

# 2 Phase Micro Step Motor Driver

# MDC2516 User Manual

1. Use the precaution	6.Output/input signal circuit
2.The confirmation of content	7.Connecting diagram
3.Store and install	8.Diemsnsions
4.The sunmary	9.Specifications
5.Introduction of the panel	10.Leads of motor connection

Please read and be familiar with the notices of specification and security in user manual before to use the driver. Please reserve this user manual

## 1. Use the precaution

### ★ Suitable range

Our product is design for general industrial, not suitable for with having great influence on safety of life as vehicle transporting or medical apparatus.

### ★ Warranty range

Warranty is one year after buying from Hanmark or distributor.

### ★Avoid the responsibility item

Following item don't belong to warranty range

- ①take apart the drive, repair or transform by oneself.
- ②The use of environment or terms are not fit in with drive specifications.
- ③Unsuitable to use the drive, make the drive breakdown.
- ④Breakdown not caused from the defect of the design or manufacture of the product.
- ⑤Breakdown due to responsibility exclusive events, such as misuse, abuse, accident, act of god, or any natural calamity.

### ★ Safety Cautions

- ①These SAFETY CAUTIONS are classified into three grades: "DANGER", "CAUTION", and "PROHIBITED", which will be well interpreted later. Please follow the indications to avoid damages or injury.
- ②Read the Operation Manual thoroughly prior to the use (placement, operation, maintenance and inspection) to put the product in use properly.

◇

DANGER: safety caution given when incorrect handling could result in hazardous situation involving the possibility of death or serious injury.

△

CAUTION: safety caution given when incorrect handling could result in hazardous situations involving the possibility of moderate or light injury or damage to property.

⊘

PROHIBITED: Indicates what shall not be done.

◇

Dangereoi

1.Do not contact the inside of the driver. Electric shock and injury may occur.

2.Be sure to connect the earth with the case of the driver and motor. Electric shock and injury may occur.

3.Switch the power off before installing, moving, inspecting, or maintaining the driver.

4.Never connect/disconnect the motor connector and wires when power is applied.

5.Do not contact the rotating parts of motors.

△

Attention

1.Do not use the product at the place where is probable to get wet, or in inflammable, explosive circumstance.Electric shock, fire ormalfunctions, and damage may occur.

2.Keep ventilative to the drive for heat dissipation. Avoid things obstructing the exhaust window and keep distance with other devices.

3.Wire correctly as indications and mount the motor on incombustible metal material to avoid shake or impact.

4. Use DC independently as the power input. Do not connect with other devices such as relay or magnetic valve to avoid interference.

5.Run with good ventilation (implement of fan is suggested) while applying voltage higher than 30V DC or constant current higher than 3A. Overheat may occur.

6.Motor, drive and relatives should be well fastened before trial run.

7.Motor, drive and relatives should be well fastened before trial run.

8.If any abnormalities occur in operation, check thoroughly and do not restart the motor before safety is confirmed.

9.Do not touch the motor, case and other components once power failure occurs. High temperature and high voltage might still exist.

10.Emergency stop system is suggested to add with the motor tranportion facility.

△

Attention

1.We suggest to check or replace elements, such as condensers and transistors etc..of the drive power wiring every five years. The equipment might be out of order or damaged because of aging attenuation.

⊘

Prohibited

1. Don't take apart the driver when breakdown. Please handed over to the agent.

## 2. The confirmation of content

The content of package is listed below for confirmation, please check out after taking off a seal, if any damage or lack, please contact us at once.

● The driver	Unit
● 3.5mm terminal	1 piece
● screws	1 package
● user manual	1 book

## 3.Storage and Installation

### 3.1 Storage

To meet the warranty and extend the product life, store the product as following instructions while not used.

- ① Store in the original package as possible
- ② Keep the storage place clean and dry. The proper temperature is between -20℃~50℃, and proper humidity is lower than 80%.
- ③ Avoid to exposure under greased and corrosive atmosphere. Well packaged and put on shelf.
- ④ Prevent the body of the machine from impact or shake.

