SVD800

AC Servo System

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NIETZ MECHATROLINK EtherCAT®

WHO WE ARE

NIETZ is one Leading Manufacturer of industrial automation products, with more than millions units sold worldwide, established 2005 Shanghai, China. We are committed to building long-lasting and successful business relations with our partners, has gained good reputation and deep influence.

We aim to provide the best quality, unmatched reliability and low price in our services and our products. We aim to reduce your costs, streamline manufacturing, to improve productivity.

CONTENTS

SVD 880

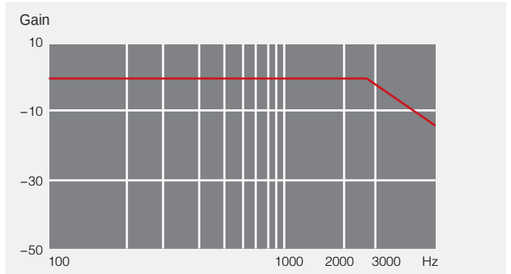
SVD 880 servo drive

Efficient and Performance Servo Drive

- Diversified function control
- Position/Speed/Torque Control
- Electronic gearing
- Speed/torque limit function
- Search origin function
- Zero speed lock function
- Speed command ramp smoothing function
- Dynamic braking and dynamic braking functions
- Multiple fault protection functions
- Soft reset function
- Support EtherCAT, MECHATROLINK III protocol

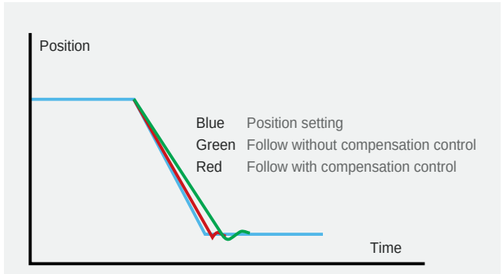
Excellent High Speed Response

Using high-frequency adjustment technology, the current loop response frequency reaches 3KHz, and the current sampling reaches 64K, which can quickly follow the change of the load and achieve high dynamic performance.



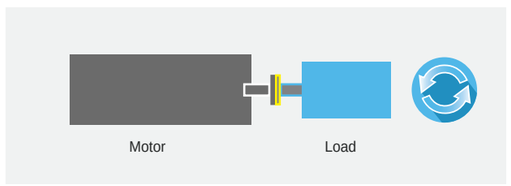
Composite Compensation Control

Through compound compensation, the response bandwidth of the speed and position loops can be effectively improved, and the rapid adjustment of the two loops can be realized to meet the requirements of fast mechanical operation.



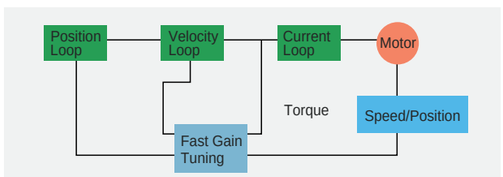
Accurate inertia identification

Through the simple operation of the driver button or the host computer, the identification of the inertia ratio can be realized within 100 ms, which is easy for customers to operate on site.



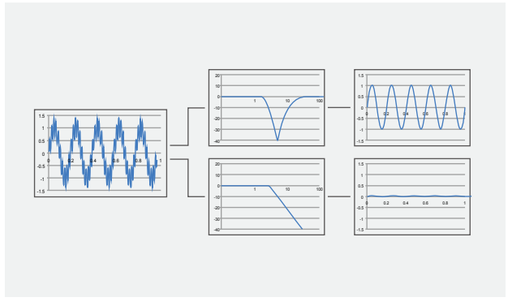
Fast Gain Tuning

Through the simple operation of the driver button or the host computer, the control gain and integral time constant can be adjusted within 0.5-2 minutes to meet the optimal operation requirements of various rigid and inertial equipment.



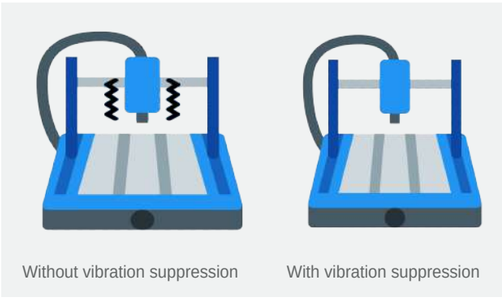
Multiple Banks of Notch Filters

Through the setting of multiple groups of notch filters, multiple mechanical high-frequency resonance points can be filtered to eliminate resonance.



Medium and low frequency oscillation suppression

Through the medium and low frequency vibration suppression algorithm, the low frequency mechanical vibration can be suppressed which is conducive to the stable operation of the equipment.



Various Bus Type

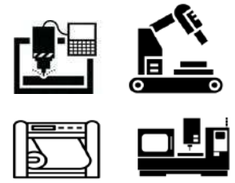
Support EtherCAT, MECHATROLINK III

EtherCAT®

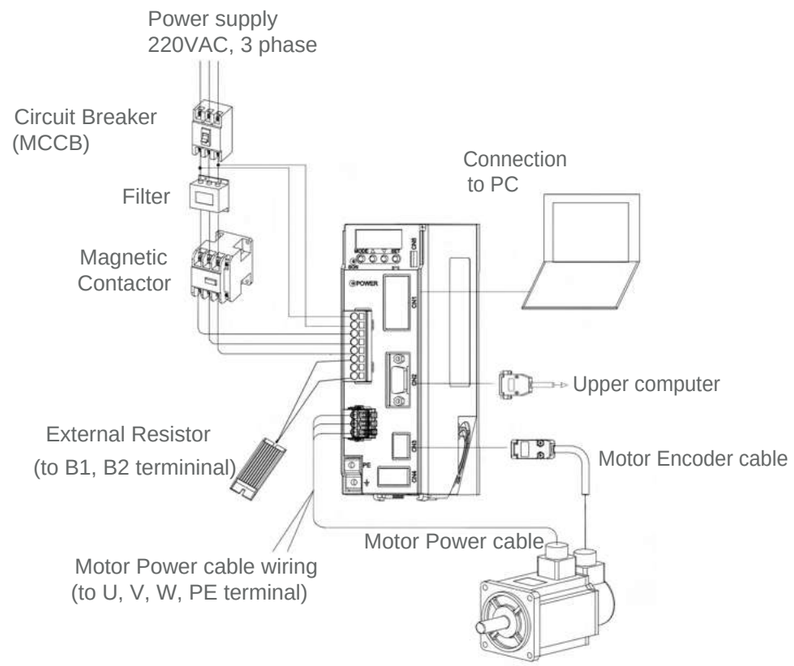
MECHATROLINK

Typical Application

- CNC lathe
- Engraving machine
- Carving machine
- Engraving machine
- Drilling machine
- Machining Center



Peripheral Equipment Structure



Servo Drive — Model Designation

SVD 880 - 0R75 - C - 02 ＊＊

① ② ③ ④ ⑤

① Products Series	
SVD 880	SVD 810

② Power Specifications	
0R2	200W
0R4	400W
0R7	750W
1R0	1kW
1R5	1.5kW
2R5	2.5kW
3R0	3.0kW
11	11.0kW

③ Communication Type	
A	Absolute encoder + Modbus RS485
C	Absolute encoder + EtherCAT
D	Absolute encoder + MECHATROLINK III
G	Incremental, ABZ

④ Voltage Rating	
02	220V, 3 phase
04	380V, 3 phase

⑤ Costumization	
＊＊	Special specification

Servo Motor — Model Designation

ZD M1 - 080 - K L 032 30 - 5 B P

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

① Motor Type	
ZD	High performance motor
UD	Normal Motor

② Motor Type	
M1	Optical encoder
M2	Megnetic encoder

③ Frame Size	
040	40 mm
060	60 mm
080	80 mm

④ Encoder Type	
K	23 bit absolute, multi-turn
K1	23 bit absolute, multi-turn, split type
N	24 bit absolute, multi-turn
C	17 bit absolute, single turn, magnetic type
C1	17 bit absolute, multi turn, magnetic type

