

# Single Axis Actuator

## Motor Driven Single Axis Actuator SX–Overview

Motors and peripherals are integrated with High Accuracy Single Axis Actuators SX

### High Accuracy

Built with Precision Grade actuators with  $\pm 3\mu\text{m}$  repeatability.

### Save on design and assembly process steps

Motors and peripherals are pre-assembled and accuracy inspected before shipment. (Inspection Reports Included)

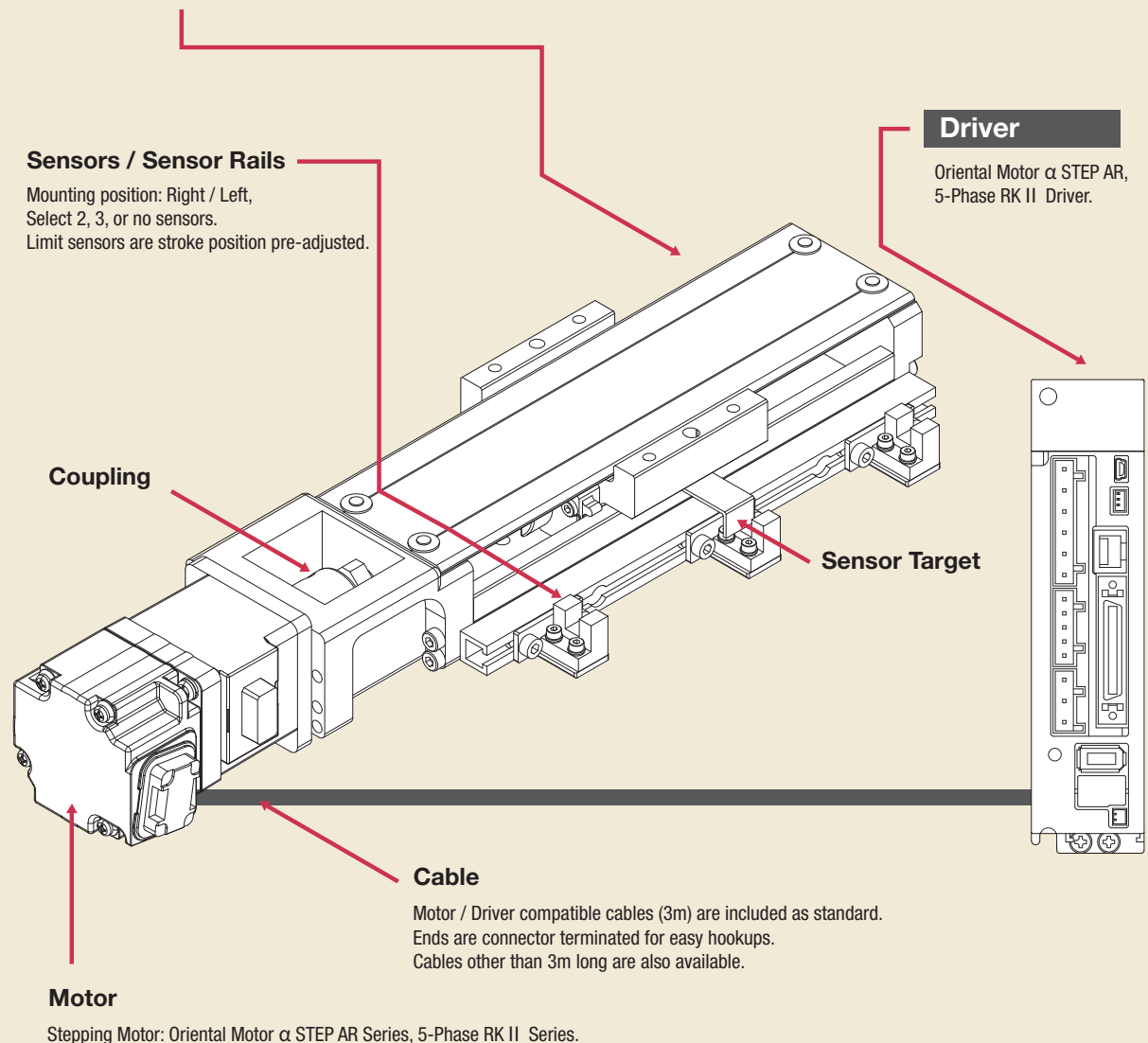
### Motor Selection

**Oriental Motor (Stepping) is offered.**

Amplifiers and drivers are also supplied in sets. Customers can freely configure with upstream control systems.



