BEIJING KND CNC TECHNIQUE CO.,LTD.

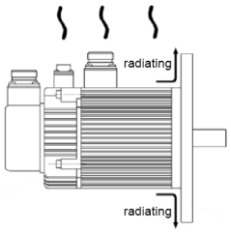
ST SERIES
SERVO MOTOR

BEIJING KND CNC TECHNIQUE CO.,LTD.

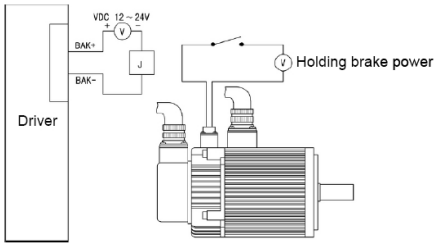
01.2012

CONTENTS

▲ NOTE!



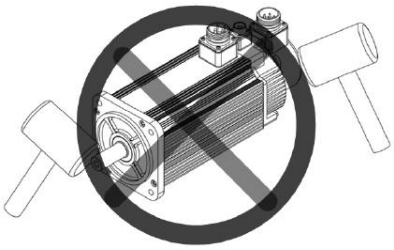
Motors should be installed on an armor plate as big as possible because it is self-cooled. Motors will generate heat when working for a long time, and it is normal phenomenon.



When a motor equipped with a holding brake, the power of the holding brake should be provided by the servo driver itself, otherwise the motor may work abnormally.

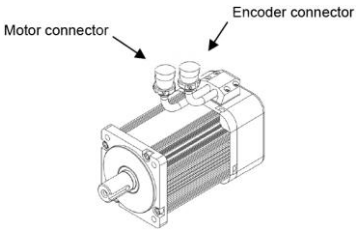
▲ PROHIBITED!

Optional changing, dismantling or machining the motor is prohibited. If must do it, please contact with KND company.

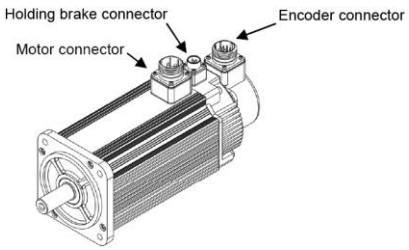


There is precise feedback component inside the motor, do not apply any strong whack to the shaft extension or the terminal of the motor.

▲ SOCKET FIG.!



Cable Socket



Aviation Socket

▲ CAUTION!

Do not store or install the motor in the following places:

- Locations subject to exposure to water or coolant.
- Locations subject to installation humidity conditions.
- Locations subject to shock or vibration.

◆ General

ST series AC servo motors developed by Beijing KND CNC technique Co., LTD. are used for equipping CNC machines. Foundation sizes contain 80, 90, 110, 130 and 150 five series, altogether more than 30 varieties. Selection quality raw materials and parts can effectively keep motors working well during long-term, high-speed, continuous running. The motor and KND SD series AC servo driver used together can make the machine work in good performance.

◆ Characteristics of product

1. Full airproof and compact structure, beautiful contour.

2. Low harmonic, low magnetic resistance torque, high performance back electromotive force sine, sine-wave current drive and excellent low speed performance.

3. Using high performance permanent magnet material and high grade cold rolled silicon-steel sheet, high power and large overload ability.

4. Using optimization electromagnetism design, low noise, running steady, high efficiency, and keeping good working condition during long-term continuous running.

5. Using optimization inertia design, quick motor response speed, suitable for various domains especially driving CNC machine.

6. Using IP66 protection class to meet industry environment such as temperature -15℃ – 40℃, dust and oil mist.

7. Using high-speed and high precision photoelectric encoder, working in with KND driving unit to achieve high speed high precision and position control.

◆ Superiority of product

1. Standard equipping 2500 p/r incremental type encoder, and optional equipping absolute encoder containing 17-bit single-turn and 17-bit multi-turn encoder.

2. Work in with SD series servo driver and KND CNC system to make working more reliable and performance more excellent.

◆ Description of servo motor model

EXAMPLE:

110ST	-M	040	30	M	A	Z
1	2	3	4	5	6	7

1. Sine-wave permanent magnet synchronous AC servo motor
   Foundation number: 80, 90, 110, 130 and 150

2. Types of encoder: M – Photoelectric type X – Magnetoelectric type

3. Rated torque: 040 × 0.1 = 4 Nm

4. Rated speed: 30 × 100 =3000 r/min

5. Resolution of encoder:
   F – 2500 p/r incremental type (Default) F1 – 2500 p/r wire-saving type
   M – 17-bit multi-turn (TAMAGAWA) M1 – 17-bit multi-turn (DANAHER)
   E – 17-bit single-turn (TAMAGAWA)

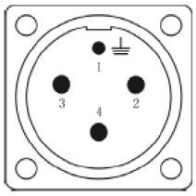
6. Structure of shaft extension: Default – Standard smooth and straight shaft
   A – Straight with standard keyway
   C – Straight with special keyway

7. Holding brake: Default – Without brake Z – With brake

◆ Wiring way of servo motor

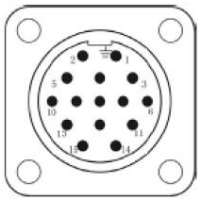
1. Power connector (4 cores)

Winding lead-wire	U	V	W	Ground
Connector number	2	3	4	1



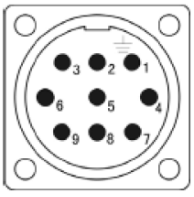
2. Incremental encoder connector (15 cores)

Signal	+5V	0V	A+	B+	Z+	A-	B-	Z-	U+	V+	W+	U-	V-	W-	Shield
Connector number	2	3	4	5	6	7	8	9	10	11	12	13	14	15	1



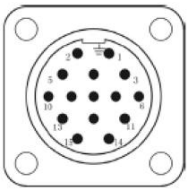
3. Wire-saving type incremental encoder connector (9 cores)

Signal	+5V	0V	A+	B+	Z+	A-	B-	Z-	Shield
Connector number	2	3	4	5	6	7	8	9	1



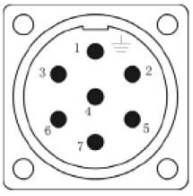
4. Absolute encoder of DANAHER connector (15 cores)

Signal	+5V	0V	A+	B+	A-	B-	Sensor +S 5V	SLA Dat+	May Clk+	Sensor S0V	SLB Dat-	Maz Clk-	Shield
Connector number	2	3	4	5	7	8	10	11	12	13	14	15	1



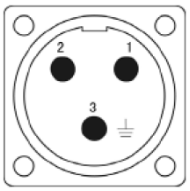
5. Absolute encoder of TAMAGAWA connector (7 cores)

