

#### Installation and Wiring for SV-X3E Series Servo Drive

#### Hardware Instruction

Manual Number	HPPD0010000EN
Manual Version	V5.0
Date	Oct.2021

#### http://www.hcfa.com.cn

Thank you for purchasing this product.

This manual mainly describes the safety use, installation and wiring for SV-X3E

For more details, please refer to <SV-X3E Series Servo Drive User Manual>.

#### Confirm the following items when unpacking:

Number		Name	Quantity					
1	Servo drive	1						
		Connecting terminal	3					
	A	Cold-pressed terminal	8					
2	Accessories	Crowbar	1					
		Straight screwdriver	1					
3	Installation and Wiri	ng for SV-X3E Series Servo Drive Hardware Instruction	1					
4	Certificate of Q	Certificate of Quality						

OCheck if there are some damage to the products during transportation. Any Oquestions, please contact the HCFA Technology.

### Safety precautions

Please pay attention to the flowing safety precautions anywhere and any time during acceptance inspection, installation, wiring, operation and maintenance.

■ In this manual, the safety precautions are ranked as "DANGER" and "CAUTION"

<u></u> ∆ DANGER

Indicates that incorrect handling may result in death or severe injury.

**⚠** CAUTION

Indicates that incorrect handling may result in medium or slight personal injury or physical damage. Indicates "Prohibitions" (Indicates what must not be done.)

 $\bigcirc$ 

Indicates "Forced".(Indicates what must be done.)

	↑ DANGER				
	Installing and wiring				
$\bigcirc$	Do not connect the motor to the commercial power.	To prevent fire or malfunction.			
•	Do not place the combustibles around the servo motor and drive.	To prevent fire.			
	Be sure to protect the drives through the case, and leave specified clearances between the case or other equipment and the drive.	To prevent electric shock, fire or malfunction.			
•	Install it at the place free from excessive dust and dirt, water and oil mist	To prevent electric shock, fire , malfunction or damage			
	Install the equipment to incombustibles, such as metal.	To prevent fire.			
	Any person who is involved in wiring and inspection should be fully competent to do the work.	To prevent electric shock.			
	FG terminal of motor and drive must be grounded.	To prevent electric shock.			
	Perform the wiring correctly after cut off the breaker.	To prevent electric shock, injury, malfunction or damage			
	Have the insulation processing when connecting cables.	To prevent electric shock, fire or malfunction.			
	Operation and running				
	During operation, never touch the internal parts of the drive.	To prevent burns or electric shock.			
	The cables should not be damaged, stressed loaded, or pinched.	To prevent electric shock, malfunction or damage.			
	During operation, never touch the rotating parts of the servo motor.	To prevent injury.			
	Do not install the equipment under the conditions with water, corrosive and flammable gas.	To prevent fire.			

	Do not use it at the location with great vibration and shock.	To prevent electric shock, injury or fire.			
	Do not use the servo motor with its cable soaked in oil or water.	To prevent electric shock, malfunction or damage			
$\bigcirc$	Operate the switches and wiring with dry hand.	To prevent electric shock, injury or fire.			
	Do not touch the keyway directly when using the motor with shaft-end keyway	To prevent injury.			
	Do not touch the motor and drive heat sink, asthey are very hot.	To prevent burns or parts damaged.			
	Do not drive the motor by external drive.	To prevent fire.			
	Other safety instructions				
	Confirm the equipment's safety after the earthquake happens.	To prevent electric shock, injury or fire.			
0	Installing and setting correctly to prevent the fire and personal injury when earthquake happens.	To prevent injury, electric shock, fire, malfunction or damage.			
	Provide an external emergency stop circuit to ensure that operation can be stopped and power switched off immediately.	To prevent injury, electric shock, fire, malfunction or damage.			
	Before wiring or inspection, turn off the power and wait for 5 minutes or more.	To prevent electric shock.			

