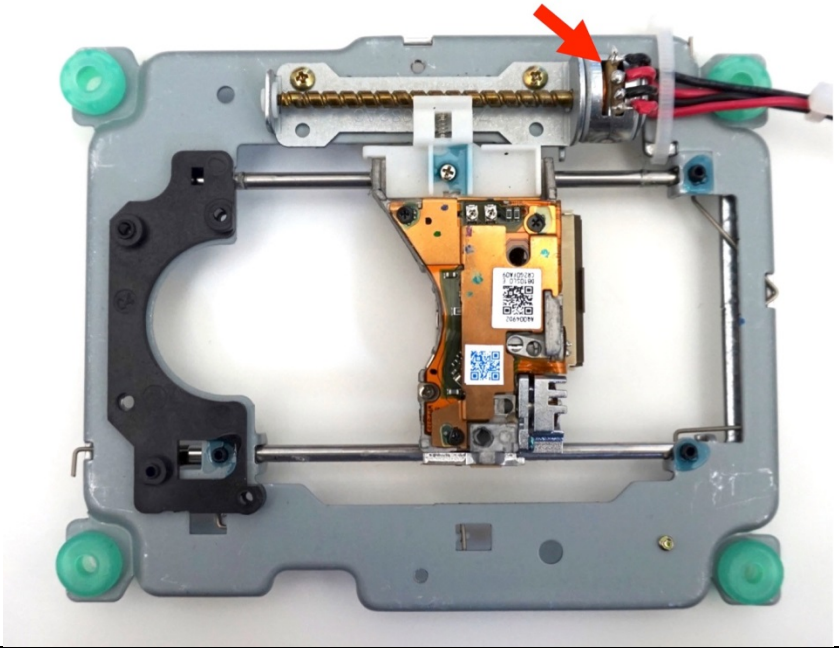
O-600 STEPPER MOTOR

Required knowledge Ohm's Law, stepper motor principle

JUST Google It!	**Steppermotor – how steppermotors work** **Steppermotor CDROM drive – bipolar stepper – unipolar stepper** **Stepper motor Full step, half step, wave step, microstep**

Stepper motors are ideal to make accurate small movements. Steps of less than 1° are possible and that is why they are used in many electronic projects and in 3D printers. Stepper motors are not cheap, but they can be recycled quite easily from old CD-ROM's and printers.

Steppermotor	From CDROM, Printer…. (Farnell, DX.com, Conrad) 

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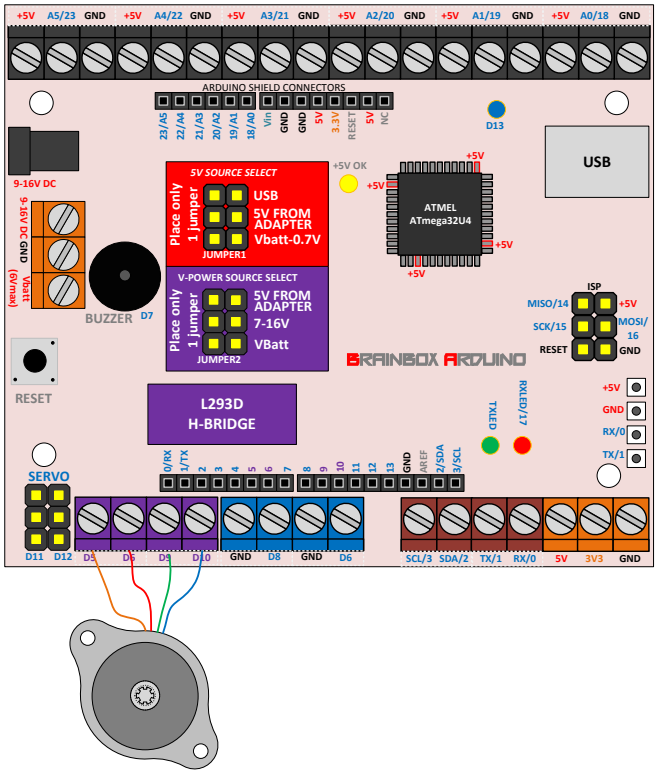
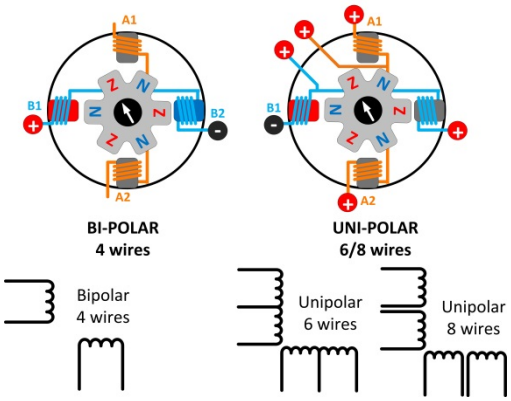
- Have a look at how stepper motors work and try to determine these things about your stepper motor:
  - Working voltage :What is the working voltage of your stepper
  - Bipolar of unipolar :Unipolar can be used as bipolar – we prefer to use bipolar.
  - Coil resistance :$\frac{Working\ Voltage}{Coil\ resistance} = Load\ Current$ – Keep this under 600mA/coil

