



## STEP MOTOR DRIVER SMD-9.0

Manual

SMD.9.0.001

### 1. Product designation

Step motor driver SMD-9.0 is an electronic device designed to operate with 2 or 4-phase stepper motor with maximum current per phase up to 9.0 Amp.

### 2. Technical characteristic

The SMD-9.0 driver receives logic signals "Step", "Direction" and "Enable" and convert them into motor commutation. The motor's shaft moves one angle step (or microstep) as the driver receives one "Step" signal. One step (or microstep) executes as the front edge of the voltage pulse on the "STEP" input. Rotation direction depends on the voltage level and switches by changing voltage level on the "DIR" input. The motor can be urgent stopped by the active signal on the "EN" input.

Maximum phase current and microstepping mode are set by switches at the driver frame.

#### Common characteristics:

- Maximum output current per phase: 9.0 Amp
- Minimum output current per phase: 2.5 Amp
- Microstepping modes: 1, 1/2, 1/4, 1/16
- Voltage input: 24 – 120 VDC
- Maximum overall dimensions: 49x93x100 mm

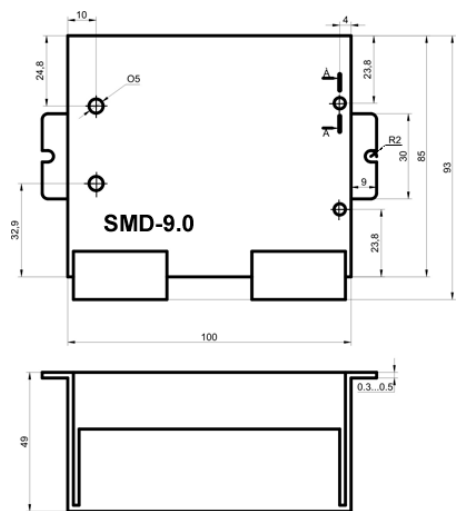
#### Inputs DIR, STEP, EN:

- High voltage level: 5-24 VDC  
(Please, connect current-limiting resistance when use high level voltage more, then 5VDC: 1 KOhm for 12VDC, 2 KOhm for 24VDC).
- Low voltage level: 0-1 VDC
- Logic signal current: 10-16 mA
- Minimum "Step" pulse length: 3 μs
- Direction setting time: 5 μs

#### Environmental Conditions:

Ambient Temperature: -25...+50°C  
 Humidity: 90% RH or less upon condition +25°C  
 Condensation and freezing: none  
 Pressure: 650...800 mm of mercury

#### Dimensions:



Img. 1 - Dimensions

### 3. Construction

SMD-9.0 is designed as a circuit plate with electronics elements, installed on a heatsink plate and covered with a metal case. Besides electronic components, there are indicating and control elements, connection terminals and connectors on the board:

- terminal screws for power supply, steppmotor windings and control circuit connection;
- LED for indication of the driver status;
- switches SW1 – SW4 to set the maximum output current per phase;
- switches SW5 – SW6 to set the microstepping mode;
- switch SW7 – to set full or reduced holding current.

### 4. Assembly and connection

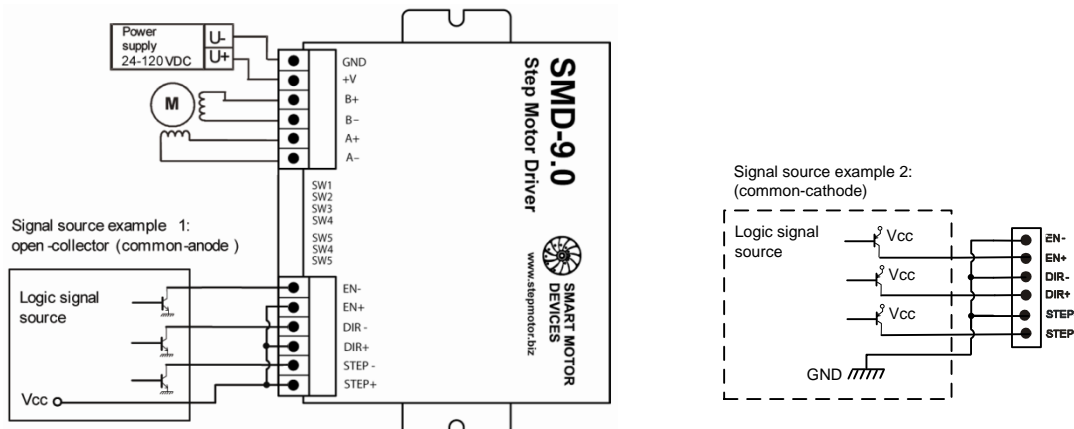
Please, learn this manual carefully before connection and assembly.