	Installing and wiring						
0	Please follow the specified combination of the motor and drive.	To prevent fire or malfunction.					
•	Do not touch the terminals of connector directly.	To prevent electric shock or malfunction.					
	Do not block intake and prevent the foreign matters from entering into the motor and drive.	To prevent electric shock or fire.					
•	Fix the motor and have the test run away from the mechanical system. After confirming the operation, the motor can be securely mounted to mechanical system.	To prevent injury.					
•	The servo motor must be installed in the specified direction.	To prevent injury or malfunction.					
	Install the equipment correctly in accordance with its weight and rated output.	To prevent injury or malfunction.					
	Operation and running						
	Do not climb or stand on servo equipment. Do not put heavy objects on equipment.	To prevent electric shock, injury, fault or damage.					
	The parameter settings must not be changed excessively. Operation will be instable.	To prevent injury.					
	When power is restored after an instantaneous power failure, keep away from the machine because the machine may be restarted suddenly (design the machine so that it is secured against hazard if restarted).	To prevent injury.					
	Keep it away from the direct sunlight.	To prevent malfunction.					
	Do not put strong impact on the motor, drive and motor shaft.	To prevent malfunction.					
•	The electromagnetic brake on the servo motor is designed to hold the servo motor shaft and should not be used for ordinary braking.	To prevent injury or malfunction.					
	Do not install or operate a faulty servo motor or drive.	To prevent injury, electric shock or fire					
	Check the power specification.	To prevent fault.					
A	The electromagnetic brake may not hold the servo motor shaft. To ensure safety, install a stopper on the machine side.	To prevent injury.					
	A sudden restart is made if an alarm is reset with the run signal on.	To prevent injury.					
	Connect the relay for emergency stop and for brake in series.	To prevent injury or malfunction.					
	Transportation and storage						
	Do not subject the equipment to the place with rain, waterdrop, poisonous gases or liquids.	To prevent malfunction.					
	Do not carry the servo motor by the cables, shaft or encoder during transportation.	To prevent injury or malfunction.					
	Do not drop or dump the motor during transportation and installation.	To prevent injury or malfunction.					
0	Store the unit in a place in accordance with the instruction manual.	To prevent malfunction.					
	Other safety instructions						
	Please dispose the battery according to your local l	aws and regulations.					
4	When disposing of the product, handle it as industri	al waste.					
	Maintenance and inspection						
$\bigcirc$	Do not disassemble and/or repair the equipment on customer side.	To prevent malfunction.					
$\bigcirc$	Do not turn on or switch off the main power frequently.	To prevent malfunction.					
	Do not touch the servo drive heat sink, regenerative resistor, servo motor etc. Their temperatures may be high while power is on or for some time after power-off.	To prevent burns or electric shock.					
•	When the drive become faulty, switch off the control circuit and main power.	To prevent fire.					
•	If the servo motor is to be stored for a long time, switch off the power.	To prevent misoperation and injury.					

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#### About maintenance and inspection

< Warranty period>
The term of warranty for the product is 18 months from the date of manufacture. It's exceptional to brake motors as they are warranted when acceleration /deceleration times is not beyond the specified service life.

#### < Warranty coverage >

This warranty applies only when the condition, method, environment, etc. of use are in compliance with the terms and conditions and instructions that are stated in the instruction manual and user manual for the Product. However, even during warranty period, the repair cost will be charged on customer in the following cases.

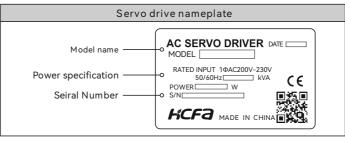
- A failure caused by improper storing or handling, repair and modification.
   A failure caused by the parts which have dropped down or damaged during transportation.
- A failure caused when the products have been used beyond the product specification A
   failure caused by external factors such as inevitable accidents, including but not limited to fire, earthquake, lighthing stroke, windstorm disaster, flood, salt damage, abnormal fluctuation of voltage and other natural disaster.
- 5) A failure caused by the intrusion of water, oil, metal and other foreign matters.

