

Kinavo[®]



SMH Servo Motor

Product Manual



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Kinavo Servo Motor (Changzhou) Limited

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Servo Motor Description

1.1 The SMH Servo Motor Typical Specification

The SMH series servo motors based on rare earth neodymium-iron-boron permanent magnet rotors that provide.

- An economical, compact design that can function in harsh environments.
- Neodymium-iron-boron magnet rotors that provide low rotor inertia, small size, high power density and high peak torques, a high torque-to-inertia ratio for faster light machinery acceleration and more than three times than rated torque for intermittent use.
- The special segmented stator design prevents unbalances of inner radial forces and ensures low noise, small vibration and a significant longer life of the bearings. A three-phase, sinusoidal wound stator field for smooth operation at slow speeds, low ripple and small cogging effects.
- Epoxy encapsulated windings provide a high du/dt immunity, an excellent thermal coupling and increased housing stiffness. The integrated temperature sensors make usage of working mode in insulation material class "F" possible and a high reliability of the motor at the same time.
- The feedback device encoder (incremental or absolute) or resolver.
- IP65, quick release connectors for easy installation and maintenance.
- The ability to be vertically mounted at any angle with the shaft up or down.

1.2 The SMH Servo Motor Named Principle

		S	M	H	60-40	30	2	6	E	B	C-1
S	Synchronous										
M	Motor										
H	High power density										
60	Flange dimension 60x60 (unit:mm)										
40	Rated power 40x10 (W)										
30	Rated speed 30x100 (rpm)										
2	Input voltage										
	2 --- 220VAC(50/60Hz)										
	3 --- 380VAC(50/60Hz)										
6	6 Pole (3 pole pairs)										
E	Feedback device										
	E --- Encoder(incremental 2500p/rev)										
	R --- Resolver										
B	B --- Brake										
	N --- No Brake										
C	C --- M17 connector										
	D --- Supply M23, feedback M17 connector										
	L --- Line										
	M--- Chinese connectors										
1	Design serial number										

General Information

2.1 Target Group

This manual addresses personnel with the following qualifications:

Transport : only by personnel with knowledge of handling electrostatically sensitive components.

Mech. Installation : only by mechanically qualified personnel.

Electr. Installation : only by electrically qualified personnel.

Setup: only by qualified personnel with extensive knowledge of electrical engineering and drive technology

The operator must ensure that the safety instructions in this manual are followed. The operator must ensure that all personnel responsible for working with the motor have read and understood the product manual.

2.2 Safety Notes

Read the available documentation before assembly and setup. Incorrect handling of the motors can result in injury and damage to persons and machinery. Keep strictly to the technical data and the information on the connection requirements (nameplate and documentation).

Only properly qualified personnel are permitted to perform such tasks as transport, assembly, setup and maintenance. Properly qualified personnel are persons who are familiar with the transport, assembly, installation, setup and operation of motors, and who have the appropriate qualifications for their jobs.

2.3 Thermal Protection

SMH servomotors are fitted with a Philips type KTY84-130 thermal sensor. The resistance of this sensor varies with temperature as indicated below.

Resistance change with temperature

Temperature (°C)	Resistance (Ω)
0	474 ~ 522
25	577 ~ 629
100	970 ~ 1030
150	1282 ~ 1385
160	1350 ~ 1463

The current in the sensor should be between 1mA and 3mA.

To protect the winding, the drive should shut down if the resistance exceeds 1400 Ohms.

2.4 Storage

Storage temperature - 25...+55°C, max. variation 20K/h.

Humidity rel. humidity 5% - 95%, no condensation

Max. stacking height see table under Packaging

Far away active gas, combustible gas, oil drop, ash

Storage time unlimited

Technical Description

3.1 General Technical Information

Ambient temperature 5-----+40°C for site altitude up to 1000m alms (at rated values) It is vital to consult our applications department for ambient temperatures above 40°C and encapsulated mounting of the motors.

Permissible humidity 95% rel. humidity, no condensation (at rated values)

Power derating 1.5% / K in range 40°C----50°C up to 1000m alms
(currents and torques) for site altitude above 1000m alms and 40°C

Holding Brake Options

At present only a spring applied holding brake is available with SMH servomotors as standard. However, it may be possible to fit a permanent magnet brake if required. For further information, please contact SMH for more details.

Spring Applied Brake

The brake is of the "spring set" fail to safe type. This is primarily a holding brake e.g. to hold a load under a no voltage condition. However, the brake can also be used in some applications for emergency stopping.

Connection should be such that when the motor is powered the brake coil is energized and the brake released. Under normal conditions, no maintenance is required other than ensuring that the hub and stationary plates are kept free from foreign matter.

Radial force

If the motors drive via pinions or toothed belts, then high radial forces will occur. The maximum values at rated speed you will find at the technical data. Power take-off from the middle of the free end of the shaft allows a 10% increase in Fr.

Axial force

When pinions or wheels are being assembled to the shaft or e.g. angular gear heads being used, axial forces arise. The maximum values at rated speed you will find at the technical data.

Bearings

All SMH servomotors are fitted with double shell protected, single row radial ball bearings.

Ball-bearing life: The bearings are selected to give a minimum of 20,000 hours life.

Under normal conditions, no maintenance is required.

3.2 Electrical Technical Information

The motors contain electrical / electronic systems liable to cause an electromagnetic disturbance.

The motors contain electrical / electronic systems which may have their performance affected by an electromagnetic disturbance.

The motor housing must be connected to PE by the motor cable PE wire. Take care of the related national or international standards for maximum resistance of the PE connection!

The motor power cable and the feedback cable must be shielded and the cable shields must be connected to the mounting plate of the electric cabinet by low RF resistance (large surface contact). If the feedback cable contains inner shielding it's recommended to connect this inner shielding to the feedback signal ground.

To wire up the motor, use the wiring diagrams in the Installation and Setup Instructions of the servo amplifier which is used.

Requirements to cable material:

Capacity

Motor cable less than 150 pF/m

Resolver cable less than 120 pF/m

3.3 Mechanical Installation

It is recommended that a general inspection be made at regular intervals to check all bolts, nuts couplings etc to ensure that they are still tightened to the correct torque

Protect the motor from unacceptable stresses.

Take care, especially during transport and handling, which components are not bent and that insulation clearances are not altered. Attended to holding the tolerance of shaft extension run-out, concentricity of and shaft and perpendicularity of mounting face to shaft.

Check the compliance to the permitted radial and axial forces Fr and Fa.

When you use a toothed belt drive, the minimal permitted diameter of the pinion which is directly assembled to the motor shaft e.g. follows from the equation: $d_{min} \geq 2 \times T_m / F_r$ while T_m is the applied maximum torque of the motor.

Caution: toothbelts are usually pre-loaded by tension force up to the force (or even more) to be transmitted. This kind of pre-load force Fp will cause a radial shaft load force of $F_r = 2 \times F_p$.

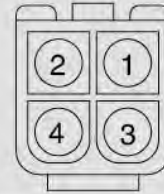
That's why $F_p < F_r/2$ should be respected and thus the equation $d_{min} \geq 2 \times T_m / F_p$ is recommended.

Connection Details

4.1 L series diagram for motors fit Encoder or Resolver (SMH60 & SMH80) connectors

Motor Wire

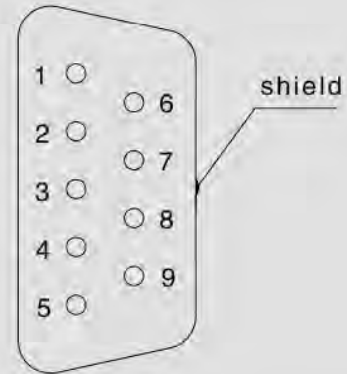
PIN	FUNCTION
1	MOTOR U
2	MOTOR V
3	MOTOR W
4	Motor PE \perp



H66L6-04P
T66L6-A

Resolver Wire

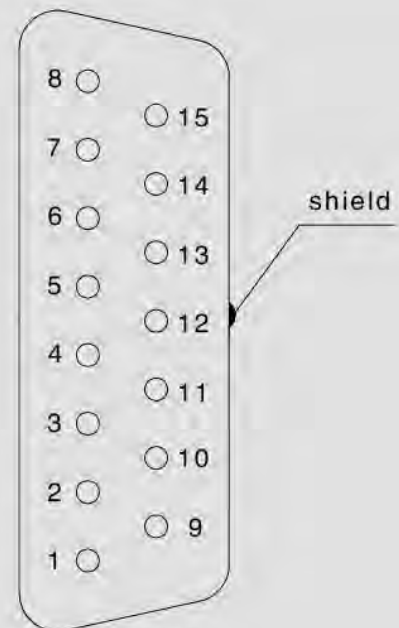
PIN	FUNCTION
1	Ref+ 10KHz, 7V
2	Ref- Pulse power
3	Cos+
4	Cos-
5	Sin+
6	Sin-
7	KTY (+)
8	KTY (-)
9	NC
shield	shield



DB 9M

Encoder Wire

PIN	FUNCTION
1	DC +5 V
2	A
3	B
4	Z
5	U
6	V
7	W
8	NC
9	0 V
10	/A
11	/B
12	/Z
13	/U
14	/V
15	/W
shield	shield



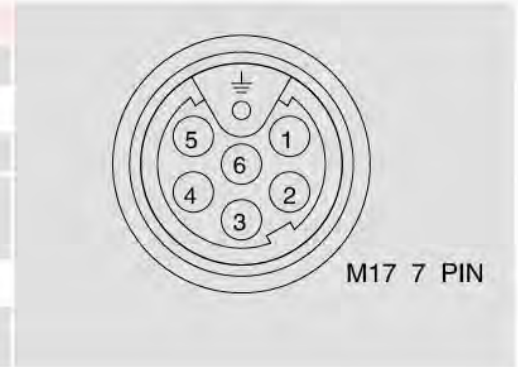
DB 15M

Connection Details

4.2 SMH Motor C and D series connectors

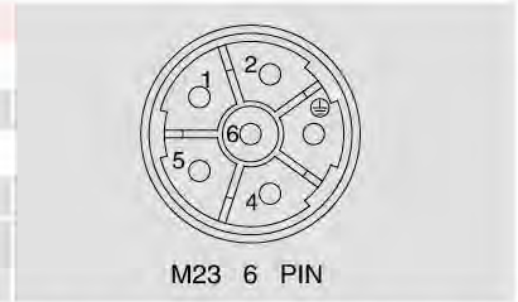
Motor M17 C series connectors

PIN	FUNCTION
1	MOTOR U
2	MOTOR V
3	MOTOR W
4	Brake B+
5	Brake B-
6	NC
\perp	Motor PE \perp



Motor M23 D series connector

PIN	FUNCTION
1	MOTOR U
2	MOTOR V
\perp	Motor PE \perp
4	MOTOR W
5	Brake B+
6	Brake B-



Feedback M17 C and D series connector (Resolver)

PIN	FUNCTION
1	Ref+ 10KHz, 7V
2	Ref- Pulse power
3	Cos+
4	Cos-
5	Sin+
6	Sin-
7	KTY (+)
8	KTY (-)
9	(IF FITTED)
10	
11	
12	
13	
14	
15	
16	
17	



