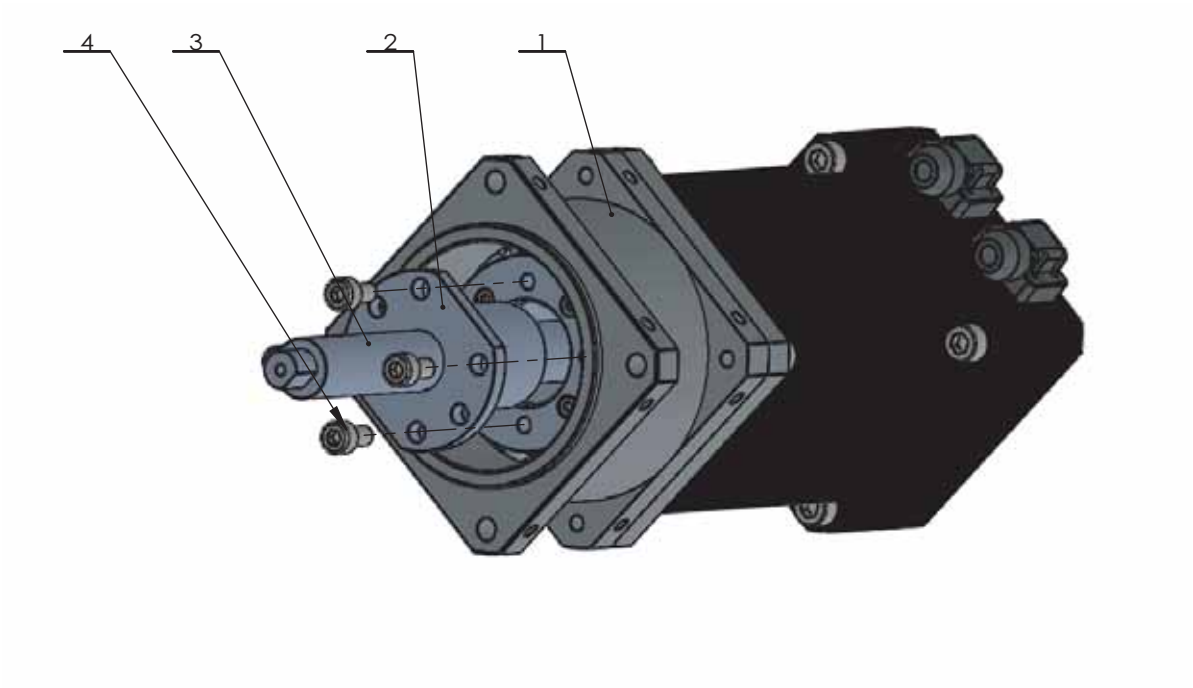
ELECTRIC ACTUATOR

SHANGHAI MINDONG MECHANISM ELECTRON CO., LTD

LIST OF COMPONENTS FOR ASSEMBLY

List of components in the picture:
1.Motor type SEA80
2.Nut , not supplied with motor (WRANING:when fitting, the screw must already be inserted in the Nut !!)
3.Screw, not supplied with motor
4.Hexagon socket head fixing rotor, 4 units provided in the kit