## The warranty coverage is only for the product itself. We assume no responsibilities for any losses of opportunity and/or profit incurred by you due to a failure of the product

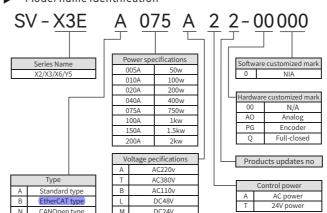
#### 1.Product introduction and model selection



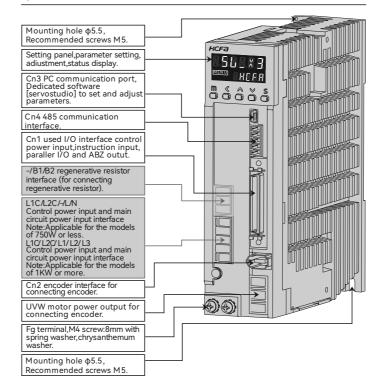
Introduction for drive nameplate



#### Model name identification



#### Drive parts name



#### Model selection of peripheral braking resistor

Rated output	50W	100W	200W	400W	750W	1kW	15kW	2kW
Resistance	40 ~ 50Ω	30Ω	30Ω	20Ω				
Capacity	40W	40W	40W	40W	40W	50W	60W	80W

#### 2. Product specification



#### Servo drive specification

Model Name			Ite	ems					Specifi	cation								
Applicable motor   SOW   100W   200W   400W   750W   1kW   1.5kW   2   Weight(K)   Weight(K)   1.5kW   2   4.9   8.4   Weight(K)   1.5kW   2   4.9   Weight(K)   2   4.9   4.9   Weight(K)   2   4.9   4.9   Weight(K)   2   4.9   Weight(	Г		1odel	Na	me	005	010	020			100	150	200					
Dimension W(mm)   42    49    84		_											2kW					
D(mm)   135   135   135   136   136   136   Weight(Kg)   0.7   0.8   1.6   1		_				3011		20011	_									
Weight(Kg)   0.7   0.8   1.6																		
Prame A   Single-phase 200~240V±10% 50/60Hz   Prame B   Three-phase 200~240V±10% 50/60Hz   Prame B   Pra		L		_	_				_									
Input		$\vdash$	Т	Ī	<u> </u>													
Dielectric strength 1 minute at 1500 VAC across the primary and FG Control type		Inp	- 1	ain	Frame B	Thre	e-phase 2	00~240V	/±10% 50	/60Hz								
Dielectric strength 1 minute at 1500 VAC across the primary and FG Control type Three-phase PWM inverting sine-wave Encoder feedback Single-turn absolute 17-bit (multi-turn absolute with battery)  Digital signal output 9 inputs (24VDC, photo-coupler insulation) Switch by control mode output 9 outputs (24VDC, photo-coupler insulation, open-collector output) Switch by control mode  Digital signal Input 2 inputs (24VDC, photo-coupler insulation, open-collector output) Switch by control mode  Input 2 inputs (24VDC, photo-coupler insulation, open-collector output) Switch by control mode  Signal output 4 outputs (A/B/Z-phase RS-422 differential, open-collector output)  USB Connection with PC (with "Servostudio" software)  Communication RS-485 Remote communication(1: n)  Regeneration function External regenerative resistor possible  Dynamic brake Not built-in  Tontrol mode Tontrol modes: Position control, speed control, speed control, fully (losed-loop control) (optional part needed)  Servo ON, alarm reset, deviation counter clear, posit negative direction over-travel, internal command select homing start etc.  Digital output signals   Differential input: Up to 2Mpps, pulse width larger than 0.25us; Open-collector input: Up to 200Kpps, pulse width larger than 2. Input pulse form   Pulse of the pulse form   Pulse of the pulse input: Division ration Arbitrary frequency division.  Digital input signals   Differential input; open-collector speed output, etc.   Diput pulse output: Division ration Arbitrary frequency division.  Digital input signals   Servo ON, alarm reset, speed instruction can be set).  Digital input signals   Servo ON, alarm reset, speed instruction can be set).  Speed input   Servo ON, alarm reset, speed instruction can be set).  Speed input   Division ration Arbitrary frequency division.  Digital input signals   Servo ON, alarm reset, speed instruction can be set).  Speed input   Division ration Arbitrary frequency division.  Digital input signals   Servo ON, alarm reset, speed instruction can be set).		pov	иe			Sing	le-phase 2	00~240\	/±10% 50	/60Hz								
Encoder feedback   Single-turn absolute 17-bit (multi-turn absolute with battery)		Die	electr	_		1 mir	<u> </u>											
Digital signal   Input   9 inputs (24VDC, photo-coupler insulation) Switch by control mode   Output   9 outputs (24VDC, photo-coupler insulation, open-collector output) Switch by control mode   Output   Switch by control mode   Output   Switch by control mode   Output		-		_														
Digital signal output 9 outputs (24VDC, photo-coupler insulation, open-collector output) Switch by control mode  Digital signal Input 2 inputs (±10V) Switch by control mode  Input 2 inputs (photo-coupler insulation, RS-422 differential, open-collector)  output 3 outputs (A/B/Z-phase RS-422 differential, Z-phase open collector output)  Output 4 outputs (A/B/Z-phase RS-422 differential, Z-phase open collector output)  Output 5 output (A/B/Z-phase RS-422 differential, Z-phase open collector output)  Output 6 output (A/B/Z-phase RS-422 differential, Z-phase open collector output)  Output 7 output (A/B/Z-phase RS-422 differential, Z-phase open collector output)  Output 6 outputs (A/B/Z-phase RS-422 differential, Z-phase open collector output)  Output 6 outputs (A/B/Z-phase RS-422 differential, Z-phase open collector output)  Output 6 outputs (A/B/Z-phase RS-422 differential, Z-phase open collector output)  Output 6 outputs (A/B/Z-phase RS-422 differential, Z-phase open collector output)  Output 6 outputs (A/B/Z-phase RS-422 differential, Z-phase open collector output, and a collection output outp		End	code				9 inputs (24VDC, photo-coupler insulation) Switch by control											
