

Mecheltron DM556M

Stepper Motor Driver



1. Features:

- Supply voltage up to +50 VDC (recommended not above 45 V due to "back EMF")
- Output current selectable in eight steps from 1.8 to 5,6 A (peak) via DIP switch
- Automatic current reduction (in idle mode) to reduce the motor heat
- „Soft-Start“ – no “Jump” when powered on
- Pulse input frequency up to 200 KHz
- Optically isolated inputs
- 16 selectable micro-step resolutions of 200 - 51.200 via DIP switches
- Suitable for 2-phase and 4-phase motors
- Protections for over-voltage and over-current

2. Description:

The DM556M is a digital stepper drive with simple design and easy setup. This stepper drive is able to power 2-phase and 4 phase stepper motors smoothly with optimal torque and low motor heating & noise. Its operating voltage is 20 – 50 V DC and it can output up to 5.6 A current. All the micro step and output current are done via DIP switches. Therefore, the DM556M is an ideal choice for Applications requiring simple step & direction control of NEMA 23, 24 and 34 stepper motors.

3. Applications:

Suitable for a wide range of stepper motors of NEMA sizes 23, 24 and 34 (57 x 57 mm to 86 x 86 mm). It can be used in various kinds of machines, such as X-Y tables, engraving machines, labelling machines, laser cutters, pick-place devices, and so on. Particularly well suited for applications where low noise levels, less heat development, high speed and high precision are desired.

4. Electrical Specification:

Parameters	Min.	Typ.	Max.	Unit
Output current	1.8	-	5.6 (4.0 RMS)	A
Supply Voltage	24	36 - 48	50	V DC
Logical Signal Current	7	10	16	mA
Pulse input frequency	0	-	200	kHz
Minimal pulse width	2.5			µs
Minimal direction setup	5.0			µs
Isolation Resistance	500			MΩ

5. Further Specifications:

Parameters	Min.	Typ.	Max.
Microsteps / 1.8°	200		51200
Puls / Direction (PUL / DIR)		X	
NEMA Sizes	23		34
Motor Type Mecheltron	57BYGH-XXX		86BYGH-XXX

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6. Environment:

Cooling	Natural or forced cooling	
Operating Environment	Environment	Avoid dust, oil, fog and corrosive gases
	Ambient Temperature	0 °C - 40 °C
	Humidity	40 % RH bis 90 % RH
	Operating Temperature	max. 90 °C
Storage Temperature	-20 °C to 65 °C	

7. DIP Switch Settings:

Dynamic Current Configuration				
Peak Current	RMS Current	SW 1	SW 2	SW 3
1,50 A	1,10 A	Off	Off	Off
2,10 A	1,50 A	On	Off	Off
2,70 A	1,90 A	Off	On	Off
3,20 A	2,30 A	On	On	Off
3,80 A	2,70 A	Off	Off	On
4,30 A	3,10 A	On	Off	On
4,90 A	3,50 A	Off	On	On
5,60 A	4,00 A	On	On	On

SW4 is used to set the percentage of the motor idle current. In the OFF position, this means that the stall current is set to 50% of the selected output current. In the ON position, this means that the stall current is set equal to the selected dynamic current. The current is automatically reduced to 50% of the selected dynamic current 0.4 seconds after the last pulse.

Micro-Step-Resolution Configuration					
Micro Steps	Steps/rev. (1,8°)	SW 5	SW 6	SW 7	SW 8
1	200	On	On	On	On
1/4	800	Off	On	On	On
1/8	1600	On	Off	On	On
1/16	3200	Off	Off	On	On
1/32	6400	On	On	Off	On
1/64	12800	Off	On	Off	On
1/128	25600	On	Off	Off	On
1/256	51200	Off	Off	Off	On
1/5	1000	On	On	On	Off
1/10	2000	Off	On	On	Off
1/20	4000	On	Off	On	Off
1/25	5000	Off	Off	On	Off
1/40	8000	On	On	Off	Off
1/50	10000	Off	On	Off	Off
1/100	20000	On	Off	Off	Off
1/200	40000	Off	Off	Off	Off