Feedback M17 C and D series connector (Encoder)

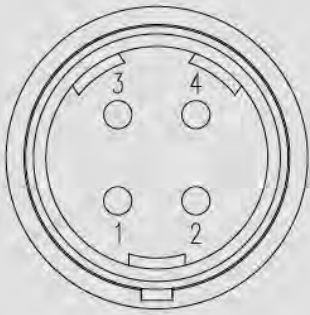
PIN	FUNCTION
1	DC +5V
2	0 V
3	A
4	/A
5	B
6	/B
7	KTY (+)
8	KTY (-)
9	U
10	/U
11	V
12	/V
13	NC
14	Z
15	/Z
16	W
17	/W



Connection Details

4.3 SMH60/80 Motor M series connectors

Motor connectors

PIN	FUNCTION	
1	Motor PE \perp	
2	Motor U	
3	Motor V	
4	Motor W	


4 PIN

Feedback connector (Resolver)

PIN	FUNCTION	
1	Ref+ 10KHz, 7V	
2	Ref- Pulse power	
3	Cos+	
4	Cos-	
5	Sin+	
6	Sin-	
7	KTY(+) (IF FITTED)	
8	KTY(-) (IF FITTED)	
9		
10		
11		
12		
13		
14		
15		
16		
17		

17 PIN

Feedback connector (Encoder)

PIN	FUNCTION	
1	DC +5V	
2	0 V	
3	A	
4	/ A	
5	B	
6	/ B	
7	KTY(+) (IF FITTED)	
8	KTY(-) (IF FITTED)	
9	U	
10	/ U	
11	V	
12	/ V	
13	NC	
14	Z	
15	/ Z	
16	W	
17	/ W	


17 PIN

Connection Details

4.4 SMH110 M series connectors

Motor connector(Without Brake)

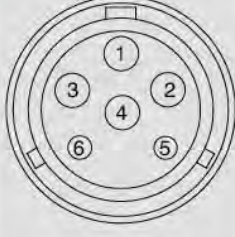
PIN	FUNCTION
1	Motor PE \perp
2	MOTOR U
3	MOTOR V
4	MOTOR W
5	NC
6	NC
7	NC



7 PIN

Motor connector(With Brake)

PIN	FUNCTION
1	MOTOR U
2	MOTOR V
3	MOTOR W
4	Motor PE \perp
5	Brake B+
6	Brake B-



6 PIN

Feedback Connector (Resolver)


PIN	FUNCTION
1	Ref+ 10KHz, 7V Pulse power
2	Ref-
3	Cos+
4	Cos-
5	Sin+
6	Sin-
7	KTY(+) (IF FITTED)
8	KTY(-)
9	
10	
11	
12	
13	
14	
15	
16	
17	



17 PIN

Feedback Connector (Encoder)

PIN	FUNCTION
1	DC +5V
2	0 V
3	A
4	/A
5	B
6	/B
7	KTY(+) (IF FITTED)
8	KTY(-)
9	U
10	/U
11	V
12	/V
13	NC
14	Z
15	/Z
16	W
17	/W



17 PIN

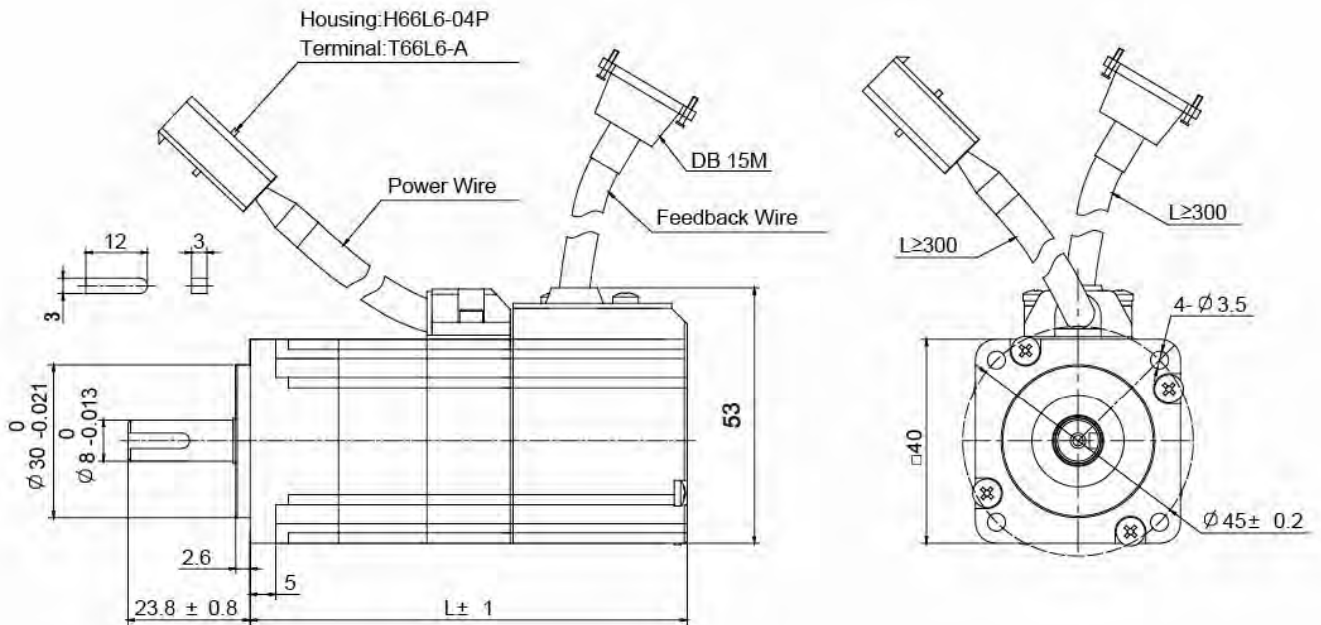
SMH40 Technical Information

5.1 Technical Data

Motor Type		SMH40—53028ENL	SMH40—103028ENL
Environmental conditions	Rated power P_n (W)	50	100
	Rated torque T_n (Nm)	0.16	0.32
	Rated speed n (rpm)	3000	3000
	Rated current I_n (A)	0.7	1.2
	DC Link Voltage U_{DC} (V)	300	300
	Maximum torque T_m (Nm)	0.48	0.96
	Maximum current I_m (A)	2.1	3.6
	Standstill torque T_s (Nm)	0.176	0.352
	Standstill current I_s (A)	0.77	1.32
	Voltage constant K_e (V/krpm)	16	16
	Torque constant K_t (Nm/A)	0.265	0.265
	Resistance line-line R_L (Ω)	16.6	5.53
	Inductance line-line L_L (mH)	14	6
	Electrical time constant T_e (ms)	0.84	1.08
	Mechanical time constant T_m (ms)	1.28	0.86
	Rotor moment of inertia J_m (kgcm ²)	0.031	0.059
	Pole number	8	8
	Max. voltage rising du/dt (kV/ μ s)	8	8
	Insulation class	F	F
	Max. radial force F_r (N)	120	120
	Max. axial force F_a (N)	60	60
	Weight (Kg)	0.5	0.73
Rating conditions	Feedback device	2500p/rev incremental encoder	
	Temperature sensor	n.a.	
	Cooling method	Totally enclosed non-ventilated	
	Protection level	IP64	
Environmental conditions	Temperature	-20℃~40℃	
	Humidity	Below 90%RH (No dewing)	
	Environment	Far away active gas, combustible gas, oil drop, ash.	
	Installation altitude	Up to 1000m: rated power Above 1000m: 1.5% power Decreasing per 100m,max.4000m	
Rating conditions	Mounting	Aluminum flange 175*200*10mm	
	Temperature	60K housing temperature ring at 40℃ ambient	

SMH40 Technical Information

5.2 Product Dimension Drawing (unit: mm)

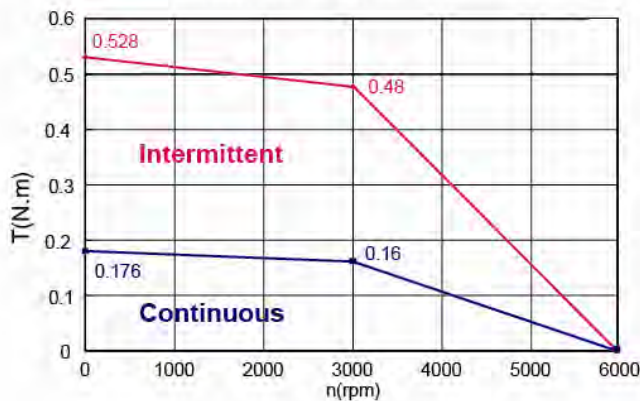


SMH40 series Length Without Brake (Unit: mm)

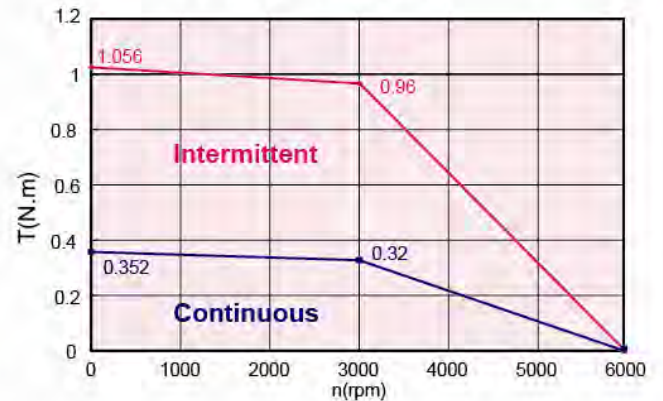
Power (W)	L
50	85.3
100	110.8

5.3 SMH40 Series Performance Curve

SMH40-53028ENL



SMH40-103028ENL



SMH60 Technical Information

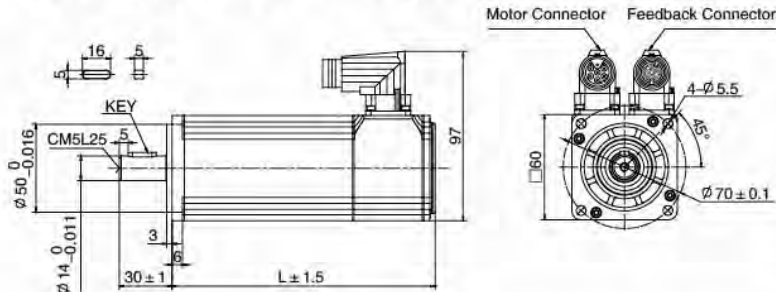
6.1 Technical Data

Motor Type	SMH60—203026xxL	SMH60—403026xxL
	SMH60—203026xxC	SMH60—403026xxC
	SMH60—203026xxM	SMH60—403026xxM
Rated power P_n (W)	200	400
Rated torque T_n (Nm)	0.64	1.27
Rated speed n_n (rpm)	3000	3000
Rated current I_n (A)	1.6	3.1
DC Link Voltage U_{DC} (V)	300	300
Maximum torque T_m (Nm)	1.92	3.81
Maximum current I_m (A)	4.8	9.3
Standstill torque T_s (Nm)	0.7	1.4
Standstill current I_s (A)	1.8	3.41
Voltage constant K_e (V/krpm)	29	29
Torque constant K_t (Nm/A)	0.48	0.48
Resistance line-line R_L (Ω)	8.02	3.52
Inductance line-line L_L (mH)	16.3	7.8
Electrical time constant T_e (ms)	2.03	2.22
Mechanical time constant T_m (ms)	2.26	1.35
Rotor moment of inertia J_m (kgcm ²)	0.375	0.51
Pole number	6	6
Max. voltage rising du/dt (kV/ μ s)	8	8
Insulation class	F	F
Max. radial force F_r (N)	180	180
Max. axial force F_a (N)	90	90
Weight (Kg)	1.3	1.8
Feedback device	2500p/rev incremental encoder or Resolver (sin--cos)	
Temperature sensor	KTY84-130(If Fitted)	
Cooling method	Totally enclosed non-ventilated	
Protection level	IP65, shaft sealing IP54	
Environmental conditions	Temperature	-20℃~40℃
	Humidity	Below 90%RH (No dewing)
	Environment	Far away active gas, combustible gas, oil drop, ash.
	Installation altitude	Up to 1000m: rated power Above 1000m: 1.5% power Decreasing per 100m, max. 4000m
Rating conditions	Mounting	Black Aluminum flange 255x255x6mm
	Temperature	60K housing temperature rising at 40℃ ambient