⑤ Voltage Rating	
L	220V, 3 phase
S	380V, 3 phase

⑥ Rated Torque	
003	0.32 N.m
006	0.64 N.m
013	1.27 N.m

⑦ Rated Speed	
15	1500 rpm
20	2000 rpm

⑧ Pole's number	
5	5 pairs of poles motors
4	4 pairs of poles motors

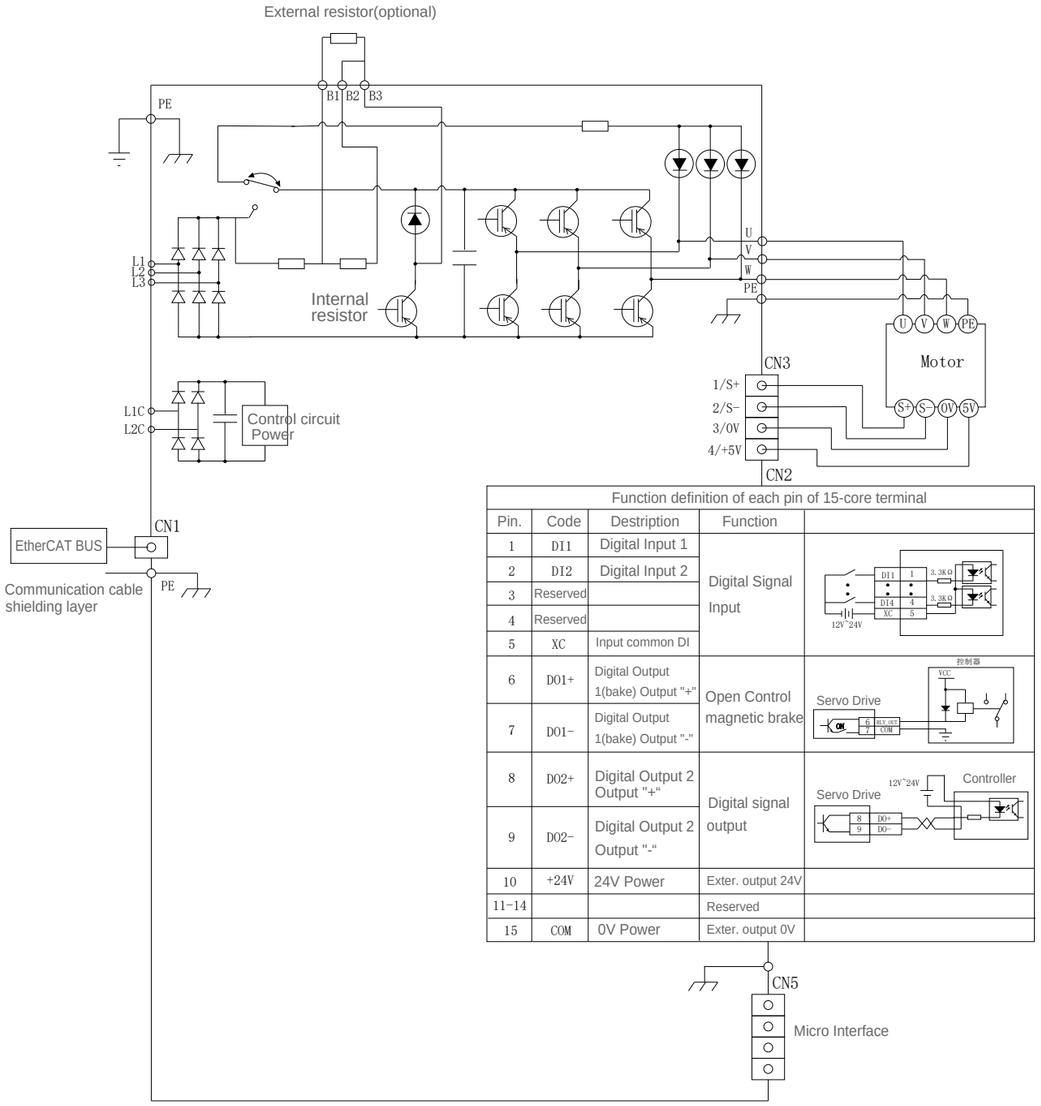
⑨ Brake Specifications	
E	Non brake
B	With brake

⑩ Water proof / Oil seal	
Y	Oil seal
W	Non seal
P	Oil seal and water proof with high class

Technical Data of AC Servo Drive

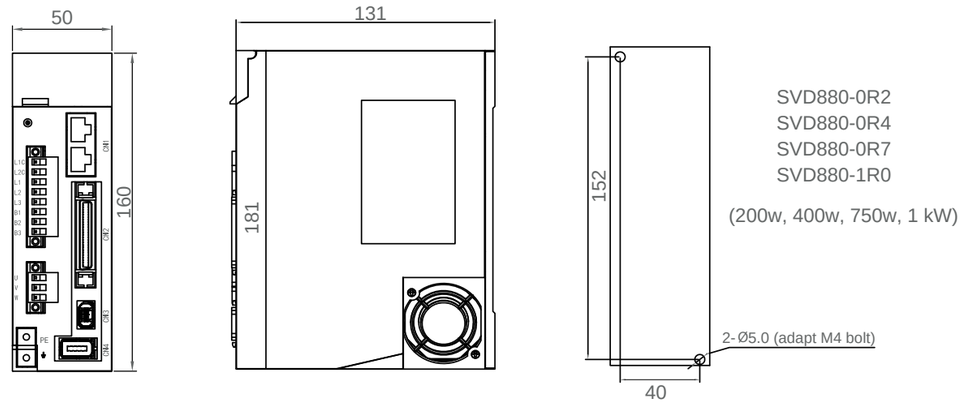
Basic Features	Input power	Control circuit power		1 Phase AC200V ~ AC2400 50/60Hz
		Main circuit power	SVD880: 3 ph 220V: 0.2 - 5.5kW; 3 ph 380V: 1.5 - 11kW	SVD810: 1 ph 220V: 0.2 - 1.0kW; 3 ph 220V: 1.5 - 2.0kW; 3 ph 380V: 1.5 - 15.0kW
	Environment	Temperature	Ambient temperature 0° C~55° C (no condensation) Storage temperature ~20~65° C (max. temperature 87° C for 72 hours)	
		Humidity	0~90%RH (no frost)	
		Altitude	Under 1000 meters	
		Vibration	Below 5.88m^2/ S, 10-60Hz (can not be used continuously at the resonant frequency)	
	Control method		IGBT PWM sine wave control	
	Enocder feedback		23 bit absolute (8388608 resolution) 24 bit absolute (16777216 resolution)	17 bit absolute (131072 resolution)
	Communicaton		EtherCAT MECHATROLINK III	
	Front panel		4 buttons LED 5 digits	Working light CPU Vector signal monitor output
	Regenerative		Built-in regenerative resistor (also can be external)	
	Dynamic brake		Built-in	
Function	Position Control	BUS input	EtherCAT, MECHATROLINK III (SVD880) EtherCAT pulse signal input (SVD810)	
		Anti-vibration control	Available	
	Speed Control	BUS input	EtherCAT, MECHATROLINK III (SVD880) EtherCAT, Outside speed input (SVD810)	
		Zero speed clamp	Zero-clamp input according to speed	
		Instantaneous velocity observer	Available	
		Speed command filter	Available	
	Torque Control	BUS input	EtherCAT, MECHATROLINK III (SVD880) EtherCAT, Outside torque input (SVD810)	
Common	Protective function	Hardware error	Overvoltage, undervoltage, overspeed, overload, overheating, overcurrent, encoder failure, etc.	
		Hardware error	Excessive position deviation, command pulse frequency division, EEPROM failure, etc.	
	Alarm data tracking function		Alarm data history can be referred to	

