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Empire Magnetics Inc.

WATERPROOF STEPPER MOTORS

SPECIFICATIONS FOR U4x SERIES

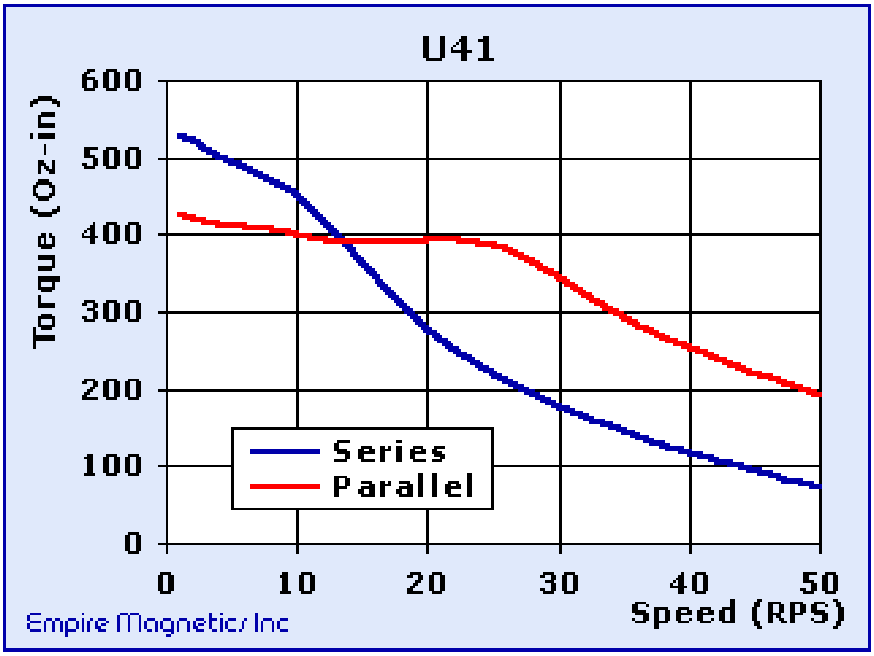
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Waterproof Stepper Motors -WP
42 Family Size - U Series

Individual Motor Specifications

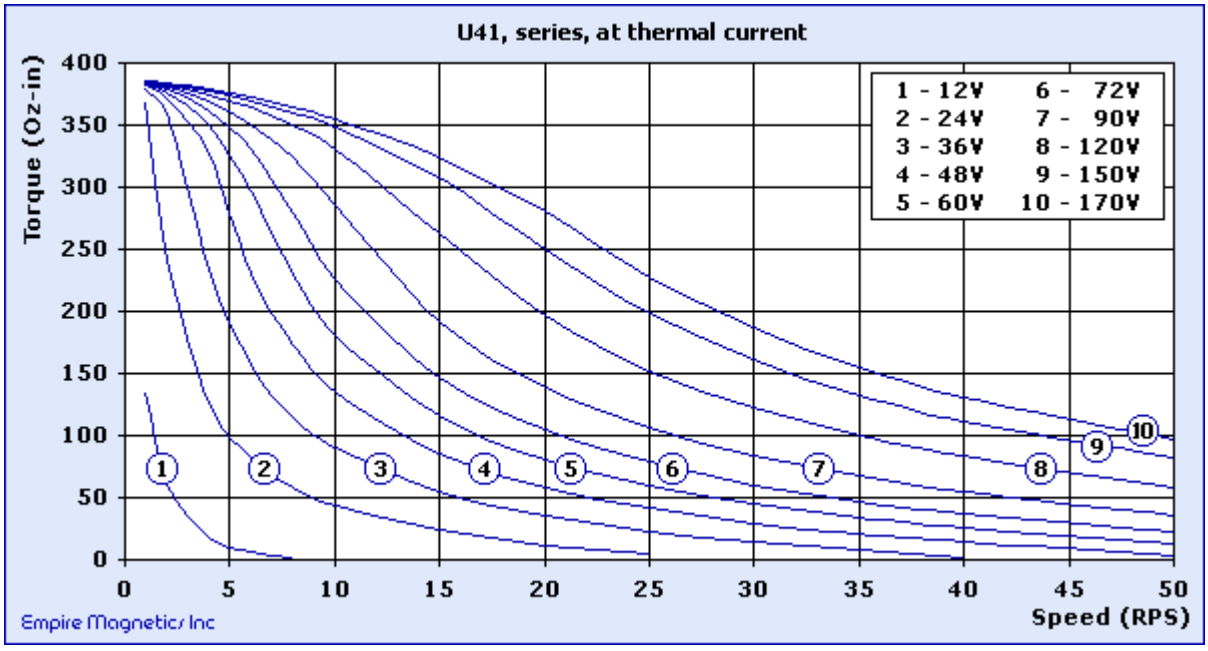
Model Number	WP-U41	WP-U42	WP-U43
Drawing Number	list	list	list
Environment	WP	WP	WP
Motor	U41	U42	U43
NEMA Frame Size	42	42	42
Pricing	WP-U41	WP-U42	WP-U43
Number of Magnetic Stacks	1	2	3
Step Angle	1.8	1.8	1.8
Accuracy Grade (%)	3	3	3
Detent Torque (oz-in)	16	25	38
Static Torque At Thermal Current {unipolar} (oz-in)	375	375	730
Static Torque At Thermal Current {parallel} (oz-in)	400	800	1150
Static Torque At Thermal Current {series} (oz-in)	525	1000	1480
Thermal Current {unipolar} (A)	5.0	6.3	8.1
Thermal Current {parallel} (A)	5.4	7.2	9.0
Thermal Current {series} (A)	4.5	5.4	7.2
Single Coil Inductance (mH)	3.5	3.5	3.5
Single Coil Resistance (ohm)	0.3	0.3	0.2
Series Inductance (mH)	14	14	14
Series Resistance (ohm)	0.8	0.6	0.6
Bearing Type	C/F	C/F	C/F
Bearing Thrust Load (lbs)	50	50	50
Bearing Radial Load (lbs)	300	300	300
Bearing End Play (10**-3 in)	C/F	C/F	C/F
Bearing Radial Play (10**-3 in)	8	8	8
Rotor Inertia (oz-in^2)	22	44	66
Body Diameter (in)	4.35	4.35	4.35
Body Length (in)	6.0	8.7	11.3
Weight (lbs)	26.02	30.90	43.91

