Lightweight Actuator

ALK



A lightweight model with
a body made of aluminum alloy

Lightweight aluminum body



Lightweight Actuator

ALK

A lightweight LM Guide actuator whose components are made of aluminum alloy, except for its main elements: the LM Guide, ball screw, and support unit. It helps make the moving parts of equipment lighter.

When compared with steel-base THK product:

Max. 49% lighter*



* This varies by model and stroke.

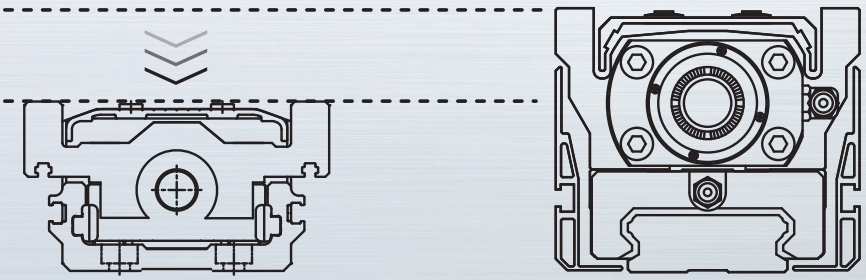


The ALK achieves significant weight reduction while still leveraging the performance of the main components, such as the smooth movement of the LM Guide and the high drive efficiency of the ball screw.

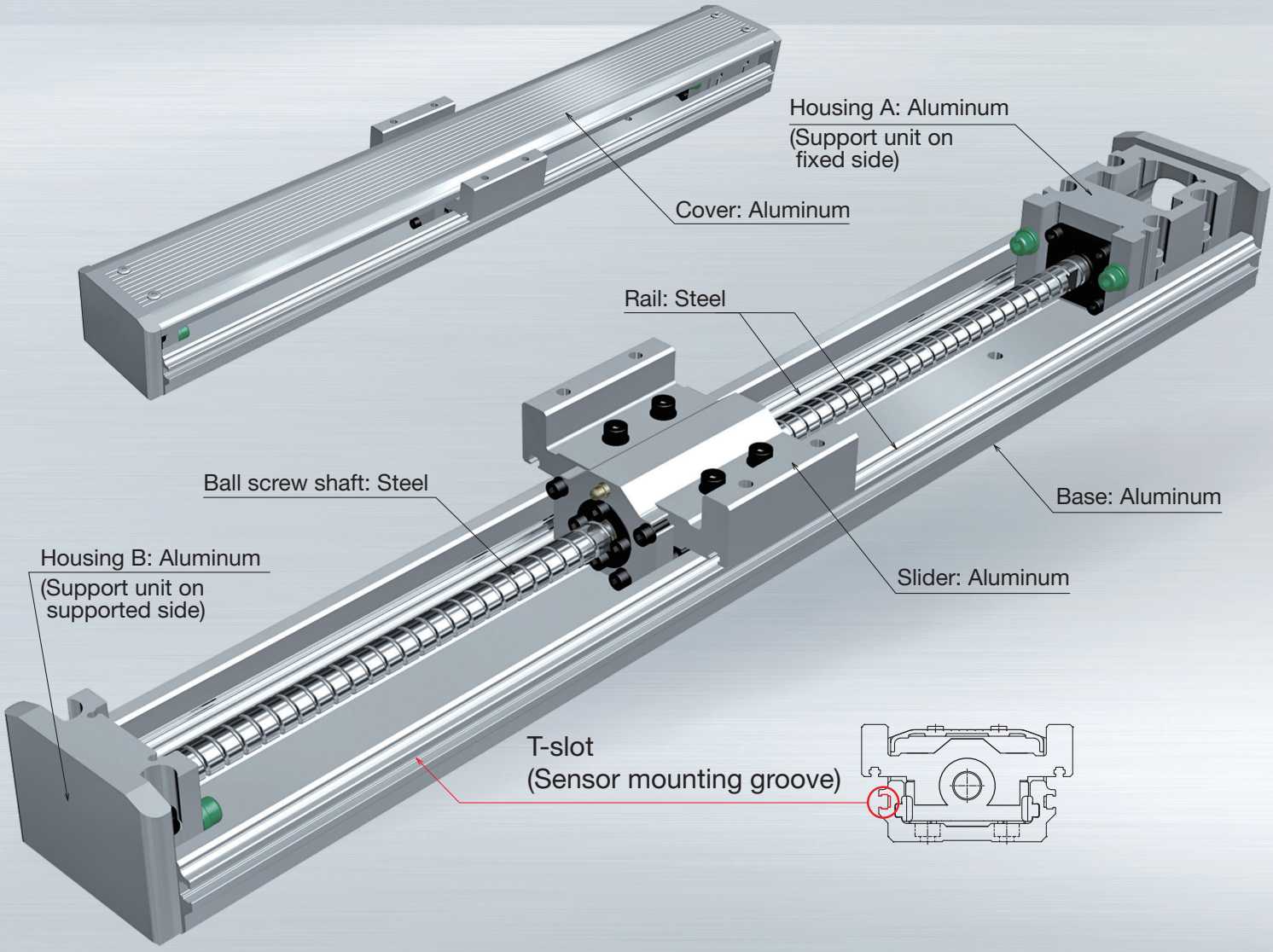
Reduces weight of moving machine parts

Lower weight of the finished axis reduces the load on the lower axis

A compact body that eliminates waste



ALK Note) Comparison against a product with a 100 W motor US8T



Modularization reduces the number of parts

Compact structure combining an LM Guide, ball screw, and support unit.
Modularization reduces the number of parts, design time, and assembly time.

Number of parts **33%** reduction

Design time **57%** reduction

Assembly time **50%** reduction

Compact body with an integrated T-slot

A T-slot for mounting overrun or other types of sensors is integrated with the base for simple installation.

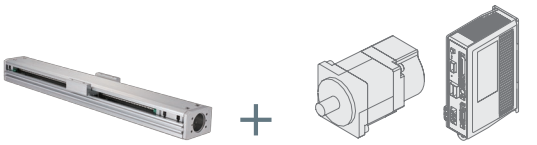
Other Features

Service Life Calculation

Because the LM Guide and ball screw are made of steel, the service life can be calculated based on the usage conditions (see p. 23).

Various Types of Motors Can Be Mounted Depending on the Application

Intermediate flanges are available for mounting various types of motor to the ALK.
You can employ the type of control you are used to.

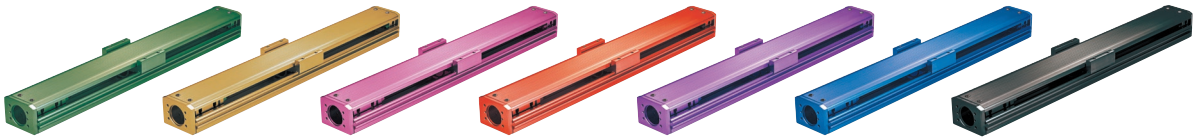


Various motors and drivers

Compatible motor manufacturers:
YASKAWA Electric Corporation, Mitsubishi Electric Corporation, TAMAGAWA SEIKI CO., LTD., Panasonic Corporation, KEYENCE CORPORATION, SANYO DENKI CO., LTD., OMRON Corporation, FANUC CORPORATION, ORIENTAL MOTOR CO., LTD.

Variety of Colors for Your Equipment Concept[1]

Choose from seven colors to fit your application.



[1] Please contact THK for more information on color variations.

Series Overview

Model	Ball screw lead (mm)	Stroke (mm)	Estimated motor capacity (W)	Maximum load capacity[2] (kg)			
				Horizontal	Wall-mounted	Vertical	
ALK20	6	30 to 130	50	11	4	2	
ALK26	6	60 to 210	50	27.5	12	4	
ALK30	6	50 to 500	100	35	19	4	
	10			24	13.5	4	
ALK45	10	200 to 800	200	60.5	28	13.5	
	20			34.5	20	8	

[2] Maximum load capacity refers to the mass at the below speed and acceleration/deceleration.
Speed: The rated rotational speed of the motor (3,000 min^{-1}).
Acceleration/deceleration: 0.15 G for a 6 mm lead, 0.3 G for a 10 mm or higher lead.
[3] The maximum speed is restricted by the permissible speed of the actuator.

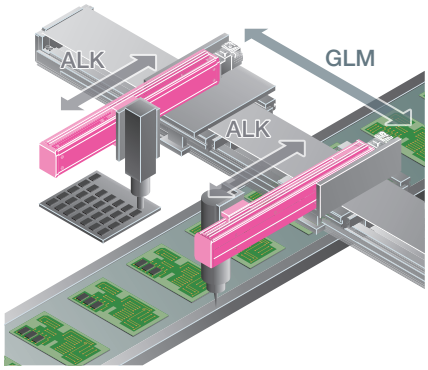
Model Number Coding

Model ①	Ball screw lead ②	Slider type ③		Stroke ④		With/without motor ⑤		Cover ⑥	Sensor ⑦	Housing A/ Intermediate flange ⑧
ALK20	06	A	–	0130	–	0	–	1	0	A0
ALK20	06: 6 mm	A: 1 block		0030: 30 mm		0: Without motor		1: With cover	0	A0
ALK26	10: 10 mm			to					2	AN
ALK30	20: 20 mm			0800: 800 mm					6	AP
ALK45									E	AQ
									J	AR
									M	AS
										AT
										AU
										AY

Example Applications

Electronic component industry

Electronic component assembly equipment



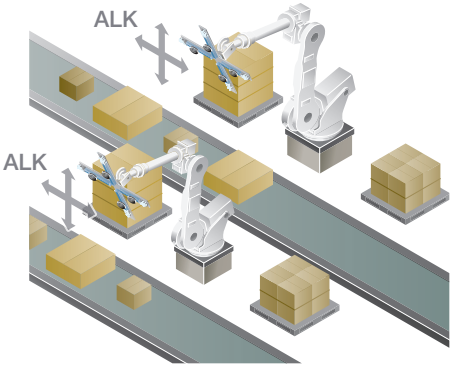
The ALK is used in the parts that move the workpiece. Utilization of an aluminum alloy body makes the unit lightweight, enabling shortened takt times.

Models used

Y axis: ALK
X axis: GLM

General industry

Work hand



The ALK is used in the hand of the vertical articulated robot. Productivity is improved by reducing the load on the lower axis due to weight reduction.

Model used

Hand: ALK

	Maximum speed at each stroke[3] (mm/s)																	Page
	Stroke (mm)																	
	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800		
	600																	p. 7
	500																	p. 11
	470								395									p. 15
	790								650									
	520														430			p. 19
	1050														840			

ALK20

Servo motor 10 W | Servo motor 20 W | Servo motor 30 W | Servo motor 50 W | Stepper motor 28×28 | Stepper motor 42×42 | Motor Direct coupling | Body width 40 mm | Body height 32 mm | Stroke max. 130 mm | Speed max. 600 mm/s

Model Number Coding

Model ①	Ball screw lead ②	Slider type ③		Stroke ④		With/without motor ⑤		Cover ⑥	Sensor ⑦	Housing A/ Intermediate flange ⑧
ALK20	06	A	–	0130	–	0	–	1	0	A0
ALK20	06: 6 mm	A: 1 block		0030: 30 mm		0: Without motor		1: With cover	0	A0
				0080: 80 mm					2	AN
				0130: 130 mm					6	AP
									E	AQ
									J	AR
									M	AS

Sensors
→ p. 9

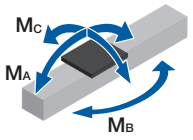
Selection Information

Basic Specifications

LM Guide	Basic dynamic load rating C (N)		2380
	Basic static load rating C_0 (N)		2970
	Radial clearance (mm)		0 max.
	Geometric moment of inertia[1,2]	I_X (mm^4)	8.54×10^3
		I_Y (mm^4)	7.17×10^4
		Mass (kg/m)	0.787
Ball screw	Ball screw lead (mm)		6
	Basic dynamic load rating Ca (N)		1060
	Basic static load rating C_0a (N)		1610
	Screw shaft diameter (mm)		ϕ6
	Thread minor diameter (mm)		ϕ5.07
	Ball center-to-center diameter (mm)		ϕ6.3
	Permissible rotational speed[3] (min^{-1})		6000
Bearing unit (fixed side)	Axial direction	Basic dynamic load rating Ca (N)	980
		Static permissible load P_0a (N)	250
Starting torque[4] (N·m)			0.005
Positioning repeatability[5] (mm)			±0.01
Backlash (mm)			0.02
Permissible input torque (N·m)			0.27
Permissible moment[6] (N·m)			M_A: 1.6, M_B: 3.8, M_C: 16
Standard grease/Grease nipple used			AFB–LF/PB107

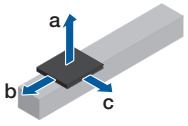
[1] I_X is the geometric moment of inertia about the X axis.
[2] I_Y is the geometric moment of inertia about the Y axis.
[3] The permissible rotational speed may decrease as the stroke becomes longer.
[4] The starting torque refers to the values when standard grease is used.
[5] The values shown are those when using an inspection motor.
[6] This is the maximum load that can be permitted while the product is stationary and in motion.

