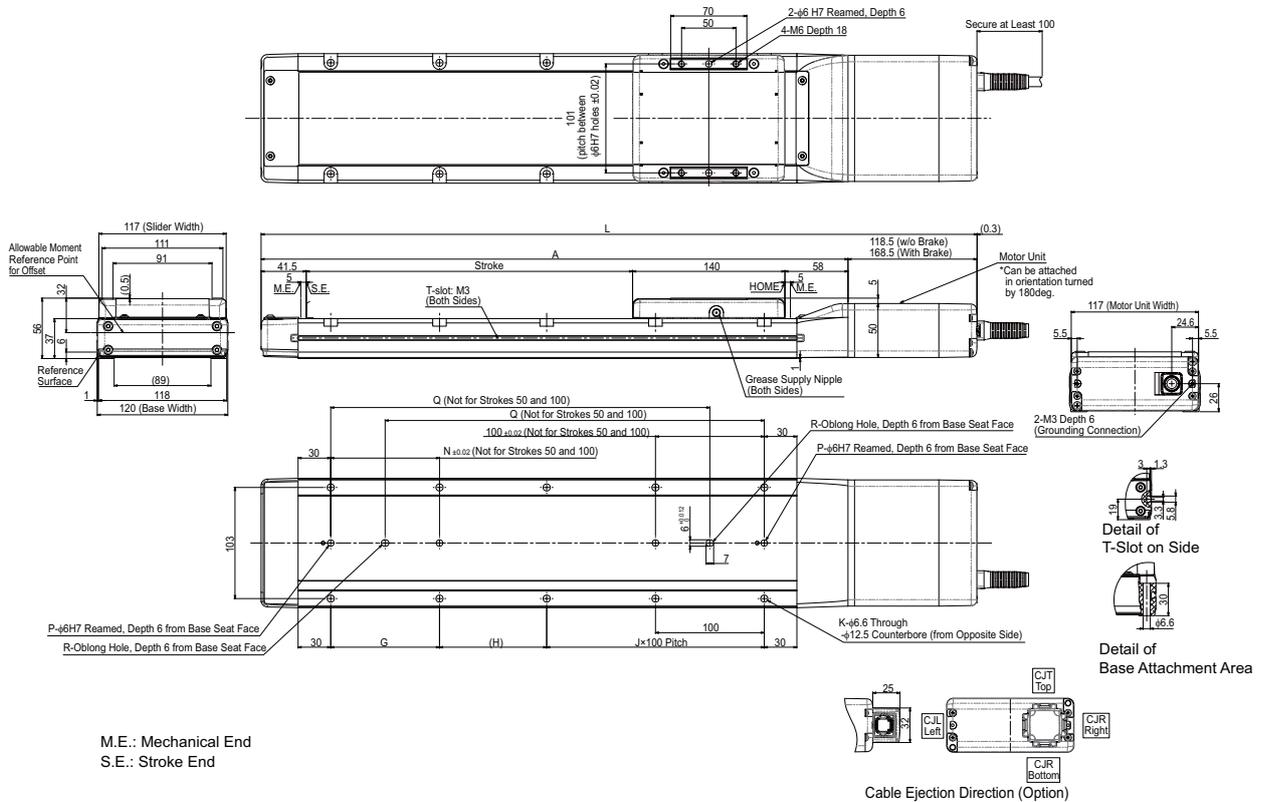
7.2 Built-in Controller Specification RCP6S-WSA10C



Stroke	L		A	G	H	J	K	N	P	Q	R	Mass [kg]	
	w/o Brake	With Brake										w/o Brake	With Brake
50	452	467	293	-	156	0	4	-	1	-	0	3.0	3.1
100	502	517	343	-	206	0	4	-	1	-	0	3.2	3.4
150	552	567	393	100	56	1	8	100	2	206	1	3.5	3.6
200	602	617	443	100	106	1	8	100	2	256	1	3.7	3.9
250	652	667	493	100	56	2	10	100	2	306	1	3.9	4.1
300	702	717	543	100	106	2	10	100	2	356	1	4.2	4.3
350	752	767	593	100	56	3	12	100	2	406	1	4.4	4.6
400	803	817	643	100	106	3	12	100	2	456	1	4.7	4.8
450	852	867	693	100	56	4	14	100	2	506	1	4.9	5.1
500	902	917	743	100	106	4	14	100	2	556	1	5.1	5.3

(Note) L dimensions described in the table are those with no cable ejection direction (option).
For cable ejection direction types (option), the dimensions are longer in 25mm.

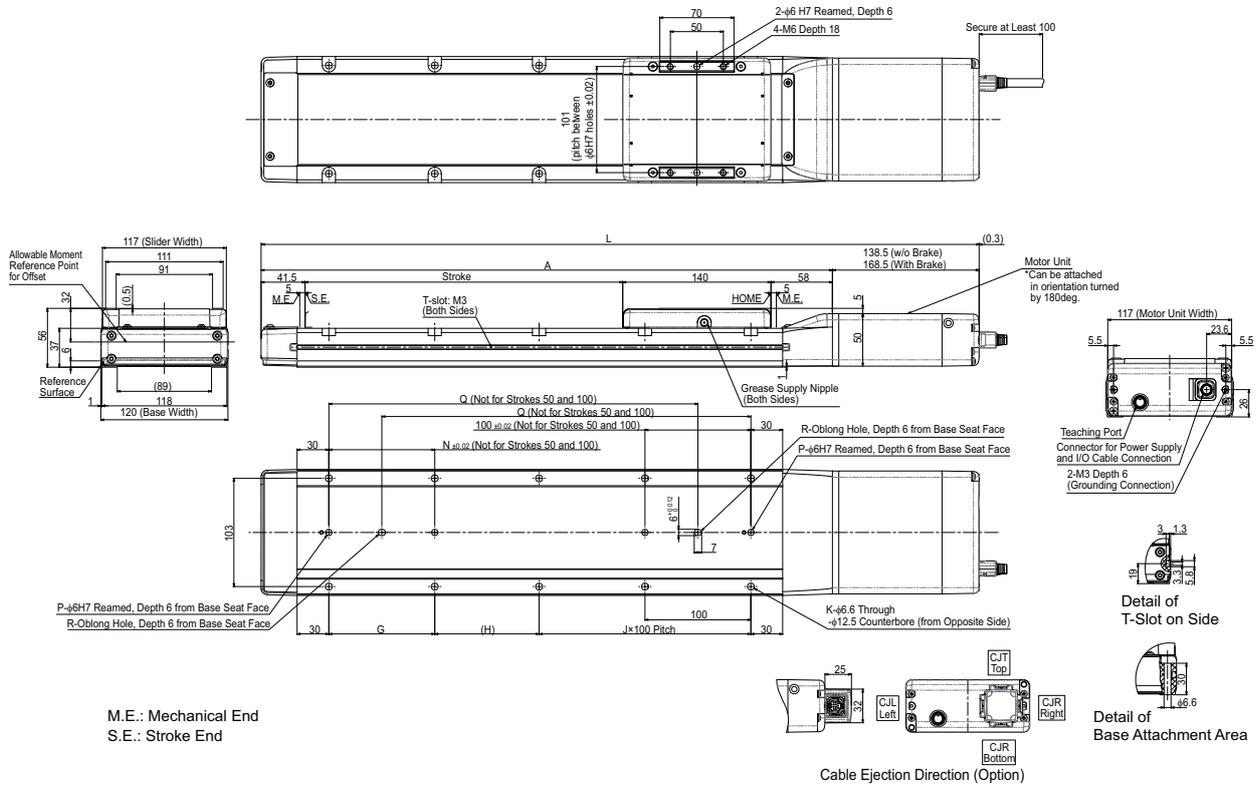
7.3 Standard Specification RCP6-WSA12C



Stroke	L		A	G	H	J	K	N	P	Q	R	Mass [kg]	
	w/o Brake	With Brake										w/o Brake	With Brake
50	408	458	289.5	-	148.5	0	4	-	1	-	0	3.8	4.0
100	458	508	339.5	-	198.5	0	4	-	1	-	0	4.1	4.4
150	508	558	389.5	100	48.5	1	8	100	2	198.5	1	4.4	4.7
200	558	608	439.5	100	98.5	1	8	100	2	248.5	1	4.8	5.0
250	608	658	489.5	100	48.5	2	10	100	2	298.5	1	5.1	5.4
300	658	708	539.5	100	98.5	2	10	100	2	348.5	1	5.4	5.7
350	708	758	589.5	100	48.5	3	12	100	2	398.5	1	5.8	6.0
400	758	808	639.5	100	98.5	3	12	100	2	448.5	1	6.1	6.4
450	808	858	689.5	100	48.5	4	14	100	2	498.5	1	6.4	6.7
500	858	908	739.5	100	98.5	4	14	100	2	548.5	1	6.8	7.1
550	908	958	789.5	100	48.5	5	16	100	2	598.5	1	7.1	7.4
600	958	1008	839.5	100	98.5	5	16	100	2	648.5	1	7.4	7.7
650	1008	1058	889.5	100	48.5	6	18	100	2	698.5	1	7.8	8.1
700	1058	1108	939.5	100	98.5	6	18	100	2	748.5	1	8.1	8.4
750	1108	1158	989.5	100	48.5	7	20	100	2	798.5	1	8.4	8.7
800	1158	1208	1039.5	100	98.5	7	20	100	2	848.5	1	8.8	9.1

(Note) L dimensions described in the table are those with no cable ejection direction (option).
For cable ejection direction types (option), the dimensions are longer in 25mm.

