CIRO PRODUCTS LTD

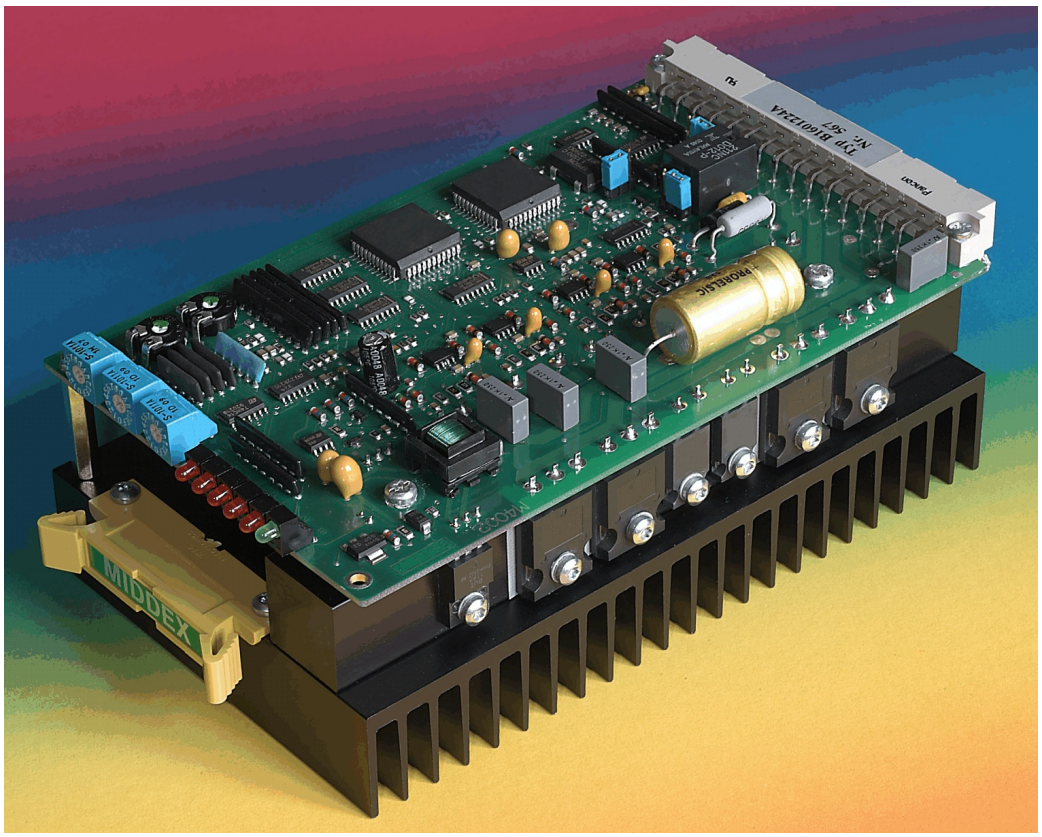
Caring Beyond Our Products

Bipolar Chopper-Driver

For 2-Phase Step Motors

Type B1601224A/B

Technical Documentation



MIDDEX ELECTRONIC

Version 03051

Introduction

The B1601224A/B series step motor drivers are high efficiency drivers for 2-phase step motors utilizing a new current regulator with pulse-width modulation.

The driver is protected against:

- Short between phases, and between phase and ground
- Over and under voltage
- Excess temperature

The ready relay switches against ground. A jumper configures relay as either normally open or normally closed. If no faults are encountered the relay switches approximately 100ms after powering the driver. The motor receives power and the green LED lights up.

The zero output and the zero LED are activated 50 times per revolution. This indicates one of the 50 fixed rotor positions. The open collector output switches to 0V and has a current-carring capacity of up to 30V/20mA.

A pulse signal immediately feeds the working current (step switch RUN) to the step motor coils. The motor moves on each positive phase edge one step in the direction indicated by the turning direction input signal. Motor turning direction cw/ccw is easily changed by jumper.

The Boost input is used during the motor acceleration phase to increase the motor current.

Cycle frequencies smaller than approximately 10Hz activates the automatic current reduction to the selected standby power.

The de-energize input switches the power to the motor off, holding moment is lost, and allows turning of the motor shaft.

The Reset input moves the motor to one of the fixed 50 positions, indicated by the Zero output and Zero LED.

C2 input for changing step resolution electrically.

Executions

B1601224A Ub = 35..160V, 200/400/500/1000 steps/revolution
B1601224B Ub = 35..160V, 200/400/800/1600 steps/revolution

Please Note

The supply voltage may only be switched at the primary side. It is not permissible to switch the direct current to the driver card.

Use the charging capacitor's terminals only to supply power to the driver.

Never unplug or plug in the driver card while under power! Observe the capacitors discharge time.

Connect the signal ground on the card plug with the negative of the supply voltage. Avoid ground loops at all cost!

Do not place signal wires with motor power supply lines. Use shielded cables in critical areas.