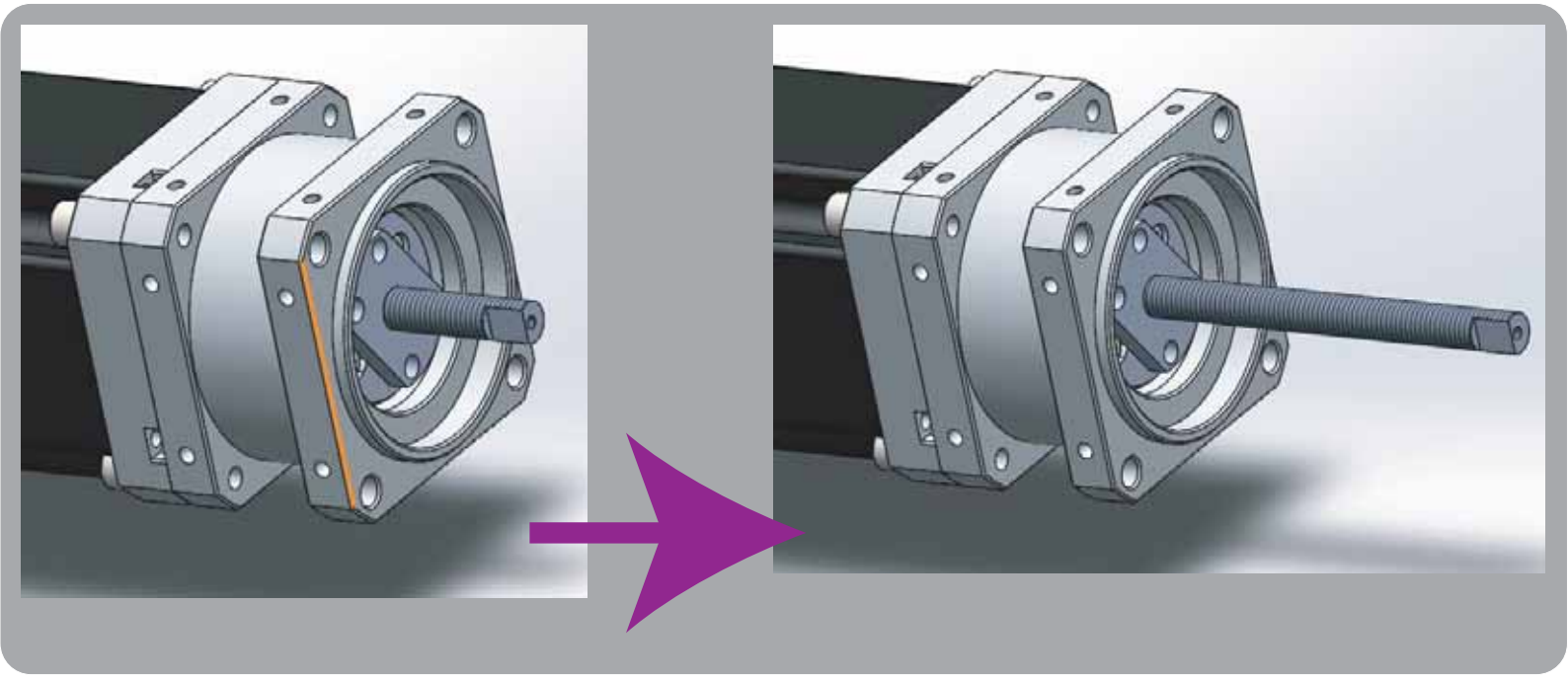


Assembly screw and nut:

1.Assembly the screw and nut according to the manufacturer's instructions. The screw must be already worked on the extremity before thread it in the nut.

2. Enter the nut with the screw in the seat of the hollow shaft, aligning the holes of the nut and the holes of the rotor.

WARNING



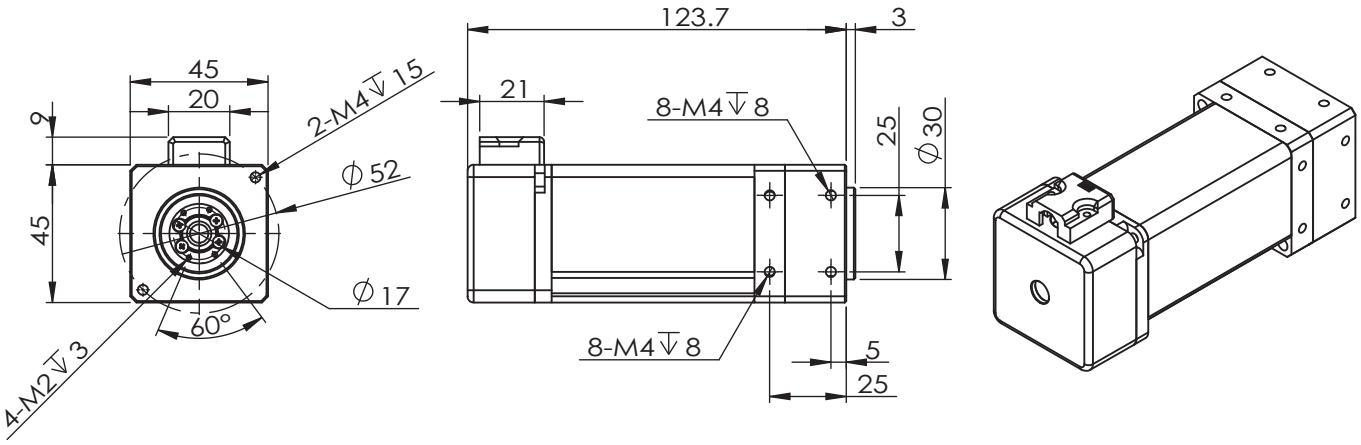
PRECAUTION DURING THE ASSEMBLY

1.Do not power the motor during the assembly of the nut-screw.
2.Do not power the motor with the screw system inserted before putting the application in safety.
3.Test the motor only befor the assembly of the screw system of only when application is comlpeted.
4.If necessary move the screw before final assembly, do it manually.

GENERAL WARNINGS

Avoid power on the motor with the nut and screw inserted and not fixed securely to the application. Ttranslate the screw, turn it manually until the desired position. If you need to move the screw with using the motor,please adopt a safety behave and in particular:
1.Do not stand in front of the screw.
2.Set the motor speed low to avoid abrupt shifts of the screw.
3.Absolutely avoid the screw go out of the nut.