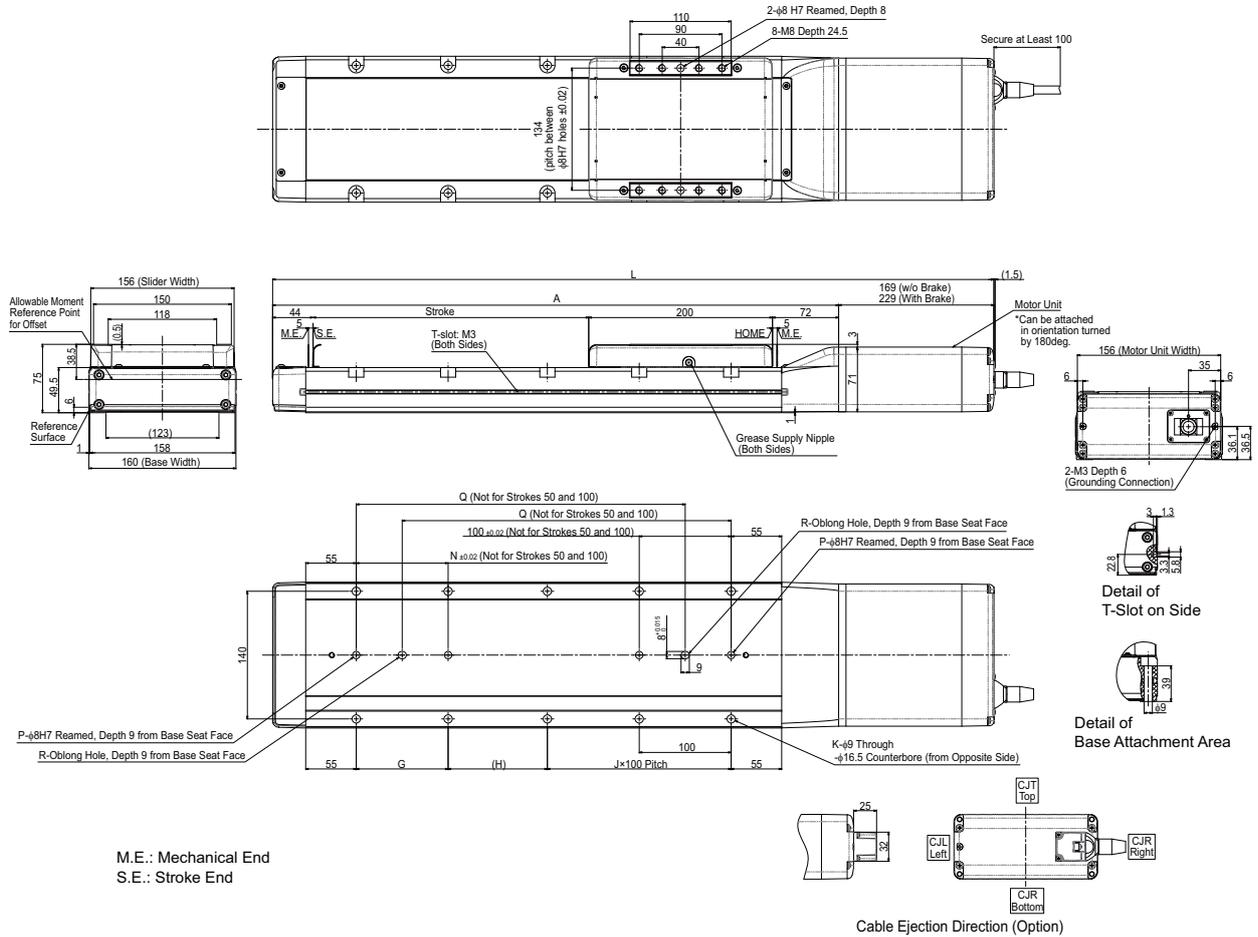
7.4 Built-in Controller Specification RCP6S-WSA12C



Stroke	L		A	G	H	J	K	N	P	Q	R	Mass [kg]	
	w/o Brake	With Brake										w/o Brake	With Brake
50	428	458	289.5	-	148.5	0	4	-	1	-	0	3.8	4.1
100	478	508	339.5	-	198.5	0	4	-	1	-	0	4.2	4.4
150	528	558	389.5	100	48.5	1	8	100	2	198.5	1	4.5	4.7
200	578	608	439.5	100	98.5	1	8	100	2	248.5	1	4.8	5.1
250	628	658	489.5	100	48.5	2	10	100	2	298.5	1	5.2	5.4
300	678	708	539.5	100	98.5	2	10	100	2	348.5	1	5.5	5.7
350	728	758	589.5	100	48.5	3	12	100	2	398.5	1	5.8	6.1
400	778	808	639.5	100	98.5	3	12	100	2	448.5	1	6.2	6.4
450	828	858	689.5	100	48.5	4	14	100	2	498.5	1	6.5	6.7
500	878	908	739.5	100	98.5	4	14	100	2	548.5	1	6.8	7.1
550	928	958	789.5	100	48.5	5	16	100	2	598.5	1	7.2	7.4
600	978	1008	839.5	100	98.5	5	16	100	2	648.5	1	7.5	7.8
650	1028	1058	889.5	100	48.5	6	18	100	2	698.5	1	7.8	8.1
700	1078	1108	939.5	100	98.5	6	18	100	2	748.5	1	8.2	8.4
750	1128	1158	989.5	100	48.5	7	20	100	2	798.5	1	8.5	8.8
800	1178	1208	1039.5	100	98.5	7	20	100	2	848.5	1	8.8	9.1

(Note) L dimensions described in the table are those with no cable ejection direction (option).
For cable ejection direction types (option), the dimensions are longer in 25mm.