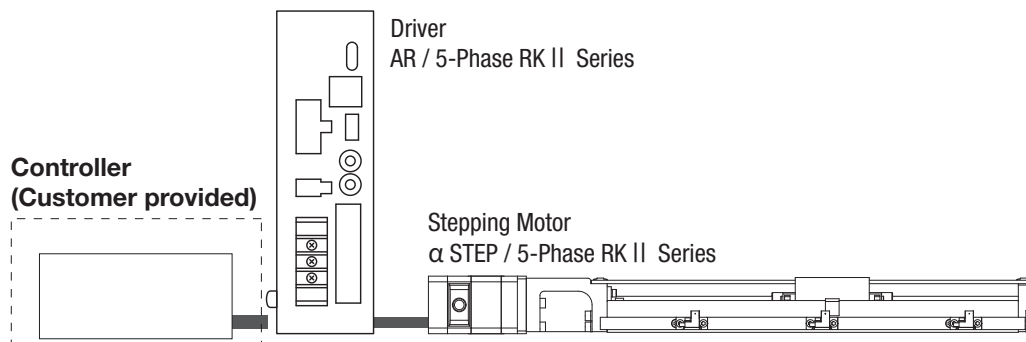
### Single Axis Actuator SX Precision Grade Two types are offered: With or without Way Cover



# Spec List

## Oriental Motor Stepping Motor Specifications

System Diagram



Specifications

Actuator	Motor, Driver Set	Motor Output	Repeatability (mm)	Load Capacity (kg)		Max. Speed (mm/sec.)		Stroke (mm)	Page		
				Horizontal	Vertical	Horizontal	Vertical				
SXM2001	AR26SAK	αSTEP	±0.003	15	2	30	—	30~130 (50 Pitch)	PA-045·046		
	AR46AA/MA	5-Phase				45	50				
	RK545AA/AMA					40	35				
SXM2005	AR26SAK			αSTEP		10	2			125	—
	AR46AA/MA	5-Phase		200						225	
	RK545AA/AMA			120						115	
SXM2602	AR26SAK			αSTEP	20	5		45	—	60~210 (50 Pitch)	PA-047·048
	AR46AA/MA	5-Phase		90				90			
	RK545AA/AMA			55				45			
SXM2605	AR26SAK			αSTEP			18	5	100		
	AR46AA/MA	5-Phase		175					175		
	RK545AA/AMA			105					80		
SXM3005	AR46AA/MA		αSTEP	32	8	160	150		40~490 (50 Pitch)	PA-049·050	
	AR66AA/MA	5-Phase	175			160					
	RK545AA/AMA		90			70					
	RK566AAE/AMAE		150			140					
SXM3010	AR46AA/MA		αSTEP			24	8	250			200
	AR66AA/MA	5-Phase	275					275			
	RK545AA/AMA		135					10			
	RK566AAE/AMAE		210					45			
SXM4510	AR66AA/MA		αSTEP	40	16	200		175	200~450 (50 Pitch)	PA-051·052	
	RK566AAE/AMAE	5-Phase	165			25					
SXM4520	AR66AA/MA	αSTEP	24			16		300			200
	RK566AAE/AMAE	5-Phase						255			10

\*The Load Capacity and Max. Speed values are our experimental values, and for reference only. The actual results will vary according to application conditions.

\*The "Horizontal" values are with motors without brake, and the "Vertical" values are with motors with brakes.

\*Accel./Decel. distances: 25mm each. 50mm each for SXM3010 and SXM4520.

## Motor Driven Linear Axis Actuators SX20 Standard / Cover Type

⊙ A unit consists of a motor, driver, coupling, cable, sensors, sensor rail and flag. Accuracy of the unit is inspected before shipment (Inspection Certificate included).