SEA45



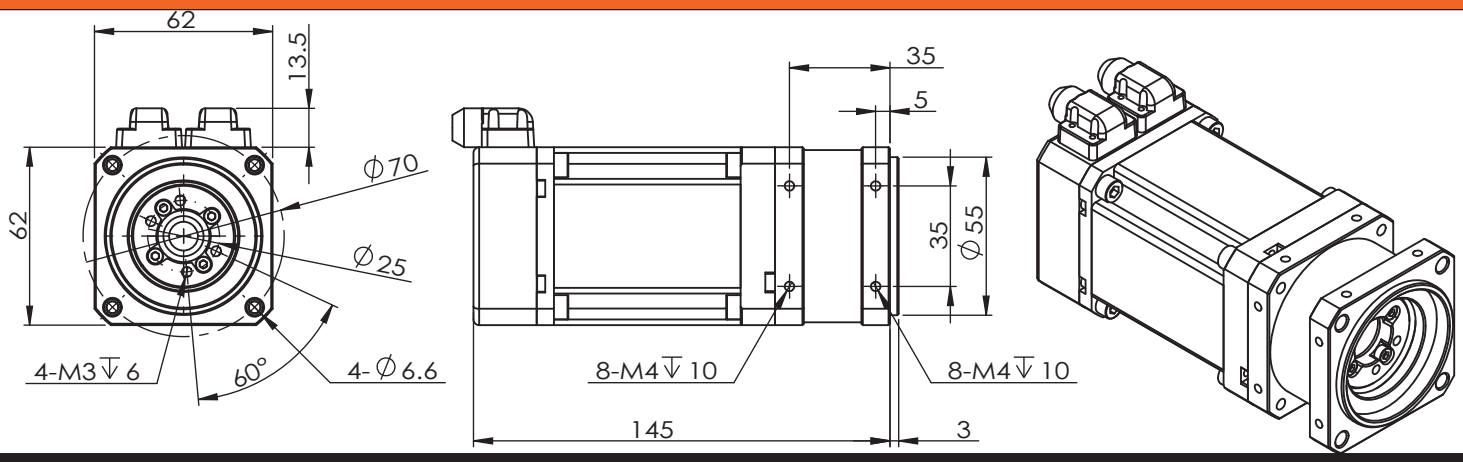
Motor Data

1	motor model		SEA4512	SEA4524		Unit
2	nominal voltage	VT	12	24		V
3	nominal torque	TR	0.18	0.16		Nm
4	peak torque	TP	0.45	0.91		Nm
5	nominal current	IR	8.5	7.5		A
6	peak current	IP	20	39		A
7	nominal speed	NR	3000	5000		rpm
8	power at nominal speed	PR	57	84		W
9	number of pole pairs	2p	3	3		
10	rotor inertia	J	0.34	0.34		Kg*cm^2
11	shaft type	Ballscrew & Sliding screw				
12	screw diameter	φ5				
13	feedback	increamental (2500ppr)				
14	protection class	IP64				
15	motor insulation class	class B				

Screw selection reference

lead mm	Nominal thrust force kgf			Maximum thrust force kgf	Nominal speed mm/s		
	SEA4512	SEA4524		SEA4512	SEA4512	SEA4524	
4	28	28		120	200	500	

SEA62



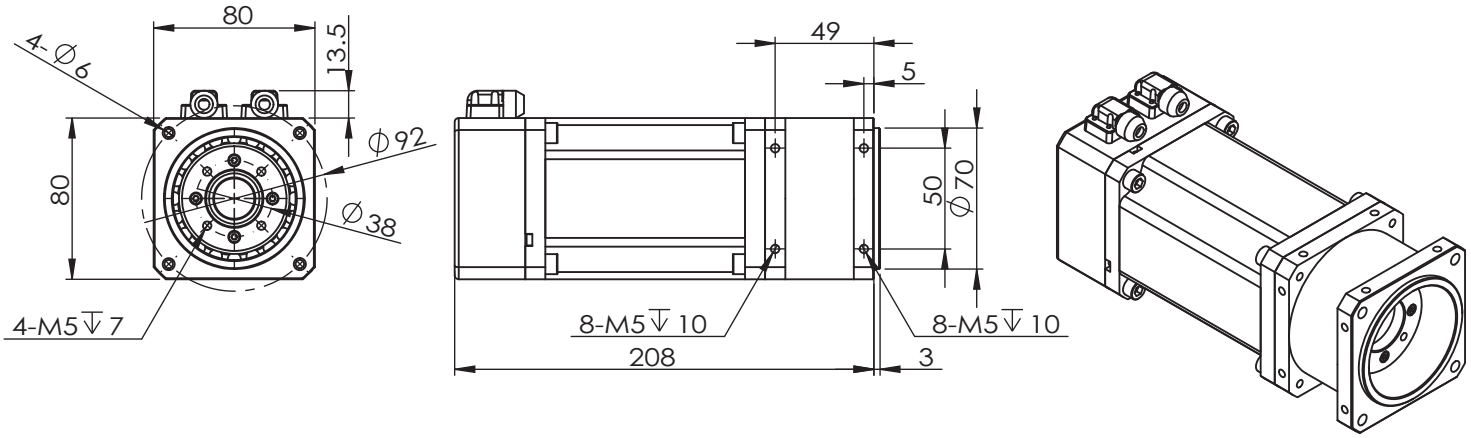
Motor Data

1	motor model		SEA6212	SEA6224		Unit
2	nominal voltage	VT	12	24		V
3	nominal torque	TR	0.6	0.6		Nm
4	peak torque	TP	3	3.2		Nm
5	nominal current	IR	22.8	11.4		A
6	peak current	IP	105	54.2		A
7	nominal speed	NR	3000	3000		rpm
8	power at nominal speed	PR	188	188		W
9	number of pole pairs	2p	4	4		
10	rotor inertia	J	1.98	1.98		Kg*cm^2
11	shaft type	Ballscrew & Sliding screw				
12	screw diameter	φ8;φ10				
13	feedback	increamental(2500ppr)				
14	protection class	IP64				
15	motor insulation class	class B				

