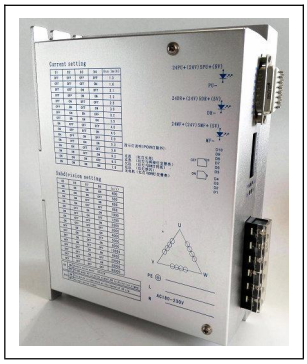
JK3MD2207



The JK3MD2207 is full digital 3 phase stepper driver based on DSP control. As a new generation of digital stepper motor drives, it is combined the advanced DSP control chip with the three-phase inverter driver module.The drive voltage of which is from 160V to 230VAC.It is designed for using with the 3 phase hybrid stepper motor of all kinds with 0.57mm to 130mm outside diameter, regulated phase current from 1.3A to 7.0A. The circuit that it adopts is similar to the circuit of servo control which enables the motor to run smoothly without noise and vibration. Moreover, its torque is far greater than 2 and 5 phase hybrid stepping motors.Furthemore, the highest micro step is 60000ppr. Due to these obvious advangtages, it is widely used in middle and big size numerical control devices such as curving machine, CNC machine, computer embroider machine, packing machine and etc.

Obvious,outstangding

FEATURES

- 16 channels constant angle, constant torque micro steps, highest micro step: 60000ppr
- Highest response frequency: 200Kpps
- Current of winding will be reduced by approximately 50% when no step pulse command is received for 1.5 second
- Opto-isolated signal I/O
- Drive current is adjustable in 16 channels from 1.3A/phase to 7.0A/phase
- Single power supply from 110V to 230VAC
- **Phase terminal memory function (motor phase terminal is memorized after input pulse train stopping 3s and it is recovered when stepper driver power on or signal MF changes from low level to high level)**

CURRENT SETTING

Stepper driver working current is set by DIP switches D1 to D4.

Working current(A)	**JK3MD2207**	**1.3**	**1.6**	**2.1**	**2.3**	**2.5**	**3.0**	**3.2**	**3.5**
D1		OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
D2		OFF	OFF	OFF	OFF	ON	ON	ON	ON

D3		OFF	OFF	ON	ON	OFF	OFF	ON	ON
D4		OFF	ON	OFF	ON	OFF	ON	OFF	ON
Working current	**JK3MD2207**	**4.0**	**4.5**	**5.0**	**5.3**	**5.8**	**6.2**	**6.5**	**7.0**
D1		ON	ON	ON	ON	ON	ON	ON	ON
D2		OFF	OFF	OFF	OFF	ON	ON	ON	ON
D3		OFF	OFF	ON	ON	OFF	OFF	ON	ON
D4		OFF	ON	OFF	ON	OFF	ON	OFF	ON

SUBDIVISION (MICRO STEP) SETTING

The subdivision (micro step) is set by DIP switches D5 to D8, 16 channels in total. D9 and D10 are used to set the driver function.

Subdivision (micro step) ppr	**400**	**500**	**600**	**800**	**1000**	**1200**	**2000**	**3000**
D5	ON	ON	ON	ON	ON	ON	ON	ON
D6	ON	ON	ON	ON	OFF	OFF	OFF	OFF
D7	ON	ON	OFF	OFF	ON	ON	OFF	OFF
D8	ON	OFF	ON	OFF	ON	OFF	ON	OFF
Subdivision (micro step) ppr	**4000**	**5000**	**6000**	**10000**	**8000**	**20000**	**30000**	**60000**
D5	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
D6	ON	ON	ON	ON	OFF	OFF	OFF	OFF
D7	ON	ON	OFF	OFF	ON	ON	OFF	OFF
D8	ON	OFF	ON	OFF	ON	OFF	ON	OFF
D9	ON, double pulse: PU is positive pulse signal, DR is negative pulse signal							
	OFF, single pulse: PU is pulse signal, DR is direction signal							
D10	Self detect switch (OFF: accept external pulse, ON: the driver send pulse to make the motor work at the speed of 30r/m)							

I/O SIGNAL

All of the input signals are opto-isolated. To ensure the built-in high speed optocoupler effective, the drive capacity of current for control signal must be 15mA or more. Because of internal optocoupler current-limiting resistor, if input signal voltage of stepper driver is above 5V, please use external resistor R to limit current.