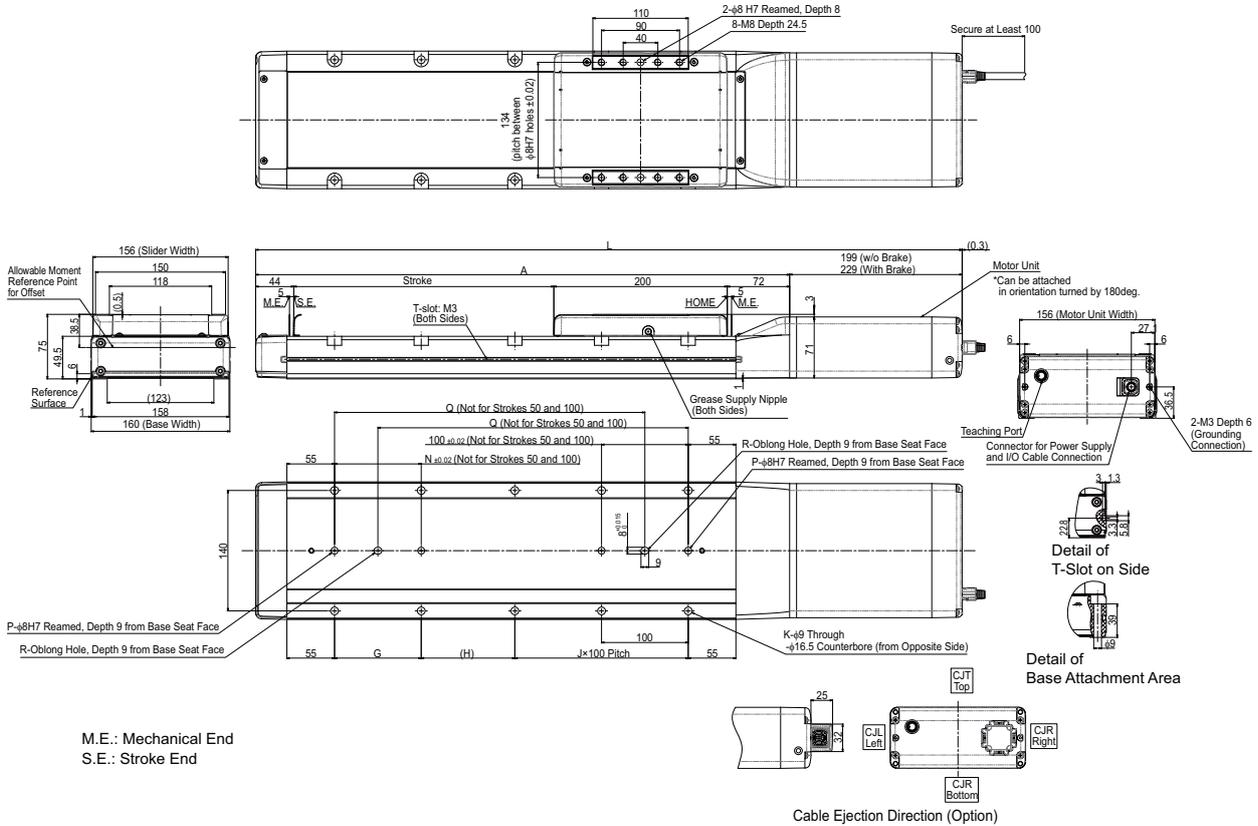
7.7 Standard Specification RCP6-WSA16C



Stroke	L		A	G	H	J	K	N	P	Q	R	Mass [kg]	
	w/o Brake	With Brake										w/o Brake	With Brake
50	535	595	366	-	158	0	4	-	1	-	0	9.0	9.5
100	585	645	416	-	208	0	4	-	1	-	0	9.6	10.1
150	635	695	466	100	58	1	8	100	2	208	1	10.2	10.7
200	685	745	516	100	108	1	8	100	2	258	1	10.8	11.3
250	735	795	566	100	58	2	10	100	2	308	1	11.4	11.9
300	785	845	616	100	108	2	10	100	2	358	1	12.0	12.5
350	835	895	666	100	58	3	12	100	2	408	1	12.6	13.1
400	885	945	716	100	108	3	12	100	2	458	1	13.2	13.7
450	935	995	766	100	58	4	14	100	2	508	1	13.8	14.3
500	985	1045	816	100	108	4	14	100	2	558	1	14.4	14.9
550	1035	1095	866	100	58	5	16	100	2	608	1	15.0	15.5
600	1085	1145	916	100	108	5	16	100	2	658	1	15.7	16.1
650	1135	1195	966	100	58	6	18	100	2	708	1	16.2	16.7
700	1185	1245	1016	100	108	6	18	100	2	758	1	16.9	17.3
750	1235	1295	1066	100	58	7	20	100	2	808	1	17.4	17.9
800	1285	1345	1116	100	108	7	20	100	2	858	1	18.1	18.5
850	1335	1395	1166	100	58	8	22	100	2	908	1	18.7	19.1
900	1385	1445	1216	100	108	8	22	100	2	958	1	19.3	19.7
950	1435	1495	1266	100	58	9	24	100	2	1008	1	19.9	20.3
1000	1485	1545	1316	100	108	9	24	100	2	1058	1	20.5	21.0
1050	1535	1595	1366	100	58	10	26	100	2	1108	1	21.1	21.5
1100	1585	1645	1416	100	108	10	26	100	2	1158	1	21.7	22.2

(Note) L dimensions described in the table are those with no cable ejection direction (option).
For cable ejection direction types (option), the dimensions are longer in 25mm.

7.8 Built-in Controller Specification RCP6S-WSA16C

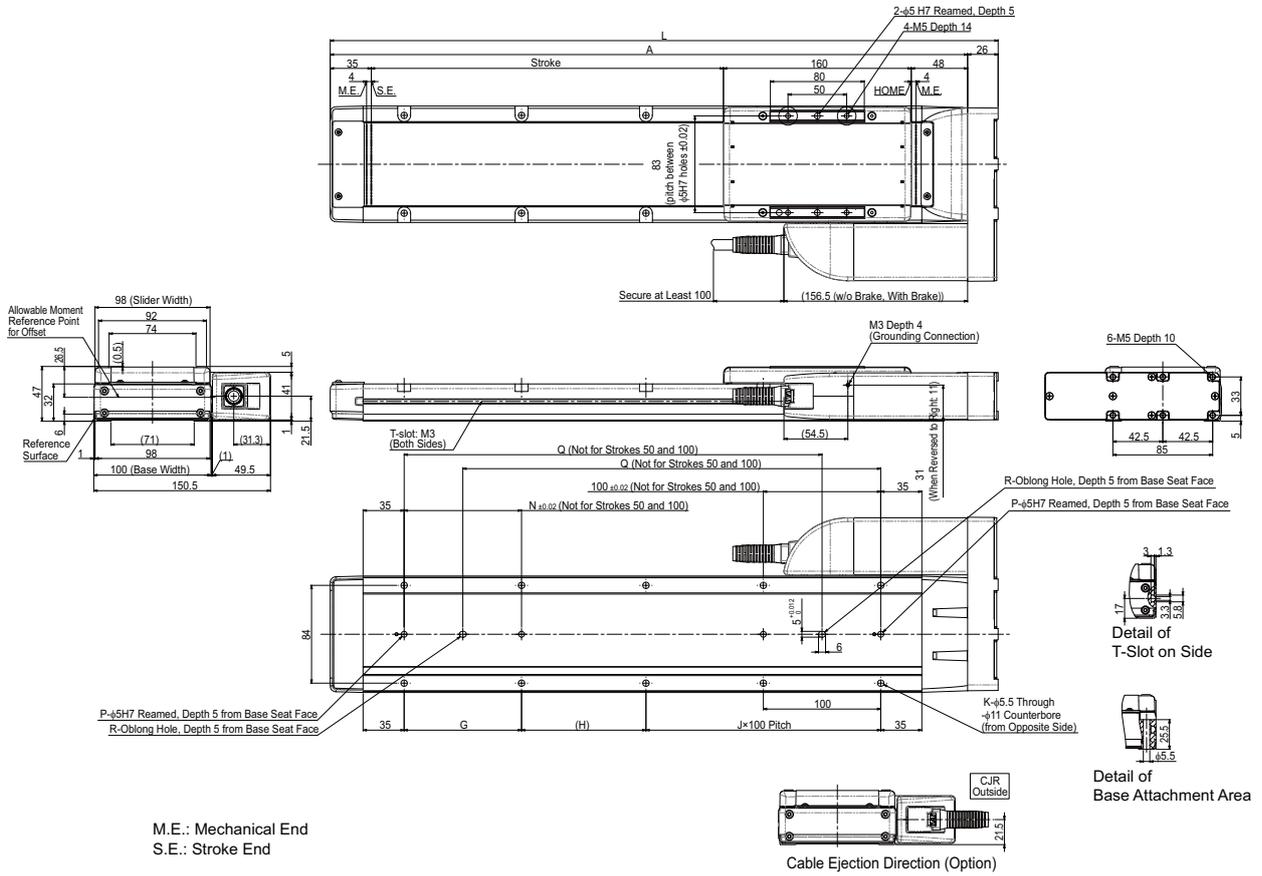


Stroke	L		A	G	H	J	K	N	P	Q	R	Mass [kg]	
	w/o Brake	With Brake										w/o Brake	With Brake
50	565	595	366	-	158	0	4	-	1	-	0	9.2	9.5
100	615	645	416	-	208	0	4	-	1	-	0	9.8	10.2
150	665	695	466	100	58	1	8	100	2	208	1	10.4	10.7
200	715	745	516	100	108	1	8	100	2	258	1	11.0	11.4
250	765	795	566	100	58	2	10	100	2	308	1	11.6	11.9
300	815	845	616	100	108	2	10	100	2	358	1	12.2	12.6
350	865	895	666	100	58	3	12	100	2	408	1	12.8	13.2
400	915	945	716	100	108	3	12	100	2	458	1	13.4	13.8
450	965	995	766	100	58	4	14	100	2	508	1	14.0	14.4
500	1015	1045	816	100	108	4	14	100	2	558	1	14.6	15.0
550	1065	1095	866	100	58	5	16	100	2	608	1	15.2	15.6
600	1115	1145	916	100	108	5	16	100	2	658	1	15.8	16.2
650	1165	1195	966	100	58	6	18	100	2	708	1	16.4	16.8
700	1215	1245	1016	100	108	6	18	100	2	758	1	17.0	17.4
750	1265	1295	1066	100	58	7	20	100	2	808	1	17.6	18.0
800	1315	1345	1116	100	108	7	20	100	2	858	1	18.2	18.6
850	1365	1395	1166	100	58	8	22	100	2	908	1	18.8	19.2
900	1415	1445	1216	100	108	8	22	100	2	958	1	19.4	19.8
950	1465	1495	1266	100	58	9	24	100	2	1008	1	20.0	20.4
1000	1515	1545	1316	100	108	9	24	100	2	1058	1	20.6	21.0
1050	1565	1595	1366	100	58	10	26	100	2	1108	1	21.2	21.6
1100	1615	1645	1416	100	108	10	26	100	2	1158	1	21.8	22.2

(Note) L dimensions described in the table are those with no cable ejection direction (option).
For cable ejection direction types (option), the dimensions are longer in 25mm.