Servo Drive — Control circuit connection diagram



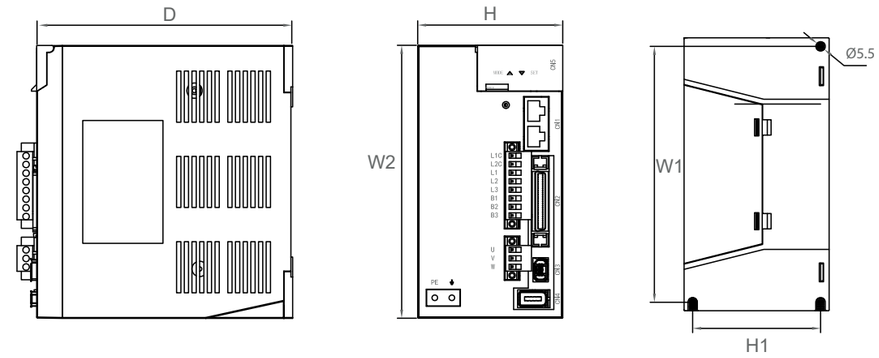
Function definition of each pin of 15-core terminal				
Pin.	Code	Description	Function	
1	DI1	Digital Input 1	Digital Signal Input	
2	DI2	Digital Input 2		
3	Reserved			
4	Reserved			
5	XC	Input common DI		
6	DO1+	Digital Output 1(bake) Output "+"	Open Control magnetic brake	
7	DO1−	Digital Output 1(bake) Output "-"		
8	DO2+	Digital Output 2 Output "+"	Digital signal output	
9	DO2−	Digital Output 2 Output "-"		
10	+24V	24V Power	Exter. output 24V	
11~14			Reserved	
15	COM	0V Power	Exter. output 0V	

Dimensions of Servo Drive



SVD880-0R2
SVD880-0R4
SVD880-0R7
SVD880-1R0

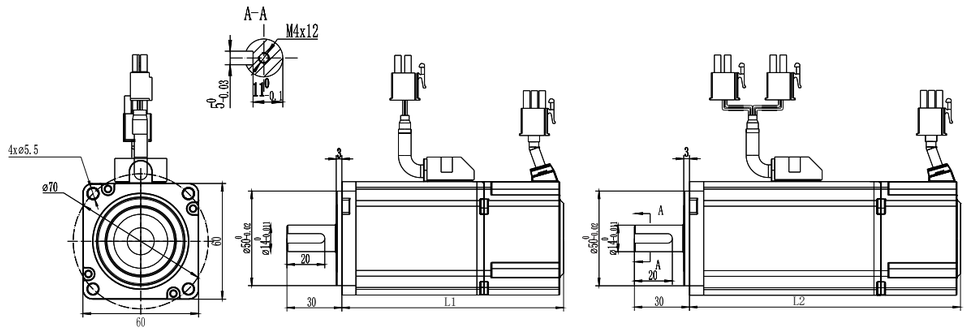
(200w, 400w, 750w, 1 kW)



1.5kW~11kW Dimension, mm		
Dimension \ Model	SVD880-1R5 to SVD880-3R0	SVD880-4R0 to SVD880-11
D	150	180
H	85	90
H1	75	55
W1	150	202
W2	160	210

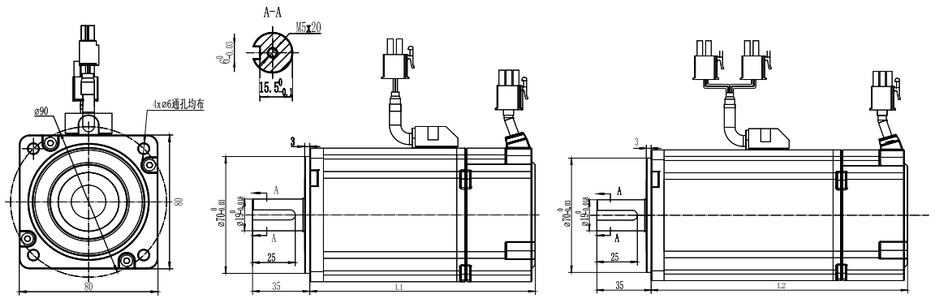
ZD M1

Servo Motor — Mounting Dimension of M1 series



60 Frame (ZD M1)

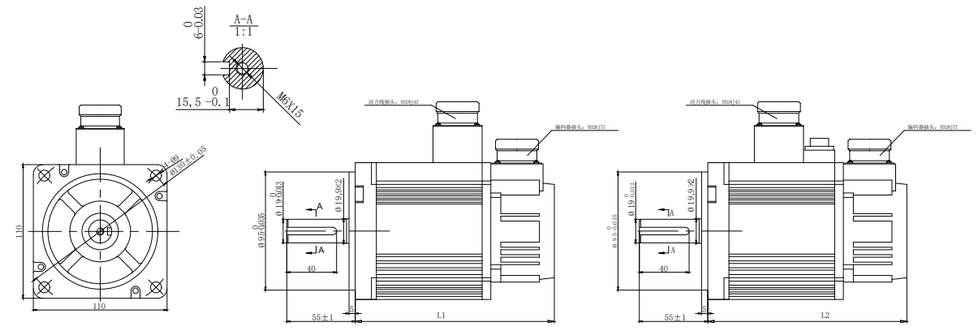
Voltage, V	220		
Rated Power, kW	0.2	0.4	0.6
Rated Torque, N.m	0.64	1.27	1.9
Shaft Size, mm	Ø14	Ø14	Ø8
Motor Length without Brake, L1, mm	93	109	128
Motor Length with Brake, L2, mm	125.5	141.5	160.5



80 Frame (ZD M1)

Voltage, V	220	
Rated Power, kW	0.75	1.0
Rated Torque, N.m	2.39	3.18
Shaft Size, mm	Ø19	Ø19
Motor Length without Brake, L1, mm	120	134
Motor Length with Brake, L2, mm	155	169

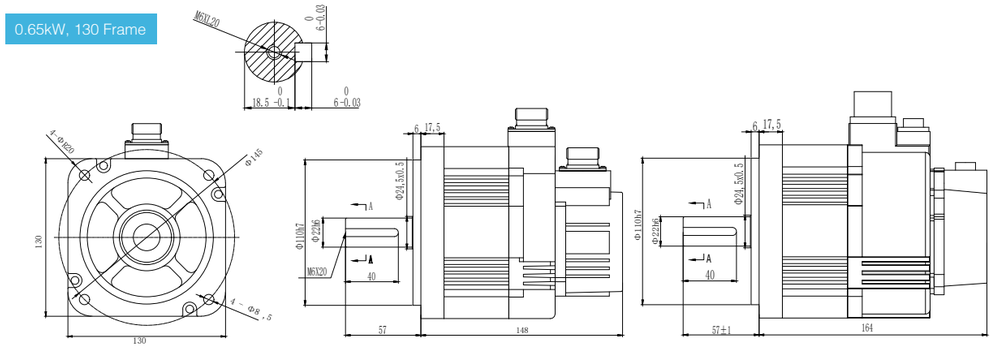
Dimesions of Servo Motor



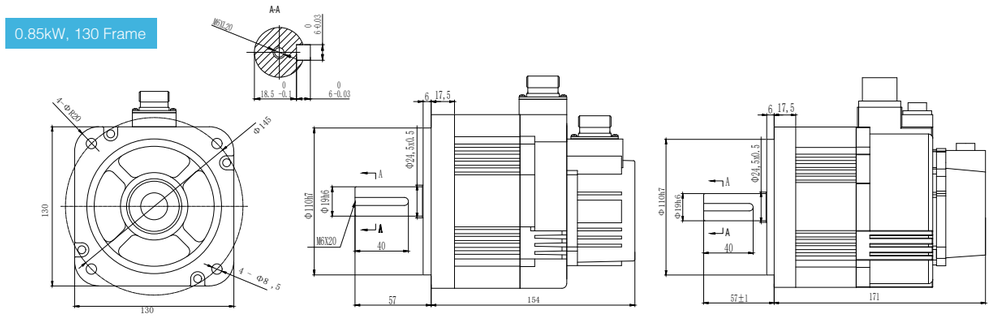
110 Frame (ZD M1)

Voltage, V	220	
Rated Power, kW	1.3	1.7
Rated Torque, N.m	4.2	5.4
Shaft Size, mm	Ø19	Ø19
Motor Length without Brake, L1, mm	160	170
Motor Length with Brake, L2, mm	191	201

