

Boxer Pumps > Products > Accessories

Advanced stepper driver for accurate flow control of 9K, 9QQ and 9QX peristaltic pumps:

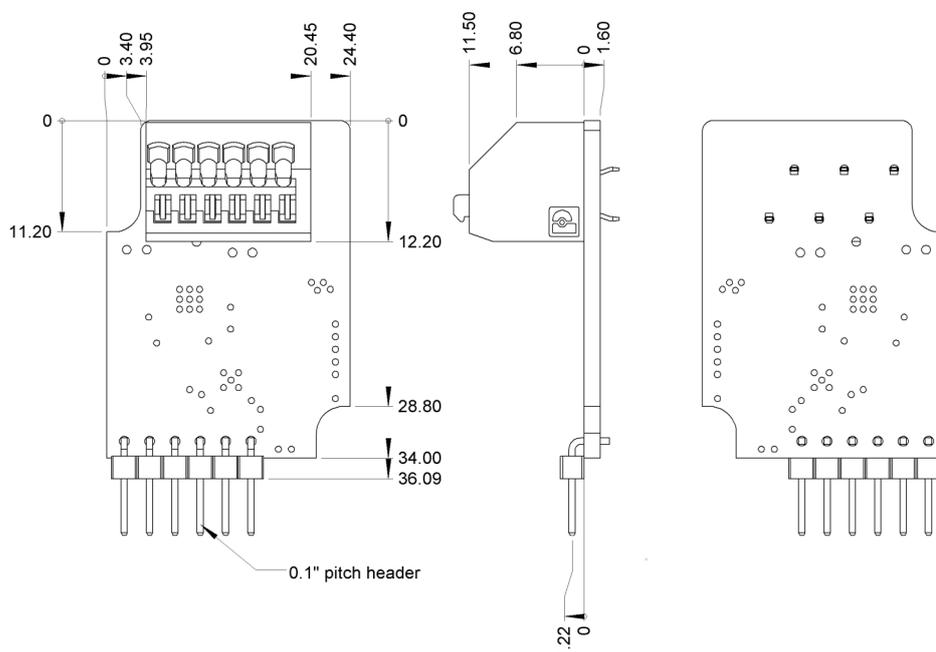
- 0 to 5.0 V, PWM or individual step input
- 1/256 micro-stepping
- 2 speed ranges
- mounts directly on Nema 17 stepper motor



## Technical Data

Driver Type	Full H-Bridge for 2 phase unipolar stepper motors
Size / Mounting	Nema 14 motors (9K / 9QQ / 9QX) / direct on motor
Voltage Range	10.0 to 24.0 V DC
Max Current	1.4 A intermittent (1.0 A continuous)
Current Limiter Factory Setting	1.0 A
Control Inputs	Speed (analogue, PWM or step), Enable, Direction
Control Outputs	+5.0 V DC reference output (for use with external potentiometer for speed control)
Jumpers (on reverse side)	Speed Range, Current Limiter, Micro-Stepping, Analogue or Step Input
Micro-Stepping	1/256 or 1/16
Automatic Acceleration (during start or speed adjust)	Ramp over 0.3 seconds
Thermal Protection	Automatic / Re-setting
Weight	7.0 g

## Drawing

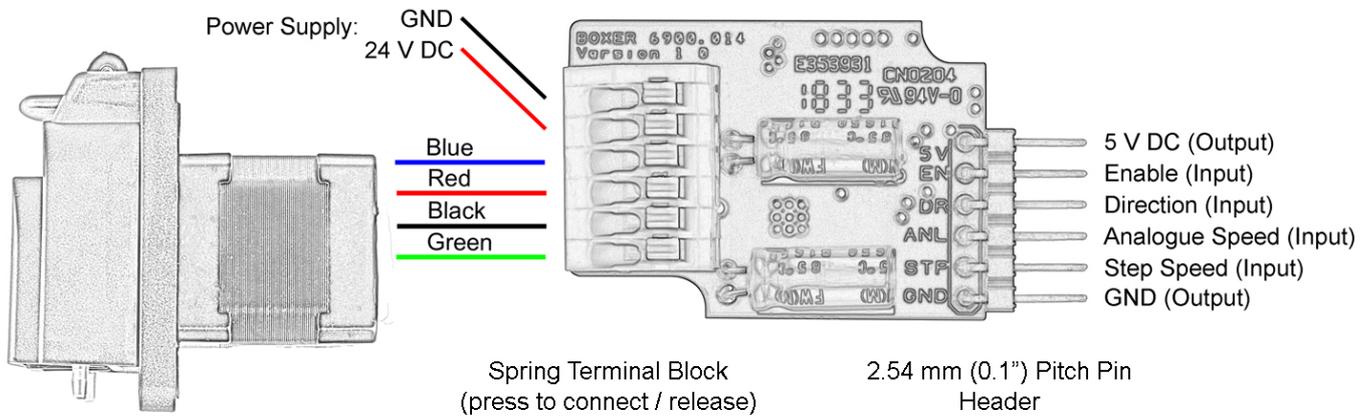


Links to Drawing and STEP file:

→ [Drawing \(.png\)](#)

→ [STEP \(.zip\)](#)

## Electrical Connection Details



### Outputs (to stepper motor):

A+ / A-	Black / Green	Phase A
B- / B+	Red / Blue	Phase B

Note: reversing polarity of A or B will cause the motor to run in the opposite direction

### Inputs / Outputs (to /from driver):

V+	Supply Voltage	+ 24.0 V DC (range 10.0 to 24.0 V DC)
GND	Ground	GND
5V <sup>1</sup>	5V DC (Output)	For use with external potentiometer for speed control
EN <sup>2</sup>	Enable / Disable	Open (or +5.0 V) = enabled / GND = disabled (motor coils are not energised)
DR <sup>2, 3</sup>	Direction	Open (or +5.0 V) = direction anti-clockwise / GND = direction clockwise
ANL <sup>4</sup>	Analogue Speed	0 to 5.0 V or 0 to 100% PWM (resolution 1024 increments / 10 bit)
STP <sup>4</sup>	Step Speed	1 pulse = 1 micro-step rotation
		1/256 micro stepping mode: 1 rotation = 51,200 (200 x 256) pulses. 51.2 kHz = 60 rpm, 512 kHz = 600 rpm
		1/16 micro stepping mode: 1 rotation = 3,200 (200 x 16) pulses. 3.2 kHz = 60 rpm, 32.0 kHz = 600 rpm
GND	GND (Output)	For use with external potentiometer

**Always start a peristaltic pump at slow to medium speed (less than 300 rpm) to avoid stalling**

<sup>1</sup> Supplied insulated. Damage will occur if connected to any voltage or GND

<sup>2</sup> Inputs are internally pulled up

<sup>3</sup> Direction is defined as looking at the pump from the front (anti-clockwise means inlet right, outlet left)

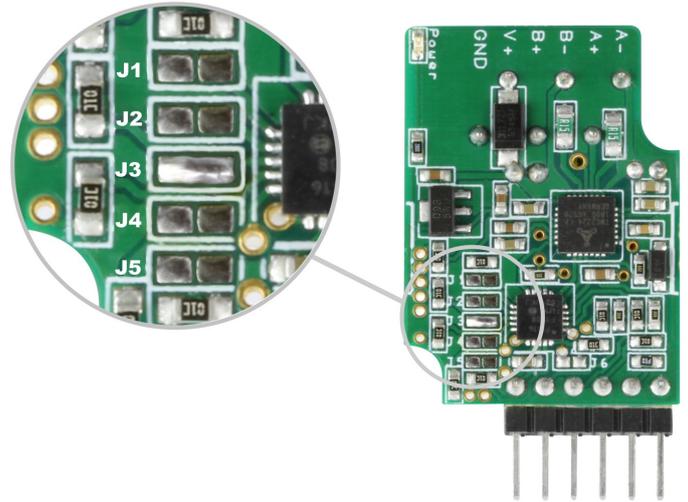
<sup>4</sup> Analogue or Step Speed mode is selected by the jumper settings (see page 3)

## Jumpers

Jumpers are provided on the reverse side as solder bridges. To close a bridge, carefully apply solder between the pads. To open a bridge, carefully use de-soldering braid. The photo below shows the default settings of J1 open, J2 open, J3 closed, J4 open and J5 open. The jumper settings are read when the driver is powered-up.

Jumper					Mode
J1	J2	J3	J4	J5	
<b>0</b>	-	-	-	-	Speed Range : 0 to 800 rpm
1	-	-	-	-	Speed Range 0 to 150 rpm
-	0	0	-	-	Current Limiter 0.4 A
-	1	0	-	-	Current Limiter 0.7 A
-	<b>0</b>	<b>1</b>	-	-	Current Limiter 1.0 A
-	1	1	-	-	Current Limiter 1.4 A
-	-	-	<b>0</b>	-	1/256 Micro-Stepping
-	-	-	1	-	1/16 Micro Stepping
-	-	-	-	<b>0</b>	Analogue or PWM Speed Input Mode
-	-	-	-	1	Step Speed Input Mode

Default settings shown in **bold**.



