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# Chapter 2

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## Installation

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## APD-VS[Standard Type] Manual

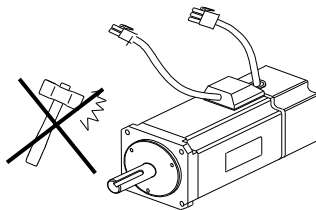
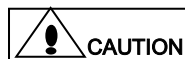
### 2.1 Servo motor

#### 2.1.1 Operating Environment

Item	Environment	Remark
Temp.	0~40[°C]	In case of out of temp-range, inquire to Technical department and order separately
Humidity	Less than 80[%]RH	There should be no steam
External Vibration	Vibration Acceleration X, Y direction less 19.6[m/s <sup>2</sup> ]	Excessive vibration might cause shortening of bearing lifetime

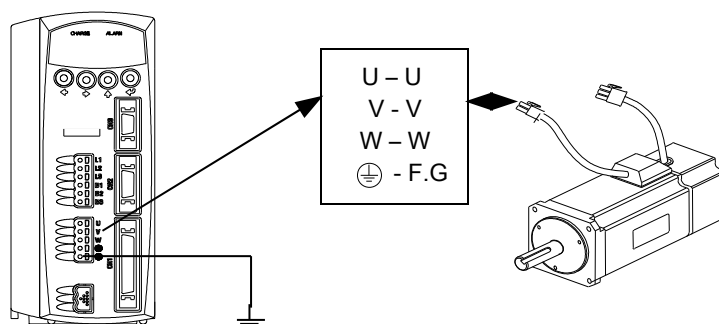
#### 2.1.2 Preventing Excessive Impact

- Impacting the shaft when installation or dropping the motor might cause the damage of encoder.



#### 2.1.3 Wiring

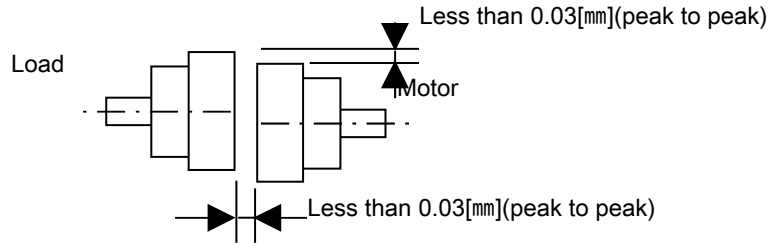
- Connecting commercial power supply directly to motor would cause damage of motor  
So, the User should certainly connect to designated drive
- Ground terminal of motor should be connected to one of ground terminals (two) in drive and another terminal should be connected to 3 class earth ground.



- Match the U, V and W terminals of the motor with those of the driver
- Check if there are out of placed pin or fault of connection
- In case of moisture or condensation on motor, Surely check if the insulation resistance is more than 10[MΩ] and (500V), and then installation.

### 2.1.4 Assembling Load System

- Coupling assembling : Install motor shaft accurately match with load shaft within tolerance range.

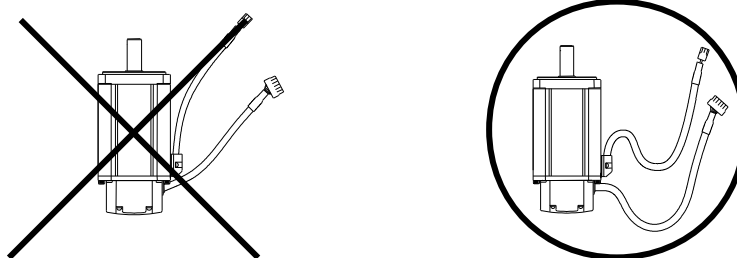


- Pulley assembling :

Flange	Radial load		Axial load		Reference diagram
	N	kgf	N	kgf	
40	148	15	39	4	
60	206	21	69	7	
80	255	26	98	10	
130	725	74	362	37	
180	1548	158	519	53	
220	1850	189	781	90	
250	5880	600	2156	220	Nr : Less than [100mm]
280	7448	760	2156	220	

### 2.1.5 Cable Installation

- In case of vertical Installation, care about oil or water that can be flowed into joint





- Prevent Cable from the stress or flaw  
Especially, while motor is moving, surely use the movable cable and cable should not be rolled.