Digital signal   Input   2 inputs (±10V) Switch by control mode   2 inputs (±10V) Switch by control mode   2 inputs (±10V) Switch by control mode   3 input   2 inputs (photo-coupler insulation, RS-422 differential, open-collector)   3 output   4 outputs (A/B/Z-phase RS-422 differential, Z-phase open   5 output   5 output   5 output   6 ou				-	nput				<u> </u>									
Signal   Input   2 inputs (photo-coupler insulation, RS-422 differential, open-collector)   Output   Output   Communication   Output   Collector output)   Output   Output   Collector output		L		0	utput					rinsulat	ion, ope	n-collect	or					
Pulse signal output de output (A/B/Z-phase RS-422 differential, Z-phase open collector output)    Output				ı	nput						22 diffora	ntial						
Output   Collector output   Control mode   Control mode   Control mode   To control mode   Control mode   To c				ı	nput				ilisulatio	11, 13 742	zz umere	illual,						
Regeneration function   External regenerative resistor possible   Dynamic brake   Not built-in   Control mode   7 control modes: Position control, speed control, speed/tord control, fully closed-loop control (optional part needed)   Digital input signals   Servo ON, alarm reset, deviation counter clear, positing start etc.   Digital output signals   Servo ON, alarm reset, deviation counter clear, positing start etc.   Digital output signals   Servo ON, alarm reset, deviation counter clear, positing start etc.   Digital output signals   Servo ON, alarm reset, deviation counter clear, positing start etc.   Digital output signals   Servo ON, alarm reset, deviation counter clear, positing start etc.   Digital output signals   Servo ON, alarm reset, deviation counter clear, positing required in position reached, servo state, torque limiting, speed limiters, position reached, servo state, torque limiters, position reached, servo state, position reached, servo state, position reached, servo state, position reached, servo state, servo ready, brake off, speed reached, torque limit topy position reached, servo state, position		sig	gnal	0	utput				RS-422 (	differenti	al, Z-pha	ase open	l					
Regeneration function   External regenerative resistor possible				-	USB	Conr	nection wit	h PC (wit	th "Servo	studio" s	oftware)	1						
Dynamic brake   Not built-in   7 control modes: Position control, speed control, torque control, position/speed control, position/torque control, speed/torcontrol, fully closed-loop control (optional part needed)   Servo ON, alarm reset, deviation counter clear, position gative direction over-travel, internal command select homing start etc.		fund	ction															
Control mode  Tontrol modes: Position control, speed control, torque controls position/speed control, position/broque control, speed/forcontrol, fully closed-loop control (optional part needed)  Servo ON, alarm reset, deviation counter clear, position regulate control, speed/forcontrol, fully closed-loop control (optional part needed)  Servo ON, alarm reset, deviation counter clear, position regative direction over-travel, internal command select homing start etc.  Alarm state, servo ready, brake off, homing composition reached, servo state, torque limiting, speed limiting. Speed limiting position reached, servo state, torque limiting, speed limiting. Speed limiting per limiting per limiting. Speed limiting per limiting. Speed limiting per limiting. Speed		_				·												
Digital input signals  Servo ON, alarm reset, deviation counter clear, posit negative direction over-travel, internal command select homing start etc.  Digital output signals  Alarm state, servo ready, brake off, homing comp position reached, servo state, torque limiting, speed lim zero-speed output, etc.  Max input pulse trequency  Input pulse input  Input pulse						7 control modes: Position control, speed control, torque control.												
Input pulse	S						Servo ON, alarm reset, deviation counter clear, positive/ nals negative direction over-travel, internal command selection,											
Input pulse	fication		Digit	tal c	outputsi	gnals	Alarm state, servo ready, brake off, homing complete, gnals position reached, servo state, torque limiting, speed limiting											
Input pulse type   Differential input; open-collector	Speci	_			pulse '	·	Differential input: Up to 2Mpps, pulse width larger than 0.25us;											
Servo ON, alarm reset, speed instruction negator reverse torque limiting, speed limiting, speed output, etc.		contro			Input p	-	lse											
Servo ON, alarm reset, speed instruction negator reverse torque limiting, speed limiting, speed output, etc.		sition			Input p	ulse	Pulse+ direction, A-Phase + B-Phase, CW+CCW											
Smoothing Smoothing filter, FIR filter.  Output pulse A-Phase, B-Phase: Differential output Z-Phase: Differential output of Division ratio Arbitrary frequency division.  Output pulse Encoder pulse or position Pulse instruction (can be set).  Digital input signals Servo ON, alarm reset, speed instruction negat zero-speed clamp, internal speed control, external forw reverse torque limit etc.  Digital output signals Alarm state, servo ready, brake off, speed reached, torquimiting, speed limiting, zero-speed output, etc.  Speed input Input voltage -10V to +10V (Maximum speed at ±10V).  1) Internal torque limit by P03.11, P03.12 enabled by P. CL/N, CL signals 3) TLMTP i.e. Al1 or Al2 as external forward/reverse torque limit to Torque feedforward 2) TFFD, Al1 or Al2  Digital input signals Servo ON, alarm reset, torque instruction negation,		Po			Electro	nic												
