

VEICHI

SD700 Series High Performance Servo System



VEICHI

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Creative Technology, Service Leading!



Shenzhen Veichi Electric Co., Ltd. is a high-tech enterprise that is professionally engaged in the development, manufacturing and marketing of industrial automation control products, and committed to becoming a global leading provider of industrial automation control products and system solutions.

The company owns powerful R&D team, relatively perfect production system, independent intellectual property and manufacturing bases in Shenzhen and Suzhou. To improve our R&D strength, we keep on introducing advanced overseas technology and broadening our partnerships with first-class universities and research institutions.

The main products of Veichi Electric include a variety of Variable Frequency Drive (VFD), Servo Drive System, Photovoltaic Inverter, PLC, HMI, Automation Equipment, etc, which are widely used in industries such as oil & gas, chemical industry, ceramic, crane & hoist, metallurgy, electrical cable and wire, plastic, print and package, textile, metal work and cable, coal mining and municipal engineering. Suitable solutions and products are always ready to meet the demands and improve comprehensive competitiveness of users.

With the spirit of "Innovation is the lifeblood of Veichi", we're committed to becoming one of the leading providers of electric drives, industrial control and green energy products. Veichi has set up more than 40 branch offices in China and dozens of partners in Asia, Europe and Africa. Veichi has been named Chinese Electric Industry's Top Ten National Brands, Chinese Electric Industry Top Ten Satisfying Brands and Top Ten National Brands of Inverter Industry. Veichi products have become the first choice of many enterprises.

SD700 Series
High Performance Servo System

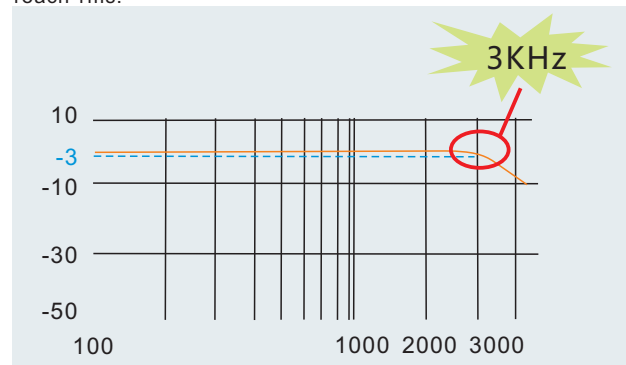
- Latest software algorithm design
- Latest hardware platform design
- Latest structure appearance design



Product features

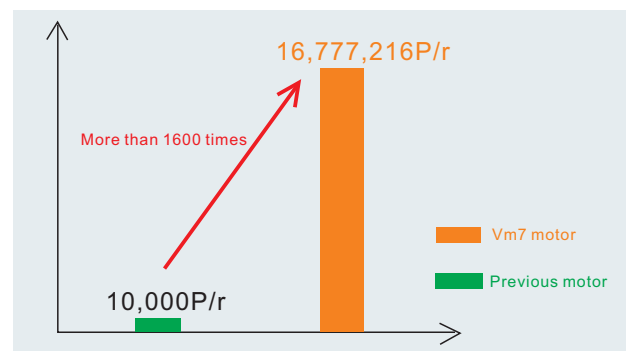
3KHz speed loop response bandwidth

The unique current algorithm can effectively improve the speed loop bandwidth which can greatly reduce the adjusting time and improve production efficiency. The fastest adjusting time can reach 1ms.



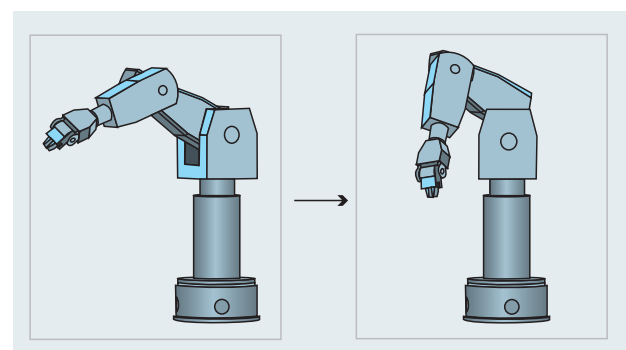
24-bit absolute encoder

Use the industrial top level 24-bit absolute encoder which single loop is up to 16,777,216 pulses and communication speed is up to 4Mbps. It can achieve more accurate positioning, more stability at low speed and no loss under power failure.



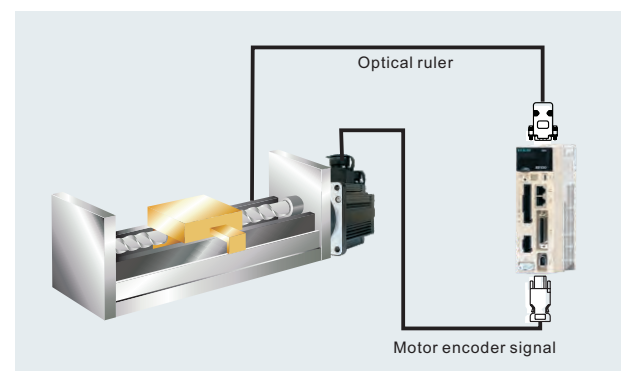
Robust control

Adopt latest control theory algorithm to achieve load rotating inertia within 30 times (even load changes during processing). It can ensure stable operation without parameter adjustment and can be used after installation.



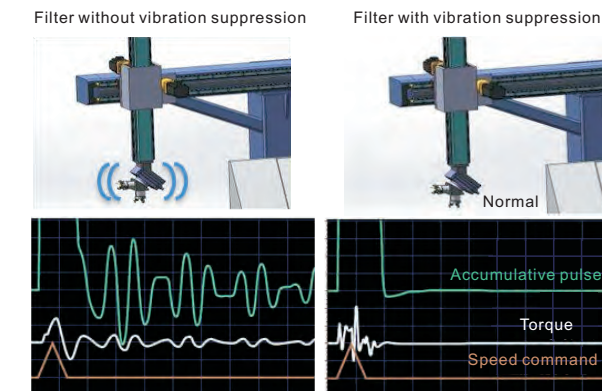
Support full closed loop mode

The full closed loop mode supports external second encoder or grating ruler to reduce mechanical transmission gaps and increase the actual positioning accuracy.



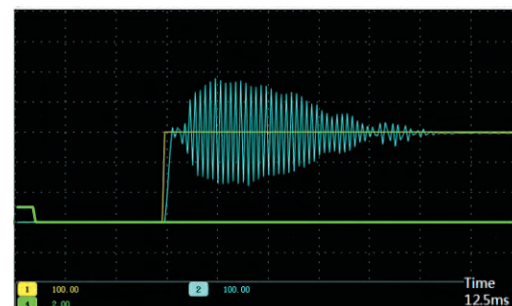
Low frequency vibration suppression function

The vibration filter can be set manually or automatically via the upper machine softwares to effectively eliminate the inherent vibration frequency, greatly reduce the stop axis jitter (sloshing) and effectively suppress vibration in 0~100Hz frequency.



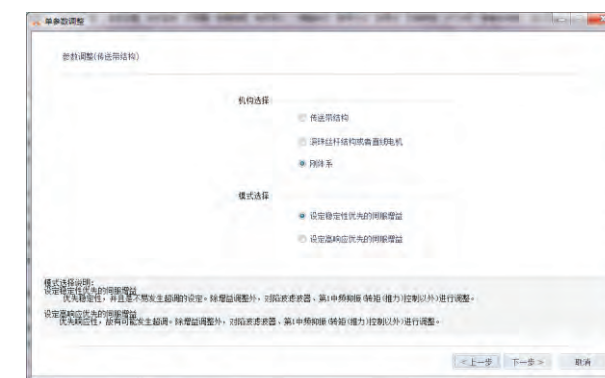
Auto set notch filter

There is no need to do complex vibration frequency measurement and analysis. The notch filter is quickly searched and automatically set through the single parameter adjustment function of the upper machine. It features easy to use, and the shortest time is within 70ms. It can greatly reduce the noise and vibration due to the equipment mechanical resonance so as to achieve more rapid response operation.



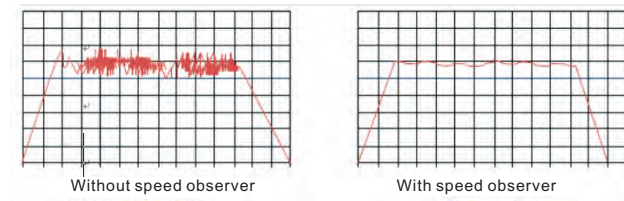
Intelligent setting

Automatic gain adjustment, guided setting mode, and sequential setting can complete servo gain settings, which is easy to use. It also provides more adjustment modes, which can be adjusted according to different mechanical structure and technological characteristics, so that the machine can reach the optimum state.