## Current Limiter Recommendation

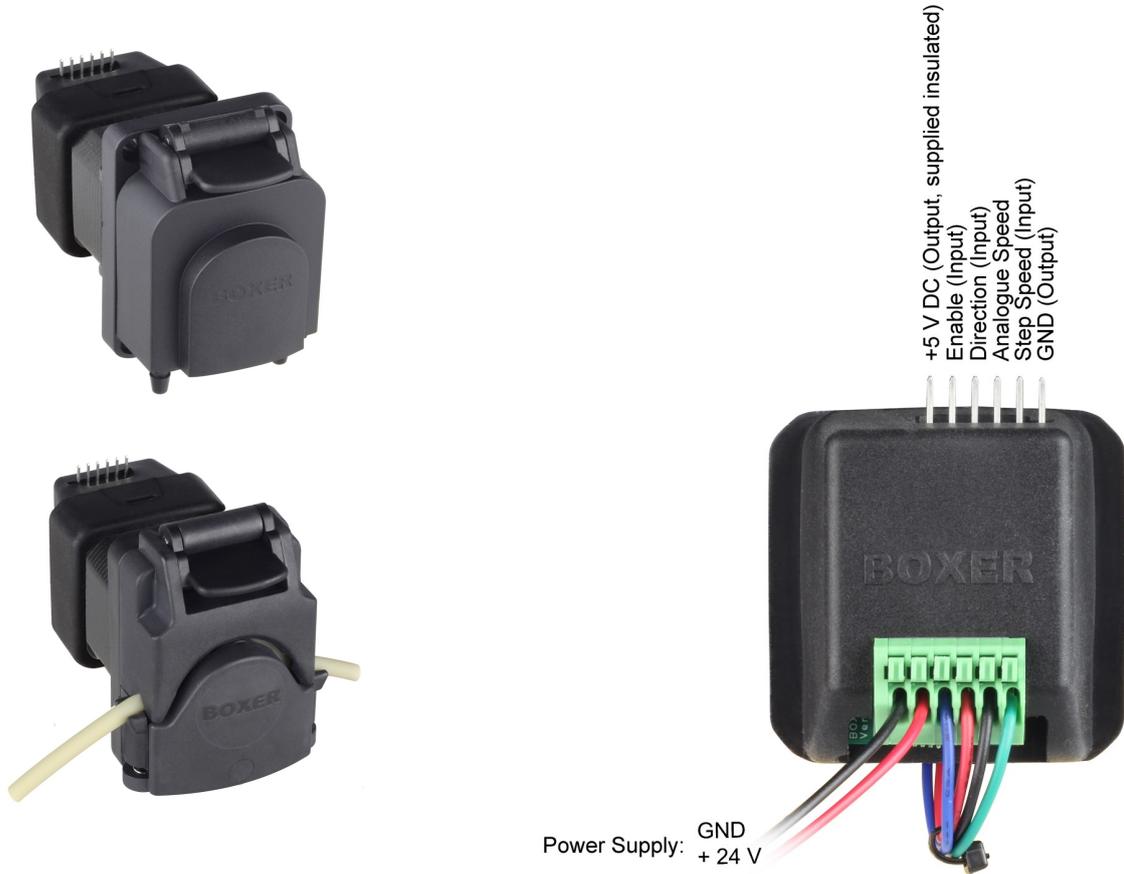
Peristaltic Pump	Limiter Setting
9QQ, 9QX	1.0 A (J2 open, J3 closed ) Possible to reduce to 0.4 A or 0.7 A depending on tube size, tube material and speed
9K	1.0 A (J2 open, J3 closed) for 1 mm ID tube only 1.4 A (J2 closed , J3 closed) for 2 mm and 3mm ID tube, intermittent operation only <sup>1</sup>

<sup>1</sup> Driver will thermal trip after approx. 1 min (automatically resets)

Boxer Pumps > Products > Accessories

## 9QQ / 9QX Direct Mounting

The Pico 1.4 stepper driver can be supplied assembled directly on the 9QQ and 9QX peristaltic pumps using a silicone mounting boot.



## Order Information

Part Number	Description
6900.014	Pico 1.4 Stepper Driver
9000.950	Mounting Boot (silicone)

All data is representative for initial selection purposes. It is the responsibility of the user to determine suitability for the intended use. Technical changes reserved.