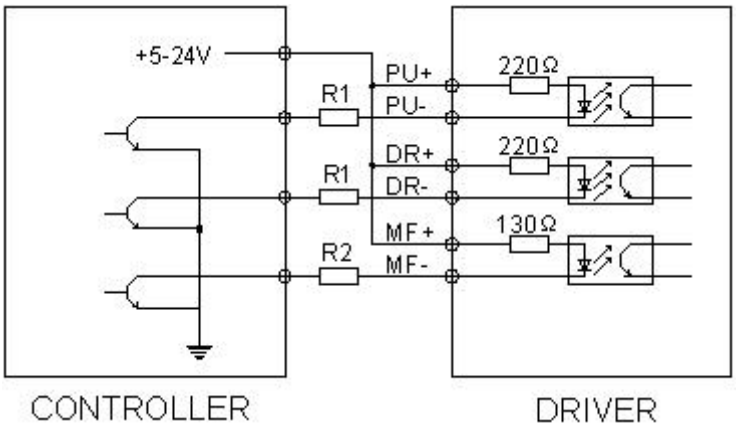
When input signal voltage is:

+5V: R1=0, R2=0;

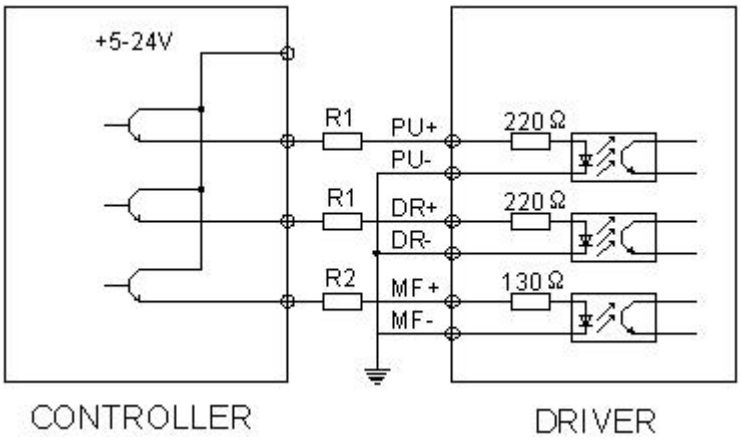
+12V: R1=510Ω, R2=820Ω;