TORQUE CHARTS U41



Calculated Torque Charts for Stepper Motor U41

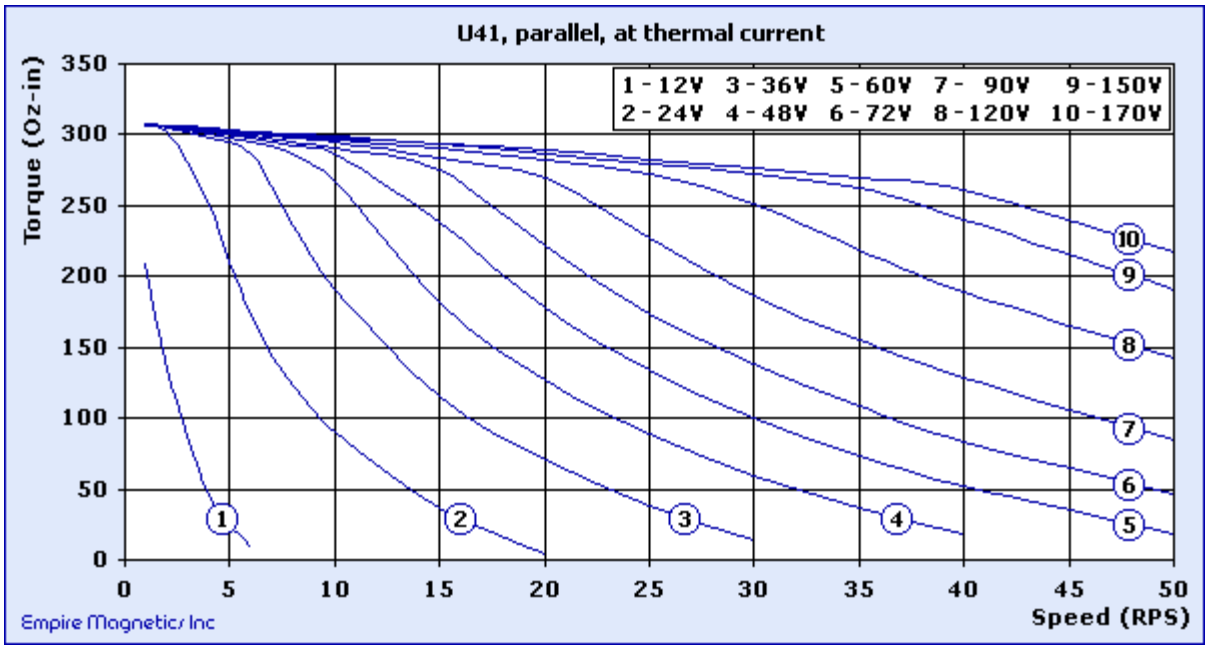
The following are calculated torque speed curves based on a series of assumptions,
actual performance may vary depending on the drive electronics.
These calculations are offered only as estimates of performance,
as such Empire Magnetics Inc. does not offer assurances that such performance will be achieved.