SMH60 Technical Information

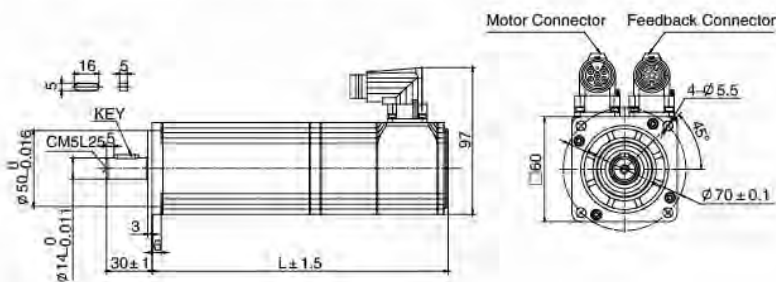
6.2 Product Dimension Drawing

6.2.1 SMH60 C series dimension (unit: mm)



SMH60 C series Length Without Brake
(Unit: mm)

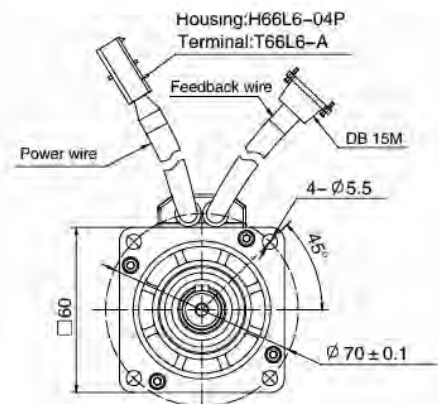
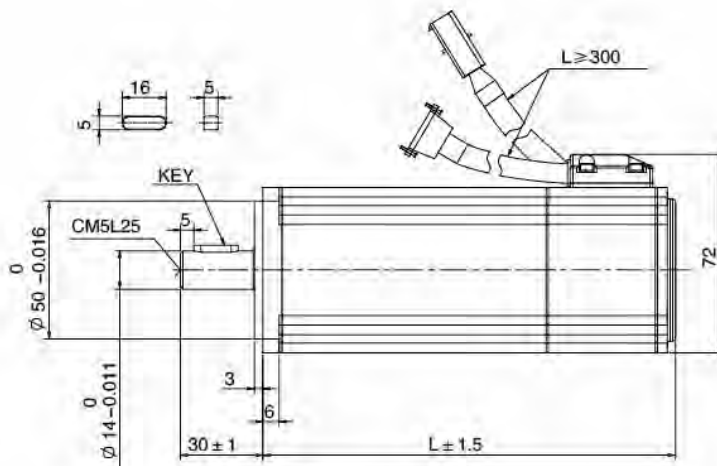
Power (W)	L
200	120
400	150



SMH60 C series Length With Brake
(Unit: mm)

Power (W)	L
200	164
400	194

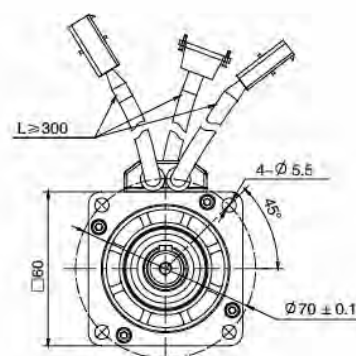
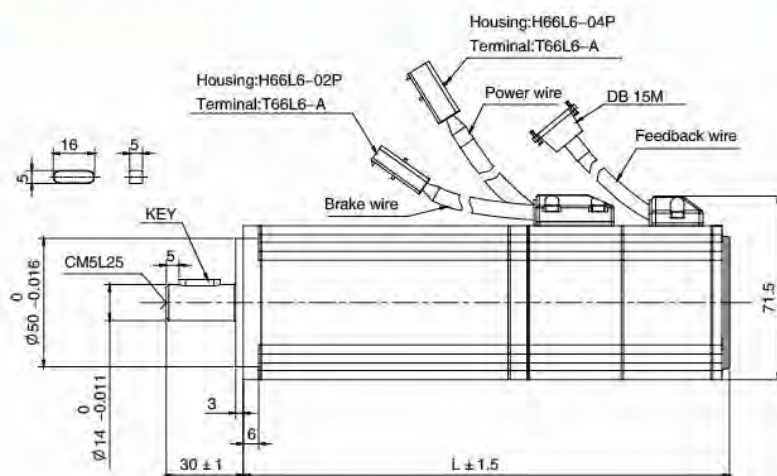
6.2.2 SMH60 L series dimension (unit: mm)



SMH60 L series Length Without Brake (Unit: mm)

Power (W)	L	
	Fit Encoder	Fit Resolver
200	120	115
400	150	145

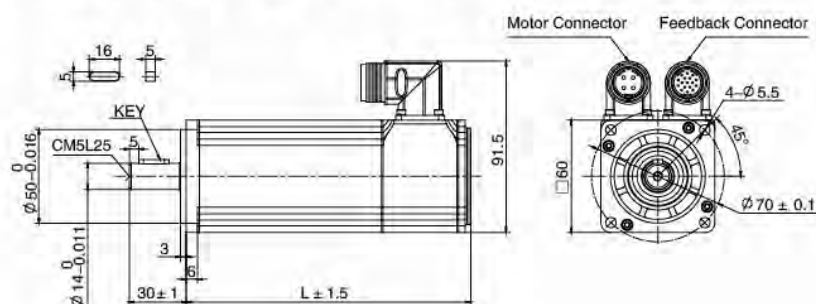
SMH60 Technical Information



SMH60 L series Length With Brake (Unit: mm)

Power (W)	L	
	Fit Encoder	Fit Resolver
200	159	154
400	189	184

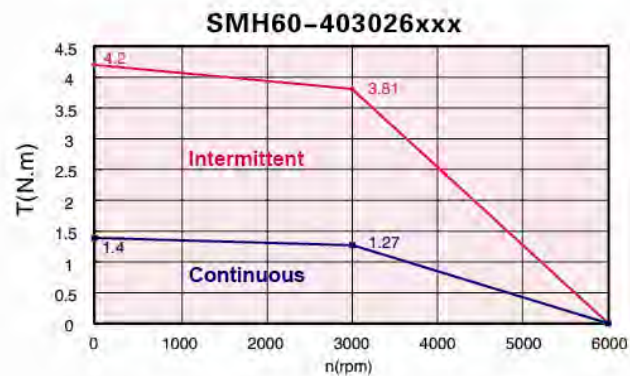
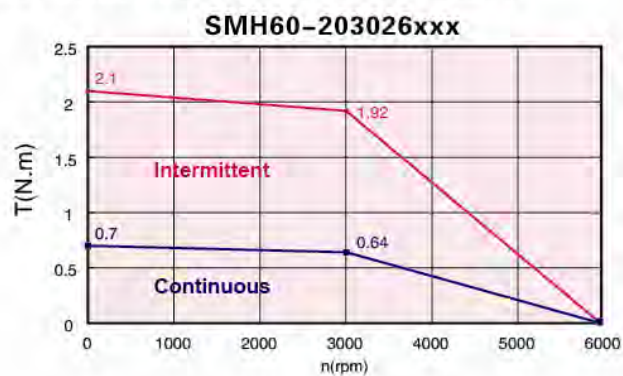
6.2.3 SMH60 M series dimension (unit: mm)



SMH60 M series Length Without Brake
(Unit: mm)

Power(W)	L
200	120
400	150

6.3 SMH60 Series Performance Curve



SMH80 Technical Information

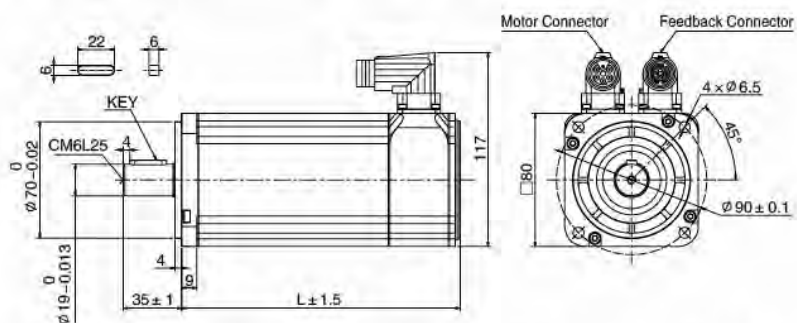
7.1 Technical Data

Motor Type		SMH80—753026xxL SMH80—753026xxC SMH80—753026xxM	SMH80—1003026xxL SMH80—1003026xxC SMH80—1003026xxM
Rated power P_n (W)		750	1000
Rated torque T_n (Nm)		2.39	3.18
Rated speed n_n (rpm)		3000	3000
Rated current I_n (A)		3.9	6.3
DC Link Voltage U_{dc} (V)		300	300
Maximum torque T_m (Nm)		7.17	9.48
Maximum current I_m (A)		11.7	18.9
Standstill torque T_s (Nm)		2.63	3.3
Standstill current I_s (A)		4.29	6.93
Voltage constant K_e (V/krpm)		40	34
Torque constant K_t (Nm/A)		0.662	0.562
Resistance line-line R_L (Ω)		1.4	0.86
Inductance line-line L_L (mH)		7.5	4.5
Electrical time constant T_e (ms)		5.35	5.23
Mechanical time constant T_m (ms)		0.75	0.89
Rotor moment of inertia J_m (kgcm ²)		1.36	1.9
Pole number		6	6
Max. voltage rising du/dt (kV/ μ s)		8	8
Insulation class		F	F
Max. radial force F_r (N)		335	335
Max. axial force F_a (N)		167.5	167.5
Weight (Kg)		3.3	3.9
Feedback device		2500p/rev incremental encoder or Resolver (sin--cos)	
Temperature sensor		KTY84-130(If Fitted)	
Cooling method		Totally enclosed non-ventilated	
Protection level		IP65,shaft sealing IP54	
Environmental conditions	Temperature	-20℃~40℃	
	Humidity	Below 90%RH (No dewing)	
	Environment	Far away active gas, combustible gas, oil drop, ash.	
	Installation altitude	Up to 1000m: rated power Above 1000m: 1.5% power Decreasing per 100m,max.4000m	
Rating conditions	Mounting	Black Aluminum flange 255x255x6mm	
	Temperature	60K housing temperature rising at 40℃ ambient	