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### 2.2 Servo Drive

#### 2.2.1 Operating Environment

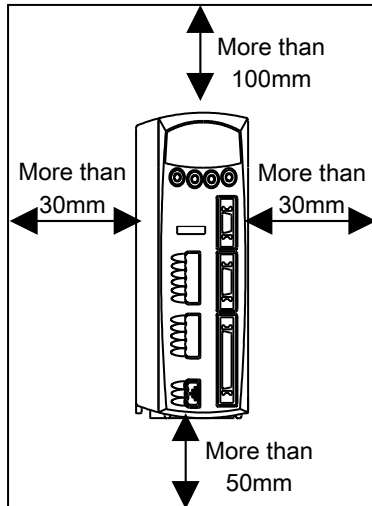
- Must use Servo Drive in indoors which satisfy below conditions

Items	Operating environment	Remarkable
Temp.	0~50[°C]	 Avoid heat by installing fans in order to keep the proper ambient temperature.
Humidity	Less than 90[%]RH	 Stopping for long time, drive can be damaged by condensation or tree zing. Therefore, operate after removing the moisture of drive sufficiently.
External Vibration	Vibration Acceleration Less than 5.9[m/s <sup>2</sup> ]	Excessive vibration might cause shortening the lifetime and malfunction.
Environment	<ul style="list-style-type: none"> <li>- Avoid direct sunlight</li> <li>- Avoid corrosive and flammable gas.</li> <li>- Avoid oil mist or dust.</li> <li>- Keep ventilation on closed place.</li> </ul>	

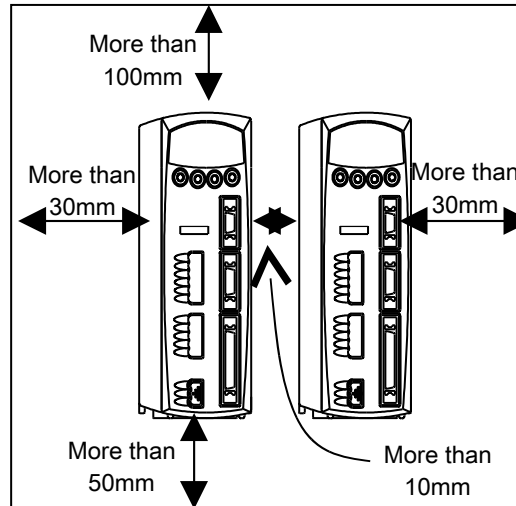
## Chapter2 Installation

### 2.2.2 Installing in a Control Board(Panel)

- Installation space is as below.



Install 1 drive



Install more than 2 drives

Note1) Install heat sources, such as regenerative resistance, away from the driver



- Exercise caution to prevent chips produced by drilling from getting into the drive when drilling control panels.
- Take appropriate measures to prevent oils, water and metal powder from getting into the driver from openings in the control panels.
- If the drive is used in a place with large amount of toxic gases and dust, protect the drive with and air purge.


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### 2.2.3 Wiring

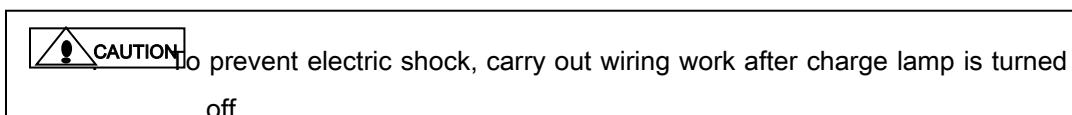
- Check the input voltage, and keep it within range.



- Connecting commercial power supply to the U,V,W terminals of drive may cause damage.  
( Certainly connect power supply to L1, L2, L3 terminals )
- Certainly use the standard resistance value for regenerative resistance that is to be connected to B1, B2 terminals of drive.

Model	Resistance	Standard Capacity	*Remarkable
VS02~VS04	50[Ω]	Internal 50[W]	 When expanding regenerative capacity, the resistance value should be referred to "7.3 Option and peripherals"
VS05~VS10	40[Ω]	External 140[W]	
VS15~VS20	23[Ω]	External 300[W]	
VS35~VS75	11.5[Ω]	External 300[W] × 2	

- If there is additional control power supply (more than VS05), construct system in which control power supply (L1C, L2C) is supplied first and then main power supply (L1, L2, L3) is to be supplied.
- "High voltage" still remains for a while even after power is turned off.



- Ground the terminals at the shortest distance  
Long ground distance can lead to wrong operation by noise effect.