### Oriental Motor Stepping Motor Specification

RoHS



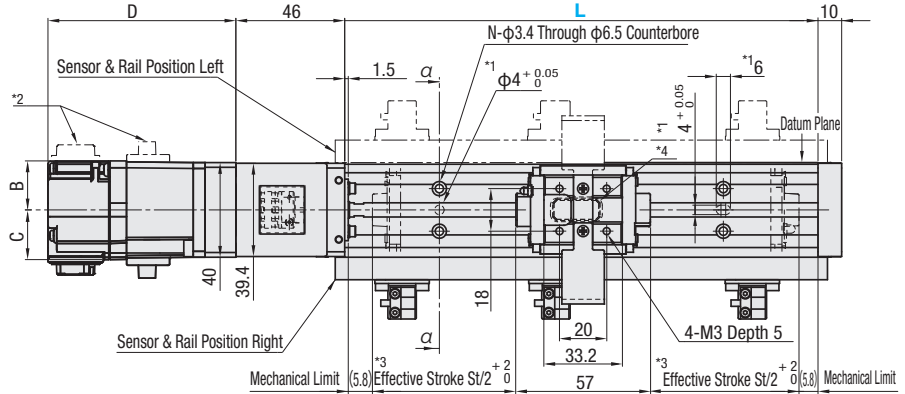
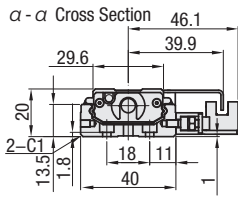
■ Components  
Actuator / Driver / Cable  
Accessories: Instruction Manual for Driver

#### ■ Actuator

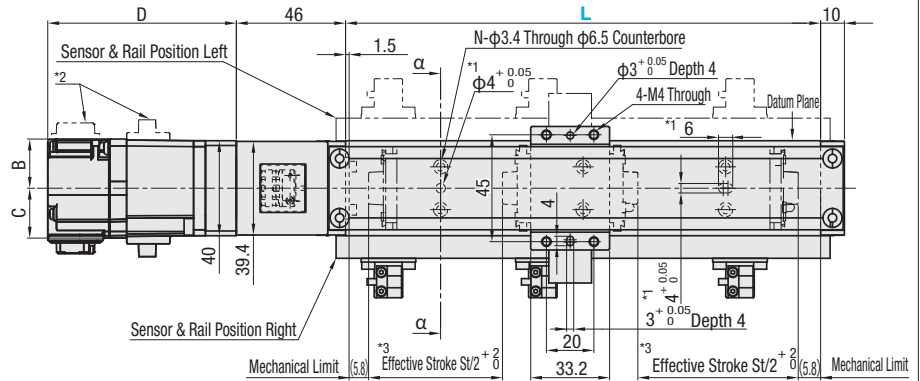
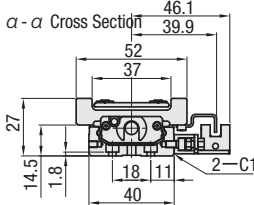
	Base	Block
<b>M</b> Material	Carbon Steel	SCM Material
<b>S</b> Surface Treatment	Low Temperature Black Chrome Plating	
<b>H</b> Hardness	Induction Hardened HRC58-64	HRC58-62

Specification of Driver PA-053~055

### SXM2001 SXM2005

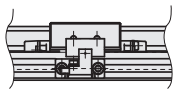


### SXM2001C SXM2005C

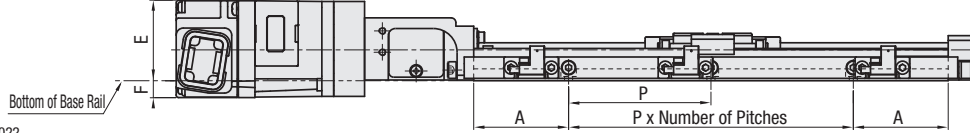


- \*1: Dowel Holes for Base Positioning
- \*2: Motor Cable will be attached to left side when position for sensor and rail is selected as "left".
- \*3: Limit sensor is adjusted to the positions that correspond to effective stroke  $St/2 + \frac{2}{0}$ .
- \*4: Ball returning plates are built with units with 5mm lead.
- \*5: Motor in the figure is for an example. For dimensions lineup, see Control Functions and Motor Dimensions Table.