0.65kW, 130 Frame

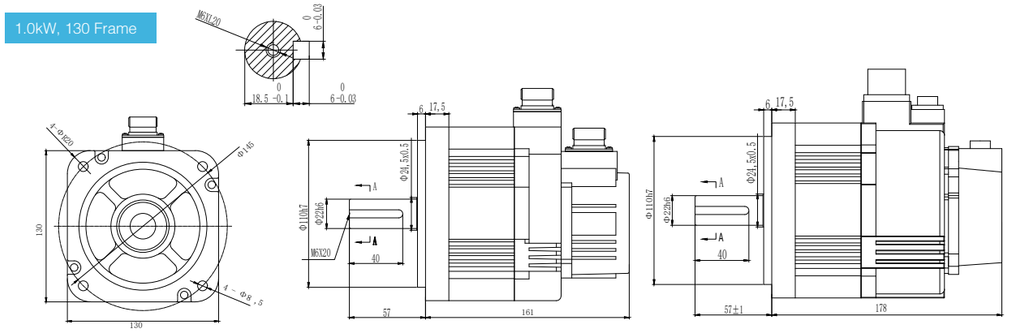


0.85kW, 130 Frame

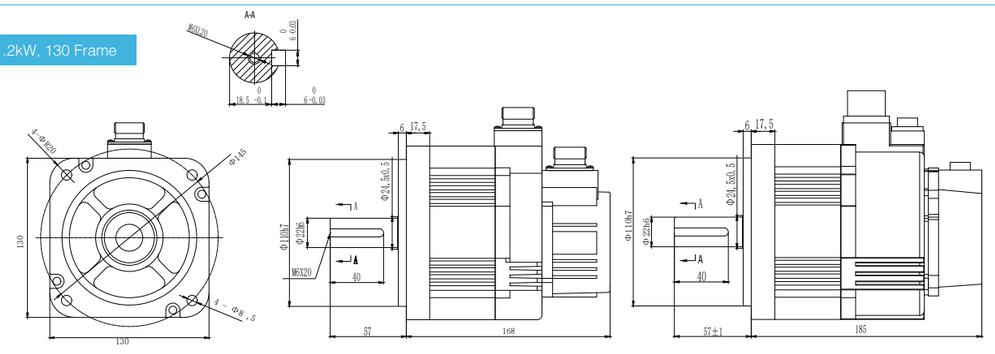


Servo Motor — Mounting Dimension of M1 series

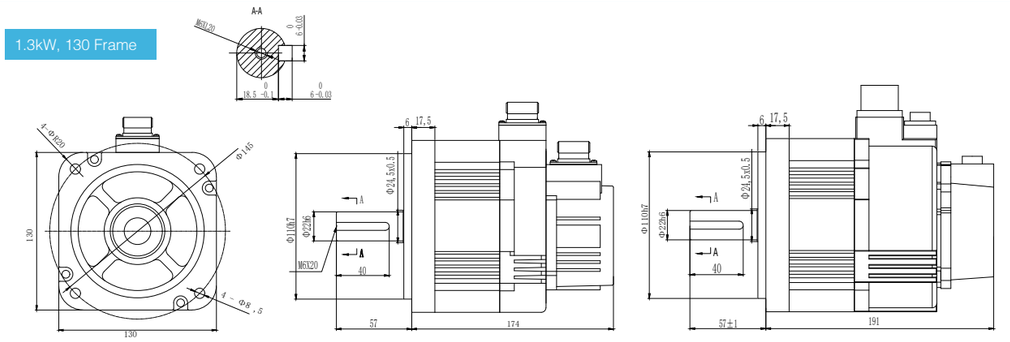
1.0kW, 130 Frame



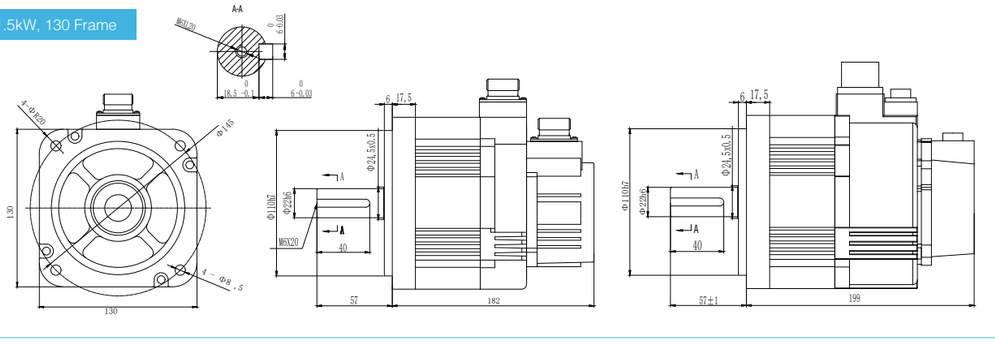
1.2kW, 130 Frame



1.3kW, 130 Frame

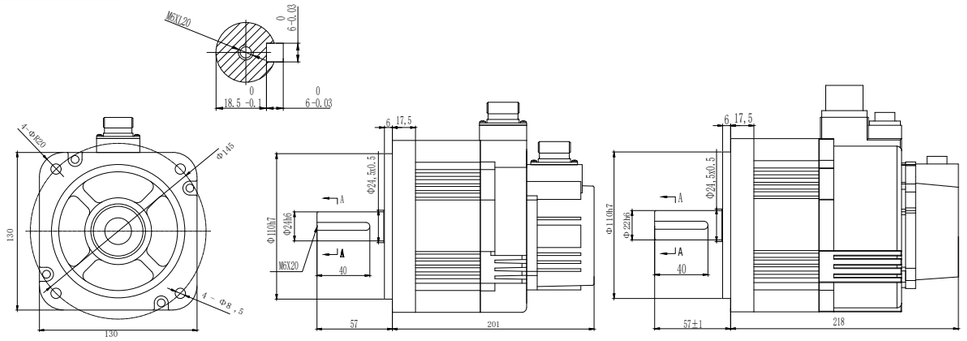


1.5kW, 130 Frame

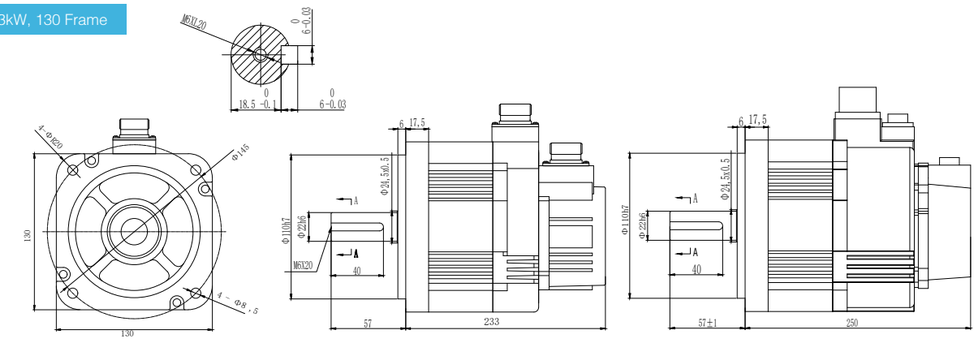


Dimesions of Servo Motor

1.8kW, 130 Frame



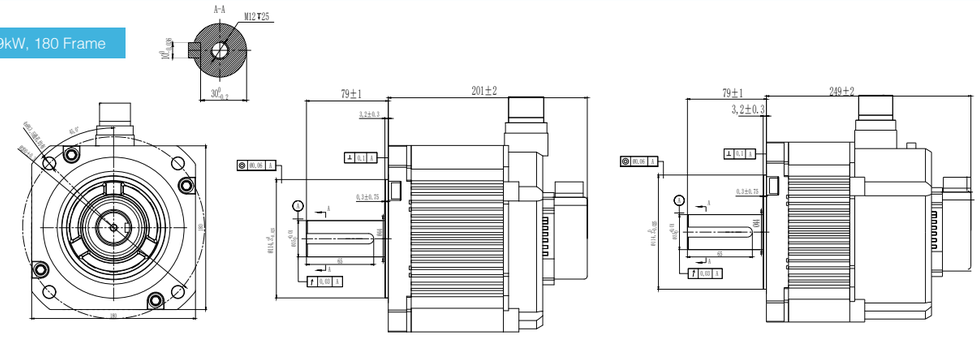
2.3kW, 130 Frame



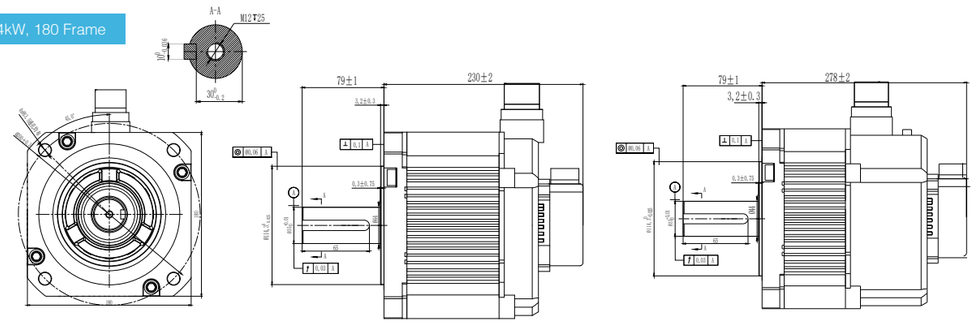
130 Frame (ZD M1)								
Voltage, V	220							
Rated Power, kW	0.65	0.85	1.0	1.2	1.3	1.5	1.8	2.3
Rated Torque, N.m	4.2	5.4	6.4	7.5	8.3	9.6	11.5	14.6
Shaft Size, mm	Ø22	Ø19	Ø22	Ø22	Ø22	Ø22	Ø24	Ø22
Motor Length without Brake, L1, mm	148	154	161	168	174	182	201	233
Motor Length with Brake, L2, mm	164	171	178	185	191	199	218	250

Servo Motor — Mounting Dimension of M1 series

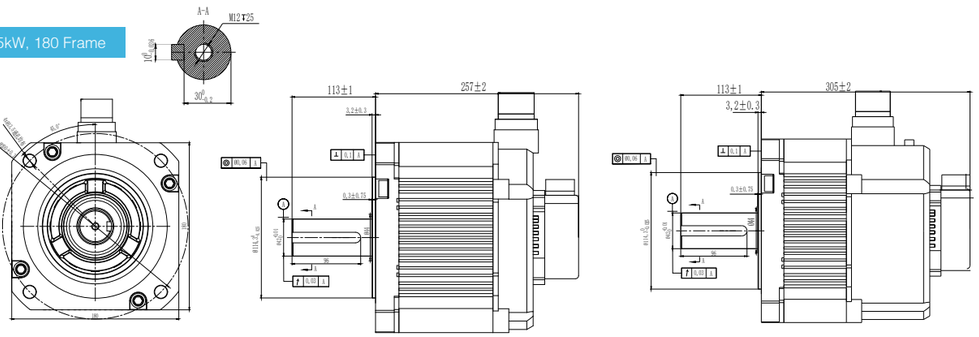
2.9kW, 180 Frame



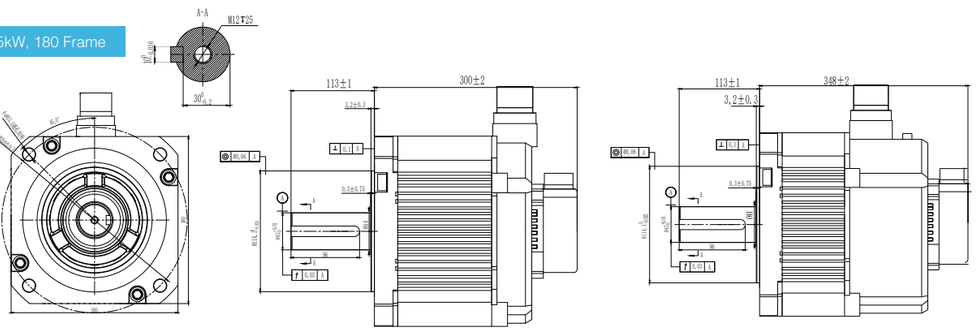
4.4kW, 180 Frame



5.5kW, 180 Frame