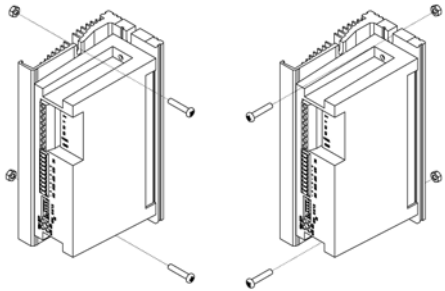
### 3.2 Installation environment

- ① Places far away from mist, steam, corrosive atmosphere, ignitable gas, comburstibles, floatingt. metal or greased dust.
- ② Operating temperature: 0℃~40℃. Environment humidity: lower than 90% and no condensation.
- ③ Use DC independently as the power input. Do not connect with other devices such as relay or magnetic valve to avoid interference.
- ④ Places without EMI noise and electric leakage.
- ⑤ Ventilate if the motor temperature over 70℃.
- ⑥ Avoid to install at places where the motor might be shocked or with continuous shake. Impact guidance system is necessary for such places.

## 3.3 Install the way and space of assembly

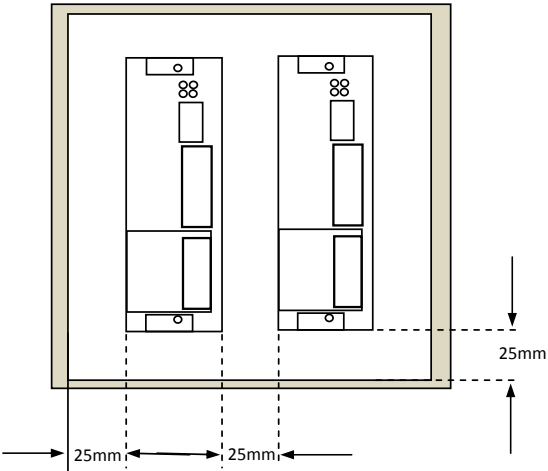
### 3.3.1 Install the way

Use two pcs M3 screws to fixed the aluminium to ventilate well place.



### 3.3.2 Space of assembly

In order to use and cool the result well, driver with close object must keep enough 25mm(up). The following picture shows.

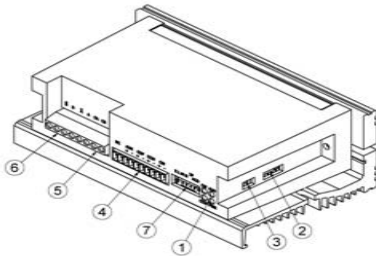


## 4. The summary

- A. Low vibration, high resolution, suitable for smoothly applications.
- B. DC18~80V Power input (current > 4A).
- C. Can adjust and operate the current,0.5~4.0A/phase.
- D. Driving method is constant bi-polar current, match 2 phase motors of 4 or 6 or 8 lead wire.
- E. Two methods of pulse input, Single-pluse (1P) and Two-pulse (2P).
- F. Alarm (ALM) output signal function.
- G. External current off (COF) function.
- H. Driving the micro step drive, just use the normal 2 phase step motor.
- I. Input and ouptut both use Photo coupler to provide noise isolation.
- J. Resolution 200、400、500、800、1000、1600、2000、3200、5000、6400、10000、12800、25000、25600、50000、51200。

## 5. Introduction of the panel

- 1. Green/ Red LED
- 2. 4PIN Current setting switch
- 3. 2PIN Stop current setting switch
- 4. 10 PIN 3.5mm terminal
- 5~6. 8PIN 3.5mm terminal
- 7. 6PIN Function setting switch



LED	Name	Color	Description
PWR	Power light	Green	When the driver accept DC18~80V, PWR will be light.
CW	Clock-wise light	Green	When the driver received one pulse signal, CW will be light.
CCW	Count clock-wise light	Green	When the driver received one pulse signal, CCW will be light.
ALM	current overload light	Red	When motor current overload, ALM will be light.