#### Cover Type



#### Standard Type



⊙ For hole dimension details, PA-021 • 022  
Avoid interference with Sensor Flag.

Note: When F dimensions are minus, the motor falls below the bottom of the base rail.

### ■ Standard Specifications

Part Number	Lead (mm)	Ball Screw Diameter (mm)	Positioning Repeatability (mm)	Positioning (mm)	Parallelism (mm)	Backlash (mm)	Allowable Static Moment (N·m)		
							Ma	Mb	Mc
SXM2001	1	φ6 (Ground)	±0.003	0.02	0.01	0.003	27	27	93
SXM2005	5								
SXM2001C	1								
SXM2005C	5								

### ■ Control Functions

Manufacturer Name	Motor Type					Driver Type			Motor Driver Set Part Number	
	Selection	Motor	Manufacturer Part Number	Output / Type	Brake (Note 1)	Mass (kg)	Selection	Power Supply		Manufacturer Part Number
Oriental Motor	T1E	Stepping	ARM26SAK	αSTEP	None	0.22	D1E	DC24V	ARD-K	-
	T2E		ARM46AC			0.47			ARD-A	-
	T2BE		ARM46MC			0.62			ARD-A	-
	T4E		PKE545AC			0.38			AC100V	RKSD503-A
	T4BE	PKE545MC-A1	0.52	RKSD503M-A	-					

Load Capacity / Max. Velocity Correlation Table

Part Number	Manufacturer	Motor Type	Load Capacity (kg)		Max. Velocity (mm/sec)	
			Horizontal	Vertical	Horizontal	Vertical
SXM2001 SXM2001C	Oriental Motor	T1E	15	-	30	-
		T2 (B) E		2	45	50
		T4 (B) E			40	35
SXM2005 SXM2005C	Oriental Motor	T1E	10	-	125	-
		T2 (B) E		2	200	225
		T4 (B) E			120	115

- Ⓜ Load capacity and max. velocity are reference values and may vary depending on operating conditions.
- Ⓜ Horizontal load capacity is for motor without brake and vertical load is for motor with brake.
- Ⓜ Distance for Acceleration / Deceleration: 25mm

Motor Dimensions Table

Manufacturer Name	Motor Type	Width B(mm)	Width C(mm)	Length D(mm)	Height E (mm)	Bottom Height F (mm)
Oriental Motor	T1E	14	14	70	27	-1
	T2E	21	21	75	34	-8
	T2BE			104.6		
	T4E			53		
	T4BE			82		

\*E, F Value in ( ) is for Sensor & Rail Position "Left".

Dimensions / Actuator Body Mass

Part Number	Item	Base Length L (mm)		
		100	150	200
SXM2001 SXM2005 SXM2001C SXM2005C	Effective Stroke (St)	30	80	130
	A	20	15	40
	P	60	60	60
	Number of Pitches	1	2	2
	Number of Holes N	4	6	6
Standard Type	Body Mass (kg)	0.67	0.81	0.94
Cover Type	Body Mass (kg)	0.69	0.63	0.95

- Ⓜ Mass shown includes actuator, coupling, sensor rail, 3 sensors and sensor flag.
- Ⓜ For motor mass, see the control function table.

Cable Configuration List

Cables come with terminal plug that directly connects with motor, amplifier and driver.

Manufacturer Name	Motor Type	Motor Power Cable	Brake Cable	Encoder Cable
Oriental Motor	T1E	1 pc. CC030VA2R2	-	-
	T2E	1 pc. CC030VAR		
	T2BE	1set CC030VARB(Cable for with electromagnetic brake motor set)		
	T4E	1 pc. CC030VPF	-	
	T4BE	1set CC030VPFB(Cable for with electromagnetic brake motor set)		

- (Note 1) Choose motor with brake when unit is used in vertical position.
- (Note 2) When ordering "Without Driver" Type, driver is not included.
- (Note 3) When ordering "with cables" type, cables indicated in cable configuration list will be included with unit.
- (Note 4-1) Sensor rail comes with the unit even when no. of sensor is specified as "none"; sensor flag will not be included.
- (Note 4-2) Terminals of the sensor cable, you need connector processing.