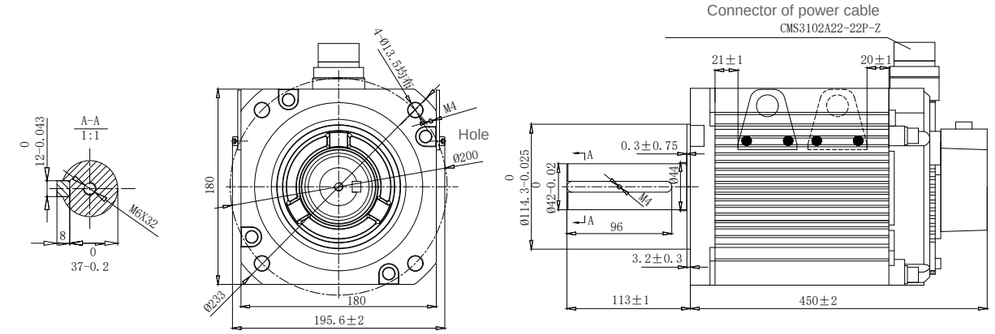


7.5kW, 180 Frame

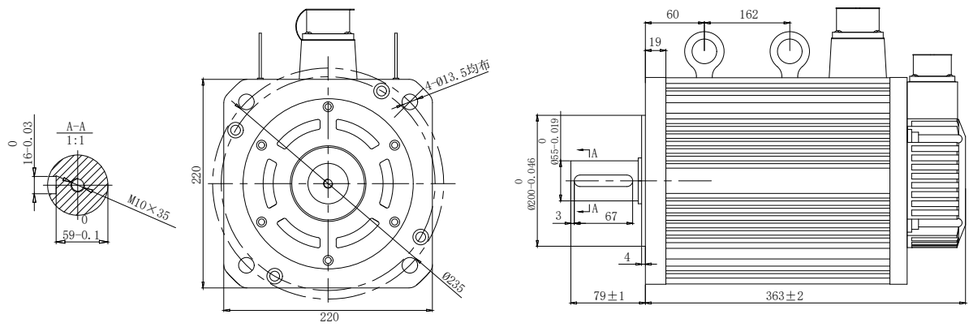


Dimesions of Servo Motor

13kW, 180 Frame



15kW, 180 Frame



180 Frame (ZD M1)						
Voltage, V	220				380	
Rated Power, kW	2.9	4.4	5.5	7.5	13	15
Rated Torque, N.m	18.6	28.4	35	48	83	95.5
Shaft Size, mm	Ø35	Ø35	Ø42	Ø42	Ø42	Ø55
Motor Length without Brake, L1, mm	201	230	257	300	450	363
Motor Length with Brake, L2, mm	249	278	305	348		

Servo Motor — ZD M1 with 5 poles series Specification

Model of motor	ZD M1-060 □L00630–5 □P	ZD M1-060 □L01330–5□P	ZD M1-080 □L02430–5□P	ZD M1-080 □L03230–5 □P	ZD M1-110 □L04230–5 □P
Model of drive	SVD880-0R2□0□	SVD880-0R4□0□	SVD880-0R7□0□	SVD880-1R0□0□	SVD880-1R5□0□
Frame, mm	60	60	80	80	110
Voltage	220	220	220	220	220
Rated power, kW	0.2	0.4	0.75	1.0	1.3
Rated torque, Nm	0.64	1.27	2.39	3.18	4.2
Max. torque, Nm	2.23	4.46	8.36	11.1	12.6
Rated speed, min	3000	3000	3000	3000	3000
Max. speed, min	6000	6000	6000	4500	3000
inertia (kg・cm^2)	0.26	0.55	1.71	2.17	7.78
Rated current, A	1.9	2.3	4.2	6.5	4.5
Encoder	Absolute type (K: 23 bit, 8388608; N:24 bit, 1677216)				