Signal	+5V	0V	SD+	SD-	E+	E-	Shield
Connector number	7	6	5	4	3	2	1



6. Holding brake connector (3 cores)

Signal	DC24V (Nonpolarity)		Ground
Connector number	1	2	3



◆ Parameters for foundation equipped holding brake

Parameter for foundation 80/90 series equipped holding brake: 4Nm DC24V 0.8A (2 cores)

Parameter for foundation 110 series equipped holding brake: 8Nm DC24V 0.9A

Parameter for foundation 130 series equipped holding brake: 16Nm DC24V 1.2A

Parameter for foundation 150 series equipped holding brake: 30Nm DC24V 1.6A

◆ Size of 80 series motor

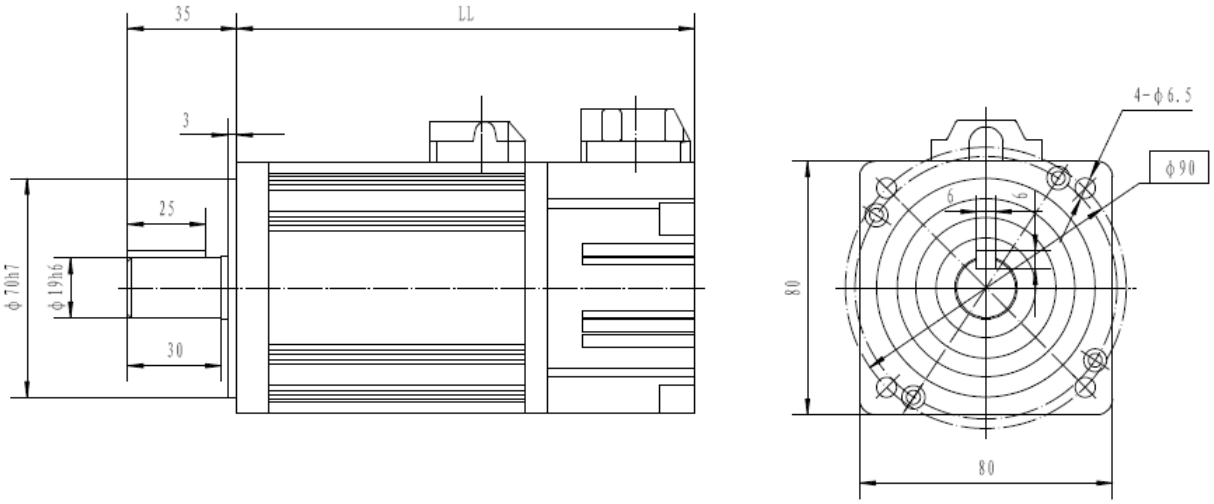


Fig. 1. The dimension of 80 series AC servo motor (unit:mm)

◆ Specification of 80 series motor

Model		80ST-01030	80ST-01330	80ST-02430	80ST-03330
Rated output (KW)		0.3	0.4	0.75	1.0
Rated torque (N.m)		1.0	1.3	2.4	3.3
Instantaneous peak Torque (N.m)		2.0	2.6	4.8	6.6
Rated speed (rpm)		3000	3000	3000	3000
Max. speed (rpm)		3600	3600	3600	3600
Rated current (A)		2.5	2.6	4.0	4.5
Instantaneous max current(A)		5.0	5.2	8.0	9.0
Rotor inertia (Kg.cm^2)		0.85	1.13	1.87	2.55
Number of poles		4			
Working voltage of adapted driver (VAC)		220			
Insulation class		F			
Protection class		IP66			
Encoder		2500 p/r			
Mounting method		Flange method			
Environment	**Ambient temperature**	-15 to 40℃ (no freeze), Stored temperature: -15 to 70℃ (no freeze)			
	Ambient humidity	80% RH below (no condensation), Stored humidity: 90% RH below (no condensation)			
	Air	Indoor (no direct sunlight), No corrosive or flammable gases, No dust or oil			
	Standard height	Elevation of 1000 meters below			
	Vibration	Vibration speed 1.8 mm/s below			
LL	**Without holding break**	138mm	148mm	175mm	204mm
	With holding break	198mm	208mm	235mm	264mm
Torque-Speed characteristics (T-M)		Chart 1	Chart 2	Chart 3	Chart 4

Tab. 1. The specification table of 80 series AC servo motor

◆ Size of 90 series motor

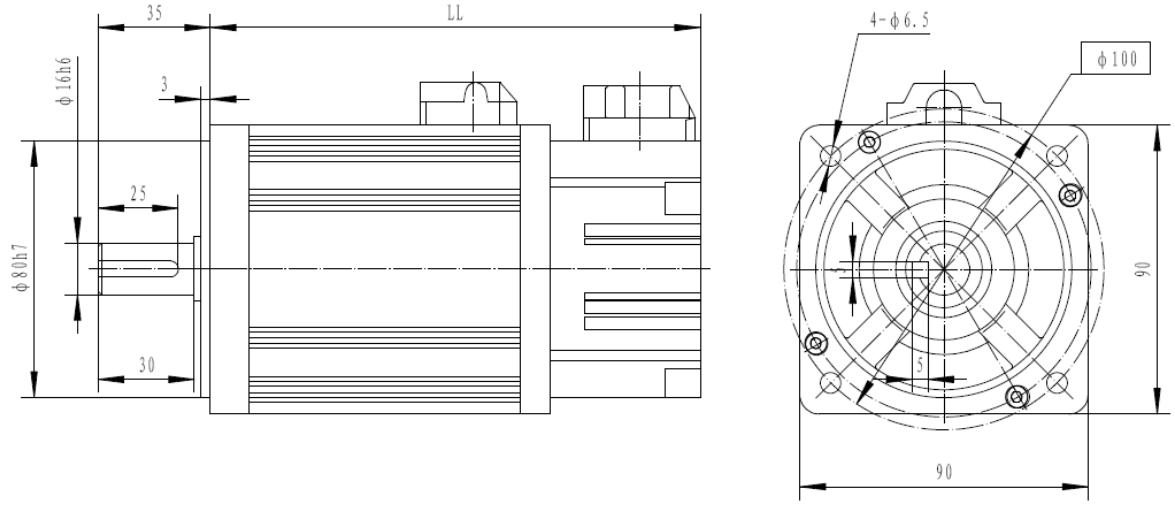


Fig. 2. The dimension of 90 series AC servo motor (unit:mm)