7.9 Standard Specification RCP6-WSA10R Left Reversed (Model No.: ML)

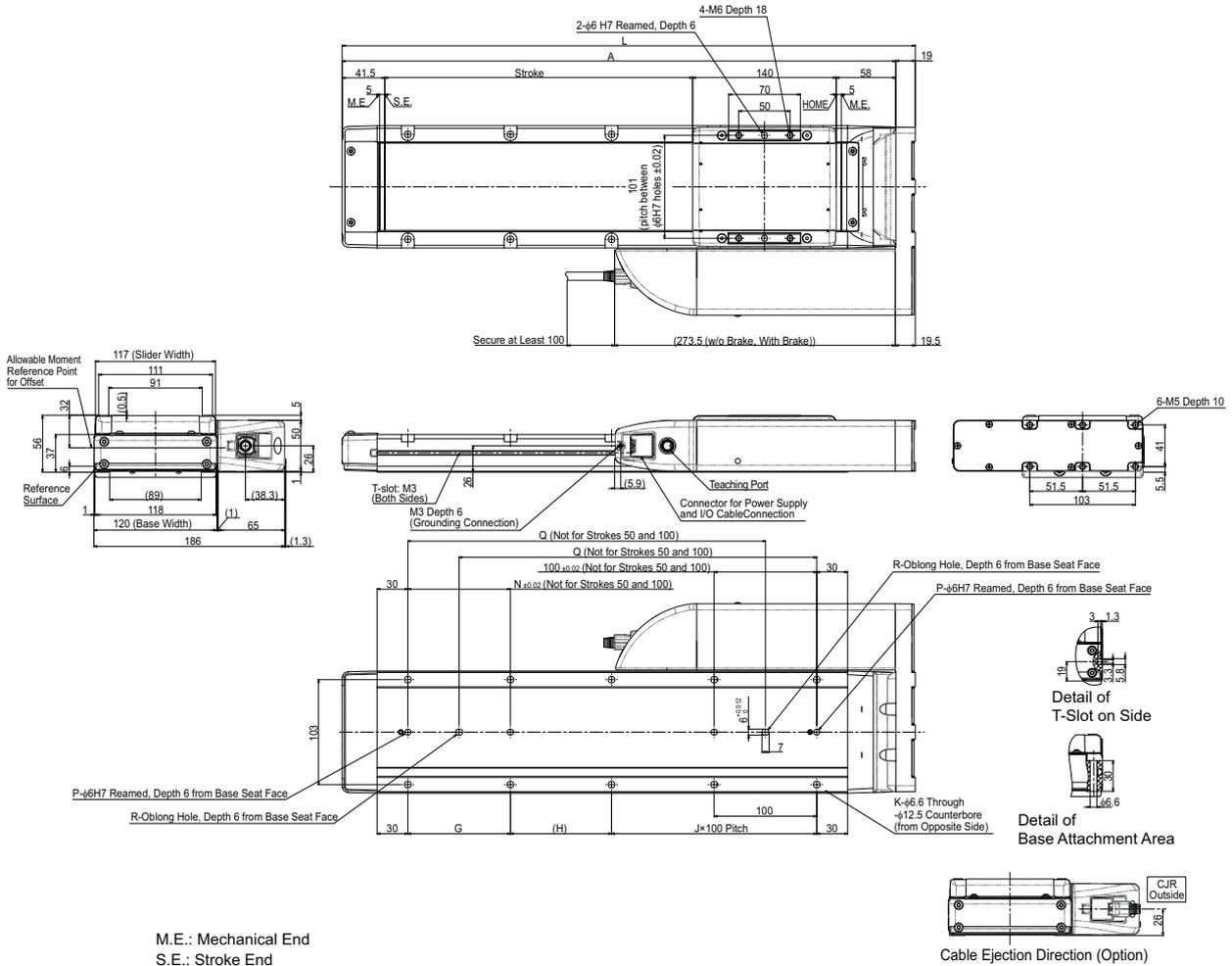
(Note) Right reversed type (model code: MR) should have the motor reversed to the right to the figure below.



Stroke	L	A	G	H	J	K	N	P	Q	R	Mass [kg]	
											w/o Brake	With Brake
50	319	293	-	156	0	4	-	1	-	0	2.9	3.0
100	369	343	-	206	0	4	-	1	-	0	3.2	3.2
150	419	393	100	56	1	8	100	2	206	1	3.4	3.5
200	469	443	100	106	1	8	100	2	256	1	3.6	3.7
250	519	493	100	56	2	10	100	2	306	1	3.9	3.9
300	569	543	100	106	2	10	100	2	356	1	4.1	4.2
350	619	593	100	56	3	12	100	2	406	1	4.4	4.4
400	669	643	100	106	3	12	100	2	456	1	4.6	4.7
450	719	693	100	56	4	14	100	2	506	1	4.8	4.9
500	769	743	100	106	4	14	100	2	556	1	5.1	5.2

7.12 Built-in Controller Specification RCP6S-WSA12R Left Reversed (Model No.: ML)

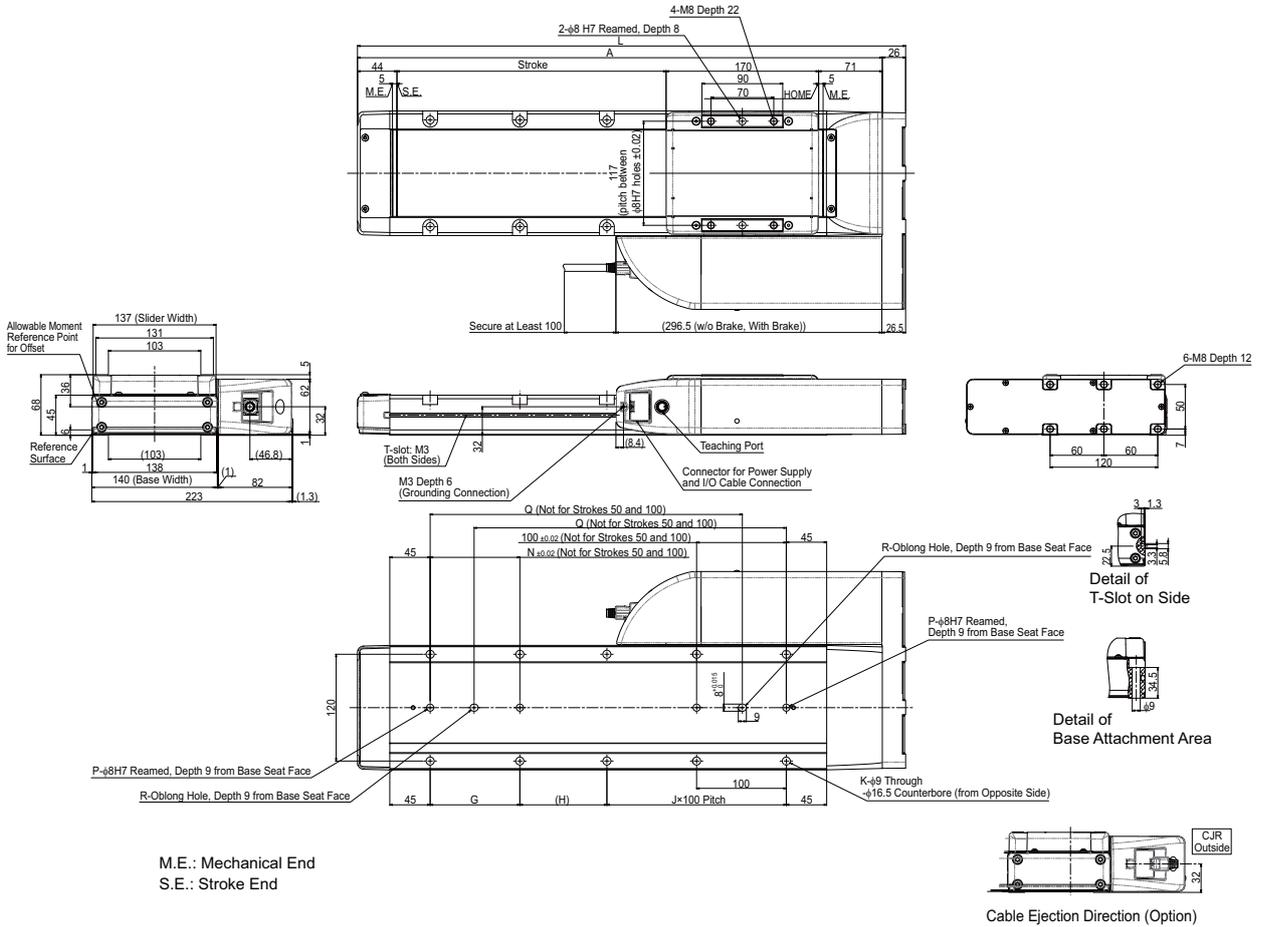
(Note) Right reversed type (model code: MR) should have the motor reversed to the right to the figure below.



Stroke	L	A	G	H	J	K	N	P	Q	R	Mass [kg]	
											w/o Brake	With Brake
50	308.5	289.5	-	148.5	0	4	-	1	-	0	4.2	4.3
100	358.5	339.5	-	198.5	0	4	-	1	-	0	4.5	4.6
150	408.5	389.5	100	48.5	1	8	100	2	198.5	1	4.9	4.9
200	458.5	439.5	100	98.5	1	8	100	2	248.5	1	5.2	5.3
250	508.5	489.5	100	48.5	2	10	100	2	298.5	1	5.5	5.6
300	558.5	539.5	100	98.5	2	10	100	2	348.5	1	5.9	5.9
350	608.5	589.5	100	48.5	3	12	100	2	398.5	1	6.2	6.3
400	658.5	639.5	100	98.5	3	12	100	2	448.5	1	6.5	6.6
450	708.5	689.5	100	48.5	4	14	100	2	498.5	1	6.9	6.9
500	758.5	739.5	100	98.5	4	14	100	2	548.5	1	7.2	7.3
550	808.5	789.5	100	48.5	5	16	100	2	598.5	1	7.5	7.6
600	858.5	839.5	100	98.5	5	16	100	2	648.5	1	7.9	7.9
650	908.5	889.5	100	48.5	6	18	100	2	698.5	1	8.2	8.3
700	958.5	939.5	100	98.5	6	18	100	2	748.5	1	8.5	8.6
750	1008.5	989.5	100	48.5	7	20	100	2	798.5	1	8.9	8.9
800	1058.5	1039.5	100	98.5	7	20	100	2	848.5	1	9.2	9.3