Speed observer

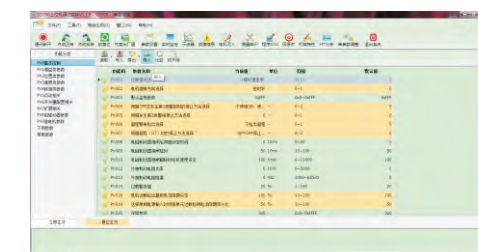
It can effectively eliminate noise feedback from low resolution encoder and improve speed loop response bandwidth.



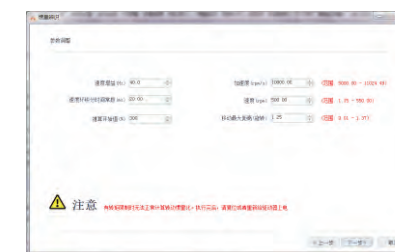
Powerful PC software

Free of installing debugging softwares.

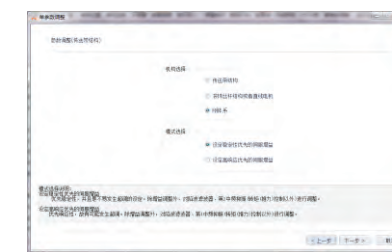
The USB communication between the drive and computer is simple and easy to use.



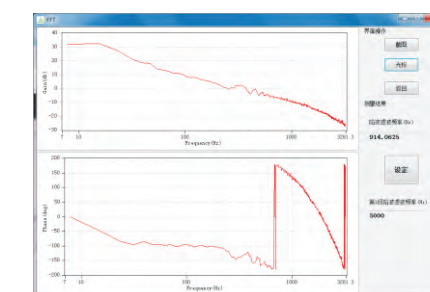
Batch parameter reading and writing



Inertia identification



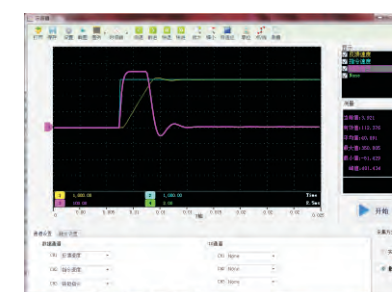
Guide PID parameters according to different mechanical structures



Mechanical characteristics analysis, automatic resonance suppression



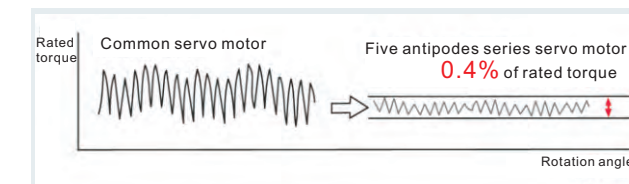
Internal position loop program JOB facilitates easy debugging



The online oscilloscope can monitor in real-time (125us) with multi-channels

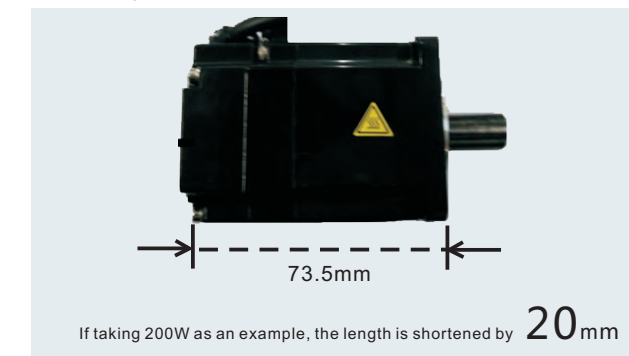
Greatly reduce motor ripple torque and stably operate at low speed

10 stages rotor and 12 slots stator are adopted. The unique magnetic circuit design can effectively suppress slot effect and greatly reduce ripple torque to ensure constant motor speed and stable operation at low speed.



Motor miniaturization and high dynamic performance

Adopt the latest manufacturing techniques to optimize magnetic circuit design and reduce magnetic loss, achieving motor high dynamic response performances; Besides, the motor volume is reduced by 20%.



Model explanation

SD: servo product code

700: rotary servo motor series
710: linear servo motor series

Rated Current

SD 700 - 3R3 A - P A *

Product management number
Standard product defaults

Encoder type
A: absolute type
B: incremental type
T: rotary transformer type

Drive type
P: pulse type
S: standard type
C:CanOpen bus type
E:EtherCat bus type
M: MECHATROLINK-II bus type
L:MECHATROLINK-III bus type

(A) 220VAC

(D) 400VAC

1R1	1.1A	7R6	7.6A	2R5	2.5A	110	1A
1R8	1.8A	9R5	9.5A	3R8	3.8A	170	17A
3R3	3.3A	160	16A	6R0	6.0A	240	24A
5R5	5.5A	180	18A	8R4	8.4A	300	30A

Rated voltage

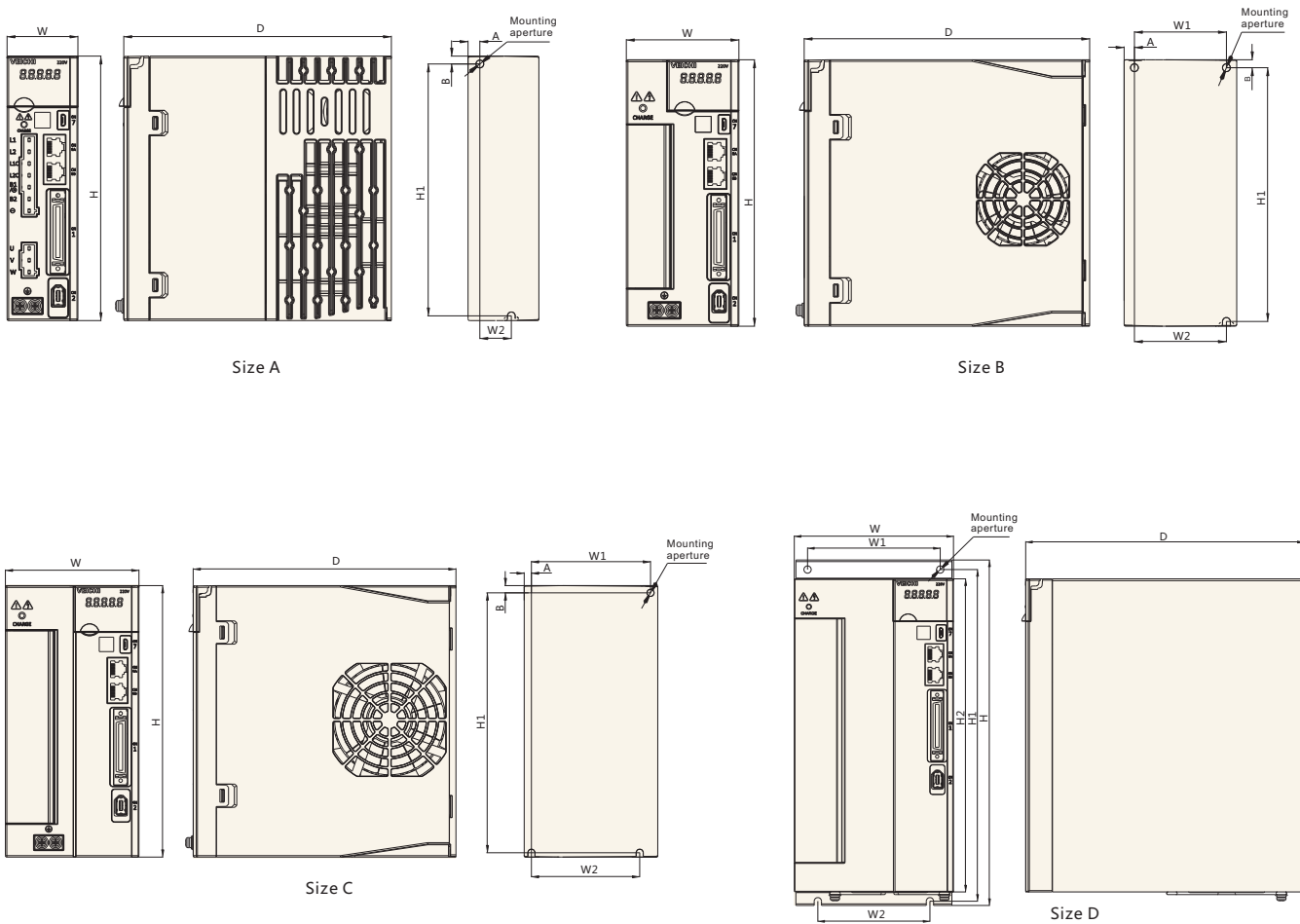
A : 220VAC
D : 400VAC

Code	Model	Pulse Input	16-bit analog	full closed loop	RS485	CANopen	PROFIBUS-DP	EtherCAT	MECHATRO LINK II	MECHATRO LINK III
P	Pulse type	√	×	×	√	×	×	×	×	×
S	Standard type	√	√	√	√	√	×	×	×	×
C	CANopen type	√	×	×	×	√	×	×	×	×
E	EtherCAT type	×	×	√	×	×	×	√	×	×
M	MECHATROLINK II type	×	×	√	×	×	×	×	√	×
L	MECHATROLINK III type	×	×	√	×	×	×	×	×	√

