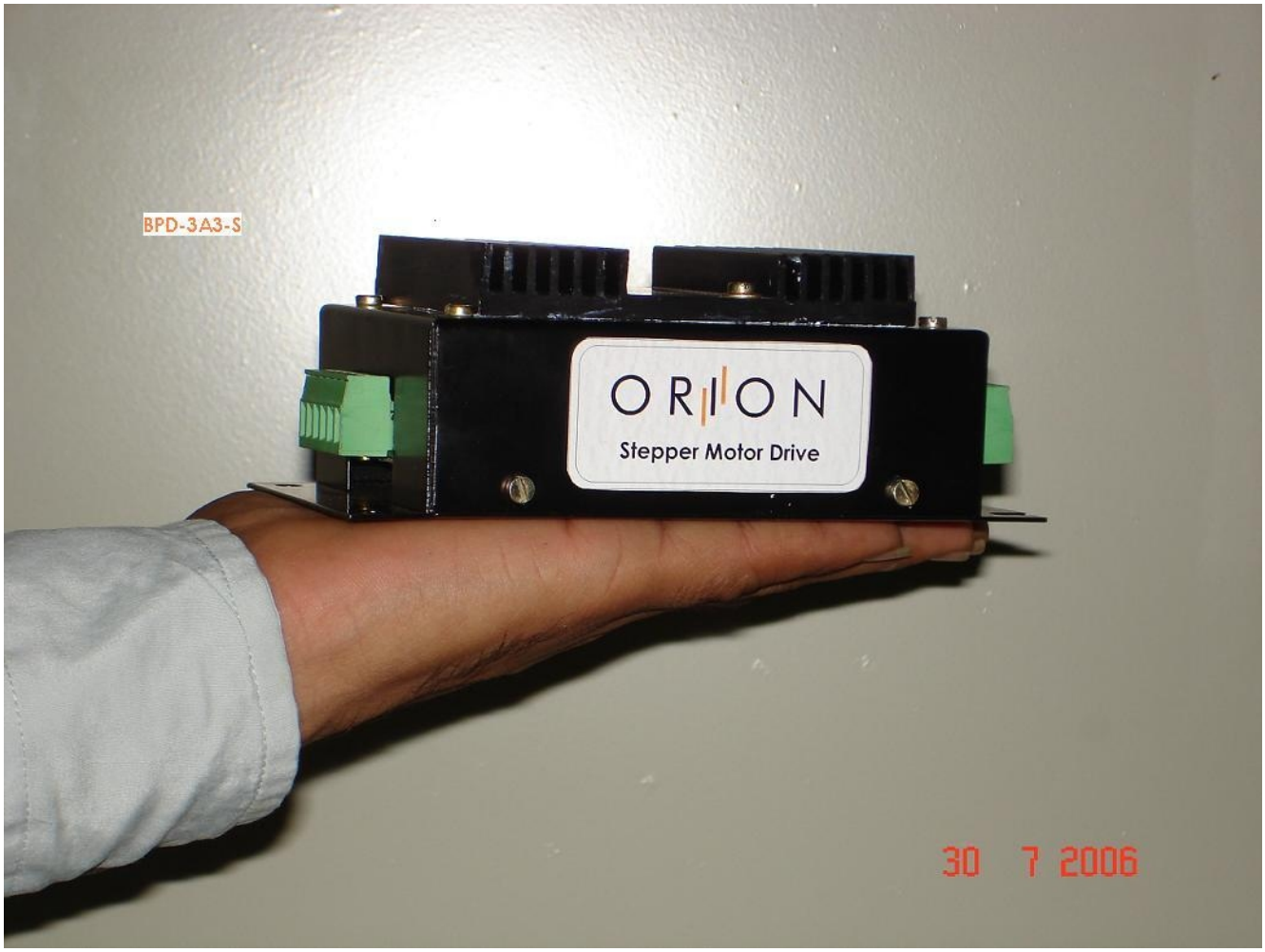
BPD-3A3-S
ORION
Stepper Motor Drive
30 7 2006

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ORION ELECTRONICS

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OPERATION MANUAL

for

MODEL NO. BPD-3A3-S

= =

4041, Bhandup Industrial Estate,
L.B.S. Marg, Bhandup (W),
MUMBAI : 400 078

Tel : 022-2564 1671, 022-2569 3478
Email : orionele@vsnl.com
URL : www.orionele.com

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STEPPER MOTOR DRIVE
MODEL NO. BPD-3A3-S

Stepper motor drive has now become a commonly used device, for various motion control applications. Stepper motors, along with good drives; present many unique abilities and features. For example-

- Good stopping accuracy.
- Instant start / stop and direction reversal at least up to 60 rpm.
- Constant speed even if supply voltage changes.
- Good power efficiency.

