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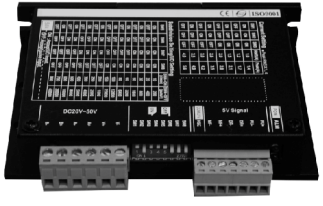
FUYU
福誉科技

FMDD50D40NOM
驱动器

使用指南手册版本: V 2.0

FUYU TECHNOLOGY CO.,LTD



FMDD50D40NOM是公司根据市场需求以及发展趋势而成功研发的一款新型的步进驱动器，采用全新 32 位电机控制专用 DSP 芯片，从而使得电机运行更平稳，不易丢步。接收输入信号脉冲，方向和使能输入。当使用内部位置时，脉冲和方向接口可用于传感器信号输入，接受 485 控制运行。将电机的发热程度和振动幅度降至最低，从而更好地提高了机械运转的加工速度和精度。工作电压为 DC20-50V，适配电流 4.0A 以下、外径42-60mm 的各种型号的二相步进电机。

具有 2 种运动模式：位置模式和速度模式，由 SW4 拨码开关控制

设有 16 档等角度恒力矩细分，最高分辨率 40000 步/转

最高响应频率可达 200Kpps

步进脉冲停止超过 1.5s 时，线圈电流自动减到设定电流的一半

光电隔离信号输入/输出

驱动电流 1.0A/相到 4.0A/相分 8 档可调

直流电源输入，电压范围：DC20V~50V

驱动器安装尺寸：118×24.3×75.5mm3 ，净重：0.2Kg

电流设置

驱动器工作电流由拨码开关 SW1~SW3 设定，运行电流为工作有效输出电流。峰值电流=运行电流×1.4。

运行电流 (A)	1.0	1.2	1.5	2.0	2.5	3.0	3.5	4.0
峰值电流 (A)	1.4	1.7	2.1	2.8	3.5	4.2	4.9	5.6
SW1	ON	OFF	ON	OFF	ON	OFF	ON	OFF
SW2	ON	ON	OFF	OFF	ON	ON	OFF	OFF
SW3	ON	ON	ON	ON	OFF	OFF	OFF	OFF

细分设置/I/O 模式设置

细分设置和 I/O 模式设置由拨码开关 SW4 控制。 当 SW4=OFF 时，则为细分设置模式；当 SW4=ON时，则为 I/O 模式。其中细分和速度由拨码开关 SW5~SW8 设定，共 16 档。

细分数(puls/r)	200	400	800	1600	3200	6400	12800	25600
速度值 (rpm)	10	20	30	50	60	80	100	150
SW5	ON	OFF	ON	OFF	ON	OFF	ON	OFF
SW6	ON	ON	OFF	OFF	ON	ON	OFF	OFF
SW7	ON	ON	ON	ON	OFF	OFF	OFF	OFF
SW8	ON	ON	ON	ON	ON	ON	ON	ON
细分数 (puls/r)	1000	2000	4000	5000	8000	10000	20000	40000
速度值 (rpm)	200	250	300	400	500	600	700	800
SW5	ON	OFF	ON	OFF	ON	OFF	ON	OFF
SW6	ON	ON	OFF	OFF	ON	ON	OFF	OFF
SW7	ON	ON	ON	ON	OFF	OFF	OFF	OFF
SW8	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

使用环境	使用场合	避免粉尘、油雾及腐蚀性气体
	温度	0℃——60℃
	湿度	30—75%RH
	震动	4.2m/s2 Max
储存温度	-20℃ - +80℃	