SMH80 Technical Information

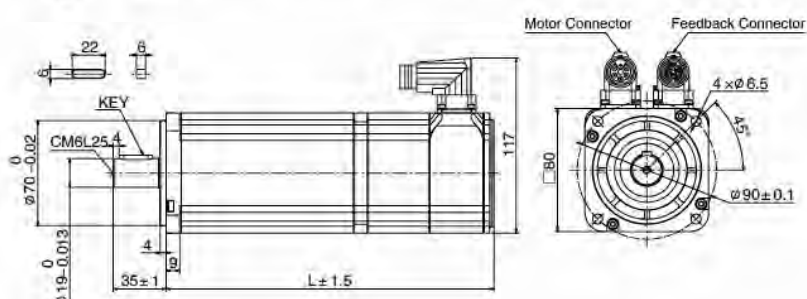
7.2 Product Dimension Drawing

7.2.1 SMH80 C series dimension (unit: mm)



SMH80 C series Length Without Brake
(Unit: mm)

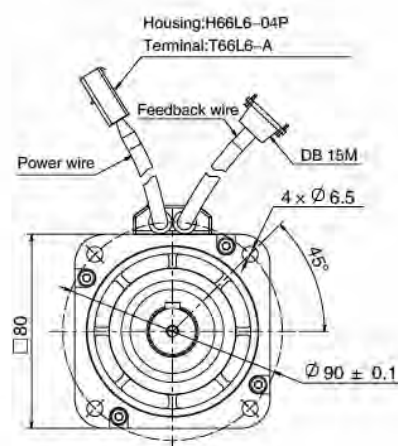
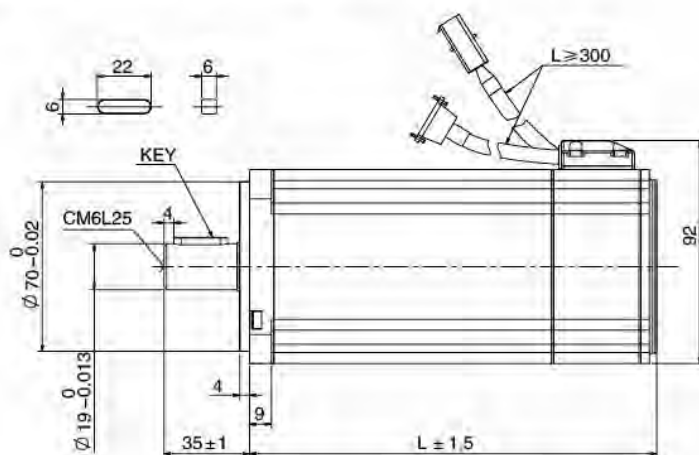
Power (W)	L
750	147
1000	167



SMH80 C series Length With Brake
(Unit: mm)

Power (W)	L
750	197
1000	217

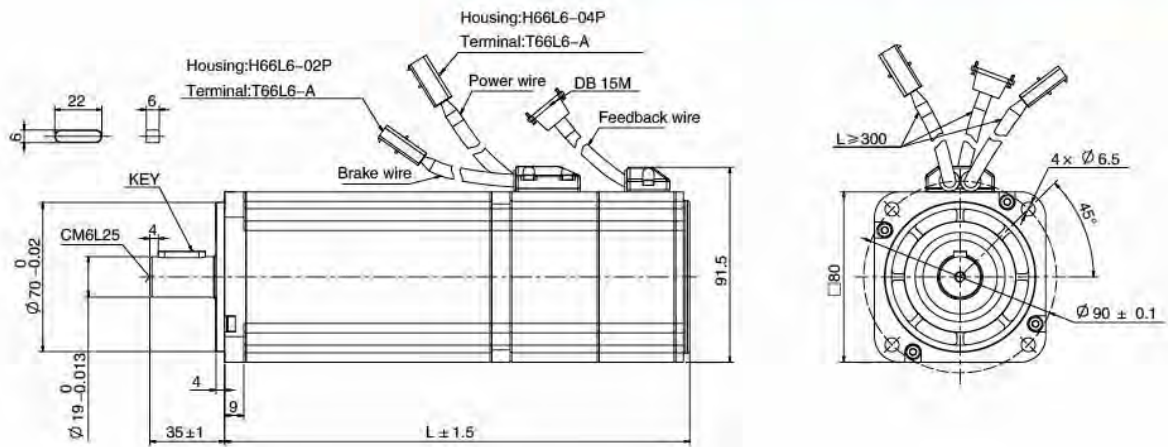
7.2.2 SMH80 L series dimension (unit: mm)



SMH80 L series Length Without Brake (Unit: mm)

Power (W)	Fit Encoder	Fit Resolver
750	147	142
1000	167	162

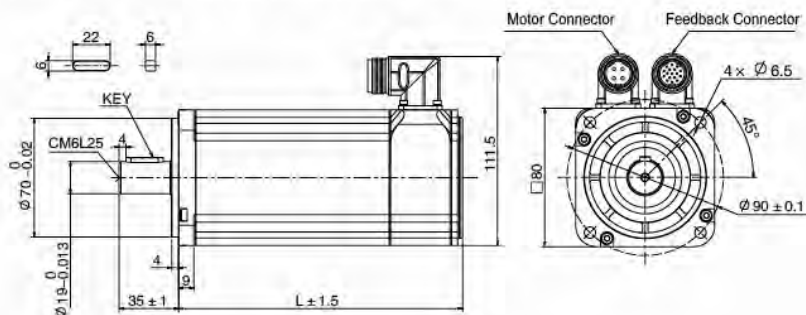
SMH80 Technical Information



SMH80 L series Length With Brake (Unit: mm)

Power (W)	L	
	Fit Encoder	Fit Resolver
750	197	192
1000	217	212

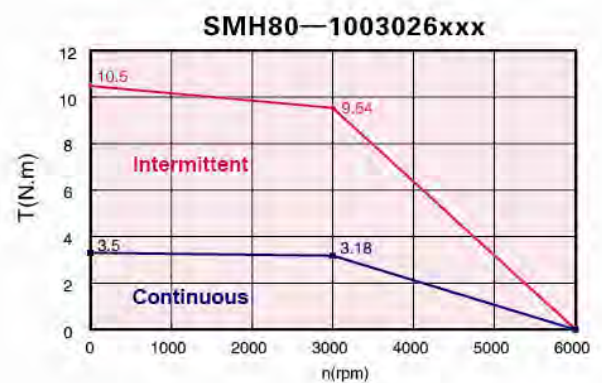
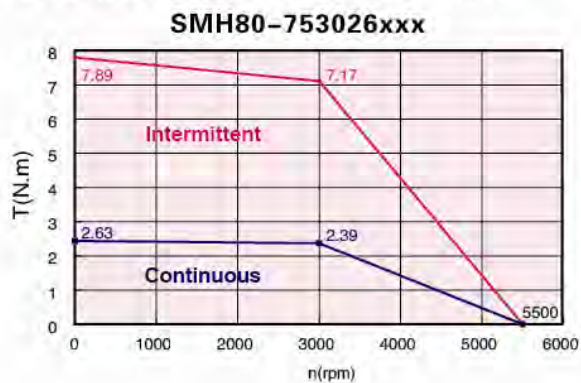
7.2.3 SMH80 M series dimension (Unit: mm)



SMH80 M series Length Without Brake
(Unit: mm)

功率 (W)	L
750	147
1000	167

7.3 SMH80 Series Performance Curve



SMH110 Technical Information

8.1 SMH110 (U_{DC} 300V) Technical Data

Motor Type	SMH110— 842028xxx	SMH110— 842028xxx-1	SMH110— 1263028xxx	SMH110— 1052028xxx	SMH110— 1573028xxx	SMH110— 1262028xxx	SMH110— 1883028xxx
Rated power P _n (W)	840	840	1260	1050	1570	1260	1880
Rated torque T _n (Nm)	4	4	4	5	5	6	6
Rated speed \bar{n} (rpm)	2000	2000	3000	2000	3000	2000	3000
Rated current I _n (A)	4.3	6.2	7.7	5.9	9.6	6.15	11
DC Link Voltage U _{DC} (V)	300	300	300	300	300	300	300
Maximum torque T _m (Nm)	12	12	12	15	15	18	18
Maximum current I _m (A)	12.9	18.6	23.1	17.7	28.8	18.45	33
Standstill torque T _s (Nm)	4.4	4.4	4.4	5.5	5.5	6.6	6.6
Standstill current I _s (A)	4.73	6.82	8.47	6.49	10.56	6.765	12.1
Voltage constant K _e (V/krpm)	64	45	35	55	35	64	35
Torque constant K _t (Nm/A)	1.058	0.744	0.578	0.91	0.578	1.058	0.578
Resistance line-line R _L (Ω)	1.83	0.8	0.492	1.04	0.5	1.258	0.45
Inductance line-line L _L (m H)	13.5	6.4	4.3	7.2	3.3	9.62	2.9
Electrical time constant T _e (ms)	7.37	7.9	8.74	7.5	6.6	7.64	6.44
Mechanical time constant T _m (ms)	1.63	1.4	1.47	1.57	1.86	1.65	1.98
Rotor moment of inertia J _m (kgcm ²)	5.8	5.8	5.8	7.2	7.2	8.5	8.5
Pole number	8	8	8	8	8	8	8
Max. voltage rising du/dt (kV/μs)	8	8	8	8	8	8	8
Insulation class	F	F	F	F	F	F	F
Max. radial force F _r (N)	630	630	630	630	630	630	630
Max. axial force F _a (N)	315	315	315	315	315	315	315
Weight (Kg)	6.2	6.2	6.2	7.2	7.2	8.2	8.2
Feed back device	2500p/rev incremental encoder or Resolver (sin--cos)						
Temperature sensor	KTY84-130 (If Fitted)						
Cooling method	Totally enclosed non-ventilated						
Protection level	IP65,shaft sealing IP54						
Environmental conditions	Temperature	-20℃ ~ 40℃					
	Humidity	Below 90%RH (No dewing)					
	Environment	Far away active gas, combustible gas, oil drop, ash.					
	Installation altitude	Up to 1000m: rated power ; Above 1000m: 1.5% power ; Decreasing per 100m,max.4000m					
Rating conditions	Mounting	Black Aluminum flange 305x305x13mm					
	Temperature	60K housing temperature rising at 40℃ ambient					

