DQ245M is 2-phase stepping motor driver based on advanced DSP control algorithm. It is fully digital stepping motor driver of new generation. The driving voltage range is DC24V-50V, adapting to all models of 2-phase hybrid stepping motor whose current is below 4.0A and with 42-57mm outer diameter. The internal driver circuit is similar to that of servo control theory, which makes the motor run smoothly, almost no vibration and noise. The max positioning accuracy can be up to 40,000 steps per revolution. DQ245M is widely used in medium/small NC equipment with high resolution like engraving machines, small CNC machine, computer embroidery machine, packaging machinery and etc.

Features

- High performance and competitive price
- 16-channel selectable resolution, max 40,000 steps/R
- Max response frequency up to 200Kpps
- Coil current will be automatically reduced to 1/2 of pre-set current when stepping pulse stops over 100ms.
- Optical isolating signals I/O
- Driving current can be adjusted from 1.2A/phase to 4.0A/phase through the 16 channels.
- Single power supply (DC24V-50V)
- Phase memory function (Note: The driver can memorize the motor phase automatically when the input stops over 3 seconds. And it also can recover the phase automatically when it is re-powered or MF signals changes from low level to high level.)

Current Setting

The working current of the driver is set by DIP-1 terminal. For more details, please refer to the following diagram.

Current (A)	1.2	1.5	2.0	2.3	2.5	3.0	3.2	3.6	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
D1	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON	ON	ON
D2	OFF	OFF	OFF	OFF	ON	ON	ON	ON	OFF	OFF	OFF	OFF	ON	ON	ON	ON
D3	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON
D4	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON

Micro Steps Setting

The micro steps of the driver are set by DIP-2 terminal. The total 16 channels are separately set by the first 4 of the 6 DIP-switch. (The other 2 are for function setting).
Details are as below. Micro steps (pulse/R)

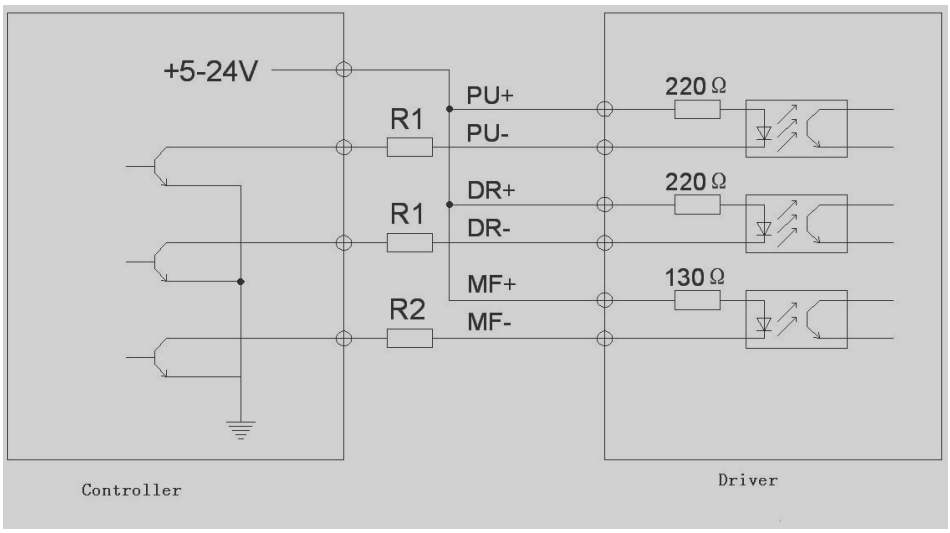
	200	400	800	1000	1600	2000	3200	4000	5000	6400	8000	10000	12800	20000	25600	40000
D1	ON	ON	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
D2	ON	ON	ON	ON	OFF	OFF	OFF	OFF	ON	ON	ON	ON	OFF	OFF	OFF	OFF
D3	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF	OFF
D4	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
D5	ON, double pulses, PU: CW stepping pulse signal, DR: CCW stepping pulse signal.															
	OFF, single pulse, PU: stepping pulse signal, DR: direction control signal.															
D6	Self-test switch (OFF: to receive outer pulse ON: the driver is running at 30 R/M internal)															