Drive power and chassis Division

Model	Input	Output			Chassis size
		Rated current (A)	Instant current (A)	Power (kW)	
SD700-1R1A	单相220	1.1	3.9	100	A
SD700-1R8A	单相220	1.8	6.3	200	
SD700-3R3A	单相220	3.3	11.6	400	
SD700-5R5A	单相/三相220	5.5	16.5	750	B
SD700-7R6A	单相/三相220	7.6	22.8	1000	
SD700-9R5A	三相220	9.5	23.8	1500	
SD700-160A	三相220	16.0	40.0	2000	C
SD700-2R5D	三相400	2.5	7.5	750	B
SD700-3R8D	三相400	3.8	11.4	1000	
SD700-6R0D	三相400	6.0	18.0	1500	
SD700-8R4D	三相400	8.4	25.2	2000	C
SD700-110D	三相400	11.0	27.5	3000	
SD700-170D	三相400	17.0	42.5	4400	
SD700-240D	三相400	24.0	60.0	5500	D
SD700-300D	三相400	30.0	70.0	7500	

Drive appearance and installation size



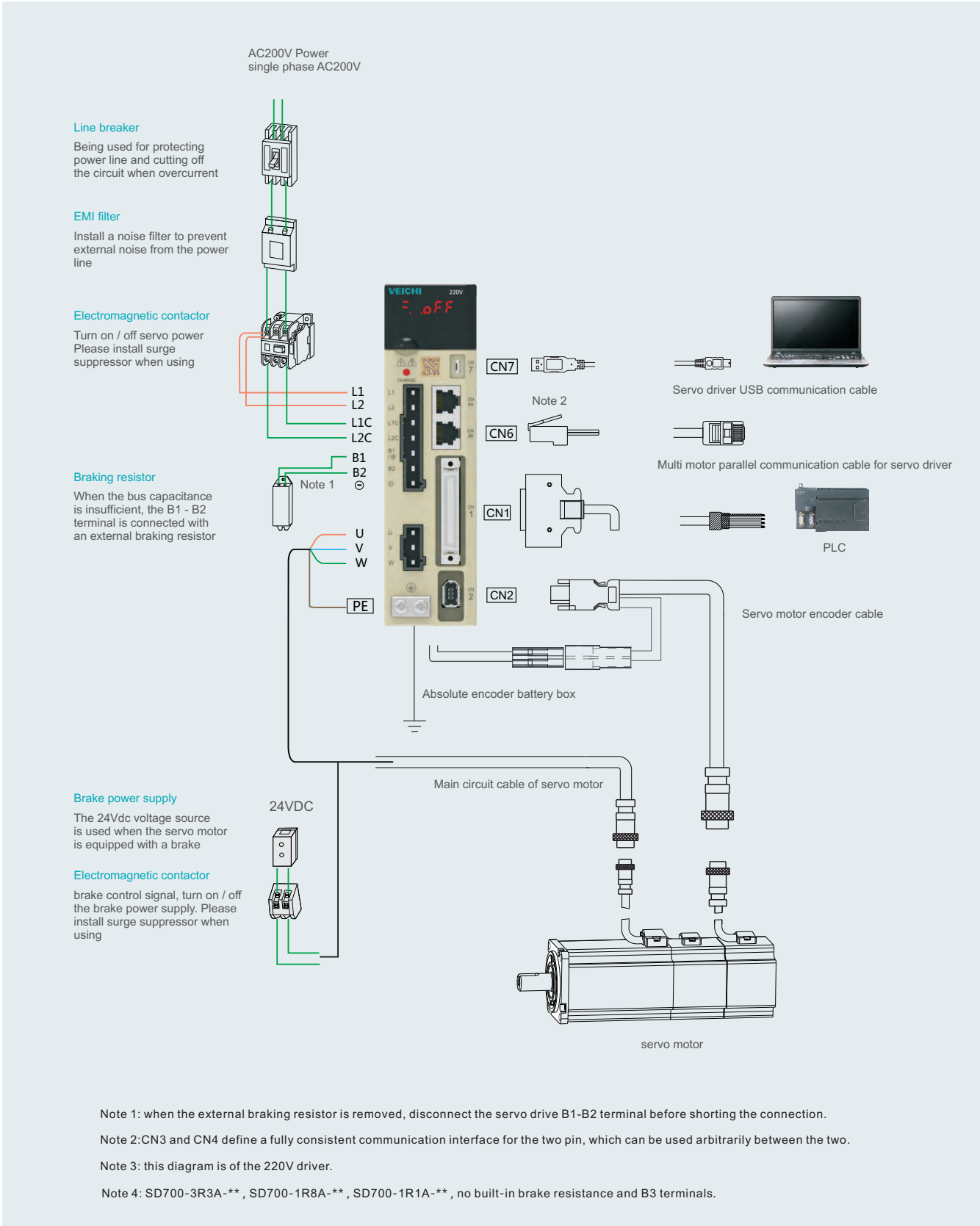
Chassis size	Model	Overall size (mm)			Installation size(mm)						Mounting aperture
		W	H	D	W1	W2	H1	H2	A	B	
A	SD700-1R1A-**	45	168	170	\	20	160	\	7.5	5	2-M4
	SD700-1R8A-**										
	SD700-3R3A-**										
B	SD700-5R5A-**	71	168	180	58	58	160	\	6.5	5	3-M4
	SD700-7R6A-**										
	SD700-9R5A-**										
	SD700-2R5D-**										
C	SD700-3R8D-**	92.5	188	182	82.5	75	180	\	5	5	3-M4
	SD700-160A-**										
	SD700-6R0D-**										
	SD700-8R4D-**										
D	SD700-110D-**	120	260	210	100	84.5	250	236	\	\	4-M5
	SD700-170D-**										
	SD700-240D-**										
	SD700-300D-**										

Drive specifications (50W~7.5kW)