SMH110 Technical Information

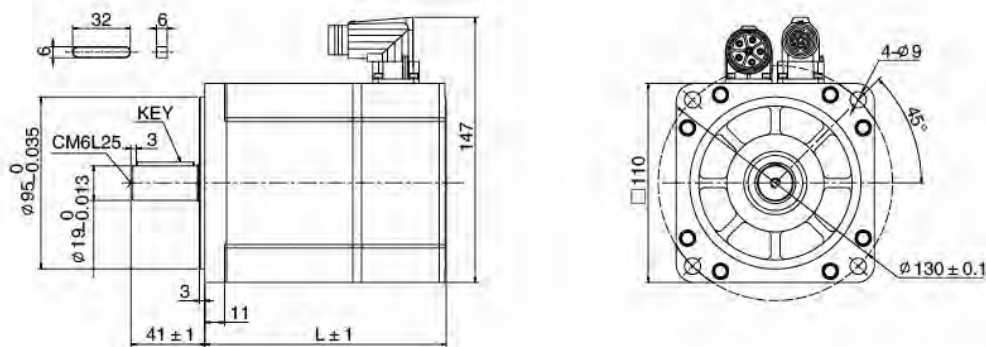
8.2 SMH110 (U_{dc} 560V) Technical Data

Motor Type	SMH110— 1263038xxx	SMH110— 1573038xxx	SMH110— 1883038xxx
Rated power P _n (W)	1260	1570	1880
Rated torque T _n (Nm)	4	5	6
Rated speed Ω _n (rpm)	3000	3000	3000
Rated current I _n (A)	4.3	5.9	6.15
DC Link Voltage U _{dc} (V)	560	560	560
Maximum torque T _m (Nm)	12	15	18
Maximum current I _m (A)	12.9	17.7	18.45
Standstill torque T _s (Nm)	4.4	5.5	6.6
Standstill current I _s (A)	4.73	6.49	6.765
Voltage constant K _e (V/krpm)	64	55	64
Torque constant K _t (Nm/A)	1.058	0.91	1.058
Resistance line-line R _L (Ω)	1.83	1.04	1.258
Inductance line-line L _L (m H)	13.5	7.2	9.62
Electrical time constant T _e (ms)	7.37	7.5	7.64
Mechanical time constant T _m (ms)	1.63	1.57	1.65
Rotor moment of inertia J _m (kgcm ²)	5.8	7.2	8.5
Pole number	8	8	8
Max. voltage rising du/dt (kV/μs)	8	8	8
Insulation class	F	F	F
Max. radial force F _r (N)	630	630	630
Max. axial force F _a (N)	315	315	315
Weight (Kg)	6.2	7.2	8.2
Feed back device	2500p/rev incremental encoder or Resolver (sin--cos)		
Temperature sensor	KTY84-130 (If Fitted)		
Cooling method	Totally enclosed non-ventilated		
Protection level	IP65,shaft sealing IP54		
Environmental conditions	Temperature	-20℃ ~ 40℃	
	Humidity	Below 90%RH (No dewing)	
	Environment	Far away active gas, combustible gas, oil drop, ash.	
	Installation altitude	Up to 1000m: rated power ; Above 1000m: 1.5% power ; Decreasing per 100m,max.4000m	
Rating conditions	Mounting	Black Aluminum flange 305x305x13mm	
	Temperature	60K housing temperature rising at 40℃ ambient	

SMH110 Technical Information

8.3 SMH110 Product Dimension Drawing

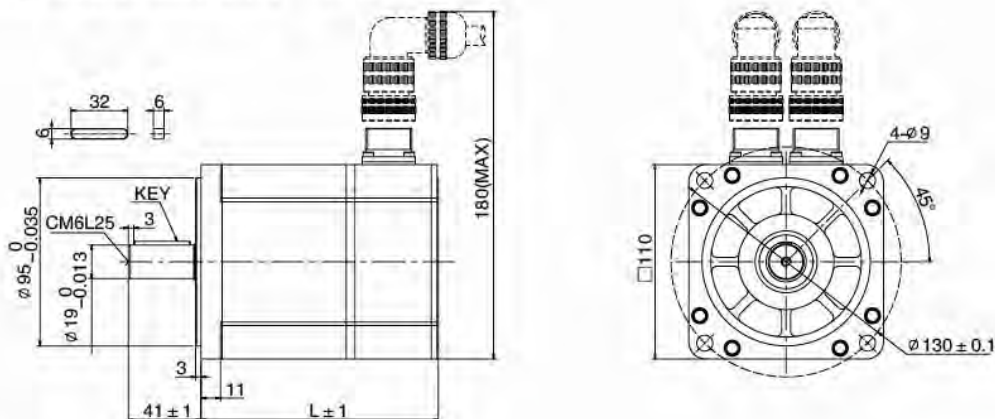
8.3.1 SMH110 D series dimensions (unit: mm)



SMH110 D series Length

Torque	L	No Brake		Fit Brake	
		Encoder	Resolver	Encoder	Resolver
4 N.m		168	163	228	223
5 N.m		185	180	245	240
6 N.m		202	197	262	257

8.3.2 SMH110 M series dimensions (unit: mm)



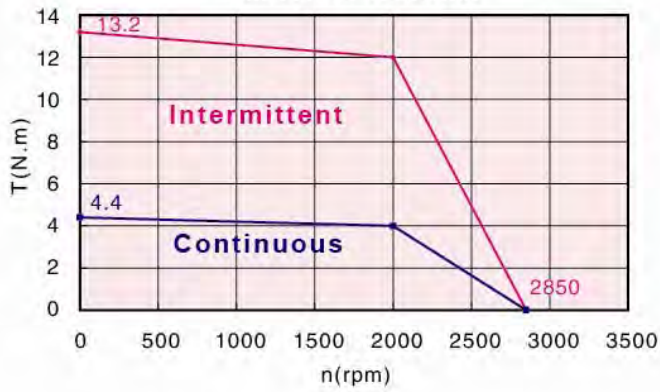
SMH110 M series Length (Unit: mm)

Torque	L	No Brake		Fit Brake	
		Encoder	Resolver	Encoder	Resolver
4 N.m		168	163	228	223
5 N.m		185	180	245	240
6 N.m		202	197	262	257