7.14 Built-in Controller Specification RCP6S-WSA14R Left Reversed (Model No.: ML)

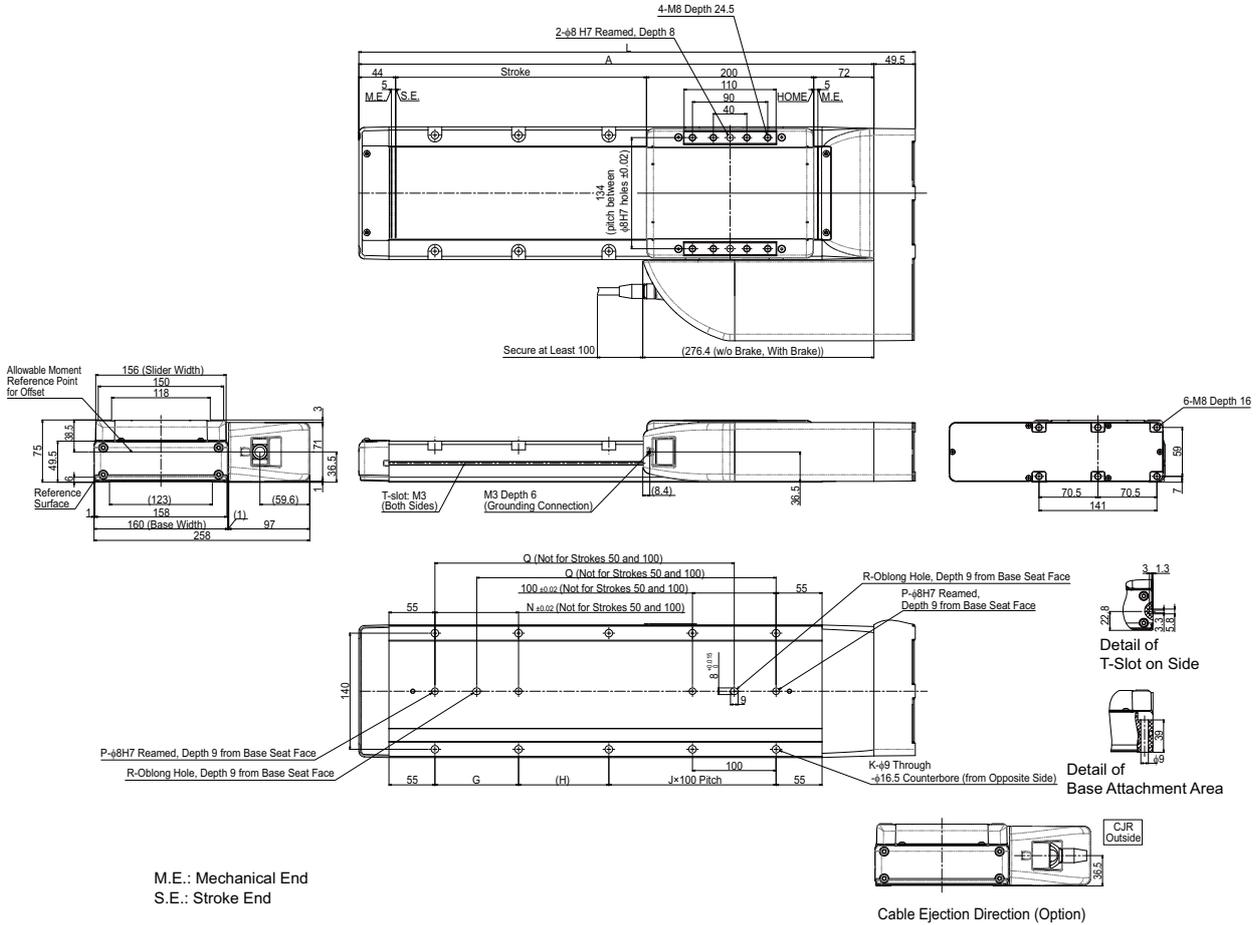
(Note) Right reversed type (model code: MR) should have the motor reversed to the right to the figure below.



Stroke	L	A	G	H	J	K	N	P	Q	R	Mass [kg]	
											w/o Brake	With Brake
50	361	335	-	147	0	4	-	1	-	0	7.4	7.6
100	411	385	-	197	0	4	-	1	-	0	7.9	8.0
150	461	435	100	47	1	8	100	2	198	1	8.4	8.5
200	511	485	100	97	1	8	100	2	248	1	8.9	9.0
250	561	535	100	47	2	10	100	2	298	1	9.3	9.4
300	611	585	100	97	2	10	100	2	348	1	9.8	9.9
350	661	635	100	47	3	12	100	2	398	1	10.3	10.4
400	711	685	100	97	3	12	100	2	448	1	10.8	10.9
450	761	735	100	47	4	14	100	2	498	1	11.2	11.4
500	811	785	100	97	4	14	100	2	548	1	11.7	11.8
550	861	835	100	47	5	16	100	2	598	1	12.2	12.3
600	911	885	100	97	5	16	100	2	648	1	12.7	12.8
650	961	935	100	47	6	18	100	2	698	1	13.1	13.3
700	1011	985	100	97	6	18	100	2	748	1	13.6	13.7
750	1061	1035	100	47	7	20	100	2	798	1	14.1	14.2
800	1111	1085	100	97	7	20	100	2	848	1	14.6	14.7

7.15 Standard Specification RCP6-WSA16R Left Reversed (Model No.: ML)

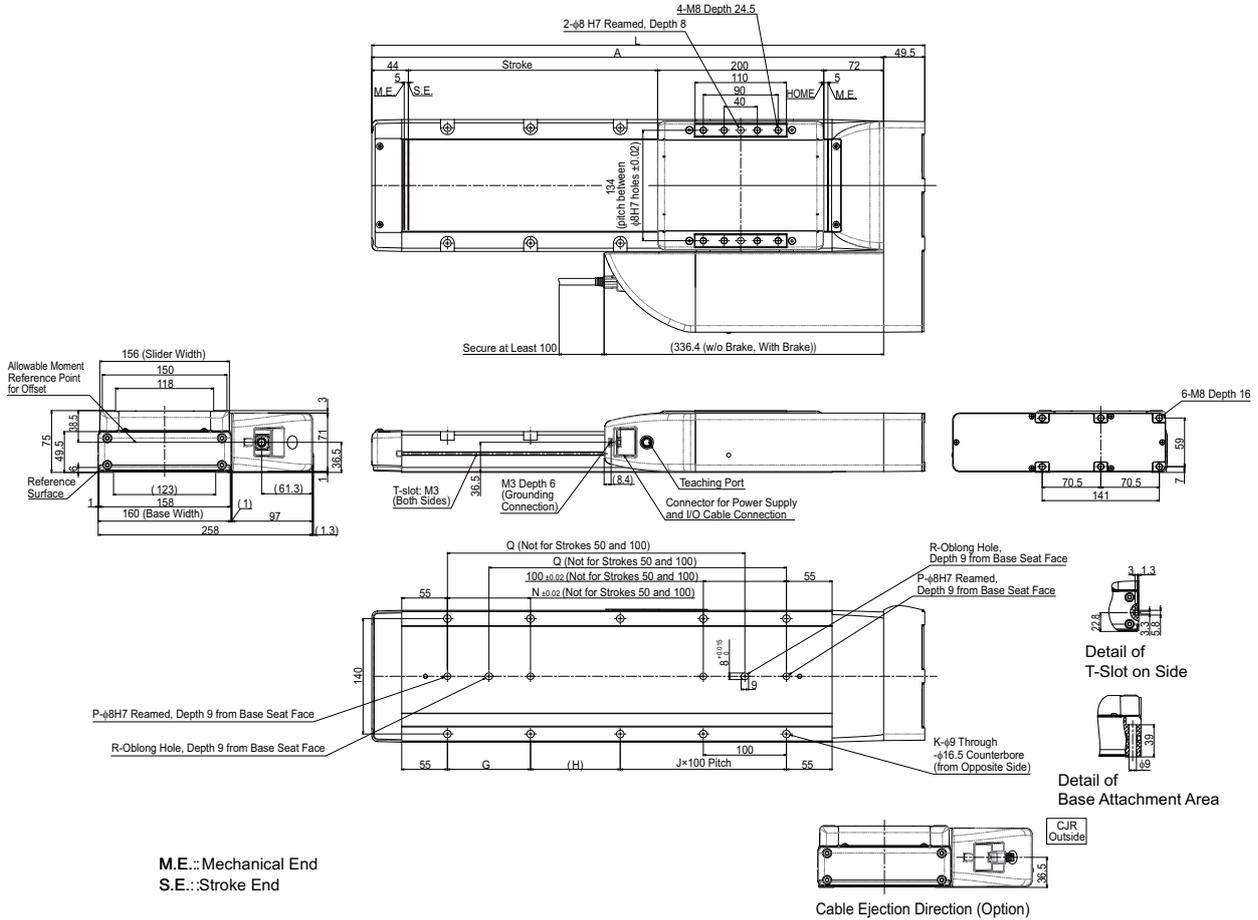
(Note) Right reversed type (model code: MR) should have the motor reversed to the right to the figure below.