Model of motor	ZD M1-110 □L06430–5 □P	ZD M1-130 □L04215–5□P	ZD M1-130 □L05415–5□P	ZD M1-130 □L08415–5 □P	ZD M1-130 □L11515–5 □P
Model of drive	SVD880-1R5□0□	SVD880-1R5□0□	SVD880-1R5□0□	SVD880-1R5□0□	SVD880-1R5□0□
Frame, mm	110	130	130	130	130
Voltage	220	220	220	220	220
Rated power, kW	1.7	0.65	0.85	1.0	1.2
Rated torque, Nm	6.4	4.2	5.4	6.4	7.5
Max. torque, Nm	18	12.6	16.2	19.2	22.5
Rated speed, min	3000	1500	1500	1500	1500
Max. speed, min	3000	3000	3000	3000	3000
Inertia (kg・cm^2)	10.6	11.63	13.88	16.04	18.57
Rated current, A	6.5	5.0	6.5	8.0	9.0
Encoder	Absolute type (K: 23 bit, 8388608; N:24 bit, 1677216)				

Servo Motor — ZD M1 with 5 poles series Specification

Model of motor	ZD M1-130 □L08315–5 □P	ZD M1-130 □L09615–5□P	ZD M1-130 □L11515–5□P	ZD M1-130 □L14615–5 □P	ZD M1-180 □L18615–5 □P
Model of drive	SVD880-1R5□0□	SVD880-3R0□0□	SVD880-3R0□0□	SVD880-3R0□0□	SVD880-4R0□0□
Frame, mm	130	130	130	130	180
Voltage	220	220	220	220	220 380
Rated current, A	9.5	10	14	16	18 11.8
Rated power, kW	1.3	1.5	1.8	2.3	2.9
Rated torque, Nm	8.4	9.6	11.5	14.6	18.6
Max. torque, Nm	25.2	28.8	34.5	43.8	55.8
Rated speed, min	1500	1500	1500	1500	1500
Max. speed, min	3000	3000	3000	3000	3000
Inertia (kg・cm^2)	20.59	23.69	30.15	40.7	56.8
Encoder	Absolute type (K: 23 bit, 8388608; N:24 bit, 1677216)				

Model of motor	ZD M1-180 □□28415–5 □P	ZD M1-180 □□35015–5□P	ZD M1-180 □□48015–5□P	ZD M1-180 □□83015–5 □P	ZD M1-220 □□95015–5 □P
Model of drive	SVD880-5R0□0□	SVD880-5R5□0□	SVD880-11□0□	SVD880-11□0□	SVD810-15□0□
Frame, mm	180	180	180	180	180
Voltage	220 380	220 380	220 380	380	380
Rated current, A	29 15.7	34.5 20.6	48.5 25.7	26.5	40
Rated power, kW	4.4	5.5	7.5	13	15
Rated torque, Nm	28.4	35	48	83	95.5
Max. torque, Nm	85	87.5	115	208	240
Rated speed, min	1500	1500	1500	1500	1500
Max. speed, min	3000	3000	3000	2000	2000
Inertia (kg・cm^2)	78.2	109	130	272	248
Encoder	Absolute type (K: 23 bit, 8388608; N:24 bit, 1677216)				

Encoder Cable

9-core waterproof, ZD M1- 60/80 motor (absolute,Green)				10-core aviation plug 130, 180(Absolute type)			
Encoder wire	ZC M880-X-BM-☐M			Encoder wire	ZC M880--Z/D-BM-☐M		
Motor side	Signal	Drive side	Cable color	Motor side	Signal	Drive side	Cable color
1	SD+	1	Red	10	PE	Shielded layer	Shielded wire
2	SD–	2	Red,white	2	Vcc	4	Blue, black
3	VB+	Battery +	Back, white	3	GND	3	Blue
4	–	–		4	VB+	Battery +	Black, white
5	–	–		5	VB–	Battery -	Black
6	Vcc	4	Blue, black	6	SD+	1	Red
7	GND	3	Blue	7	SD–	2	Red, white
8	VB–	Battery -	Black				
9	PE	Shielded layer	Shielded wire				

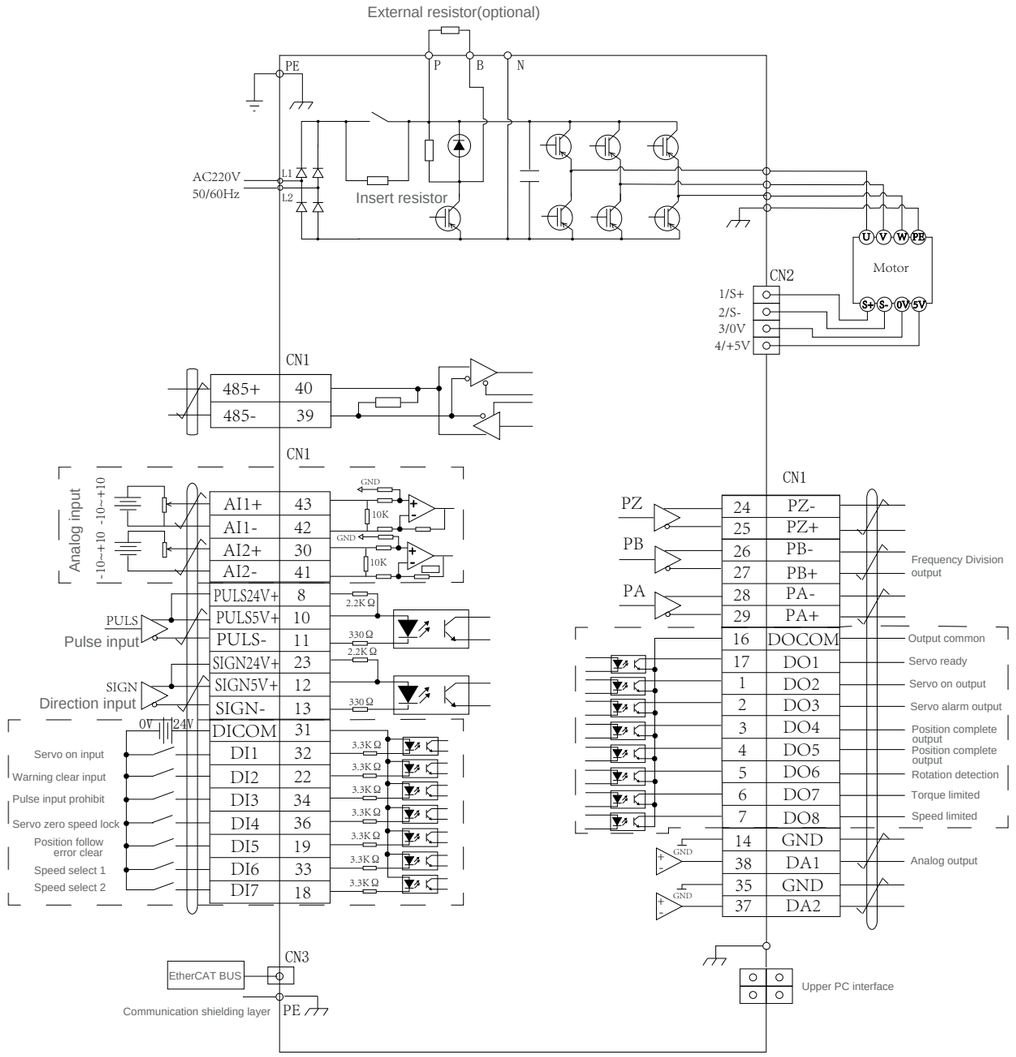
Power Cable

6-core waterproof, ZD M1-60/80 Motor, orange color			4-core interface Mil-spec plug, 130/180 motors		
Cable witthout brake	ZC M880-X-DL-☐M		Cable without brake	ZC M880--Z/D-DL-☐M	
Cable with brake	ZC M880-X-DL-SC-☐M		Cable with brake	ZC M880-Z/D-SC-☐M	
Terminal	Signal	Cable color	Terminal	Signal	Cable color
1	U		A	U	
2	V		B	V	
3	W		C	W	
4	PE		D	PE	
Electromagnetic brake			Electromagnetic brake		
5	24V		1	24V	
6	0V		2	0V	

Remark: The shielded wire of the Tamagawa encoder should be connected with the gray wire.