使用说明

1.电机与驱动的常见连线

A+	黑		红
A-	绿	或者	绿
B+	红		黄
B-	蓝		蓝

其它注意事项

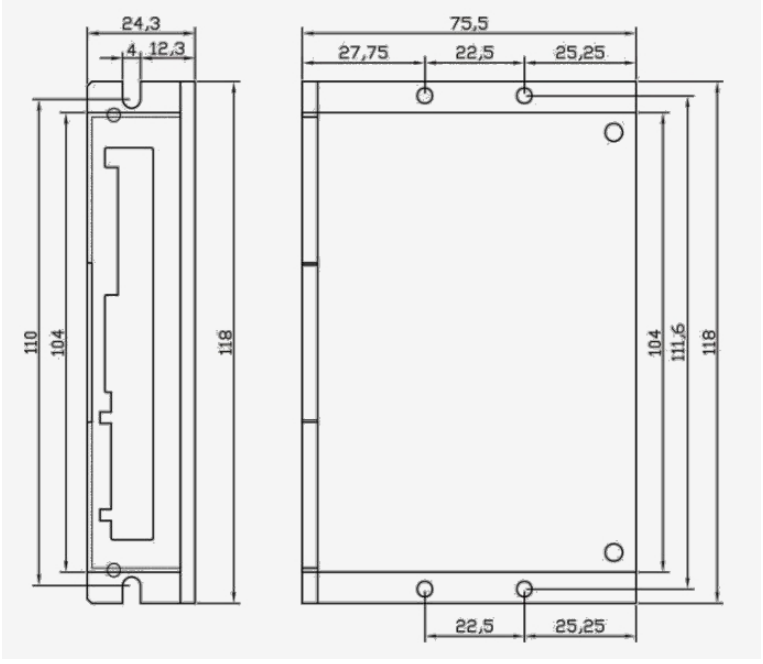
1) 输入电压不能超过DC50V；

2) 输入脉冲信号下降沿有效；

3) 驱动器温度超过80℃时驱动器停止工作，故障指示灯ALM亮，直到驱动器温度降到50℃时，驱动器需要重新上电才能恢复工作。出现过热保护请加装散热器；控制柜内多个驱动器并排安装时，互相之间的距离不小于50mm。

4) 过流（负载短路）故障指示灯ALM亮，请检查电机接线及其他短路故障，排除后需要重新上电恢复；

5) 无电机故障指示灯ALM亮，请检查电机接线，排除后需要重新上电恢复。



驱动与控制器的常见接线

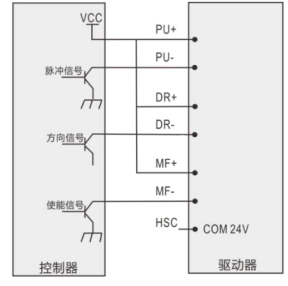
标记符号	功能说明	注释
PU+	输入信号光电隔离正端	输入信号光电隔离正端 接信号电源 5V 正端，高于+5V 时切换到 COM24V 接口。
PU-	步进脉冲信号	下降沿有效，每当脉冲由高变低时电机走一步，输入电阻 220Ω，低电平 0-0.5V，高电平大于 4V，脉冲宽度>2.5μS。
DR+	输入信号光电隔离正端	接信号电源 5V 正端，高于+5V 时切换到 COM24V 接口
DR-	方向控制信号	用于改变电机转向。输入电阻 220Ω，要求：低电平 0-0.5V，高电平大于 4V，脉冲宽度>2.5μS。
MF+	输入信号光电隔离正端	接信号电源 5V 正端，高于+5V 时切换到 COM24V 接口。
MF-	电机释放信号	有效（低电平）时关断电机接线电流，驱动器停止工作，电机处于自由状态。
COM24V HSC	24V 信号公共端	脉冲方向端口默认是 5V 信号输入，若做内部位置模式回零时，接 24V 传感器信号，需切换到 COM24V 接口。COM 24V 为 24V 共阴共阳输入端。如用共阳接法输入 24V脉冲信号，只需 24V+接 COM24V，24V-接 PU-。共阴接法，24V+接 PU+，24V-接 COM24V。