Current settings

Switch position	Current/phase
0	2.0Aeff (2.8Amax)
1	2.7Aeff (3.8Amax)
2	3.4Aeff (4.8Amax)
3	4.1Aeff (5.8Amax)
4	4.8Aeff (6.8Amax)
5	5.5Aeff (7.8Amax)
6	6.2Aeff (8.8Amax)
7	6.9Aeff (9.8Amax)
8	7.6Aeff (10.7Amax)
9	8.3Aeff (11.7Amax)
A	9.0Aeff (12.7Amax)
B	9.7Aeff (13.7Amax)
C	10.4Aeff (14.7Amax)
D	11.1Aeff (15.7Amax)
E	11.8Aeff (16.7Amax)
F	12.5Aeff (17.7Amax)

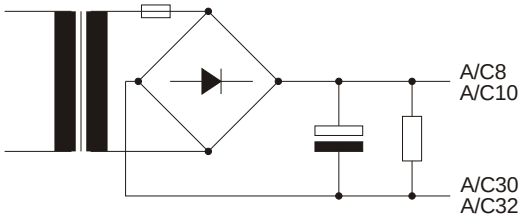
Step resolution B900624A

Input A2	BR1 open	BR1 closed
Low/<1V	200 Steps/rev.	500 Steps/rev.
High/>10V/open	400 Steps/rev.	1000 Steps/rev.

Step resolution B900624B

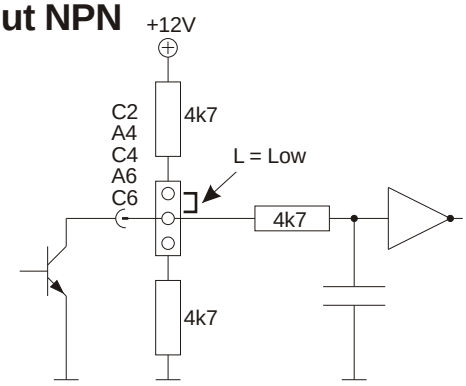
Input A2	BR1 open	BR1 closed
Low/<1V	200 Steps/rev.	800 Steps/rev.
High/>10V/open	400 Steps/rev.	1600 Steps/rev.

Power Supply

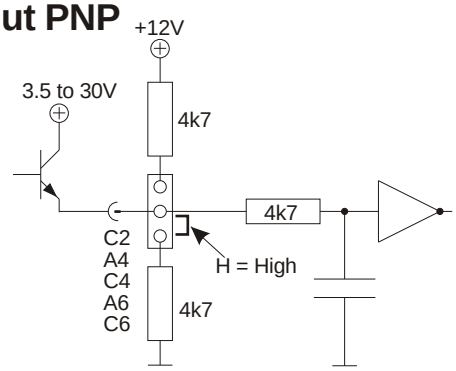


Transformer:	100VAC/450VA
Rectifier:	B250/25A
Fuse :	6.3AT
Capacitor:	6800uF/200V
Resistor:	10kOhm/4W