◆ Specification of 90 series motor

Model		90ST-M01530	90ST-M02430	90ST-M03530
Rated output (KW)		0.45	0.75	1.1
Rated torque (N.m)		1.5	2.4	3.5
Instantaneous peak torque (N.m)		3.0	4.8	7.0
Rated speed (rpm)		3000	3000	3000
Max. speed (rpm)		3600	3600	3600
Rated current (A)		2.8	3.0	4.2
Instantaneous max. current(A)		5.6	6.0	8.4
Rotor Inertia (Kg.cm^2)		1.53	2.56	3.07
Number of poles		4		
Working voltage of adapted driver (VAC)		220		
Insulation class		F		
Protection class		IP66		
Encoder		2500 p/r		
Mounting method		Flange method		
Environment	**Ambient temperature**	-15 to 40℃ (no freeze), Stored temperature: -15 to 70℃ (no freeze)		
	Ambient humidity	80%RH below (no condensation), Stored humidity: 90%RH below (no condensation)		
	Air	Indoor (no direct sunlight), No corrosive or flammable gases, No dust or oil		
	Standard height	Elevation of 1000 meters below		
	Vibration	Vibration speed 1.8 mm/s below		
LL	**Without holding break**	141mm	161mm	171mm
	With holding break	201mm	221mm	231mm
Torque-Speed characteristics (T-M)		Chart 5	Chart 6	Chart 7

Tab. 2. The specification table of 90 series AC servo motor

◆ Size of 110 series motor

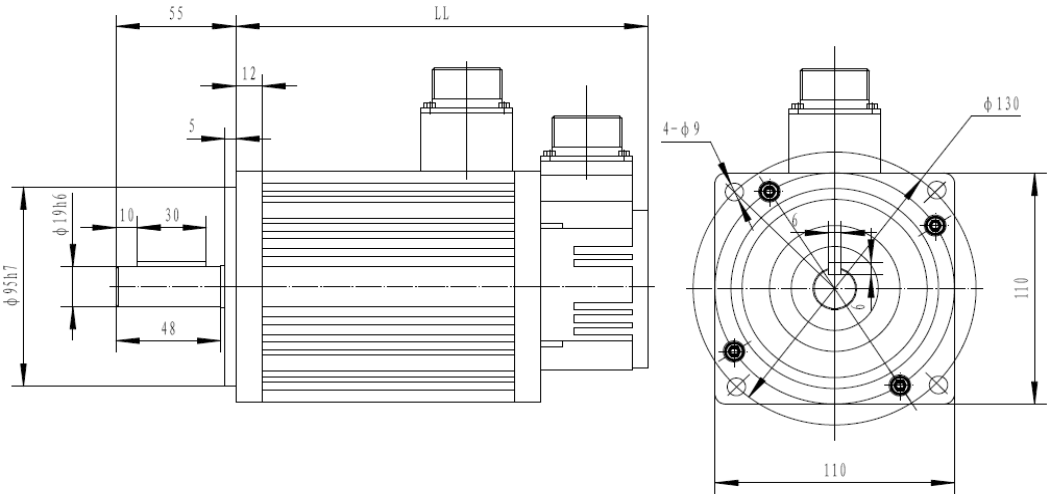


Fig. 3. The dimension of 110 series AC servo motor (unit:mm)

◆ Specification of 110 series motor

Model		110ST-M02020	110ST-M02030	110ST-M04020	110ST-M04030	110ST-M05030	110ST-M06020	110ST-M06030
Rated output (KW)		0.4	0.6	0.8	1.2	1.5	1.2	1.8
Rated torque (N.m)		2	2	4	4	5	6	6
Instantaneous peak torque (N.m)		5	5	10	10	12.5	15	15
Rated speed (rpm)		2000	3000	2000	3000	3000	2000	3000
Max. speed (rpm)		2400	3600	2400	3600	3600	2400	3600
Rated current (A)		2.3	2.7	3.5	5.0	6.0	5.5	7.0
Instantaneous max current(A)		5.75	6.75	8.75	12.5	15.0	13.75	17.5
Rotor inertia (Kg.cm^2)		3.81	3.81	7.61	7.61	9.51	11.4	11.4
Number of poles		4						
Working voltage of adapted driver (VAC)		220						
Insulation class		F						
Protection class		IP66						
Encoder		2500 p/r						
Mounting method		Flange method						
Environment	Ambient temperature	-15 to 40℃ (no freeze), Stored temperature: -15 to 70℃ (no freeze)						
	Ambient humidity	80%RH below (no condensation), Stored humidity: 90%RH below (no condensation)						
	Air	Indoor (no direct sunlight), No corrosive or flammable gases, No dust or oil						
	Standard height	Elevation of 1000 meters below						
	Vibration	Vibration speed 1.8 mm/s below						
LL	Without holding break	157mm	157mm	187mm	187mm	202mm	217mm	217mm
	With holding break	231mm	231mm	261mm	261mm	276mm	291mm	291mm
Torque-Speed characteristics (T-M)		Chart 8	Chart 9	Chart 10	Chart 11	Chart 12	Chart 13	Chart 14

Tab. 3. The specification table of 110 series AC servo motor

◆ Size of 130 series motor

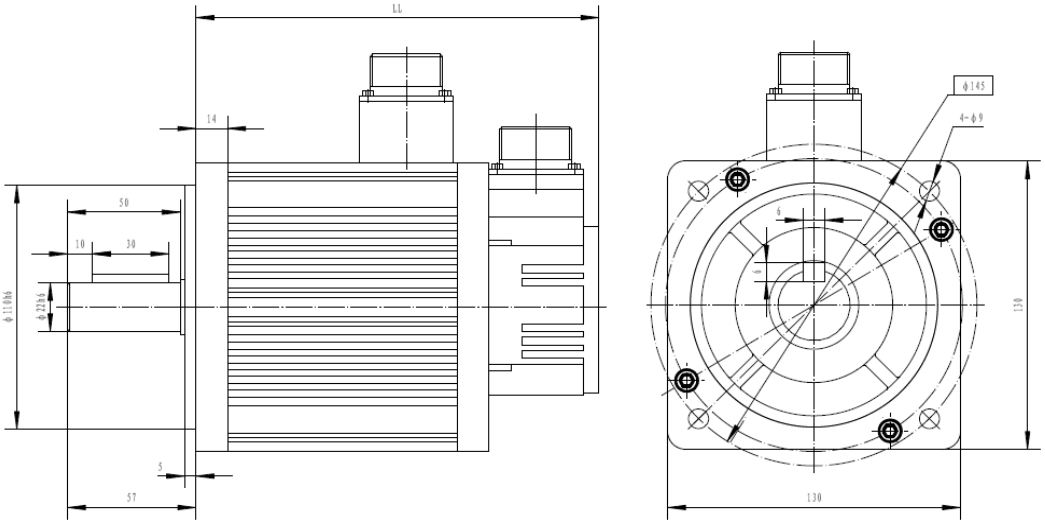


Fig. 4. The dimension of 130 series AC servo motor (unit:mm)