Part Number	Selection					
	Motor Type	Driver Type	Cable (Note 3)	Number of Sensors (Note 4)	Sensor & Rail Location	Base Length L (mm)
SXM2001 SXM2005 SXM2001C SXM2005C	Select from control function table	Select from control function table	Included (3m):3 None:N	2 units:2 3 units:3 None:N	Right:R Left:L	100~200 (50 Pitch)



Part Number	-	Motor Type	-	Driver Type	-	Cable	-	Number of Sensors	-	Sensor & Rail Position	-	Base Length L
SXM2001	-	T1E	-	D1E	-	3	-	3	-	R	-	200

Actuator+Control Price (Price per Base Length L mm)

Part Number	Motor Type	Driver Type
SXM2001 SXM2005	T1E	D1E
	T2E	D2E
	T2BE	D2E
	T4E	D4E
	T4BE	D6E
SXM2001C SXM2005C	T1E	D1E
	T2E	D2E
	T2BE	D2E
	T4E	D4E
	T4BE	D6E

# Single Axis Actuator

## Motor Driven Single Axis Actuators SX26 Standard / Cover Type

⚠ A unit consists of a motor, driver, coupling, cable, sensors, sensor rail and flag. Accuracy of the unit is inspected before shipment (Inspection Certificate included).

Oriental Motor Stepping Motor Specification

Cable

Driver

Actuator (With Motor)

**RoHS**

Components  
Actuator / Driver / Cable  
Accessories: Instruction Manual for Driver

**Actuator**

	Base	Block
<b>M</b> Material	Carbon Steel	SCM Material
<b>S</b> Surface Treatment	Low Temperature Black Chrome Plating	
<b>H</b> Hardness	Induction Hardened HRC58-64	HRC58-62

Specification of Driver PA-053~055

**SXM2602**  
**SXM2605**

$\alpha$ - $\alpha$  Cross Section

Sensor & Rail Position Left

Sensor & Rail Position Right

Mechanical Limit (6.3)

Effective Stroke  $St/2 \pm \frac{0.05}{6.3}$

**SXM2602C**  
**SXM2605C**

$\alpha$ - $\alpha$  Cross Section

Sensor & Rail Position Left

Sensor & Rail Position Right

Mechanical Limit (6.3)

Effective Stroke  $St/2 \pm \frac{0.05}{6.3}$

**Cover Type**      **Standard Type**

Bottom of Base Rail

A, P, Px Number of Pitches, A

\*1: Dowel Holes for Base Positioning  
 \*2: Motor Cable will be attached to left side when position for sensor and rail is selected as "left".  
 \*3: Limit sensor is adjusted to the positions that correspond to effective stroke  $St/2 \pm \frac{0.05}{6.3}$ .  
 \*4: Lead 5 has a return tube.  
 \*5: Motor in the figure is for an example. For dimensions lineup, see Control Functions and Motor Dimensions Table.

⚠ For hole dimension details, PA-025 • 026 ⚠ Avoid interference with Sensor Flag.      Note: When F dimensions are minus, the motor falls below the bottom of the base rail.

**Standard Specifications**

Part Number	Lead (mm)	Ball Screw Diameter (mm)	Positioning Repeatability (mm)	Positioning (mm)	Parallelism (mm)	Backlash (mm)	Allowable Static Moment (N·m)		
							Ma	Mb	Mc
SXM2602	2	$\phi 8$ (Ground)	$\pm 0.003$	0.02	0.01	0.003	70	70	225
SXM2605	5								
SXM2602C	2								
SXM2605C	5								

**Control Functions**

Manufacturer Name	Motor Type						Driver Type			Motor Driver Set Part Number
	Selection	Motor	Manufacturer Part Number	Output / Type	Brake (Note 1)	Mass (kg)	Selection	Power Supply	Manufacturer Part Number	
Oriental Motor	T1E	Stepping	ARM26SAK	$\alpha$ STEP	None	0.22	D1E	DC24V	ARD-K	-
	T2E		ARM46AC			0.47	D2E		ARD-A	-
	T2BE		ARM46MC			0.62	D2E		ARD-A	-
	T4E		PKE545AC	5-phase	None	0.38	D4E	RKSD503-A	RKS545AA	
	T4BE		PKE545MC-A1			0.52		D6E	RKSD503M-A	-