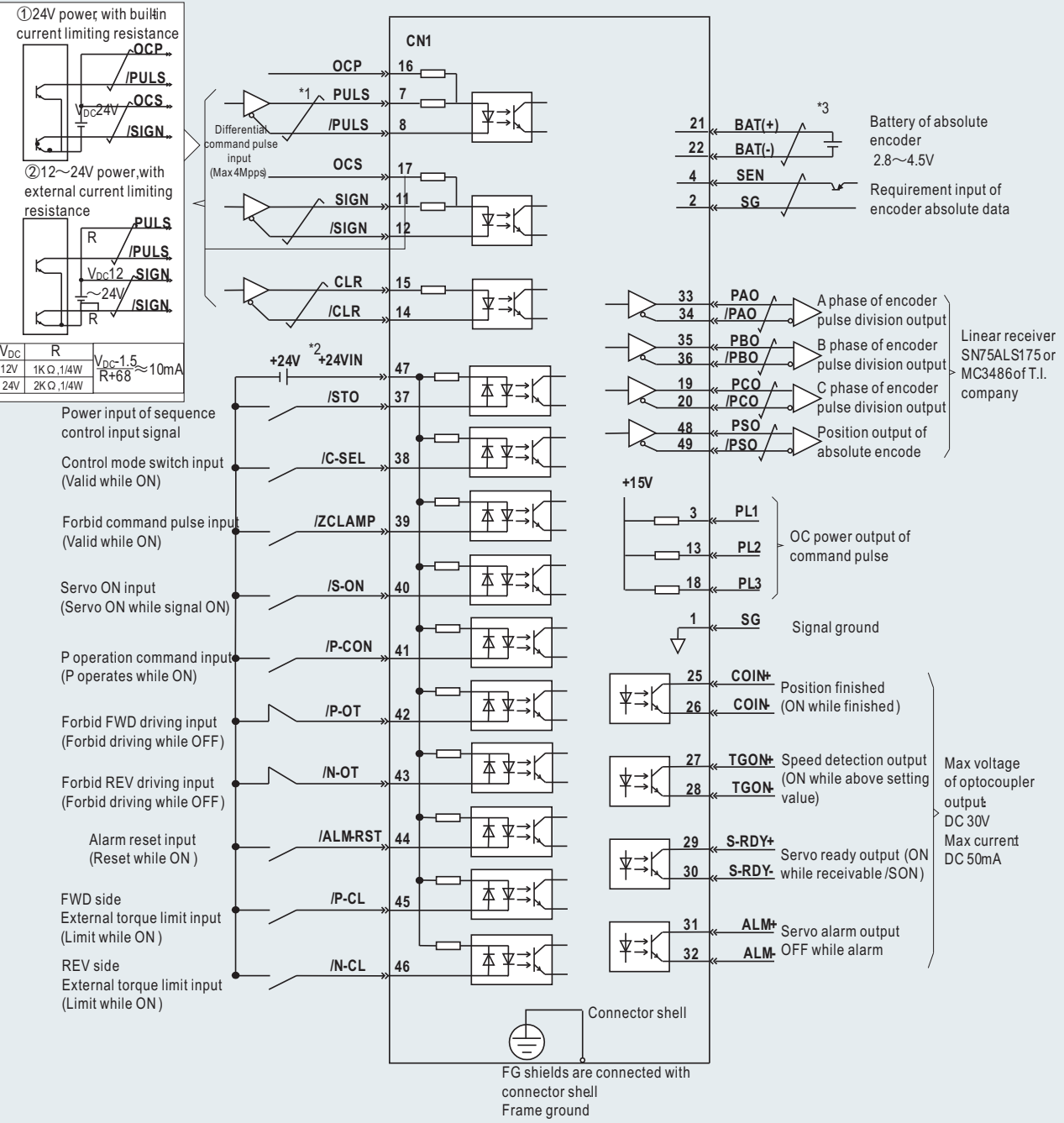
Items			Specifications
Control mode			IGBT PWM control; sine wave current drive mode
Feedback	Rotating motor combination		Serial communication encoder: 17-bit, 20-bit, 24-bit (absolute encoder)
			Pulse type encoder: wireless type 2500 wires
			Rotary transformer type encoder
Environment condition	Atmosphere temperature	-5℃ ~ 55℃(derating use at 55℃ ~ 60℃)	
	Storage temperature	-20℃ ~ 85℃	
	Atmosphere humidity	Below 95%RH (no freezing, no condensation)	
	Storage humidity	Below 95%RH (no freezing, no condensation)	
	Vibration resistance	4.9m/s²	
	Impact resistance	19.6m/s²	
	Protection class	IP20	
		No corrosive gases or flammable gases	
	Cleanliness	No water, oil or chemicals	
		Environment with less dust, ash, salt, and metal powders	
	Altitude	Below 1000m (derating use at 1000m to 2000m)	
Others	No static interference, strong electric field, strong magnetic sound, radiation and so on		
Applicable standard			EN 61800-5-1:2007 EN 61800-3:2004/A1:2012
Installation type			Base mounting type: all models
			Shelf mounting type: all models
Performance	Speed control range		1:5000 (the lower limit of speed control range is the value under the rated torque load condition but not stop)
	Speed fluctuation rate	Load fluctuation	Below rated speed ±0.01% (load fluctuation:0%~100%)
		Voltage fluctuation	Rated speed 0% (rated voltage±10%)
		Temperature fluctuation	Below rated speed ±0.1% (temperature fluctuation:25±25℃)
	Torque control accuracy		±1%
Soft start time setting			0 ~ 10s (Can set ACC and DEC separately)
Communication function	RS-485	1:N communication	For RS-485 port,Nmax== 127
		Axis address setting	Parameters setting
	USB communication	Equipment connection	Computer
		Communication specifications	According to USB1.1 specifications(12M)
Display function			CHARGE indicator
Keypad operator function			Button switch ×4
Input/output signal	Encoder pulse division output		A phase, B phase, C phase: number of pulse division output for linear drive can be arbitrarily set
	Sequential control input signal	Fixed input	Working voltage range:DC5V±5%
			Input points: 1
			Input (SEN) signal of absolute encoder data requirements
		Assignable input signal	Working voltage range : DC24V±20%
			Input points:9
			Input mode: common collector input, common emitter input
			Input signal
			Servo ON (/S-ON)
			P operation (/P-ON)
			Origin reset deceleration switch signal (/DEC)
			Forward drive banned (P-OT), reverse drive banned (N-OT)
			Alarm reset (/ALM-RST)
			FWD side external torque limit (/P-CL) REV side external torque limit (/N-CL)
			速度旋转方向选择 (/SPD-D) 信号
			Control mode switch (/C-SEL)
			Zero position fixed (/ZCLAMP)
			Command pulse inhibited (/INHIBIT)
			Magnetic poles detection input (/P-DET) signal
			Gain switch (/G-SEL)
			Command pulse input rate switch (/PSEL)
			SEN input (/SEN) signal
			Assignable signals and variable positive / negative logic

Items				Specifications		
Input/ output signal	Sequential control output signal	固定输出		Working voltage range : DC5V~DC30V		
				Output points:1		
				Output signal:servo alarm (ALM)		
		Assignable output signals		Working voltage range : DC5V~DC30V		
				Output points:3		
				Input method: optocoupler output (isolated)		
				Output signal		
				Position finished(/COIN)		
				Rotational detection (/TGON)		
				Servo ready(S-RDY)		
				Torque limited detection (/CLT)		
				Speed limit detection (/VLT)		
				Brake (/BK)		
				Warning (/WARN)		
				Location nearby (/NEAR)		
				Assignable output signals and change positive / negative logic		
Dynamic brake				Operate when the main loop power OFF, servo alarm, servo OFF, Over travel(OT)		
Regeneration treatment				Built-in function		
Over travel (OT) prevention				the dynamic brake (DB) stops, DEC stops, or free stops when P-OT, N-OT inputs operate		
Protection function				Over current, over voltage, under voltage, overload, regeneration fault, etc		
Auxiliary function				Gain adjustment, alarm record, JOG operation, origin search, etc		
Security function		Input		STO, base block signal for the power module		
Control	Position control	Feedforward compensation		0%~100%		
		Position arrived range		0~1073741824 Command unit		
		Input signal	Command pulse	Command pulse morphology	Choose either of the following	
				Input morphology	Symbol + pulse sequence, CW+CCW pulse sequence,two-phase pulse of 90°difference	
					Linear drive, open collector	
				Maximum input frequency	Line drive	
					Symbol + pulse sequence, CW+CCW pulse sequence: 4Mpps	
					Two-phase pulse of 90°difference: 1Mpps	
					Open collector	
					Symbol + pulse sequence, CW+CCW pulse sequence: 200Kpps	
					Two-phase pulse of 90°difference: 200Kpps	
				Input rate switching		1~100 times
		signal clearance		Clearance of position deviation		
		speed control	Soft start time setting		0~10s(setting acceleration and deceleration respectively)	
	Input signal		Command voltage	Maximum input voltage: ±10V (motor runs forwardly under positive voltage command)		
				Rated speed at DC6V [factory setting]		
				Variable input gain setting		
	Input impedance		About 14KΩ			
	Internal set speed control		Loop time parameter		30μs	
			Rotation direction selection	Use the P action signal		
				Use forward / reverse side external torque limit signal input		
			Speed selection		Stop or change to other control modes when both sides are OFF	
	Torque control		Input signal	Command voltage	Maximum input voltage: ±10V (motor runs forwardly under positive voltage command)	
		Rated speed at DC6V [factory setting]				
		Variable input gain setting				
		Input impedance		About 14KΩ		
		Loop time setting		16μs		

