XINJE

xinje electronic co., ltd.
4th floor building 7, originality
park, 100 dicui road, wuxi, jiangsu 214072
Tel: 0510-85166657 85123803
Fax: 0510-85111290
http://www.xinje.com
www.thinget.com
E-mail: sales@xinje.com

XINJE

Exquisite appearance
Powerful function

Perfect quality stable performance

DP series digital stepper drive

Xinje drive technology

DP series digital stepper drive uses more advanced sinusoidal current (PWM) control technology to form closed-loop current, open loop position and position error correction. It has more stable performance, stronger anti-jamming capability, compact volume and high performance-price ratio. It is compatible with 2-phase (4, 6, 8 wires) and 3-phase (3, 6 wires) stepper motors.

Stable performance

DP series drives have high input voltage and high output current which can increase the motor output torque at high speed and control the position precision at low speed. The drives improve the motor running defects of high noise, vibration and severe heating to make the motor running more stable.

High step resolution, easy to set the current

The step resolution of DP series drives can be set freely which can up to 300, and the current can be selected at any levels.

Strong motor drive capability

The performance of drive has been improved significantly which used advanced current control technology. Input pulse frequency can up to 200 kHz, no-load speed can up to 3000 rpm, be with high torque at high speed.

Control panel, easy to operate

The DP-708, DP-5022 type of drives equipped with control panel which has rich functions and easy operation. Users can modify the step resolutions, current; configure the internal pulse, and RS485 communication. The control panel also adds monitor function including drive configuration and alarm information.

Perfect protection functions

DP series drives have protection functions. When overvoltage or overcurrent, the protection circuit will cut the PWM output, and the LED (ERR and COM) will illuminate.

Type list

Type	Sort	Current (A)	Voltage (V)	Step resolution	Compatible motor	Dimension (mm)
DP-504	2-phase standard	0 ~ 5.0	DC+20 ~ +40	2 ~ 200	42、57、86	138.0*85.0*38.0
DP-508	2-phase standard		DC+20 ~ +80		86	
DP-708	2-phase enhanced	0 ~ 7.0	DC20 ~ 80	2 ~ 300	86、110	165.0*137.0*50.0
DP-5022	3-phase enhanced	0 ~ 5.0	AC200 ~ 240		86、110、130	
DP-7022	3-phase standard	0 ~ 7.0	AC200 ~ 240	2 ~ 200	86、110、130	187.0*121.4*20.0

Naming rule

The principles of stepper motor and drive selection

- **Torque**
  Holding torque is a very important parameter for motor matching. When the load is large, it needs high torque motor.
- **Motor running speed**
  When the motor speed is high, the drive needs big phase current motor and higher supply voltage to increase the input power.
- **Position precision**
  It is related to the step resolution.
- **To select the suitable drive also needs to consider the motor current, step resolution and supply voltage**

Low noise 40/80 V 2-phase drives

DP- 504 / DP- 508

DP-504 / DP-508 2-phase drives: input voltage DC 40/80 V, compatible with 2-phase (4, 6, 8 wires) mixed stepper motors whose current is below 5.0 A, suitable for small automatic devices require low noise, high precision, low vibration such as cutting machine, CNC machine.

Performance features

- Digital control, excellent performance
- Motor running with low noise
- Supply voltage: up to DC 40/80 V
- Output current peak: up to 5.0A
- Step resolution (up to 200 steps) is dynamic selectable
- Compatible with 2–phase (4, 6, 8 wires) stepper motors
- Optical isolation signal I/O
- Current can be selected at any levels
- Protection functions of overvoltage and overcurrent
- Delicate appearance, easy to install

Electrical Characteristics

Item	DP- 504			DP- 508		
	Min	Typical	Max	Min	Typical	Max
Output current (A)	1.4	-	5.0	1.4	-	5.0
Input supply voltage	20	36	40	20	80	80
Logical input current (mA)	7	10	16	7	10	16
Step pulse frequency (kHz)	0	-	200	0	-	200
Insulation resistor (mΩ)	500	-	-	500	-	-
Ambient temperature	0℃ ~ 50℃					
Max working temperature	60℃					
Humidity	0~90% RH (no condensation, no water drops)					
Vibration	5.9m/s² Max					
Storage temperature	- 20℃ ~ 65℃					
Dimension (mm)	138×85×38					