Load Capacity / Max. Velocity Correlation Table

Part Number	Manufacturer	Motor Type	Load Capacity (kg)		Max. Velocity (mm/sec)	
			Horizontal	Vertical	Horizontal	Vertical
SXM2602 SXM2602C	Oriental Motor	T1E	20	-	45	-
		T2 (B) E		5	90	90
		T4 (B) E		-	55	45
SXM2605 SXM2605C	Oriental Motor	T1E	18	-	100	-
		T2 (B) E		5	175	175
		T4 (B) E		-	105	80

⚠ Load capacity and max. velocity are reference values and may vary depending on operating conditions.  
 ⚠ Horizontal load capacity is for motor without brake and vertical load is for motor with brake.  
 ⚠ Distance for Acceleration / Deceleration: 25mm

Motor Dimensions Table

Manufacturer Name	Motor Type	Width B(mm)	Width C(mm)	Length D(mm)	Height E (mm)	Bottom Height F (mm)
Oriental Motor	T1E	14	14	70	28	2
	T2E	21	21	74.5	37	-5
	T2BE			104.1		
	T4E			52.5		
	T4BE			81.5		

\*E, F Value in ( ) is for Sensor & Rail Position "Left".

Dimensions / Actuator Body Mass

Part Number	Item	Base Length L (mm)			
		150	200	250	300
SXM2602 SXM2605 SXM2602C SXM2605C	Effective Stroke (St)	60	110	160	210
	A	35	20	45	30
	P	80	80	80	80
	Number of Pitches	1	2	2	3
	Number of Holes N	4	6	6	8
Standard Type	Body Mass (kg)	1.08	1.30	1.51	1.73
Cover Type	Body Mass (kg)	1.27	1.49	1.71	1.93

⚠ Mass shown includes actuator, coupling, sensor rail, 3 sensors and sensor flag.  
 ⚠ For motor mass, see the control function table.


Cable Configuration List

Cables come with terminal plug that directly connects with motor, amplifier and driver.

Manufacturer Name	Motor Type	Motor Power Cable	Brake Cable	Encoder Cable
Oriental Motor	T1E	1pc. CC030VA2R2	-	-
	T2E	1pc. CC030VAR	-	
	T2BE	1set CC030VARB(Cable for with electromagnetic brake motor set)	-	
	T4E	1pc. CC030VPF	-	
	T4BE	1set CC030VPFB(Cable for with electromagnetic brake motor set)	-	

(Note 1) Choose motor with brake when unit is used in vertical position.  
 (Note 2) When ordering "Without Driver" Type, driver is not included.  
 (Note 3) When ordering "with cables" type, cables indicated in cable configuration list will be included with unit.  
 (Note 4-1) Sensor rail comes with the unit even when no. of sensor is specified as "none"; sensor flag will not be included.  
 (Note 4-2) Terminals of the sensor cable, you need connector processing.

Part Number	Selection					
	Motor Type	Driver Type	Cable (Note 3)	Number of Sensors (Note 4)	Sensor & Rail Location	Base Length L (mm)
SXM2602 SXM2605 SXM2602C SXM2605C	Select from control function table	Select from control function table	Included (3m):3 None:N	2 units:2 3 units:3 None:N	Right:R Left:L	150~300 (50 Pitch)

	Part Number	-	Motor Type	-	Driver Type	-	Cable	-	Number of Sensors	-	Sensor & Rail Position	-	Base Length L
	SXM2602	-	T1E	-	D1E	-	3	-	3	-	R	-	300

Actuator+Control Price (Price per Base Length L mm)

Part Number	Motor Type	Driver Type
SXM2602 SXM2605	T1E	D1E
	T2E	D2E
	T2BE	D2E
	T4E	D4E
	T4BE	D6E
SXM2602C SXM2605C	T1E	D1E
	T2E	D2E
	T2BE	D2E
	T4E	D4E
	T4BE	D6E