Series configuration drawing



Standard wiring diagram - position mode



*1. $\neq$ is twisted shields

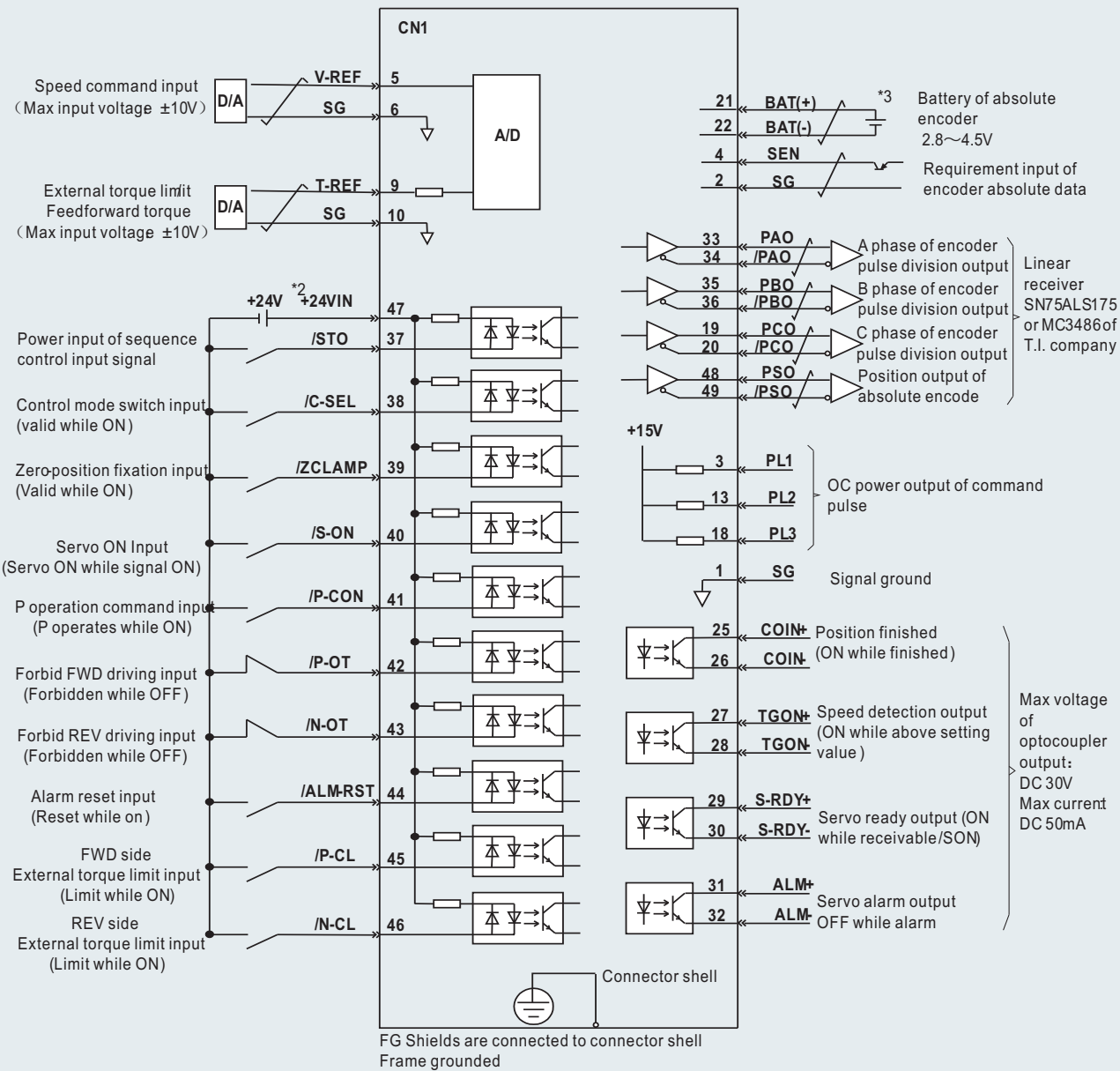
*2. DC24V power should be prepared by user. And double insulation or reinforced insulation equipments should be used for DC 24V power.

*3. Connected while using absolute encoder. But never connect backup battery while using encoder cables with battery unit

*4. Output signal should be received by linear receiver.

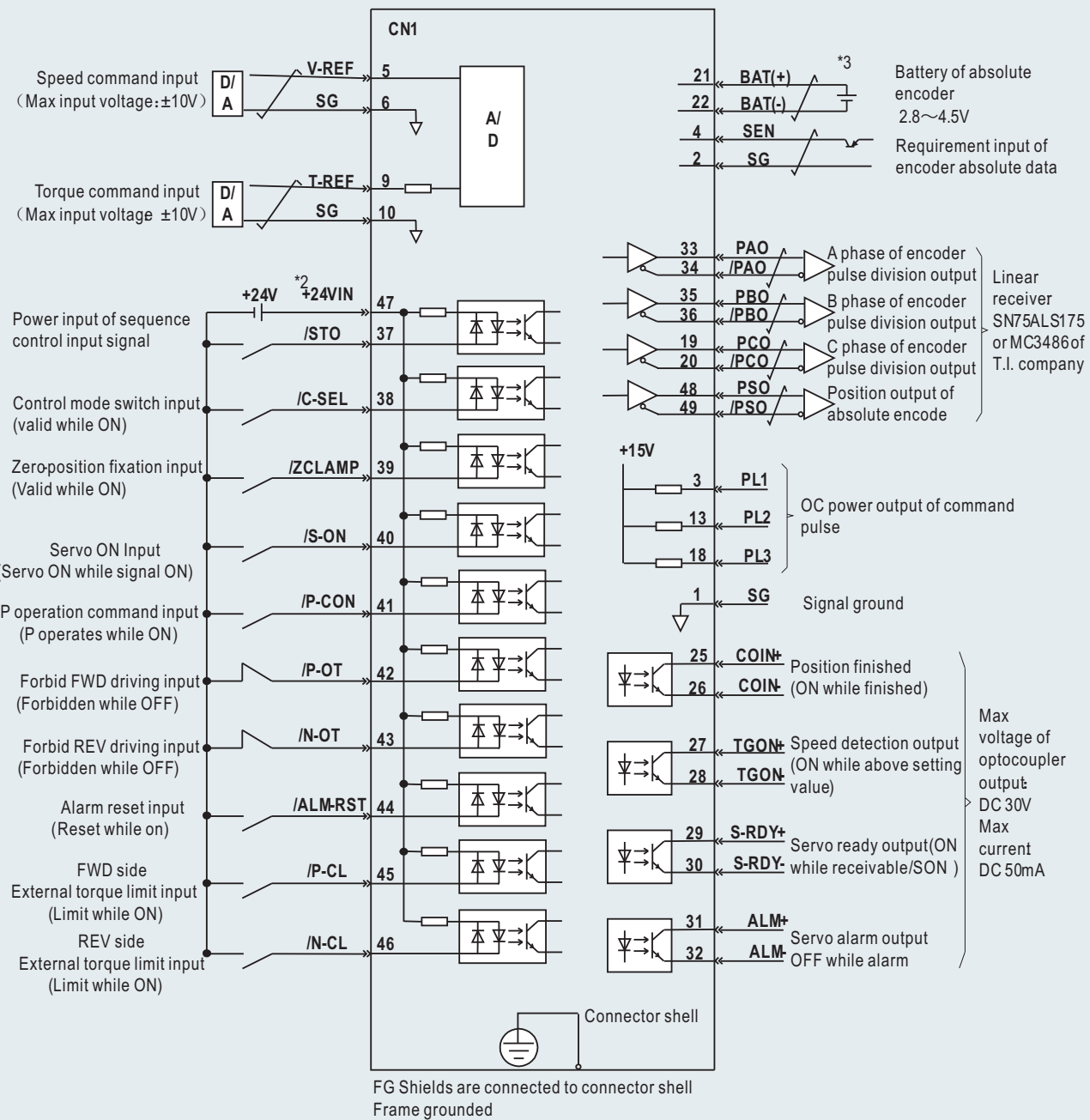
(Note) While using 24V Braker, DC24V power should be separated from the power for input and output signal (CN1). Please prepare other power individually, otherwise, there may be misoperation of input and output signal while power on.

Standard wiring diagram - speed mode



*1. ∇ is the twisted shields
*2. DC24V power should be prepared by user. Double insulation or reinforced insulation equipments should be used for DC24V power
*3. Connected while using absolute encoder. But never connect backup battery while using encoder cables with battery unit.
*4. Output signal should be received by linear receiver
(Note) While using 24V BRaker, DC24V power should be separated Form the power for input and output signal (CN1). Please prepare other power individually, otherwise, there may be misoperation of input and output signal while power on.

Standard wiring diagram - torque mode



*1. ∇ is the twisted shields
*2. DC24V power should be prepared by user. And double insulation or reinforced insulation equipments should be used for DC24V power
*3. Connected while using absolute encoder. But never connect backup battery while using encoder cables with battery unit
*4. Output signal should be received by linear receiver
(Note) While using 24V BRaker, DC24V power should be separated Form the power for input and output signal (CN1). Please prepare other power individually, otherwise, there may be misoperation of input and output signal while power on.