Output pulse form Z-Phase; B-Phase: Differential output Z-Phase: Differential output or open collector output Division ratio Arbitrary frequency division.  Output pulse Encoder pulse or position Pulse instruction(can be set).  Digital input signals Servo ON, alarm reset, speed instruction negat zero-speed clamp, internal speed control, external forw reverse torque limit etc.  Digital output signals Alarm state, servo ready, brake off, speed reached, torque limiting, speed limiting, zero-speed output, etc.  Speed input Input voltage-10V to +10V (Maximum speed at ±10V).  1) Internal torque limit by P03.09, P03.10 2) External torque limit by P03.11, P03.12 enabled by P_CL/N_CL signals 3) TLMTP i.e. Al1 or Al2 as external forward/reverse torque limit 4) TLMTP as forward limit; TLMTN as reverse limit  Torque feedforward 2) TFFD, Al1 or Al2  Digital input riginals Servo ON, alarm reset, torque instruction negation,						nina	Encoder resolution/10000000 < A/B < Encoder resolution/2.5											
Digital input signals  Analog input  Analog input  Torque limit source  Digital input signals  Analog input  Analog input  Analog input  Analog input  Analog input  Analog input  Digital input signals  Analog input  Analog inp					Output	-	e A-Phase, B-Phase: Differential output											
Digital input signals  Digital output signals  Analog input  Analog input  Digital output signals  Analog of English Surve  Analog of English Surv						o ratio					collecto	r output						
Digital output signals  Alarm state, servo ready, brake off, speed reached, tord limiting, speed limiting, zero-speed output, etc.  Speed input  Input voltage -10V to +10V (Maximum speed at ±10V).  1) Internal torque limit by P03.09, P03.10  2) External torque limit by P03.11, P03.12 enabled by P_CL/N_CL signals  3) TLMTP i.e. Al1 or Al2 as external forward/reverse torque limit  4) TLMTP as forward limit; TLMTN as reverse limit  Torque  1) Internal torque feedforward  feedforward 2) TFFD, Al1 or Al2  Digital input signals  Servo ON, alarm reset, torque instruction negation,			Jour	Juc							ruction(d	an be se	t).					
Digital output signals  Alarm state, servo ready, brake off, speed reached, tord limiting, speed limiting, zero-speed output, etc.  Speed input Input voltage -10V to +10V (Maximum speed at ±10V).  1) Internal torque limit by P03.09, P03.10 2) External torque limit by P03.11, P03.12 enabled by P_CL/N_CL signals 3) TLMTP i.e. Al1 or Al2 as external forward/reverse torque limit 4) TLMTP as forward limit; TLMTN as reverse limit  Torque 1) Internal torque feedforward feedforward 2) TFFD, Al1 or Al2  Digital input rigids Servo ON, alarm reset, torque instruction negation,			Digi	ital	inputsiç	Servo ON, alarm reset, speed instruction negation, gnals zero-speed clamp, internal speed control, external forward/												
source 3) TLMTP i.e. All or Al2 as external forward/reverse torque limit 4) TLMTP as forward limit; TLMTN as reverse limit  Torque 1) Internal torque feedforward feedforward 2) TFFD, Al1 or Al2  Digital input cionals Servo ON, alarm reset, torque instruction negation,		_	Digit	tal c	outputsi	Alarm state, servo ready, brake off, speed reached, torque												
source 3) TLMTP i.e. All or Al2 as external forward/reverse torque limit 4) TLMTP as forward limit; TLMTN as reverse limit  Torque 1) Internal torque feedforward feedforward 2) TFFD, All or Al2  Digital input signals Servo ON, alarm reset, torque instruction negation,		ontro			Speed	input												
source 3) TLMTP i.e. All or Al2 as external forward/reverse torque limit 4) TLMTP as forward limit; TLMTN as reverse limit  Torque 1) Internal torque feedforward feedforward 2) TFFD, Al1 or Al2  Digital input cionals Servo ON, alarm reset, torque instruction negation,		eedc			Torquo	limit	2) Externa	l torque li	mit by P03			ed by						
Torque 1) Internal torque feedforward 2) TFFD, AI1 or AI2		Sp					3) TLMTP i.e. Al1 or Al2 as external forward/reverse torque limit											
Digital input signals   Servo ON, alarm reset, torque instruction negation,							1) Internal torque feedforward											
Alarm state servicing du hrake off speed reached toro		0	Digi	ital			Servo ON, alarm reset, torque instruction negation,											
Digital output signals limiting etc.		contro	Digi	talo	output si	gnals	Alarm stat	te, servo		ake off, s	speed re	ached, to	orque					
Analog input   Torque input   DC±10V as to rated torque(adjustable by function codes   Speed limit   1) Positive/negative speed limit P03.27, P03.28		anb.	Analo	og in	put Torqu	ie input			d torque(	adjus ta b	le by fun	ction co	des)					
Speed limit 1) Positive/ negative speed limit P03.27, P03.28 2) SPL i.e. Al input		Tor	Spe	ed l	imit					limit P03	3.27, P03	3.28						