Permissible Moment



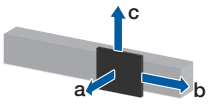
Permissible Overhang Length[7]

Horizontal



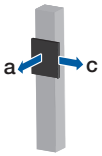
Ball screw lead (mm)	Load mass (kg)	a (mm)	b (mm)	c (mm)
6	2	400	70	270
	4	200	30	130
	8	80	10	60

Wall-Mounted



Ball screw lead (mm)	Load mass (kg)	a (mm)	b (mm)	c (mm)
6	1	400	270	400
	2	210	130	400
	4	90	50	330

Vertical



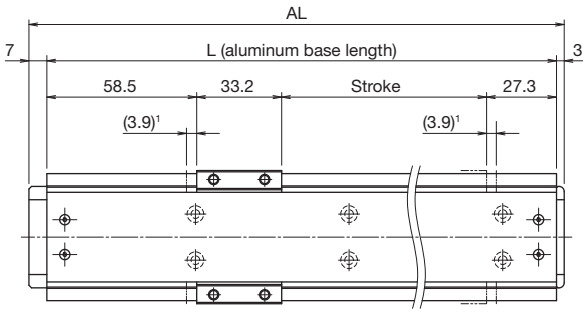
Ball screw lead (mm)	Load mass (kg)	a (mm)	c (mm)
6	0.5	290	400
	1	140	240
	2	60	100

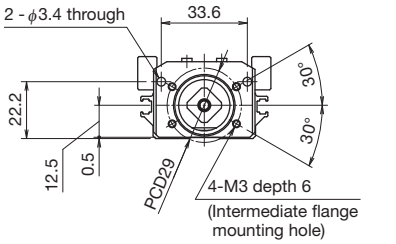
[7] This is the overhang length in all directions with a service life of 5,000 km.
It is the permissible value when loaded in one direction.

Motor Selection Information

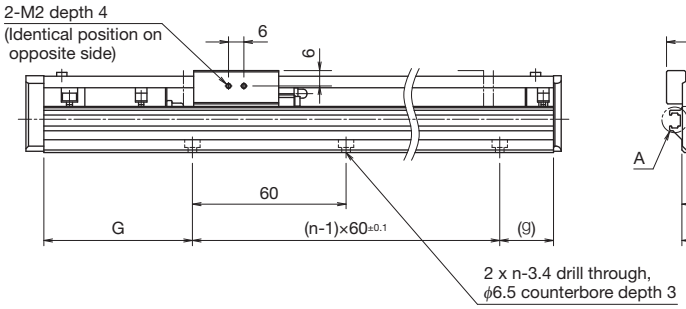
Stroke (mm)	Base length (mm)	LM Guide		Ball screw		Motor mounting part
		Moving part mass (kg)	Sliding resistance (N)	Lead (mm)	Shaft length (mm)	Shaft end diameter (mm)
30 to 130	149 to 249	0.059	1.5	6	130 to 230	ϕ4h7

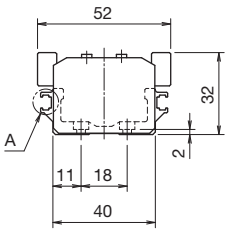
Dimensions

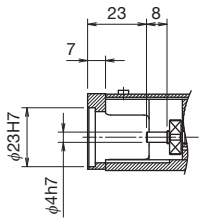




Side surface without motor (when A0 is selected)[2]







Motor attachment details (when A0 is selected)[2]

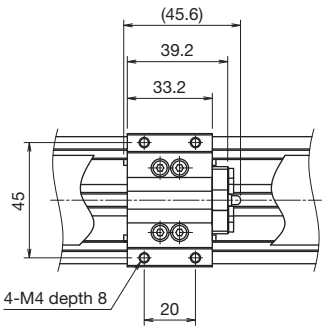
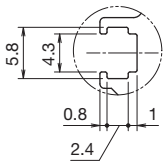


Table details



A details

[1] This is the stroke up to the mechanical stopper.
[2] Please see p. 10 for information on the intermediate flange dimension.

Stroke (mm) (Stroke between mechanical stoppers)		30 (37.8)	80 (87.8)	130 (137.8)
Maximum speed[3] (mm/s)	Ball screw lead: 6 mm	600		
Dimensions (mm)	AL	159	209	259
	L	149	199	249
	G	58	58	70
	g	31	21	59
No. of mounting holes	n	2	3	3
Mass (kg)		0.37	0.44	0.5

[3] The maximum speed is restricted by the permissible speed of the actuator.

Options

Sensors

Optional proximity sensors and photo sensors are available. If you select the sensor option, the dedicated sensor dog will be included. See the following precautions (Notes 1 to 2) before using.

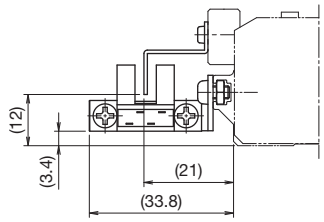
Symbol	Details	Model	Accessories
0	None	—	—
2	Photo sensors[1] (x3)	EE–SX671 (OMRON Corporation)	Mounting screw/nut, sensor dog (x1 or x2), mounting plates (x3), connectors (EE–1001 x3)
6	Photo sensors[1] (x3)	EE–SX674 (OMRON Corporation)	Mounting screw/nut, sensor dog (x1 or x2), mounting plates (x3), connectors (EE–1001 x3)
E	Proximity sensors: N.O. contact[2] (x1) N.C. contact[3] (x2)	APM–D3A1–001 (Azbil Corporation) APM–D3B1–003 (Azbil Corporation)	Mounting screws, nuts, sensor dog (x1 or x2)
J	Proximity sensors: N.O. contact[2] (x1) N.C. contact[3] (x2)	GX–F12A (Panasonic Industrial Devices SUNX Co., Ltd.) GX–F12B (Panasonic Industrial Devices SUNX Co., Ltd.)	Mounting screws, nuts, sensor dog (x1 or x2)
M	Sensors: N.O. contact[2] (x1) (PNP output) N.C. contact[3] (x2) (PNP output)	GX–F12A–P (Panasonic Industrial Devices SUNX Co., Ltd.) GX–F12B–P (Panasonic Industrial Devices SUNX Co., Ltd.)	Mounting screws, nuts, sensor dog (x1 or x2)

[1] The photo sensors can be switched between ON when lit and ON when unlit.
[2] N.O. contact: Normally open contact
[3] N.C. contact: Normally closed contact

Note 1) If proximity sensors are close to one another, they may not function properly. If that happens, please prepare a type with a different frequency.
Note 2) It is possible to install sensors other than those listed above. Contact THK for details.

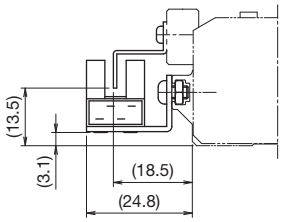
Photo Sensor Mounting Dimensions

Sensor dog width: 10 mm



Symbol	Model	Manufacturer
2	EE–SX671	OMRON Corporation

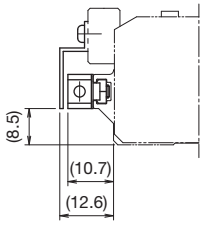
Sensor dog width: 10 mm



Symbol	Model	Manufacturer
6	EE–SX674	OMRON Corporation

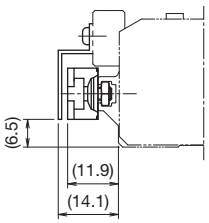
Proximity Sensor Mounting Dimensions

Sensor dog width: 10 mm



Symbol	Model	Manufacturer
E	APM–D3A1–001	Azbil Corporation
	APM–D3B1–003	

Sensor dog width: 10 mm



Symbol	Model	Manufacturer
J	GX–F12A	Panasonic Industrial Devices SUNX Co., Ltd.
	GX–F12B	
M	GX–F12A–P	
	GX–F12B–P	

Intermediate Flange

Several types of intermediate flanges for mounting motors are available.
Specify an intermediate flange that matches the motor used.

Motors Used and Corresponding Intermediate Flanges

Motor type	Manufacturer	Motor model			Motor rated output (W)	Flange size	Housing A/ Intermediate flange	Compatible coupling models	
								MIKI PULLEY CO., LTD.	Nabeya Bi-tech Kaisha (NBK)
AC servo motor	YASKAWA Electric Corporation	Σ–Vmini		SGMMV–A1	10	25×25	AN	SFC–010DA2–4B–5B–L32	XGT2–15C–4–5
				SGMMV–A2	20				
				SGMMV–A3	30				
		Σ–V		SGMJV–A5	50	40×40	AQ	SFC–010DA2–4B–8B	XGT2–19C–4–8
				SGMAV–A5					
		Σ–7		SGM7J–A5	50	40×40	AQ	SFC–010DA2–4B–8B	XGT2–19C–4–8
				SGM7A–A5					
		Σ–X		SGMXJ–A5	50	40×40	AQ	SFC–010DA2–4B–8B	XGT2–19C–4–8
				SGMXA–A5					
	Mitsubishi Electric Corporation	MELSERVO	J4	HG–AK0136	10	25×25	AN	SFC–010DA2–4B–5B–L32	XGT2–15C–4–5
				HG–AK0236	20				
				HG–AK0336	30				
				HG–KR053	50	40×40	AQ	SFC–010DA2–4B–8B	XGT2–19C–4–8
				HG–MR053					
			J5	HK–KT053W	50	40×40	AQ	SFC–010DA2–4B–8B	XGT2–19C–4–8
			JN	HF–KN053	50	40×40	AQ	SFC–010DA2–4B–8B	XGT2–19C–4–8

Note 3) The table shows only a portion of the model numbers for motors. For details regarding model numbers, please see the catalog for each respective motor manufacturer. You may not be able to mount the motor depending on the options, so please confirm beforehand.
Note 4) If the maximum torque of the installed motor will exceed the permissible input torque (p. 7), please consider a safety measure to limit the torque.

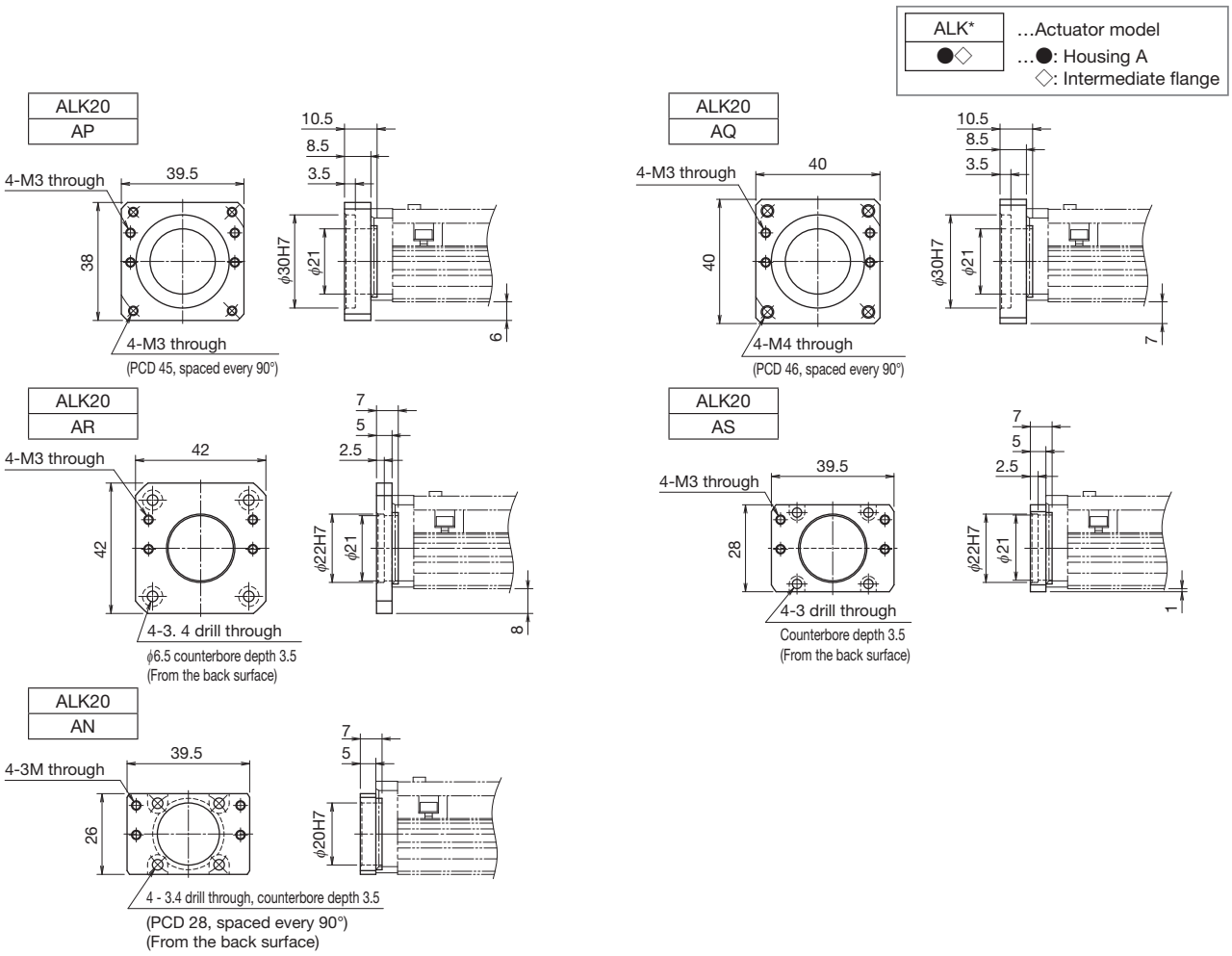
Motors Used and Corresponding Intermediate Flanges