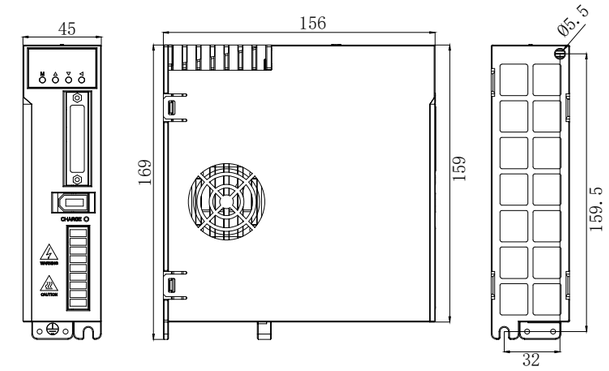
SVD810
SERVO DRIVE

Control circuit connection diagram

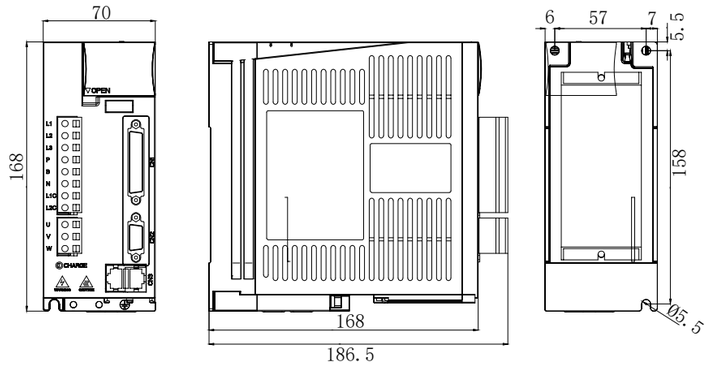


Specification of SVD 810

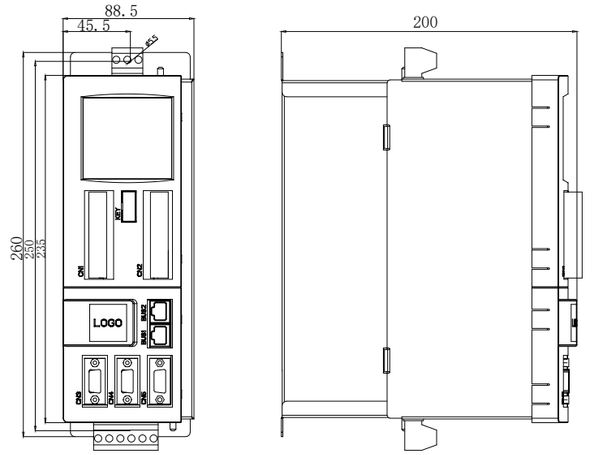
0.2 to 1.0 kW



1.5 to 3.0 kW

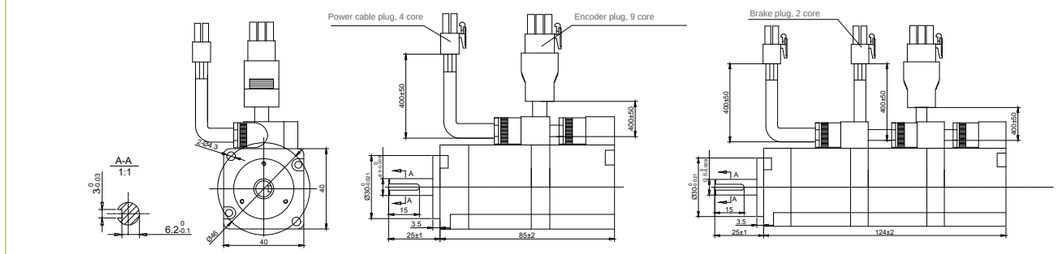


4.5 to 15.0 kW



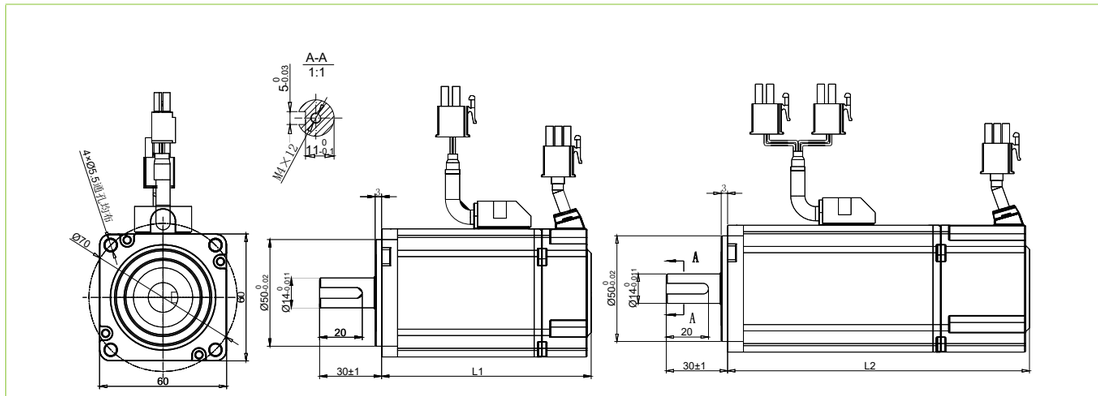
Servo Motor

Mounting Dimension of UD M1 / M2 series



60 Frame (UD M1 / UD M2)

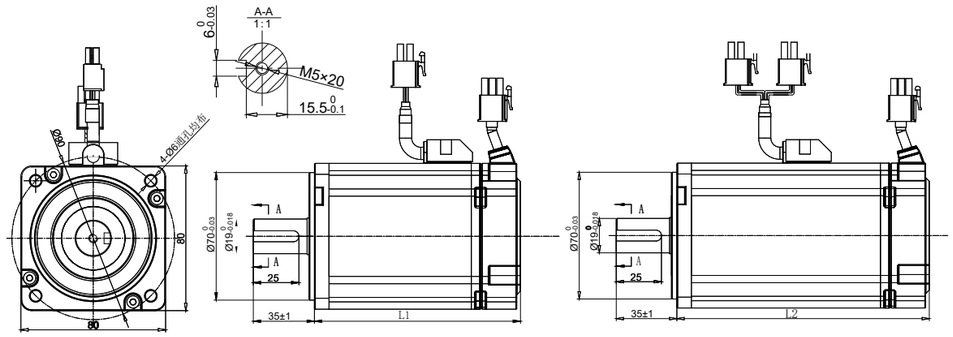
220V		
Rated Power, kW	0.1	
Rated Torque, N.m	0.32	
Shaft Size, mm	Ø8	
Motor Length without Brake, L1, mm	85	
Motor Length with Brake, L2, mm	124	



60 Frame (UD M1 / UD M2)

220V		
Rated Power, kW	0.2	0.4
Rated Torque, N.m	0.64	1.27
Shaft Size, mm	Ø14	Ø14
Motor Length without Brake, L1, mm	74	92
Motor Length with Brake, L2, mm	106	125

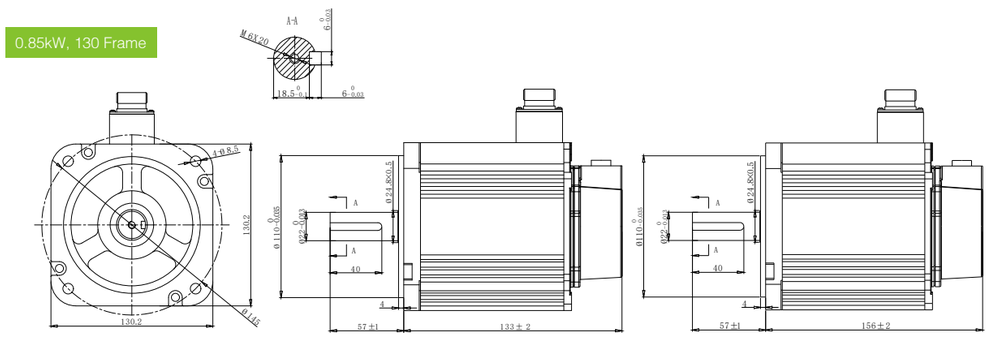
Dimesions of Servo Motor



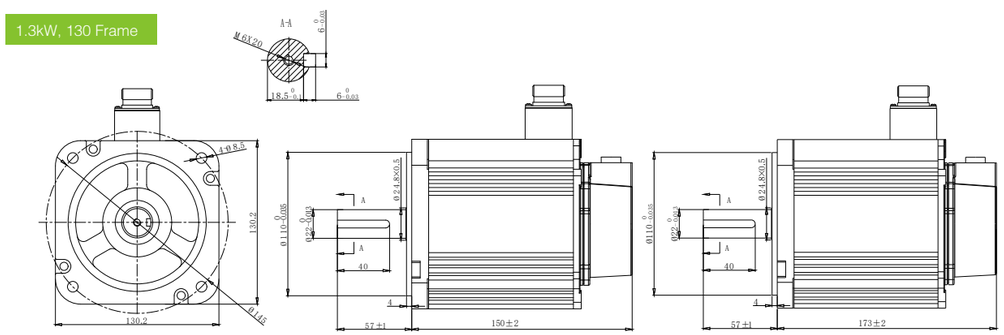
80 Frame (UD M1 / UD M2)