Model explanation

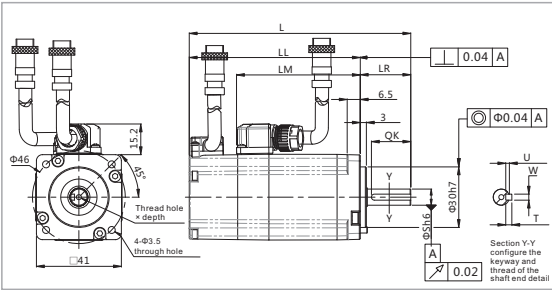
VM7 - L 06 A - 1R0 15 - F 1 *					
Product series		Internal management number			
Inertia level		Encoder model			
L : Low inertia		A : 2500 wires (standard)			
M : Middle inertia		B : 2500 wires (wires saving)			
H : High inertia		C : 17 bit single/ Multiloop absolute value (TAMAGAWA)			
Installing flange		D : 23 bit single/ Multiloop absolute value (TAMAGAWA)			
04 : 40mm		E : 24 bit single loop absolute value (NIKON)			
06 : 60mm		F : 24 bit multi loop absolute value (NIKON)			
08 : 80mm		G : 20 bit multi loop absolute value (NIKON)			
11 : 110mm		H : 20 bit single loop absolute value (NIKON)			
13 : 130mm		I : Rotary transformer			
18 : 180mm					
Rated voltage		Rated RPM (RPM)			
A : 220VAC		10 : 1000			
D : 400 VAC		15 : 1500			
		20 : 2000			
		25 : 2500			
		30 : 3000			
Rated power					
Mark	Power(W)	Mark	Power(W)	Mark	Power(W)
R05	50	R75	750	1R8	1800
R10	100	R85	850	2R9	2900
R20	200	1R0	1000	4R4	4400
R40	400	1R3	1300	5R5	5500
R60	600	1R5	1500	7R5	7500

Mark	Axis		Oil seal		Brake	
	Optical axis	Key axis	Yes	No	Yes	No
1		●	●			●
2		●	●		●	
3		●		●		●
4		●		●	●	
5	●		●			
6	●		●			●
7	●				●	
8	●			●		●
9	●			●	●	

Voltage level(400V)	Motor model						
Motor model Vm7-	L13D-R8515-□□	L13D-1R315-□□	M13D-1R815-□□	M18D-2R915-□□	M18D-4R415-□□	M18D-5R515-□□	M18D-7R515-□□
Rated power(W)	850	1300	1800	2900	4400	5500	7500
Rated RPM(RPM)	1500	1500	1500	1500	1500	1500	1500
Maximum RPM(RPM)	3000	3000	3000	3000	3000	3000	3000
Rated torque(N.m)	5.4	8.3	11.5	18.5	28	35	48
Instantaneous maximum torque(Nm)	16	24.9	34.5	55.5	71	88	119
Rated current(A)	3.8	5.4	7	11.5	15.5	19.5	27
Instantaneous maximum current(A)	11.5	16.2	21	34.5	39	49	68
Torque factor (Nm/A)	1.64	1.7	1.7	1.8	1.9	1.9	1.8
Rotary inertia(with brake)(Kgcm²)	13.9 (16)	19.2 (22)	25 (28)	46 (52.5)	67.5 (74.5)	89 (97)	125 (131.5)
Electrical time constant(ms)	6.8	8.3	9.4	13.2	16	18.4	20
Mechanical time constant(ms)	2.7	2.1	1.9	1.27	1	0.76	0.7

Servo motor installing dimensions

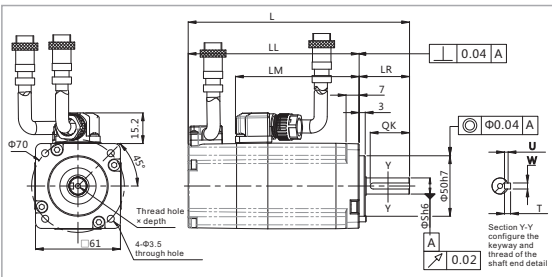
40 flange



Motor model Vm7-	L	LL	LM	LR	S	U	W	T	QK	Thread hole × depth
L04A-R0530-F1 (L04A-R0530-F2)	87.3 (115.6)	62.3 (90.6)	44.3 (72.6)	25	8	1.8	3	3	19.5	M2.5×8
L04A-R1030-F1 (L04A-R1030-F2)	103.3 (131.6)	78.3 (106.6)	60.3 (88.6)	25	8	1.8	3	3	19.5	M2.5×8

- ※ When the non-standard encoder is selected, L, LL, LM need to increase 9mm on the basis of the above values;
- ※ The value in () is the model and size of the motor equipped with the holding brake;

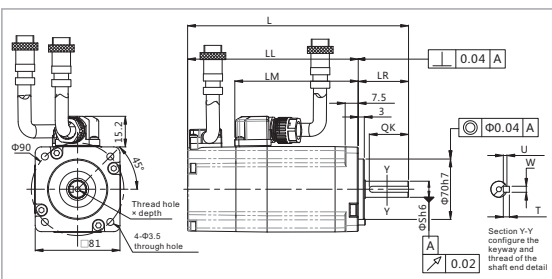
60 flange



Motor model Vm7-	L	LL	LM	LR	S	U	W	T	QK	Thread hole × depth
L06A-R2030-F1 (L06A-R2030-F2)	103.5 (140)	73.5 (110)	53 (90)	30	14	3	5	5	22.5	M5×8
L06A-R4030-F1 (L06A-R4030-F2)	125.5 (162)	95.5 (132)	75 (112)	30	14	3	5	5	22.5	M5×8
L06A-R6030-F1 (L06A-R4030-F2)	143.5 (180)	113.5 (150)	93 (130)	30	14	3	5	5	22.5	M5×8

- ※ When the non-standard encoder is selected, L, LL, LM need to increase 9mm on the basis of the above values;
- ※ The value in () is the model and size of the motor equipped with the holding brake;

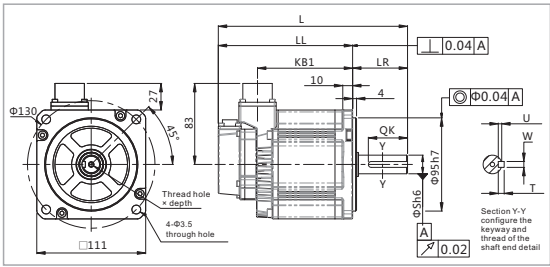
80 flange



Motor model Vm7-	L	LL	LM	LR	S	U	W	T	QK	Thread hole × depth
L08A-R7530-F1 (L08A-R7530-F12)	140 (182)	105 (147)	84 (126)	35	19	3.5	6	6	25	M6×12

- ※ When the non-standard encoder is selected, L, LL, LM need to increase 9mm on the basis of the above values;
- ※ The value in () is the model and size of the motor equipped with the holding brake;

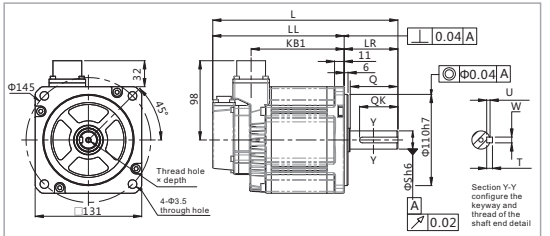
110 flange



Motor model Vm7-	L	LL	LM	LR	S	U	W	T	QK	Thread hole × depth
L11A-1R230-F1 (L11A-1R230-F2)	193 (227)	137 (171)	97 (131)	56	19	3.5	6	6	40	M5×12
L11A-1R530-F1 (L11A-1R530-F2)	203 (237)	147 (181)	107 (141)	56	19	3.5	6	6	40	M5×12
L11A-1R830-F1 (L11A-1R830-F2)	218 (252)	162 (196)	122 (156)	56	19	3.5	6	6	40	M5×12
L11A-1R220-F1 (L11A-1R220-F2)	213 (247)	157 (191)	117 (151)	56	19	3.5	6	6	40	M5×12

※ The value in () is the model and size of the motor equipped with the holding brake;

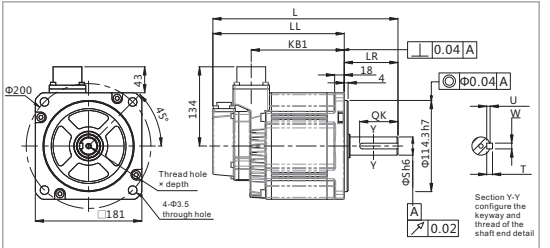
130 flange



Motor model Vm7-	L	LL	LM	LR	S	U	W	T	QK	Thread hole × depth
M13□-R8515-F1 (M13□-R8515-F2)	195 (232)	137 (174)	93.5 (130)	58	40	19	3	5	27.5	M5×12
M13□-1R315-F1 (M13□-1R315-F2)	210 (247)	152 (189)	108.5 (145)	58	40	22	3.5	6	28	M5×12
M13D-1R815-F1 (M13D-1R815-F2)	225 (262)	167 (204)	123.5 (160)	58	40	24	4	8	29	M5×12

※ The value in () is the model and size of the motor equipped with the holding brake;