Motor type	Manufacturer	Motor model			Motor rated output (W)	Flange size	Housing A/ Intermediate flange	Compatible coupling models	
								MIKI PULLEY CO., LTD.	Nabeya Bi-tech Kaisha (NBK)
AC servo motor	TAMAGAWA SEIKI CO., LTD.	TBL–iII		TS4602	50	40×40	AQ	SFC–010DA2–4B–8B	XGT2–19C–4–8
		TBL–iIV		TSM3102	50	40×40	AQ	SFC–010DA2–4B–8B	XGT2–19C–4–8
	Panasonic Corporation	MINAS	A5	MSMD5A	50	38×38	AP	SFC–010DA2–4B–8B	XGT2–19C–4–8
				MSME5A					
			A6	MSMF5A	50	38×38	AP	SFC–010DA2–4B–8B	XGT2–19C–4–8
				MHMF5A		40×40	AQ	SFC–010DA2–4B–8B	XGT2–19C–4–8
	KEYENCE CORPORATION	SV		SV–M005	50	40×40	AQ	SFC–010DA2–4B–8B	XGT2–19C–4–8
		SV2		SV2–M005	50	40×40	AQ	SFC–010DA2–4B–8B	XGT2–19C–4–8
	SANYO DENKI CO., LTD.	SANMOTION R		R2AA04005	50	40×40	AQ	SFC–010DA2–4B–8B	XGT2–19C–4–8
	OMRON Corporation	OMNUC G5		R88M–K05030	50	40×40	AQ	SFC–010DA2–4B–8B	XGT2–19C–4–8
	FANUC CORPORATION	βis series		βis 0.2/5000	50	40×40	AQ	SFC–010DA2–4B–8B	XGT2–19C–4–8

Motor type	Manufacturer	Motor model			Flange size	Housing A/ Intermediate flange	Compatible coupling models	
							MIKI PULLEY CO., LTD.	Nabeya Bi-tech Kaisha (NBK)
Stepper motor	ORIENTAL MOTOR CO., LTD.	αStep		AZ2*, AR2*	28×28	AS	SFC–010DA2–4B–5B–L32	XGT2–15C–4–5
				AZ4*, AR4*	42×42	AR	SFC–010DA2–4B–6B	XGT2–15C–4–6
		5–phase	CRK	CRK52*	28×28	AS	SFC–010DA2–4B–5B–L32	XGT2–15C–4–5
				CRK54*	42×42	AR	SFC–010DA2–4B–5B	XGT2–15C–4–5
			RKII	RKS54*	42×42	AR	SFC–010DA2–4B–6B	XGT2–15C–4–6
			CVK	PKP52*	28×28	AS	SFC–010DA2–4B–5B–L32	XGT2–15C–4–5
				PKP54*	42×42	AR	SFC–010DA2–4B–5B	XGT2–15C–4–5
		2–phase	PKP/ CVD	PKP22*	28×28	AS	SFC–010DA2–4B–5B–L32	XGT2–15C–4–5
				PKP24*	42×42	AR	SFC–010DA2–4B–5B	XGT2–15C–4–5
	KEYENCE CORPORATION	2–phase		QS–M28	28×28	AS	SFC–010DA2–4B–5B–L32	XGT2–15C–4–5
				QS–M42	42×42	AR	SFC–010DA2–4B–5B	XGT2–15C–4–5
	SANYO DENKI CO., LTD.	PB		PBDM28*	28×28	AS	SFC–010DA2–4B–5B	XGT2–15C–4–5
				PBDM423, PBA* *423	42×42	AR	SFC–010DA2–4B–6B	XGT2–15C–4–6
		5–phase		FAF/FDF52*	28×28	AS	SFC–010DA2–4B–5B–L32	XGT2–15C–4–5
				FAF54*/FDF54*/ FA511M42/FB511M42	42×42	AR	SFC–010DA2–4B–6B	XGT2–15C–4–6
		2–phase		D*14S28*	28×28	AS	SFC–010DA2–4B–5B–L32	XGT2–15C–4–5
				DB14H52*	42×42	AR	SFC–010DA2–4B–5B	XGT2–15C–4–5
				DU15H52*	42×42	AR	SFC–010DA2–4B–5B	XGT2–15C–4–5

Note 1) The table shows only a portion of the model numbers for motors. For details regarding model numbers, please see the catalog for each respective motor manufacturer. You may not be able to mount the motor depending on the options, so please confirm beforehand.

Note 2) If the maximum torque of the installed motor will exceed the permissible input torque (p. 7), please consider a safety measure to limit the torque.



Note 3) See “Side surface without motor” and “Motor attachment details” for intermediate flange A0. (p. 8)

ALK26

Servo motor 10 W | Servo motor 20 W | Servo motor 30 W | Servo motor 50 W | Stepper motor 28×28 | Stepper motor 42×42 | Motor Direct coupling | Body width 50 mm | Body height 40 mm | Stroke max. 210 mm | Speed max. 500 mm/s

Model Number Coding

Model ①	Ball screw lead ②	Slider type ③		Stroke ④		With/without motor ⑤		Cover ⑥	Sensor ⑦	Housing A/ Intermediate flange ⑧
ALK26	06	A	–	0210	–	0	–	1	0	A0
ALK26	06: 6 mm	A: 1 block		0060: 60 mm		0: Without motor		1: With cover	0	A0
				0110: 110 mm					2	AN
				0160: 160 mm					6	AP
				0210: 210 mm					E	AQ
									J	AR
									M	AS

Sensors
→ p. 13

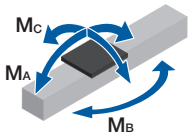
Selection Information

Basic Specifications

LM Guide	Basic dynamic load rating C (N)		4630
	Basic static load rating C_0 (N)		6000
	Radial clearance (mm)		0 max.
	Geometric moment of inertia[1,2]	I_X (mm^4)	1.65×10^4
		I_Y (mm^4)	1.55×10^5
		Mass (kg/m)	1.154
Ball screw	Ball screw lead (mm)		6
	Basic dynamic load rating Ca (N)		2390
	Basic static load rating C_0a (N)		3900
	Screw shaft diameter (mm)		ϕ8
	Thread minor diameter (mm)		ϕ6.77
	Ball center-to-center diameter (mm)		ϕ8.4
	Permissible rotational speed[3] (min^{-1})		5000
Bearing (fixed side)	Axial direction	Basic dynamic load rating Ca (N)	1370
		Static permissible load P_0a (N)	640
Starting torque[4] (N·m)			0.015
Positioning repeatability[5] (mm)			±0.01
Backlash (mm)			0.02
Permissible input torque (N·m)			0.68
Permissible moment[6] (N·m)			M_A: 3.6, M_B: 8.6, M_C: 22
Standard grease/Grease nipple used			AFB–LF/PB107

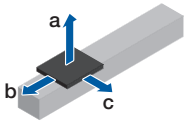
[1] I_X is the geometric moment of inertia about the X axis.
[2] I_Y is the geometric moment of inertia about the Y axis.
[3] The permissible rotational speed may decrease as the stroke becomes longer.
[4] The starting torque refers to the values when standard grease is used.
[5] The values shown are those when using an inspection motor.
[6] This is the maximum load that can be permitted while the product is stationary and in motion.

Permissible Moment



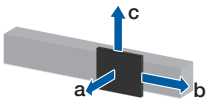
Permissible Overhang Length[7]

Horizontal



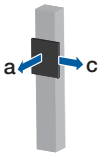
Ball screw lead (mm)	Load mass (kg)	a (mm)	b (mm)	c (mm)
6	4.5	500	80	310
	9	230	40	150
	18	90	10	60

Wall-Mounted



Ball screw lead (mm)	Load mass (kg)	a (mm)	b (mm)	c (mm)
6	2.5	500	270	500
	5.5	210	110	500
	11.5	80	40	370

Vertical



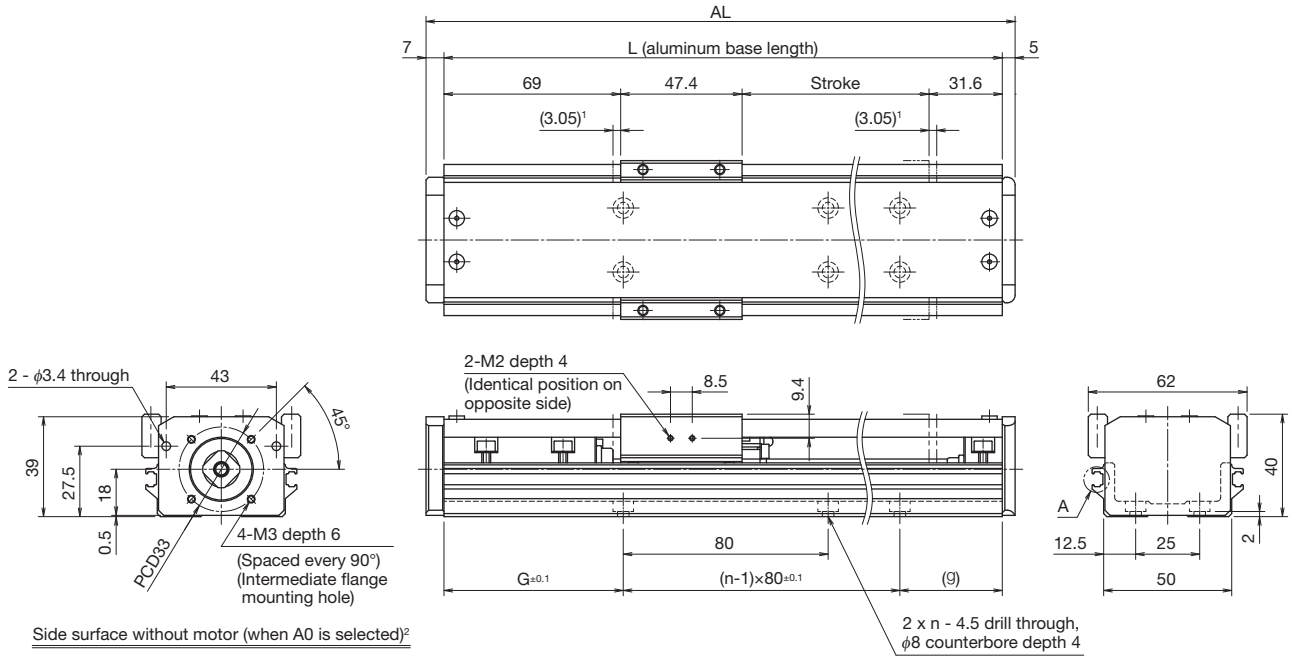
Ball screw lead (mm)	Load mass (kg)	a (mm)	c (mm)
6	1	390	500
	2	180	320
	4	80	140

[7] This is the overhang length in all directions with a service life of 5,000 km.
It is the permissible value when loaded in one direction.

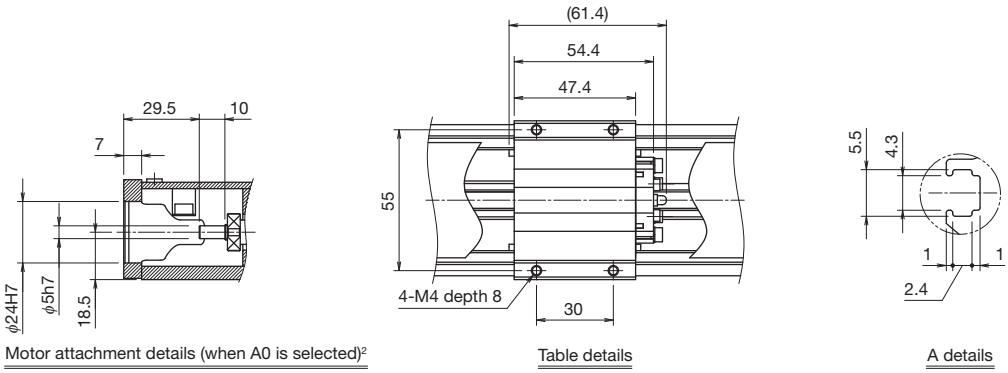
Motor Selection Information

Stroke (mm)	Base length (mm)	LM Guide		Ball screw		Motor mounting part
		Moving part mass (kg)	Sliding resistance (N)	Lead (mm)	Shaft length (mm)	Shaft end diameter (mm)
60 to 210	208 to 358	0.186	2	6	183 to 333	ϕ5h7

Dimensions



Side surface without motor (when A0 is selected)[2]



Motor attachment details (when A0 is selected)[2]

Table details

A details

[1] This is the stroke up to the mechanical stopper.

[2] Please see p. 14 for information on the intermediate flange dimension.

Stroke (mm) (Stroke between mechanical stoppers)		60 (66.1)	110 (116.1)	160 (166.1)	210 (216.1)
Maximum speed[3] (mm/s)	Ball screw lead: 6 mm	500			
Dimensions (mm)	AL	220	270	320	370
	L	208	258	308	358
	G	70	70	90	90
	g	58	28	58	28
No. of mounting holes	n	2	3	3	4
Mass (kg)		0.75	0.86	0.97	1.08

[3] The maximum speed is restricted by the permissible speed of the actuator.