Stepper motor voltage	Adapter voltage	Jumper position
5V	9V of 12V, …	5V from adapter
9V	9V	7-16V
12V	12V	7-16V

- Connect the stepper COIL A: (D5, D6) COIL B: (D9, D10)



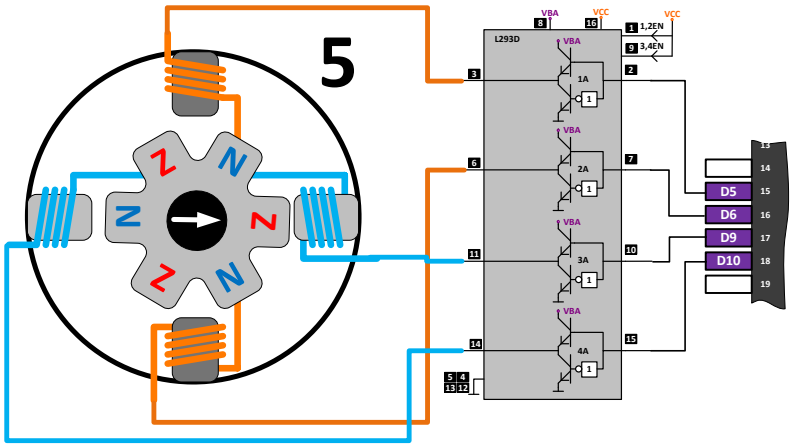


STEPPERMOTOR programming:

CODE EXAMPLE: **'O-600 - STEPPER'**

Select the demo programs for the stepper motor

Stepper motors can be driven in different modes. Each mode has specific advantages and disadvantages. It all comes down to making the correct pins high and low at the correct time.
Modes **bipolar stepper motor**:



WAVE STEP : 1 active phase at one time – less power – less current consumption

WAVE STEP	D5	D6	D9	D10
Step 1	1	0	0	0
Delay (minimal 5 msec – dependent of type, load and desired speed)				
Step 2	0	0	1	0
Delay (minimal 5 msec – dependent of type, load and desired speed)				
Step 3	0	1	0	0
Delay (minimal 5 msec – dependent of type, load and desired speed)				
Step 4	0	0	0	1
Delay (minimal 5 msec – dependent of type, load and desired speed)				
Step 1	1	0	0	0

FULL STEP : 2 active phases at one time – Maximum power – maximum current consumption

FULL STEP	D5	D6	D9	D10
Step 1	1	0	0	1
Delay (minimal 5 msec – dependent of type, load and desired speed)				
Step 2	1	0	1	0
Delay (minimal 5 msec – dependent of type, load and desired speed)				
Step 3	0	1	1	0
Delay (minimal 5 msec – dependent of type, load and desired speed)				
Step 4	0	1	0	1
Delay (minimal 5 msec – dependent of type, load and desired speed)				
Step 1	1	0	0	1

HALF STEP : half stepsize – alternating phases, power and current

HALF STEP	D5	D6	D9	D10
Step 1	1	0	0	1
Delay (minimal 5 msec – dependent of type, load and desired speed)				
Step 2	1	0	0	0
Delay (minimal 5 msec – dependent of type, load and desired speed)				
Step 3	1	0	1	0
Delay (minimal 5 msec – dependent of type, load and desired speed)				
Step 4	0	0	1	0
Delay (minimal 5 msec – dependent of type, load and desired speed)				
Step 5	0	1	1	0
Delay (minimal 5 msec – dependent of type, load and desired speed)				
Step 6	0	1	0	0
Delay (minimal 5 msec – dependent of type, load and desired speed)				
Step 7	0	1	0	1
Delay (minimal 5 msec – dependent of type, load and desired speed)				
Step 8	0	0	0	1
Delay (minimal 5 msec – dependent of type, load and desired speed)				
Step 1	1	0	0	1