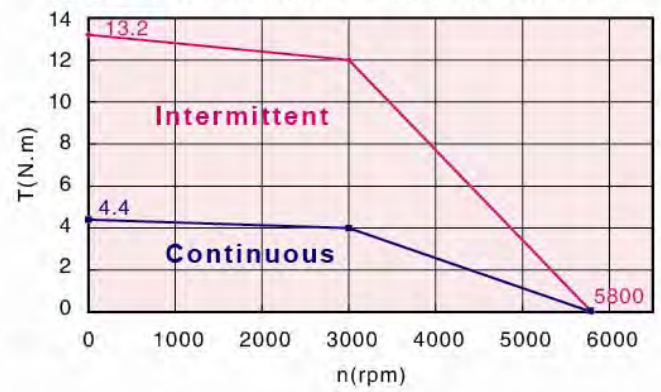
SMH110 Technical Information

8.4 SMH110 Series Performance Curve

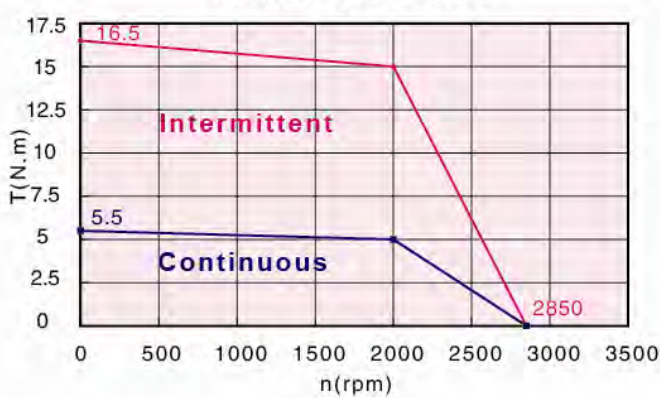
SMH110-842028xxx



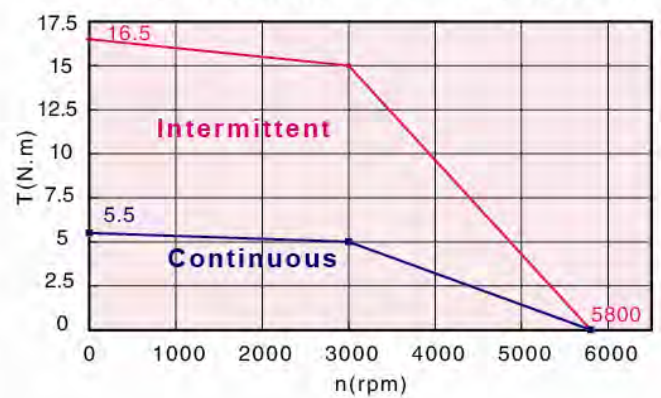
SMH110-1263028xxx / SMH110-1263038xxx



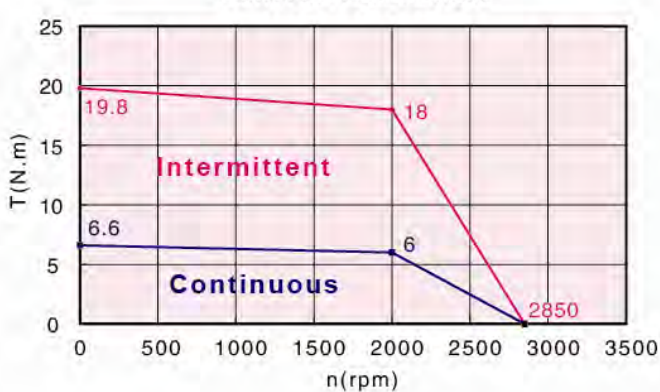
SMH110-1052028xxx



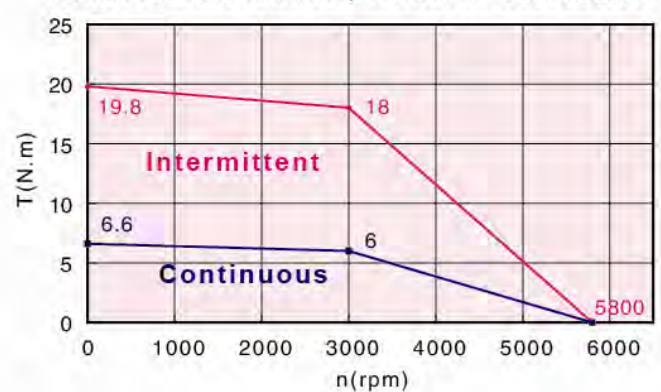
SMH110-1573028xxx / SMH110-1573038xxx



SMH110-1262028xxx



SMH110-1883028xxx / SMH110-1883038xxx



SMH130 Technical Information

9.1 SMH130 (U_{DC} 300V) Technical Data

Motor Type	SMH130— 1052028xxx	SMH130— 1572028xxx	SMH130— 2102028xxx	SMH130— 3002028xxx
Rated power P _n (W)	1050	1570	2100	3000
Rated torque T _n (Nm)	5	7.5	10	14.3
Rated speed \bar{n} (rpm)	2000	2000	2000	2000
Rated current I _n (A)	4.2	6.3	8.4	12
DC Link Voltage U _{DC} (V)	300	300	300	300
Maximum torque T _m (Nm)	12.5	18.75	25	35.75
Maximum current I _m (A)	10.5	15.75	21	30
Standstill torque T _s (Nm)	5.5	8.25	11	15.73
Standstill current I _s (A)	4.62	6.93	9.24	13.2
Voltage constant K _e (V/krpm)	72	72	72	72
Torque constant K _t (Nm/A)	1.19	1.19	1.19	1.19
Resistance line-line R _L (Ω)	1.98	1.17	0.81	0.64
Inductance line-line L _L (mH)	25.3	16.2	12	9.5
Electrical time constant T _e (ms)	12.78	13.85	14.8	14.8
Mechanical time constant T _m (ms)	2.9	2.53	2.3	2.3
Rotor moment of inertia J _m (kgcm ²)	12	17.7	23.4	29.1
Pole number	8	8	8	8
Max. voltage rising du/dt (kV/μs)	8	8	8	8
Insulation class	F	F	F	F
Max. radial force F _r (N)	900	900	900	900
Max. axial force F _a (N)	450	450	450	450
Weight (Kg)	7.5	9.1	10.7	12.3
Feed back device	2500p/rev incremental encoder or Resolver (sin--cos)			
Temperature sensor	KTY84-130(If fitted)			
Cooling method	Totally enclosed non-ventilated			
Protection level	IP65,shaft sealing IP54			
Environmental conditions	Temperature	-20℃ ~40℃		
	Humidity	Below 90%RH (No dewing)		
	Environment	Far away active gas, combustible gas, oil drop, ash.		
	Installation altitude	Up to 1000m: rated power Above 1000m: 1.5% power Decreasing per 100m,max.4000m		
Rating conditions	Mounting	Aluminum flange 457*457*12.7mm		
	Temperature	60K housing temperature ring at 40℃ ambient		

SMH130 Technical Information

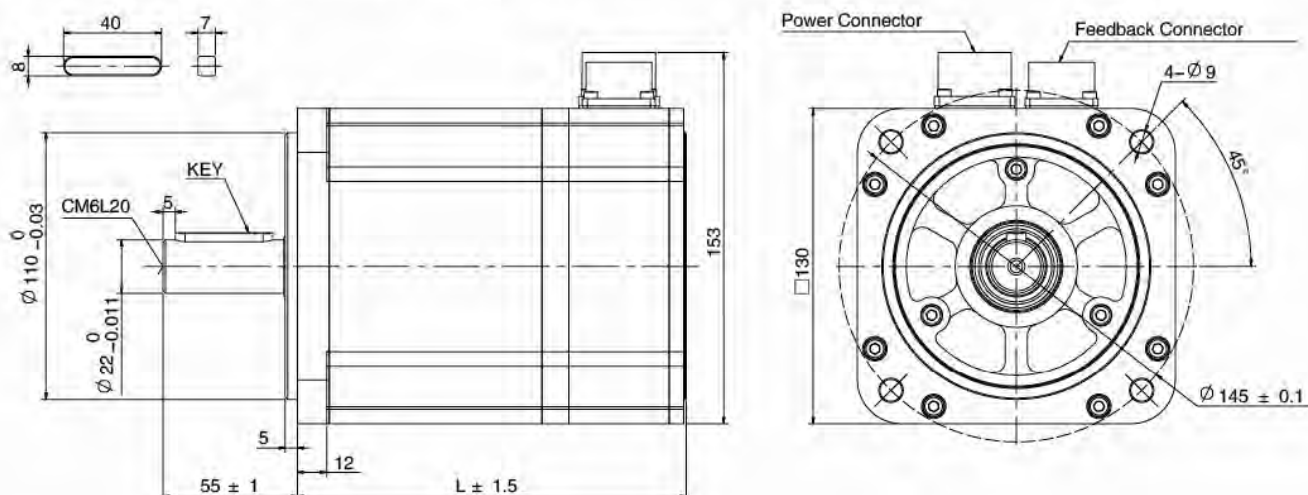
9.2 SMH130 (U_{DC} 560V) Technical Data

Motor Type	SMH130— 1052038xxx	SMH130— 1572038xxx	SMH130— 2102038xxx	SMH130— 3002038xxx
Rated power P _n (W)	1050	1570	2100	3000
Rated torque T _n (Nm)	5	7.5	10	14.3
Rated speed \bar{n} (rpm)	2000	2000	2000	2000
Rated current I _n (A)	4.3	6.3	7.6	10.8
DC Link Voltage U _{DC} (V)	560	560	560	560
Maximum torque T _m (Nm)	12.5	18.75	25	35.75
Maximum current I _m (A)	10.75	15.75	19	27
Standstill torque T _s (Nm)	5.5	8.25	11	15.73
Standstill current I _s (A)	4.73	6.93	8.36	11.88
Voltage constant K _e (V/krpm)	70	72	80	80
Torque constant K _t (Nm/A)	1.16	1.19	1.32	1.32
Resistance line-line R _L (Ω)	1.85	1.17	0.98	0.77
Inductance line-line L _L (mH)	23.7	16.2	14.3	11.4
Electrical time constant T _e (ms)	12.81	13.85	14.59	14.8
Mechanical time constant T _m (ms)	2.87	2.53	2.27	2.22
Rotor moment of inertia J _m (kgcm ²)	12	17.7	23.4	29.1
Pole number	8	8	8	8
Max. voltage rising du/dt (kV/μs)	8	8	8	8
Insulation class	F	F	F	F
Max. radial force F _r (N)	900	900	900	900
Max. axial force F _a (N)	450	450	450	450
Weight (Kg)	7.5	9.1	10.7	12.3
Feed back device	2500p/rev incremental encoder or Resolver (sin--cos)			
Temperature sensor	KTY84-130(If fitted)			
Cooling method	Totally enclosed non-ventilated			
Protection level	IP65, shaft sealing IP54			
Environmental conditions	Temperature	-20℃ ~ 40℃		
	Humidity	Below 90%RH (No dewing)		
	Environment	Far away active gas, combustible gas, oil drop, ash.		
	Installation altitude	Up to 1000m: rated power Above 1000m: 1.5% power Decreasing per 100m, max. 4000m		
Rating conditions	Mounting	Aluminum flange 457*457*12.7mm		
	Temperature	60K housing temperature ring at 40℃ ambient		

SMH130 Technical Information

9.3 SMH130 Product Dimension Drawing

9.3.1 SMH130 M series dimensions (unit: mm)

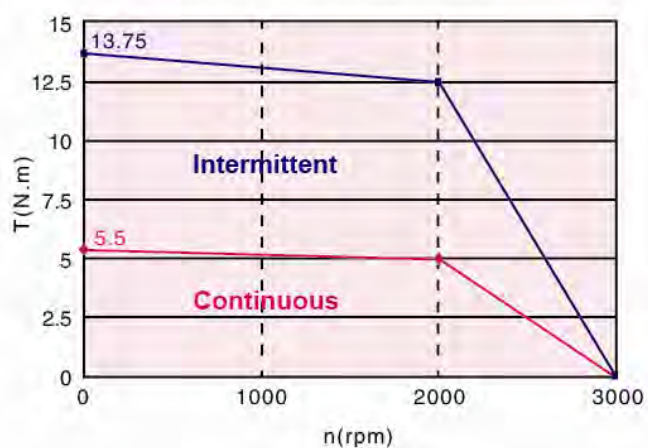


SMH130 M series Length (Unit: mm)

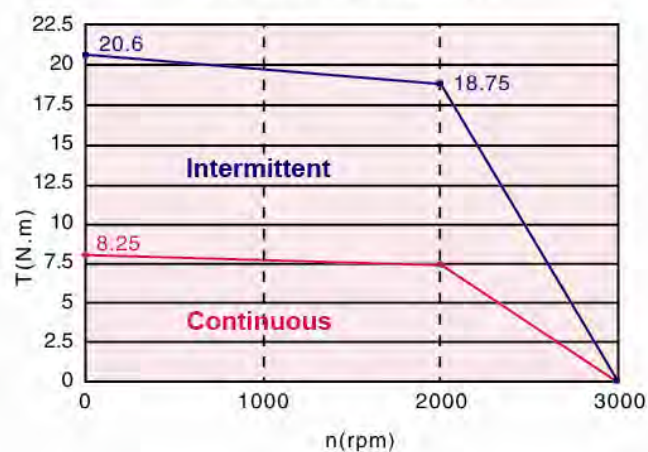
	L	No Brake	Fit Brake
Torque			
5 N.m		159	220
7.5 N.m		179	240
10 N.m		199	260
14.3 N.m		219	280