Compact, economic and reliable stepper drives is a need of many automation products.

This model **BPD-3A3-S**, presents all the above advantages. A convenient chassis (default), or din rail mounting, which is ideal for control panels, can be opted for.

Specifications

Control supply	24 VDC / 3 Amps (BPD-3A3-SS), OR 36 VDC and 12 VDC (BPD-3A3-SD)
Inputs	Optocoupled By default 5V signal levels. (Higher voltage, on request)
Current setting	Up to 3.3 Amp per phase, by on board preset
Type	Bipolar
Outermost Size	140 X 80 mm, height 50 mm

Installation and settings

The drive module should be mounted in a well -ventilated place in the control panel. The output devices heat up. For continuous duty cycle it may be necessary to provide a cooling fan, depending on ambient conditions.

The unit cannot work without proper interfacing of signals. The attached diagrams indicate how sinking or sourcing signals of various voltages can be connected. Ensure that the signals are connected properly and the power supply polarity is correct, before putting the power on.

Power supply and clock signal is minimum requisite of the drive to run.

You may choose to keep **the start signal** active permanently.

The direction signal may be left open if unidirectional motion is sufficient. In such case, initial setting of direction may be effected by exchanging the connections A1 and A2 of the motor.

Stepper motors when stopped may remain energized or completely de-energized, as desired by the user. Pins 3 & 4 from left, decide which. If **the enable signal** is active, it is the "Enable" i.e. energized mode.

How to set the suitable current

Remove the top cover of the box and heat sink, and the pcb will be seen. The diagram shows the component side view of the PCB when the top heat sink is removed. Please note the orientation of the PCB. The 6 pin connector on top side and the 10 pin on the bottom side.

A blue colored "current SET" preset is easily visible in front of the regulator IC with smaller heat sink. There are test points marked "-TP+" just above the left most pins of the 10 way connector. Out of the group of 3 pads, the middle pad is unconnected. Connect a multimeter on voltage range, with red probe on right most pad, marked '+' and the black probe on the left most pad, marked '-'.

Put the power on, with clock signal unconnected. It is best to remove the clock signal wire from pin marked 'CK+' or 'CK-' (pins 7 & 8 from left) before putting the power on. Ensure that the START signal is active. This can be done by connecting RN+ terminal to 5 V+ and RN- terminal to ground. Connect a multimeter to measure voltage at 'TP+' and 'TP-'.
The formula is-

Vset = Iset * Rsense

Vset is the voltage reading on multimeter.
Iset is the required per phase current for the motor to be used.
Rsense = 0.2 2 Ω.
Thus, if the Vset is adjusted to 0.66 volts using the "Current set" preset, described above, the current set is 3 Amp.

Check points and trouble shooting

Refer the pin numbers on the diagram page.

Voltage measured between

1 & 2 24 VDC

7 & 8 24 VDC

Both these DC voltages may be unregulated but they should be well-filtered.

By default the inputs are designed for 5 V signals. If you are using 12V or 24 V signal level, appropriate resistor should be connected in series. This is illustrated in the diagram attached.

TP+ and TP- This voltage in reset state should be 0.22 V per Amp. Refer section "How to set the suitable current"

Check this if motor torque is found to be less than rated.

Check this if motor is getting unduly heated, say above 95° C.

Resistance measured between (Power must be off)

3 & 4 Winding-A resistance
Generally a few ohms only.

5 & 6 Winding-B resistance
Generally a few ohms only.

Both the above readings should be equal.

Check this if motor is vibrating or unwarranted direction change is taking place.

Remember....

"EN" input active means "Enable" mode.

"RN" input active means the motor will move if clock is present.

"DR" input active will reverse the direction of motion.

A few points worth noting

- Generally, the stepper motors get heated up, to about 75°C. It is a good practice to provide heat sinking by way of a well-machined mounting plate, made of good conducting material. Providing good air flow with a cooling fan is necessary for machine with long working cycles.
- The cables running from the drive to the motor, should be of proper size. Unnecessary lengths of this cable should be avoided. While designing the panel cabling layout, make it a point, not to bunch the signal and motor cables together.
- Use shielded cable for signals, especially when you are using higher lengths.
- It is critically important that the stepper motor shafts are not machined at customer's end. The motor may get permanently damaged. Similarly, in case there is some problem with the motor, **do not try to open the motor and do not put oil.** Instead, the manufacturer should be informed and motor should be sent for repairs.
- Do not attempt component level servicing on drive or other PCB's without instructions from ORION.