## 5.2 Current Setting Switch ( up is 1 , down is 0 )

Name	PIN	Description
RUN	DCBA	To set the drive current when motor run (0.5A~4.0A)

DCBA

1.0A

DCBA

1.4A

DCBA

1.8A

DCBA

2.2A

DCBA

2.6A

DCBA

3.0A

DCBA

3.4A

DCBA

3.8A

DCBA

1.2A

DCBA

1.6A

DCBA

2.0A

DCBA

2.4A

DCBA

2.8A

DCBA

3.2A

DCBA

3.6A

DCBA

4.0A

## 5.3 Stop Current Setting Switch

Name	PIN	Description
STOP	FE	To set percentage of current down (30%~60%)

FE

60%

FE

50%

FE

40%

FE

30%

## 5.4.1 Input Signal Terminal

Name	Description
CW+	When 2P mode, The pluse input terminal which have the motor CW.
CW-	When 1P mode, The pluse input terminal which have the motor running.
CCW+	When 2P model, The pluse input terminal which have the motor CCW.
CCW-	When 1P model, The pluse input terminal which control the running direction of the motor.

## 5.5 DC Input Signal Terminal

Name	Description
V+	Power DC18~80V @4A ; positive input.
V-	Power negative input.

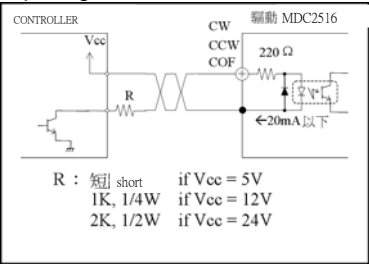
## 5.7 Function Setting Switch (up is 1,down is 0)

Name	Description
KLMN	To choose driver resolution of step.
ACD /OFF	Auto current down switch. When motor stops, ACD is used for driving auto current down. OFF is used for fixed driving current when motor stops.
1P /2P	Pulse wave input. Up is 2P, Down is 1P.

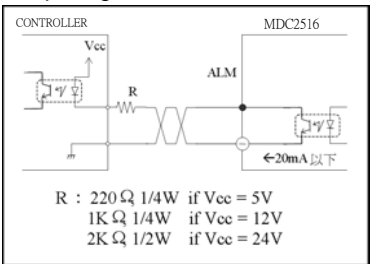
KLMN	KLMN	KLMN	KLMN	KLMN	KLMN	KLMN	KLMN
200	1600	6400	25600	400	1000	5000	25000
KLMN	KLMN	KLMN	KLMN	KLMN	KLMN	KLMN	KLMN
800	3200	12800	51200	500	2000	10000	50000

