



a **WOLONG** company



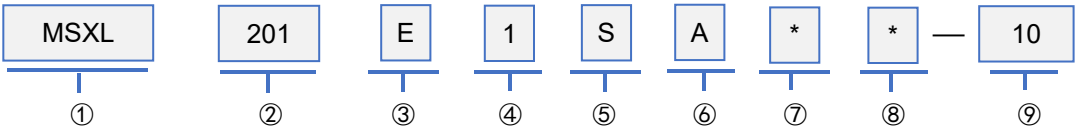
M SERIES AC SERVO MOTOR PRODUCT SELECTION MANUAL



1 Naming Scheme



M series servo motor naming scheme



①	Inertia
Code	Spec.
MSXL	Low Inertia
MCXL	Low Inertia
MSYM	Medium Inertia
MSTM	Medium Inertia
MIXH	High Inertia
MIYH	High Inertia

②	Rated Power
Code	Spec.
500	50*1 W
201	20*10 W
401	40*10 W
751	75*10 W
102	10*100 W
152	15*100 W
202	20*100 W
302	30*100 W
502	50*100 W
752	75*100 W
113	11*1000 W
.....	

③	Poles
Code	Spec.
E	8 poles
T	10 poles

④	Voltage
Code	Spec.
0	24V
1	100V
2	200V
4	400V
A	48V
B	72V

⑤	Encoder
Code	Spec.
F	Incremental 2500P 14 wire
E	Incremental 2500P 8 wire
S	Single Turn Absolute Value 20bit
I	Single Turn Absolute Value 17bit
Z	Single Turn Absolute Value 23/24bit
M	Multiple Turns Absolute Value 20+16bit
A	Multiple Turns Absolute Value 17+16bit
D	Multiple Turns Absolute Value 23/24+16bit

⑥ Structure						
Code	Shaft		Brake		Oil sealing	
	circular	keyway	No	Yes	No	Yes
A	•		•		•	
B	•			•	•	
C	•		•			•
D	•			•		•
S		•	•		•	
T		•		•	•	
U		•	•			•
V		•		•		•

Note①: 7 & 8 digits are internal identification codes

⑨ Reducer Ratio	
Code	Spec.
10	10: 1
15	15: 1

Note②:

- MS/MC are spm design
- MI is IPM design

2 Product Type



Low capacity - Low inertia



Medium capacity - Medium inertia



Medium capacity - High inertia



Ultra small capacity - Low inertia



High capacity - High inertia

Fr.50W to 30kW

3 Technology Specification

Ultra small capacity-Low inertia

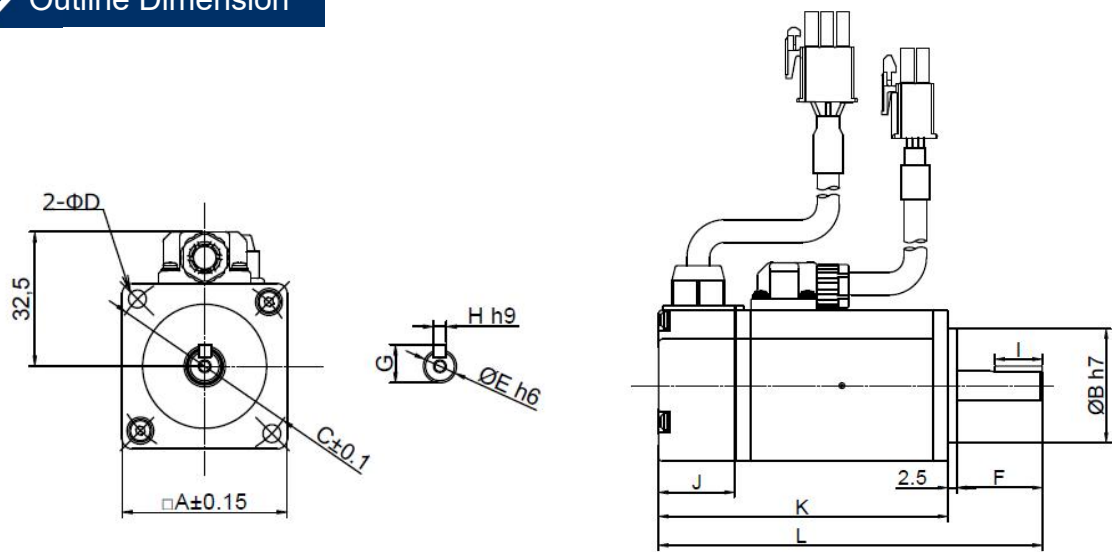
Servo series		MSXL	
Motor model		MSXL500T2*	MSXL101T2*
Flange		□ 40	
Voltage		AC220	
Rated output 【kW】		0.05	0.1
Rated torque 【N•m】		0.16	0.32
Rated speed 【r/min】		3000	3000
Max speed 【r/min】		6000	6000
Max torque 【N•m】		0.48	0.96
Moment of inertia 【× 10 ⁻⁴ kg•m ² 】		0.025 (0.029)	0.051 (0.057)
Rated current 【A】		0.9	1.1
Max current 【A】		2.7	3.3
Resistance 【Ω】		17	19
Inductance 【mH】		17	16
Back EMF 【V/1000RPM】		14	21
Weight 【kg】		0.29 (0.47)	0.49 (0.67)
Poles		10P	
Insulation class		CLASS F	
Protection grade		IP65 / IP67	
Encoder		More than 20 bit/2500P	
Vibration		Less than V15	
The inertia ratio of load		Less than 30 times	
Brake specification	Rated voltage V	DC 24	
	Current A	0.07	
	Friction torque N.m	>0.4	
	Release time ms	20	
	Attract time ms	35	

Notice

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Outline Dimension

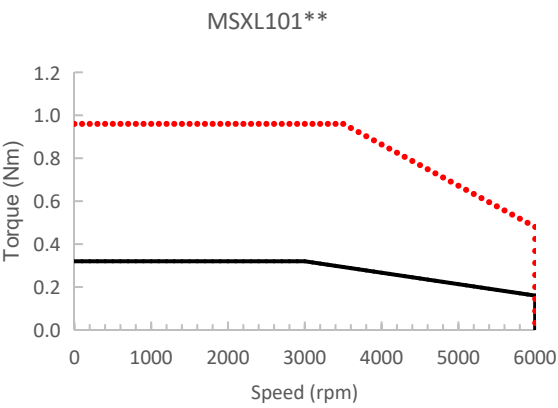
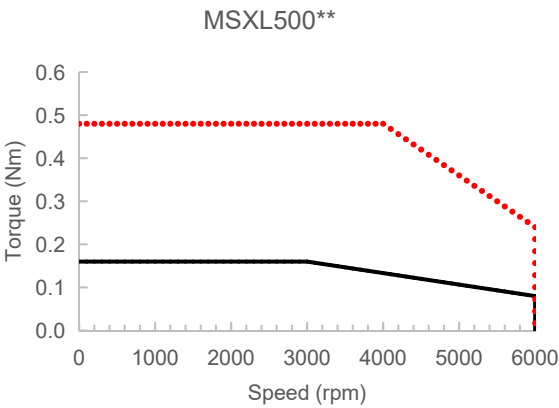


Model	Size value											
	A	B	C	D	E	F	G	H	I	J	K	L
MSXL500T2*S*	40	30	46	4.3	8	22.5	9.2	3	13	20	67.5	92.5
MSXL101T2*S*											88	113
MSXL500T2*T*	40	30	46	4.3	8	22.5	9.2	3	13	20	94.5	119.5
MSXL101T2*T*											115	139.5

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T—N Curve

--- Transient — Steady



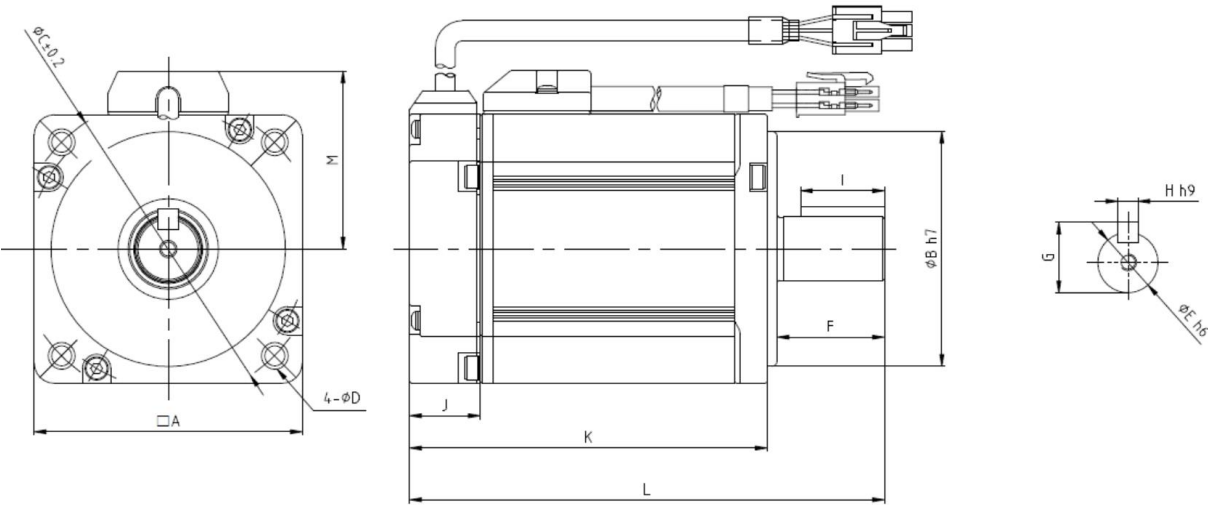
6 Technology Specification

Small capacity-Low inertia

Servo series		MSXL/MCXL		
Flange		□ 60	□ 60	□ 80
Voltage		AC220		
Motor model		MS/MCXL201T2*	MS/MCXL401T2*	MS/MCXL751T2*
Rated output 【kW】		0.2	0.4	0.75
Rated torque 【N•m】		0.64	1.27	2.4
Rated speed 【r/min】		3000	3000	3000
Max speed 【r/min】		5000	5000	4500
Max torque 【N•m】		1.91	3.8	7.1
Moment of inertia 【×10 ⁻⁴ kg•m ² 】		0.14(0.16)	0.26(0.28)	0.87(0.96)
Rated current 【A】		1.7	2.7	4.5
Max current 【A】		6.5	10.2	17.4
Resistance 【Ω】		6.25	3.95	1.15
Inductance 【mH】		24.45	17.6	10.5
Back EMF 【V/1000RPM】		25.5	32	34
Weight 【kg】		0.88(1.23)	1.16(1.60)	2.28(3.06)
Poles		10P		
Insulation class		CLASS B		
Protection grade		IP65 / IP67		
Encoder		More than 20 bit/2500P		
Vibration		Less than V15		
The inertia ratio of load		Less than 30 times		
Brake specification	Rated voltage V	DC 24		
	Current A	0.09		0.16
	Friction torque N.m	>1.3		>2.5
	Release time ms	20		20
	Attract time ms	50		70