Screw selection reference

lead mm	Nominal thrust force kgf	Maximum thrust force kgf		Nominal speed mm/s		lead mm	Nominal thrust force kgf	Maximum thrust force kgf		Nominal speed mm/s	
		SEA6212	SEA6224	SEA6212	SEA6224			SEA6212	SEA6224	SEA6212	SEA6224
2	185	530	530	100		8	46	131	268	400	
2.5	148	300	300	125		10	37	105	214	500	
5	74	209	428	250		12	31	87	178	600	

SEA80



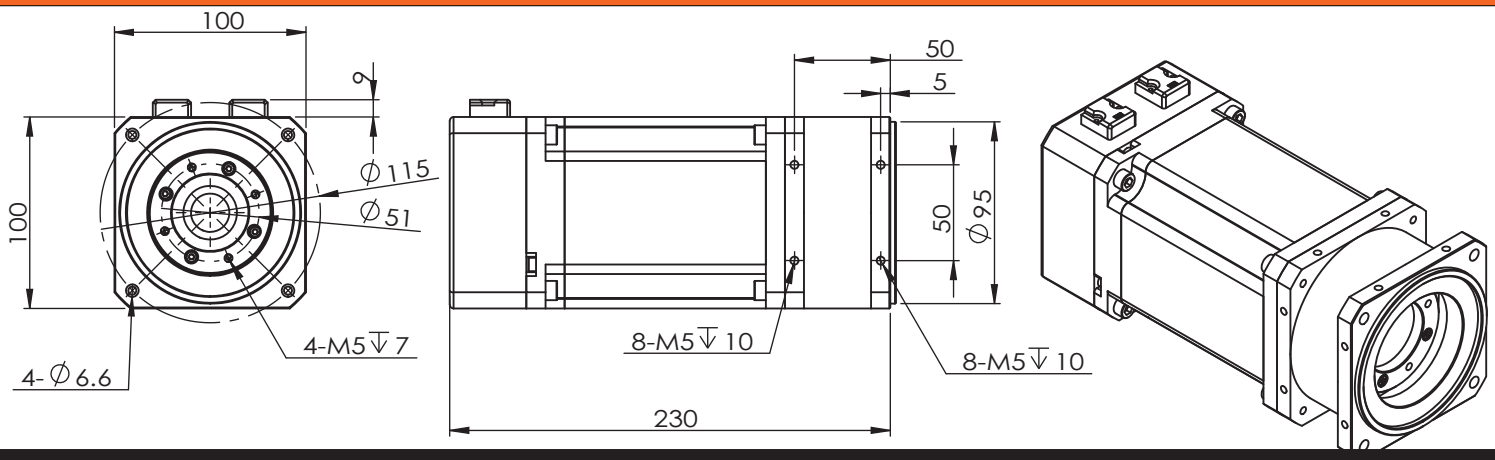
Motor Data

1	motor model		SEA8024	SEA8048		Unit
2	nominal voltage	VT	24	48		V
3	nominal torque	TR	1.0	1.0		Nm
4	peak torque	TP	10.7	11		Nm
5	nominal current	IR	21.6	10.8		A
6	peak current	IP	210	108.4		A
7	nominal speed	NR	3650	3650		rpm
8	power at nominal speed	PR	382	382		W
9	number of pole pairs	2p	4	4		
10	rotor inertia	J	6.05	6.05		Kg*cm^2
11	shaft type	Ballscrew & Sliding screw				
12	screw diameter	φ14; φ15; φ16 ; φ20				
13	feedback	increamental(2500ppr)				
14	protection class	IP64				
15	motor insulation class	class B				

Screw selection reference

lead mm	Nominal thrust force kgf	Maximum thrust force kgf		Nominal speed mm/s	lead mm	Nominal thrust force kgf	Maximum thrust force kgf		Nominal speed mm/s
		SEA8024	SEA8048				SEA8024	SEA8048	
4	154	471	941	243	16	38	118	235	973
5	123	376	753	304	20	31	94	188	1217
10	62	188	376	608					

