

DC BRUSHLESS MOTOR CONTROLLER BLD-20

Manual B103-20

1. Product designation

Brushless controllers B103 are electronic devices designed to operate and control brushless synchronous 3-phase dc motors with Hall encoder. Motor operation parameters are set via controller's inputs.

2. Technical characteristic

Controllers are designed to control speed, direction, smooth start and stop of brushless motors by input signals "START/STOP", "REVERSE", analog "SPEED", "ACCEL" and "RESET".

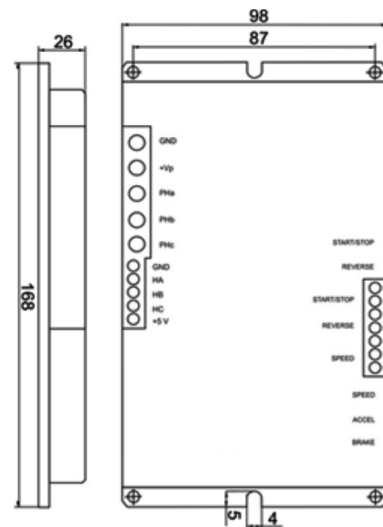
Table 1

Controller	B103-20
Power supply voltage, VDC	24-48
Maximum continuous current, A	20
Short-time maximum overload, A	<30
Acceleration/Deceleration time, s	1/3-8

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 – B103-20 dimensions

3. Construction and control elements

B103-20 is designed as circuit plate with electronics elements, installed on a 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, brushless motor windings and encoder lines, and control circuit connection;
- Buttons "START/STOP", "REVERSE" and "RESET";
- Internal preset potentiometers to adjust speed "SPEED", acceleration and deceleration "ACCEL";
- LED for indication of the controller status.

Control by inputs: To adjust motor speed internal potentiometer "SPEED" and analog input "(0..5)V" are provided. To adjust acceleration and deceleration internal potentiometers "ACCEL" is provided. For sudden stop or for controller reset button "RESET" is intended. To change the direction button and input "REVERSE" are intended. To start or stop motion button and input "START/STOP" is intended. With standard firmware "START/STOP" and "REVERSE" signals use pulse logic and activate as per the front edge of the signal. Firmware with level signal logic is available as per a request.

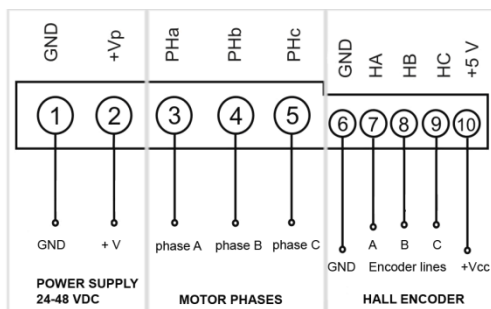
4. Assembly and connection.

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.

4.1. Power supply and motor connection



Img. 2

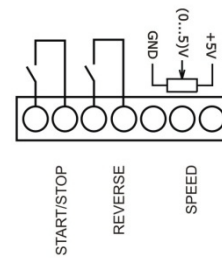
Connect brushless motor to the controller according to the scheme (image 2). Motor phases should be connected to the contacts 3 – 5 “PHa”, “PHb”, “PHc”. Hall encoder lines should be connected to the contacts 7 – 9 “HA”, “HB”, “HC”. GND of Hall encoder connects to the contact 6 “GND”, supply voltage for Hall encoder connects to the contact 10 “+5V”.

Connect power supply to the contacts 1 and 2 “GND” (“-”) and “+Vp” (“+”) according to the specification of the power supply unit. Input voltage range 24-48VDC is allowed. Connection wires should be suitable for the motor current.

4.2. External control signals connection

Make control signal wiring according to the image 3.

- external signal “START/STOP” – clean contact;
- external signal “REVERSE” – clean contact;
- external voltage source 0-5VDC or external potentiometer to provide analog speed control.



Img. 3

5. Operation

5.1. Before starting

- 1) Make sure the power supply is turned off. Please, wire just when power is off.
- 2) Please, chose the speed adjusting method:
 - Internal potentiometer - additional connection isn't required.
 - External potentiometer – connect potentiometer to the “SPEED” contacts “(0...5)V”, “+5V” and GND – image 4. The internal potentiometer “SPEED” should be turned to the end left position. The minimum resistance of the potentiometer corresponds to the maximum motor speed. Increasing resistance leads to reducing motor speed.
 - Analog signal 0-5VDC – connect the source of analog signal 0-5VDC to the “SPEED” contacts: “-“ to the “GND” contact and “+” to the “(0...5)V” contact – image 3. The motor speed is proportional to the signal voltage.
- 3) If needed, connect control elements to the “START/STOP” and “REVERSE” contacts – image 3.
- 4) Make motor and power supply wiring according to the section 4.1.
- 5) Turn on the power supply.

6. Delivery in complete sets

The brushless motor controller BLD	1 pcs.
Manual BLD.20.001	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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