## 6. Output / Input Signal Circuit

### Input signal circuit

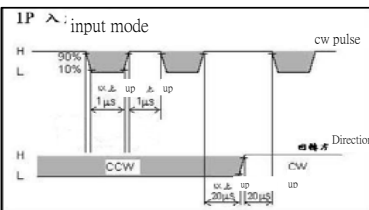


### Output signal circuit

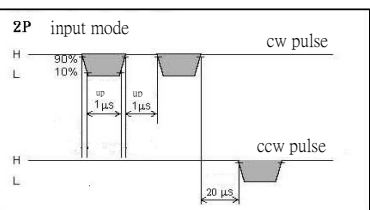


## 6.1 Pulse wave signal / Direction singal

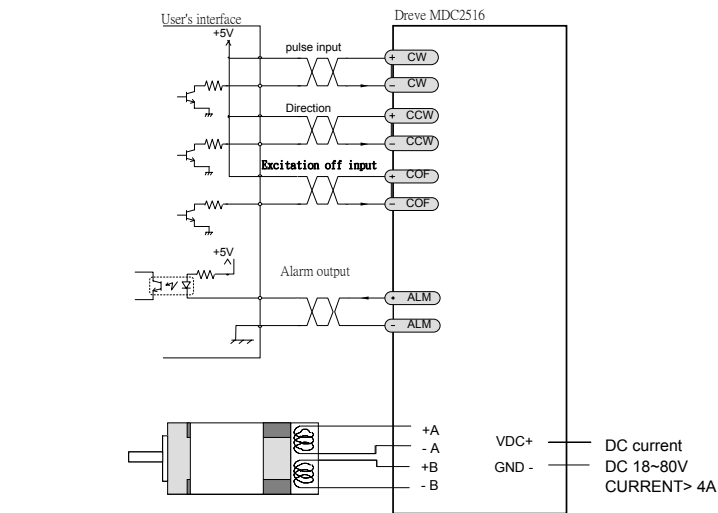
### 1P input method seting



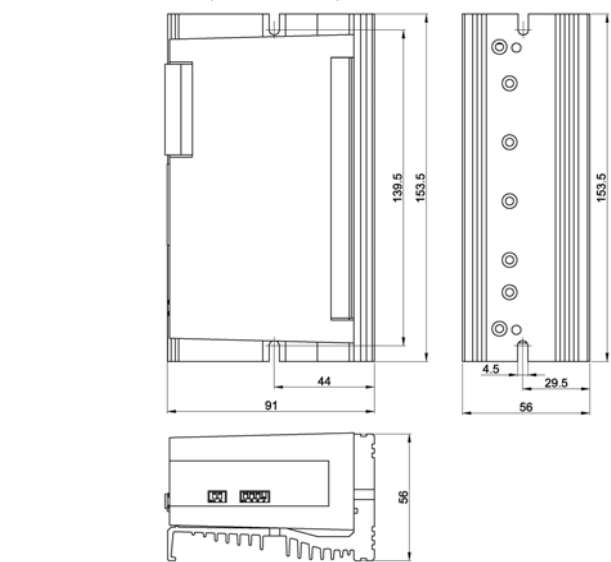
### 2P input method seting



## 7. Connecting Diagram



## 8. Dimensions ( unit:mm )



## 9. Specifications

Item / Model	2 phase micro step motor driver /MDC2516
Drive Method	PWM Constant Bi-Polar Current
Power	DC18~80V@4A
Drive Current	1.0~4.0A/phase
Resolution	200,400,500,800,1000,1600,2000,3200,5000,6400,10000,12800,25000,25600,50000,51200
Control Mode	Signal-Pulse(1P),Two-Pulse(2P)
Max Pulse Speed	400K Hz UP
Pulse Width	2us (Min)
Direction Respond	10us (Min)
Input Signal	+4~+10V, < 20mA
Input Signal Impedance	220Ω
Output Signal	Open Collector, 24V, 10mA(Max)
Signal Type	Open Collector
Temperature	0~40°C
Moisture	<85% RH
Dimension (mm)	153.5(L)*91(W)*56(H)
Weight (g)	660g

## 10. Leads of Motor Connetio

Model	Phase	A	/A	B	/B	CA	CB
VEXTA	6	Black	Green	Red	Blue	Yellow	White
TAMAGAWA	6	Black	Green	Red	Blue	Yellow	White
SANYO	6	Black	Green	Red	Blue	Yellow	White
TECO	6	Black	Green	Red	Blue	Yellow	White
TECO	6 Leads	Red	Red White	Green	Green White	Black	White
TECO	8 Leads	Red	Black	Green	Yellow	Red,White Black,White	Green,White Yellow,White

## 【 2 Phase 】

- DC Input 2 Phase Step Motor Driver.....SD200
- AC110V Input 2 Phase Step Motor Driver.....SD225 SD245 SD265 MSD228 MSD248

## MSD268

- AC85~260V Input 2 Phase Step Motor Driver...SD2202 MSD2204 MSD2206

- DC Input 2 Phase Micro Step Motor Driver.....MD26 MDC2116 MDC2516

- AC 2 Phase Micro Step Motor Driver.....MAC7516

## 【 5 Phase 】

- DC Input 5 Phase Step Motor Driver.....SD520
- AC110V Input 5 Phase Step Motor Driver...SD500 MSD508
- AC85~260V Input 5 Phase Step Motor Driver...SD528 SD528F-2.8A MSD550 MSD550



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