Load Capacity / Max. Velocity Correlation Table

Part Number	Manufacturer	Motor Type	Load Capacity (kg)		Max. Velocity (mm/sec)	
			Horizontal	Vertical	Horizontal	Vertical
SXM3005 SXM3005C	Oriental Motor	T2 (B) E	32	8	160	150
		T3 (B) E			175	160
		T4 (B) E			90	70
		T5 (B) E			150	140
SXM3010 SXM3010C	Oriental Motor	T2 (B) E	24	8	250	200
		T3 (B) E			275	275
		T4 (B) E			135	10
		T5 (B) E			210	45

- Ⓢ Load capacity and max. velocity are reference values and may vary depending on operating conditions.
- Ⓢ Horizontal load capacity is for motor without brake and vertical load is for motor with brake.
- Ⓢ Distance for Acceleration / Deceleration: 25mm

Motor Dimensions Table

Manufacturer Name	Motor Type	Width B(mm)	Width C(mm)	Length D(mm)	Height E (mm)	Bottom Height F (mm)
Oriental Motor	T2E	21	21	74.5	42	0.3
	T2BE			104.1		
	T3E	30	30	74.5	51.3	-8.7
	T3BE			109.5		
	T4E	21	21	52.5	42	0.3
	T4BE			81.5		
	T5E	30	30	69.5	51.3	-8.7
	T5BE			104.5		

\*E, F Value in ( ) is for Sensor & Rail Position "Left".

Dimensions / Actuator Body Mass

Part Number	Item	Base Length L (mm)									
		150	200	250	300	350	400	450	500	550	600
SXM3005 SXM3010 SXM3005C SXM3010C	Effective Stroke (St)	40	90	140	190	240	290	340	390	440	490
	A	25	50	50	50	50	50	50	50	50	50
	P1	-	-	100	100	100	100	100	100	100	100
	P2	100	100	50	100	50	100	50	100	50	100
	Number of Pitches	1	1	2	2	3	3	4	4	5	5
	Number of Holes N	4	4	6	6	8	8	10	10	12	12
Standard Type	Body Mass (kg)	1.64	1.99	2.32	2.67	3.01	3.36	3.70	4.04	4.39	4.73
Cover Type	Body Mass (kg)	2.09	2.43	2.78	3.12	3.47	3.82	4.16	4.50	4.84	5.19

- Ⓢ Mass shown includes actuator, coupling, sensor rail, 3 sensors and sensor flag.
- Ⓢ For motor mass, see the control function table.

Cable Configuration List

Cables come with terminal plug that directly connects with motor, amplifier and driver.

Manufacturer Name	Motor Type	Motor Power Cable	Brake Cable	Encoder Cable
Oriental Motor	T2E	1pc. CC030VAR	-	-
	T3E			
	T4E	1pc. CC030VPF	-	
	T5E			
	T2BE	1set CC030VARB		
	T3BE	(Cable for with electromagnetic brake motor set)		
	T4BE	1set CC030VPFB		
	T5BE	(Cable for with electromagnetic brake motor set)		

- (Note 1) Choose motor with brake when unit is used in vertical position.
- (Note 2) When ordering "Without Driver" Type, driver is not included.
- (Note 3) When ordering "with cables" type, cables indicated in cable configuration list will be included with unit.
- (Note 4-1) Sensor rail comes with the unit even when no. of sensor is specified as "none"; sensor flag will not be included.
- (Note 4-2) Terminals of the sensor cable, you need connector processing.

Part Number	Selection					
	Motor Type	Driver Type	Cable (Note 3)	Number of Sensors (Note 4)	Sensor & Rail Location	Base Length L (mm)
SXM3005 SXM3010 SXM3005C SXM3010C	Select from control function table	Select from control function table	Included (3m):3 None:N	2 units:2 3 units:3 None:N	Right:R Left:L	150~600 (50 Pitch)



Part Number	-	Motor Type	-	Driver Type	-	Cable	-	Number of Sensors	-	Sensor & Rail Position	-	Base Length L
SXM3005	-	T2E	-	D2E	-	3	-	3	-	R	-	600

Actuator+Control Price (Price per Base Length L mm)