◆ Specification of 130 series motor

Model		130ST-M04015	130ST-M04025	130ST-M05015	130ST-M05025	130ST-M06015	130ST-M06025
Rated output (KW)		0.6	1.0	0.75	1.3	1.0	1.5
Rated torque (N.m)		4	4	5	5	6	6
Instantaneous peak torque (N.m)		10	10	12.5	12.5	15	15
Rated speed (rpm)		1500	2500	1500	2500	1500	2500
Max. speed (rpm)		1800	3000	1800	3000	1800	3000
Rated current (A)		2.5	4.0	3.5	5.5	4.0	6.0
Instantaneous max. current (A)		6.25	10	8.75	13.75	10	15
Rotor inertia (Kg.cm^2)		10.8	10.8	13.6	13.6	14.9	14.9
Number of poles		4					
Working voltage of adapted driver (VAC)		220					
Insulation class		F					
Protection class		IP66					
Encoder		2500 p/r					
Mounting method		Flange method					
Environment	**Ambient temperature**	-15 to 40℃ (no freeze), Stored temperature: -15 to 70℃ (no freeze)					
	Ambient humidity	80%RH below (no condensation), Stored humidity: 90%RH below (no condensation)					
	Air	Indoor (no direct sunlight), No corrosive or flammable gases, No dust or oil					
	Standard height	Elevation of 1000 meters below					
	Vibration	Vibration speed 1.8 mm/s below					
LL	**Without holding break**	164mm	164mm	177mm	177mm	177mm	177mm
	With holding break	239mm	239mm	252mm	252mm	252mm	252mm
Torque-Speed characteristics (T-M)		Chart 15	Chart 16	Chart 17	Chart 18	Chart 19	Chart 20

Tab. 4. The specification table of 130 series AC servo motor

◆ Size of 130 series motor

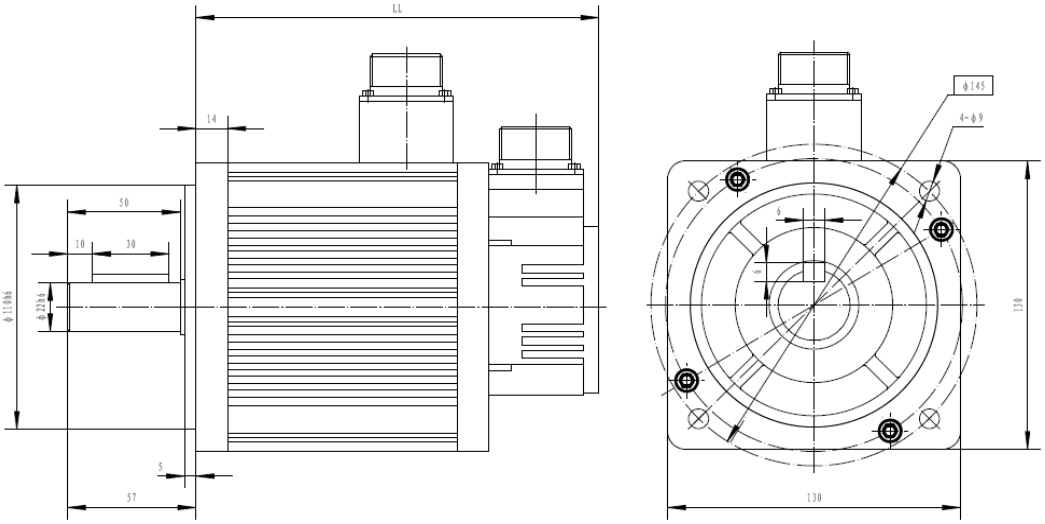


Fig. 5. The dimension of 130 series AC servo motor (unit:mm)

◆ Specification of 130 series motor

Model		130ST-M07715	130ST-M07725	130ST-M10015	130ST-M10025	130ST-M15015	130ST-M15025
Rated output (KW)		1.2	2.0	1.6	2.6	2.4	3.9
Rated torque (N.m)		7.7	7.7	10	10	15	15
Instantaneous peak torque (N.m)		19.3	19.3	25	25	37.5	37.5
Rated speed (rpm)		1500	2500	1500	2500	1500	2500
Max. speed (rpm)		1800	3000	1800	3000	1800	3000
Rated current (A)		4.6	6.5	6.0	10	9.0	14.5
Instantaneous max. current (A)		11.5	16.25	15	25	22.5	36.25
Rotor inertia (Kg.cm^2)		21.7	21.7	27.9	27.9	34.1	34.1
Number of poles		4					
Working voltage of adapted driver (VAC)		220					
Insulation class		F					
Protection class		IP66					
Encoder		2500 p/r					
Mounting method		Flange method					
Environment	Ambient temperature	-15 to 40℃ (no freeze), Stored temperature: -15 to 70℃ (no freeze)					
	Ambient humidity	80%RH below (no condensation), Stored humidity: 90%RH below (no condensation)					
	Air	Indoor (no direct sunlight), No corrosive or flammable gases, No dust or oil					
	Standard height	Elevation of 1000 meters below					
	Vibration	Vibration speed 1.8 mm/s below					
LL	Without holding break	203mm	203mm	223mm	223mm	239mm	239mm
	With holding break	278mm	278mm	298mm	298mm	314mm	314mm
Torque-Speed characteristics (T-M)		Chart 21	Chart 22	Chart 23	Chart 24	Chart 25	Chart 26

Tab. 5. The specification table of 130 series AC servo motor

◆ Size of 150 series motor

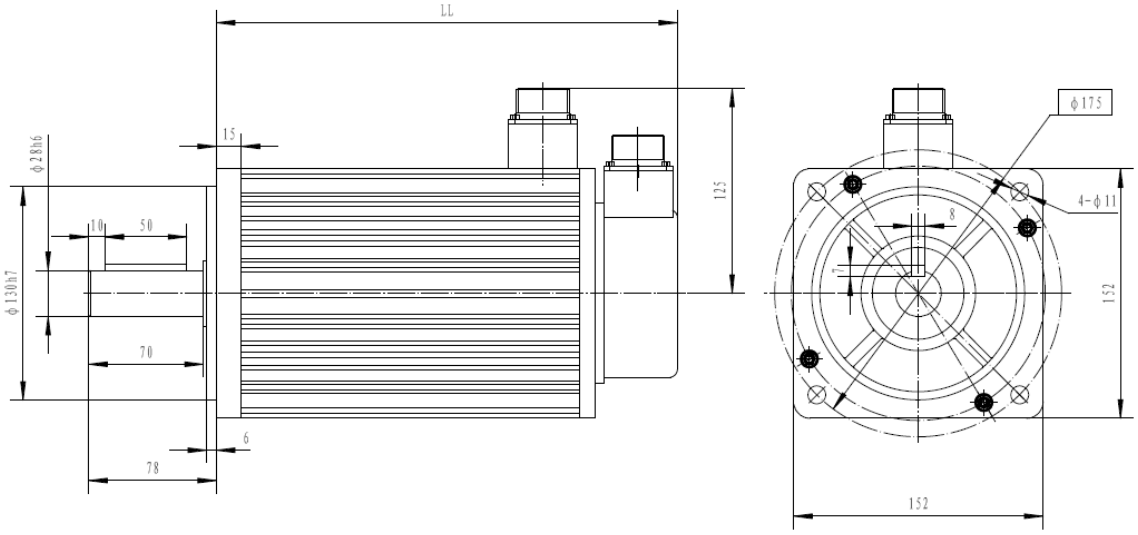


Fig. 6. The dimension of 150 series AC servo motor (unit:mm)