即 PU+ 和 DR+ 都接信号电源正极

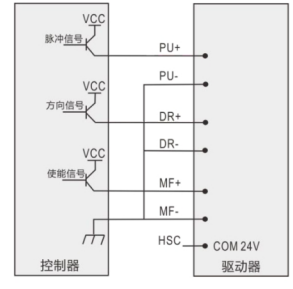
PU- 接 脉冲信号

DR- 接 方向信号（ 低电平/或者不接正转，高电平反转 ）更详细的驱动器参数及其它相关说明见下

5V信号接法

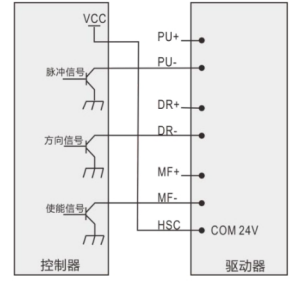


共阳接法

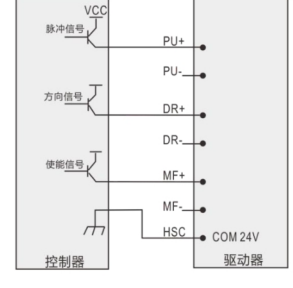


共阴接法

24V 信号接法



共阳接法



共阴接法

三．常见问题解答

1. 为什么我用控制器控制时，发现电机的方向控制不了？

答：把sw4 置off，本驱动器只支持单脉冲的控制模式。即PU 端回路发送脉冲信号，DR端回路发送持续的低电平（或不接）；则电机正转；PU 端回路发送脉冲信号，DR端回路发送持续的高电平；则电机反转。

2. 细分数含义是什么？设置多少范围才好？

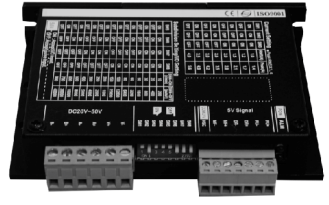
答：细分数含义是驱使电机转一圈所需要的脉冲数。细分数越大其实精度越难控制。普通的开环步进电机实际是无法分辨这个精度的。高的细分只能保证运行平滑，减少振动和噪音。如果对平稳性和精度要求不高，但对转速要求很高的话。建议用中低细分确保每秒发出的脉冲数能满足速度需要。且在实际使用时，如果转速很低情况下，应该选高细分，确保平滑，减少振动和噪音。

3. 驱动器上的使能端口 MF+ MF- 要接吗？

答：应根据自己的需求，可不接，使能端一旦接通，驱动器停止工作，电机处于释放状态。常用于想要手动调节位置的情况。

4. 输入信号光电隔离正端要接限流电阻吗？

答：+5V~+28V均可驱动，高于5V时不需要外接限流电阻。



FMDD50D40NOM is a new type of stepper driver successfully developed by the company according to market demand and development trend. It adopts a new 32-bit motor control dedicated DSP chip, so that the motor runs more smoothly and is not easy to lose steps. Receive input signal pulse, direction and enable input. When using the internal position, the pulse and direction interface can be used for sensor signal input, accepting 485 control operation. The heating degree and vibration amplitude of the motor are minimized, thereby better improving the processing speed and precision of mechanical operation. The working

voltage is DC20-50V, suitable for various types of two-phase stepping motors

There are two motion modes: position mode and speed mode, controlled by SW4 dial switch

Equipped with 16 gear constant angle torque subdivision with a maximum resolution of 40000 steps/revolution

Maximum response frequency up to 200 Kpps

When the step pulse stops for more than 1.5 seconds, the coil current automatically decreases to half of the set current

Photoelectric isolation signal input/output

Drive current 1.0A/phase to 4.0A/phase adjustable in 8 gears

DC power input, voltage range: DC20V~50V

Driver installation size: 118 × twenty-four point three × 75.5 mm3, net weight: 0.2 Kg

current setting

The operating current of the driver is set by the dial switches SW1 to SW3, and the operating current is the working effective output current. Peak current=operating current × 1.4。

operating current	1.0	1.2	1.5	2.0	2.5	3.0	3.5	4.0
Peak current	1.4	1.7	2.1	2.8	3.5	4.2	4.9	5.6
SW1	ON	OFF	ON	OFF	ON	OFF	ON	OFF
SW2	ON	ON	OFF	OFF	ON	ON	OFF	OFF
SW3	ON	ON	ON	ON	OFF	OFF	OFF	OFF

Subdivision Settings/I/O Mode Settings

The subdivision setting and I/O mode setting are controlled by the dial switch SW4. When SW4=OFF, it is the subdivision setting mode; When SW4=ON, it is in I/O mode. The subdivision and speed are set by the dial switches SW5 to SW8, with a total of 16 gears.