I/O Signal

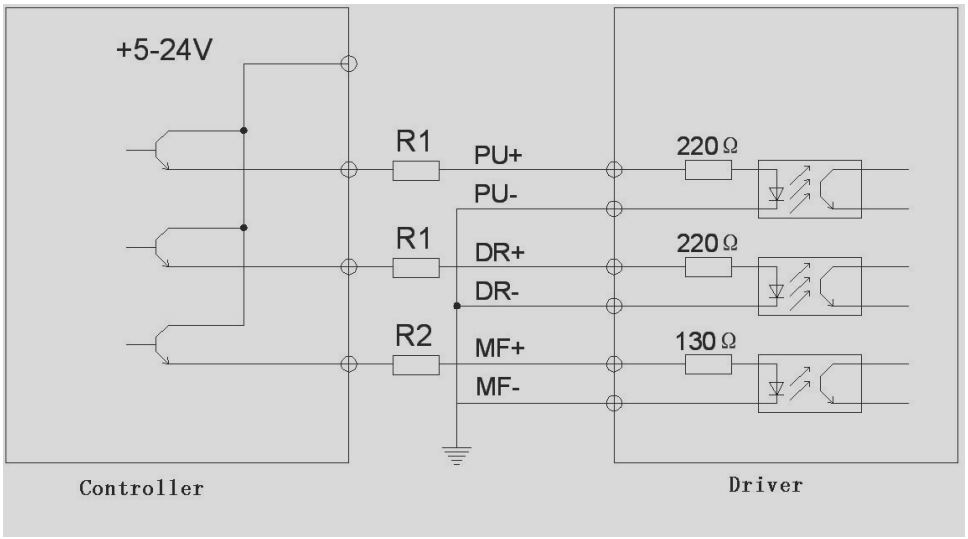
All input signals are optically isolated to guarantee the reliable running of the built-in high-speed optocoupler. The driving current to control the signal is required to be 15mA at least. And the driver has been set in the optocoupler current limit resistor. When the input voltage is beyond 5V, please limit the current by connecting resistance R if necessary.

Resistance R value option:
The output voltage of the controller/actuator is
+5V： R1=0, R2=0
+12V： R1=510Ω，R2=820Ω；
+24V： R1=1.2KΩ，R2=1.8KΩ。

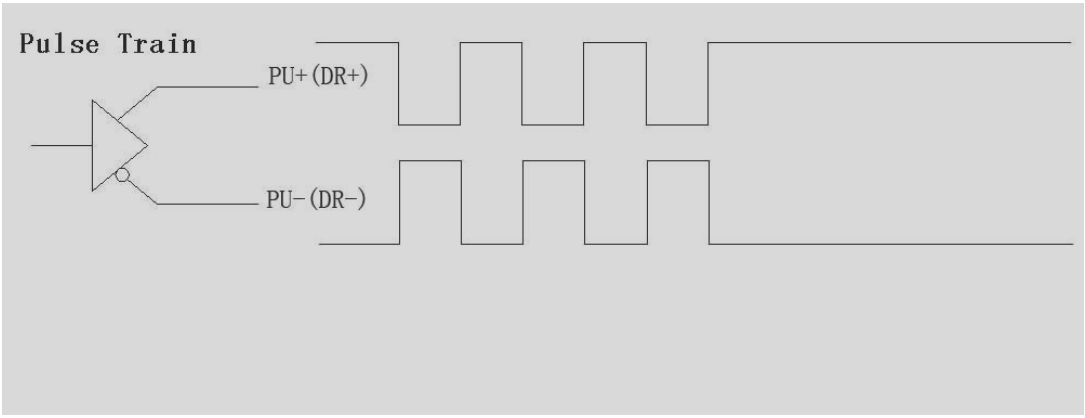
Common Anode Connection for Signal Input