SEA100



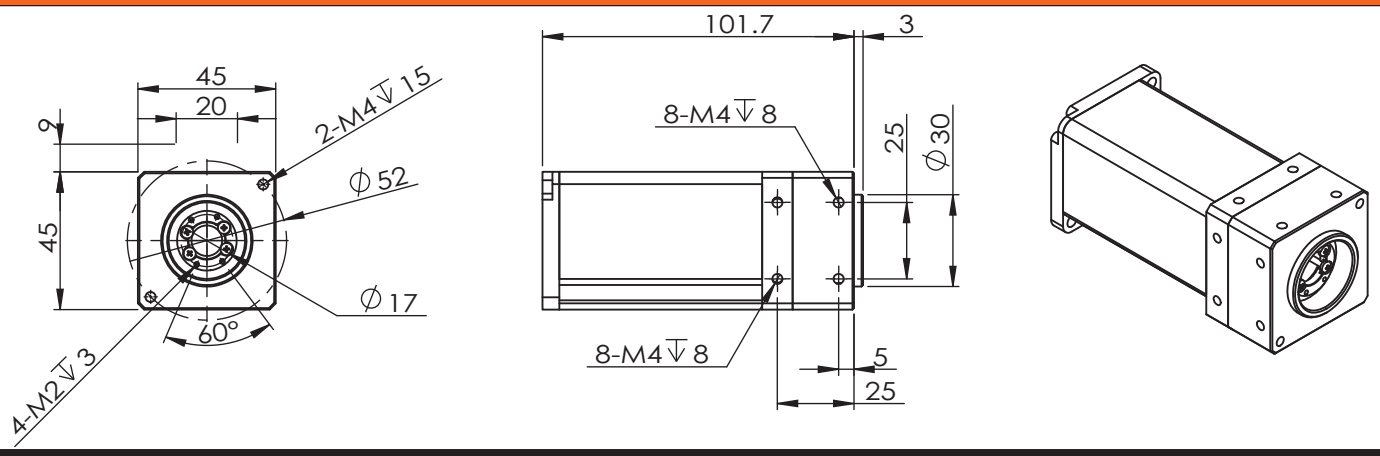
Motor Data

1	motor model		SEA10048	SEA10072		Unit
2	nominal voltage	VT	48	72		V
3	nominal torque	TR	2.5	2.5		Nm
4	peak torque	TP	25.6	38.4		Nm
5	nominal current	IR	15	15		A
6	peak current	IP	140	210		A
7	nominal speed	NR	2300	3450		rpm
8	power at nominal speed	PR	600	900		W
9	number of pole pairs	2p	4	4		
10	rotor inertia	J	35.4	35.4		Kg*cm^2
11	shaft type	Ballscrew & Sliding screw				
12	screw diameter	φ15; φ16; φ20; φ; φ25				
13	feedback	increamental(2500ppr)				
14	protection class	IP64				
15	motor insulation class	class B				

Screw selection reference

lead	Nominal thrust force	Maximum thrust force	Nominal speed		lead	Nominal thrust force	Maximum thrust force	Nominal speed	
mm	kgf	kgf	mm/s		mm	kgf	kgf	mm/s	
			SEA10048	SEA10072				SEA10048	SEA10072
5	308	1351	192	288	20	77	338	767	1150
10	154	675	383	575	25	62	270	958	1438
16	96	422	613	920					

BEA45



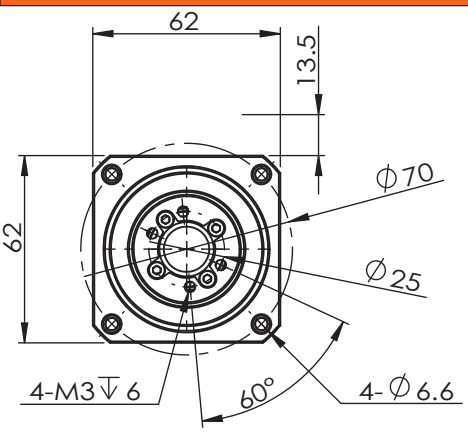
Motor Data

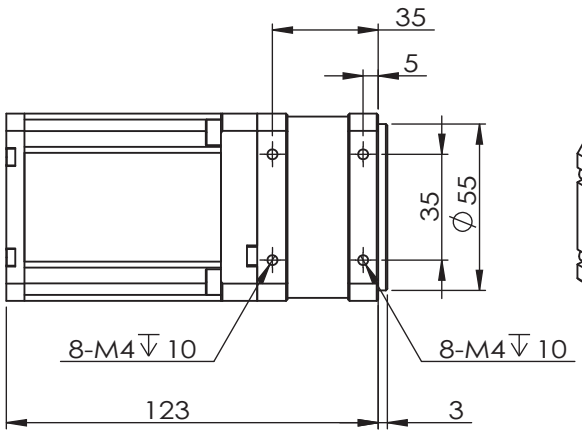
1	motor model		BEA4512	BEA4524	BEA4536	Unit
2	nominal voltage	VT	12	24	36	V
3	nominal torque	TR	0.18	0.16	0.14	Nm
4	peak torque	TP	0.45	0.91	1.36	Nm
5	nominal current	IR	8.5	7.5	6.6	A
6	peak current	IP	20	39	58.5	A
7	nominal speed	NR	3000	7500	12000	rpm
8	power at nominal speed	PR	57	126	176	W
9	number of pole pairs	2p	3	3	3	
10	rotor inertia	J	0.34	0.34	0.43	Kg*cm^2
11	shaft type	Ballscrew & Sliding screw				
12	screw diameter	φ5				
13	feedback	None				
14	protection class	IP64				
15	motor insulation class	class B				

