

# Stepper Motors and Drivers

DT Workshop Equipment Reference — D&T / STEM resource for school workshops | Robotics & Mechatronics



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Stepper motors rotate in precise discrete steps, making them ideal for 3D printers, CNC machines and any project needing exact position control. Drivers such as A4988 and DRV8825 convert step and direction pulses into the motor's coil currents.

## Key Features

- 28BYJ-48 and NEMA 17 common sizes
- Steps of 1.8 or 0.9 degrees per step
- Unipolar and bipolar windings
- Drivers with micro-stepping up to 1/16 or 1/32
- Heatsinks needed for larger currents

## Typical Uses in the Workshop

- Drive 3D printer and CNC axes
- Build precise turntables and scanners
- Make automated camera and astronomy mounts
- Teach open-loop position control

## Safe Operation

1. Match motor voltage and driver current
2. Wire coils correctly - wrong pairs stall or buzz
3. Set the driver current with the reference
4. Connect step, direction and enable pins
5. Test one axis before adding others

## SAFETY NOTES

- Drivers and motors get hot - fit heatsinks
- Do not exceed the motor current rating
- Keep wiring away from moving parts
- Disconnect power before changing wiring
- Check the supply handles the peak current

#### Maintenance & Consumables

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- Check the shaft coupling screws
- Clean dust from the motor body
- Check the driver heatsinks are attached
- Test each axis movement at low speed
- Keep spare drivers in stock

#### Specification & Buying Notes

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NEMA 17 motors with A4988 or DRV8825 drivers cover educational CNC and 3D printing. Buy drivers in packs of five with heatsinks and capacitors for the power supply.