Options

Sensors

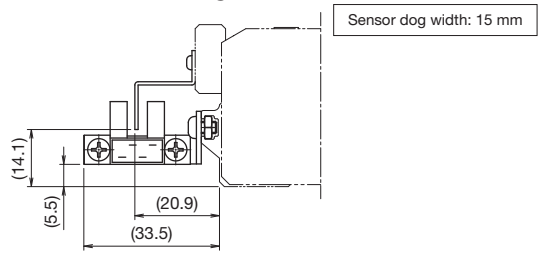
Optional proximity sensors and photo sensors are available. If you select the sensor option, the dedicated sensor dog will be included. See the following precautions (Notes 1 to 2) before using.

Symbol	Details	Model	Accessories
0	None	—	—
2	Photo sensors[1] (x3)	EE–SX671 (OMRON Corporation)	Mounting screw/nut, sensor dog (x1 or x2), mounting plates (x3), connectors (EE–1001 x3)
6	Photo sensors[1] (x3)	EE–SX674 (OMRON Corporation)	Mounting screw/nut, sensor dog (x1 or x2), mounting plates (x3), connectors (EE–1001 x3)
E	Proximity sensors: N.O. contact[2] (x1) N.C. contact[3] (x2)	APM–D3A1–001 (Azbil Corporation) APM–D3B1–003 (Azbil Corporation)	Mounting screws, nuts, sensor dog (x1 or x2)
J	Proximity sensors: N.O. contact[2] (x1) N.C. contact[3] (x2)	GX–F12A (Panasonic Industrial Devices SUNX Co., Ltd.) GX–F12B (Panasonic Industrial Devices SUNX Co., Ltd.)	Mounting screws, nuts, sensor dog (x1 or x2)
M	Sensors: N.O. contact[2] (x1) (PNP output) N.C. contact[3] (x2) (PNP output)	GX–F12A–P (Panasonic Industrial Devices SUNX Co., Ltd.) GX–F12B–P (Panasonic Industrial Devices SUNX Co., Ltd.)	Mounting screws, nuts, sensor dog (x1 or x2)

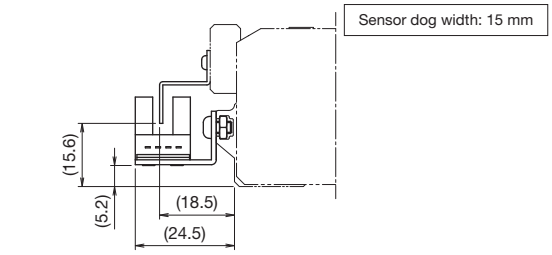
[1] The photo sensors can be switched between ON when lit and ON when unlit.
[2] N.O. contact: Normally open contact
[3] N.C. contact: Normally closed contact

Note 1) If proximity sensors are close to one another, they may not function properly. If that happens, please prepare a type with a different frequency.
Note 2) It is possible to install sensors other than those listed above. Contact THK for details.

Photo Sensor Mounting Dimensions

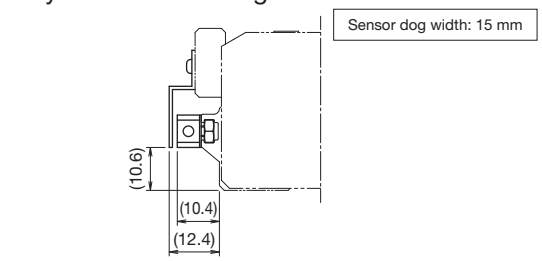


Symbol	Model	Manufacturer
2	EE–SX671	OMRON Corporation

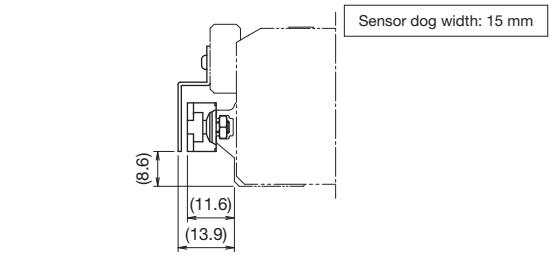


Symbol	Model	Manufacturer
6	EE–SX674	OMRON Corporation

Proximity Sensor Mounting Dimensions



Symbol	Model	Manufacturer
E	APM–D3A1–001	Azbil Corporation
	APM–D3B1–003	



Symbol	Model	Manufacturer
J	GX–F12A	Panasonic Industrial Devices SUNX Co., Ltd.
	GX–F12B	
M	GX–F12A–P	
	GX–F12B–P	

Intermediate Flange

Several types of intermediate flanges for mounting motors are available.
Specify an intermediate flange that matches the motor used.

Motors Used and Corresponding Intermediate Flanges

Motor type	Manufacturer	Motor model			Motor rated output (W)	Flange size	Housing A/ Intermediate flange	Compatible coupling models	
								MIKI PULLEY CO., LTD.	Nabeya Bi-tech Kaisha (NBK)
AC servo motor	YASKAWA Electric Corporation	Σ–Vmini		SGMMV–A1	10	25×25	AN	SFC–010DA2–5B–5B–L37	XGL2–15C–5–5
				SGMMV–A2	20				
				SGMMV–A3	30				
		Σ–V		SGMJV–A5	50	40×40	AQ	SFC–010DA2–5B–8B–L32	XGT2–19C–5–8
				SGMAV–A5					
		Σ–7		SGM7J–A5	50	40×40	AQ	SFC–010DA2–5B–8B–L32	XGT2–19C–5–8
				SGM7A–A5					
		Σ–X		SGMXJ–A5	50	40×40	AQ	SFC–010DA2–5B–8B–L32	XGT2–19C–5–8
				SGMXA–A5					
	Mitsubishi Electric Corporation	MELSERVO	J4	HG–AK0136	10	25×25	AN	SFC–010DA2–5B–5B–L37	XGL2–15C–5–5
				HG–AK0236	20				
				HG–AK0336	30				
				HG–KR053	50	40×40	AQ	SFC–010DA2–5B–8B–L32	XGT2–19C–5–8
				HG–MR053					
			J5	HK–KT053W	50	40×40	AQ	SFC–010DA2–5B–8B–L32	XGT2–19C–5–8
			JN	HF–KN053	50	40×40	AQ	SFC–010DA2–5B–8B–L32	XGT2–19C–5–8

Note 3) The table shows only a portion of the model numbers for motors. For details regarding model numbers, please see the catalog for each respective motor manufacturer. You may not be able to mount the motor depending on the options, so please confirm beforehand.
Note 4) If the maximum torque of the installed motor will exceed the permissible input torque (p. 11), please consider a safety measure to limit the torque.

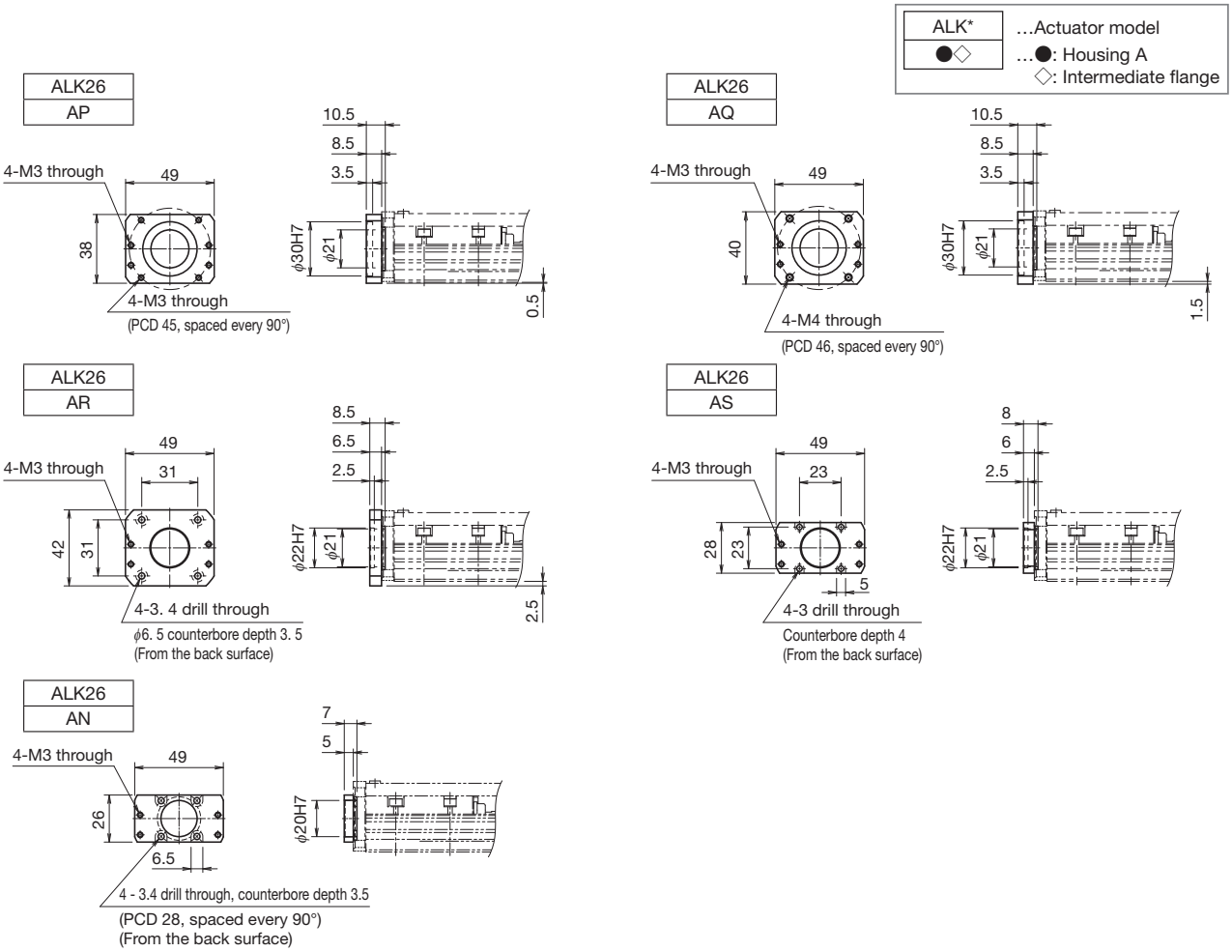
Motors Used and Corresponding Intermediate Flanges

Motor type	Manufacturer	Motor model			Motor rated output (W)	Flange size	Housing A/ Intermediate flange	Compatible coupling models	
								MIKI PULLEY CO., LTD.	Nabeya Bi-tech Kaisha (NBK)
AC servo motor	TAMAGAWA SEIKI CO., LTD.	TBL–iII		TS4602	50	40×40	AQ	SFC–010DA2–5B–8B–L32	XGT2–19C–5–8
		TBL–iIV		TSM3102	50	40×40	AQ	SFC–010DA2–5B–8B–L32	XGT2–19C–5–8
	Panasonic Corporation	MINAS	A5	MSMD5A	50	38×38	AP	SFC–010DA2–5B–8B–L32	XGT2–19C–5–8
				MSME5A					
			A6	MSMF5A	50	38×38	AP	SFC–010DA2–5B–8B–L32	XGT2–19C–5–8
				MHMF5A		40×40	AQ	SFC–010DA2–5B–8B–L32	XGT2–19C–5–8
	KEYENCE CORPORATION	SV		SV–M005	50	40×40	AQ	SFC–010DA2–5B–8B–L32	XGT2–19C–5–8
		SV2		SV2–M005	50	40×40	AQ	SFC–010DA2–5B–8B–L32	XGT2–19C–5–8
	SANYO DENKI CO., LTD.	SANMOTION R		R2AA04005	50	40×40	AQ	SFC–010DA2–5B–8B–L32	XGT2–19C–5–8
	OMRON Corporation	OMNUC G5		R88M–K05030	50	40×40	AQ	SFC–010DA2–5B–8B–L32	XGT2–19C–5–8
	FANUC CORPORATION	βis series		βis 0.2/5000	50	40×40	AQ	SFC–010DA2–5B–8B–L32	XGT2–19C–5–8

Motor type	Manufacturer	Motor model			Flange size	Housing A/ Intermediate flange	Compatible coupling models	
							MIKI PULLEY CO., LTD.	Nabeya Bi-tech Kaisha (NBK)
Stepper motor	ORIENTAL MOTOR CO., LTD.	αStep		AZ2*, AR2*	28×28	AS	SFC–010DA2–5B–5B–L39	XGL2–15C–5–5
				AZ4*, AR4*	42×42	AR	SFC–010DA2–5B–6B–L37	XGL2–15C–5–6
		5–phase	CRK	CRK52*	28×28	AS	SFC–010DA2–5B–5B–L39	XGL2–15C–5–5
				CRK54*	42×42	AR	SFC–010DA2–5B–5B–L37	XGL2–15C–5–5
			RKII	RKS54*	42×42	AR	SFC–010DA2–5B–6B–L37	XGL2–15C–5–6
			CVK	PKP52*	28×28	AS	SFC–010DA2–5B–5B–L39	XGL2–15C–5–5
				PKP54*	42×42	AR	SFC–010DA2–5B–5B–L37	XGL2–15C–5–5
		2–phase	PKP/ CVD	PKP22*	28×28	AS	SFC–010DA2–5B–5B–L39	XGL2–15C–5–5
				PKP24*	42×42	AR	SFC–010DA2–5B–5B–L37	XGL2–15C–5–5
	KEYENCE CORPORATION	2–phase		QS–M28	28×28	AS	SFC–010DA2–5B–5B–L39	XGL2–15C–5–5
				QS–M42	42×42	AR	SFC–010DA2–5B–5B–L37	XGL2–15C–5–5
	SANYO DENKI CO., LTD.	PB		PBDM28*	28×28	AS	SFC–010DA2–5B–5B–L39	XGL2–15C–5–5
				PBDM423, PBA* *423	42×42	AR	SFC–010DA2–5B–6B–L37	XGL2–15C–5–6
		5–phase		FAF/FDF52*	28×28	AS	SFC–010DA2–5B–5B–L39	XGL2–15C–5–5
				FAF54*/FDF54*/ FA511M42/FB511M42	42×42	AR	SFC–010DA2–5B–6B–L37	XGL2–15C–5–6
		2–phase		D*14S28*	28×28	AS	SFC–010DA2–5B–5B–L39	XGL2–15C–5–5
				DB14H52*	42×42	AR	SFC–010DA2–5B–5B–L37	XGT2–15C–5–5
				DU15H52*	42×42	AR	SFC–010DA2–5B–5B–L37	XGT2–15C–5–5

Note 1) The table shows only a portion of the model numbers for motors. For details regarding model numbers, please see the catalog for each respective motor manufacturer. You may not be able to mount the motor depending on the options, so please confirm beforehand.