Step resolution setting

Times	Step/circle (1.8°/ full-step)	SW2	SW3	SW4	SW5
1	200	OFF	OFF	OFF	OFF
2	400	OFF	OFF	OFF	ON
4	800	OFF	OFF	ON	OFF
8	1600	OFF	OFF	ON	ON
16	3200	OFF	ON	OFF	OFF
32	6400	OFF	ON	OFF	ON
64	12800	OFF	ON	ON	OFF
128	25600	OFF	ON	ON	ON
5	1000	ON	OFF	OFF	OFF
10	2000	ON	OFF	OFF	ON
20	4000	ON	OFF	ON	OFF
25	5000	ON	OFF	ON	ON
40	8000	ON	ON	OFF	OFF
50	10000	ON	ON	OFF	ON
100	20000	ON	ON	ON	OFF
200	40000	ON	ON	ON	ON

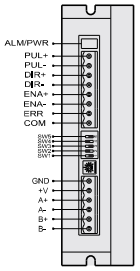
Current setting

Set the semi-current/full-current by DIP switch SW1.
SW1=OFF, semi-current; SW1=ON, full-current.
Set to any current levels in the range of 0 to 5.0 A via single-circle potentiometer. See the right diagram:

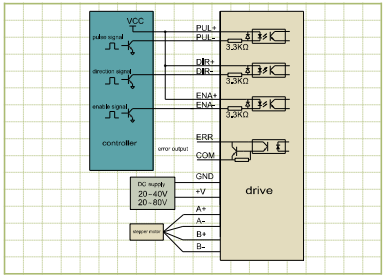
Signal description

Signal description		Function	Explanation
P1 control signal interface	PUL +	Pulse signal	The motor moves one step at the rising edge of the pulse when the rising edge is effective. High voltage: 22~24 V, low voltage: 0~0.5 V.
	PUL -		
	DIR +	Direction signal	Exchange of any phase can change the direction of the motor when high/low voltage is effective, because the original direction of the motor depends on the motor connection.
	DIR -		
	ENA +	Enable signal	To release the motor, the drive will cut off each phase current and make the motor free, when ENA+ connects positive voltage and ENA- connects negative voltage. Please let the terminal be vacant if out of use.
	ENA -		
	ERR	Error signal	Output error signal if overcurrent or overvoltage (DP-504: > 50 V, DP-508: > 85 V).
	COM		
P2 interface	GND	DC supply ground	
	+ V	DC supply positive	20~40 V (DP-504), 20~80 V (DP-508)
	A+、A-	Motor phase A	Exchange of A+ and A- can change the motor direction
	B+、B-	Motor phase B	Exchange of B+ and B- can change the motor direction

Terminals



Typical wiring diagram



DP-708 2-phase drive

DP–708 2–phase drive: input voltage DC 80 V, compatible with 2–phase mixed stepper motors whose current is below 7.0 A, suitable for small automatic devices require low noise, high precision, low vibration, low heating such as engraving machine, CNC machine.

Features

- Digital control, excellent performance
- Low running motor noise
- Power supply: up to DC 80 V
- Output peak current: up to 7.0 A
- The step resolution (up to 300 steps) is dynamic selectable
- Suitable for 2–phase (4, 6, 8 wires) stepper motors
- Optical isolation signal I/O
- The current can be selected at any levels
- Protection functions of overvoltage and overcurrent
- Operate through control panel, simply and directly

Electrical characteristics

Item	Min	Typical	Max
Output current (A)	0.5	-	7.0
Input supply voltage (VDC)	20	80	80
Logical input current (mA)	7	10	16
Step pulse frequency (kHz)	0	-	200
Insulation resistor (mΩ)	500	-	-
Ambient temperature	0℃ ~ 50℃		
Max working temperature	60℃		
Humidity	1.0~90% RH (no condensation, no water drops)		
Vibration	5.9m/s² Max		
Storage temperature	- 20℃ ~ 65℃		

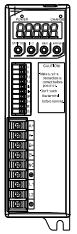
Current setting

Set to any current levels in the range of 0 to 7.0 A in parameter P0–00 through the control panel. Set full–current, semi–current in parameter P0–01.

