

Nano Variac Controller Assembly BOM							
Designator	Comment	Description	Footprint	Quantity	From	Cost	Comments
Blank PCB		WG45Rev2		1			
C1, 2	22n	Film Capacitor	0.2" Pitch	2			50/63V
C3	150n	Capacitor	0.2" Pitch	1			50/63V
C4, 5	220n	Capacitor	0.2" Pitch	2			50/63V
C6, 8, 9, 12, 14, C18 - 24, 26	100n	Capacitor	0.2" Pitch	13			50/63V
C7, 11, 13	4u7	Capacitor Tant.	0.1/0.2" Pitch	3			From 6 - 35V ok
C10, 25	10n	Capacitor	0.2" Pitch	2			50/63V
C15	220u 63V	Capacitor	10D 5mm Pitch	1			Any value from 100u up is OK
C16, 17	100u 16V	Capacitor	6.3D 2.5mm Pitch	2			Any value from 47u up is OK
C27	470p	Capacitor	0.2" Pitch	1			50/63V
C28, 29	470n	Capacitor	0.2" Pitch	2			50/63V
D1 - 6, 10	1N4148	Diode	0.3" Pitch	7			
D7	16V 1W	Zener Diode	0.4" Pitch	1			
D8	5V6 1W	Zener Diode	0.4" Pitch	1			
D9	1N4004	Diode 1A	0.4" Pitch	1			
J1	4 Pin PCB Socket	PCB V 5.08	0.2" Pitch	1	Element14	0.88/1	4176384
(J1)	4 Pin Pluggable	4 Pin Plug	0.2" Pitch	1	Element14	\$1.44/1	249364401
J2, J4	2 Pin PCB Socket	PCB V 5.08mm	0.2" Pitch	2	Element14	\$2.86/10	3770486
(J2, J4)	2 Pin Pluggable	2 Pin Plug		2	Element14	\$10.80/10	1787765
(J2, J4) Alternative	2 Pin Pluggable	2 Pin Plug		2	Digikey	7.35/10	102-6390-ND
J3	6 way Pin Header	Pin Strip 0.1" Pitch	HDR6	1			
J5	8 way Pin Header	Pin Strip 0.1" Pitch	HDR8	1			
J6	2 way Pin Header	Pin Strip 0.1" Pitch	HDR2	1			
J7, J8	3 way Pin Header	Pin Strip 0.1" Pitch	HDR3	2			
LD1	LED GREEN	3mm or 5mm LED	2P 0.1" pitch	1			
LD2	LED RED	3mm or 5mm LED	2P 0.1" pitch	1			
PS1	K78U12 (75-12V)	75V-12V DC/DC	3P 0.1" pitch	1	Element14	\$7.99	4254310
PS1 Alternate	LMW78_12-0.5R	75V-12V DC/DC	3P 0.1" pitch	1	Digikey	\$5.97	4254310
PS2	LMO78_05-0.5	5V 0.5A Regulator	3P 0.1" Pitch	1	Digikey	\$2.74	3182-LMO78_05-0.5-ND
PS2 Alternative	12 - 5V 500mA	MINI360 DC/DC	3P 0.1" Pitch	1	Ali Express	\$1.20	MINI360 or MP1584
Q1, Q2, Q5	BS170 or equiv.	NCH 50V 0.2A	TO92/100/DGS	3	Element14	26c	1362623
Q3, 7	2N3904 or equiv.	NPN 50V 0.2A	TO92/100/EBC	2			
Q4	2N3906 or equiv.	PNP 50V 0.2A	TO92/100/EBC	1			
Q6	NCE6020AI	NCH 60V 20A	TO251V	1		68c/5	LCSC
Q6	WGP30N10V Alt.	NCH 100V 30A	TO220V	1		90c/5	LCSC
R4, 5, 10, 43, 46	10K	Resistor 0.4W	10mm (0.4" Pitch)	5			
R6	15K	Resistor 0.4W	10mm (0.4" Pitch)	1			
R7	150K	Resistor 0.4W	10mm (0.4" Pitch)	1			
R8	120K	Resistor 0.4W	10mm (0.4" Pitch)	1			
R9	9K1	Resistor 0.4W	10mm (0.4" Pitch)	1			
R12, R31 - R33, R51	100K	Resistor 0.4W	10mm (0.4" Pitch)	5			
R14	270R	Resistor 0.4W	10mm (0.4" Pitch)	1			
R15, 24, 26	1K	Resistor 0.4W	10mm (0.4" Pitch)	3			
R16	100R	Resistor 0.4W	10mm (0.4" Pitch)	1			
R17	470R	Resistor 0.4W	10mm (0.4" Pitch)	1			
R18 - R22, R28 - R30	4K7	Resistor 0.4W	10mm (0.4" Pitch)	8			
R23	56K	Resistor 0.4W	10mm (0.4" Pitch)	1			
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R27, 38, 39, 40, 48	2K2	Resistor 0.4W	10mm (0.4" Pitch)	5			
R34, 35, 36, 37 (*)	33R	Resistor 0.4W	10mm (0.4" Pitch)	4			Use if U6 = 74ACS86
R44	220K	Resistor 0.4W	10mm (0.4" Pitch)	1			
R47	33K	Resistor 0.4W	10mm (0.4" Pitch)	1			
R49	22K	Resistor 0.4W	10mm (0.4" Pitch)	1			
RV1. 3, 4	20K	1 Turn Trimpot	3306P or 3362P	1	Element14	3.85/5	108240 or 9354344
RV2	5K	1 Turn Trimpot	3306P or 3362P	1	Element14	3.70/5	108238 or 9354379
T1 (Transformer)	ZMPT107-1	2mA/2mA	TV31D	1		\$1.00	Ali Express
U1, U2, U5	MCP6002	Dual Op Amp	DIP8 x 0.3"	3	Element14	0.71	1292245
U3	NANO PCB	Nano Module	DIP30 x 0.6"	1	Ali Express	\$3.20	
U4	TLC555/ICM7555	Prog Timer	DIP8 x 0.3"	1	Element14	\$1.46	9663762
U6	74ACS86	Quad XOR Gate	DIP14 x 0.3"	1			Install R34 - R37 (4)
U6 Alternative (*)	74HC86	Quad XOR Gate	DIP14 x 0.3"	1			Install U7 & U8
U7, U8 (*)	TC4424	Dual Gate Driver	DIP8 x 0.3"	2	LCSC	\$5.80/10	Only fit if U6 is 74HC86
U7, U8 (*) Alternate	HX4424/HX4427	Dual Gate Driver	DIP8 x 0.3"	2	LCSC	0.31	Only fit if U6 is 74HC86

<b>LCD Assembly</b>							
Blank PCB		WG41Rev1					
LCD	2004	Green ?	~ 98 x 60mm	1	Ali	\$4 +Del.	20 Character 4 line LCD
U1	NANO PCB KIT		30Pin Nano Module	1	Ali		
R1	50 - 100K	single turn trimpot	3306P or similar	1	Digikey	~78c	
C1	100n		2.54mm (0.2")				Fit if any display issues
3P - 3P	2 x 3 pin females	wired connector	F - F, 3 x 0.1"		Ali		L=300mm, 10 for \$4.25
The 2 x 15 pin strip connectors supplied with the Nano kit will all be used for the assembly 6 + 6 + 3 & 6 + 4 + 3 + 2 = 30 pins							
Note J1 can be soldered vertically or horizontally							