Note 2) If the maximum torque of the installed motor will exceed the permissible input torque (p. 11), please consider a safety measure to limit the torque.



Note 3) See “Side surface without motor” and “Motor attachment details” for intermediate flange A0. (p. 12)

ALK30

Servo motor 50 W | Servo motor 80 W | Servo motor 100 W | Servo motor 150 W | Stepper motor 56×56 | Stepper motor 56.4×56.4 | Stepper motor 60×60 | Motor Direct coupling | Body width 60 mm | Body height 45 mm | Stroke max. 500 mm | Speed max. 790 mm/s

Model Number Coding

Model ①	Ball screw lead ②	Slider type ③		Stroke ④		With/without motor ⑤		Cover ⑥	Sensor ⑦	Housing A/ Intermediate flange ⑧
ALK30	06	A	–	0300	–	0	–	1	0	A0
ALK30	06: 6 mm	A: 1 block		0050: 50 mm		0: Without motor		1: With cover	0	A0
	10: 10 mm			0100: 100 mm					2	AP
				0200: 200 mm					6	AQ
				0300: 300 mm					E	AT
				0400: 400 mm					J	AU
				0500: 500 mm					M	

Sensors
→ p. 17

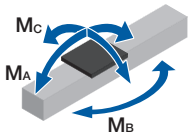
Selection Information

Basic Specifications

LM Guide	Basic dynamic load rating C (N)		6920	
	Basic static load rating C_0 (N)		8430	
	Radial clearance (mm)		0 max.	
	Geometric moment of inertia[1,2]	I_X (mm^4)	2.48×10^4	
		I_Y (mm^4)	2.76×10^5	
		Mass (kg/m)	1.531	
Ball screw	Ball screw lead (mm)		6	10
	Basic dynamic load rating Ca (N)		2800	2100
	Basic static load rating C_0a (N)		5100	3900
	Screw shaft diameter (mm)		ϕ10	
	Thread minor diameter (mm)		ϕ8.77	
	Ball center-to-center diameter (mm)		ϕ10.4	
	Permissible rotational speed[3] (min^{-1})		4700	4740
Bearing (fixed side)	Axial direction	Basic dynamic load rating Ca (N)	2060	
		Static permissible load P_0a (N)	1810	
Starting torque[4] (N·m)			0.07	
Positioning repeatability[5] (mm)			±0.01	
Backlash (mm)			0.02	
Permissible input torque (N·m)			1.23	
Permissible moment[6] (N·m)			M_A: 4.2, M_B: 11, M_C: 29	
Standard grease/Grease nipple used			AFB–LF/PB107	

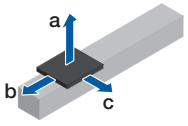
[1] I_x is the geometric moment of inertia about the X axis.
[2] I_y is the geometric moment of inertia about the Y axis.
[3] The permissible rotational speed may decrease as the stroke becomes longer.
[4] The starting torque refers to the values when standard grease is used.
[5] The values shown are those when using an inspection motor.
[6] This is the maximum load that can be permitted while the product is stationary and in motion.

Permissible Moment



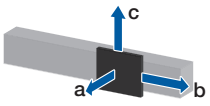
Permissible Overhang Length[7]

Horizontal



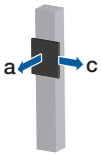
Ball screw lead (mm)	Load mass (kg)	a (mm)	b (mm)	c (mm)
6	8.5	600	70	310
	17	280	30	140
	34	120	10	60
10	4.5	540	120	420
	9.5	240	50	190
	19	100	20	80

Wall-Mounted



Ball screw lead (mm)	Load mass (kg)	a (mm)	b (mm)	c (mm)
6	4.5	540	250	600
	9	250	110	600
	18	100	40	510
10	3	490	310	600
	6	230	140	600
	12.5	90	50	280

Vertical



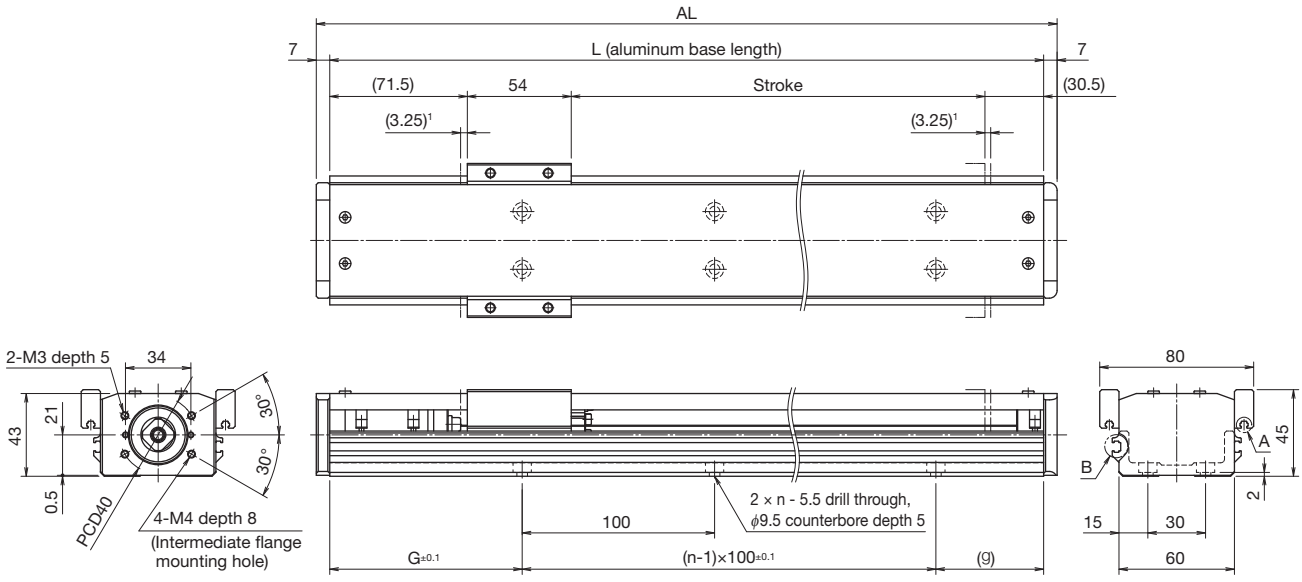
Ball screw lead (mm)	Load mass (kg)	a (mm)	c (mm)
6	1	600	600
	2	330	570
	4	150	260
10	1	520	600
	2	250	430
	4	110	190

[7] This is the overhang length in all directions with a service life of 5,000 km.
It is the permissible value when loaded in one direction.

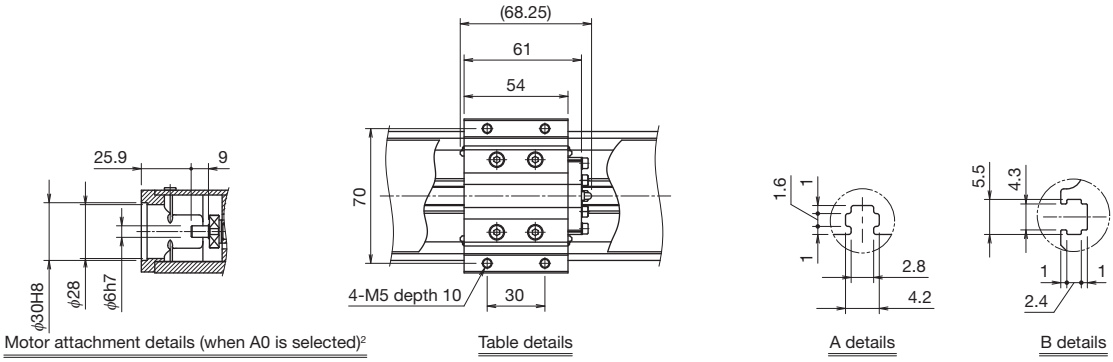
Motor Selection Information

Stroke (mm)	Base length (mm)	LM Guide		Ball screw		Motor mounting part
		Moving part mass (kg)	Sliding resistance (N)	Lead (mm)	Shaft length (mm)	Shaft end diameter (mm)
50 to 500	206 to656	0.32	2.5	6, 10	184 to634	ϕ6h7

Dimensions



Side surface without motor (when A0 is selected)[2]



Motor attachment details (when A0 is selected)[2]

Table details

A details

B details

[1] This is the stroke up to the mechanical stopper.
[2] Please see p. 18 for information on the intermediate flange dimension.

Stroke (mm) (Stroke between mechanical stoppers)		50 (56.5)	100 (106.5)	200 (206.5)	300 (306.5)	400 (406.5)	500 (506.5)
Maximum speed[3] (mm/s)	Ball screw lead: 6 mm	470					395
	Ball screw lead: 10 mm	790					650
Dimensions (mm)	AL	220	270	370	470	570	670
	L	206	256	356	456	556	656
	G	75	100	100	100	100	100
	g	31	56	56	56	56	56
No. of mounting holes	n	2	2	3	4	5	6
Mass (kg)		1.2	1.3	1.6	1.8	2.1	2.4

[3] The maximum speed is restricted by the permissible speed of the actuator.

Options

Sensors

Optional proximity sensors and photo sensors are available. If you select the sensor option, the dedicated sensor dog will be included. See the following precautions (Notes 1 to 2) before using.

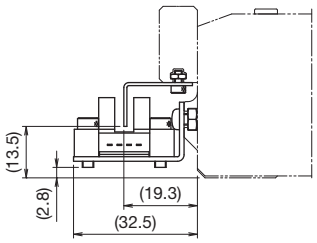
Symbol	Details	Model	Accessories
0	None	—	—
2	Photo sensors[1] (x3)	EE–SX671 (OMRON Corporation)	Mounting screw/nut, sensor dog (x1 or x2), mounting plates (x3), connectors (EE–1001 x3)
6	Photo sensors[1] (x3)	EE–SX674 (OMRON Corporation)	Mounting screw/nut, sensor dog (x1 or x2), mounting plates (x3), connectors (EE–1001 x3)
E	Proximity sensors: N.O. contact[2] (x1) N.C. contact[3] (x2)	APM–D3A1–001 (Azbil Corporation) APM–D3B1–003 (Azbil Corporation)	Mounting screws, nuts, sensor dog (x1 or x2)
J	Proximity sensors: N.O. contact[2] (x1) N.C. contact[3] (x2)	GX–F12A (Panasonic Industrial Devices SUNX Co., Ltd.) GX–F12B (Panasonic Industrial Devices SUNX Co., Ltd.)	Mounting screws, nuts, sensor dog (x1 or x2)
M	Sensors: N.O. contact[2] (x1) (PNP output) N.C. contact[3] (x2) (PNP output)	GX–F12A–P (Panasonic Industrial Devices SUNX Co., Ltd.) GX–F12B–P (Panasonic Industrial Devices SUNX Co., Ltd.)	Mounting screws, nuts, sensor dog (x1 or x2)

[1] The photo sensors can be switched between ON when lit and ON when unlit.
[2] N.O. contact: Normally open contact
[3] N.C. contact: Normally closed contact

Note 1) If proximity sensors are close to one another, they may not function properly. If that happens, please prepare a type with a different frequency.
Note 2) It is possible to install sensors other than those listed above. Contact THK for details.

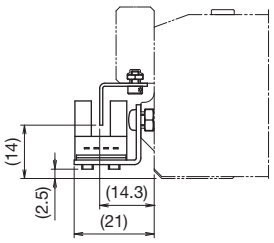
Photo Sensor Mounting Dimensions

Sensor dog width: 10 mm



Symbol	Model	Manufacturer
2	EE–SX671	OMRON Corporation

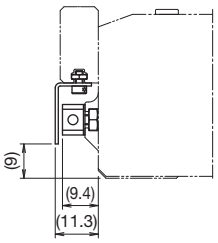
Sensor dog width: 10 mm



Symbol	Model	Manufacturer
6	EE–SX674	OMRON Corporation

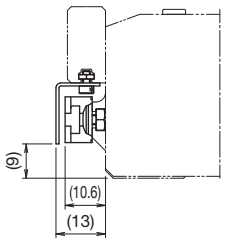
Proximity Sensor Mounting Dimensions

Sensor dog width: 10 mm



Symbol	Model	Manufacturer
E	APM–D3A1–001	Azbil Corporation
	APM–D3B1–003	

Sensor dog width: 10 mm



Symbol	Model	Manufacturer
J	GX–F12A	Panasonic Industrial Devices SUNX Co., Ltd.
	GX–F12B	
M	GX–F12A–P	
	GX–F12B–P	

Intermediate Flange

Several types of intermediate flanges for mounting motors are available.
Specify an intermediate flange that matches the motor used.