Subdivision (puls/r)	200	400	800	1600	3200	6400	12800	25600
Speed value (rpm)	10	20	30	50	60	80	100	150
SW5	ON	OFF	ON	OFF	ON	OFF	ON	OFF
SW6	ON	ON	OFF	OFF	ON	ON	OFF	OFF
SW7	ON	ON	ON	ON	OFF	OFF	OFF	OFF
SW8	ON	ON	ON	ON	ON	ON	ON	ON
Subdivision (puls/r)	1000	2000	4000	5000	8000	10000	20000	40000
Speed value (rpm)	200	250	300	400	500	600	700	800
SW5	ON	OFF	ON	OFF	ON	OFF	ON	OFF
SW6	ON	ON	OFF	OFF	ON	ON	OFF	OFF
SW7	ON	ON	ON	ON	OFF	OFF	OFF	OFF
SW8	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

The using environmental condition	Using occasion	Avoid dust, oil mist and corrosive gases
	temperature	0℃——60℃
	humidity	30—75%RH
	vibration	4.2m/s^2 Max
Storage temperature	-20℃—+80℃	

TWO . Related using instructions

1. The normal connection between motor and driver

A+	black		red
A-	green	or	green
B+	red		yellow
B-	blue		blue

Other precautions

1.Input voltage cannot exceed DC50V.

2.The falling edge of the input pulse signal is valid.

3.When the temperature of the driver exceeds 80°C, the driver stops working, and the fault indicator ALM turns on. When the driver temperature drops to 50°C, the driver needs to be powered on again to resume operation. If overheat protection occurs, install a radiator. When multiple drives in the control cabinet are installed side by side, the distance between them shall not be less than 50mm.

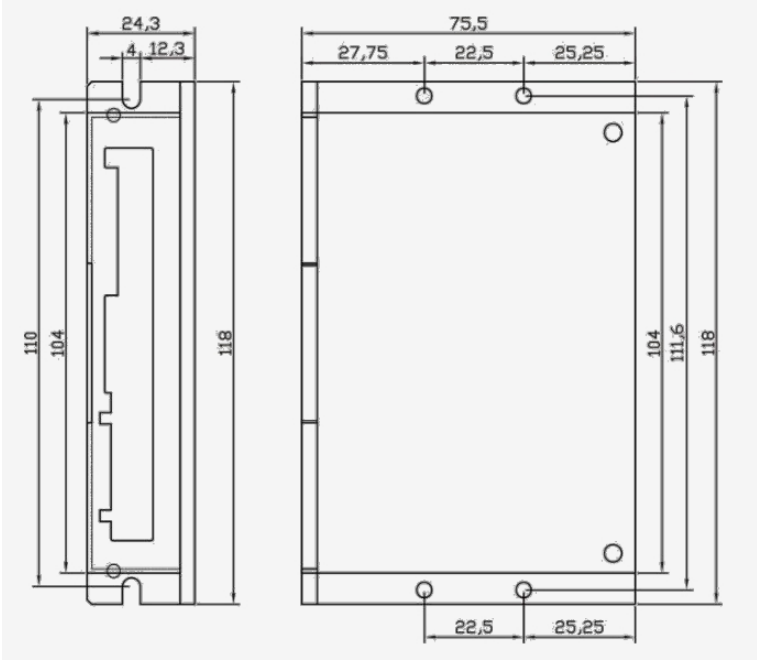
4.When overcurrent (load short-circuit) fault indicator ALM brighten, please check the motor wiring and other short-circuit faults, and then need to re-power recovery after elimination;

5.If there is no motor fault, indicator ALM is still on. Please check the motor wiring and re-power on after rectification.