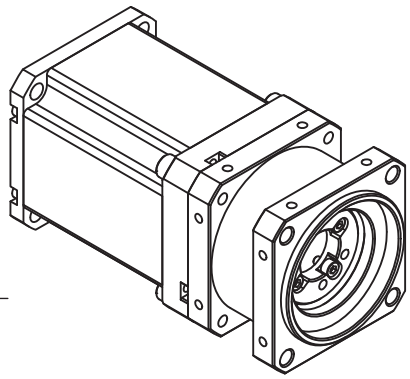
Screw selection reference

lead mm	Nominal thrust force kgf			Maximum thrust force kgf	Nominal speed mm/s		
	BEA4512	BEA4524		BEA4512	BEA4512	BEA4524	
4	28	28		120	200	500	

BEA62







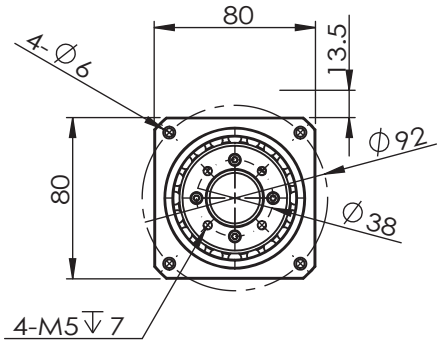
Motor Data

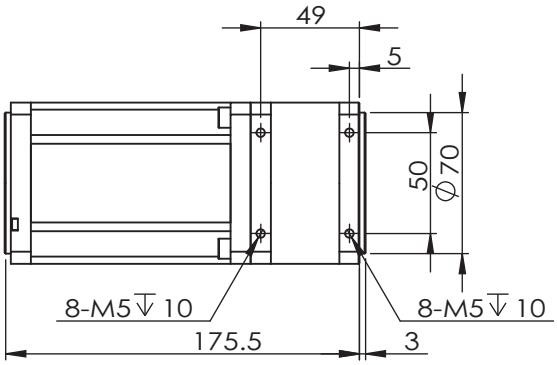
1	motor model		BEA6212	BEA6224		Unit
2	nominal voltage	VT	12	24		V
3	nominal torque	TR	0.6	0.6		Nm
4	peak torque	TP	3.1	3.1		Nm
5	nominal current	IR	22.8	11.4		A
6	peak current	IP	105	54.2		A
7	nominal speed	NR	3000	3000		rpm
8	power at nominal speed	PR	188	188		W
9	number of pole pairs	2p	4	4		
10	rotor inertia	J	1.98	1.98		Kg*cm^2
11	shaft type	Ballscrew & Sliding screw				
12	screw diameter	φ8;φ10				
13	feedback	None				
14	protection class	IP64				
15	motor insulation class	class B				

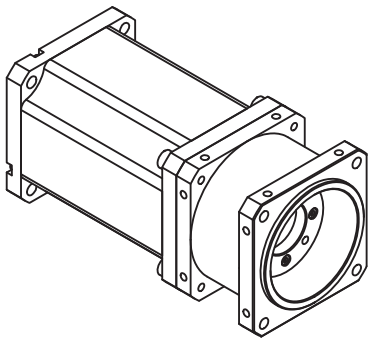
Screw selection reference

lead	Nominal thrust force	Maximum thrust force		Nominal speed		lead	Nominal thrust force	Maximum thrust force		Nominal speed	
mm	kgf	kgf		mm/s		mm	kgf	kgf		mm/s	
		BEA6212	BEA6224	BEA6212	BEA6224			BEA6212	BEA6224	BEA6212	BEA6224
2	185	530	530	100		8	46	131	268	400	
2.5	148	300	300	125		10	37	105	214	500	
5	74	209	428	250		12	31	87	178	600	