220V		
Rated Power, kW	0.75	1.0
Rated Torque, N.m	2.39	3.2
Shaft Size, mm	Ø19	Ø19
Motor Length without Brake, L1, mm	101	134
Motor Length with Brake, L2, mm	135	168

0.85kW, 130 Frame

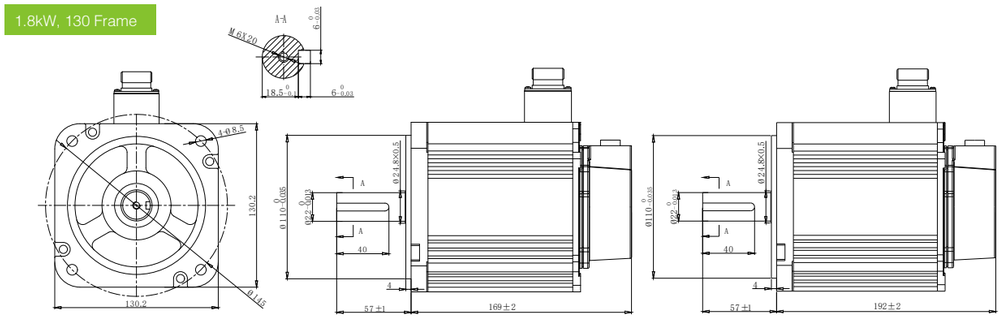


1.3kW, 130 Frame

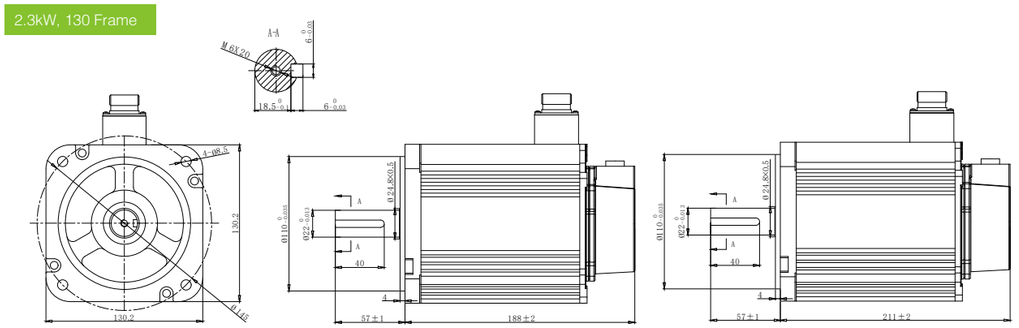


Dimesions of Servo Motor

1.8kW, 130 Frame



2.3kW, 130 Frame



130 Frame (UD M1 / UD M2)				
	220V		380V	
Rated Power, kW	0.85	1.3	1.8	2.3
Rated Torque, N.m	5.4	8.34	11.5	14.6
Shaft Size, mm	Ø22	Ø22	Ø22	Ø22
Motor Length without Brake, L1, mm	133	150	169	188
Motor Length with Brake, L2, mm	156	173	192	211

UD M1 / 2 with 5 poles series Specification

Model of motor	UD M□-040 □L00330–4 □P	UD M□-060 □L006430–5□P	UD M□-060 □L01330–5□P	UD M□-080 □L02430–5 □P	UD M□-080 □L03230–5 □P
Model of drive	SVD810-0R2□0□	SVD810-0R2□0□	SVD810-0R4□0□	SVD810-0R7□0□	SVD810-1R0□0□
Frame, mm	40	60	60	80	80
Voltage	220	220	220	220	220
Rated power, kW	0.1	0.2	0.4	0.75	1.0
Rated torque, Nm	0.3	0.64	1.27	2.39	3.2
Max. torque, Nm	1.1	1.91	3.81	8.36	9.6
Rated speed, min	3000	3000	3000	3000	3000
Max. speed, min	5000	6000	6000	6000	6000
inertia (kg・cm^2)	0.66	0.26	0.49	1.51	2.01
Rated current, A	1.8	1.5	2.5	4.8	6.8
Encoder	Incremental F: 2500 line; Absolute C: 17 bit, 131072; Absolute K: 23 bit, 8388608				

Model of motor	UD M□-130 □L05415–5 □P	UD M□-130 □□08315–5□P		UD M□-130 □□11515–5□P		UD M□-130 □□14615–5□P	
Model of drive	SVD810-1R5□0□	SVD810-2R0□0□		SVD810-3R0□0□		SVD810-4R0□0□	
Frame, mm	130	130		130		130	
Rated power, kW	0.85	1.3		1.8		2.3	
Rated torque, Nm	5.4	8.4		11.5		14.5	
Max. torque, Nm	16.2	25.2		34.5		43.8	
Rated speed, min	1500	1500		1500		1500	
Max. speed, min	3000	3000		3000		3000	
inertia (kg・cm^2)	11.6	20.59		30.15		40.7	
Rated voltage,V	220V	220V	380V	220V	380V	220V	380V
Rated current, A	5.6	9.5	5.2	14	6.8	16	9
Encoder	Incremental F: 2500 line; Absolute C: 17 bit, 131072; Absolute K: 23 bit, 8388608						

Encoder Cable

UD M1 / M2 - 60/80 motor, absolute				10-core aviation plug 130, 180(Absolute type)			
Encoder wire	US M810-X-BM-☐M			Encoder wire	US M810--Z/D-BM-☐M		
Motor side	Signal	Drive side	Cable color	Motor side	Signal	Drive side	Cable color
1	PE	Shielded layer	Shielded wire	10	PE	Shielded layer	Shielded wire
2	Vcc	4	Blue, black	2	Vcc	4	Blue, black
3	GND	3	Blue	3	GND	3	Blue
4	VB+	Battery +	Black, white	4	VB+	Battery +	Black, white
5	VB–	Battery -	Black	5	VB–	Battery -	Black
6	SD+	1	Red	6	SD+	1	Red
7	SD–	2	Red, white	7	SD–	2	Red, white
8							
9							

Power Cable

UD M1 / M2 -60/80 Motor			4-core interface Mil-spec plug, 130/180 motors		
Cable witthout brake	ZC M810-X-DL-☐M		Cable without brake	ZC M810--Z/D-DL-☐M	
Cable with brake	ZC M810-XDL-SC-☐M		Cable with brake	ZC M810-Z/D-SC-☐M	
Terminal	Signal	Cable color	Terminal	Signal	Cable color
1	U		A	U	
2	V		B	V	
3	W		C	W	
4	PE		D	PE	
Electromagnetic brake			Electromagnetic brake		
5	24V		1	24V	
6	0V		2	0V	

Remark: The shielded wire of the Tamagawa encoder should be connected with the gray wire.

NIETZ

OPTIMIZE MOTOR CONTROL

NIETZ ELECTRIC CO,.LTD

No.988, Fulian Rd. Gucun Industry, Baoshan District. Shanghai, China

Tel/Fax: +86 21 336 346 49
E-mail: info@nietz.cn
Website: www.nietz.cn

DISTRIBUTORS