- Notice
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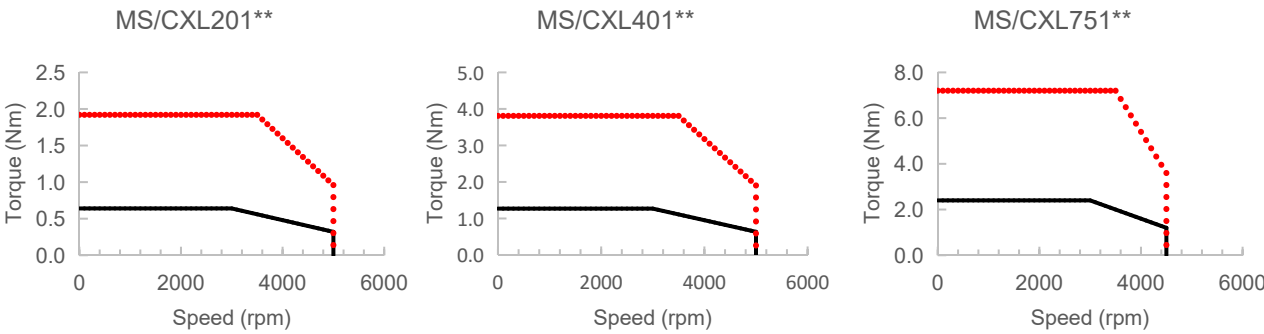
7 Outline Dimension



Model	Size value												
	A	B	C	D	E	F	G	H	I	J	K	L	M
MS/CXL201T2*U*	60	50	70	5.5	11	27	12.5	4	18	18	75.1	105.1	43
MS/CXL201T2*V*	60	50	70	5.5	11	27	12.5	4	18	18	110.6	140.6	43
MS/CXL401T2*U*	60	50	70	5.5	14	27	16	5	22.5	18	94.5	124.5	43
MS/CXL401T2*V*	60	50	70	5.5	14	27	16	5	22.5	18	130	160	43
MS/CXL751T2*U*	80	70	90	6	19	32	21.5	6	22	20	106.7	141.7	53
MS/CXL751T2*V*	80	70	90	6	19	32	21.5	6	22	20	142.7	177.7	53

8 T—N Curve

--- Transient — Steady



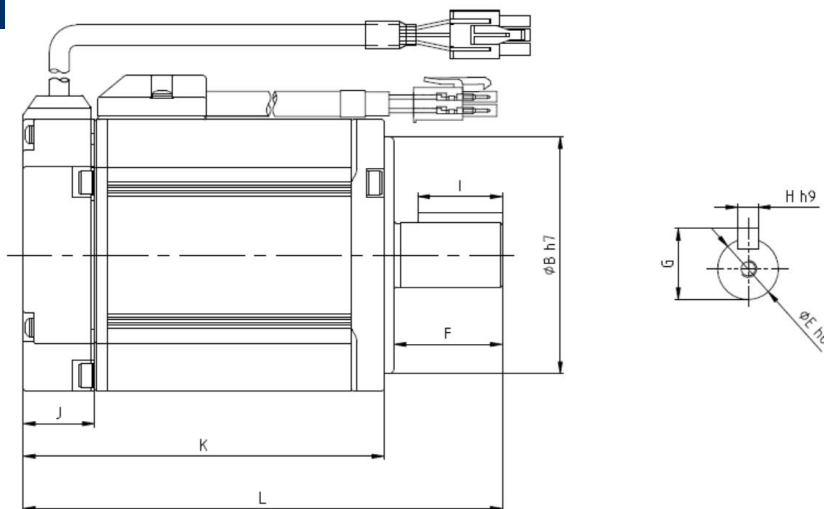
Small capacity-High inertia

9 Technology Specification

Servo series		MCXH/MIXH		
Flange		□ 60	□ 60	□ 80
Voltage		AC220		
Motor model		MCXH/MIXH201T2*	MCXH/MIXH401T2*	MCXH/MIXH751T2*
Rated output 【kW】		0.2	0.4	0.75
Rated torque 【N•m】		0.64	1.27	2.4
Rated speed 【r/min】		3000	3000	3000
Max speed 【r/min】		5000/6000	5000/6000	4500/6000
Max torque 【N•m】		1.91	3.8	7.1
Moment of inertia 【× 10 ⁻⁴ kg•m ² 】		0.42(0.44)/0.28(0.3)	0.67(0.69)/0.56(0.58)	1.51(1.59)/1.44(1.52)
Rated current 【A】		1.7/1.5	2.7/2.3	4.5/3.9
Max current 【A】		6.5/4.5	10.2/7.2	17.4/11.7
Resistance 【Ω】		6.25/6.1	3.95/4.23	1.15/1.78
Inductance 【mH】		24.45/19.5	17.6/15.9	10.5/9.1
Back EMF 【V/1000RPM】		25.5/29.4	32/37.2	34/40
Weight 【kg】		1.0(1.31)/1.0(1.31)	1.36(1.80)/1.36(1.80)	2.46(3.19)/2.46(3.19)
Poles		10P		
Insulation class		CLASS B		
Protection grade		IP65 / IP67		
Encoder		More than 20 bit/2500P		
Vibration		Less than V15		
The inertia ratio of load		Less than 20 times/Less than 20 times		
Brake specification	Rated voltage V	DC 24		
	Current A	0.09		0.16
	Friction torque N.m	> 1.3		>2.5
	Release time ms	20		20
	Attract time ms	50		70

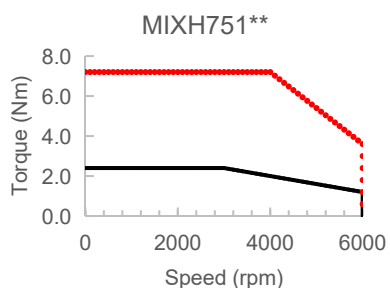
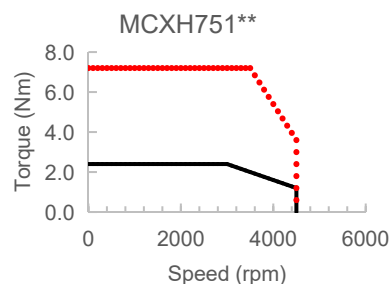
Notice

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Model	Size value												
	A	B	C	D	E	F	G	H	I	J	K	L	M
MC/IXH201T2*U*	60	50	70	5.5	11	27	12.5	4	18	18	95/75	125/105	43
MC/IXH201T2*V*	60	50	70	5.5	11	27	12.5	4	18	18	130/111	160/141	43
MC/IXH401T2*U*	60	50	70	5.5	14	27	16	5	22.5	18	115/95	145/125	43
MC/IXH401T2*V*	60	50	70	5.5	14	27	16	5	22.5	18	150/130	180/160	43
MC/IXH751T2*U*	80	70	90	6	19	32	21.5	6	22	20	122/107	157/142	53
MC/IXH751T2*V*	80	70	90	6	19	32	21.5	6	22	20	158/143	193/178	53

--- Transient — Steady



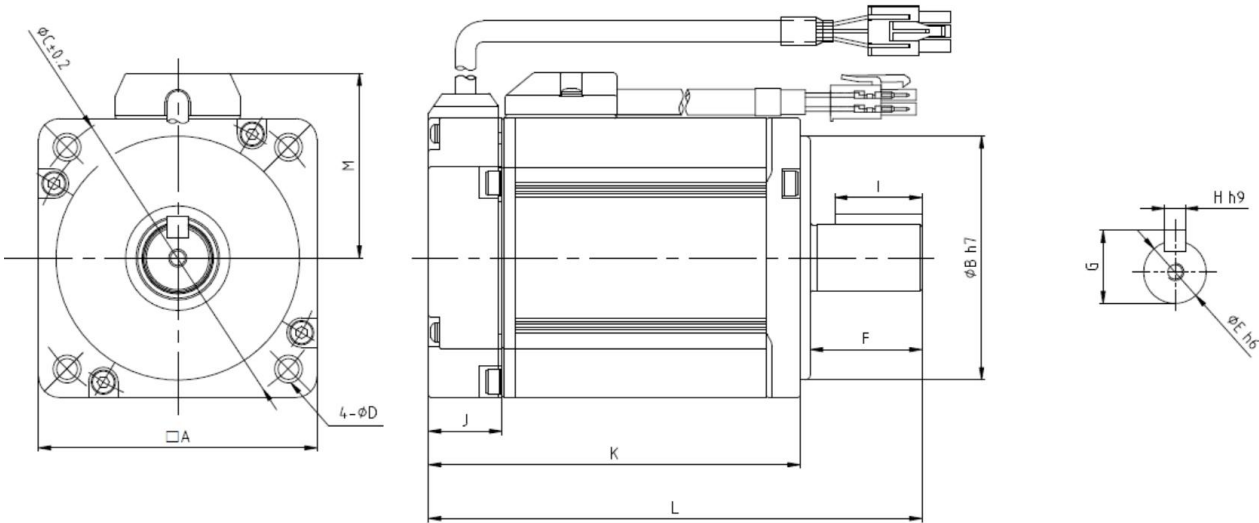
12 Technology Specification

Small capacity-High inertia

Servo series		MIXH		
Flange		□ 60	□ 60	□ 80
Voltage		AC380		
Motor model		MIXH201T4*	MIXH401T4*	MIXH751T4*
Rated output 【kW】		0.2	0.4	0.75
Rated torque 【N•m】		0.64	1.27	2.4
Rated speed 【r/min】		3000	3000	3000
Max speed 【r/min】		6000	6000	6000
Max torque 【N•m】		1.91	3.8	7.1
Moment of inertia 【× 10 ⁻⁴ kg•m ² 】		0.28(0.3)	0.56(0.58)	1.44(1.52)
Rated current 【A】		1.0	1.6	2.6
Max current 【A】		3.0	4.8	7.8
Resistance 【Ω】		9.1	6.3	2.7
Inductance 【mH】		29.2	23.8	13.6
Back EMF 【V/1000RPM】		44	55	60
Weight 【kg】		1.0(1.31)	1.36(1.80)	2.46(3.19)
Poles		10P		
Insulation class		CLASS B		
Protection grade		IP65 / IP67		
Encoder		More than 20 bit/2500P		
Vibration		Less than V15		
The inertia ratio of load		Less than 20 times/Less than 20 times		
Brake specification	Rated voltage V	DC 24		
	Current A	0.09		0.16
	Friction torque N.m	> 1.3		>2.5
	Release time ms	20		20
	Attract time ms	50		70

- Notice
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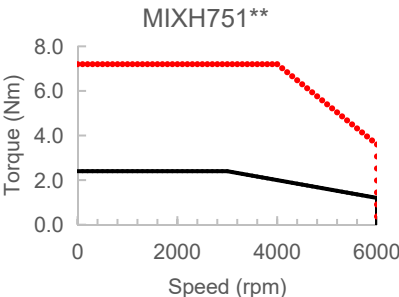
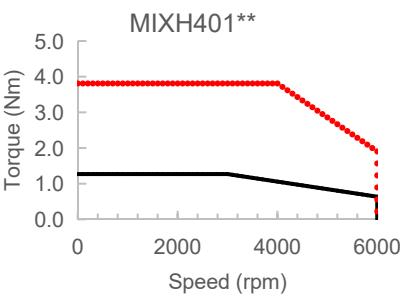
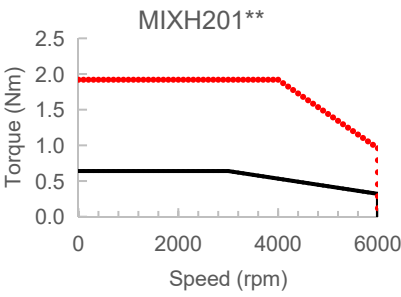
13 Outline Dimension