Step resolution setting

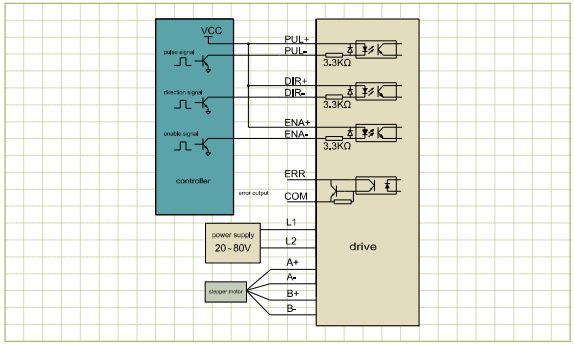
Set the step resolution in parameter P0–02 through the control panel. The resolution can up to 300.

Terminals



Signal		Function	Explanation
Signal interface	A-、B/COM1	RS485/232 communication	Set F3-00 to C-out to support Modbus-RTU protocol can be applied to data monitoring and drive parameters configuration.
	PUL +	Pulse signal	The motor moves one step at the rising edge of the pulse, when the rising edge is effective. High voltage: 22~24 V, low voltage: 0~0.5 V.
	PUL -		
	DIR +	Direction signal	Exchange of any phase can change the direction of the motor when high/low voltage is effective, because the original direction of the motor depends on the motor connection.
	DIR -		
	ENA +	Enable signal	To release the motor, the drive will cut off each phase current and make the motor free, when ENA+ connects positive voltage and ENA- connects negative voltage. Please let the terminal be vacant if out of use.
	ENA -		
	ERR	Error signal	Output error signal if overvoltage (> 90 V), undervoltage (< 18.6 V), overcurrent.
	COM		
Strong electricity interface	A+、A-	Motor phase A	Exchange of A+ and A- can change the motor direction
	B+、B-	Motor phase B	Exchange of B+ and B- can change the motor direction
	NC	-	Vacant
	⊕	Ground	Power supply ground
	L1、L2	Power supply	In the range of 20 to 80 V, please use recommended value
	⊕	Ground	Power supply ground

Typical wiring diagram



DP-5022 3-phase stepper drive

DP–5022 3–phase drive: input voltage AC 220 V, compatible with 3–phase mixed stepper motors whose current is below 5.0 A, suitable for automatic devices require high positioning accuracy, low–speed stable running, such as engraving machine, CNC machine, cutting machine.

Features

- Digital control, perfect performance
- Sine wave current control: up to 5.0 A
- Supply voltage 200~240VAC
- Optical isolation signal I/O
- Step resolution (up to 300 steps) is dynamic selectable
- Current can be set to any levels
- Protection functions of overvoltage, overcurrent
- High startup speed
- Simple and direct operation through the control panel

Electrical characteristics

Item	Min	Typical	Max
Output current (A)	0	-	5.0
Input supply voltage (VAC)	200	-	240
Logical input current (mA)	7	10	16
Step pulse frequency (kHz)	0	-	200
Insulation resistor (mΩ)	500	-	-
Ambient temperature	0℃~50℃		
Max working temperature	60℃		
Humidity	0~90% RH (no condensation, no water drops)		
Vibration	5.9m/s² Max		
Storage temperature	- 20℃~65℃		

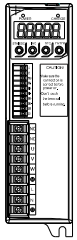
Current setting

Set to any current levels in the range of 0 to 5.0 A in parameter P0–00 through the control panel. Set full–current, semi–current in parameter P0–01.

Step resolution setting

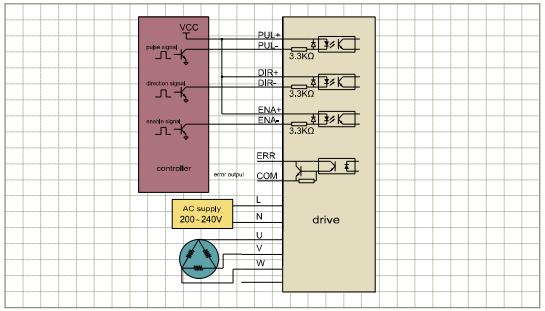
Set the step resolution in parameter P0–02 through the control panel. The resolution can up to 300.

