USING A NSA12/NSA12V6 WITH A CONTROLLER OTHER THAN THE NEWPORT CONEX-PP

NSA12V6

NSA12

DESIGNED FOR NEWPORT CONEX-PP

The NSA12 / NSA12V6 are miniature motorized Actuators that are designed to work with the CONEX-PP controller. The warranty on the NSA12 / NSA12V6 will be voided if damaged by a controller other than the Newport CONEX-PP controller. Newport discourages the use of other controllers with this actuator for the following reasons:

• Only 1 limit signal (negative).

• The current and duty cycle must be strictly controlled.

ALTERNATIVE CONTROLLERS

If the NSA12 is used with any controller other than the Newport CONEX-PP controller, the following must be understood and implemented:

- The actuator must be homed to the negative limit at initialization (Power On). Because the NSA12 is an open loop actuator this homing process is required for a controller to validate current actuator position. The CONEX-PP controller homing routine includes motion to the negative limit and 10 μm in the positive direction.

- Software limits must be established because there is no positive hard limit. If the actuator is energized at initialization, (power on) without being homed, and the motor is energized so that the shaft extends (out / away) from the casing, it could continue moving until the lead screw jams and it could damage the motor. **If the actuator gets jammed, there is no way to manually "screw back" the lead screw and un-jam it.** Attempting to do so will break internal components.

- The Negative limit is activated with plunger retracted (pulled) into the casing. See the suggested pull-up resistor circuit for the negative limit below.

- Never use more than the rated values (especially current) in the specifications table below.

- Because of the high screw pitch (no chance of back driving), Newport recommends to always remove power to the motor when a move is done - because of the high screw pitch there is no need to energize the motor with "holding current". Leaving the motor ON continuously, will heat up the actuator excessively and degrade it's performance. A "torque reduction" scheme could be used to reduce the heat, but it is strongly recommended to cut motor power OFF completely when not moving.

- **If any of the above instructions are not adhered to, the actuators will be damaged or destroyed and the warranty will be void.**

When connecting the NSA12 to an other controller than the Newport CONEX-PP controller, connect it to a connector that is compatible with your controller. See the wire color code table below.
**Remember** that +5 V and ground will be needed to activate the negative limit signal.

NSA12/NSA12V6 Specifications	
Winding	Bipolar
Travel/step (full step)	0.00025 in (0.00635 mm)
Suggested mini-step size	64
Travel/step (mini-step 64)	0.0000039 in (0.00009906 mm)
Operating voltage	5 V
Current/phase	340 mA
Resistance/phase	14.7 Ohm
Inductance/phase	8.5 mH
Power consumption	3.4 W
Rotor inertia	1.2 g.cm^2

Wire Color Code Table

Pin #	Signal	Wire Color	Wire Size
Pin # 1	Homing	White	28 AWG
Pin # 2	Phase A+	Green	28 AWG
Pin # 3	+5 V	Red	28 AWG
Pin # 4	Phase B-	Orange	28 AWG
Pin # 5	Phase B+	Blue	28 AWG
Pin # 6	Phase A-	Yellow	28 AWG
Pin # 7	GND (0 V)	Black	28 AWG
Pin # 8	Connected to Pin 7	--	--
Pin # 9	Not used	Brown	28 AWG
Shield (V6)	GND (0 V)	Violet	26 AWG

9-Pin Connector
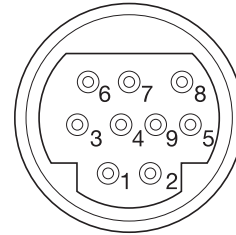
End view

Motor Board Schematic
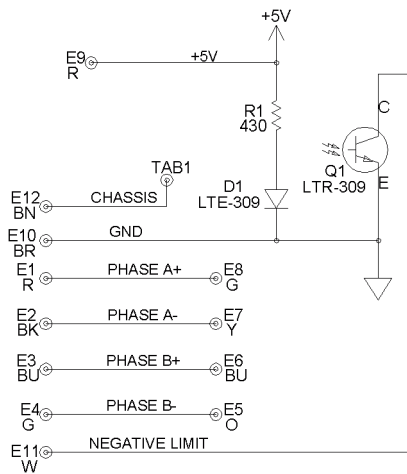
Suggested Pull-up Circuit for the Negative Limit