Model	Size value												
	A	B	C	D	E	F	G	H	I	J	K	L	M
MIXH201T4*U*	60	50	70	5.5	11	27	12.5	4	18	18	75	105	43
MIXH201T4*V*	60	50	70	5.5	11	27	12.5	4	18	18	111	141	43
MIXH401T4*U*	60	50	70	5.5	14	27	16	5	22.5	18	95	125	43
MIXH401T4*V*	60	50	70	5.5	14	27	16	5	22.5	18	130	160	43
MIXH751T4*U*	80	70	90	6	19	32	21.5	6	22	20	107	142	53
MIXH751T4*V*	80	70	90	6	19	32	21.5	6	22	20	143	178	53

14 T—N Curve

--- Transient — Steady



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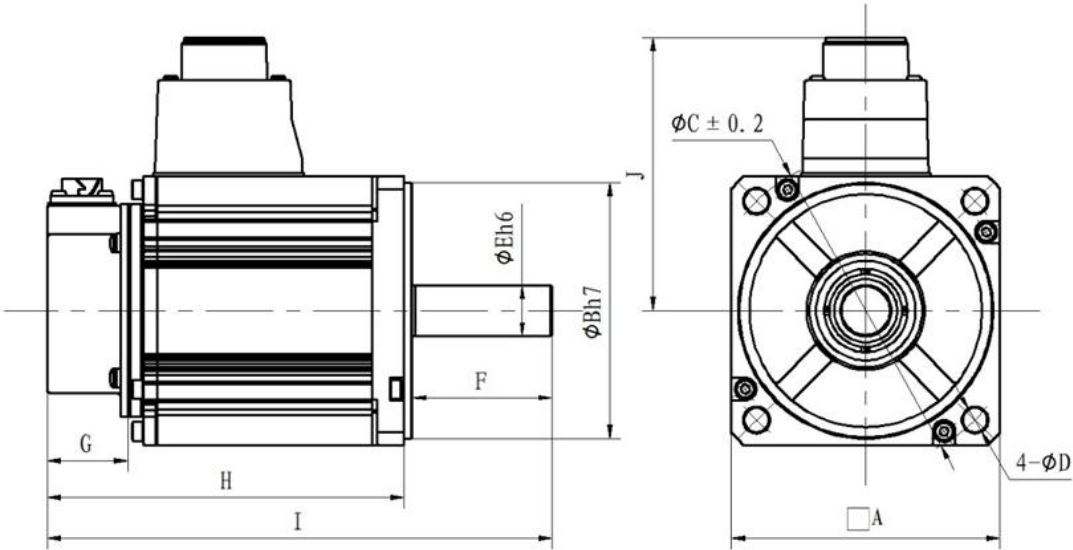
Technology Specification

Medium capacity-Low inertia

Servo series		MSXL		
Flange		□ 100		
Voltage		AC220		
Motor model		MSXL102T2*	MSXL152T2*	MSXL202T2*
Rated output 【kW】		1.0	1.5	2.0
Rated torque 【N•m】		3.18	4.78	6.36
Rated speed 【r/min】		3000	3000	3000
Max speed 【r/min】		5000	5000	5000
Max torque 【N•m】		9.54	14.3	19.0
Moment of inertia 【× 10 ⁻⁴ kg•m ² 】		2.03 (2.62)	2.84 (3.43)	3.68 (4.27)
Rated current 【A】		6.6	8.2	11.3
Max current 【A】		28	35	48
Resistance 【Ω】		0.525	0.47	0.31
Inductance 【mH】		4.50	4.17	2.93
Back EMF 【V/1000RPM】		31.2	37.6	36.5
Weight 【kg】		3.4 (4.2)	4.2 (5.0)	5.2 (6.0)
Poles		10P		
Insulation class		CLASS F		
Protection grade		IP67		
Encoder		More than 20 bit/2500P		
Vibration		Less than V15		
The inertia ratio of load		Less than 30 times		
Brake specification	Rated voltage V	DC 24		
	Current A	0.66		
	Friction torque N.m	>8		
	Release time ms	60		
	Attract time ms	100		

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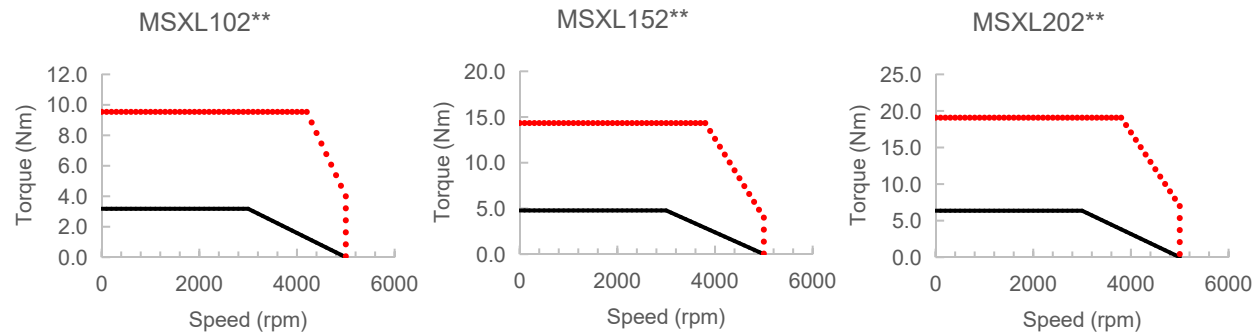
16 Outline Dimension



Model	Size value									
	A	B	C	D	E	F	G	H	I	J
MSXL102T2*C*	100	95	115	9	19	52	30	133	188	101.5
MSXL102T2*D*	100	95	115	9	19	52	30	162	217	101.5
MSXL152T2*C*	100	95	115	9	19	52	30	151.5	206.5	101.5
MSXL152T2*D*	100	95	115	9	19	52	30	180.5	235.5	101.5
MSXL202T2*C*	100	95	115	9	19	52	30	170.5	225.5	101.5
MSXL202T2*D*	100	95	115	9	19	52	30	199.5	254.5	101.5

17 T—N Curve

--- Transient — Steady



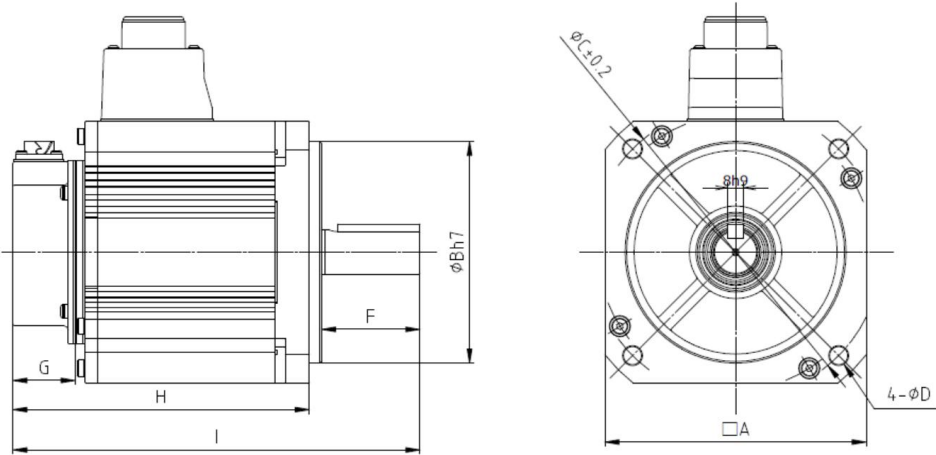
18 Technology Specification

Medium capacity-Medium inertia

Servo series		MSYM			
Flange		□ 130			
Voltage		AC220			
Motor model		MSYM102T2*	MSYM152T2*	MSYM202T2*	MSYM302T2*
Rated output 【kW】		1.0	1.5	2.0	3.0
Rated torque 【N•m】		4.78	7.17	9.55	14.3
Rated speed 【r/min】		2000	2000	2000	2000
Max speed 【r/min】		3000	3000	3000	3000
Max torque 【N•m】		14.3	21.5	28.6	42.9
Moment of inertia 【× 10 ⁻⁴ kg•m ² 】		4.6 (6.4)	6.7 (8.5)	8.7 (10.5)	12.9 (14.7)
Rated current 【A】		5.9	9.7	11.4	17.4
Max current 【A】		24	40	49	74
Resistance 【Ω】		0.93	0.44	0.43	0.21
Inductance 【mH】		11.7	6.1	5.4	3.0
Back EMF 【V/1000RPM】		55.3	49.5	55.6	51.9
Weight 【kg】		5.2 (7.0)	6.6 (8.4)	7.9 (9.7)	10.8 (12.6)
Poles		10P			
Insulation class		CLASS F			
Protection grade		IP67			
Encoder		More than 20 bit/2500P			
Vibration		Less than V15			
The inertia ratio of load		Less than 30 times			
Brake specification	Rated voltage V	DC 24			
	Current A	0.92			
	Friction torque N.m	> 16			
	Release time ms	40			
	Attract time ms	80			

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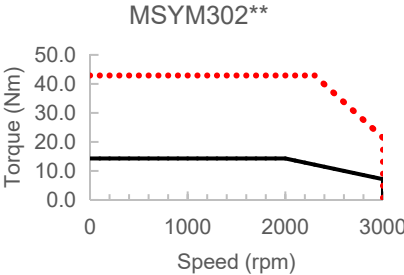
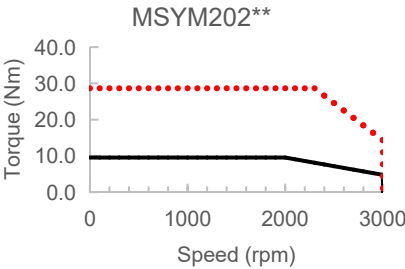
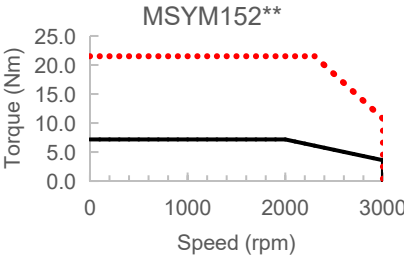
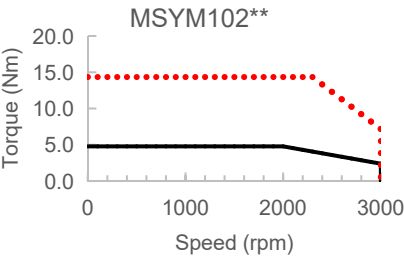
19 Outline Dimension



Model	Size value										
	A	B	C	D	E	F	G	H	I	J	H
MSYM102T2*C*	130	110	145	9	22	49	30	130	185	8	25
MSYM102T2*D*	130	110	145	9	22	49	30	158	213	8	25
MSYM152T2*C*	130	110	145	9	22	49	30	147.5	202.5	8	25
MSYM152T2*D*	130	110	145	9	22	49	30	175.5	230.5	8	25
MSYM202T2*C*	130	110	145	9	22	49	30	165	220	8	25
MSYM202T2*D*	130	110	145	9	22	49	30	193	248	8	25
MSYM302T2*C*	130	110	145	9	24	49	30	200	255	8	27
MSYM302T2*D*	130	110	145	9	24	49	30	228	283	8	27