Stroke	L	A	G	H	J	K	N	P	Q	R	Mass [kg]	
											w/o Brake	With Brake
50	415.5	366	-	158	0	4	-	1	-	0	10.4	10.6
100	465.5	416	-	208	0	4	-	1	-	0	11.0	11.2
150	515.5	466	100	58	1	8	100	2	208	1	11.6	11.8
200	565.5	516	100	108	1	8	100	2	258	1	12.2	12.4
250	615.5	566	100	58	2	10	100	2	308	1	12.7	13.0
300	665.5	616	100	108	2	10	100	2	358	1	13.3	13.6
350	715.5	666	100	58	3	12	100	2	408	1	13.9	14.2
400	765.5	716	100	108	3	12	100	2	458	1	14.5	14.8
450	815.5	766	100	58	4	14	100	2	508	1	15.1	15.4
500	865.5	816	100	108	4	14	100	2	558	1	15.7	16.0
550	915.5	866	100	58	5	16	100	2	608	1	16.3	16.6
600	965.5	916	100	108	5	16	100	2	658	1	16.9	17.2
650	1015.5	966	100	58	6	18	100	2	708	1	17.5	17.7
700	1065.5	1016	100	108	6	18	100	2	758	1	18.1	18.3
750	1115.5	1066	100	58	7	20	100	2	808	1	18.7	18.9
800	1165.5	1116	100	108	7	20	100	2	858	1	19.3	19.5
850	1215.5	1166	100	58	8	22	100	2	908	1	19.9	20.1
900	1265.5	1216	100	108	8	22	100	2	958	1	20.5	20.7
950	1315.5	1266	100	58	9	24	100	2	1008	1	21.0	21.3
1000	1365.5	1316	100	108	9	24	100	2	1058	1	21.7	21.9
1050	1415.5	1366	100	58	10	26	100	2	1108	1	22.2	22.5
1100	1465.5	1416	100	108	10	26	100	2	1158	1	22.8	23.1

7.16 Built-in Controller Specification RCP6S-WSA16R Left Reversed (Model No.: ML)

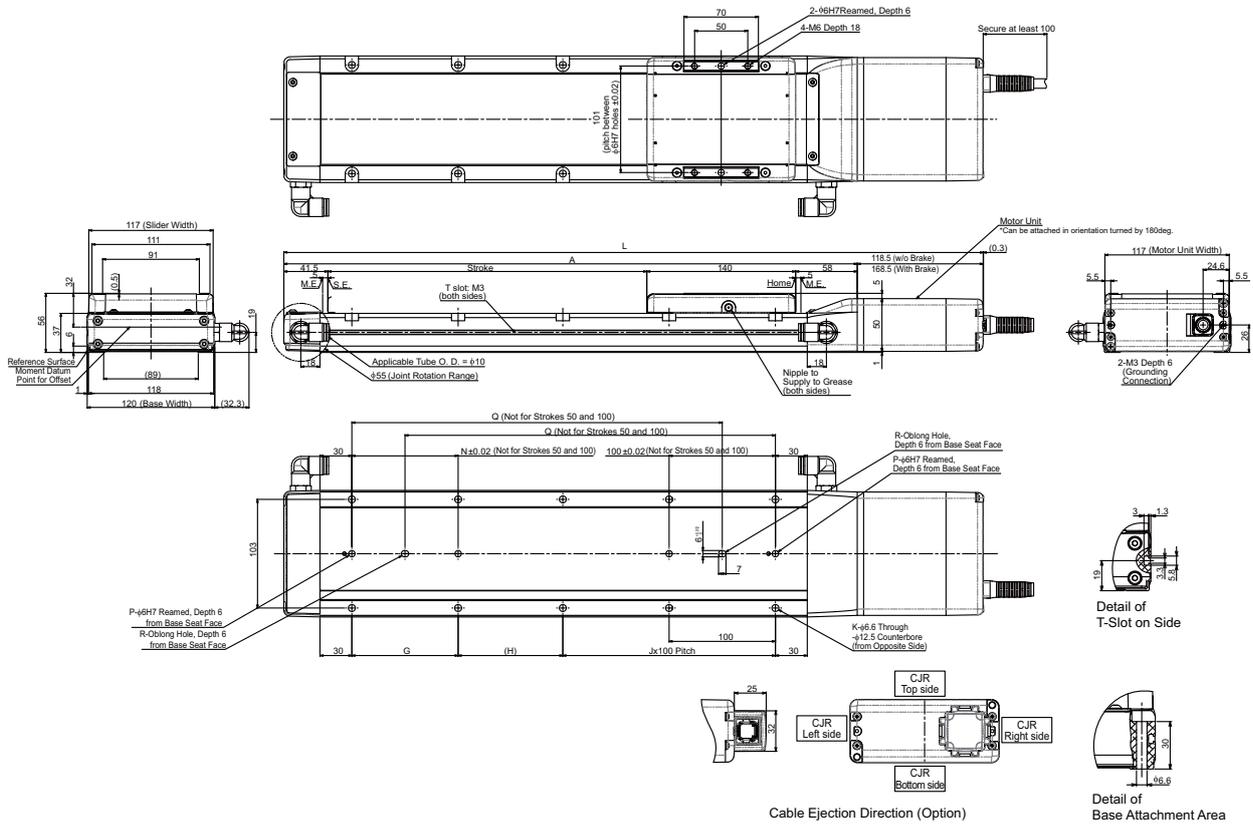
(Note) Right reversed type (model code: MR) should have the motor reversed to the right to the figure below.



Stroke	L	A	G	H	J	K	N	P	Q	R	Mass [kg]	
											w/o Brake	With Brake
50	415.5	366	-	158	0	4	-	1	-	0	10.6	10.9
100	465.5	416	-	208	0	4	-	1	-	0	11.2	11.5
150	515.5	466	100	58	1	8	100	2	208	1	11.8	12.1
200	565.5	516	100	108	1	8	100	2	258	1	12.4	12.7
250	615.5	566	100	58	2	10	100	2	308	1	13.0	13.3
300	665.5	616	100	108	2	10	100	2	358	1	13.6	13.9
350	715.5	666	100	58	3	12	100	2	408	1	14.2	14.4
400	765.5	716	100	108	3	12	100	2	458	1	14.8	15.0
450	815.5	766	100	58	4	14	100	2	508	1	15.4	15.6
500	865.5	816	100	108	4	14	100	2	558	1	16.0	16.2
550	915.5	866	100	58	5	16	100	2	608	1	16.6	16.8
600	965.5	916	100	108	5	16	100	2	658	1	17.2	17.4
650	1015.5	966	100	58	6	18	100	2	708	1	17.7	18.0
700	1065.5	1016	100	108	6	18	100	2	758	1	18.4	18.6
750	1115.5	1066	100	58	7	20	100	2	808	1	18.9	19.2
800	1165.5	1116	100	108	7	20	100	2	858	1	19.5	19.8
850	1215.5	1166	100	58	8	22	100	2	908	1	20.1	20.4
900	1265.5	1216	100	108	8	22	100	2	958	1	20.7	21.0
950	1315.5	1266	100	58	9	24	100	2	1008	1	21.3	21.6
1000	1365.5	1316	100	108	9	24	100	2	1058	1	21.9	22.2
1050	1415.5	1366	100	58	10	26	100	2	1108	1	22.5	22.7
1100	1465.5	1416	100	108	10	26	100	2	1158	1	23.1	23.4

7.19 Cleanroom Type Standard Specification RCP6CR-WSA12C Standard Specification RCP6-WSA12C/WSA12R (Option Model No.: SR)

* There is no pipe joint in Slider Roller Type (SR).



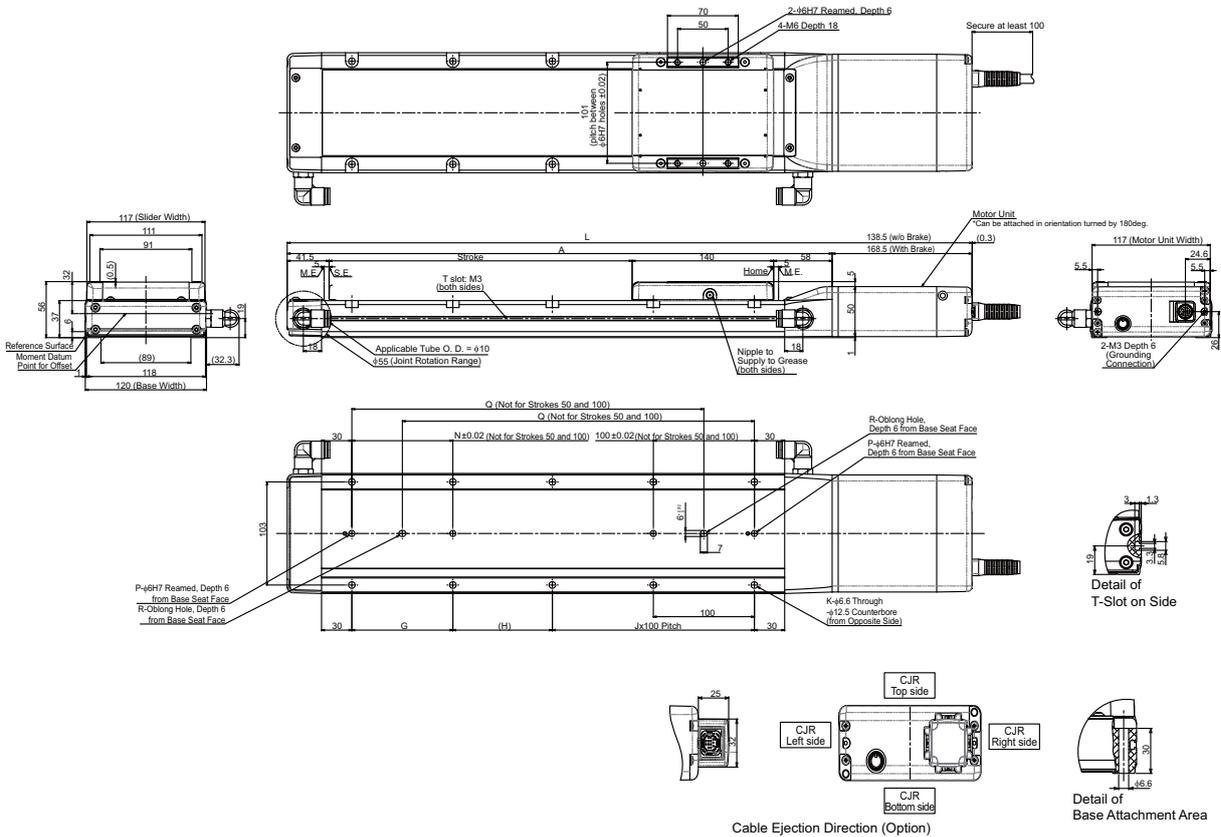
Stroke	L		A	G	H	J	K	N	P	Q	R	Mass [kg]	
	w/o Brake	With Brake										w/o Brake	With Brake
50	408	458	289.5	—	148.5	0	4	—	1	—	0	3.8	4.0
100	458	508	339.5	—	198.5	0	4	—	1	—	0	4.1	4.4
150	508	558	389.5	100	48.5	1	8	100	2	198.5	1	4.4	4.7
200	558	608	439.5	100	98.5	1	8	100	2	248.5	1	4.8	5.0
250	608	658	489.5	100	48.5	2	10	100	2	298.5	1	5.1	5.4
300	658	708	539.5	100	98.5	2	10	100	2	348.5	1	5.4	5.7
350	708	758	589.5	100	48.5	3	12	100	2	398.5	1	5.8	6.0
400	758	808	639.5	100	98.5	3	12	100	2	448.5	1	6.1	6.4
450	808	858	689.5	100	48.5	4	14	100	2	498.5	1	6.4	6.7
500	858	908	739.5	100	98.5	4	14	100	2	548.5	1	6.8	7.1
550	908	958	789.5	100	48.5	5	16	100	2	598.5	1	7.1	7.4
600	958	1008	839.5	100	98.5	5	16	100	2	648.5	1	7.4	7.7
650	1008	1058	889.5	100	48.5	6	18	100	2	698.5	1	7.8	8.1
700	1058	1108	939.5	100	98.5	6	18	100	2	748.5	1	8.1	8.4
750	1108	1158	989.5	100	48.5	7	20	100	2	798.5	1	8.4	8.7
800	1158	1208	1039.5	100	98.5	7	20	100	2	848.5	1	8.8	9.1