1.4 SMH130 Series Performance Curve

SMH130-1052028xxx

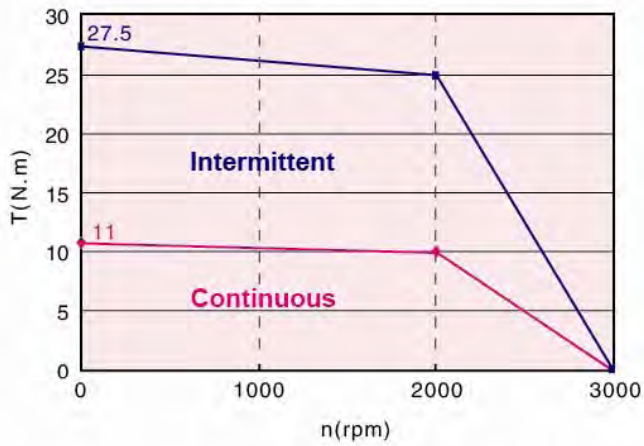


SMH130-1572028xxx

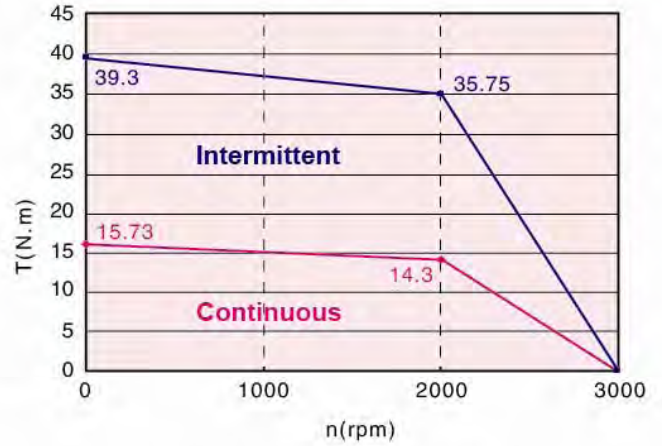


SMH130 Technical Information

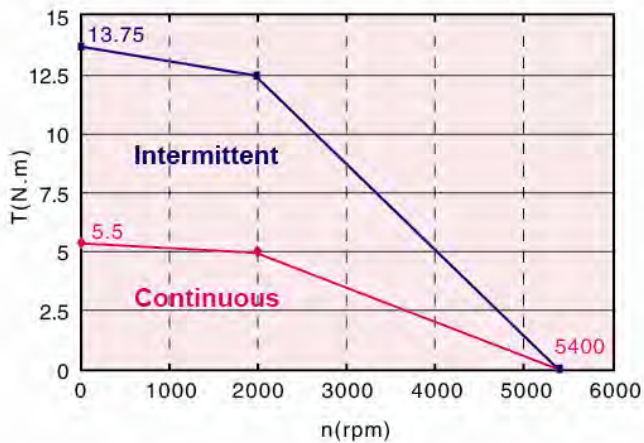
SMH130-2102028xxx



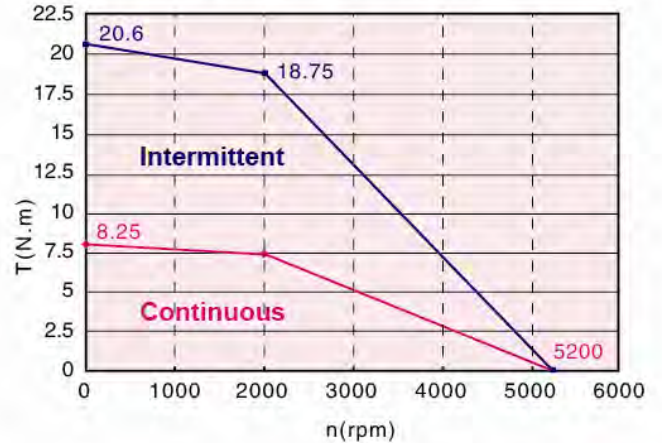
SMH130-3002028xxx



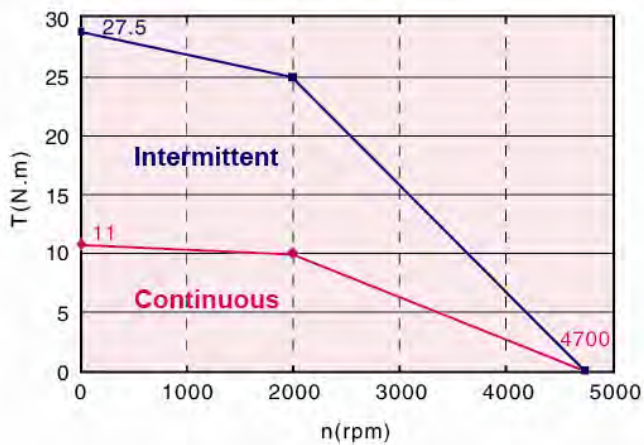
SMH130-1052038xxx



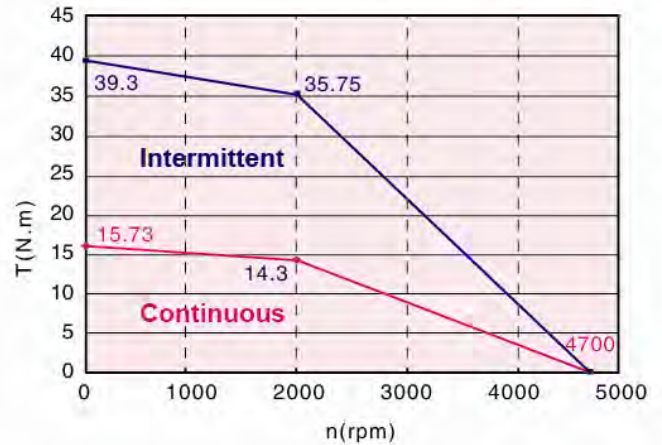
SMH130-1572038xxx



SMH130-2102038xxx



SMH130-3002038xxx



SMH150 Technical Information

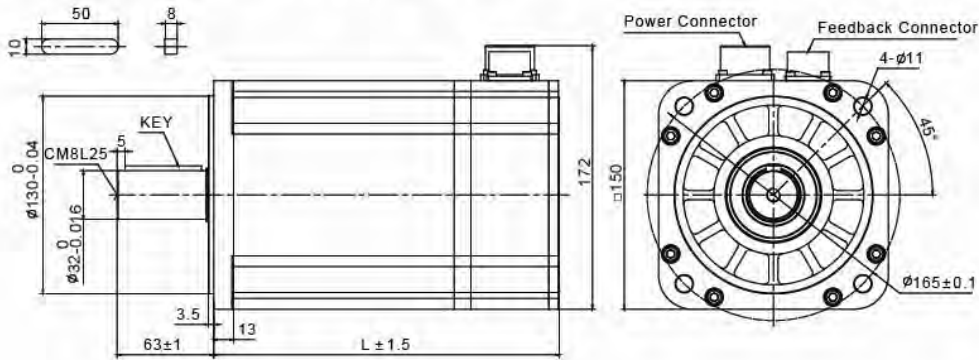
10.1 SMH150 (U_{DC} 560V) Technical Data

Motor Type	SMH150— 2302038xxx	SMH150— 3002038xxx	SMH150— 3802038xxx	SMH150— 4602038xxx
Rated power P _n (W)	2300	3000	3800	4600
Rated torque T _n (Nm)	11.1	14.3	18	22
Rated speed \bar{n} (rpm)	2000	2000	2000	2000
Rated current I _n (A)	7.1	8.5	9.3	10.7
DC Link Voltage U _{DC} (V)	560	560	560	560
Maximum torque T _m (Nm)	27.5	35.75	45	55
Maximum current I _m (A)	17.75	21.25	23.25	26.75
Standstill torque T _s (Nm)	12.1	15.73	19.8	24.2
Standstill current I _s (A)	7.81	9.35	10.23	11.77
Voltage constant K _e (V/krpm)	100	107	125	130
Torque constant K _t (Nm/A)	1.65	1.77	2.07	2.15
Resistance line-line R _L (Ω)	2.2	1.4	1.3	1.1
Inductance line-line L _L (mH)	14	10.6	10.5	9.4
Electrical time constant T _e (ms)	6.36	7.58	8.08	8.55
Mechanical time constant T _m (ms)	4.48	3.68	3.32	3.27
Rotor moment of inertia J _m (kgcm ²)	33.5	47.6	63.1	21
Pole number	8	8	8	8
Max. voltage rising du/dt (kV/μs)	8	8	8	8
Insulation class	F	F	F	F
Max. radial force F _r (N)	1200	1200	1200	1200
Max. axial force F _a (N)	600	600	600	600
Weight (Kg)	12	15	18	21
Feed back device	2500p/rev incremental encoder or Resolver (sin--cos)			
Temperature sensor	KTY84-130(If fitted)			
Cooling method	Totally enclosed non-ventilated			
Protection level	IP65,shaft sealing IP54			
Environmental conditions	Temperature	-20℃ ~40℃		
	Humidity	Below 90%RH (No dewing)		
	Environment	Far away active gas, combustible gas, oil drop, ash.		
	Installation altitude	Up to 1000m: rated power Above 1000m: 1.5% power Decreasing per 100m,max.4000m		
Rating conditions	Mounting	Aluminum flange 457*457*12.7mm		
	Temperature	60K housing temperature ring at 40℃ ambient		

SMH150 Technical Information

10.2 SMH150 Product Dimension Drawing

10.2.1 SMH150 M series dimensions (unit: mm)

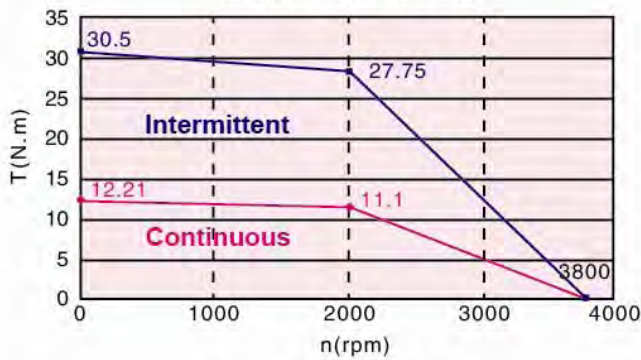


SMH150 M series Length (Unit: mm)

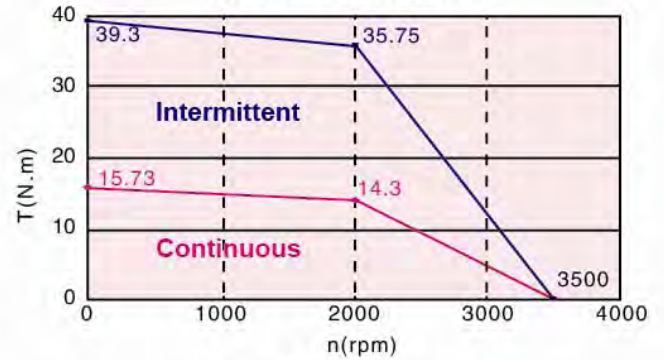
Torque	L	No Brake	Fit Brake
11.1 N.m		226	292
14.3 N.m		254	320
18 N.m		282	352
22 N.m		310	380

10.3 SMH150 Series Performance Curve

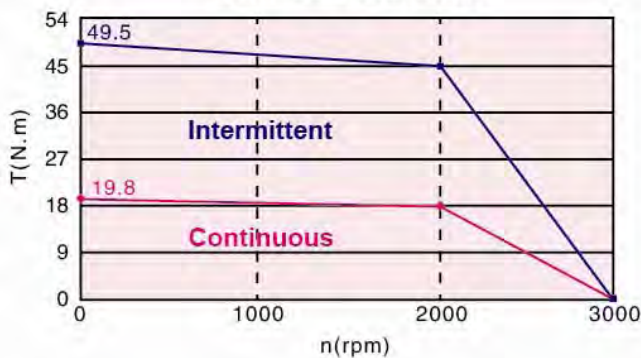
SMH150-2302038xxx



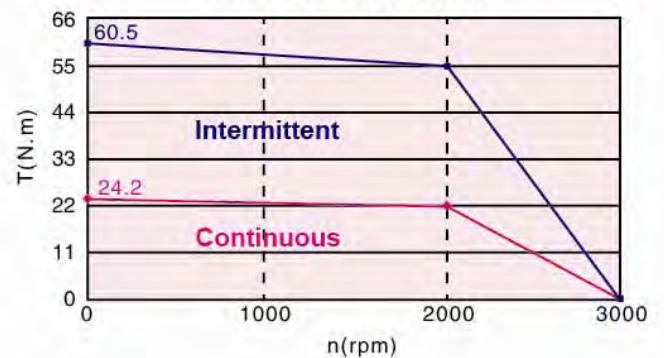
SMH150-3002038xxx



SMH150-3802038xxx



SMH150-4602038xxx



SMH180 Technical Information

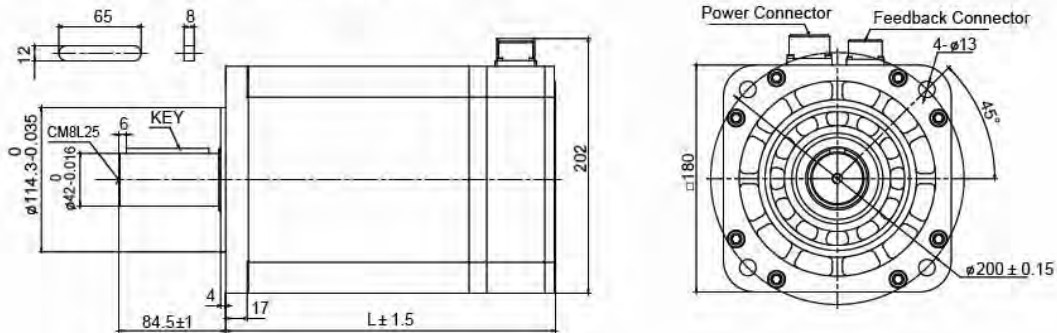
11.1 SMH180 (U_{DC} 560V) Technical Data

