

P2 Based Pick and Place

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Ordered DIY Kit from web

<http://www.smt-nozzle-store.com/diy-pick-place-head.htm>

DIY SMT Head Set 8B - Juki Nozzle + Nozzle Holder B + Hollow Shaft Stepper Motor(20x20x38mm) + ABS Rotary Joint Connector + Rot

Description	Unit price	Qty	Amount
DIY SMT Head Set 8B - Juki Nozzle + Nozzle Holder B + Hollow Shaft Stepper Motor(20x20x38mm) + ABS Rotary Joint Connector + Rot Item# SMTHEADSET8B Model: Juki Nozzle 508 Sets Color: Green	\$105.00 USD	1	\$105.00 USD
High-Speed Mounter Nozzles Juki 503 (40001341) (Metal Core) Item# NJUKI503	\$7.30 USD	1	\$7.30 USD
Juki 502 SMT Nozzles (40001340) (Metal Core) Item# NJUKI502	\$7.30 USD	1	\$7.30 USD
High-Speed Mounter Nozzle Juki 506 (40001344) Item# NJUKI506	\$7.30 USD	1	\$7.30 USD
High Quality Pick-and-place Nozzle Juki 507 (40001345) Item# NJUKI507	\$7.30 USD	1	\$7.30 USD
High-Speed Mounter Nozzles Juki 505 (40001343) Item# NJUKI505	\$7.30 USD	1	\$7.30 USD

Subtotal

\$141.50 USD

No instructions...

- Stepper motor: Checking resistance on wires
 - Coil1: red/white wires
 - Coil2: black/yellow wires (yellow is actually yellow&green)
 - Can't find info on Benzhi BT1030, but maybe [like this one](#)
- Photoelectric Sensor: [PM-L25](#)
 - Output: NPN open-collector transistor
 - Incorporated with 2 outputs: Light-ON/Dark-ON

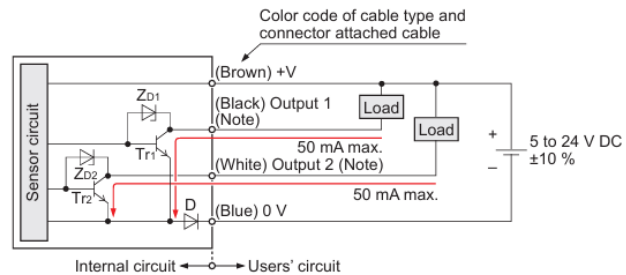
Photoelectric Rotation Sensor

- Think can connect black and white wires to P2 pins and use internal pullups

I/O CIRCUIT AND WIRING DIAGRAMS

NPN output type

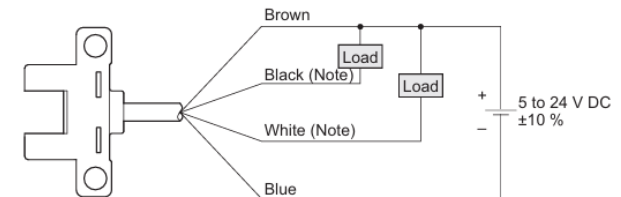
I/O circuit diagram



Note: Ensure to insulate the unused output wire.

Symbols...D: Reverse supply polarity protection diode
ZD1, ZD2: Surge absorption zener diode
Tr1, Tr2: NPN output transistor

Wiring diagram (PM-25 series / PM-45 series)

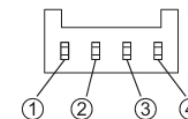


Note: Ensure to insulate the unused output wire.