BEA80







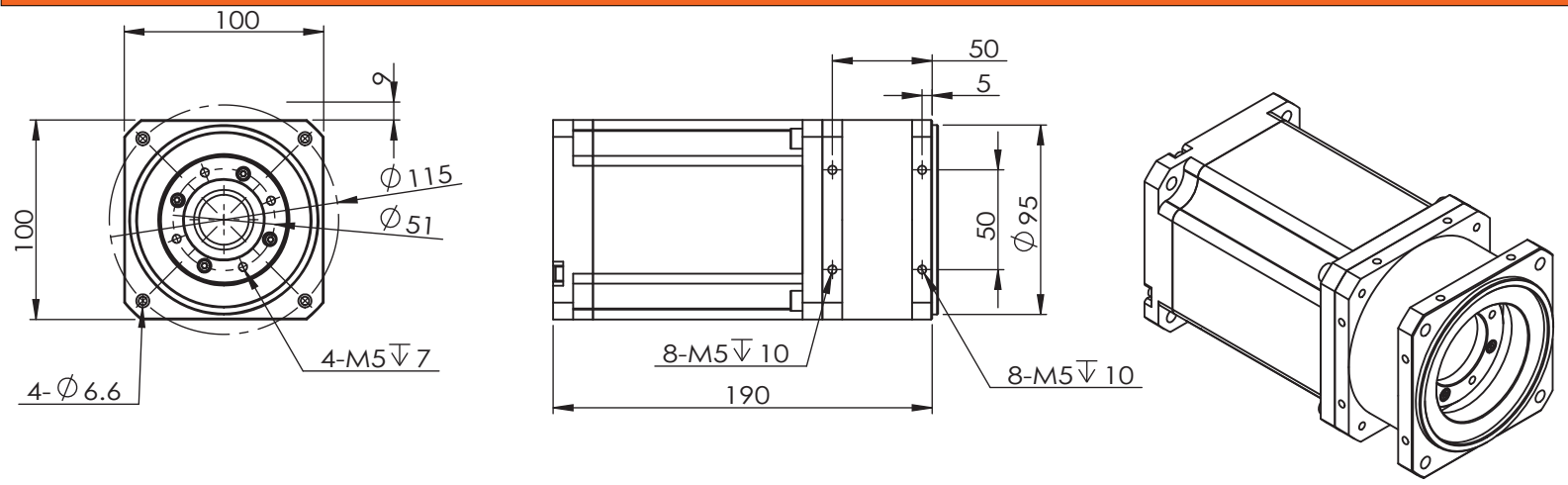
Motor Data

1	motor model		BEA8024	BEA8048		Unit
2	nominal voltage	VT	24	48		V
3	nominal torque	TR	1.0	1.0		Nm
4	peak torque	TP	10.7	11.1		Nm
5	nominal current	IR	21.6	10.8		A
6	peak current	IP	210	108.4		A
7	nominal speed	NR	3650	3650		rpm
8	power at nominal speed	PR	382	382		W
9	number of pole pairs	2p	4	4		
10	rotor inertia	J	6.05	6.05		Kg*cm^2
11	shaft type	Ballscrew & Sliding screw				
12	screw diameter	φ14; φ15; φ16; φ20				
13	feedback	None				
14	protection class	IP64				
15	motor insulation class	class B				

Screw selection reference

lead	Nominal thrust force	Maximum thrust force		Nominal speed	lead	Nominal thrust force	Maximum thrust force		Nominal speed
mm	kgf	kgf		mm/s	mm	kgf	kgf		mm/s
		BEA8024	BEA8048				BEA8024	BEA8048	
4	154	471	941	243	16	38	118	235	973
5	123	376	753	304	20	31	94	188	1217
10	62	188	376	608					

BEA100



Motor Data

1	motor model		BEA10048	BEA10072		Unit
2	nominal voltage	VT	48	72		V
3	nominal torque	TR	2.5	2.5		Nm
4	peak torque	TP	25.6	38.4		Nm
5	nominal current	IR	15	15		A
6	peak current	IP	140	210		A
7	nominal speed	NR	2300	3450		rpm
8	power at nominal speed	PR	600	900		W
9	number of pole pairs	2p	4	4		
10	rotor inertia	J	35.4	35.4		Kg*cm^2
11	shaft type	Ballscrew & Sliding screw				
12	screw diameter	φ15; φ16; φ20; φ25				
13	feedback	None				
14	protection class	IP64				
15	motor insulation class	class B				

Screw selection reference

lead mm	Nominal thrust force kgf	Maximum thrust force kgf	Nominal speed mm/s		lead mm	Nominal thrust force kgf	Maximum thrust force kgf	Nominal speed mm/s	
			BEA10048	BEA10072				BEA10048	BEA10072
5	308	1351	192	288	20	77	338	767	1150
10	154	675	383	575	25	62	270	958	1438
16	96	422	613	920					

To select electric actuator

The relationship between thrust and torque

Get the required thrust of the motor torque

$$T=(Fa\cdot Ph)/(2\pi \cdot \eta 1)$$

T : Motor output torque (N·mm)
Fa : Friction resistance (N)
Fa=μ×mg
μ : Coefficient of friction
g : Gravitational acceleration (9.8m/s2)
m : Weight (kg)
Ph : Ball screw lead (mm)
η1 : Ball screw efficiency