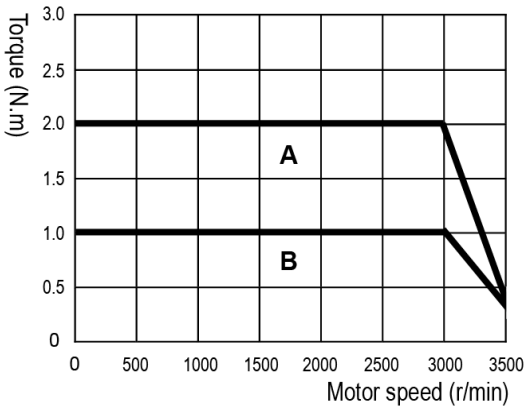
◆ Specification of 150 series motor

Model		150ST-M18015	150ST-M23015	150ST-M27015	150ST-M32015			
Rated output (KW)		2.8	3.6	4.2	5.0			
Rated torque (N.m)		18	23	27	32			
Instantaneous peak torque (N.m)		45	57.5	67.5	80			
Rated speed (rpm)		1500	1500	1500	1500			
Max. speed (rpm)		2000	2000	2000	2000			
Rated current (A)		8.8	11.8	15	18.5			
Instantaneous max. current (A)		22	29.5	37.5	46.3			
Rotor inertia (Kg.cm^2)		69.7	90.7	105	119			
Number of poles		4						
Working voltage of adapted driver (VAC)		220						
Insulation class		F						
Protection class		IP66						
Encoder		2500 p/r						
Mounting method		Flange method						
Environment	Ambient temperature	-15 to 40℃ (no freeze), Stored temperature: -15 to 70℃ (no freeze)						
	Ambient humidity	80%RH below (no condensation), Stored humidity: 90%RH below (no condensation)						
	Air	Indoor (no direct sunlight), No corrosive or flammable gases, No dust or oil						
	Standard height	Elevation of 1000 meters below						
	Vibration	Vibration speed 1.8 mm/s below						
LL	Without holding break	247mm	277mm	297mm	317mm			
	With holding break	332mm	362mm	382mm	402mm			
Torque-Speed characteristics (T-M)		Chart 27	Chart 28	Chart 29	Chart 30			

Tab. 6. The specification table of 150 series AC servo motor

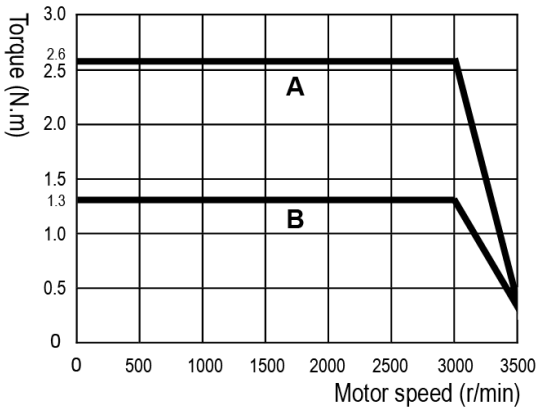
◆ Torque-Speed characteristics of AC servo motor

(1) 80 series characteristics are as follows:



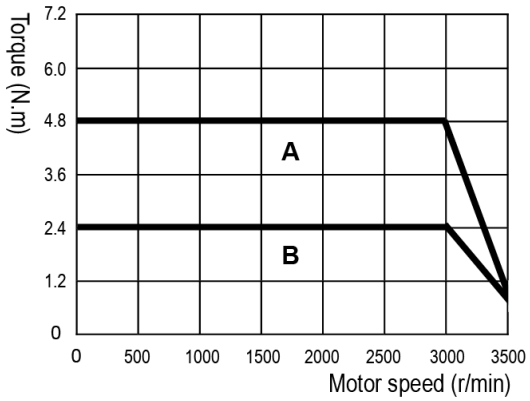
80ST-M01030

Chart 1



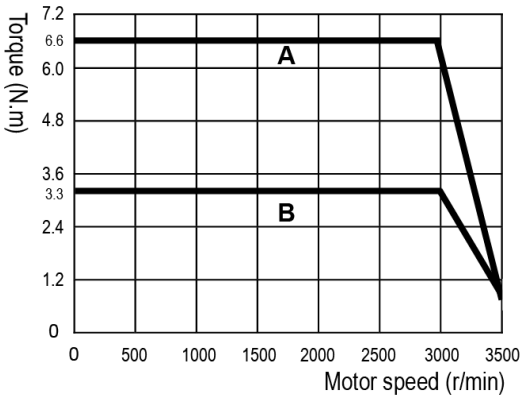
80ST-M01330

Chart 2



80ST-M02430

Chart 3



80ST-M03330

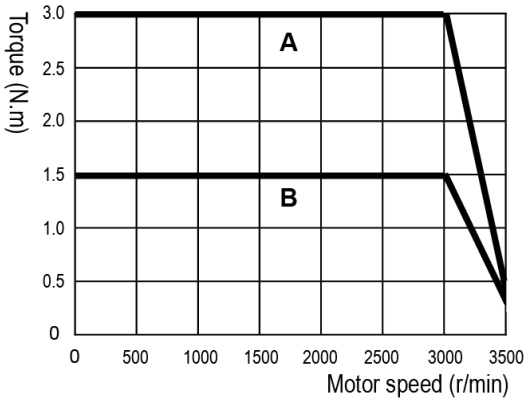
Chart 4

ANNOTATION :

A : Intermittent Duty Zone B : Continuous Duty Zone

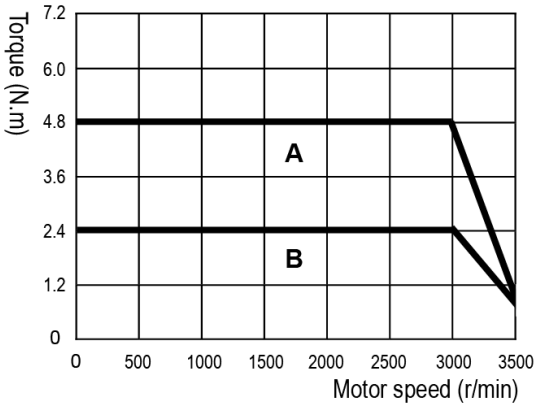
◆ Torque-Speed characteristics of AC servo motor