Signal description



Signal		Function	Explanation
Signal interface	A、B/COM1	RS485/232 communication	Set F3-00 to C-out to support Modbus-RTU protocol; can be applied to data monitoring and drive parameters configuration.
	PUL+	Pulse signal	The motor moves one step at the rising edge of the pulse, when the rising edge is effective. High voltage: 22~24 V, low voltage: 0~0.5 V.
	PUL–		
	DIR+	Direction signal	Exchange of any phase can change the direction of the motor when high/low voltage is effective, because the original direction of the motor depends on the motor connection.
	DIR-		
	ENA+	Enable signal	To release the motor, the drive will cut off each phase current and make the motor free, when ENA+ connects positive voltage and ENA- connects negative voltage.Please let the terminal be vacant if out of use.
	ENA -		
	ERR	Error signal	Output error signal if overvoltage (>268 V), undervoltage (<180V), overcurrent.
	COM		
Strong electricity interface	NC	-	Vacant
	U	Motor phase U	Motor phase U output
	V	Motor phase V	Motor phase V output
	W	Motor phase W	Motor phase W output
	⏚	Ground	Ground
	L、N	Power supply	Power supply input: 200 ~ 240 VAC

Typical wiring diagram



DP-7022 3-phase stepper drive

DP–7022 3–phase drive: input voltage AC 220 V, compatible with 3–phase mixed stepper motors whose current is below 7.0 A, suitable for automatic devices require high positioning accuracy, low–speed stable running, such as engraving machine, CNC machine, cutting machine.

Features

- Digital control, perfect performance
- Sine wave current control: up to 7.0 A
- Power supply 200~240 VAC
- Optical isolation signal I/O
- Step resolution (up to 200 steps) is dynamic selectable
- Current can be set to any levels easily
- Protection functions of overvoltage, overcurrent
- Delicate appearance, easy to install

Step resolution setting

Times	Step/circle (1.8°/full-step)	SW2	SW3	SW4	SW5
1	200	OFF	OFF	OFF	OFF
2	400	OFF	OFF	OFF	ON
4	800	OFF	OFF	ON	OFF
8	1600	OFF	OFF	ON	ON
16	3200	OFF	ON	OFF	OFF
32	6400	OFF	ON	OFF	ON
64	12800	OFF	ON	ON	OFF
128	25600	OFF	ON	ON	ON
5	1000	ON	OFF	OFF	OFF
10	2000	ON	OFF	OFF	ON
20	4000	ON	OFF	ON	OFF
25	5000	ON	OFF	ON	ON
40	8000	ON	ON	OFF	OFF
50	10000	ON	ON	OFF	ON
100	20000	ON	ON	ON	OFF
200	40000	ON	ON	ON	ON

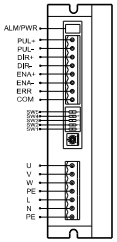
Electrical characteristics

Item	Min	Typical	Max
Output current (A)	0	-	7.0
Input supply voltage (VAC)	200	-	240
Logical input current (mA)	7	10	16
Step pulse frequency (kHz)	0	-	200
Insulation resistor (mΩ)	500	-	-
Ambient temperature	0℃~50℃		
Max working temperature	60℃		
Humidity	0~90% RH (no condensation, no water drops)		
Vibration	5.9m/s² Max		
Storage temperature	- 20℃~65℃		

Current setting

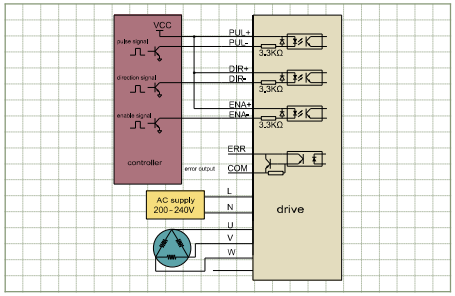
Set the semi–current/full–current by DIP switch SW1.
SW1=OFF, semi–current; SW1=ON, full–current. Set any current levels in the range of 0 to 5.0 A via single–circle potentiometer. See below diagram:

Terminals



Signal		Function	Explanation
Signal interface	PUL+	Pulse signal	The motor moves one step at the rising edge of the pulse, when the rising edge is effective. High voltage: 22~24 V, low voltage: 0~0.5 V.
	PUL–		
	DIR+	Direction signal	Exchange of any phase can change the direction of the motor when high/low voltage is effective, because the original direction of the motor depends on the motor connection.
	DIR–		
	ENA+	Enable signal	To release the motor, the drive will cut off each phase current and make the motor free, when ENA+ connects positive voltage and ENA- connects negative voltage. Please let the terminal be vacant if out of use.
	ENA–		
	ERR	Error signal	Output error signal if overcurrent, overvoltage.
	COM		
Strong electricity interface	U	Motor phase U	Motor phase U output
	V	Motor phase V	Motor phase V output
	W	Motor phase W	Motor phase W output
	PE	Ground	Ground
	L	Power supply	Supply input: 200 ~ 240 VAC
	N		
	PE	Ground	Ground