(Note) L dimensions described in the table are those with no cable ejection direction (option).

For cable ejection direction types (option), the dimensions are longer in 25mm.

7.20 Cleanroom Type Built-in Controller Specification RCP6 SCR-WSA12C Built-in Controller Specification RCP6S-WSA12C/WSA12R (Option Model No.: SR)

* There is no pipe joint in Slider Roller Type (SR).

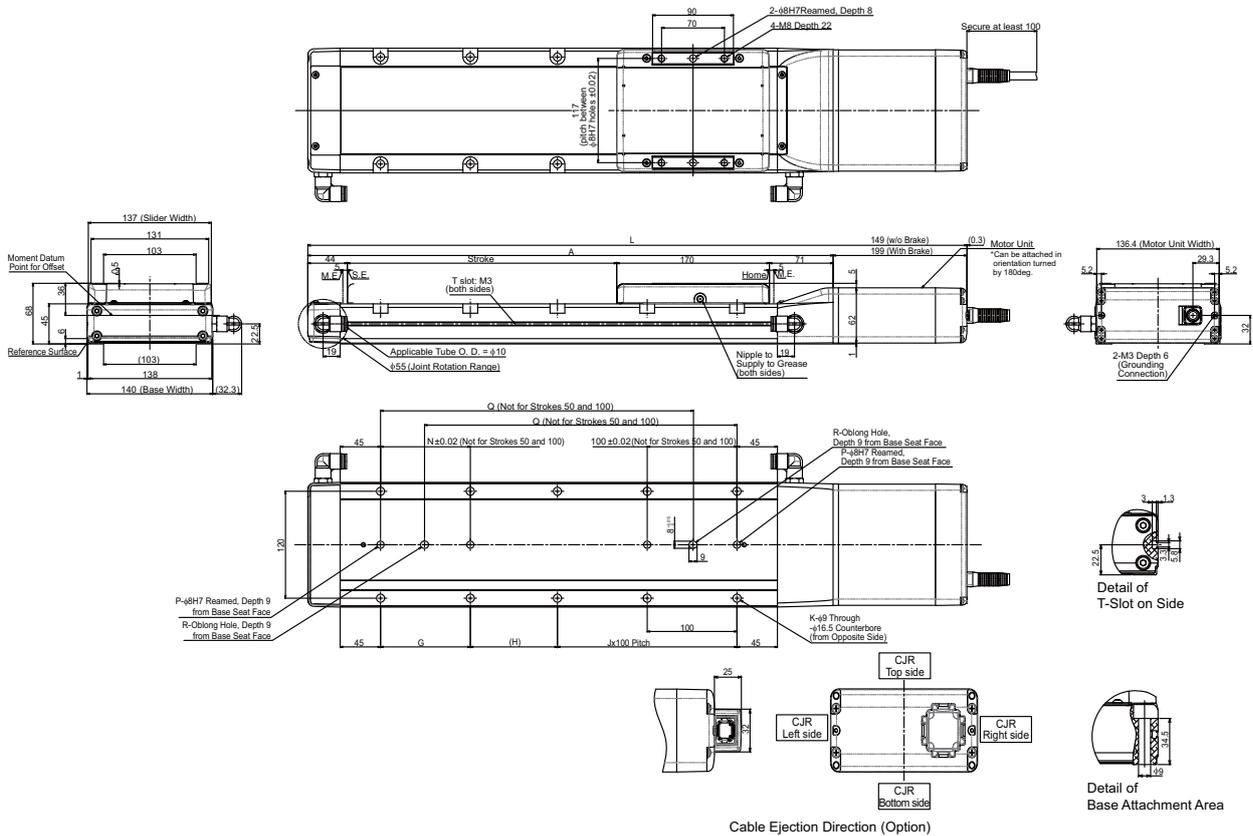


Stroke	L		A	G	H	J	K	N	P	Q	R	Mass [kg]	
	w/o Brake	With Brake										w/o Brake	With Brake
50	428	458	289.5	—	148.5	0	4	—	1	—	0	3.8	4.1
100	478	508	339.5	—	198.5	0	4	—	1	—	0	4.2	4.4
150	528	558	389.5	100	48.5	1	8	100	2	198.5	1	4.5	4.7
200	578	608	439.5	100	98.5	1	8	100	2	248.5	1	4.8	5.1
250	628	658	489.5	100	48.5	2	10	100	2	298.5	1	5.2	5.4
300	678	708	539.5	100	98.5	2	10	100	2	348.5	1	5.5	5.7
350	728	758	589.5	100	48.5	3	12	100	2	398.5	1	5.8	6.1
400	778	808	639.5	100	98.5	3	12	100	2	448.5	1	6.2	6.4
450	828	858	689.5	100	48.5	4	14	100	2	498.5	1	6.5	6.7
500	878	908	739.5	100	98.5	4	14	100	2	548.5	1	6.8	7.1
550	928	958	789.5	100	48.5	5	16	100	2	598.5	1	7.2	7.4
600	978	1008	839.5	100	98.5	5	16	100	2	648.5	1	7.5	7.8
650	1028	1058	889.5	100	48.5	6	18	100	2	698.5	1	7.8	8.1
700	1078	1108	939.5	100	98.5	6	18	100	2	748.5	1	8.2	8.4
750	1128	1158	989.5	100	48.5	7	20	100	2	798.5	1	8.5	8.8
800	1178	1208	1039.5	100	98.5	7	20	100	2	848.5	1	8.8	9.1

(Note) L dimensions described in the table are those with no cable ejection direction (option).
For cable ejection direction types (option), the dimensions are longer in 25mm.

7.21 Cleanroom Type Standard Specification RCP6CR-WSA14C Standard Specification RCP6-WSA14C/WSA14R (Option Model No.: SR)

* There is no pipe joint in Slider Roller Type (SR).



Stroke	L		A	G	H	J	K	N	P	Q	R	Mass [kg]	
	w/o Brake	With Brake										w/o Brake	With Brake
50	484	534	335	—	147	0	4	—	1	—	0	6.6	7.0
100	534	584	385	—	197	0	4	—	1	—	0	7.0	7.5
150	584	634	435	100	47	1	8	100	2	198	1	7.5	8.0
200	634	684	485	100	97	1	8	100	2	248	1	8.0	8.5
250	684	754	535	100	47	2	10	100	2	298	1	8.5	8.9
300	734	784	585	100	97	2	10	100	2	348	1	8.9	9.4
350	784	834	635	100	47	3	12	100	2	398	1	9.4	9.9
400	834	884	685	100	97	3	12	100	2	448	1	9.9	10.4
450	884	934	735	100	47	4	14	100	2	498	1	10.4	10.9
500	934	984	785	100	97	4	14	100	2	548	1	10.9	11.3
550	984	1034	835	100	47	5	16	100	2	598	1	11.3	11.8
600	1034	1084	885	100	97	5	16	100	2	648	1	11.8	12.3
650	1084	1134	935	100	47	6	18	100	2	698	1	12.3	12.8
700	1134	1184	985	100	97	6	18	100	2	748	1	12.8	13.2
750	1184	1234	1035	100	47	7	20	100	2	798	1	13.2	13.7
800	1234	1284	1085	100	97	7	20	100	2	848	1	13.7	14.2

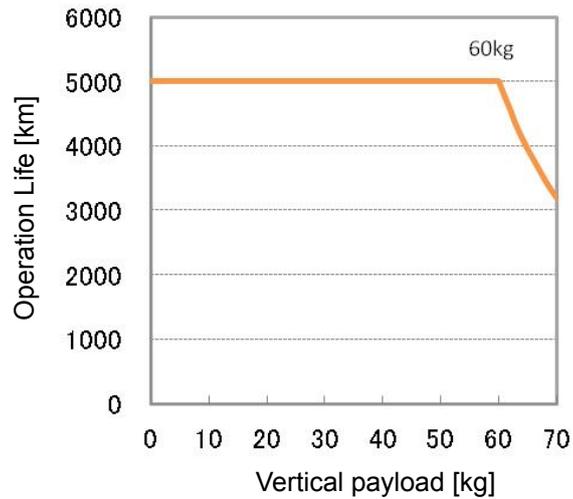
(Note) L dimensions described in the table are those with no cable ejection direction (option).
For cable ejection direction types (option), the dimensions are longer in 25mm.