(2) 90 series characteristics are as follows:



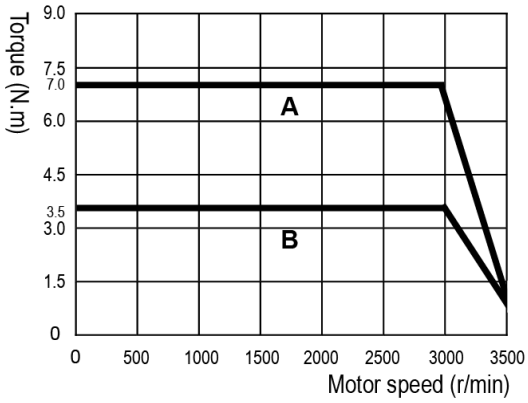
90ST-M01530

Chart 5



90ST-M02430

Chart 6



90ST-M03530

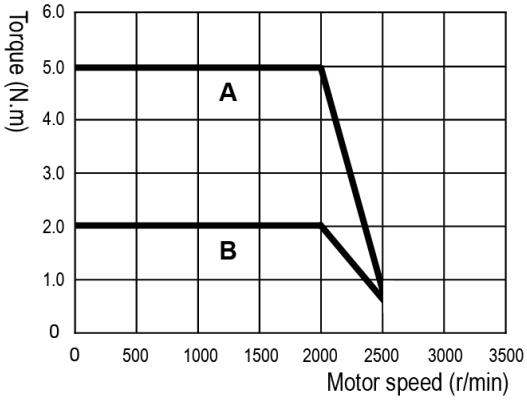
Chart 7

ANNOTATION :

A : Intermittent Duty Zone B : Continuous Duty Zone

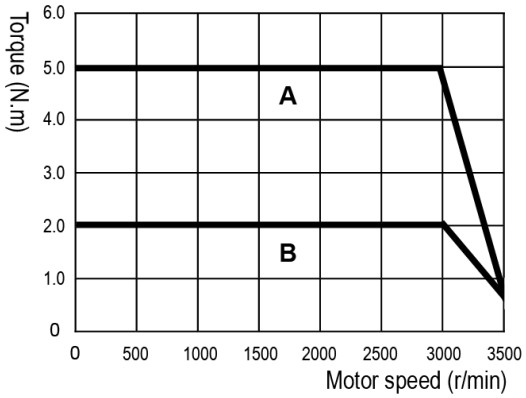
◆ Torque-Speed characteristics of AC servo motor

(3) 110 series characteristics are as follows – (a):



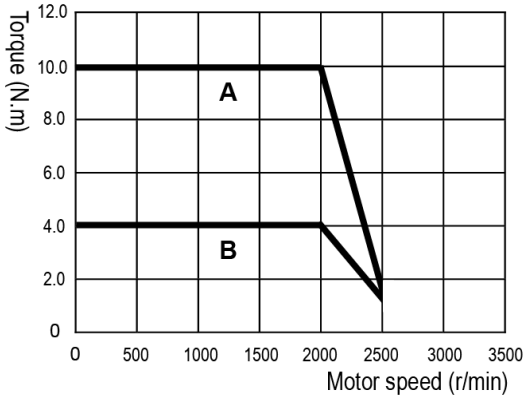
110ST-M02020

Chart 8



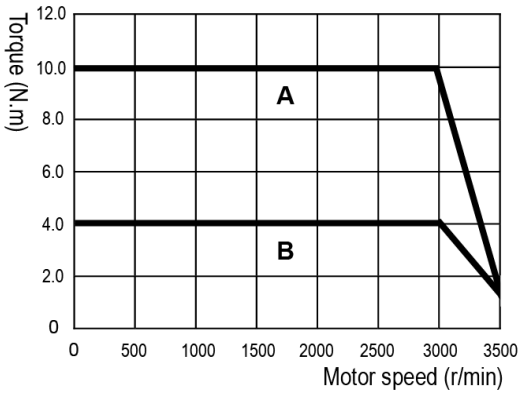
110ST-M02030

Chart 9



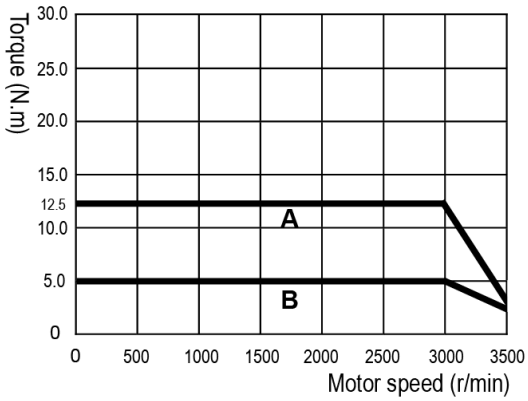
110ST-M04020

Chart 10



110ST-M04030

Chart 11



110ST-M05030

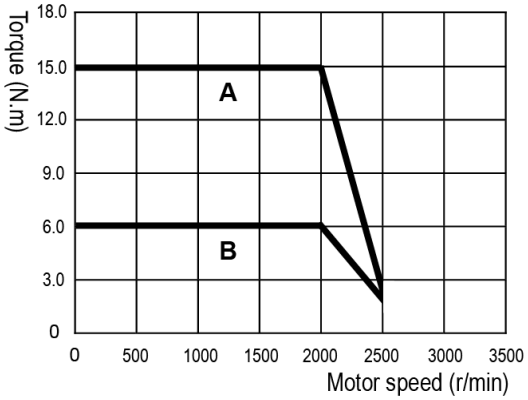
Chart 12

ANNOTATION :

A : Intermittent Duty Zone B : Continuous Duty Zone

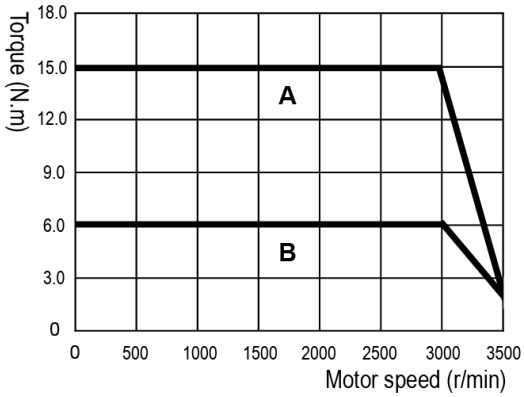
◆ Torque-Speed characteristics of AC servo motor