20 T—N Curve

--- Transient — Steady



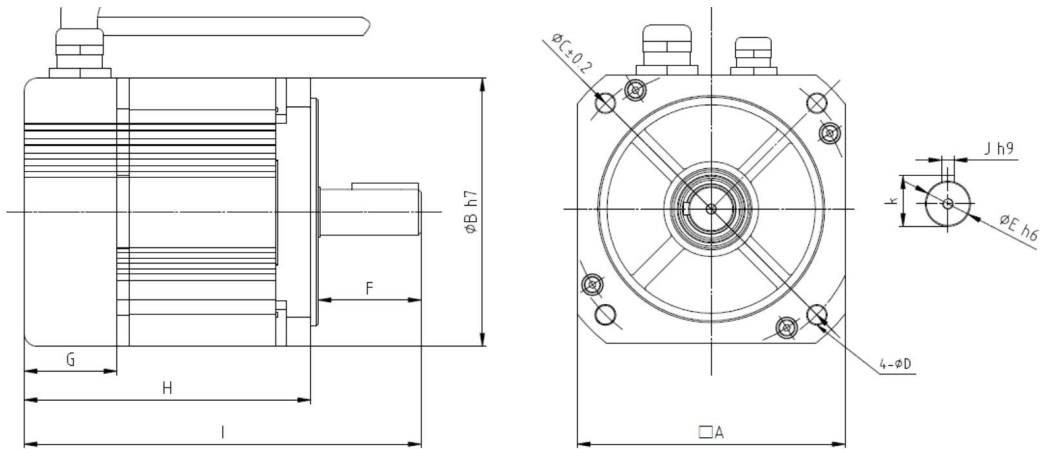
21 Technology Specification

Medium capacity-High inertia

Servo series		MIYH				MITH		
Flange		□ 130						
Voltage		AC220						
Motor model		MIYH102 T2*	MIYH152 T2*	MIYH202 T2*	MIYH302 T2*	MITH851T 2*	MITH132T 2*	MITH182T 2*
Rated output 【kW】		1.0	1.5	2.0	3.0	0.85	1.3	1.5
Rated torque 【N•m】		4.78	7.17	9.55	14.3	5.41	8.28	11.46
Rated speed 【r/min】		2000	2000	2000	2000	1500	1500	1500
Max speed 【r/min】		3000	3000	3000	3000	2000	2000	2000
Max torque 【N•m】		14.3	21.5	28.6	42.9	13	24	34
Moment of inertia 【× 10 ⁻⁴ kg•m ² 】		8.9 (9.4)	13.8 (14.3)	18.1 (18.6)	25.2 (25.7)	8.9 (9.4)	13.8 (14.3)	18.1 (18.6)
Rated current 【A】		5.7	8.4	10.9	15.9	4.45	6.4	8.5
Max current 【A】		24	34	44	65	11	22	30
Resistance 【Ω】		0.8	0.58	0.44	0.33	2.4	1.1	0.88
Inductance 【mH】		19	14.9	10.8	8.3	40	25	19
Back EMF 【V/1000RPM】		52	52	53.5	57.9	70	69	66
Weight 【kg】		5.2 (7.0)	6.6 (8.4)	7.9 (9.7)	10.8 (12.6)	5.2 (7.0)	6.6 (8.4)	7.9 (9.7)
Poles		10P						
Insulation class		CLASS F						
Protection grade		IP65/IP67						
Encoder		20bit以上 / 2500PMore than 20 bit/2500P						
Vibration		V15以下 Less than V15						
The inertia ratio of load		10倍以下 Less than 10 times						
Brake specification	Rated voltage V	DC 24						
	Current A	0.92						
	Friction torque N.m	> 16						
	Release time ms	40						
	Attract time ms	80						

- Notice
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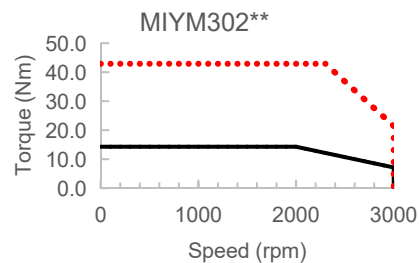
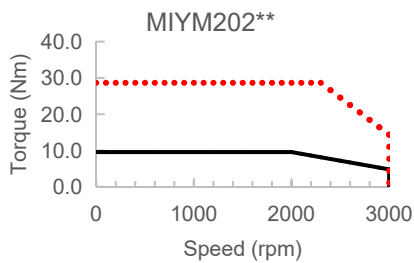
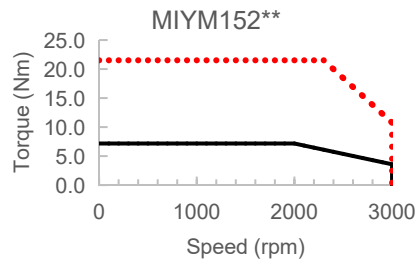
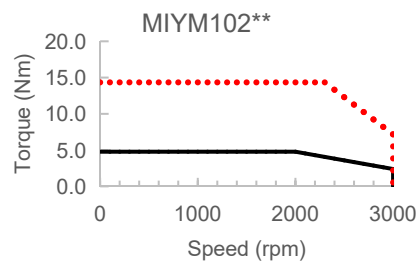
22 Outline Dimension



Model	Size value										
	A	B	C	D	E	F	G	H	I	J	K
MIYH102T2*U*	130	110	145	9	22	49	30	130	185	8	25
MIYH102T2*V*	130	110	145	9	22	49	30	158	213	8	25
MIYH152T2*U*	130	110	145	9	22	49	30	147.5	202.5	8	25
MIYH152T2*V*	130	110	145	9	22	49	30	175.5	230.5	8	25
MIYH202T2*U*	130	110	145	9	22	49	30	165	220	8	25
MIYH202T2*V*	130	110	145	9	22	49	30	193	248	8	25
MIYH302T2*U*	130	110	145	9	24	49	30	200	255	8	27
MIYH302T2*V*	130	110	145	9	24	49	30	228	283	8	27

23 T—N Curve

--- Transient — Steady



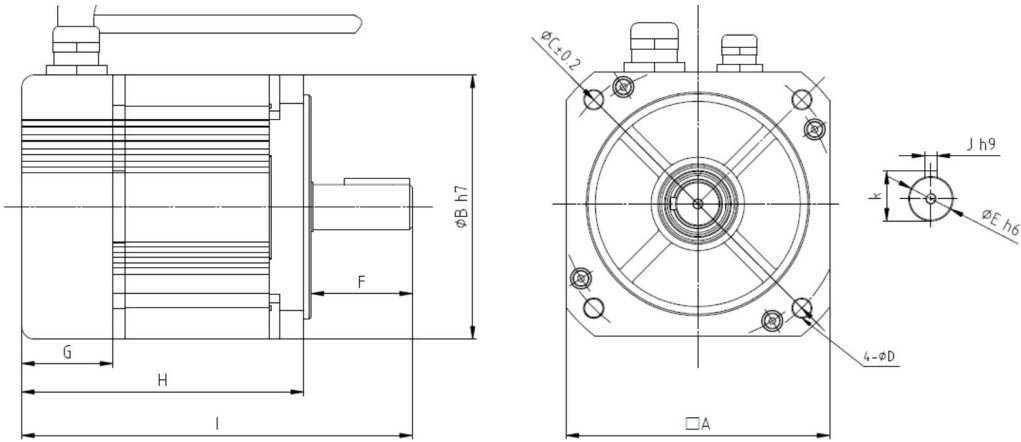
24 Technology Specification

Medium capacity-High inertia

Servo series		MIYH			
Flange		□ 130			
Voltage		AC380			
Motor model		MIYH102T4*	MIYH152T4*	MIYH202T4*	MIYH302T4*
Rated output 【kW】		1.0	1.5	2.0	3.0
Rated torque 【N•m】		4.78	7.17	9.55	14.3
Rated speed 【r/min】		2000	2000	2000	2000
Max speed 【r/min】		3000	3000	3000	3000
Max torque 【N•m】		14.3	21.5	28.6	42.9
Moment of inertia 【× 10 ⁻⁴ kg•m ² 】		8.9 (9.4)	13.8 (14.3)	18.1 (18.6)	25.2 (25.7)
Rated current 【A】		4.8	7.0	9.1	14
Max current 【A】		20	28	36	54
Resistance 【Ω】		1.00	0.70	0.53	0.40
Inductance 【mH】		23	18	13	10
Back EMF 【V/1000RPM】		63	62	64	69
Weight 【kg】		5.2 (7.0)	6.6 (8.4)	7.9 (9.7)	10.8 (12.6)
Poles		10P			
Insulation class		CLASS F			
Protection grade		IP65/IP67			
Encoder		More than 20 bit/2500P			
Vibration		Less than V15			
The inertia ratio of load		Less than 10 times			
Brake specification	Rated voltage V	DC 24			
	Current A	0.92			
	Friction torque N.m	> 16			
	Release time ms	40			
	Attract time ms	80			

- Notice
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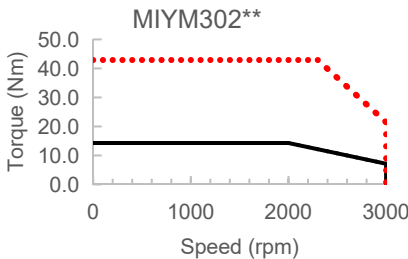
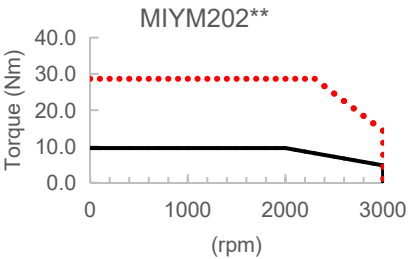
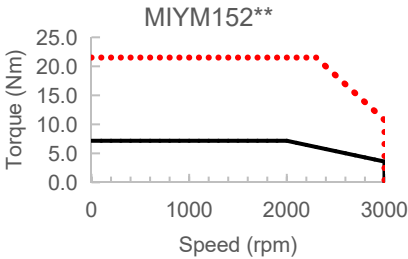
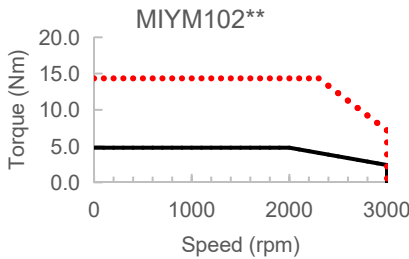
25 Outline Dimension