180 flange

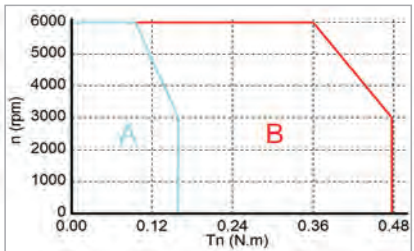


Motor model Vm7-	L	LL	LM	LR	S	U	W	T	QK	Thread hole × depth
M18D-2R915-F1 (M18D-2R915-F2)	239 (294)	160 (215)	113 (170)	79	35	5	10	8	65	M12×25
M18D-4R415-F1 (M18D-4R415-F2)	263 (318)	184 (239)	137 (194)	79	35	5	10	8	65	M12×25
M18D-5R515-F1 (M18D-5R515-F2)	334 (389)	221 (276)	174 (211)	113	42	5	12	8	96	M12×25
M18D-7R515-F1 (M18D-7R515-F2)	380 (435)	267 (322)	220 (257)	113	42	5	12	8	96	M12×25

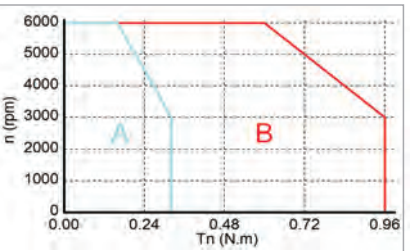
※ The value in () is the model and size of the motor equipped with the holding brake;