+24V: R1=1.2KΩ, R2=1.8KΩ

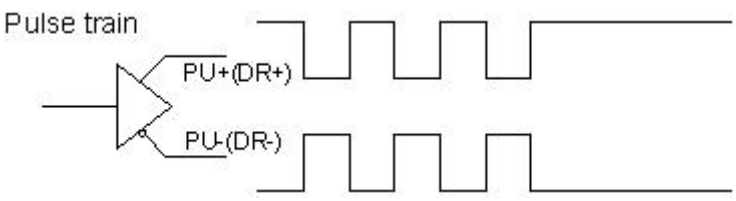
INPUT SIGNAL COMMON ANODE CONNECTION



INPUT SIGNAL COMMON CATHODE CONNECTION



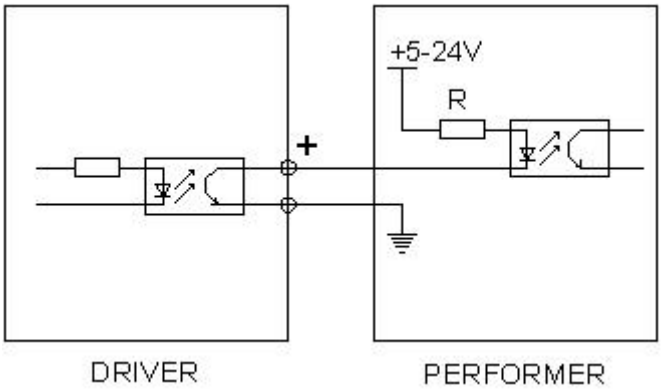
DIFFERENTIAL INPUT CONNECTION



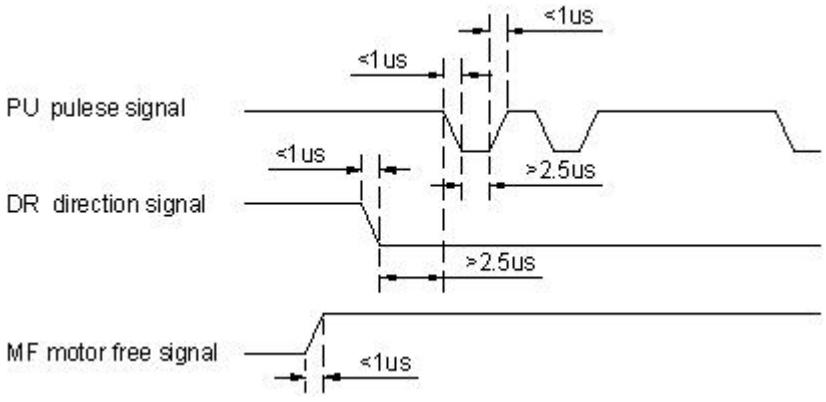
OUTPUT SIGNAL

The output signals of stepper driver are opto-isolated. Drive current is 50mA max.

RDY signal output.