Common Cathode Connection for Signal Input

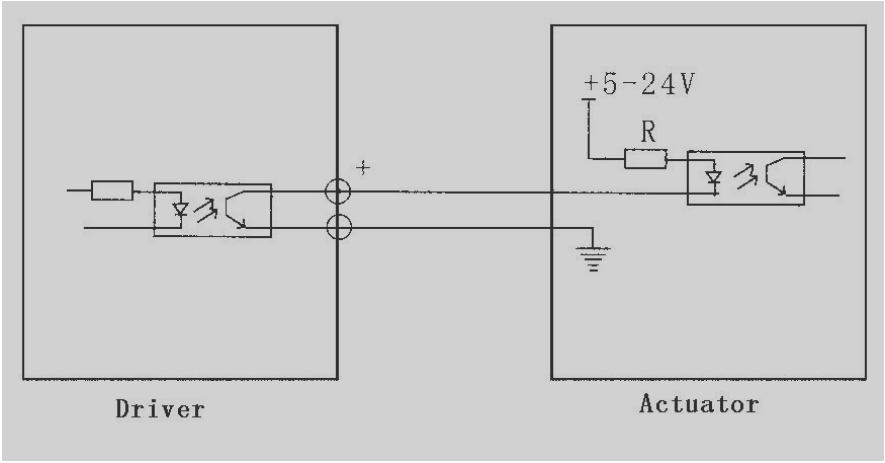


Connection for Differential Signal Input

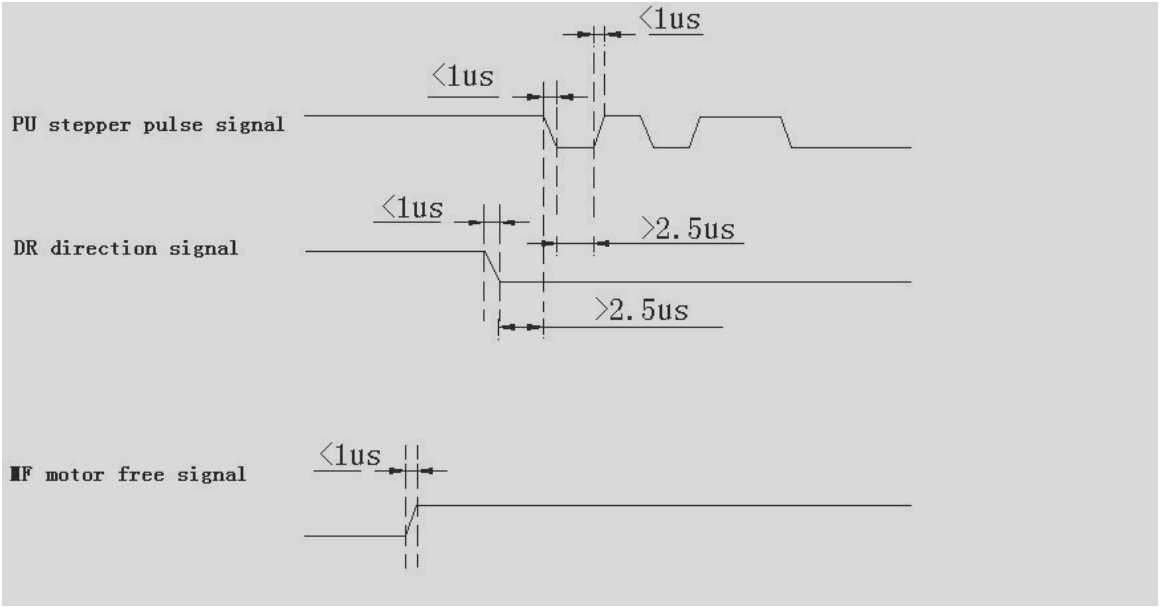


Signal Output

The driver outputs the signals through optocoupler. The max driving current can be 50mA.
RDY/ALM Signals Output