ADD ONS FOR BPD-3A3-S

With BPD-3A3-S, several functional modules can be added. They are as follows-

1. Analog input for speed (0 to 10 V OR 4 to 20 mA), digital inputs for speed and direction.
2. Manual control of start, direction and speed, with two limit switches.
3. Start and Stop on sensors.

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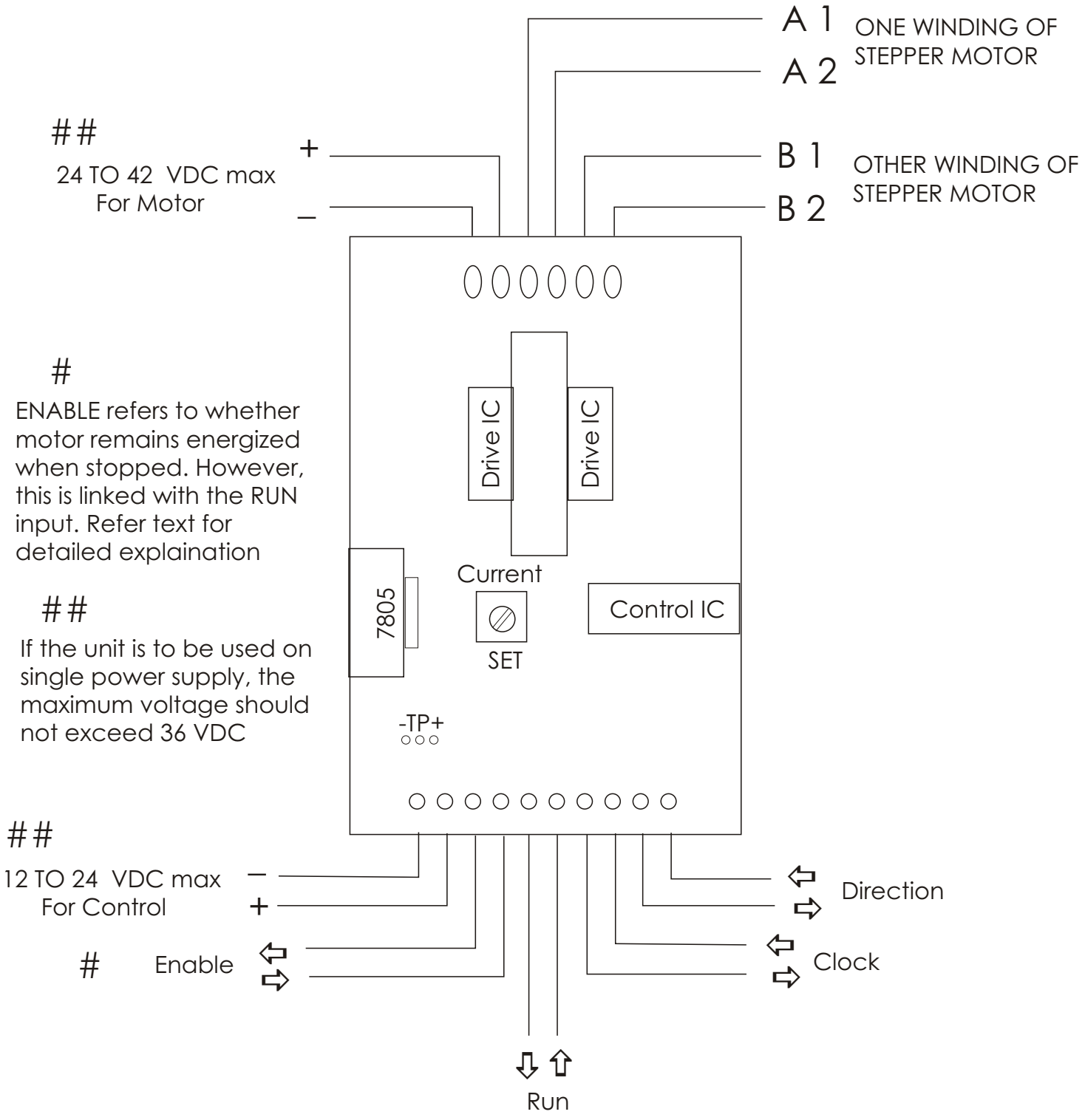
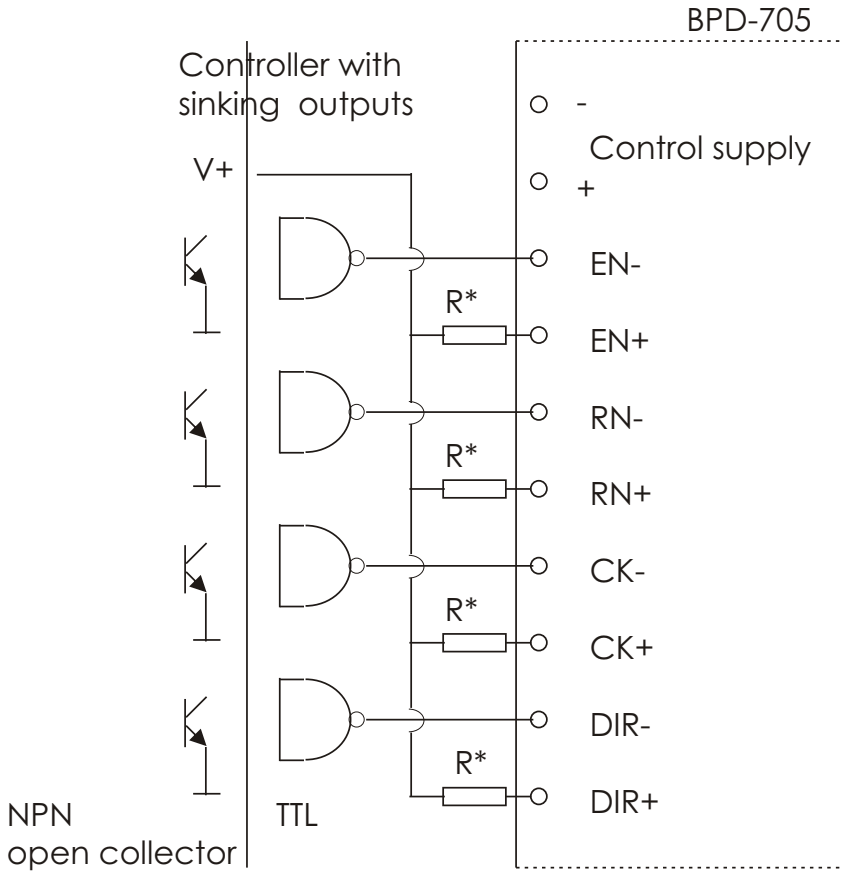
COMPONENT SIDE VIEW