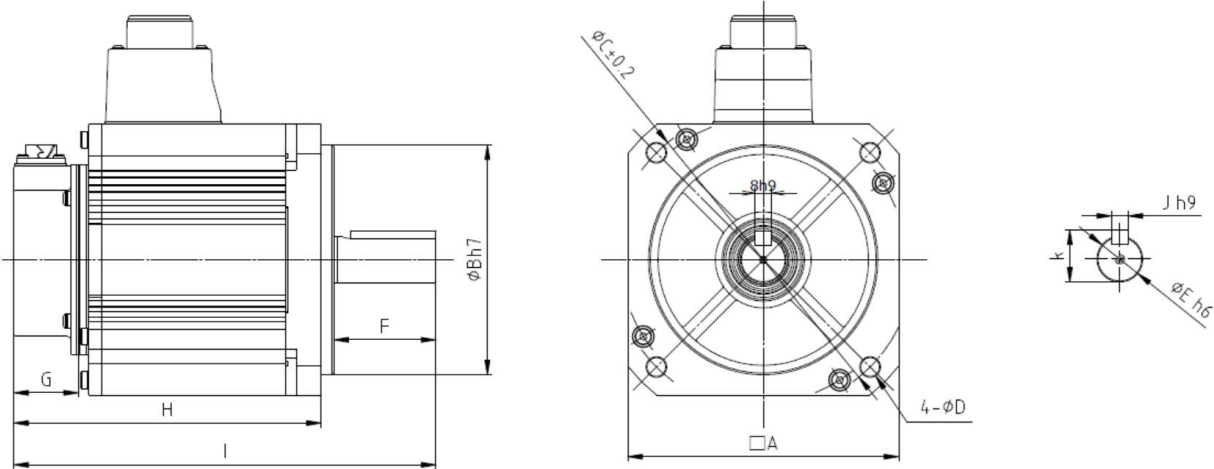
Model	Size value										
	A	B	C	D	E	F	G	H	I	J	K
MIYH102T4*U*	130	110	145	9	22	49	30	130	185	8	25
MIYH102T4*V*	130	110	145	9	22	49	30	158	213	8	25
MIYH152T4*U*	130	110	145	9	22	49	30	147.5	202.5	8	25
MIYH152T4*V*	130	110	145	9	22	49	30	175.5	230.5	8	25
MIYH202T4*U*	130	110	145	9	22	49	30	165	220	8	25
MIYH202T4*V*	130	110	145	9	22	49	30	193	248	8	25
MIYH302T4*U*	130	110	145	9	24	49	30	200	255	8	27
MIYH302T4*V*	130	110	145	9	24	49	30	228	283	8	27

26 T—N Curve

--- Transient — Steady



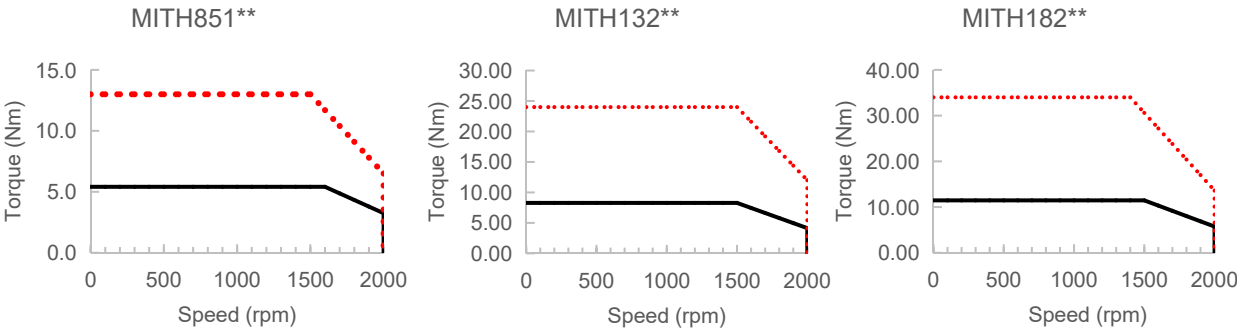
27 Outline Dimension



Model	Size value										
	A	B	C	D	E	F	G	H	I	J	K
MITH851T2*U*	130	110	145	9	22	49	30	130	185	8	25
MITH851T2*V*	130	110	145	9	22	49	30	158	213	8	25
MITH132T2*U*	130	110	145	9	22	49	30	147.5	202.5	8	25
MITH132T2*V*	130	110	145	9	22	49	30	175.5	230.5	8	25
MITH182T2*U*	130	110	145	9	22	49	30	165	220	8	25
MITH182T2*V*	130	110	145	9	22	49	30	193	248	8	25

28 T—N Curve

--- Transient — Steady



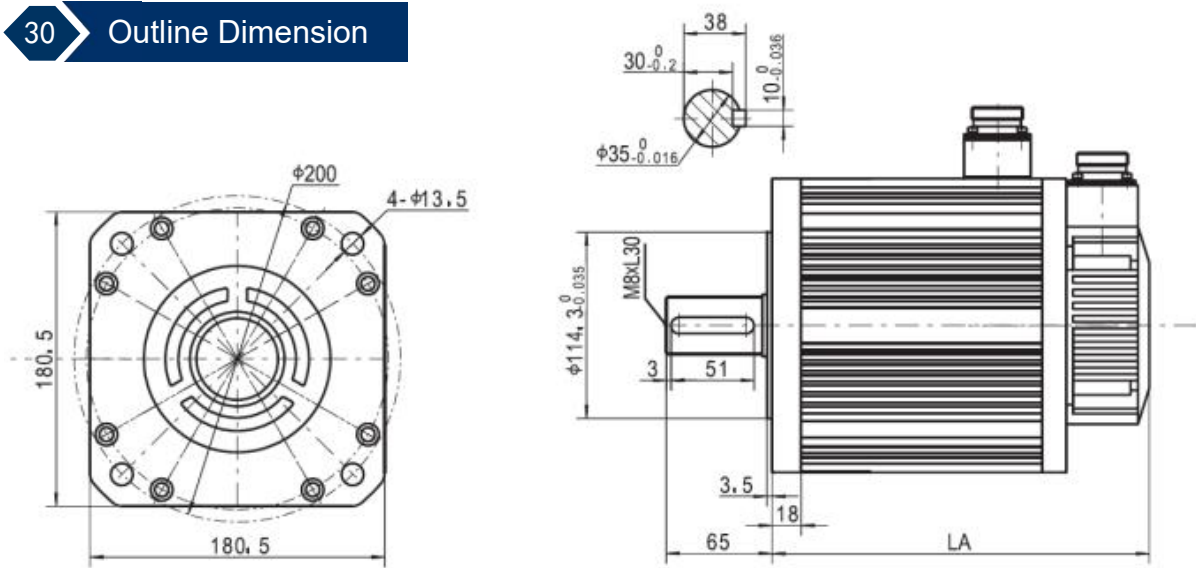
29 Technology Specification

High capacity-High inertia

Servo series		MSTH				
Flange		□ 180				
Voltage		AC220				
Motor model		MSTH252E2*	MSTH302E2*	MSTH432E2*	MSTH552E2*	MSTH752E2*
Rated output 【kW】		2.5	3.0	4.3	5.5	7.5
Rated torque 【N·m】		17	19	27	35	48
Rated speed 【r/min】		1500	1500	1500	1500	1500
Max speed 【r/min】		1800	1800	1800	1800	1800
Max torque 【N·m】		42	47	67	70	96
Moment of inertia 【× 10 ⁻⁴ kg·m ² 】		65	70	96.4	122.5	167.2
Rated current 【A】		10	12	16	24	32
Max current 【A】		25	30	40	48	64
Resistance 【Ω】		0.6	0.42	0.32	0.28	0.11
Inductance 【mH】		4.0	2.42	1.74	1.0	0.77
Back EMF 【V/1000RPM】		108	97	103	90	94
Weight 【kg】		19.5	20.5	25.5	30.5	40
Poles		8P				
Insulation class		CLASS F				
Protection grade		IP65				
Encoder		More than 20bit/2500P				
Vibration		Less than V15				
The inertia ratio of load		Less than 10 times				
Brake specification	Rated voltage V	DC 24				
	Current A	1.86				
	Friction torque N.m	> 50				
	Release time ms	130				
	Attract time ms	152				

- Notice
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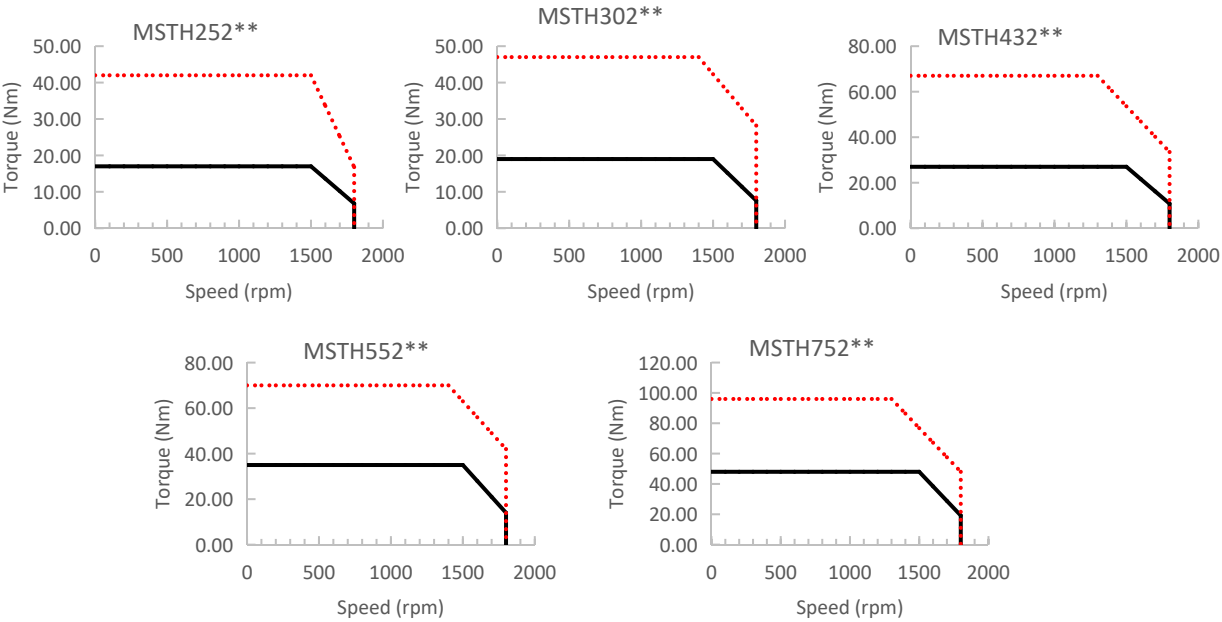
30 Outline Dimension



Motor type	180 series servo				
Torque(N/m)	17	19	27	35	48
LA Non-locking(mm)	226	232	262	292	346
LA With electromagnetic lock(mm)	298	204	334	364	418