Motors Used and Corresponding Intermediate Flanges

Motor type	Manufacturer	Motor model		Motor rated output (W)	Flange size	Housing A/ Intermediate flange	Compatible coupling models	
							MIKI PULLEY CO., LTD.	Nabeya Bi-tech Kaisha (NBK)
AC servo motor	YASKAWA Electric Corporation	Σ–V	SGMJV–A5	50	40×40	AQ	SFC–020DA2–6B–8B	XGT2–19C–6–8
			SGMAV–A5					
			SGMJV–01	100	40×40	AQ		
			SGMAV–01					
			SGMJV–C2	150	40×40	AQ		
		Σ–7	SGM7J–A5	50	40×40	AQ	SFC–020DA2–6B–8B	XGT2–19C–6–8
			SGM7A–A5					
			SGM7J–01	100	40×40	AQ		
			SGM7A–01					
			SGM7J–C2	150	40×40	AQ		
		Σ–X	SGMXJ–A5	50	40×40	AQ	SFC–020DA2–6B–8B	XGT2–19C–6–8
			SGMXA–A5					
			SGMXJ–01	100	40×40	AQ		
			SGMXA–01					
			SGMXJ–C2	150	40×40	AQ		
			SGMXA–C2					

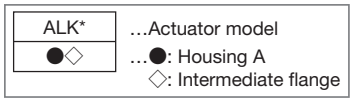
Note 3) The table shows only a portion of the model numbers for motors. For details regarding model numbers, please see the catalog for each respective motor manufacturer. You may not be able to mount the motor depending on the options, so please confirm beforehand.
Note 4) If the maximum torque of the installed motor will exceed the permissible input torque (p. 15), please consider a safety measure to limit the torque.

Motors Used and Corresponding Intermediate Flanges

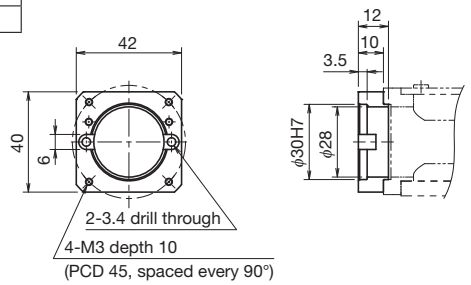
Motor type	Manufacturer	Motor model			Motor rated output (W)	Flange size	Housing A/ Intermediate flange	Compatible coupling models	
								MIKI PULLEY CO., LTD.	Nabeya Bi-tech Kaisha (NBK)
AC servo motor	Mitsubishi Electric Corporation	MELSERVO	J4	HG–KR053	50	40×40	AQ	SFC–020DA2–6B–8B	XGT2–19C–6–8
				HG–MR053					
				HG–KR13	100	40×40	AQ		
				HG–MR13					
			J5	HK–KT053W	50	40×40	AQ	SFC–020DA2–6B–8B	XGT2–19C–6–8
				HK–KT13W	100	40×40	AQ		
			JN	HF–KN053	50	40×40	AQ	SFC–020DA2–6B–8B	XGT2–19C–6–8
				HF–KN13	100	40×40	AQ		
	TAMAGAWA SEIKI CO., LTD.	TBL–iII		TS4602	50	40×40	AQ	SFC–020DA2–6B–8B	XGT2–19C–6–8
				TS4603	100	40×40	AQ		
				TS4604	150	40×40	AQ		
		TBL–iIV		TSM3102	50	40×40	AQ	SFC–020DA2–6B–8B	XGT2–19C–6–8
				TSM3104	100	40×40	AQ		
	Panasonic Corporation	MINAS	A5	MSMD5A	50	38×38	AP	SFC–020DA2–6B–8B	XGT2–19C–6–8
				MSME5A					
				MSMD01	100	38×38	AP		
				MSME01					
			A6	MSMF5A	50	38×38	AP	SFC–020DA2–6B–8B	XGT2–19C–6–8
				MHMF5A		40×40	AQ	SFC–020DA2–6B–8B	XGT2–19C–6–8
				MSMF01	100	38×38	AP	SFC–020DA2–6B–8B	XGT2–19C–6–8
				MHMF01		40×40	AQ	SFC–020DA2–6B–8B	XGT2–19C–6–8
	KEYENCE CORPORATION	SV		SV–M005	50	40×40	AQ	SFC–020DA2–6B–8B	XGT2–19C–6–8
				SV–M010	100	40×40	AQ		
		SV2		SV2–M005	50	40×40	AQ	SFC–020DA2–6B–8B	XGT2–19C–6–8
				SV2–M010	100	40×40	AQ		
	SANYO DENKI CO., LTD.	SANMOTION R		R2□A04005	50	40×40	AQ	SFC–020DA2–6B–8B	XGT2–19C–6–8
				R2AA04008	80	40×40	AQ		
				R2□A04010	100	40×40	AQ		
	OMRON Corporation	OMNUC G5		R88M–K05030	50	40×40	AQ	SFC–020DA2–6B–8B	XGT2–19C–6–8
				R88M–K10030	100	40×40	AQ		
		1S		R88M–1M10030	100	40×40	AQ	SFC–020DA2–6B–8B	XGT2–19C–6–8
	FANUC CORPORATION	βis series		βis 0.2/5000	50	40×40	AQ	SFC–020DA2–6B–8B	XGT2–19C–6–8
				βis0.3/5000	100	40×40	AQ		

Motor type	Manufacturer	Motor model			Flange size	Housing A/ Intermediate flange	Compatible coupling models	
							MIKI PULLEY CO., LTD.	Nabeya Bi-tech Kaisha (NBK)
Stepper motor	ORIENTAL MOTOR CO., LTD.	αStep		AZ6*, AR6*	60×60	AU	SFC–020DA2–6B–10B	XGT2–25C–6–10
		5–phase	CRK	CRK56* (CRK569PM*)	60×60	AU	SFC–020DA2–6B–8B (SFC–020DA2–6B–10B)	XGT2–25C–6–8 (XGT2–25C–6–10)
			RKII	RKS56*	60×60	AU	SFC–020DA2–6B–10B	XGT2–25C–6–10
			CVK	PKP56*	56.4×56.4	AT	SFC–020DA2–6B–8B	XGT2–19C–6–8
				PKP56* (PKP569FM*)	60×60	AU	SFC–020DA2–6B–8B (SFC–020DA2–6B–10B)	XGT2–25C–6–8 (XGT2–25C–6–10)
		2–phase	PKP/ CVD	PKP26*	56.4×56.4	AT	SFC–020DA2–6B–8B	XGT2–25C–6–8
	KEYENCE CORPORATION	2–phase		QS–M60	60×60	AU	SFC–020DA2–6B–8B	XGT2–25C–6–8
	SANYO DENKI CO., LTD.	PB		PBDM60*, PBA* *60*	60×60	AU	SFC–020DA2–6B–10B–L34	XGT2–25C–6–10
		5–phase		FAF56*/FDM56*/FA512M60/FB512M60	60×60	AU	SFC–020DA2–6B–10B–L34	XGT2–25C–6–10
		2–phase		D*16H71*	56×56	AT	SFC–020DA2–6B–6.35B–L34	XGT2–19C–6–6.35
				DB16H78*	60×60	AU	SFC–020DA2–6B–8B–L34	XGT2–25C–6–8

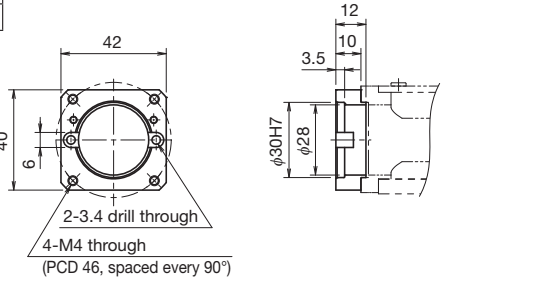
Note 1) The table shows only a portion of the model numbers for motors. For details regarding model numbers, please see the catalog for each respective motor manufacturer. You may not be able to mount the motor depending on the options, so please confirm beforehand.
Note 2) If the maximum torque of the installed motor will exceed the permissible input torque (p. 15), please consider a safety measure to limit the torque.



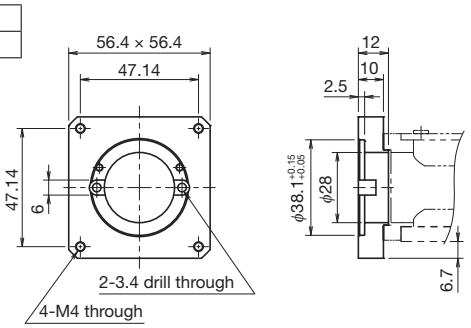
ALK30
AP



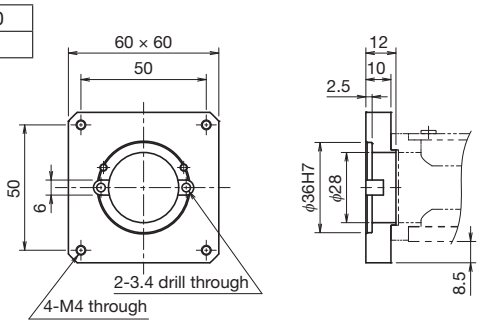
ALK30
AQ



ALK30
AT



ALK30
AU



Note 3) See “Side surface without motor” and “Motor attachment details” for intermediate flange A0. (p. 16)

ALK45

Servo motor 200 W | Servo motor 400 W | Servo motor 600 W | Stepper motor 60×60 | Motor Direct coupling | Body width 80 mm | Body height 67 mm | Stroke max. 800 mm | Speed max. 1050 mm/s

Model Number Coding

Model ①	Ball screw lead ②	Slider type ③		Stroke ④		With/without motor ⑤		Cover ⑥	Sensor ⑦	Housing A/ Intermediate flange ⑧
ALK45	10	A	–	0400	–	0	–	1	0	A0
ALK45	10: 10 mm	A: 1 block		0200: 200 mm		0: Without motor		1: With cover	0	A0
	20: 20 mm			0300: 300 mm					2	AU
				0400: 400 mm					6	AY
				0500: 500 mm					E	
				0600: 600 mm					J	
				0700: 700 mm					M	
				0800: 800 mm						

Sensors
→ p. 21

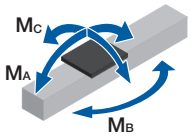
Selection Information

Basic Specifications

LM Guide	Basic dynamic load rating C (N)		13180	
	Basic static load rating C_0 (N)		17540	
	Radial clearance (mm)		0 max.	
	Geometric moment of inertia[1,2]	I_X (mm^4)	9.08×10^4	
		I_Y (mm^4)	9.17×10^5	
		Mass (kg/m)	2.953	
Ball screw	Ball screw lead (mm)		10	20
	Basic dynamic load rating Ca (N)		3020	2920
	Basic static load rating C_0a (N)		5400	5720
	Screw shaft diameter (mm)		ϕ15	
	Thread minor diameter (mm)		ϕ13.07	
	Ball center-to-center diameter (mm)		ϕ15.5	
	Permissible rotational speed[3] (min^{-1})		3120	3150
Bearing (fixed side)	Axial direction	Basic dynamic load rating Ca (N)	6660	
		Static permissible load P_0a (N)	3240	
Starting torque[4] (N·m)			0.1	
Positioning repeatability[5] (mm)			±0.01	
Backlash (mm)			0.02	
Permissible input torque (N·m)			5.34	
Permissible moment[6] (N·m)			M_A: 23, M_B: 49, M_C: 69	
Standard grease/Grease nipple used			AFB–LF/A–M6F	

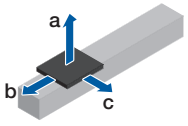
[1] I_x is the geometric moment of inertia about the X axis.
[2] I_y is the geometric moment of inertia about the Y axis.
[3] The permissible rotational speed may decrease as the stroke becomes longer.
[4] The starting torque refers to the values when standard grease is used.
[5] The values shown are those when using an inspection motor.
[6] This is the maximum load that can be permitted while the product is stationary and in motion.