Motor Type	SMH180— 3501538xxx	SMH180— 4401538xxx	SMH180— 6001538xxx	SMH180— 7501538xxx
Rated power P _n (W)	3500	4400	6000	7500
Rated torque T _n (Nm)	22	28	38	48
Rated speed \bar{n} (rpm)	1500	1500	1500	1500
Rated current I _n (A)	10.3	11.9	19.1	23.4
DC Link Voltage U _{DC} (V)	560	560	560	560
Maximum torque T _m (Nm)	55	70	95	120
Maximum current I _m (A)	25.75	29.75	47.75	58.5
Standstill torque T _s (Nm)	24.2	30.8	41.8	52.8
Standstill current I _s (A)	11.33	13.09	21.01	25.74
Voltage constant K _e (V/krpm)	135	150	127	130
Torque constant K _t (Nm/A)	2.23	2.48	2.10	2.15
Resistance line-line R _L (Ω)	1.2	0.65	0.34	0.29
Inductance line-line L _L (mH)	12.7	8.5	4.5	4.65
Electrical time constant T _e (ms)	10.58	13.08	13.24	16.03
Mechanical time constant T _m (ms)	3.42	2.16	2.06	2.06
Rotor moment of inertia J _m (kgcm ²)	82	118	154	190
Pole number	8	8	8	8
Max. voltage rising du/dt (kV/μs)	8	8	8	8
Insulation class	F	F	F	F
Max. radial force F _r (N)	1600	1600	1600	1600
Max. axial force F _a (N)	800	800	800	800
Weight (Kg)	22.8	28.6	34.4	40
Feed back device	2500p/rev incremental encoder or Resolver (sin--cos)			
Temperature sensor	KTY84-130(If fitted)			
Cooling method	Totally enclosed non-ventilated			
Protection level	IP65,shaft sealing IP54			
Environmental conditions	Temperature	-20℃ ~40℃		
	Humidity	Below 90%RH (No dewing)		
	Environment	Far away active gas, combustible gas, oil drop, ash.		
	Installation altitude	Up to 1000m: rated power Above 1000m: 1.5% power Decreasing per 100m,max.4000m		
Rating conditions	Mounting	Aluminum flange 457*457*12.7mm		
	Temperature	60K housing temperature ring at 40℃ ambient		

SMH180 Technical Information

11.2 SMH180 Product Dimension Drawing

11.2.1 SMH180 M series dimensions (unit: mm)

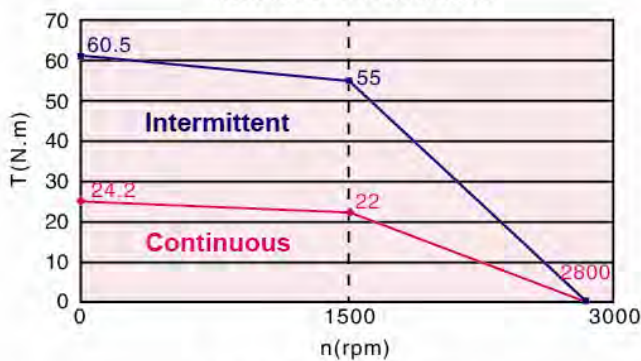


SMH180 M series Length (Unit: mm)

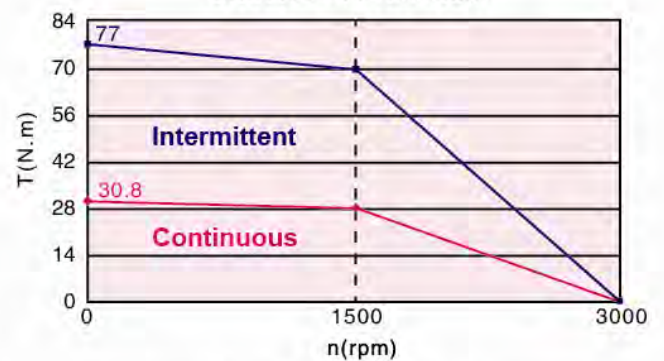
Torque	L	No Brake	Fit Brake
22 N.m		260	332
28 N.m		298	370
38 N.m		336	413
48 N.m		374	451

10.3 SMH180 Series Performance Curve

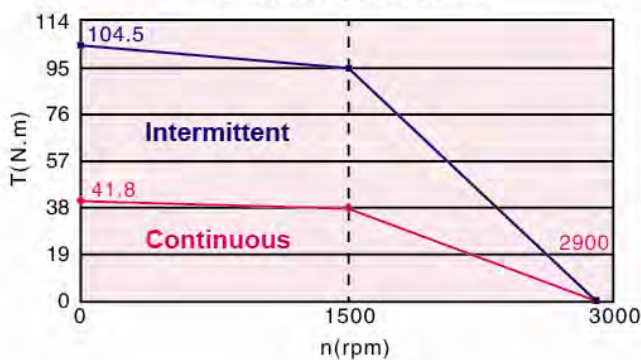
SMH180-3501538xxx



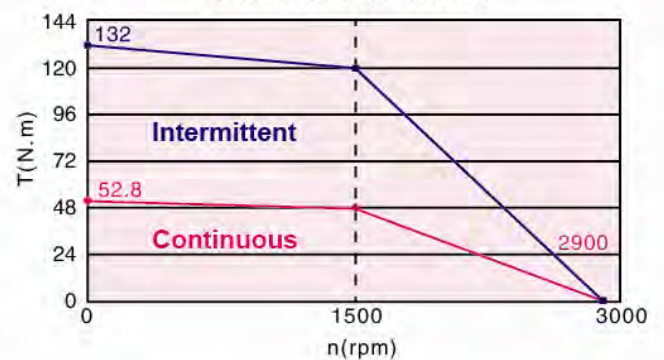
SMH180-4401538xxx



SMH180-6001538xxx



SMH180-7501538xxx



AC, DC Intelligent Digital Servo Drives Controllers

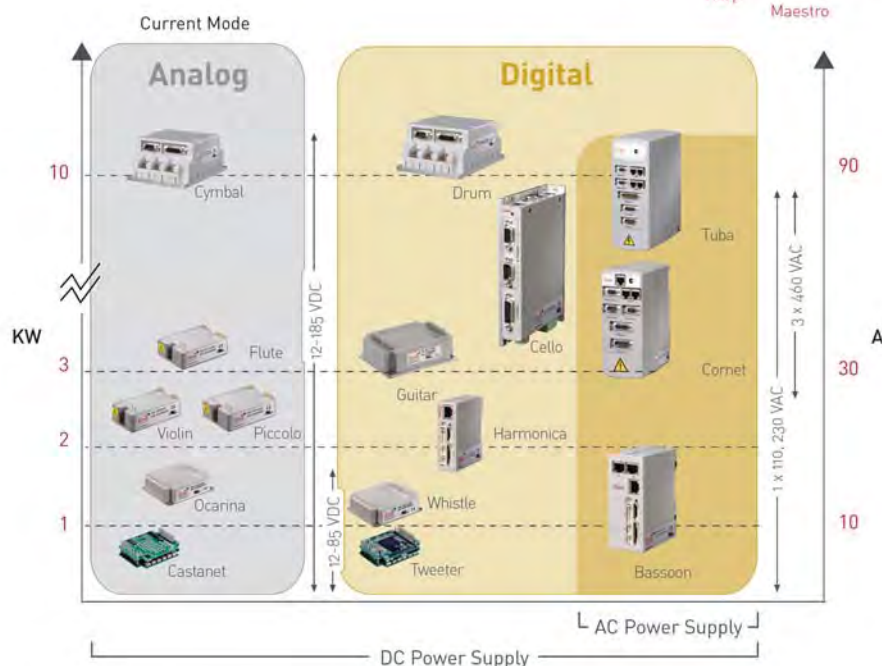
Servo Controllers for DC Brush Servo or Brushless Motors with Incremental Encoder, Resolver, Digital Halls, Analog SINCOS, Absolute, Analog Halls, Tacho, and Potentiometer Feedbacks

Current, Velocity, Advance Position Operation Modes, Analog, PWM, Pulse and Direction, Software Commands-RS-232, CANopen, DS 301 and DSP 402 Communications

- Elmo's SimplIQ digital servo drives combine high densities of power, intelligent functionality and space friendly design.
- The drives integrate Elmo's advanced, SimplIQ motion control core technology, which enables superior control performance, offers advanced programming capabilities and supports standard communication protocols.
- All the drives in the series include a fully digital motion controller that features current, velocity and position loops and selection of commutation types and position feedbacks.
- The result: higher dynamics and increased precision for a wide variety of applications.



SimpliQ Product Range



		Model Name								
Feature	Unit	Tweeter	Whistle	Harmonica	Cello	Drum	Bassoon	Cornet	Tuba	Guitar
Supply Voltage Range	VDC	7.5 ~ 95	7.5 ~ 95	10 ~ 195	10 ~ 195	11 ~ 390				11 ~ 195
Supply Voltage Range	VAC						1x30 ~ 270	1x60 up to 3x505	1x60 up to 3x505	
Motor	DC Brush, or Brushless Sinusoidal, trapezoidal									
Operating Modes	Current, Velocity, Position & Advance Position									
Commands	Analog, PWM, Pulse and Direction, Software Commands									
Feedbacks	Incremental Encoder, Resolver, Digital Halls, Analog SIN-COS, Absolute, Analog Hall, Tacho Potentiometer									
Cont. Output Current	A	2.5 ~ 3.3	1 ~ 20	2.0 ~ 13.3	2.25 ~ 30	18 ~ 90	1 ~ 6	1.4 ~ 9	12 ~ 20	3 ~ 45
Output Power Range	KW	0.16 ~ 0.2	0.05 ~ 1.60	0.20 ~ 1.10	0.24 ~ 3.40	2.7 ~ 9.6	0.32 ~ 1.90	0.42 ~ 3.40	3.60 ~ 11.30	0.48 ~ 4.8
Digital In, Out, Analog In		6/02/2001	6/02/2001	6/02/2001	10/05/2002	6/02/2001	6/02/2001	10/06/2002	10/06/2002	
Communications	RS-232, CANopen DS 301, DSP 305 and DSP 402									
Programming	SimpleIQ Programming									
Software Tools	Composer									
Memory	Up to 32KB									

Other Motion Tech Products



Other Motion Tech Products



Precision in the Extreme



Kinavo



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