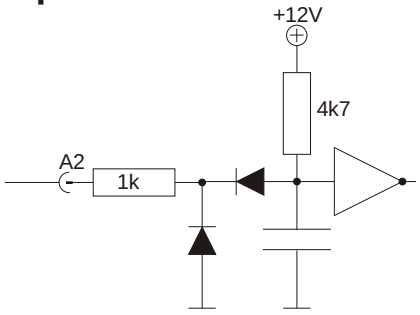
Step input NPN



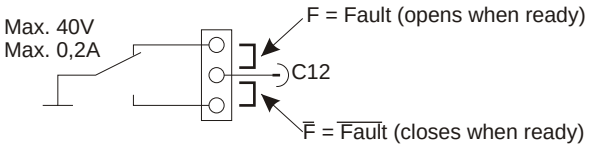
Step input PNP



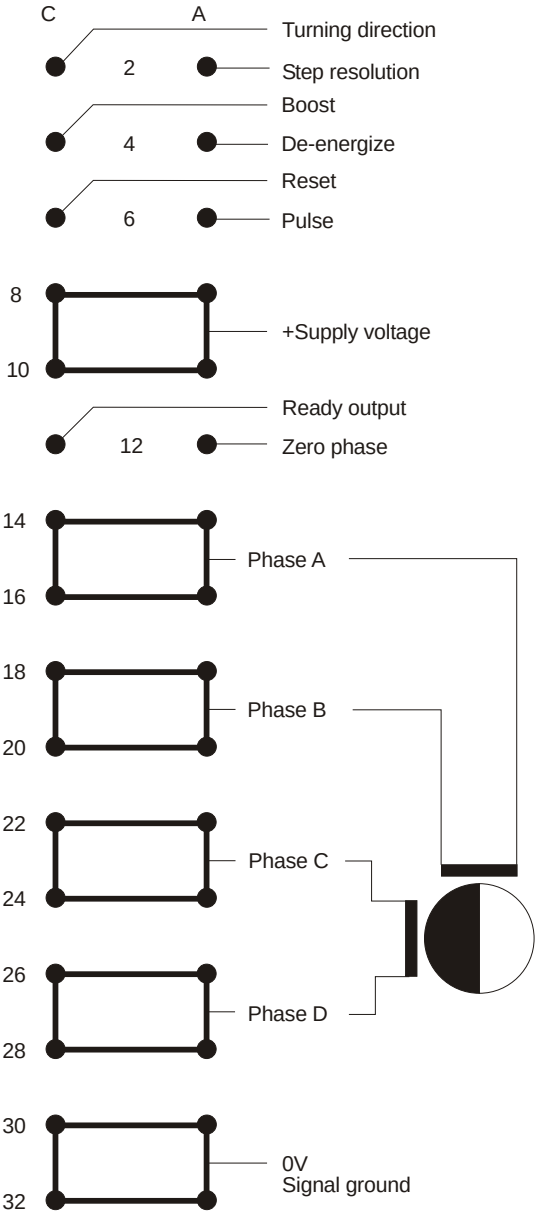
Input step resolution



Ready relays



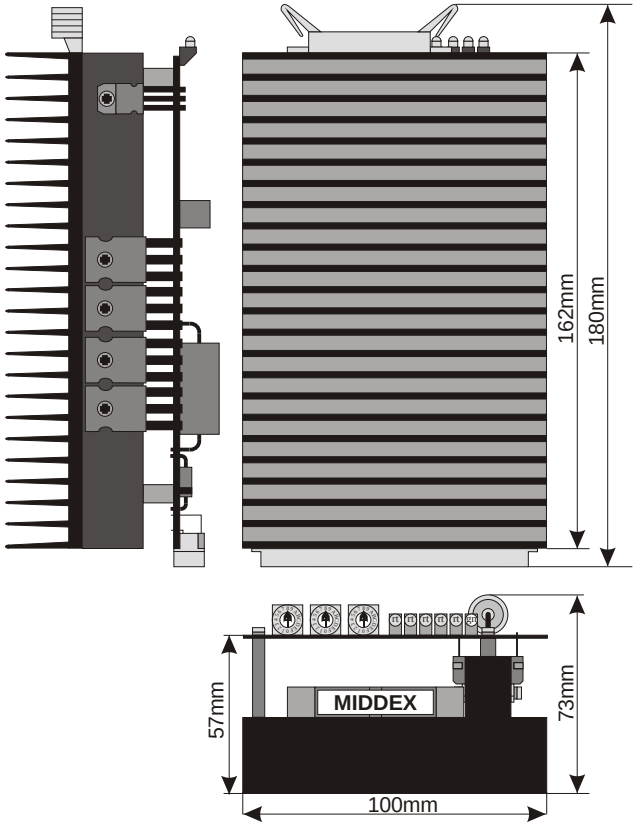
Wiring Details 32-Pin Connector



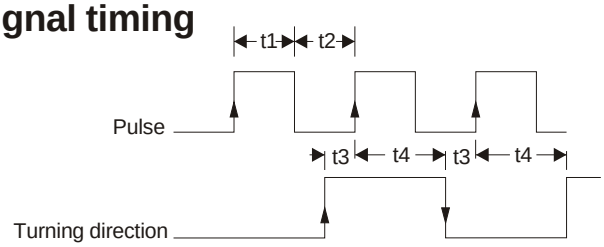
Frontal view on contact pins

Note: Connect all four pins of each corresponding phase!

Dimensions



Signal timing



t1	:	Pulse width	> 5µs
t2	:	Pulse pause	> 5µs
t3	:	Set up time direction	> 5µs
t4	:	Hold time direction	> 5µs
tr	:	Ascending edge	< 0.2µs
tf	:	Descending edge	< 0.2µs

Technical Data B1601224A/B

Working temperature:	0-50^0 C (32°F - 122°F)
Storage temperature:	0-70^0 C (32°F - 158°F)
Typical shut down temperature:	90^0 C (194°F)
Weight:	Approx. 0.7 kg (1.54 lb)
Max. working voltage:	160VDC
Typical working voltage:	140VDC
Min. working voltage:	35VDC
Max. residual ripple:	5%
Typical current capacity:	Depending on rpm, load, and motor
Rated phase current:	2 to 12 Aeff. (2.8 to 17A max. adjustable)
Min. motor inductance:	0.5 mH
Input resistance:	Approx. 2kOhm
Signal voltages:	Low < 1V; high > 3.5V, max. 30V for pulse, direction, de-energize, boost, reset Low <1V; high >10V, max. 30V for step resolution
Zero output:	Max. 30V/20mA, switching against 0V
Protective circuits:	Over/under current, exceeding temperature, short phase to phase, phase to mass
Moisture class DIN 40400:	F
Plug:	32-pin to DIN 41612 type B (pins A and C even numbered used)
Dimensions:	100x182x73 (see drawing)
EMV tested to:	EN 61000-4-4 (burst) ENV 50142 (surge)

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