Servo motor torque characteristics

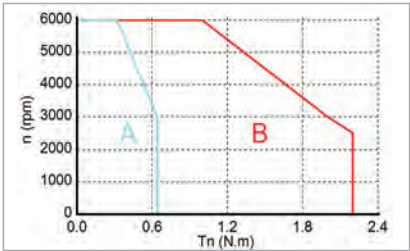
VM7-L04A-R0530-F□



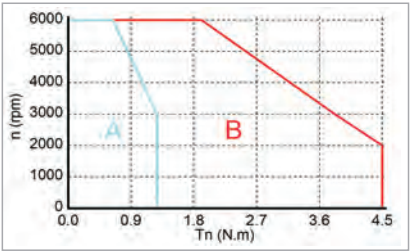
VM7-L04A-R1030-F□



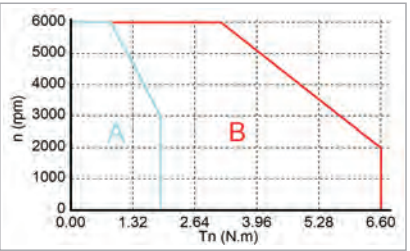
VM7-L06A-R2030-F□



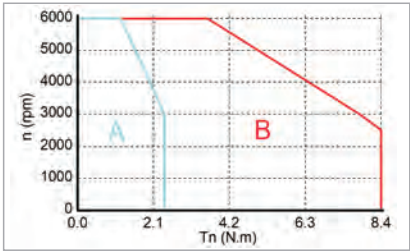
VM7-L06A-R4030-F□



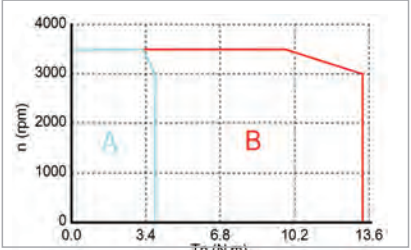
VM7-L06A-R6030-F□



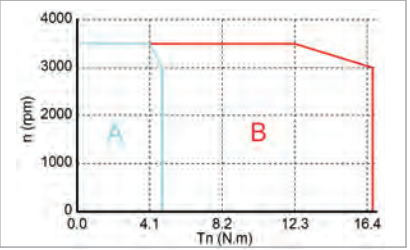
VM7-L08A-R7530-F□



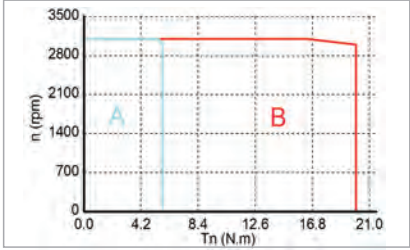
VM7-L11A-1R230-F□



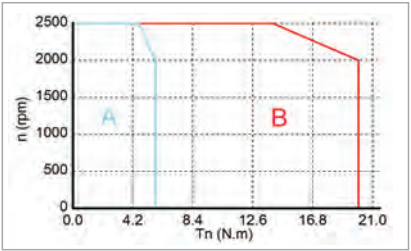
VM7-L11A-1R530-F□



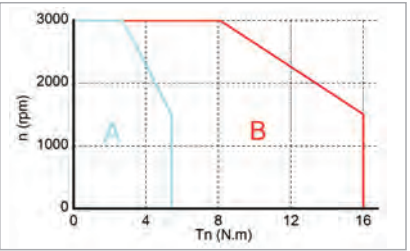
VM7-L11A-1R830-F□



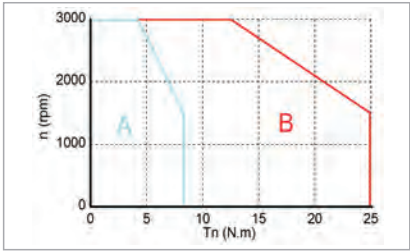
VM7-L11A-1R220-F□



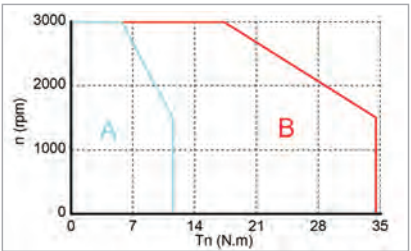
VM7-M13□-R8515-F□



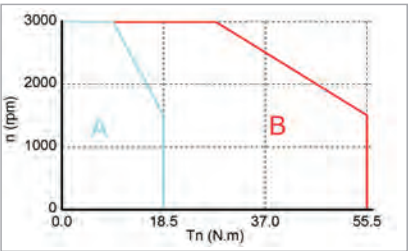
VM7-M13□-1R315-F□



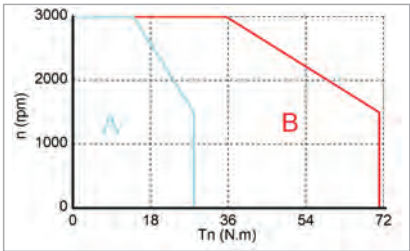
VM7-M13□-1R315-F□



VM7-M18D-2R915-F□

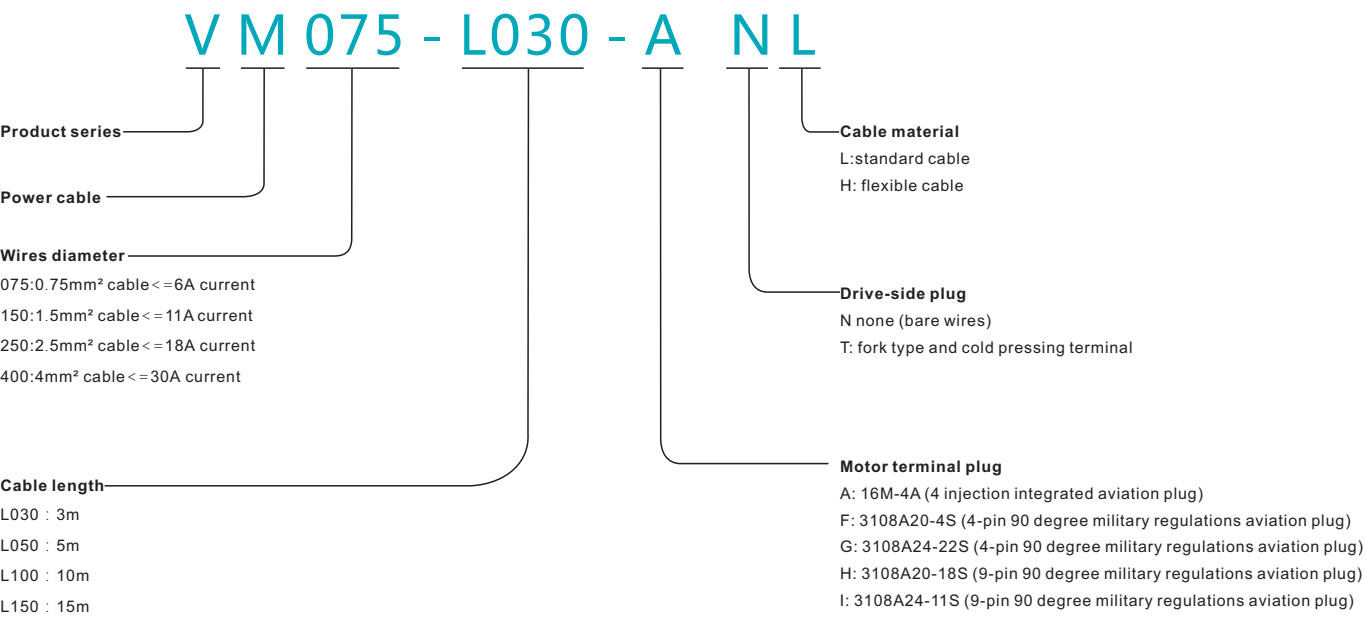


VM7-M18D-4R415-F□

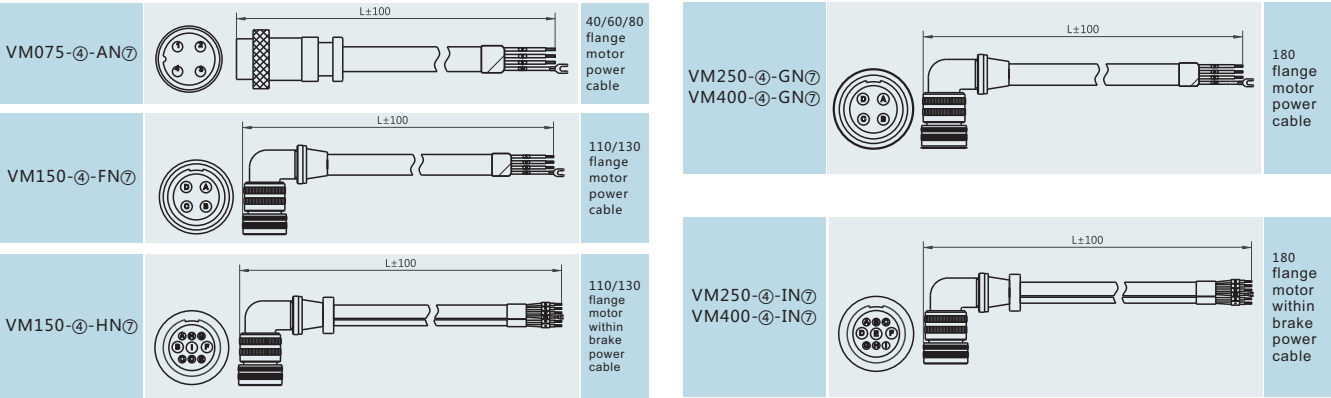


SD700 servo drive wire introduction

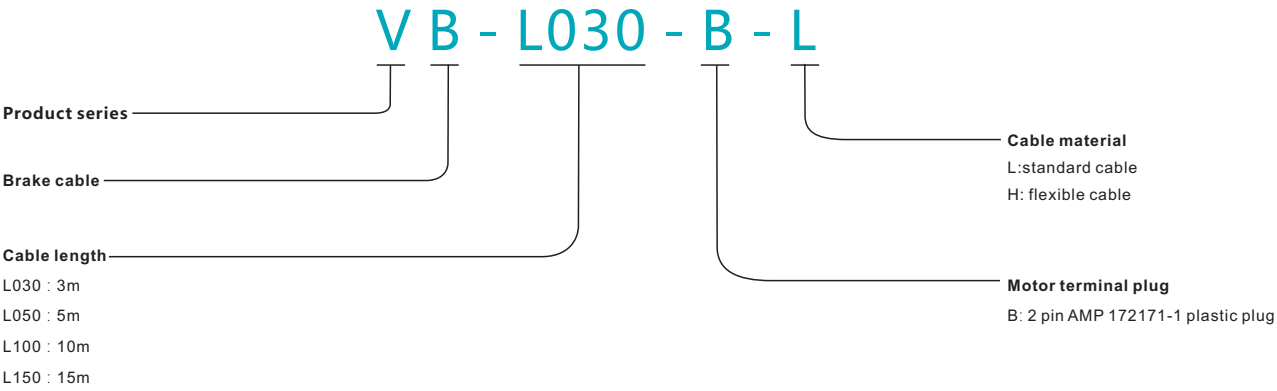
Power cable naming rules



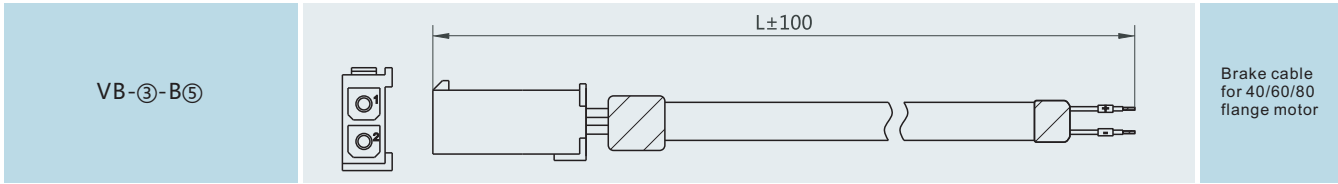
Motor power cable



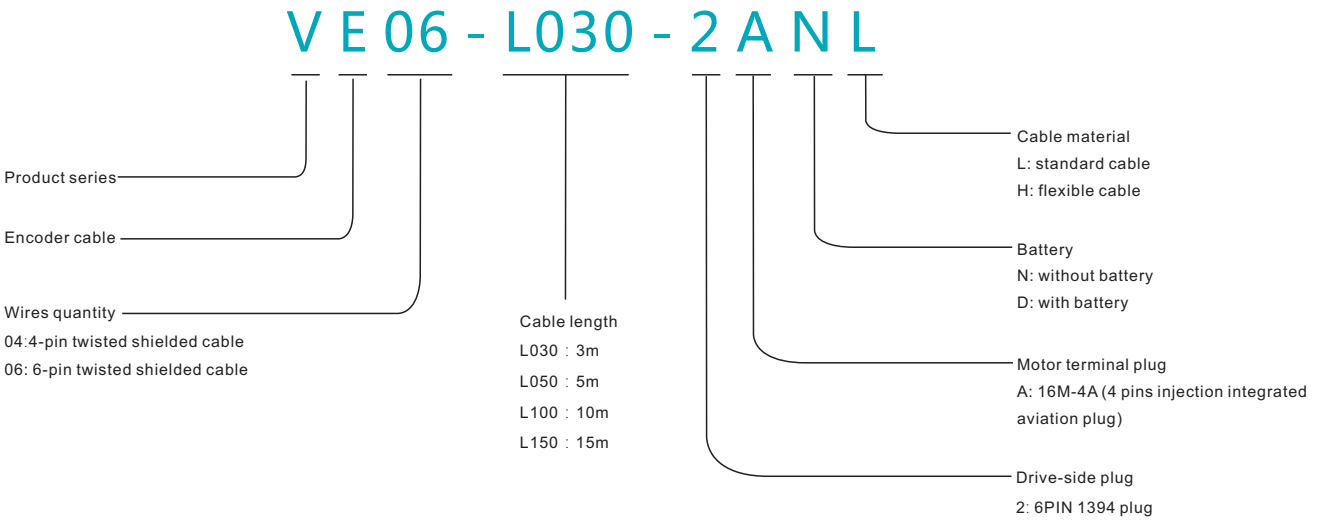
Brake cable naming rules



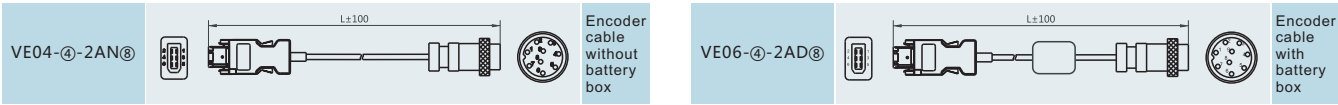
Brake cable



Encoder cable naming rules



Encoder cable



Braking resistor model selection

Model	Braking voltage	Built-in resistor	Minimum external resistor value	Maximum external resistor value
SD700-1R1A	380	No	40	400
SD700-1R8A	380	No	40	200
SD700-3R3A	380	No	40	100
SD700-5R5A	380	40Ω 60W	25	70
SD700-7R6A	380	40Ω 60W	15	50
SD700-9R5A	380	40Ω 60W	15	40
SD700-160A	380	30Ω 200W	10	30
SD700-2R5D	700	80Ω 60W	80	225
SD700-3R8D	700	80Ω 60W	55	180
SD700-6R0D	700	40Ω 60W	35	110
SD700-8R4D	700	40Ω 60W	25	85
SD700-110D	700	40Ω 60W	25	70
SD700-170D	700	30Ω 200W	30	50
SD700-240D	700	30Ω 200W	15	40
SD700-300D	700	30Ω 200W	15	30