8. Pin Assignment:

Pin	Details
PUL +	PUL signal: Pulse active on rising edge; 4-5V for PUL-HIGH, 0-0.5V for PUL-LOW. Minimum pulse width of 2.5µs. Add resistor to limit current at +12V or +24V input logic Voltage (1KΩ for +12V, 2kΩ for +24V). Same for DIR and ENA signals.
PUL -	
DIR +	DIR signal: This signal has low/high voltage levels representing two directions of motor rotation. Minimum direction setting time of 5µs.
DIR -	
ENA +	ENA signal: This signal is used to enable/disable the inverter. High level +5V (NPN control signal) to enable the inverter and low level to disable the inverter. By default it is Unconnected (ENABLED).
ENA -	
GND	Ground connection of the power supply.
+V	Positive connection of the power supply. Recommended supply voltage 24-48VDC
A +; A -	Connections of Motor Phase A.
B +; B -	Connections of Motor Phase B.

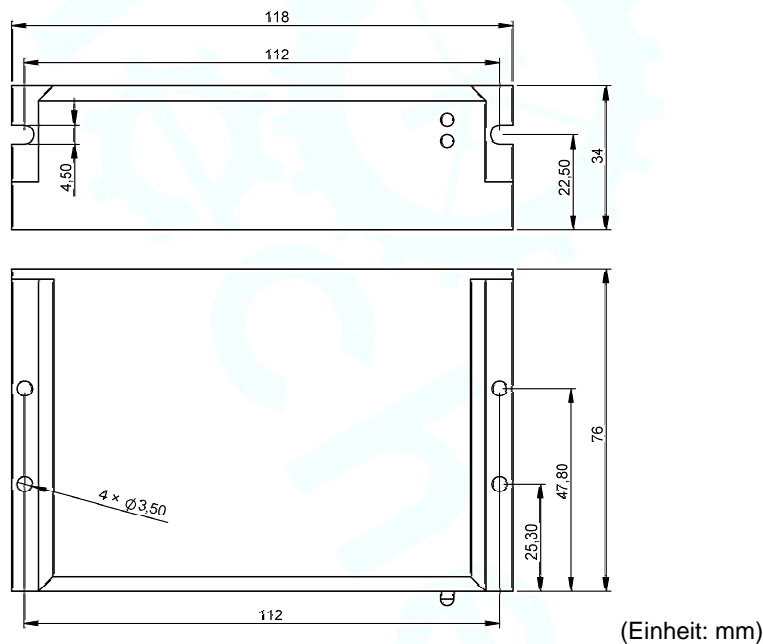
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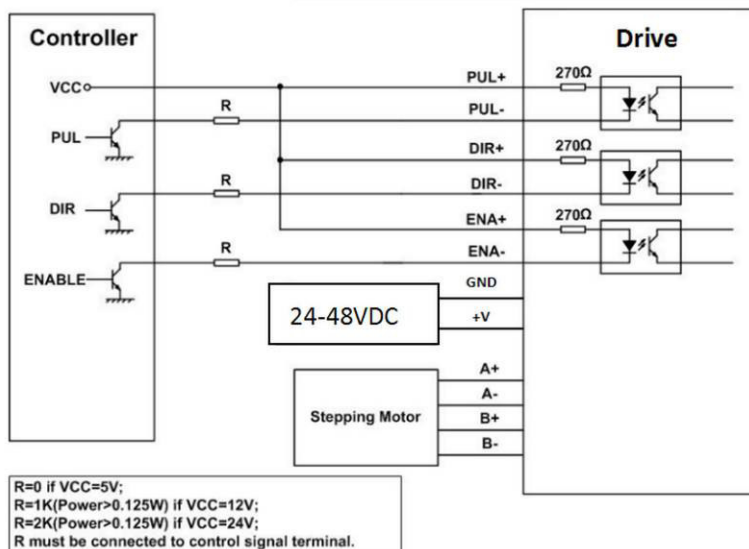
9. Protection Indication:

Incident	Possible cause	Possible solution
Red LED lights up	Short circuit of motor wires	Inspect or replace motor cables
	Voltage supplied too high	Reduce voltage supplied to $\leq 50V$ DC.

10. Mechanical Data:



11. Wiring:



A complete system consists of stepper motor, stepper motor driver, power supply and controller (pulse generator). A typical connection diagram is shown in the left figure.