8. Life

The mechanical life of the actuator is represented by that of the guide receiving the greatest moment load. Operation life of the linear guide is to be determined by the total driving distance which can reach without having 90% flaking (peeling on rail surface).

Operation life can be figured out with the calculation method shown below.

Note that the operation life will be shortened due to the payload if Lead 5mm of WSA16 is used in the vertical orientation.



8.1 How to Calculate Operation Life

For the operation life of the linear guide, use the dynamic allowable moment stated in 1.2 Specifications, and figure out with the formula below.

$$L = \left(\frac{C_M}{M} \right)^3 \bullet 5,000\text{km or } 1,000\text{km}$$

L: Operation life (km) C_M : Allowable dynamic moment (N·m)
M: Moment to work (N·m) URL: Standard rated life of ROBO Cylinder
5,000km or 10,000km: Standard rated life of ROBO Cylinder

(Note) For Lead 2.5mm of WSA10C and WSA10R, Lead 3mm of WSA12C and WSA12R, Lead 4mm of WSA14C and WSA14R and Lead 5mm of WSA16C and WSA16R, it is only 5,000km.

In addition, have a calculation for the drop of life with the formula below if there is a concern that the life could drop due to the condition of vibration or way to be attached.

$$L = \left(\frac{C_M}{M} \bullet \frac{f_{ws}}{f_w} \bullet \frac{1}{f_\alpha} \right)^3 \bullet 5,000\text{km or } 1,000\text{km}$$

L : Operation life (km) C_M : Allowable dynamic moment (N·m)
M : Moment to work (N·m) f_{ws} : Standard operational coefficient
 f_w : Load coefficient f_α : Attachment coefficient
5,000km: Standard rated life of ROBO Cylinder

Explained below is regarding the standard operational coefficient f_{ws} , load coefficient f_w and attachment coefficient f_α .

Refer to the contents below to set them up.

[Standard operational coefficient f_{ws}]

For ROBO Cylinders described in this manual, $f_{ws} = 1.2$. It is a coefficient defined for each model, some models such as RCS3 high-speed type is 1.35.

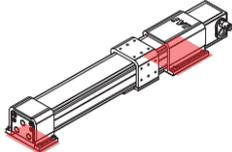
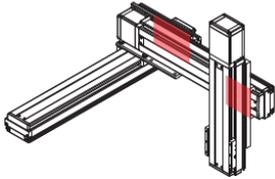
[Load coefficient f_w]

It is a coefficient to consider the life drop due to operational conditions.

Load coefficient f_w	Operation condition	Reference for acceleration/deceleration
1.0 to 1.5	Small vibration or impact in slow operation	1.0G or less

[Attachment coefficient f_{α}]

Attachment coefficient f_{α} is a coefficient to consider the life drop due to the condition of actuator attachment.

Attachment coefficient f_{α}	1.0	1.2	1.5
	Attachment in whole area	Attachment on both ends	Attachment on spots
Attached condition			

* As the figures are those in common for each manual, they are not for RCP6 Slider Type.

Replace to figures for RCP6 Slider Type and select the attachment coefficient.

* Even when in attachment in whole area, and the actuator is seated in the whole length of the product, select 1.2 or 1.5 for the attachment coefficient depending on the position of screw fixing.

* For attachment in whole area, use all of the tapped holes (counterbored holes) on the seat surface to fix.

8.2 Operation Life

The operation life depends on the applied moment. With light load, 5,000km for example, it will become longer than the standard rated life. With no consideration of vibration and attachment condition, the operation life is 40,000km according to the calculation with formula in the previous page under assumption that 0.5 C_M (half of dynamic allowable moment) of moment is applied on. It shows that it can be 8 times longer than the standard rated life, which is 5,000km.

9. Warranty

9.1 Warranty Period

One of the following periods, whichever is shorter:

- 18 months after shipment from IAI
- 12 months after delivery to the specified location
- 2,500 hours of operation

9.2 Scope of the Warranty

Our products are covered by warranty when all of the following conditions are met. Faulty products covered by warranty will be replaced or repaired free of charge:

- (1) The breakdown or problem in question pertains to our product as delivered by us or our authorized dealer.
- (2) The breakdown or problem in question occurred during the warranty period.
- (3) The breakdown or problem in question occurred while the product was in use for an appropriate purpose under the conditions and environment of use specified in the instruction manual and catalog.
- (4) The breakdown of problem in question was caused by a specification defect or problem, or by a quality issue with our product.

Note that breakdowns due to any of the following reasons are excluded from the scope of warranty:

- [1] Anything other than our product
- [2] Modification or repair performed by a party other than us (unless we have approved such modification or repair)
- [3] Anything that could not be easily predicted with the level of science and technology available at the time of shipment from our company
- [4] A natural disaster, man-made disaster, incident or accident for which we are not liable
- [5] Natural fading of paint or other symptoms of aging
- [6] Wear, depletion or other expected result of use
- [7] Operation noise, vibration or other subjective sensation not affecting function or maintenance

Note that the warranty only covers our product as delivered and that any secondary loss arising from a breakdown of our product is excluded from the scope of warranty.

9.3 Honoring the Warranty

As a rule, the product must be brought to us for repair under warranty.

9.4 Limited Liability

- (1) We shall assume no liability for any special damage, consequential loss or passive loss such as a loss of expected profit arising from or in connection with our product.
- (2) We shall not be liable for any program or control method created by the customer to operate our product or for the result of such program or control method.

9.5 Conditions of Conformance with Applicable Standards/Regulations, Etc., and Applications

- (1) If our product is combined with another product or any system, device, etc., used by the customer, the customer must first check the applicable standards, regulations and/or rules. The customer is also responsible for confirming that such combination with our product conforms to the applicable standards, etc. In such a case we will not be liable for the conformance of our product with the applicable standards, etc.
- (2) Our product is for general industrial use. It is not intended or designed for the applications specified below, which require a high level of safety. Accordingly, as a rule our product cannot be used in these applications. Contact us if you must use our product for any of these applications:
 - [1] Medical equipment pertaining to maintenance or management of human life or health
 - [2] A mechanism or mechanical equipment intended to move or transport people (such as a vehicle, railway facility or aviation facility)
 - [3] Important safety parts of mechanical equipment (such as safety devices)
 - [4] Equipment used to handle cultural assets, art or other irreplaceable items
- (3) Contact us at the earliest opportunity if our product is to be used in any condition or environment that differs from what is specified in the catalog or instruction manual.

9.6 Other Items Excluded from Warranty

The price of the product delivered to you does not include expenses associated with programming, the dispatch of engineers, etc. Accordingly, a separate fee will be charged in the following cases even during the warranty period:

- [1] Guidance for installation/adjustment and witnessing of test operation
- [2] Maintenance and inspection
- [3] Technical guidance and education on operating/wiring methods, etc.
- [4] Technical guidance and education on programming and other items related to programs

Change History

Revision Date	Description of Revision
January 2016	First edition
March 2016	1B edition <ul style="list-style-type: none"> • P.15 and 16 Correction Number of encoder pulse → 800 • P.33 and 34 Correction made Lead 30 of the WSA16C and WSA16R deleted • P.42 Correction made WSA4R → WSA10R, WSA6R → WSA12R WSA7R → WSA14R, WSA8R → WSA16R “CJL Cannot be selected for the straight type RCP6S-WSA10C.” is added • P.51 “In the case of Stroke 50 and 100, oblong holse are not provided” is added • P.70 Maker and type of belt for WSA10R to WSA14R are changed. • P.82 to 97 Change the value of the stroke 50, 100 of the table
May 2016	1C edition <ul style="list-style-type: none"> • P.74 Caution notes added for static electricity at motor replacement work
June 2016	Second edition Cleanroom Type added Performance when high output setting invalid added <ul style="list-style-type: none"> • P.55 Change made to graph of duty 6C • P.81 Grease changed for standard type Daphne Eponex Grease No.2 → Multemp PS No.2 • P.83 Change made to grease gun and nozzle • P.89, 96 Tensile force changed for WSA16R 26~30kgf → 11~13kgf
August 2016	2B edition <ul style="list-style-type: none"> • P.83 Amount of grease supply (reference) added
September 2016	2C edition <ul style="list-style-type: none"> • P.110 Extrusion at bottom of motor cover removed



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