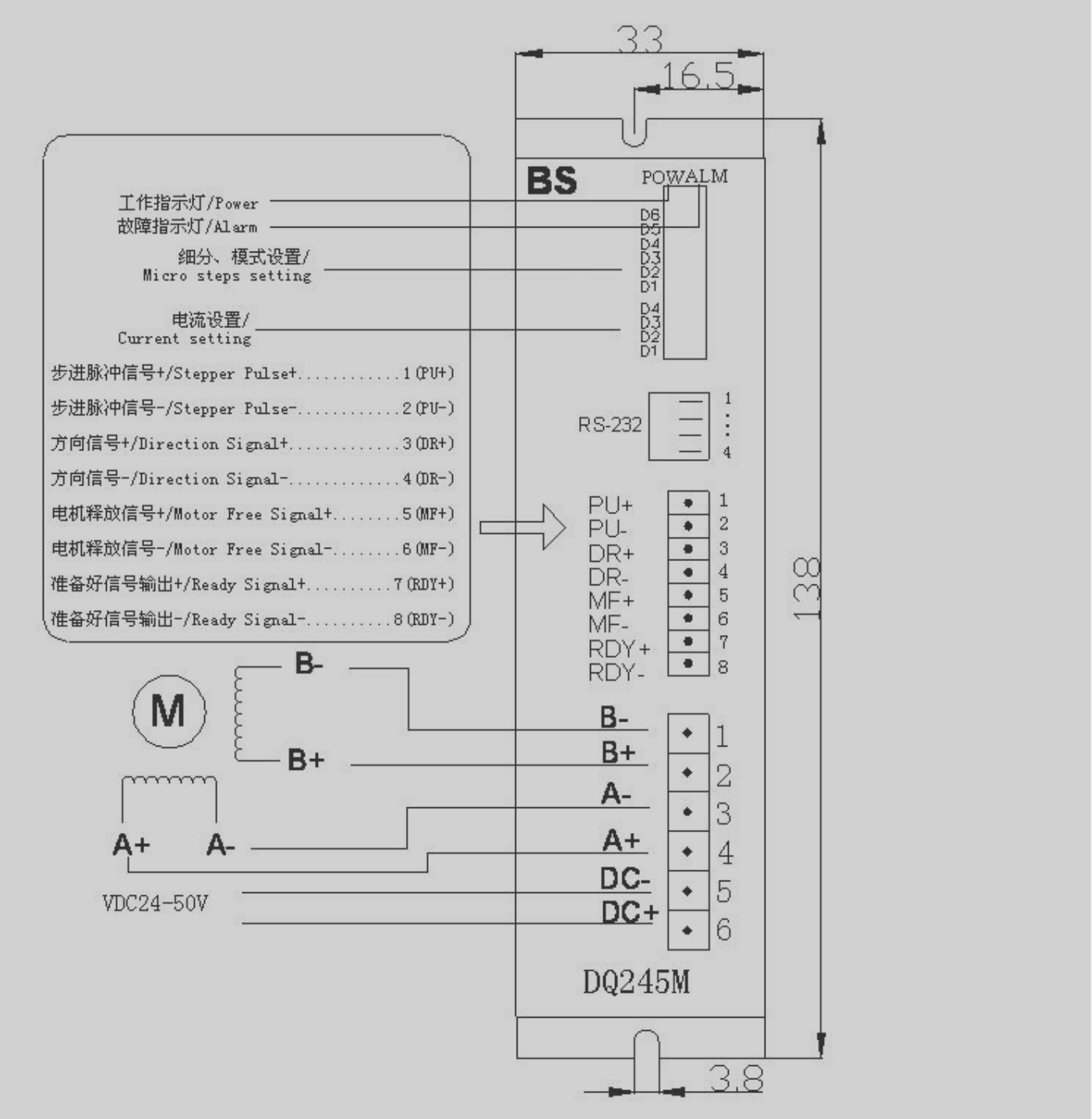
Waveform Diagram of Signal Input



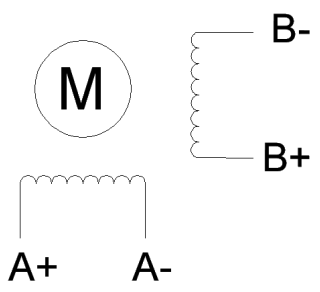
!Caution

- The input voltage can not exceed DC50V.
- The input control signal level is 5V. Once it is over 5V, please connect current limit resistance.
- The input of pulse trailing edge is valid.
- The driver will stop working once the temperature exceeds 85 degrees. And the ALM will light. Until the temperature drops to 50 degrees, the driver will restart to work after powered-up. Please install the radiator for over-heat protection.
- If short circuit ALM lights, please check motor leads and eliminate other short faults. And then repower up to recover.
- If no motor ALM lights, please check motor leads and repower up to recover.

Diagram for Driver Wiring & Dimension (Unit: mm)



Lead Pin Function Table

Port	Pin No.	Sym-bol	Function	Note
RS-232	1	RX	To receive data	NC
	2	TX	To send data	NC
	8	GND	Ground	NC
Signal Port	1	PU+	stepper pulse signal +	Driving voltage+5V-+24V, but if above +5V, current limit resistance is needed.
	2	PU-	DP5= OFF, PU: stepper pulse signal DP5=ON, PU: CW stepper pulse signal	It is valid on the trailing edge. Each time pulse changes from high level to low level, motor rotates one step and inputs resistance 220Ω. Request: Low level 0-0.5V, high level 4-5V. Pulse width>2.5μS
	3	DR+	direction signal +	Driving voltage+5V-+24V, but if above +5V, current limit resistance is needed.
	4	DR-	DP5=OFF, DR: direction control signal DP5=ON, DR: CCW stepper pulse signal	To change motor rotating direction and input resistance 220Ω. Request: Low level 0-0.5V, high level 4-5V. Pulse width>2.5μS
	5	MF+	motor free signal +	Driving voltage+5V-+24V, but if above +5V, current limit resistance is needed.
	6	MF-	Motor free signal -	Cut off motor current when it is valid (low level). The driver stops working and in free state.
	7	RDY+	ready signal +	It is valid (low level) when driver works normally and ready to receive the signal from controller.
	8	RDY-	ready signal -	
Motor Port/ Power Port	5	DC+	Power Supply	Power Supply：DC24~50V
	6	DC-		
	4	A+	Motor connection	
	3	A-		
	2	B+		
	1	B-		

Possible Problems & Solutions Table

Problems	Possible Cause	Solutions
Motor Stopped	Power indicator does not light.	Check power supply
	Alarm indicator lights.	Check if the driver over-current/over-heat/lack of motor.
	Motor spindle is locked.	Check external control signal.
	The indicator works normally, the spindle does not lock the motor.	Check if MF signal is valid.
Motor Stalled	The max speed is over-set.	Reduce the speed.
	Accelerating time is too short.	Lengthen the accelerating time or increase the constant value of pulse wave filtering.
Inaccurate Position	The Micro steps set incorrectly.	Choose correct micro steps.
	The motor load is too heavy.	Change the motor or appropriately increase driver running current.
Electric Leakage	Not reliably grounded.	Make the driver/motor reliably grounded.
Driver/Motor Over-heat	Heavy running current or terrible external heat sinking condition	Appropriately reduce running current or improve the ventilation and heat dissipation.