

Sheet1

3Step Controller Bill of Materials

<http://www.ohmark.co.nz/3step>

Component ID	qty	Value	Description
IC1, IC3	2	74HC14N	High speed CMOS hex Schmit Trigger, 14 pin DIP
IC2	1	PIC16F870P	Processor, 28pin DIP
R26, R27	2	470 Ohm	470 Ohm 1/8W resistor.
R1, R2, R3, R16, R25, status LED resistor	6	1k	1k, 1/8W resistor.
R29, R29	2	4k7	4k7 1/8W resistor.
R4 – 15, R19 – 24	18	10k	10k, 1/8W resistor.
R17, R18	2	47k	47k 1/8W resistor.
C1, C2, C3	3	100pf	100pf ceramic capacitor
C4, C6, C7, C9, C10, C11	6	0.1uf	'monocap' capacitor
C5	1	100uf, 16V	100uf, 16V electrolytic capacitor
C8, C12	2	10uf, 16V	10uf 16V electrolytic capacitor
D4	1	1N4004	General purpose power diode.
D1, D2, D3, D5	4	1N4148	General purpose signal diode
LED1, LED2, 'status' LED	3	-	3mm or 5mm LED, pick your own colour!!!
Q1 through Q12	12	IRLZ44N	N Channel mosfet, Logic level, TO220 package
Q13, Q14, Q15	3	BC548	NPN Transistor, TO92
X1	1	20Mhz	20Mhz 3pin ceramic resonator
14pin socket	2		- 14 pin DIP IC socket
28pin Socket	1		- 28 pin, 0.3" spacing, DIP IC socket. (or use two 14's on end...)
Strip / Vero board.	1	-	4x4 inch bit of strip board.
JP1, JP2	2	-	2 pin header + Jumper. (If used, can be hard wired)
Relay	1	-	Spindle Control relay, 250VAC / 10A, 5V coil.

Not Included in this list:

Misc hookup wire

DB25 Connector – You might want to hard-wire it, or chop up a printer cable, I don't know!

Power resistors – See text on website

Output connectors – I directly soldered the motor connections, and used scrap screw terminals for these.

Fan(s) – Almost certainly will be required to keep the power resistors cool!

Mains connectors / fuse for spindle control. If you're doing that part I assume you know what you're doing!!!!

estop switches – As per connections PDF file. See note about latching Estop switches on website.

Power supply – see note on website

Power supply caps, see note on website. Approx 470uf/Amp