INPUT SIGNAL OSCILLOGRAM

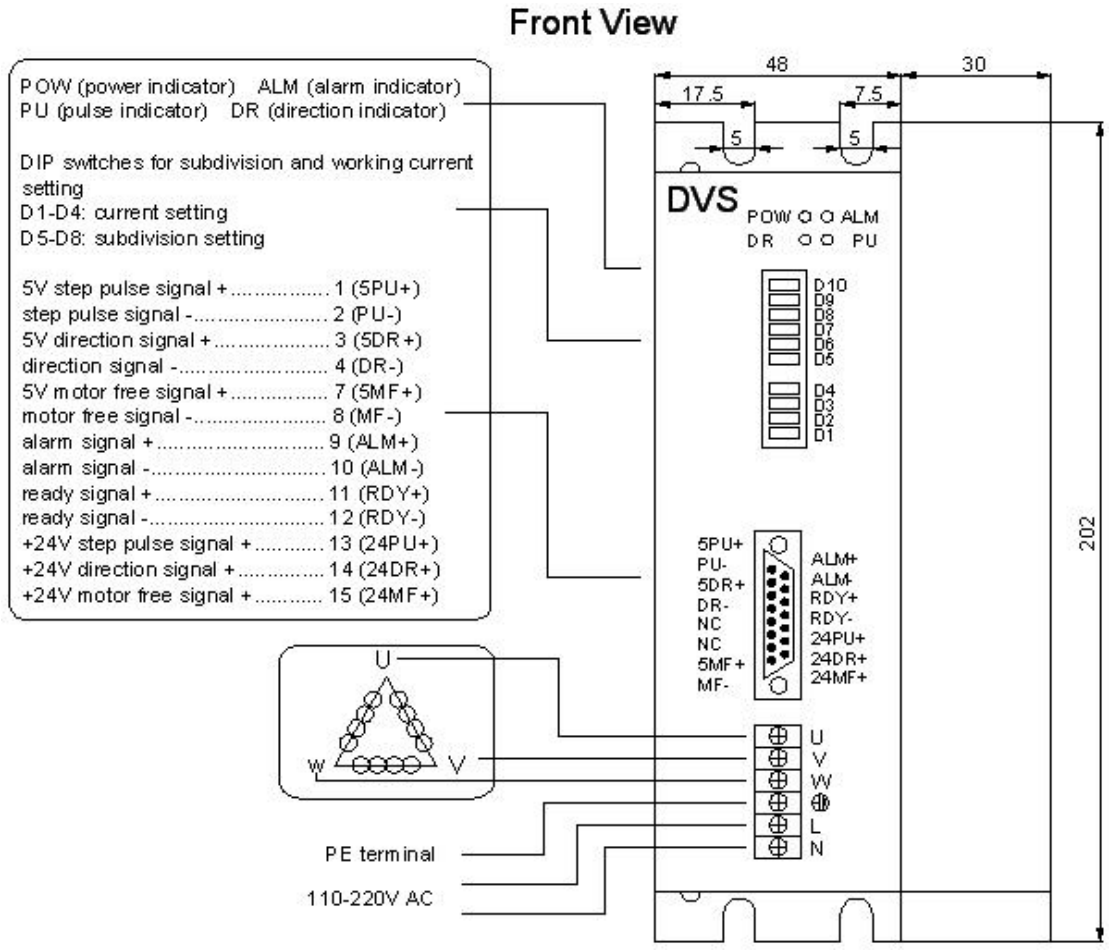


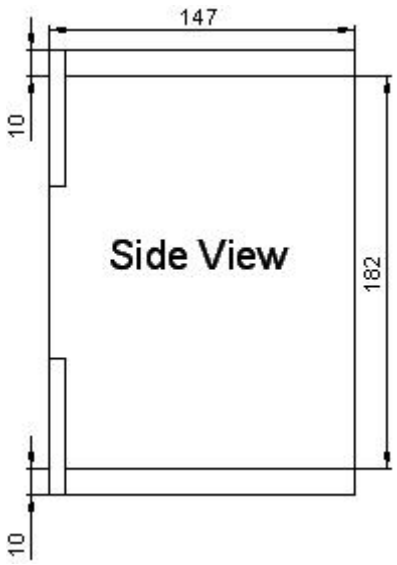
CAUTION

1. Supply voltage shouldn't exceed 220VAC.
2. Input control signal is 5V, current-limiting resistance should be connected when it is over 5V.
3. Input pulse signal is effective with the falling edge.
4. Alarm indicator lights and the driver stops working when the driver temperature is over 80℃. It restarts working until the temperature falls to 50℃. The heat sink is needed when overheat occurs.

5. Alarm indicator lights when overcurrent (short of load) occurs. Please check motor's connection and other shorts and turn the power supply on after removing the trouble.
6. Alarm indicator lights when no motor connected or poor connection. Please check motor's connection and turn the power supply on after removing the trouble.

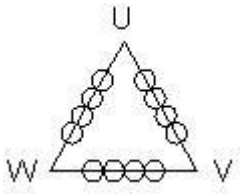
DIMENSION AND WIRING EXAMPLE





TERMINAL FUNCTION

Port	Connector pin No.	Symbol	Functions / Applications	Definition
DB15	1	5PU+	Positive of opto-isolated input signal	Connect to +5V power supply, drive voltage ranges from 5V to +24V. Current-limiting resistance is needed when it is over 5V.
	2	PU-	DP9=OFF, PU is step pulse signal	With the falling edge of the signal PU, the motor executes an angular step. The input resistance is 220Ω. Low voltage 0-0.5V, high voltage 4-5V, pulse width>2.5μS.
			DP9=ON, PU is positive step pulse signal	
	3	5DR+	Positive of opto-isolated input signal	Connect to +5V power supply, drive voltage ranges from 5V to +24V. Current-limiting resistance is needed when it is over 5V.
	4	DR-	DP9=OFF, DR is direction signal	Change the motor's direction of rotation. Input resistance is 220Ω. Low voltage 0-0.5V, high voltage 4-5V, pulse width>2.5μS
			DP9=ON, DR is negative step pulse signal	
	7	5MF+	Positive of opto-isolated input signal	Connect to +5V power supply, drive voltage ranges from 5V to +24V. Current-limiting resistance is needed when it is over 5V.
	8	MF-	Motor free signal	The motor current will be cut off and the driver stops working when it is effective.
	9	ALM+	Positive of opto-isolated alarm signal	The signal is effective (low voltage) when the driver is overcurrent, overheat.

	10	ALM-	Negative of opto-isolated alarm signal	
	11	RDY+	Positive of opto-isolated ready signal	It is effective (low voltage) when the driver is ready for receiving controller's signal.
	12	RDY-	Negative of opto-isolated ready signal	
	13	24PU+	Positive of opto-isolated input signal	Drive voltage: +24V
	14	24DR+		
	15	24MF+		
Motor and power supply	1、2	L、N	Power supply	110V-220VAC
	3	PE	Ground	Ground terminal
	4	U	Connection	
	5	V		
	6	W		

SOLUTIONS TO USUAL PROBLEMS

Phenomenon	Cause	Action
Motor is not working	Indicators don't light up	Check if the electricity supply is normal
	ALM indicator light up	Check stepper driver if overcurrent, overheat occurs, or no motor connected
	The motor shaft is locked, motor dose not work	Check the external control signal
	Indicator display normal, the motor shaft is not locked	Check if signal MF is effective
The motor is squealing	Max. speed set is too high	Reduce the max. speed
	Acceleration time short	Increase acceleration time or increase stepper driver pulse filter constant
Motor locates inaccurately	Micro step is incorrect	Select the correct micro step
	Stepper motor overloads	Change the other motor or increase the running current of stepper driver
Leakage current	stepper driver or motor are not grounded well	Make sure the driver and motor are grounded
Driver , motor heats up	Stepper driver's running current is large or the working environment temperature is high	Decrease the running current of stepper driver or improve the ventilation and heat elimination for working environment