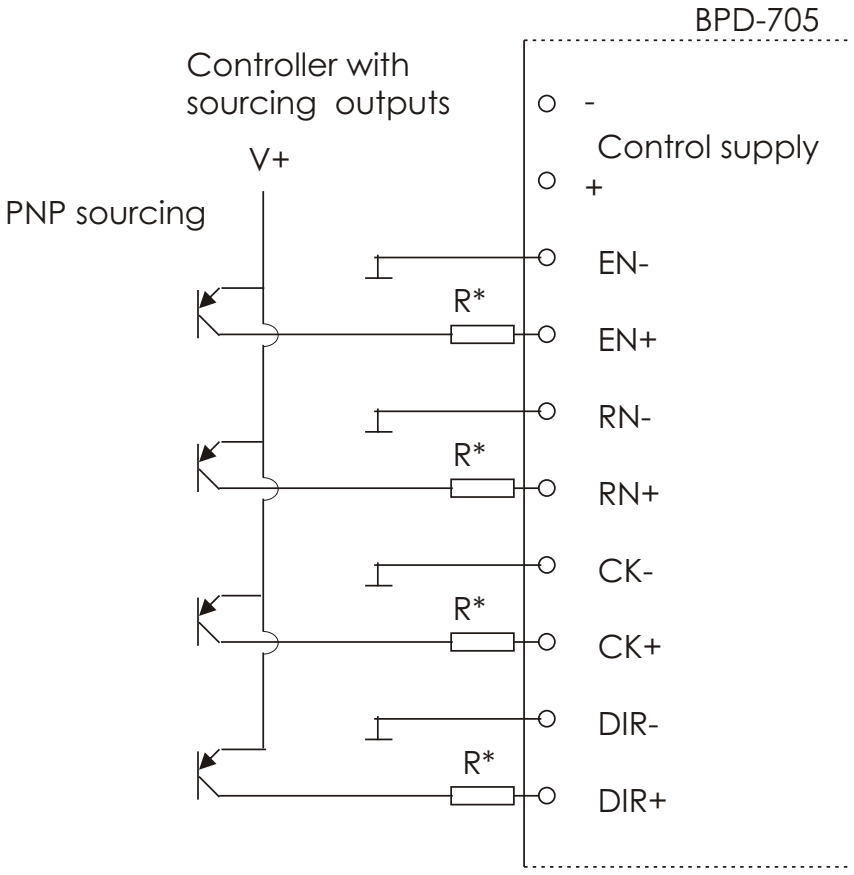


Connecting sinking outputs of controller



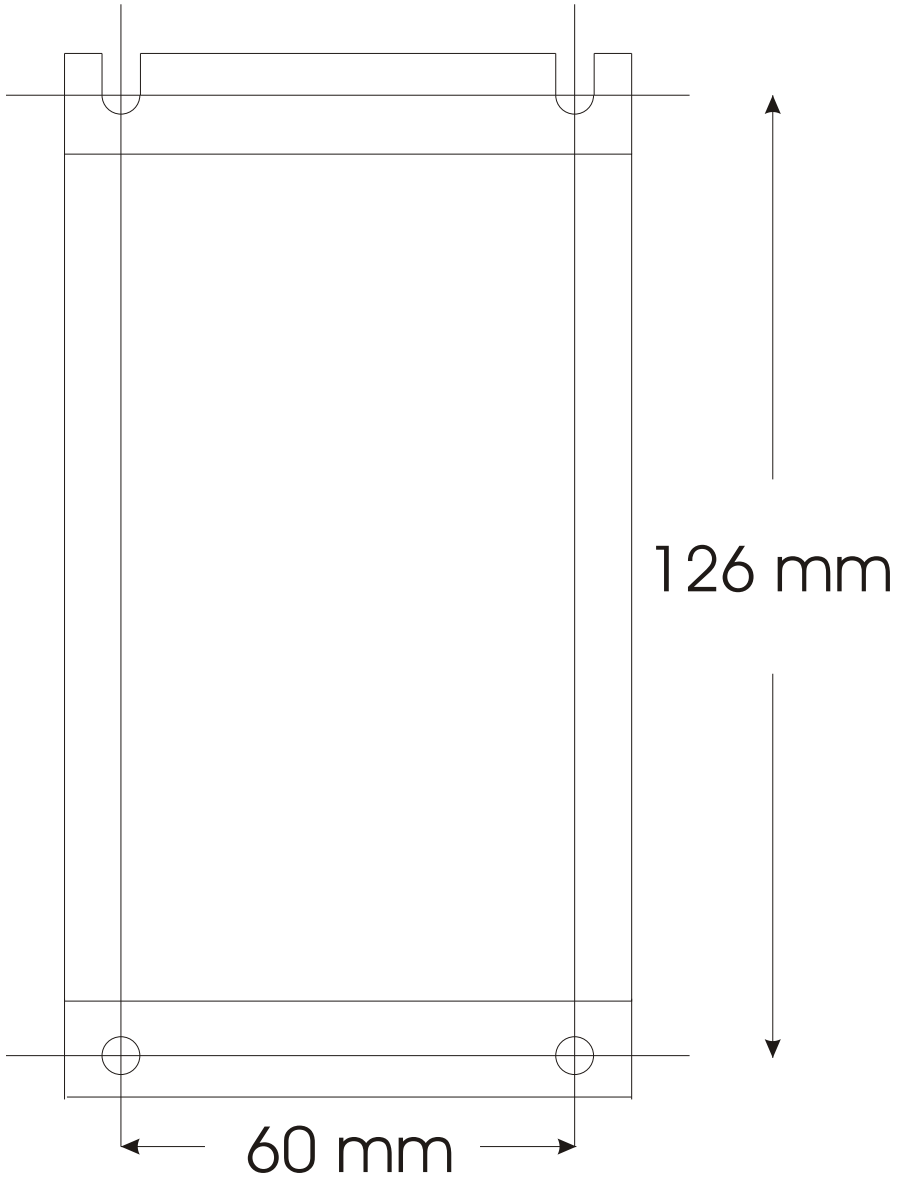
Voltage	Aditional Resistor R*
5 V	0 ohms
12 V	820 ohms
24 V	2.7 kohms

Connecting sourcing outputs of controller



Voltage	Aditional Resistor R*
5 V	0 ohms
12 V	820 ohms
24 V	2.7 kohms

Mounting Drawing



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