31 T—N Curve

--- Transient — Steady



32 Technology Specification

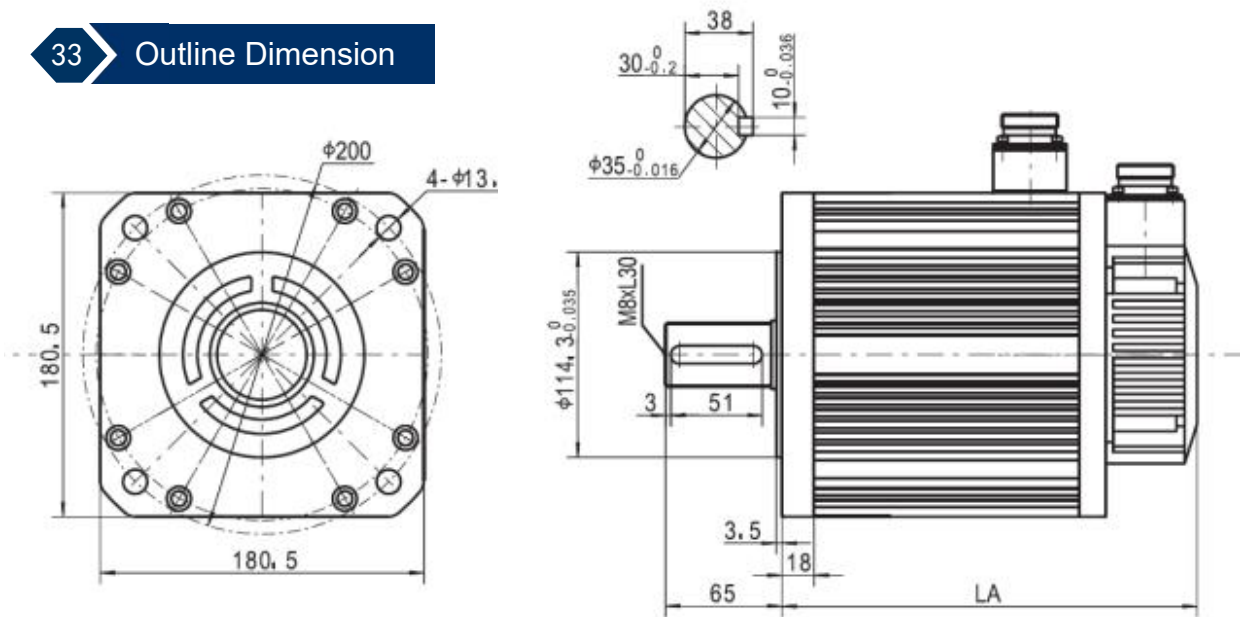
High capacity-High inertia

Servo series		MS*H				
Flange		□ 180				
Voltage		AC380				
Motor model		MSTH252E4*	MSTH302E4*	MSTH432E4*	MSTH552E4*	MSTH752E4*
Rated output 【kW】		2.5	3.0	4.3	5.5	7.5
Rated torque 【N·m】		17	19	27	35	48
Rated speed 【r/min】		1500	1500	1500	1500	1500
Max speed 【r/min】		1800	1800	1800	1800	1800
Max torque 【N·m】		42	47	67	70	96
Moment of inertia 【× 10 ⁻⁴ kg·m ² 】		65	70	96.4	122.5	167.2
Rated current 【A】		6.5	7.5	10	12	20
Max current 【A】		16	19	25	24	40
Resistance 【Ω】		1.87	1.17	0.87	0.69	0.36
Inductance 【mH】		10.5	7.3	5.5	6.2	6.3
Back EMF 【V/1000RPM】		194	165	172	179	159
Weight 【kg】		19.5	20.5	25.5	30.5	40
Poles		8P				
Insulation class		CLASS F				
Protection grade		IP65				
Encoder		More than 20bit / 2500P				
Vibration		Less than V15				
The inertia ratio of load		Less than 10 times				
Brake specification	Rated voltage V	DC 24				
	Current A	1.86				
	Friction torque N.m	> 50				
	Release time ms	130				
	Attract time ms	152				

Notice

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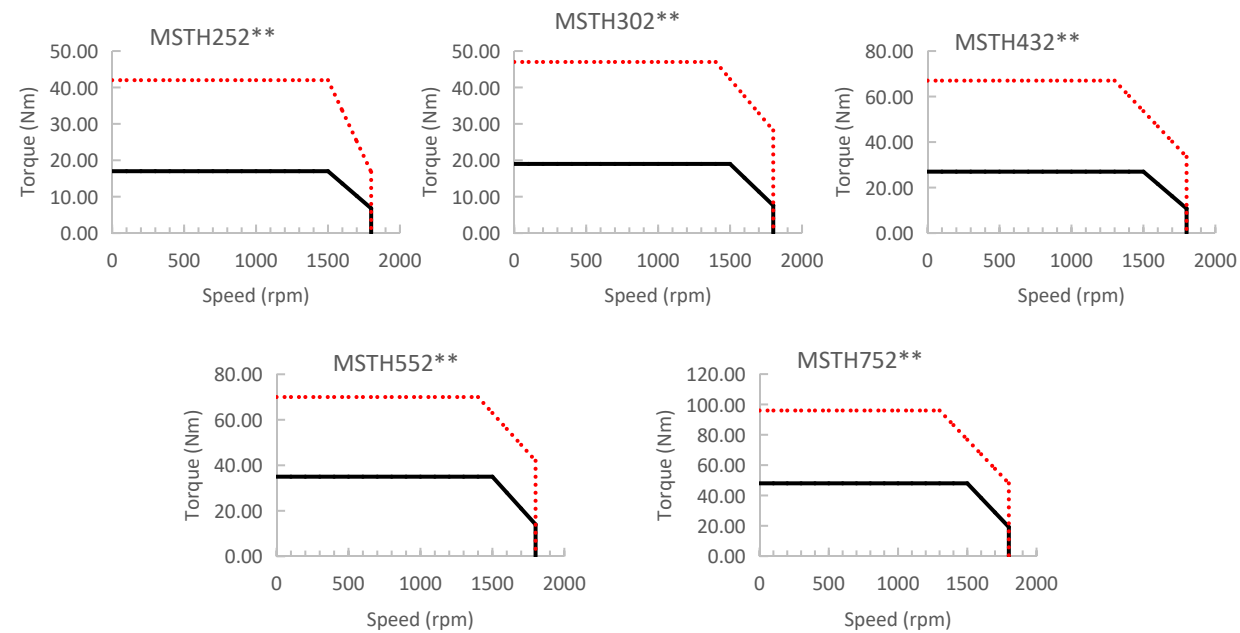
33 Outline Dimension



Motor type	180 series servo					
Torque(N/m)	17	19	21.5	27	35	48
LA Non-locking(mm)	226	232	243	262	292	346
LA With electromagnetic lock(mm)	298	204	315	334	364	418

34 T—N Curve

--- Transient — Steady



35 Technology Specification

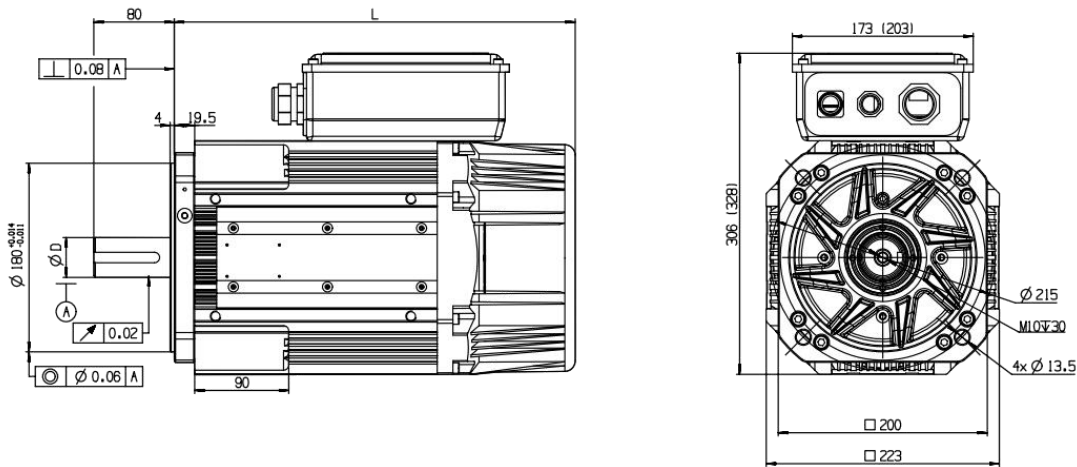
High capacity-High inertia

Servo series	MITH				
Flange	□ 200				
Voltage	AC380~480				
Motor model	MITH752E4*	MITH113E4*	MITH153E4*	MITH203E4*	MITH233E4*
Rated output 【kW】	7.5	11	15	20	23
Rated torque 【N•m】	49	73.5	98	122.5	147
Rated speed 【r/min】	1500	1500	1500	1500	1500
Max speed 【r/min】	1800	1800	1800	1800	1800
Max torque 【N•m】	132	132	175	175	210
Moment of inertia 【× 10 ⁻⁴ kg•m ² 】	53	75	96	118	139
Rated current 【A】	14	22	28	37	45
Max current 【A】	40	55	52.5	70	57.5
Resistance 【Ω】	1.83	0.85	0.69	0.39	0.35
Inductance 【mH】	36	21.85	17.65	11.77	10.61
Back EMF 【V/1000RPM】	220	212	220	200	210
Weight 【kg】	46	46	45	53	59
poles	8P				
Insulation class	CLASS F				
Protection grade	IP65				
Encoder	More than 20bit / 2500P				
Vibration	Less than V15				
The inertia ratio of load	Less than 10 times				
Brake specification	According to motor model				

Notice

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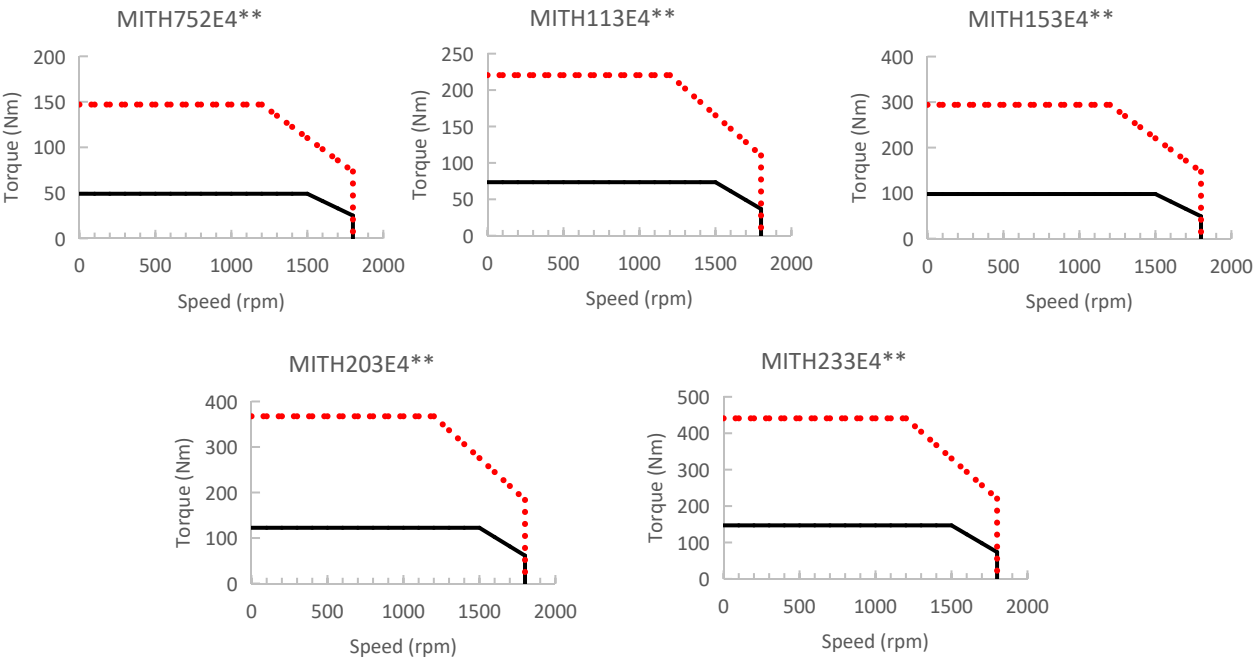
36 Outline Dimension



Model	MITH752E4**	MITH113E4**	MITH153E4**	MITH203E4**	MITH233E4*
L	357	383	419	455	491
D	38J6				
Flat key size	C10x63				