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		Items	3		Specification					
	Π	Speed	monitoring	Provided						
		Vibratio	on control	Provided						
Sc	⊆	Adaptiv	e notch filter	Provided						
ţi	ommo	Auto-tu	-	Provided						
Functions	Com	Encode division multipli	er output n and cation	Provided						
		Interna control	l position	Provided	Provided					
		PC sett	ing	S ervostudio software						
		Protecti	ve functions	Overvoltage, power supply error, overcurrent, overheat, overload, encoder error, over speed, position deviation t large, parameter error						
SL	Tom	perature	Ambient to	emperature for use	0~55°C					
pecifications	16111	perature	Ambient ten	perature for storage	-20~65°C					
fica	н	ımidity	Ambient	humidity for use	20~85% RH or less (Without condensation)					
l Seci	110	illiaity	Ambient h	umidity for storage	20~85% RH or less (Without condensation)					
nvironmental sp		Atmos	phere for u	se & storage	Indoors (Not subject to direct sunlight); free from corrosive gas, flammable gas, oil mist, or dust.					
n n			Altitud	е	1000m or less above sea level					
Enviro			Vibratio	on	5.8m/s2 (0.6G) or less, 10~60Hz (No continuous operation allowed at frequency of resonance)					

Note 1) The installation of regenerative resistor is decided by setting panel. For details, refer to [selection of external regenerative resistors]. Please select the resistor with higher resistance and power when the temperature is too high Note 2) For input pulse forms, refer to the User Manual.