Thrust generated when a torque is applied

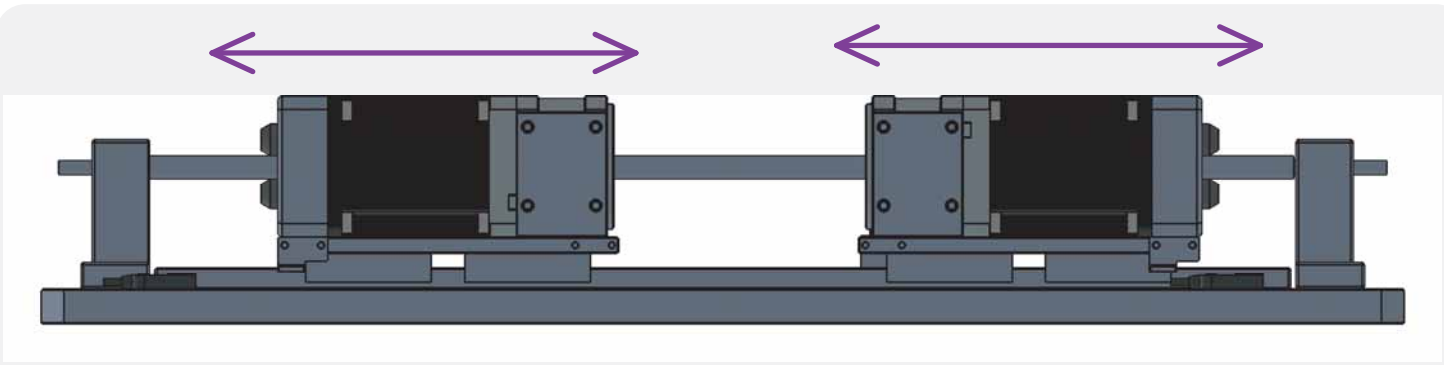
$$Fa=(2\pi \cdot \eta 1\cdot T)/Ph$$

Fa : generated thrust (N)
T : Motor output torque (N·mm)
Ph : Ball screw lead (mm)
η1 : Ball screw efficiency

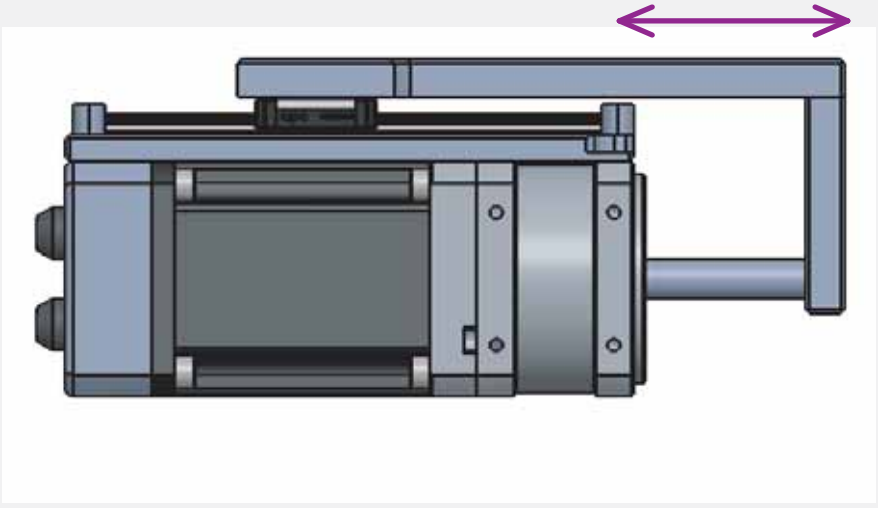
APPLICATION

INFORMATIONS FOR THE APPLICATION

1. The hollow shaft motor requires a structure that allows the accompanying of the translational motion.
2. Make sure that the system screw - motor - structure are well aligned with each other and do not generate radial forces that may dmage the motor and the nut or reduce performance.
3. The application of the motor with screws to the structure must provide the appropriate accompanying machanical and electronic safety devices required by the legislation on the matter of safety.
4. It's necessary to ues a limit switch for the drive to give the zero position.The limit switches can be used by the drive as limit switch for the over-travelling.



One or multiple motor on a stationary screw



The screw has a translational motion on the stationary motor

REFERENCE

The following table is commonly used screw and its lead:

Table A

Screw diameter mm	Lead mm	Basic static load rating kgf	Basic dynamic load rating kgf
φ3	0.5	22	15
	1	44	33
φ4	1	79	56
	2	57	42
φ5	4	72	47
φ6	1	120	68
	2	120	75
	2.5	120	75
	6	145	87
	8	160	95
φ8	1	165	78
	2	410	240
	2.5	300	185
	4	420	260
	5	300	185
	8	380	220
	12	400	220
φ10	1	200	84
	2	530	270
	4	520	300
	5	520	300
	10	590	330
	15	640	330
φ12	2	640	300
	2.5	546	309
	5	637	382
	10	980	510

REFERENCE

Table B

Screw diameter mm	Lead mm	Basic static load rating kgf	Basic dynamic load rating kgf
φ14	2	750	320
	4	1160	570
	5	1215	710
	8	1215	710
φ15	5	1700	890
	10	2500	1200
	20	1600	800
φ16	2	790	323
	4	2406	973
	5	1399	763
	10	2401	1103
	16	819	481
	32	755	432
φ20	4	1085	561
	5	1732	952
	10	2187	1139
	20	1280	719
	40	987	500
φ25	4	1376	622
	5	2209	1073
	6	2761	1453
	10	1927	1164
	20	1619	1003
	25	1926	1018
	50	1475	719

SHANGHAI MINDONG MECHANISM ELECTRON CO., LTD
TEL : +86-21-57784458
+86-21-57784341
http://www.smj-cn.com