37 T—N Curve

--- Transient — Steady



38

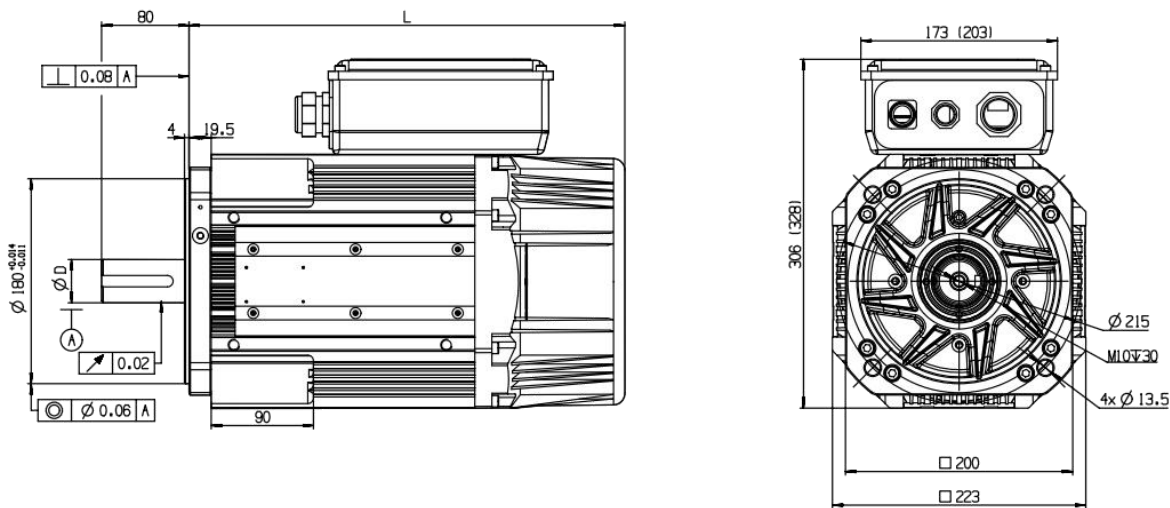
Technology Specification

High capacity-High inertia

Servo series	MIYH				
Flange	□ 200				
Voltage	AC380~480				
Motor model	MIYH103E4*	MIYH153E4*	MIYH203E4*	MIYH253E4*	MIYH303E4*
Rated output 【kW】	10	15	20	25	30
Rated torque 【N·m】	49	73.5	98	122.5	147
Rated speed 【r/min】	2000	2000	2000	2000	2000
Max speed 【r/min】	2400	2400	2400	2400	2400
Max torque 【N·m】	132	132	175	175	210
Moment of inertia 【× 10 ⁻⁴ kg·m ² 】	53	75	96	118	139
Rated current 【A】	19	29	39	49	59
Max current 【A】	40	55	52.5	70	82
Resistance 【Ω】	0.93	0.44	0.34	0.25	0.19
Inductance 【mH】	19.15	11.15	9.5	6.63	5.5
Back EMF 【V/1000RPM】	160	150	160	150	150
Weight 【kg】	33	40	45	53	59
Poles	8P				
Insulation class	CLASS F				
Protection grade	IP65				
Encoder	Mom than 20bit / 2500P				
Vibration	Less than V15				
The inertia ratio of load	Less than 10 times				
Brake specification	According to motor model				

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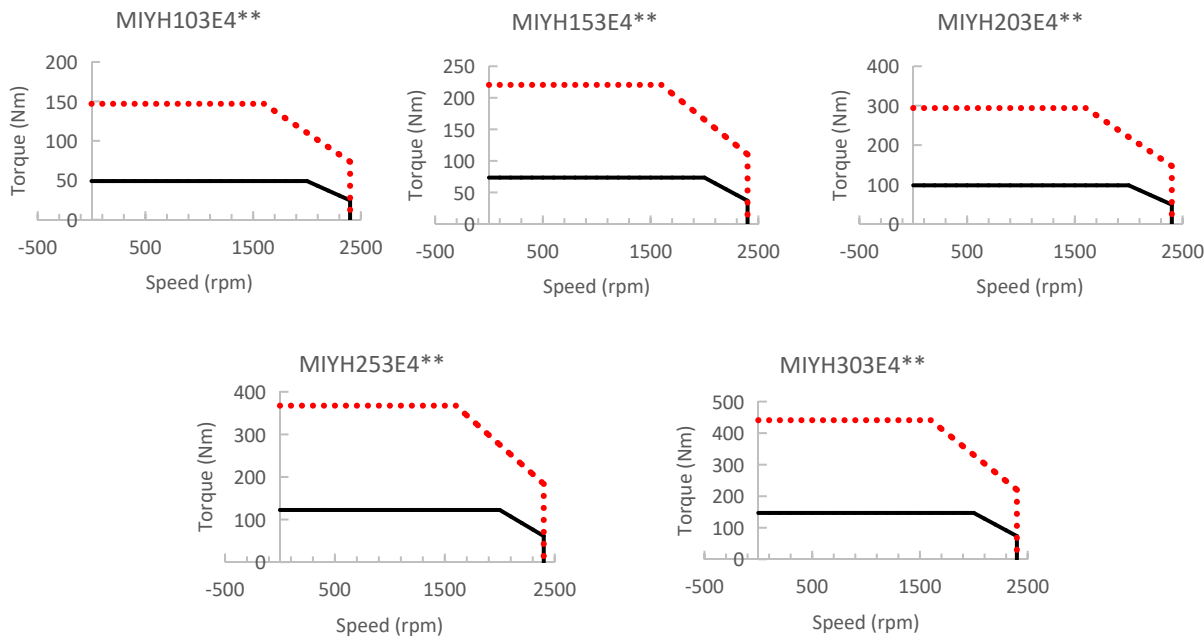
39 Outline Dimension



Model	MIYH103E4**	MIYH153E4**	MIYH203E4**	MIYH253E4**	MIYH303E4**
L	357	383	419	455	491
D	38J6				
Flat key size	C10x63				

40 T—N Curve

--- Transient — Steady

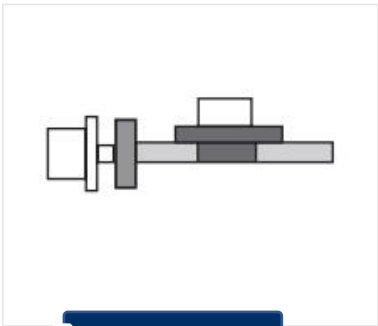


Selection Of Motor

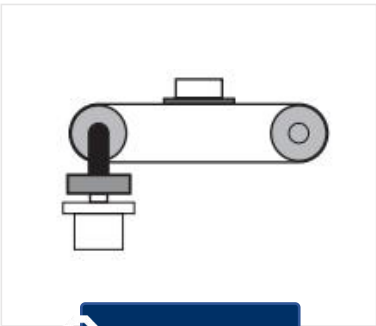
Typical mechanical structure as below:

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Selection Calculation



Ball screw

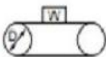
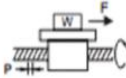


Belt drive



Gears & Racks

Inertia Calculation Methods Of Common Mechanism Part

Shape	Calculation formula of inertia J	Shape	Calculation formula of inertia J
Cylinder and Hollow cylinder 	Cylinder: $J = \frac{1}{8}WD^2[kg \cdot m^2]$ Hollow cylinder: $J = \frac{1}{8}W(D^2 - d^2)[kg \cdot m^2]$ W: Weight D: Outer Diameter d: Inner Diameter	Gear box 	Convert to A-axis inertia $J = J_1 + (\frac{n_1}{n_2})J_2[kg \cdot m^2]$ n ₁ : a axis speed n ₂ : b axis speed
Belt drive 	$J = \frac{1}{4}WD^2[kg \cdot m^2]$ W: Weight on belt D: Drive wheel diameter	Ball screw 	$J = J_B + \frac{W \cdot P^2}{4\pi^2}[kg \cdot m^2]$ W: Weight [kg] P: Lead J _B : J of Ball screw

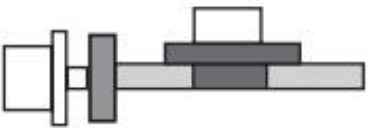
Selection Example 1: Ball Screw

41

Selection Calculation

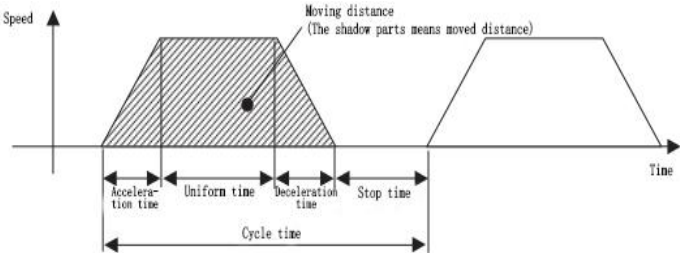
1. Determine the parameters of the mechanism parts

Workpiece weight	$W_A = 10 \text{ [kg]}$
Screw lead	$B_L = 0.5 \text{ [m]}$
Screw diameter	$B_D = 0.02 \text{ [m]}$
Screw pitch	$B_P = 0.02 \text{ [m]}$
Screw efficiency	$B_\eta = 0.9$
Moving distance	0.3 [m]
Coupler Inertia	$J_C = 10 \times 10^{-6} \text{ [kg} \cdot \text{m}^2 \text{]}$



2. Determine the operating mode

Acceleration time	$t_a = 0.1 \text{ [s]}$
Uniform time	$t_b = 0.8 \text{ [s]}$
Deceleration time	$t_d = 0.1 \text{ [s]}$
Cycle time	$t_c = 2 \text{ [s]}$
Moving distance	0.3 [m]



3. Calculate load inertia and inertia ratio

The inertia ratio is the ratio of load inertia to motor inertia.

According to the usual standards, the load inertia of the motor below 750W should be less than 20 times, and the load inertia of the motor above 1kW should be less than 10 times.

Weight of lead screw:

$$B_w = \rho \times \pi \times \left(\frac{B_D}{2}\right)^2 B_L = 7.9 \times 10^3 \times \pi \times \left(\frac{0.02}{2}\right)^2 \times 0.5 \\ = 1.24 \text{ [kg]}$$

Load inertia:

$$J_L = J_C + J_B = J_C + \frac{1}{8} B_w \times B_D^2 + \frac{W_A \cdot B_P^2}{4\pi^2} \\ = 1.73 \times 10^{-4} \text{ [kg} \cdot \text{m}^2 \text{]}$$

If selected the 200W motor, the motor inertia is

$$J_M = 0.14 \times 10^{-4} \text{ [kg} \cdot \text{m}^2 \text{]},$$

$$J_L / J_M = 1.73 \times 10^{-4} / 0.14 \times 10^{-4} = 12.3 \text{ (倍)}$$

If selected the 100W motor, the motor inertia is

$$J_M = 0.051 \times 10^{-4} \text{ [kg} \cdot \text{m}^2 \text{]},$$

$$J_L / J_M = 1.73 \times 10^{-4} / 0.051 \times 10^{-4} = 33.9 \text{ (倍)}$$

When choosing 200W motor, the inertia ratio is less than 20, which is more reasonable.