#### 3. Installation and size of servo motor and drive



#### ► Installation environment conditions

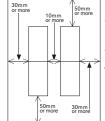
About the environmental conditions, make sure to follow the company's instructions. If you need to use the product outside the scope of the environmental conditions, please consult HCFA Corporation in advance.

- 1. Keep it away from the direct sunlight.
- 2. Drive must be installed in the cabinet.
  3. Keep it away from the water, oil (cutting oil, oil mist) and moisture.
- 4. Do not install the equipment under the conditions with water, corrosive and flammable
- gas.

  5. Free from the dust, iron powder, cutting powder and so on.
- 6. Keep it away from the area with high temperature, excessive vibration and shock.

#### Installation direction and space

Leave sufficient space around the drive to ensure the heat dissipation and convection in the cabinet when installing the drive.



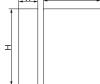
Install the drives in the vertical direction. Please use two M5 screws to fix the drive of 750W or less respectively. Use three M5 screws to fix the drive and master drive of 1kW or more respectively. In order to ensure that surrounding temperature between internal boards is not more than 55°C, cooling fan or cooler is needed to reduce the temperature, when the drives are installed in the sealed cabinet.

• The temperature on the surface of cooling plate would be 30°Chigher than

Use heat-resistant material for the wiring and isolate wiring from the achine and other cables which are easily affected by the temperature. The service life of servo drive depends on the temperature around t he electrolytic capacitor. When the electrolytic capacitor is close to the service life, the static capacity will decrease and internal resistance will increase. Consequently, it will lead to overvoltage alarm, malfunction caused by noise and components damage.

The s ervice life of electrolytic capacitor is approx. 5 to 6 years under the condition faverage annual temperature 30°C, load rate 80% and operation of less than 20 hours a day on average j.

#### Drive dimension

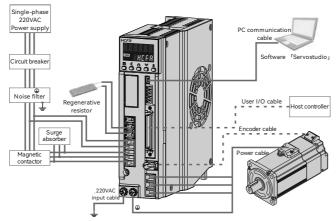


┪	MadalC	\/ \/2F	)AIIIA		Weight			
	Models	0V-V3L	иши	W(mm)	H(mm)	D(mm)	(kg)	
	005	010	020	42	160	135	0.7	
	040	075		49	160	135	0.8	
	100	150	200	84	160	135	1.6	

#### 4. Wiring explanation for servo motor and drive



#### Wiring diagram



[Points for correct wiring]

- $\times$  Control power input  $\mbox{ (L1C, L2C)}$  and main circuit power supply (L, N or L1, L2, L3) should be wired from the same 200VAC main power supply.
- \* A twisted-pair shielded cable should be used when I/O cable length is over 50cm \* The encoder cable should be less than 20m



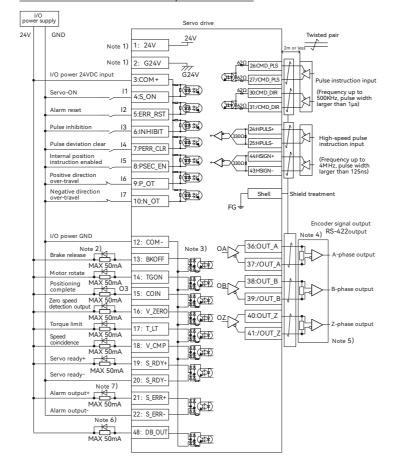
- ① Please note that there is high voltage in the solid line of wiring diagram when wiring
- $\ensuremath{\mathfrak{D}}$  The broken lines in the wiring diagram indicates the non-dangerous voltage circuit.