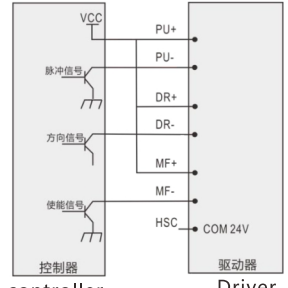
mark symbol	Function Description	note
PU+	Input signal photoelectric isolation positive terminal	Connect to the 5V positive terminal of the signal power supply, switch to the COM24V interface when it is higher than +5V.
PU-	step pulse signal	The falling edge is valid, the motor takes a step every time the pulse changes from high to low, the input resistance is 220Ω, the low level is 0-0.5V, the high level is at 4V, and the pulse width is >2.5μS.
DR+	Input signal photoelectric isolation positive terminal	Connect to the 5V positive terminal of the signal power supply, switch to the COM24V interface when it is higher than +5V.

DR-	direction control signal	Used to change the direction of the motor. Input resistance 220Ω, requirements: low level 0-0.5V, high level greater than 4V, pulse width>2.5μS.
MF+	Input signal photoelectric isolation positive terminal	Connect to the 5V positive terminal of the signal power supply, switch to the COM24V interface when it is higher than +5V.
MF-	Motor release signal	When it is valid (low level), the motor wiring current is turned off, the driver stops working, and the power supply
COM24V HSC	24V signal common	The pulse direction port defaults to 5V signal input. If it is used to return to zero in internal position mode and connect to 24V sensor signals, it needs to be switched to the COM24V port. COM24V is the 24V common cathode and common anode input terminal. If the 24V pulse signal is input by common anode connection, only need to connect 24V+ to COM24V, and 24V- to PU-. Common cathode connection, 24V+ to PU+, 24V- to COM24V

That is, both PU+and DR+are connected to the positive pole of the signal power supplyPU to pulse signalFor more detailed driver parameters and other related descriptions of DR-connected direction signals (low level/or no forward rotation, high level reverse rotation), see the following

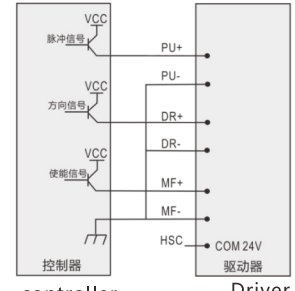


5V signal connectio



controller Driver

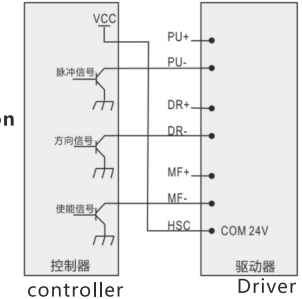
common anode connection



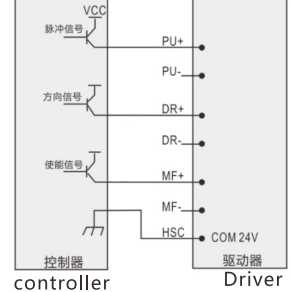
controller Driver

common cathode connection

24V signal connection



controller Driver



controller Driver

Three. Normal common troubleshooting

1. Why did I find that the direction of the motor could not be controlled when I used the controller?

Answer: Turn sw4 off. This driver only supports single-pulse control mode.

That is, the PU side loop sends a pulse signal, and the DR side loop sends a continuous low level (or not); the motor rotates forward; the PU side loop sends a pulse signal, and the DR side loop sends a continuous high level; the motor is reversed

2. What is the meaning of the breakdown number? How many ranges do I need to set?

Answer: The number of segments means the number of pulses required to drive the motor to make one revolution. When the motor is actually used, if there is a high requirement on the rotational speed and the requirement for accuracy and stability is not high, it is not necessary to select a high subdivision. In actual use, if the rotational speed is very low, large subdivisions should be selected to ensure smoothness and reduce vibration and noise.) The accuracy of the motor can meet the requirements also depends on the subdivision driver subdivision current control accuracy and other factors. The precision of subdivision drivers from different manufacturers may vary greatly; the higher the subdivision number, the more difficult it is to control.

3. Should I connect the enable port MF+ MF- on the drive?

Answer: According to their own needs, they can be disconnected. Once the enabler is connected, the driver will stop working and the motor will be released. Can be applied to situations where manual operation or adjustment of the motor is desired.

4. Is the input signal opt isolated positive terminal connected to the current limiting resistor?

Answer: +5V~+28V can be driven. When it is higher than 5V, there is no need to add external current limiting resistor.