(3) 110 series characteristics are as follows – (b):



110ST-M06020

Chart 13



110ST-M06030

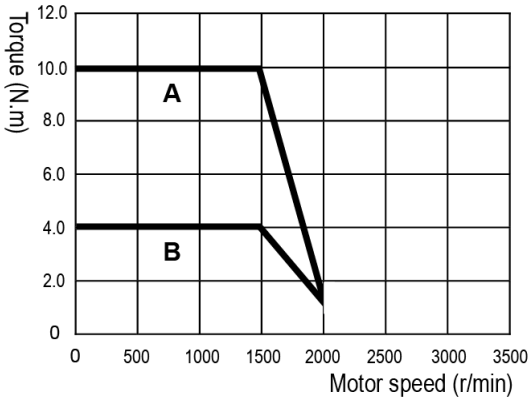
Chart 14

ANNOTATION :

A : Intermittent Duty Zone B : Continuous Duty Zone

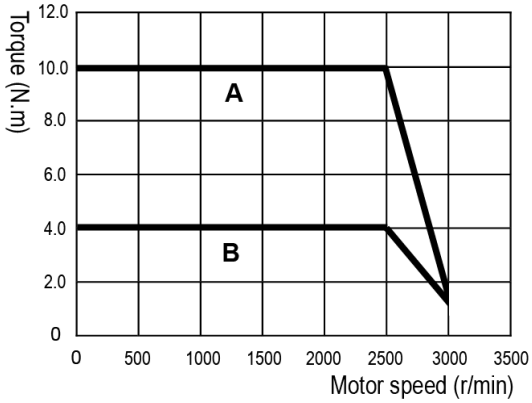
◆ Torque-Speed characteristics of AC servo motor

(4) 130 series characteristics are as follows – (a):



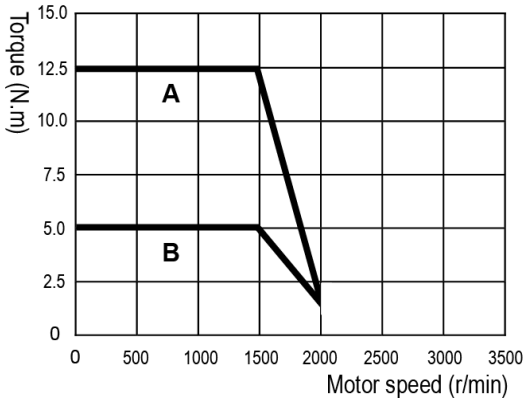
130ST-M04015

Chart 15



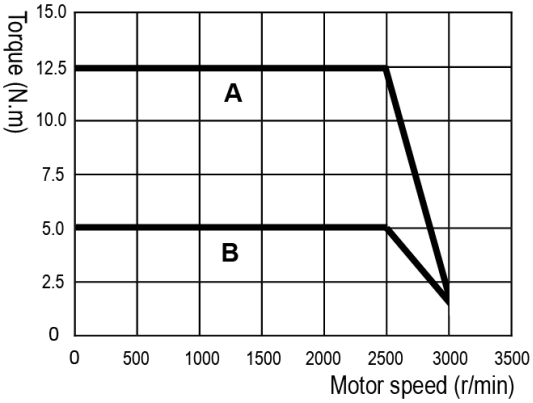
130ST-M04025

Chart 16



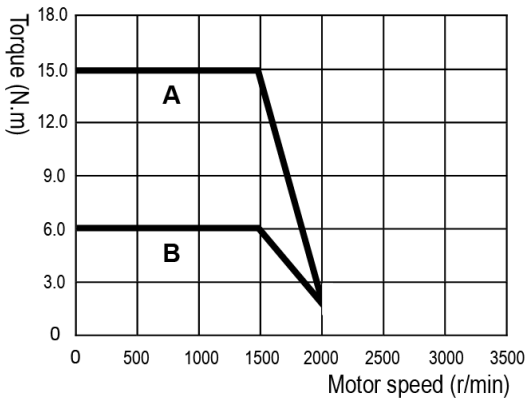
130ST-M05015

Chart 17



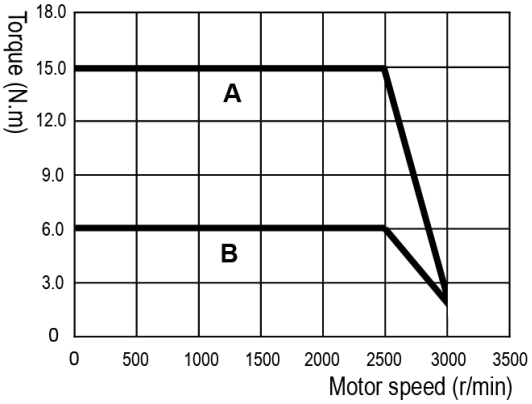
130ST-M05025

Chart 18



130ST-M06015

Chart 19



130ST-M06025

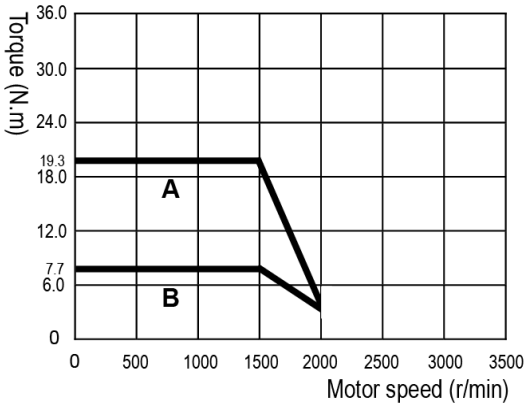
Chart 20

ANNOTATION :

A : Intermittent Duty Zone B : Continuous Duty Zone

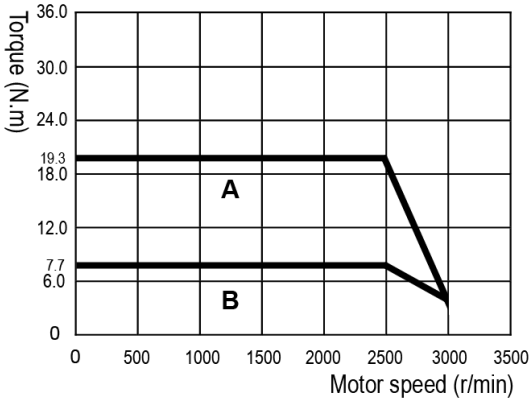
◆ Torque-Speed characteristics of AC servo motor

(4) 130 series characteristics are as follows – (b):