#### 5. Wiring



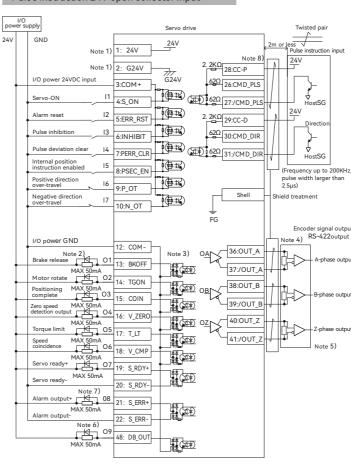
#### ► Wiring for user I/O connector (CN1)

#### Pulse instruction differential input

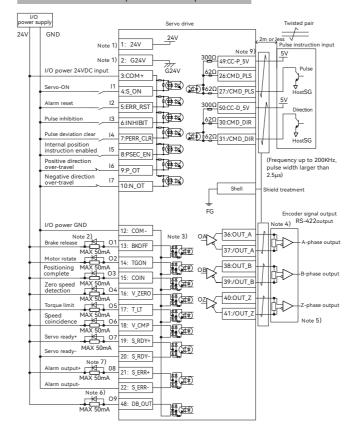


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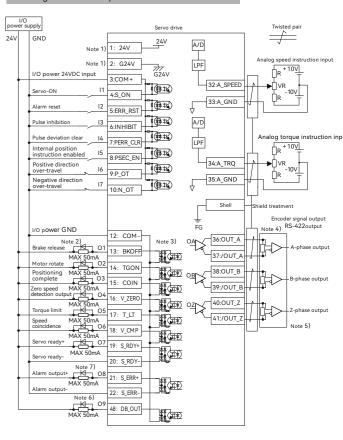
#### Pulse instruction 24V open collector input



#### Pulse instruction 5V open collector input



#### Analog instruction input



- Note 1: Control power output (24V, G24V) can be used as I/O power (COM+, COM-).

  But the maximum output current is 150mA, and when driving the output such as relay and brake, please use external independent power.
- Note 2: Please connect protective circuit (diode) when driving load with inductive component such as relay.
- Note 3: The output circuit is the transistor output mode of the Darlington-connected method of the collector open circuit, which is connected with relay or optocoupler. Please don't connect transistor directly because the voltage VCE (SAT) between collector and emitter is about 1V which cannot meet the required voltage VIL of TTLIC when transistor is ON.
- Note 4: The differential pulse output and 485 communication circuits need to connect the terminal resistor.

  Note 5: Connect the signal ground on the host control device of output signal of the
- encoder. The connection of signal ground and power supply GND may cause
- mairunction.

  Note 6: O9 does not configure any functions by default, but can be used as the DO output and the OC output of Z-pulse. In this case, do not configure any DO function to O9 that is P04. 29 is set to 0, and P04. 54 is set to 1.
- Note 7: The default function of O8 is the fault output, and the default output logic state is normally closed output.
- Note8: Two types according to the pulse generation method :NPN and PNP.
- Note9: Two types according to the pulse generation method :NPN and PNP.
- $\ensuremath{\mathbb{X}}$  DI function can be configured by function code flexibly. DI becomes valid when
- connected and the positive/negative logic can be changed by function code.
- \* DO function can be configured by function code flexibly. DO becomes valid when connected and the positive/negative logic can be changed by function code.

#### ▶ Description of User I/O connector (CN1) terminal arrangements

#### Terminal arrangements

CMD_PL			CMD_DIR A_SPEED		A_TRQ OUT_A			OUT_B			OUT_Z SG				HSIGN+					48 09		CC-D_	5V	
/CI	27 1D_PLS	CC		/CME		A_G		A_G	5 ND	0U1		0U1		0U1		HSI		Si Si		4		CC-F		
1 VCC	cc	3 M1	5	2	7		9	6	1	1 8	1		1 0		10		1º 07		2 08		2	3	25 HPUL	S-
	2 4 G24 I1		É		8 E	3 5	10		.1 CO	12 1 0M2 0		4 16 2 04		6 18 04 06		18 2 06 0		20 07-		2  -	HPU	4 LS+		