Part Number	Motor Type	Driver Type
SXM3005 SXM3010	T2E	D2E
	T3E	D3E
	T4E	D4E
	T5E	D5E
	T2BE	D2E
	T3BE	D3E
	T4BE	D6E
SXM3005C SXM3010C	T5BE	D7E
	T2E	D2E
	T3E	D3E
	T4E	D4E
	T5E	D5E
	T2BE	D2E
	T3BE	D3E
T4BE	D6E	
T5BE	D7E	



Load Capacity / Max. Velocity Correlation Table

Part Number	Manufacturer	Motor Type	Load Capacity (kg)		Max. Velocity (mm/sec)	
			Horizontal	Vertical	Horizontal	Vertical
SXM4510 SXM4510C	Oriental Motor	T3 (B) E	40	16	200	175
		T5 (B) E			165	25
SXM4520 SXM4520C	Oriental Motor	T3 (B) E	24	16	300	200
		T5 (B) E			255	10

- Ⓢ Load capacity and max. velocity are reference values and may vary depending on operating conditions.
- Ⓢ Horizontal load capacity is for motor without brake and vertical load is for motor with brake.
- Ⓢ Distance for Acceleration/Deceleration: 25mm for SX4510, 50mm for SX4520

Motor Dimensions Table

Manufacturer Name	Motor Type	Width B(mm)	Width C(mm)	Length D(mm)	Height E (mm)	Bottom Height F(mm)
Oriental Motor	T3E	30	30	74.5	60	0.5
	T3BE			109.5		
	T5E			69.5		
	T5BE			104.5		

Dimensions / Actuator Body Mass

Part Number	Item	Base Length L (mm)					
		340	390	440	490	540	590
SXM4510 SXM4520 SXM4510C SXM4520C	Effective Stroke (St)	200	250	300	350	400	450
	A	70	70	70	70	70	70
	P1	100	100	100	100	100	100
	P2		50		50		50
	Number of Pitches	2	3	3	4	4	5
	Number of Holes N	6	8	8	10	10	12
Standard Type	Body Mass (kg)	6.06	6.68	7.29	7.91	8.54	9.17
Cover Type	Body Mass (kg)	7.00	7.67	8.33	9.00	9.68	10.36

- Ⓢ Mass shown includes actuator, coupling, sensor rail, 3 sensors and sensor flag.
- Ⓢ For motor mass, see the control function table.

Cable Configuration List

Cables come with terminal plug that directly connects with motor, amplifier and driver.

Manufacturer Name	Motor Type	Motor Power Cable	Brake Cable	Encoder Cable
Oriental Motor	T3E	1pc. CC030VAR	-	-
	T5E	1pc. CC030VPF	-	
	T3BE	1set CC030VARB (Cable for with electromagnetic brake motor set)		
	T5BE	1set CC030VPFB (Cable for with electromagnetic brake motor set)		

- (Note 1) Choose motor with brake when unit is used in vertical position.
- (Note 2) When ordering "Without Driver" Type, driver is not included.
- (Note 3) When ordering "with cables" type, cables indicated in cable configuration list will be included with unit.
- (Note 4-1) Sensor rail comes with the unit even when no. of sensor is specified as "none"; sensor flag will not be included.
- (Note 4-2) Terminals of the sensor cable, you need connector processing.

Part Number	Selection					
	Motor Type	Driver Type	Cable (Note 3)	Number of Sensors (Note 4)	Sensor & Rail Location	Base Length L (mm)
SXM4510 SXM4520 SXM4510C SXM4520C	Select from control function table	Select from control function table	Included (3m):3 None:N	2 units:2 3 units:3 None:N	Right:R Left:L	340~590 (50 Pitch)

Ordering Example	Part Number	-	Motor Type	-	Driver Type	-	Cable	-	Number of Sensors	-	Sensor & Rail Position	-	Base Length L
	SXM4510	-	T3E	-	D3E	-	3	-	3	-	R	-	590

Actuator+Control Price (Price per Base Length L mm)

Part Number	Motor Type	Driver Type
SXM4510 SXM4520	T3E	D3E
	T5E	D5E
	T3BE	D3E
	T5BE	D7E
SXM4510C SXM4520C	T3E	D3E
	T5E	D5E
	T3BE	D3E
	T5BE	D7E