Typical wiring diagram



Types of mixed stepper motors

Types of 2-phase stepper motors

Drive	Compatible motor	Step Angle (°)	Length (mm)	Holding torque (N.m)	Phase current (A)	Phase resistor(Ω)	Phase inductance (mH)	Rotor inertia (g.cm²)	Shaft diameter (mm)	Weight (kg)
DP-504	42BYGH038	1.8	38	0.26	1.2	3.3	3.2	54	5.0	0.28
DP-504	42BYGH047	1.8	47	0.32	1.2	3.3	2.8	68	5.0	0.35
DP-504	57BYGH051	1.8	51	0.76	3	0.74	0.9	275	6.35	0.65
DP-504	57BYGH056	1.8	56	0.9	3	0.75	1.1	300	6.35	0.7
DP-504	57BYGH076	1.8	76	1.35	3	1.0	1.6	480	6.35	1
DP-504/DP-508	86BYGH065	1.8	65	3.3	2.8	1.4	3.9	1000	9.5	1.7
DP-508/DP-708	86BYGH080	1.8	80	4.5	4.2	0.8	3.4	1400	12.7	2.3
DP-508/DP-708	86BYGH118	1.8	118	8.5	4.2	1.2	6.0	2700	12.7	3.8
DP-508/DP-708	86BYGH156	1.8	156	12	4.2	1.25	8.0	4000	12.7	5.4
DP-708	110BYGH099	1.8	99	8.5	5.5	0.9	1.0	5500	16	5
DP-708	110BYGH115	1.8	115	12	6	0.33	1.1	7200	16	6
DP-708	110BYGH150	1.8	150	21	6.5	0.58	1.3	10900	16	8.4

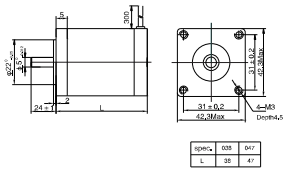
Types of 3-phase stepper motors

Drive	Compatible motor	Step Angle (°)	Length (mm)	Holding torque (N.m)	Phase current (A)	Rotor inertia (g.cm²)	Phase resistor (Ω)	Phase inductance (mH)	Shaft diameter (mm)	Shaft (mm)	Weight (kg)
DP-5022/DP-7022	86BYGH3069-H	1.2	69	2	1.75	1320	3.77	11.6	12	Flat key4*20	2
DP-5022	86BYGH3069	1.2	69	2	5.8	1320	0.5	0.9	12	Flat key4*20	2
DP-5022/DP-7022	86BYGH3097-H	1.2	97	4	2	2400	4.65	14.6	12	Flat key4*20	3
DP-5022	86BYGH3097	1.2	97	4	5.8	2400	0.7	1.5	12	Flat key4*20	3
DP-5022/DP-7022	86BYGH3125-H	1.2	125	6	3	3480	2.0	8.0	12	Flat key4*20	4
DP-5022	86BYGH3125	1.2	125	6	5.8	3480	0.9	2.17	12	Flat key4*20	4
DP-5022/DP-7022	110BYGH3125	1.2	124.5	8	4.3	6000	1.25	4.49	19	Flat key6*30	5
DP-5022	110BYGH3148	1.2	148	12	6	9720	1.89	8.34	19	Flat key6*30	6.6
DP-5022	110BYGH3182	1.2	182	16	6.4	13560	1.89	8.73	19	Flat key6*30	9
DP-5022	110BYGH3216	1.2	216	20	6.9	17400	1.859	7.26	19	Flat key6*30	11.1
DP-5022/DP-7022	130BYGH3154	1.2	154	15	4	20000	0.88	3.7	24	Flat key8*30	11
DP-5022/DP-7022	130BYGH3183	1.2	183	20	4	26700	1.1	4.9	24	Flat key8*30	14.1
DP-5022/DP-7022	130BYGH3215	1.2	215	28	4	33970	2.8	17.9	24	Flat key8*30	17.2
DP-5022/DP-7022	130BYGH3247	1.2	247	35	4	41240	3.3	21.52	24	Flat key8*30	19.8
DP-5022/DP-7022	130BYGH3311	1.2	311	50	4	55780	4.2	28.9	24	Flat key8*30	26