Permissible Moment



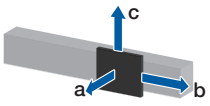
Permissible Overhang Length[7]

Horizontal



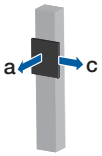
Ball screw lead (mm)	Load mass (kg)	a (mm)	b (mm)	c (mm)
10	10.5	700	160	480
	21	320	70	220
	42	130	30	100
20	7	640	190	490
	14	290	90	240
	28	110	30	110

Wall-Mounted



Ball screw lead (mm)	Load mass (kg)	a (mm)	b (mm)	c (mm)
10	6.5	670	440	800
	13	300	200	800
	26.5	120	80	490
20	4.5	580	510	800
	9	260	230	800
	18	100	90	330

Vertical



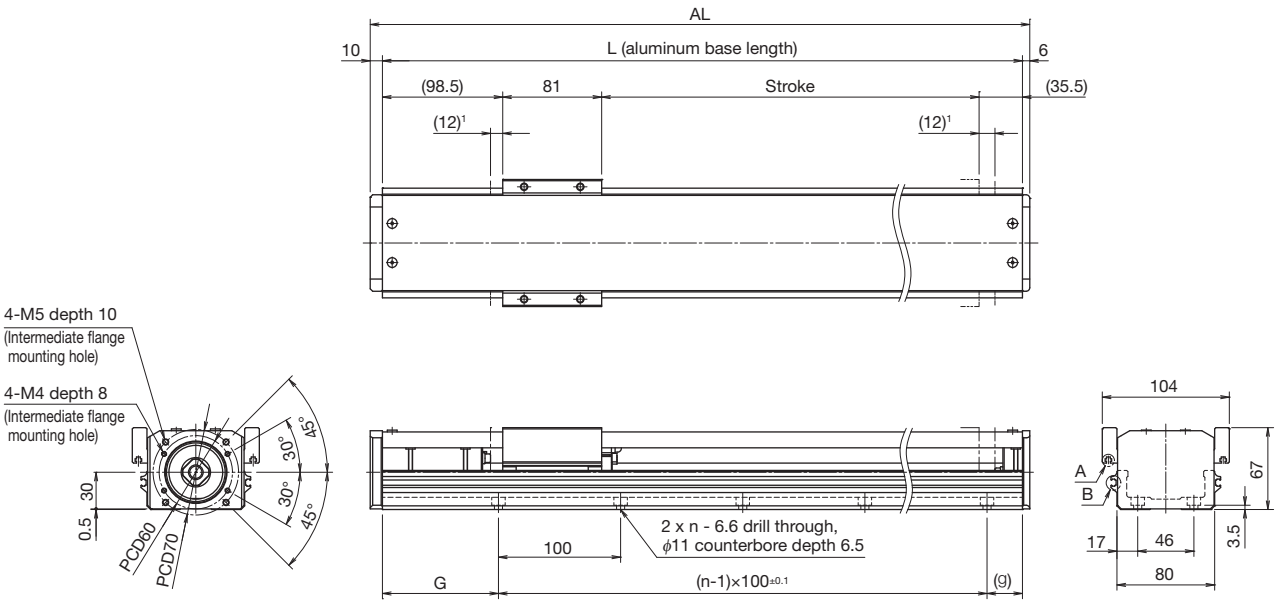
Ball screw lead (mm)	Load mass (kg)	a (mm)	c (mm)
10	3	540	800
	6.5	230	400
	13.5	90	160
20	2	610	800
	4	280	500
	8	120	210

[7] This is the overhang length in all directions with a service life of 5,000 km.
It is the permissible value when loaded in one direction.

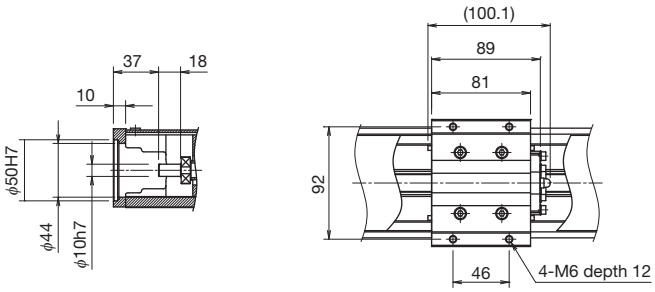
Motor Selection Information

Stroke (mm)	Base length (mm)	LM Guide		Ball screw		Motor mounting part
		Moving part mass (kg)	Sliding resistance (N)	Lead (mm)	Shaft length (mm)	Shaft end diameter (mm)
200 to 800	424 to 1024	0.8	4	10, 20	393.5 to 993.5	ϕ10h7

Dimensions



Side surface without motor (when A0 is selected)[2]



Motor attachment details (when A0 is selected)[2] | Table details | A details | B details

[1] This is the stroke up to the mechanical stopper.
[2] Please see p. 22 for information on the intermediate flange dimension.

Stroke (mm) (Stroke between mechanical stoppers)		200 (224)	300 (324)	400 (424)	500 (524)	600 (624)	700 (724)	800 (824)
Maximum speed[3] (mm/s)	Ball screw lead: 10 mm	520						430
	Ball screw lead: 20 mm	1050						840
Dimensions (mm)	AL	440	540	640	740	840	940	1040
	L	424	524	624	724	824	924	1024
	G	95	95	95	95	95	95	95
	g	29	29	29	29	29	29	29
No. of mounting holes	n	4	5	6	7	8	9	10
Mass (kg)		3.8	4.3	4.8	5.3	5.8	6.3	6.8

[3] The maximum speed is restricted by the permissible speed of the actuator.

Options

Sensors

Optional proximity sensors and photo sensors are available. If you select the sensor option, the dedicated sensor dog will be included. See the following precautions (Notes 1 to 2) before using.

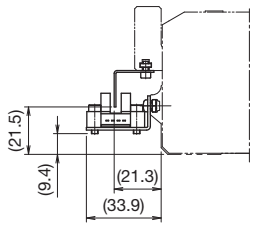
Symbol	Details	Model	Accessories
0	None	—	—
2	Photo sensors[1] (x3)	EE–SX671 (OMRON Corporation)	Mounting screw/nut, sensor dog (x1 or x2), mounting plates (x3), connectors (EE–1001 x3)
6	Photo sensors[1] (x3)	EE–SX674 (OMRON Corporation)	Mounting screw/nut, sensor dog (x1 or x2), mounting plates (x3), connectors (EE–1001 x3)
E	Proximity sensors: N.O. contact[2] (x1) N.C. contact[3] (x2)	APM–D3A1–001 (Azbil Corporation) APM–D3B1–003 (Azbil Corporation)	Mounting screws, nuts, sensor dog (x1 or x2)
J	Proximity sensors: N.O. contact[2] (x1) N.C. contact[3] (x2)	GX–F12A (Panasonic Industrial Devices SUNX Co., Ltd.) GX–F12B (Panasonic Industrial Devices SUNX Co., Ltd.)	Mounting screws, nuts, sensor dog (x1 or x2)
M	Sensors: N.O. contact[2] (x1) (PNP output) N.C. contact[3] (x2) (PNP output)	GX–F12A–P (Panasonic Industrial Devices SUNX Co., Ltd.) GX–F12B–P (Panasonic Industrial Devices SUNX Co., Ltd.)	Mounting screws, nuts, sensor dog (x1 or x2)

[1] The photo sensors can be switched between ON when lit and ON when unlit.
[2] N.O. contact: Normally open contact
[3] N.C. contact: Normally closed contact

Note 1) If proximity sensors are close to one another, they may not function properly. If that happens, please prepare a type with a different frequency.
Note 2) It is possible to install sensors other than those listed above. Contact THK for details.

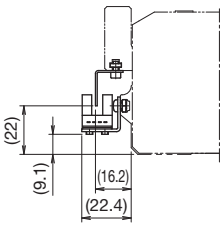
Photo Sensor Mounting Dimensions

Sensor dog width: 10 mm



Symbol	Model	Manufacturer
2	EE–SX671	OMRON Corporation

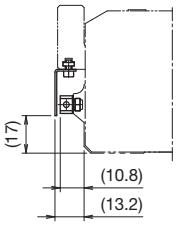
Sensor dog width: 10 mm



Symbol	Model	Manufacturer
6	EE–SX674	OMRON Corporation

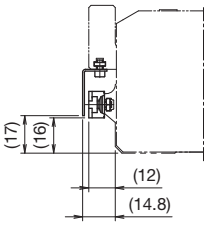
Proximity Sensor Mounting Dimensions

Sensor dog width: 10 mm



Symbol	Model	Manufacturer
E	APM–D3A1–001	Azbil Corporation
	APM–D3B1–003	

Sensor dog width: 10 mm



Symbol	Model	Manufacturer
J	GX–F12A	Panasonic Industrial Devices SUNX Co., Ltd.
	GX–F12B	
M	GX–F12A–P	
	GX–F12B–P	

Intermediate Flange

Several types of intermediate flanges for mounting motors are available.
Specify an intermediate flange that matches the motor used.

Motors Used and Corresponding Intermediate Flanges

Motor type	Manufacturer	Motor model		Motor rated output (W)	Flange size	Housing A/ Intermediate flange	Compatible coupling models	
							MIKI PULLEY CO., LTD.	Nabeya Bi-tech Kaisha (NBK)
AC servo motor	YASKAWA Electric Corporation	Σ–V	SGMJV–02	200	60×60	A0	SFC–030DA2–10B–14B	XGT2–27C–10–14
			SGMAV–02					
			SGMJV–04	400		A0	SFC–035DA2–10B–14B	XGT2–30C–10–14
			SGMAV–04					
			SGMJV–06	600		A0		XGT2–34C–10–14
		Σ–7	SGM7J–02	200	60×60	A0	SFC–030DA2–10B–14B	XGT2–27C–10–14
			SGM7A–02					
			SGM7J–04	400		A0	SFC–035DA2–10B–14B	XGT2–30C–10–14
			SGM7A–04					
			SGM7J–06	600		A0		XGT2–34C–10–14
		Σ–X	SGMXJ–02	200	60×60	A0	SFC–030DA2–10B–14B	XGT2–27C–10–14
			SGMXA–02					
			SGMXJ–04	400		A0	SFC–035DA2–10B–14B	XGT2–30C–10–14
			SGMXA–04					
			SGMXJ–06	600		A0		XGT2–34C–10–14
			SGMXA–06					

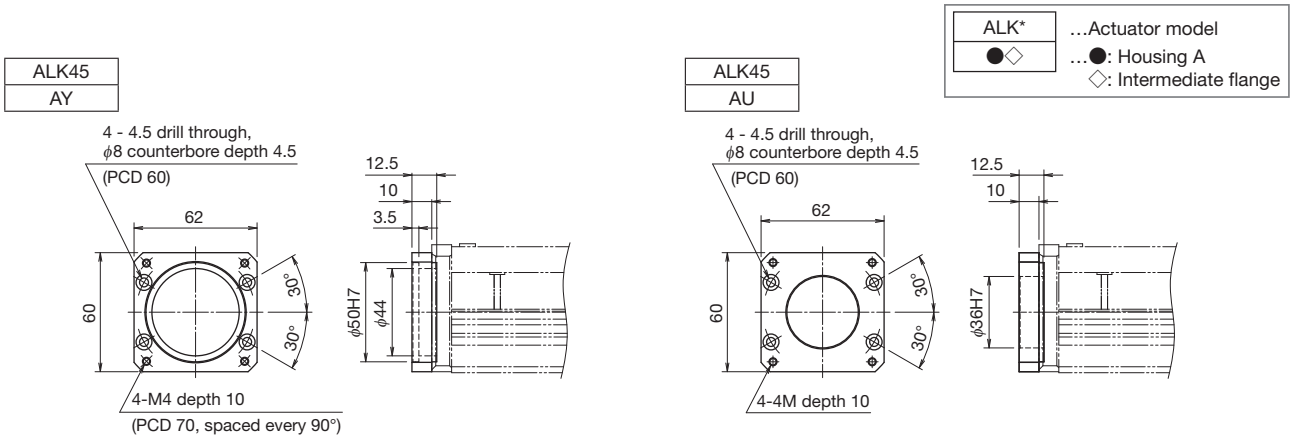
Note 3) The table shows only a portion of the model numbers for motors. For details regarding model numbers, please see the catalog for each respective motor manufacturer. You may not be able to mount the motor depending on the options, so please confirm beforehand.
Note 4) If the maximum torque of the installed motor will exceed the permissible input torque (p. 19), please consider a safety measure to limit the torque.