41

Selection Calculation

4. Speed calculation

Max speed of workpiece movement:

$$\frac{1}{2} \times t_a \times V_{\max} + t_b \times V_{\max} + \frac{1}{2} \times t_d \times V_{\max} = 0.3 \text{ (moving distance)}$$

$$V_{\max} = 0.334 [r / s]$$

The lead of ball screw is 0.02[m], max speed of motor side is

$$N = 0.334 / 0.02 \times 60 = 1002 [r / \min] < 3000 [r / \min], \text{ less than rated speed of 200W motor}$$

5. Torque calculation

Moving torque:

$$T_f = \frac{B_p}{2\pi B_\eta} (\mu g W_A + F) = 0.035 [N \cdot m]$$

Acceleration torque:

$$T_a = \frac{(J_L + J_M) \times 2\pi N [r / s]}{t_d} + T_f = 0.231 [N \cdot m]$$

Retarding torque:

$$T_d = \frac{(J_L + J_M) \times 2\pi N [r / s]}{t_d} - T_f = 0.161 [N \cdot m]$$

The max torque is 0.231 Nm, less than max torque 1.91 Nm of 200W motor.

Effective torque:

$$T_{rms} = \sqrt{\frac{T_a^2 \times t_a + T_f^2 \times t_b + T_d^2 \times t_d}{t_c}} = 0.067 [N \cdot m]$$

0.067 Nm less than rated torque 0.64 Nm of 200W motor.

6. Capacity selection of motor

Considering the load inertia and torque comprehensively, the choice of 200W motor is more reasonable.

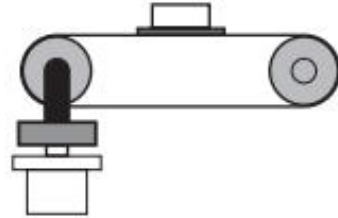
Selection Example 2: Belt Drive

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Selection Calculation

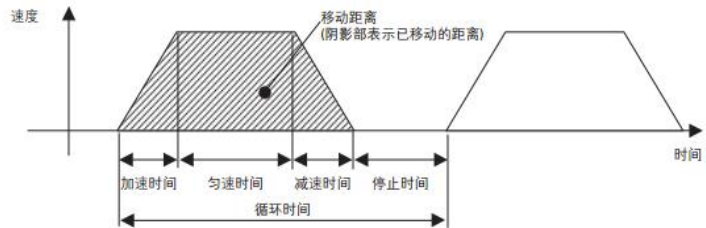
1. Determine the parameters of the mechanism parts

Workpiece weight	WA = 2[kg]
Weight on belt	WP = 0.5[kg]
Belt pulley diameter	PD = 0.05[m]
Machinery efficiency	B = 0.8
Coupler inertia	Jc=0



2. Determine the operating mode

Acceleration time	ta = 0.1 [s]
Uniform time	tb = 0.8 [s]
Deceleration time	td = 0.1 [s]
Cycle time	tc = 2 [s]
Moving distance	1 [m]



3. Calculate load inertia and inertia ratio

The inertia ratio is the ratio of load inertia to motor inertia.

According to the usual standards, the load inertia of the motor below 750W should be less than 20 times, and the load inertia of the motor above 1kW should be less than 10 times.

Load inertia:

$$J_L = J_C + J_B + J_P = J_C + \frac{1}{4}W_A \times P_D^2 + \frac{1}{8}W_P \times P_D^2 \times 2$$

$$= 0.00156 = 15.6 \times 10^{-4} [\text{kg} \cdot \text{m}^2]$$

If selected the 750W motor, the motor inertia is $J_M = 0.87 \times 10^{-4} [\text{kg} \cdot \text{m}^2]$,

$$J_L / J_M = 15.6 \times 10^{-4} / 0.87 \times 10^{-4} = 17.9 (\text{倍})$$

The inertia ratio is less than 20, which is more reasonable.

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Selection Calculation

Max speed of workpiece movement:

$$\frac{1}{2} \times t_a \times V_{\max} + t_b \times V_{\max} + \frac{1}{2} \times t_d \times V_{\max} = l (\text{moving distance})$$

$$V_{\max} = 1.111 [r/s]$$

$$\text{Take the wheel for one turn} = \pi \times P_D = 0.157 [m]$$

$$N = 1.111 / 0.157 \times 60 = 424.8 [r/min] < 3000 [r/min], \text{ can rated speed of 200W motor}$$

4. Speed calculation

Moving torque:

$$T_f = \frac{P_D}{2\eta} (\mu g W_A + F) = 0.061 [N \cdot m]$$

Acceleration torque:

$$T_a = \frac{(J_L + J_M) \times 2\pi N [r/s]}{t_d} + T_f = 0.751 + 0.061 = 0.812 [N \cdot m]$$

Retarding torque:

$$T_d = \frac{(J_L + J_M) \times 2\pi N [r/s]}{t_d} - T_f = 0.751 - 0.061 = 0.69 [N \cdot m]$$

The max torque is 0.812 Nm, less than max torque 7.1 Nm of 750W motor.

$$T_{rms} = \sqrt{\frac{T_a^2 \times t_a + T_f^2 \times t_b + T_d^2 \times t_d}{t_c}} = 0.241 [N \cdot m]$$

0.241 Nm less than rated torque 2.4 Nm of 750W motor.

5. Torque calculation

6. Capacity selection of motor

Considering the load inertia and torque comprehensively, the choice of 750W motor is more reasonable.

SAFETY PRECAUTIONS

1、Precautions for unpacking inspection:		
(1)Do not install damaged motors or missing parts		There is a risk of injury
2、Installation precautions:		
(1)Install on the non-burning metal plate, do not install near the combustible		There is a risk of fire
(2)Be sure to tighten the mounting screws of the motor		If the screws are loose, the motor may fall or personnel may be injured
(3)Do not install in an environment with flammable gas		Explosive
3、Wiring hazardous:		
(1)Please ask professional electrical operators to connect the cables. Before connecting the cables, make sure that the power is turned off. Do not touch the exposed part of the terminal after connecting the power supply (if any).		There is a risk of electric shock and fire
(2)When working on the motor terminal, cut off the power supply		There is a risk of electric shock
(3)The grounding terminal must be reliably grounded (grounding resistance below 4Ω)		There is a risk of electric shock and fire
4、Wiring precautions:		
(1)Please confirm whether the AC input power supply is consistent with the rated voltage of the motor		There is a risk of injury and fire
(2)Do not carry out voltage resistance and insulation test on the motor at will		The motor insulation system may be damaged
(3)Tighten the terminals of the motor with appropriate torque		There is a risk of fire
(4)Please follow the power line, signal line wiring correctly		Risk of fire or motor misoperation/damage, etc
5、Trial operation hazards:		
(1)Do not touch the exposed part of the terminal directly after the power is turned on or during operation (if any).		Risk of electric shock and short circuit
(2)Confirm the sequence of signal lines and power lines to ensure operation safety		Misoperation may cause casualties and damage to peripheral equipment
(3)Do not touch or let hair or fabric close when the motor shaft is running		There is a risk of injury
6、Trial operation precautions:		
(1)The motor has a high temperature rise during operation, do not touch it		There is a risk of burns
(2)The motor shaft with the key should be removed in advance or reliably fixed to prevent flying out		Risk of injury or injury or damage to peripheral equipment

USAGE ENVIRONMENT PRECAUTIONS

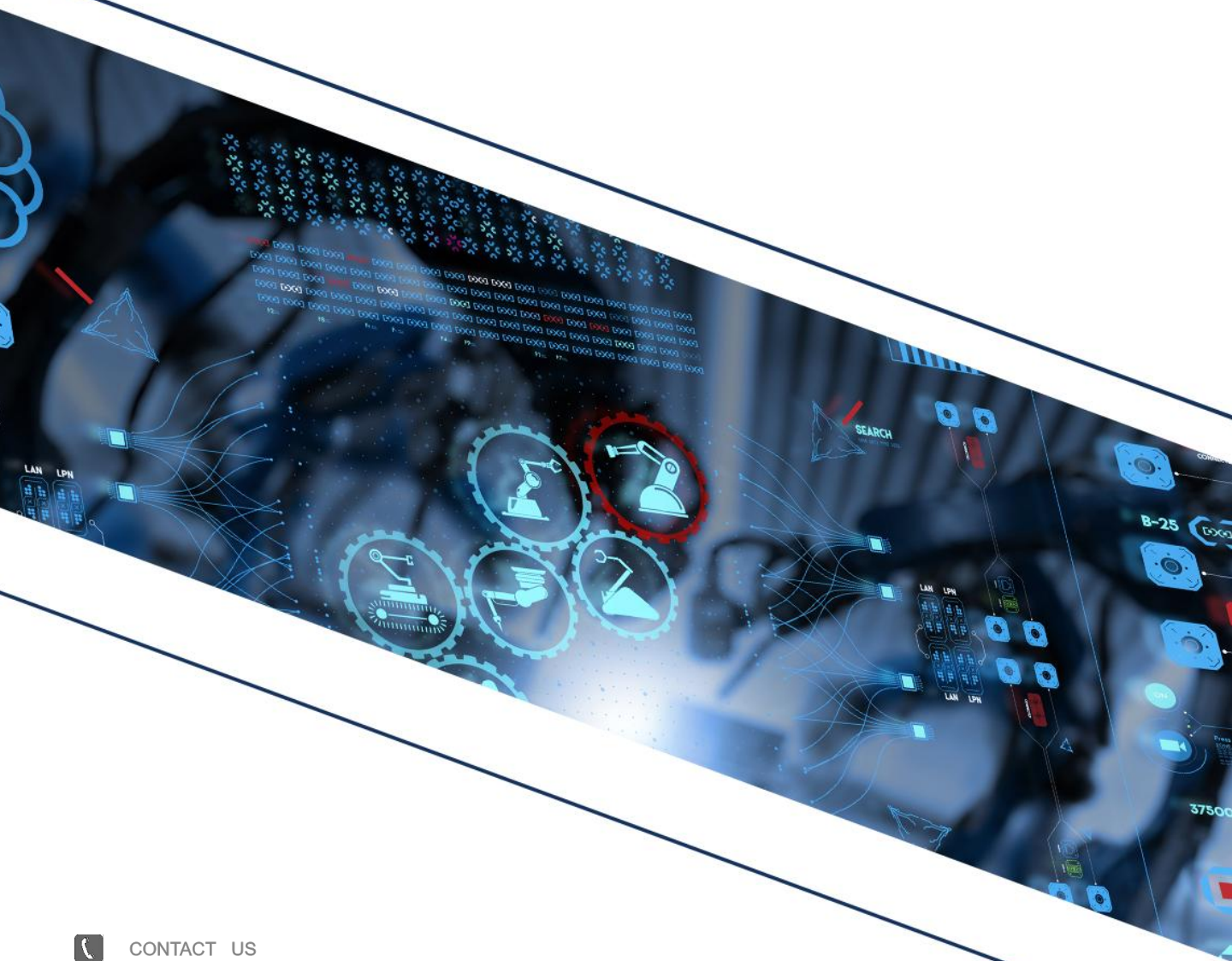
1	Temperature	Operate: 0~+40℃; Save: -20~+60℃(Not frozen)
2	Humidity	Operate & Save: Less than 90%RH (No condensation)
3	Installation method	Flange installation IMB5、IMV1、IMV3
4	Installation Location	Indoor (no direct sunlight), no corrosive gas, flammable gas, oil mist and dust
5	Altitude	Less than 1000 meters



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ANYTIME AND ANYWHERE AS YOUR NEED



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