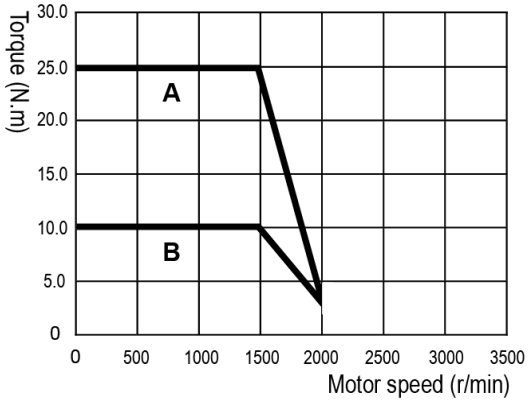
130ST-M07715

Chart 21



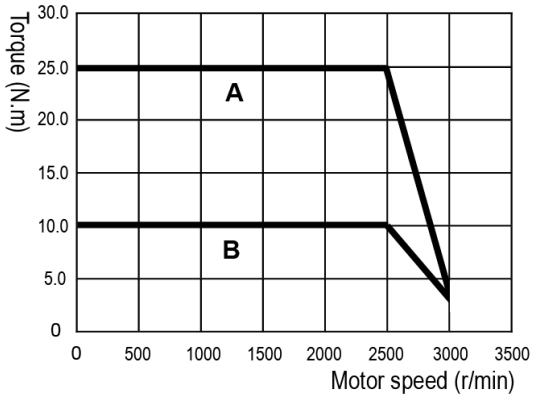
130ST-M07725

Chart 22



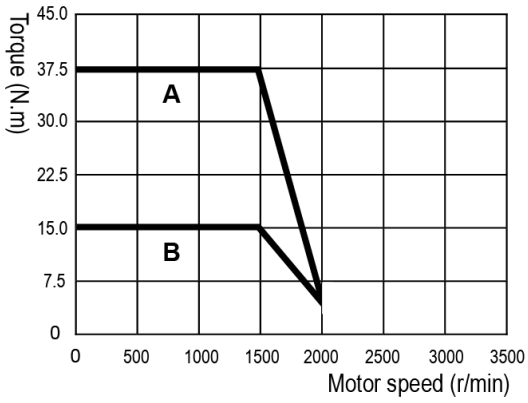
130ST-M10015

Chart 23



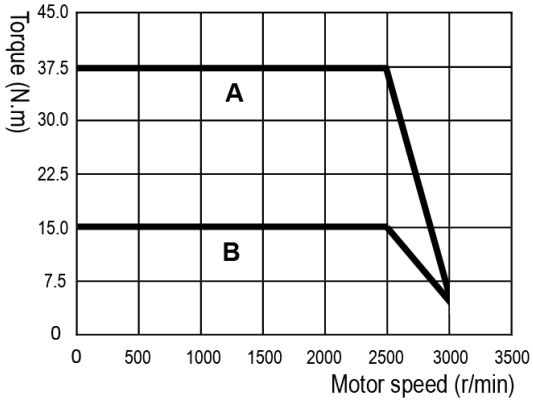
130ST-M10025

Chart 24



130ST-M15015

Chart 25



130ST-M15025

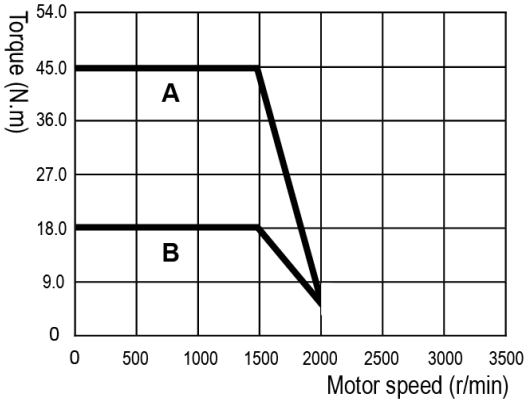
Chart 26

ANNOTATION :

A : Intermittent Duty Zone B : Continuous Duty Zone

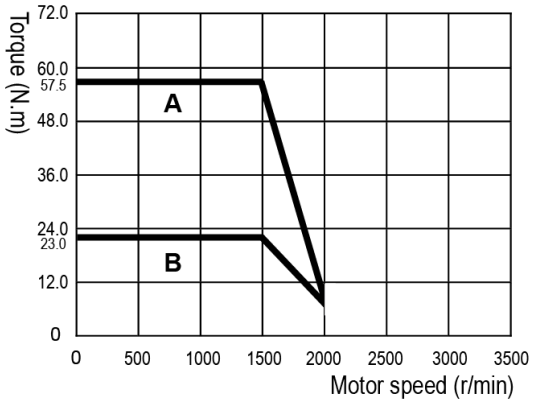
◆ Torque-Speed characteristics of AC servo motor

(5) 150 series characteristics are as follows:



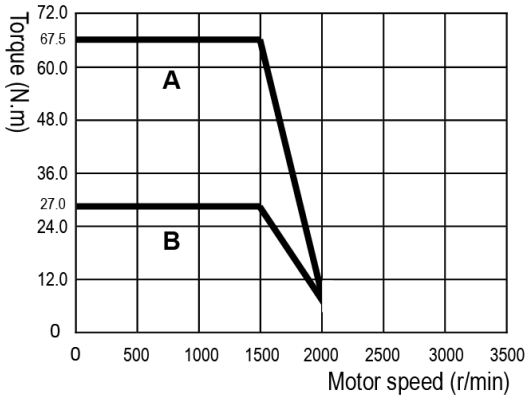
150ST-M18015

Chart 27



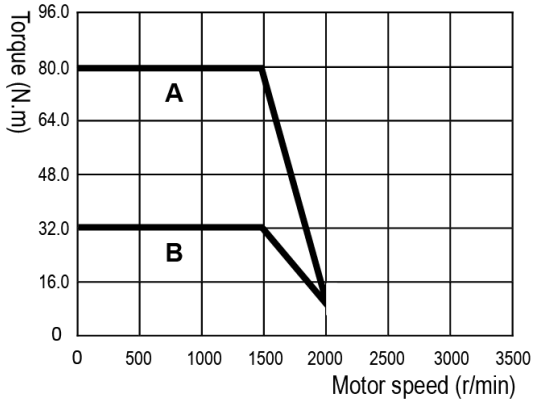
150ST-M23015

Chart 28



150ST-M27015

Chart 29



150ST-M32015

Chart 30

ANNOTATION :

A : Intermittent Duty Zone B : Continuous Duty Zone

Beijing KND CNC Technique Co.,LTD.

Address: No.3-5, 11th Block, 188 West Nansihuan Road, Fengtai District, Beijing (Postal Code: 100070)

Phone: +86-10-63701999 Fax: +86-10-63701998

Http: //www.knd.com.cn E-mail: bj@knd.com.cn

The content may be modified due to product improvement.

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