Output operation

	Color code	Output operation
Output 1	Black	Light-ON
Output 2	White	Dark-ON

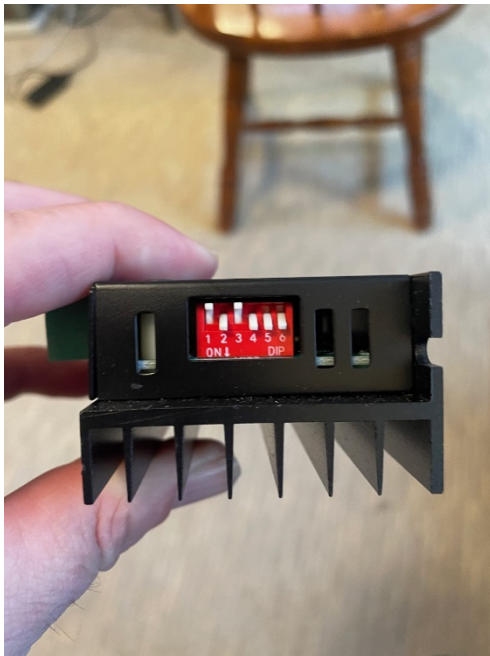
Terminal arrangement diagram (PM-65 series)



Terminal No.	Designation
①	+V
②	Output 1: Light-ON
③	Output 2: Dark-ON
④	0 V

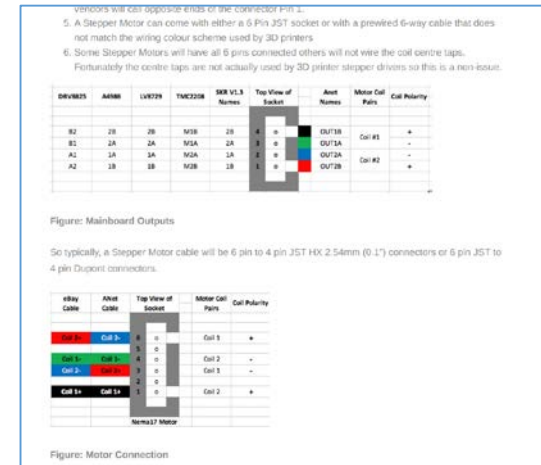
Motor Controller: Benzhi Microstep Driver

- Looks like rigged for 0.6 A drive, probably correct given small size of stepper.
- Rigged for 1/8 microsteps and 1600 pulses/revolution.
- How does it know pulses/rev? Must be because Benzzi makes both driver and stepper?
- Looks like can use the Zen 4th axis driver instead of this!

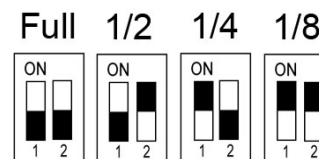


Wiring Zen 4th axis to new rotational stepper

- Some notes found here:
 - [Stepper Motor Wiring Conventions – Caggius Interweb](#)
 - Zen 6-pin is like “eBay Cable” but with black and green reversed
- Use Zen stepper control or Benzhi?
 - Try Zen first?
 - Need Red/White on pins 1&2, Black/Yellow on pins 3&4
 - Can we turn down current on Makerbot Stepper Driver?
 - Found notes on current setting here: [A3977 Single Stepper Motor Driver Board | Converting a CNC Machine to a 3D Printer](#)
 - To set the max current per phase place voltage meter from gnd to REF. Then follow table below to get your desired current by adjusting the Cur pot.
 - We want 0.6 A, so voltage = $(0.6/1) * 1.2 = 0.72 \text{ V}$
 - The present setting is 2 V (remember to set this back for egg painting!)
 - Presently have 1 on and 2 off for 1/4 stepping → both on for 1/8 stepping



Voltage	Current
1.2V	1A
1.8V	1.5A
2.4V	2A
3V	2.5A



Stuff from Amazon

- Tubing: [Amazon.com: Clear Tubing Assortment, 2mm 3mm 4mm 5mm ID, 12 Meters Length In All, 1mm Thickness, Flexible Plastic Tube Hose Set For Home Repair Water Oil Transfer Aquarium, BPA Free and non-toxic : Industrial & Scientific](#)
 - Using 4 mm for pump and solenoid valve
 - Using 2 mm for pick and place
 - End of 2 mm conveniently can be shoved into 4 mm to make connection
- Vacuum Pump: [YSJWAER Lab Vacuum Filtration Pump - Laboratory Filter Distillation Apparatus Kit for Fast Filtration of Liquids: Amazon.com: Industrial & Scientific](#)