Please, wire just when power is off. Do not attempt to change wiring while the power is ON.

Please, provide a reliable contact in connection terminals. During wiring, please, observe the polarity and wire management.

#### Assembly and connection order

Connect the SMD-9.0 driver with stepper motor, signal source and electric DC power supplier according to schemes shown on image 2.

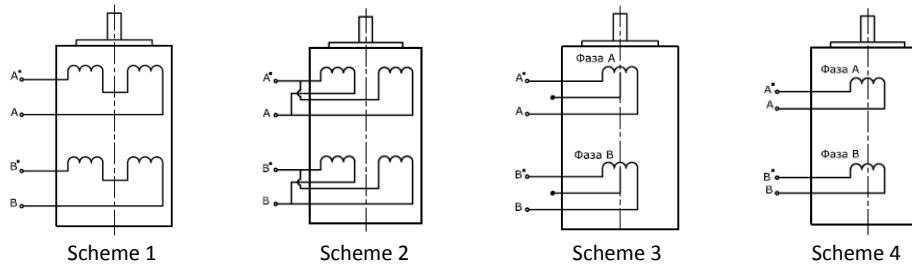


Img. 2 – Connection scheme

Please, connect current-limiting resistance when use high level voltage more, then 5VDC: 1 KOhm for 12VDC, 2 KOhm for 24VDC.

### Motor connection

The SMD-9.0 driver provides operation with 2 or 4-phase stepper motors, 4, 6 or 8 wires. Connect step motor wires to A+, A-, B+ and B- terminals of SMD-9.0 according one of the above schemes 1-4.



8 wires stepmotor connection (4 phases):

Scheme 1 – serial connection;  
Scheme 2 – parallel connection.

6 wires stepmotor connection (2 phases with midpoint taps):

Scheme 3;

4 wires stepmotor connection (2 phases without midpoint taps):

Scheme 4 .

### 5. Before starting

1. Make sure the power supply is turned off..
2. Choose suitable microstepping mode and set microswitches SW5 and SW6 according to the table 1.

Table 1

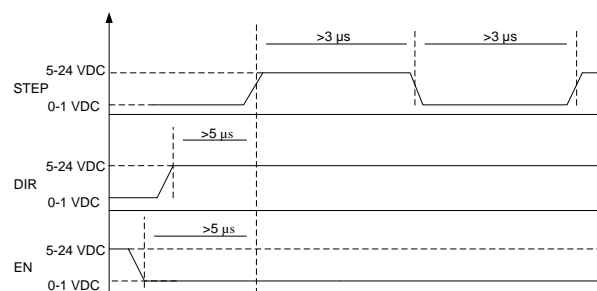
	1	1/2	1/4	1/16
SW5	ON	ON	OFF	OFF
SW6	ON	OFF	ON	OFF
Steps number per revolution (for 1.8° motor)	200	400	800	3200

3. Choose suitable for the motor maximum current per phase and set microswitches SW1-SW4 according to the table The output current should be set according the motor's description. Low current leads to a weak torque of the motor, high current leads to the motor heating and can damage the motor.

Table 2

Max current per phase, A	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
SW1	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON
SW2	OFF	OFF	ON	ON	OFF	OFF	ON	ON	ON	ON	OFF	OFF	ON	ON
SW3	OFF	OFF	OFF	OFF	ON	ON	ON	ON	OFF	OFF	ON	ON	ON	ON
SW4	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON

4. Choose holding current – 100% or 70% of maximum current per phase and set SW7: ON– 100% and OFF – 70%.
5. Make wiring according to the section 4 "Assembly and connection".
6. Check wiring once again and turn on the power supply.
7. To control the stepper motor set the required sequence of logic signals "STEP", "DIR" and "EN" according to the scheme - image 3. One step (or microstep) executes as the front edge of the voltage pulse on the "STEP" input. Direction switches by changing voltage level on the "DIR" input. The motor windings release as the front edge of the high voltage level on the "EN" input.



Img. 3 – STEP, DIR, EN signals

### 6. Delivery in complete sets

The stepper motor driver SMD-9.0  
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1 pcs.  
1 pcs.

### 7. Warranty

Any repair or modifications are performed by the manufacturer or an authorized company. The manufacturer guarantees the failure-free operation of the controller for 12 months since date of sale when the operation conditions are satisfied – section 2.

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