Motor outline and dimension

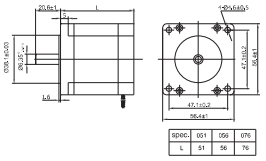
2-phase motor

42BYGH



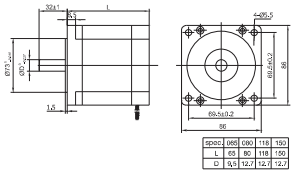
wiring diagram(see figure A)

57BYGH



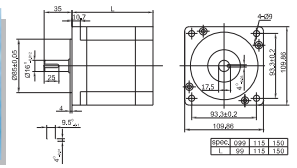
wiring diagram(see figure A)

86BYGH



wiring diagram(see figure B)

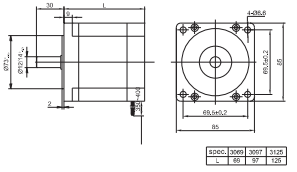
110BYGH



wiring diagram(see figure C)

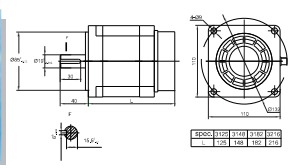
3-phase motor

86BYGH



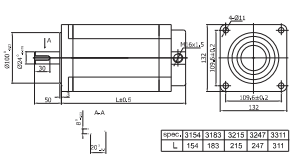
wiring diagram(see figure D)

110BYGH



wiring diagram(see figure E)

130BYGH

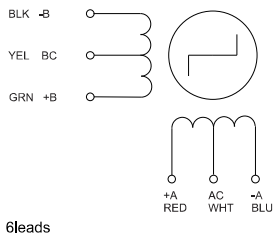


wiring diagram(see figure E)

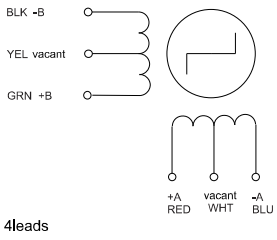
Wiring diagram

2-phase motor wiring

Figure A



6leads



4leads

Figure B

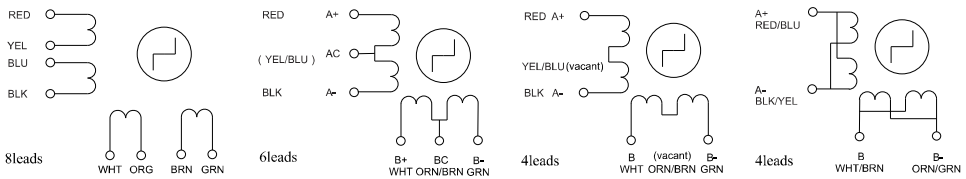
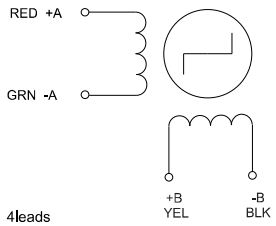


Figure C



3-phase motor wiring

Figure D

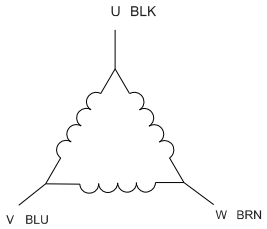
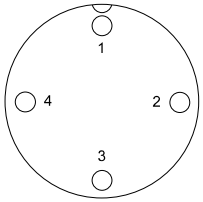


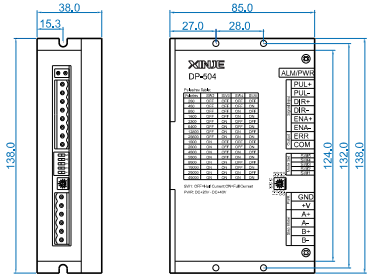
Figure E



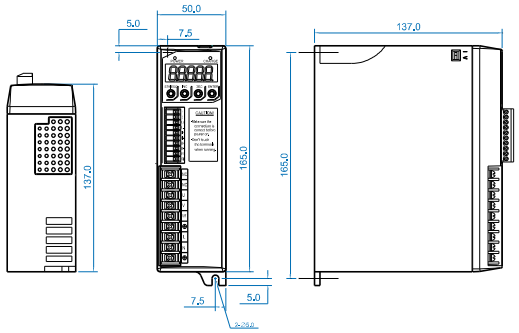
No.	1	2	3	4	4–pin socket
phase	U	V	W	GND	

Mounting Dimension (unit:mm)

● DP-504/DP-508



● DP-708/DP-5022



● DP-7022