Motors Used and Corresponding Intermediate Flanges

Motor type	Manufacturer	Motor model			Motor rated output (W)	Flange size	Housing A/ Intermediate flange	Compatible coupling models	
								MIKI PULLEY CO., LTD.	Nabeya Bi-tech Kaisha (NBK)
AC servo motor	Mitsubishi Electric Corporation	MELSERVO	J4	HG–MR23	200	60×60	A0	SFC–030DA2–10B–14B	XGT2–27C–10–14
				HG–KR23					
				HG–MR43	400		A0	SFC–035DA2–10B–14B	XGT2–30C–10–14
				HG–KR43			A0		
			J5	HK–KT23W	200	60×60	A0	SFC–030DA2–10B–14B	XGT2–27C–10–14
				HK–KT43W	400		A0	SFC–035DA2–10B–14B	XGT2–30C–10–14
			JN	HF–KN23	200	60×60	A0	SFC–030DA2–10B–14B	XGT2–27C–10–14
				HF–KN43	400		A0	SFC–035DA2–10B–14B	XGT2–30C–10–14
	TAMAGAWA SEIKI CO., LTD.	TBL–iII		TS4607	200	60×60	A0	SFC–030DA2–10B–14B	XGT2–27C–10–14
				TS4609	400		A0	SFC–035DA2–10B–14B	XGT2–30C–10–14
		TBL–iIV		TSM3202	200	60×60	A0	SFC–030DA2–10B–14B	XGT2–27C–10–14
				TSM3204	400		A0	SFC–035DA2–10B–14B	XGT2–30C–10–14
	Panasonic Corporation	MINAS	A5	MSMD02	200	60×60	AY	SFC–030DA2–10B–11B	XGT2–30C–10–11
				MSME02					
				MSMD04	400		AY	SFC–035DA2–10B–14B	XGT2–30C–10–14
				MSME04					
			A6	MSMF02	200	60×60	AY	SFC–030DA2–10B–11B	XGT2–30C–10–11
				MHMF02					
				MSMF04	400		AY	SFC–035DA2–10B–14B	XGT2–30C–10–14
				MHMF04					
	KEYENCE CORPORATION	SV		SV–M020	200	60×60	A0	SFC–030DA2–10B–14B	XGT2–27C–10–14
				SV–M040	400		A0	SFC–035DA2–10B–14B	XGT2–30C–10–14
		SV2		SV2–M020	200	60×60	A0	SFC–030DA2–10B–14B	XGT2–27C–10–14
				SV2–M040	400		A0	SFC–035DA2–10B–14B	XGT2–30C–10–14
	SANYO DENKI CO., LTD.	SANMOTION R		R2□A06020	200	60×60	A0	SFC–030DA2–10B–14B	XGT2–27C–10–14
				R2AA06040	400		A0	SFC–035DA2–10B–14B	XGT2–30C–10–14
	OMRON Corporation	OMNUC G5		R88M–K20030	200	60×60	AY	SFC–030DA2–10B–11B	XGT2–30C–10–11
				R88M–K40030	400		AY	SFC–035DA2–10B–14B	XGT2–30C–10–14
		1S		R88M–1M20030	200	60×60	AY	SFC–030DA2–10B–11B	XGT2–30C–10–11
				R88M–1M40030	400		AY	SFC–035DA2–10B–14B	XGT2–30C–10–14

Motor type	Manufacturer	Motor model			Flange size	Housing A/ Intermediate flange	Compatible coupling models	
							MIKI PULLEY CO., LTD.	Nabeya Bi-tech Kaisha (NBK)
Stepper motor	ORIENTAL MOTOR CO., LTD.	αStep		AZ6*, AR6*	60×60	AU	SFC–025DA2–10B–10B–L46	XGL2–25C–10–10
		5–phase	CRK	CRK56* (CRK569PM*)	60×60	AU	SFC–025DA2–8B–10B–L46 (SFC–025DA2–10B–10B–L46)	XGL2–25C–8–10 (XGL2–25C–10–10)
			RK II	RKS56*	60×60	AU	SFC–025DA2–10B–10B–L46	XGL2–25C–10–10
			CVK	PKP56* (PKP569FM*)	60×60	AU	SFC–025DA2–8B–10B–L46 (SFC–025DA2–10B–10B–L46)	XGL2–25C–8–10 (XGL2–25C–10–10)
	KEYENCE CORPORATION	2–phase		QS–M60	60×60	AU	SFC–025DA2–8B–10B–L46	XGL2–25C–8–10
	SANYO DENKI CO., LTD.	PB		PBDM60*, PBA* *60*	60×60	AU	SFC–025DA2–10B–10B–L46	XGL2–25C–10–10
		5–phase		FAM56*/FDM56*/ FA512M60/FB512M60	60×60	AU	SFC–025DA2–10B–10B–L46	XGL2–25C–10–10
		2–phase		DB16H78*	60×60	AU	SFC–025DA2–8B–10B–L46	XGL2–25C–8–10

Note 1) The table shows only a portion of the model numbers for motors. For details regarding model numbers, please see the catalog for each respective motor manufacturer. You may not be able to mount the motor depending on the options, so please confirm beforehand.
Note 2) If the maximum torque of the installed motor will exceed the permissible input torque (p. 19), please consider a safety measure to limit the torque.



Note 3) See “Side surface without motor” and “Motor attachment details” for intermediate flange A0. (p. 20)

Maximum Load Capacity

Model				ALK20	ALK26	ALK30		ALK45	
Ball screw lead (mm)				6	6	6	10	10	20
Estimated motor capacity (W)				50	50	100	100	100	100
Maximum load capacity* (kg)	Acceleration/ deceleration	Horizontal	0.15 G	11	27.5	35	—	—	—
			0.3 G	8	18	34	24	60.5	34.5
			0.5 G	—	—	—	19	42	28
		Wall-mounted	0.15 G	4	12	19	—	—	—
			0.3 G	4	11.5	18	13.5	28	20
			0.5 G	—	—	—	12.5	26.5	18
		Vertical	0.15 G	2	4	4	—	—	—
			0.3 G	2	4	4	4	13.5	8
			0.5 G	—	—	—	4	13.5	8
Service life (km)				5,000	5,000	5,000	10,000	10,000	10,000

* Maximum load capacity values are when the rated rotational speed of the motor is 3,000 min^{-1}.

Service Life

The ALK is made up of LM Guide units, a ball screw, and support unit. The service life of each component can be obtained from the basic dynamic load ratings listed under the “Basic Specifications” on the page for each model.

LM Guide

Nominal Life

$$L_{10} = \left(\frac{C}{P_C}\right)^3 \times 50$$

L_{10} : Nominal life (km)
(The nominal life is the total travel distance that 90% of a group of LM Guide units can achieve without flaking after individually running under the same conditions.)
C : Basic dynamic load rating (N)
P_C : Calculated load (N)

Calculating the Modified Nominal Life

During use, an LM Guide may be subjected to vibrations and shocks as well as fluctuating loads, which are difficult to detect. In addition, having LM blocks arranged directly behind one another will have a decisive impact on the service life.

Taking these factors into account, the modified nominal life (L_{10m}) can be calculated according to the following formula.

● Modified factor α

$$\alpha = \frac{1}{f_W}$$

α : Modified factor
f_W : Load factor (see the “Load Factor (f_W)” table on p. 24)

● Modified nominal life L_{10m}
LM Guide with balls

$$L_{10m} = \left(\alpha \times \frac{C}{P_C}\right)^3 \times 50$$

L_{10m} : Modified nominal life (km)
C : Basic dynamic load rating (N)
P_C : Calculated load (N)

● If a moment will be applied, multiply the applied moment by the equivalent factor listed on the “Equivalent Moment Factor (K)” on p. 24 to calculate the equivalent load.

$$P_m = K \bullet M$$

P_m : Equivalent load (N)
K : Equivalent moment factor
(see the “Equivalent Moment Factor (K)” table on p. 24)
M : Applied moment (N·mm)

Equivalent Load (LM Guide Unit)

● Use the following formula to determine the equivalent load when bearing both radial loads and horizontal loads, or reverse-radial and horizontal loads simultaneously.

$$P_E = X \cdot P_{R(L)} + Y \cdot P_T$$

P_E : Equivalent load
P_R : Radial load
P_L : Reverse-radial load
P_T : Horizontal load
X, Y : Equivalent-factor (X = 1, Y = 0.5777)

Service Life Time

Once the nominal life (L_{10}) has been obtained, the service life time can be obtained using the following formula if the stroke length and the cycles per minute are constant.

$$L_h = \frac{L_{10} \times 10^6}{2 \cdot \ell_s \cdot n_1 \times 60}$$

L_h : Service life time (h)
ℓ_s : Stroke length (mm)
n_1 : Cycles per minute (min^{-1})

Ball Screw Unit/Bearing Unit (Fixed Side)

Nominal Life

$$L_{10} = \left(\frac{C_a}{F_a}\right)^3 \times 10^6$$

L_{10} : Nominal life (rev.)
(The nominal life is the total rotations that 90% of a group of ball screw (bearing) units can achieve without flaking after individually running under the same conditions.)
C_a : Basic dynamic load rating (N)
F_a : Axial load (N)

Service Life Time

Once the nominal life (L_{10}) has been obtained, the service life time can be obtained using the following formula if the stroke length and the cycles per minute are constant.

$$L_h = \frac{L_{10} \cdot \ell}{2 \cdot \ell_s \cdot n_1 \times 60}$$

L_h : Service life time (h)
ℓ_S : Stroke length (mm)
n_1 : Cycles per minute (min^{-1})
ℓ : Ball screw lead (mm)

(f_W: Load Factor)

In general, reciprocating machines tend to experience vibrations or impacts during operation, and it is difficult to accurately determine the vibrations generated during high-speed operation and impacts during frequent starts and stops. Therefore, when speed and impacts have a significant influence, divide the basic dynamic load rating (C) by the corresponding load factor, which has been empirically obtained.

Load Factor (f_w)

Vibration/Impacts	Speed (V)	Load Factor (f_w)
Minute	Under minute speeds V ≤ 0.25 m/s	1 to 1.2
Low	Under low speeds 0.25 m/s < V ≤ 1 m/s	1.2 to 1.5
Medium	Under medium speeds 1 m/s < V ≤ 2 m/s	1.5 to 2
High	Under high speeds V > 2 m/s	2 to 3.5

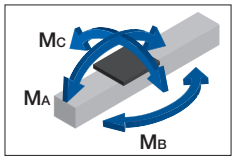
K: Equivalent Moment Factor (LM Guide Unit)

When running while bearing a load, multiply the equivalent moment factor shown in the table on the right by the moment value to calculate the load, because the load distribution of the LM Guide unit will be greater locally.

K_A, K_B, and K_C show the equivalent moment factors for directions M_A, M_B, and M_C.

Equivalent Moment Factor (K)

Model	K_A	K_B	K_C
ALK20	0.263	0.256	0.063
ALK26	0.198	0.192	0.051
ALK30	0.174	0.168	0.042
ALK45	0.105	0.101	0.033



K_A: Equivalent moment factor in the M_A direction
K_B: Equivalent moment factor in the M_B direction
K_C: Equivalent moment factor in the M_C direction

MEMO

⚠Precautions on Use

Handling

- Do not carelessly disassemble the actuator. This may result in debris entering the product and loss of functionality.
- Take care not to drop or strike the actuator. Otherwise, it may cause injury or damage the unit. Even if there is no outward indication of damage, a sudden impact could prevent the unit from functioning properly.
- Please contact THK when using the product in special environments such as locations exposed to constant vibrations, clean rooms, vacuums, and low/high temperatures.
- Tilting the slider and aluminum base may cause them to fall under their own weight.

Operating environment

An improper usage environment may cause failure of the actuator. To avoid this, prepare an environment such as the following.

- Actuator: Ambient temperature between 0°C to 40°C, ambient humidity 80% RH or lower, no freezing, no condensation
- A location with no corrosive or flammable gas
- A location where electrically conductive particles such as steel dust, dust, oil mist, cutting oil, water content, salt content, or organic solvents will not be present in the air
- A location not exposed to direct sunlight or radiant heat
- A location where no strong electric fields or powerful magnetic fields are generated
- A location where vibrations or impacts are not transmitted to the main unit
- A location where inspections and cleanings can easily be performed

Safety precautions

- Do not touch any moving parts while the product is in operation or in an operable state. In addition, do not enter the operating range of the actuator.
- When installing, adjusting, inspecting, or performing maintenance on the actuator and connected peripherals, be sure to disconnect all power. Implement safety measures to ensure that no one else can turn the power on.
- If performing a task involving multiple people, confirm how to perform the work, what signals will be used, and how to handle problems before beginning, and assign another person to monitor the work.
- Carefully read JIS B8433 “Manipulating Industrial Robots - Safety” and the Japanese Ministry of Health, Labour and Welfare’s “Ordinance on Industrial Safety and Health” before working with the product, and follow the guidance within.
- Using this product in excess of the torque limit may damage the components or cause an accident.
- Do not set the torque control parameter higher than the torque limit.
- A stopper is installed inside the product. It is intended to limit the stroke, and may become damaged in the event of a strong impact.
- In applications where this product will be moved or transferred, the conditions of use may cause inertia from the motor’s mass to result in damage to the motor attachment (Housing A) or other parts. Please contact THK before using in this manner.

Lubrication

- The ALK must be lubricated in order for it to demonstrate its full performance. Insufficient lubrication may increase wear on the rolling elements and lead to premature damage.
- Do not mix lubricants with different properties.
- Contact THK if a special lubricant will be used.
- Contact THK if oil lubricant will be used.
- The lubrication interval will vary depending on the usage conditions, so we recommend determining the lubrication interval based on the initial inspection.

Storage

- When storing the actuator, enclose it in a package designated by THK and store it in a horizontal orientation while avoiding high temperatures, low temperatures, and high humidity.

Other Recommended Products



Caged Ball LM Guide Actuator

SKR

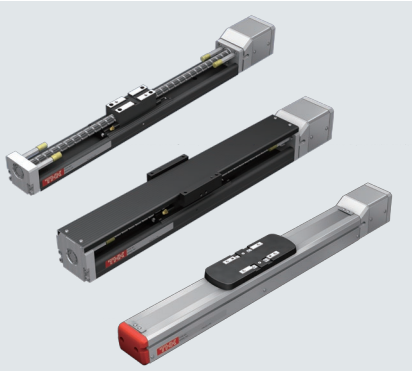
- ○ Modular structure reduces the number of parts, design hours, and assembly hours
- ○ Caged ball effect enables a long service life and long-term maintenance-free operation
- ○ Ideal for high-precision positioning and orthogonal, multi-axis designs



LM Guide Actuator

KR

- ○ Modular structure reduces the number of parts, design hours, and assembly hours
- ○ Can be used in various orientations, including horizontal, wall-mounted, vertical, and hanging
- ○ Extensive lineup of 9 sizes



LM Guide Actuator with Large-Diameter Ball Screw

KSF

Open cover/top cover/fully enclosed

- ○ Large-diameter ball screw enables high-speed and high-acceleration operations
- ○ 3 types of cover options to choose from to suit the application
- ○ Supports long strokes up to 1500 mm

Lightweight Actuator **ALK**

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