U41 SERIES AT THERMAL CURRENT

Speed (RPS)	Torque (oz-in)									
	12 V	24 V	36 V	48 V	60 V	72 V	90 V	120 V	150 V	170 V
1	134	368	380	382	383	384	384	385	385	385
2	59	240	359	372	376	379	381	382	383	383
4	18	126	233	325	350	361	369	375	377	378
6	7	82	156	231	297	330	350	364	370	372
8	2	59	115	172	229	279	324	349	360	365
10	N/A	44	90	135	181	226	286	331	348	355
15	N/A	23	54	85	115	146	192	264	308	324
20	N/A	12	35	58	81	104	139	197	251	281
25	N/A	4	23	41	60	78	106	152	199	228
30	N/A	N/A	14	30	45	60	83	122	161	186
35	N/A	N/A	8	21	34	47	67	100	133	155
40	N/A	N/A	2	14	25	37	54	83	112	131
50	N/A	N/A	N/A	3	13	22	36	59	82	97

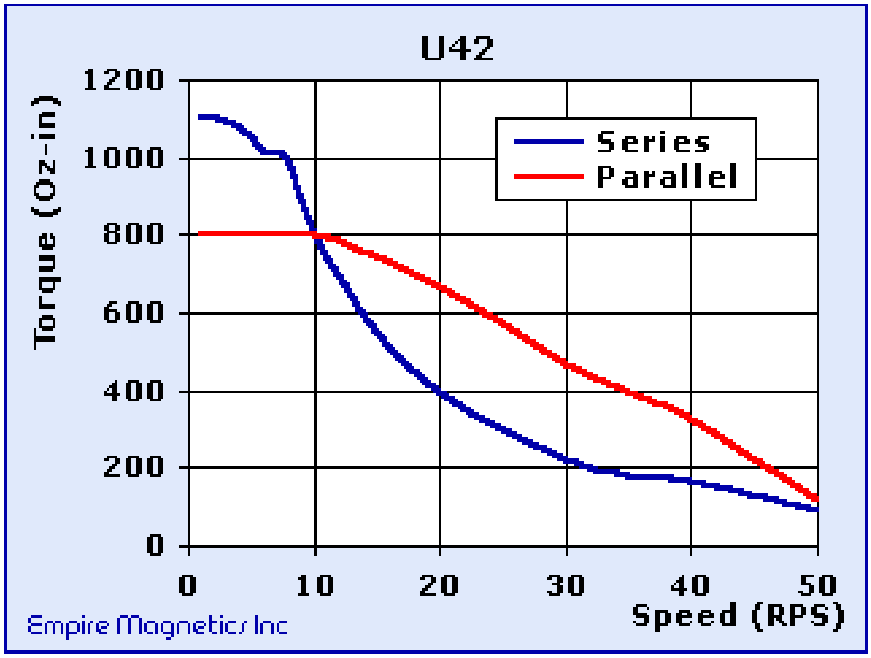
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Speed (RPS)	Torque (oz-in)									
	12 V	24 V	36 V	48 V	60 V	72 V	90 V	120 V	150 V	170 V
1	208	307	307	308	308	308	308	308	308	308
2	135	302	305	306	306	306	306	306	306	306
4	45	249	298	301	302	303	304	304	304	304
6	8	172	286	295	298	300	301	302	302	302
8	N/A	123	236	287	293	296	298	299	300	301
10	N/A	91	190	267	286	291	294	297	298	299
15	N/A	37	116	182	239	275	284	290	293	294
20	N/A	4	70	127	178	222	270	282	287	289
25	N/A	N/A	38	89	134	174	227	272	280	283
30	N/A	N/A	15	59	100	138	186	252	272	276
35	N/A	N/A	N/A	36	74	108	155	219	263	269
40	N/A	N/A	N/A	18	52	84	128	189	239	261
50	N/A	N/A	N/A	N/A	19	46	85	143	190	218

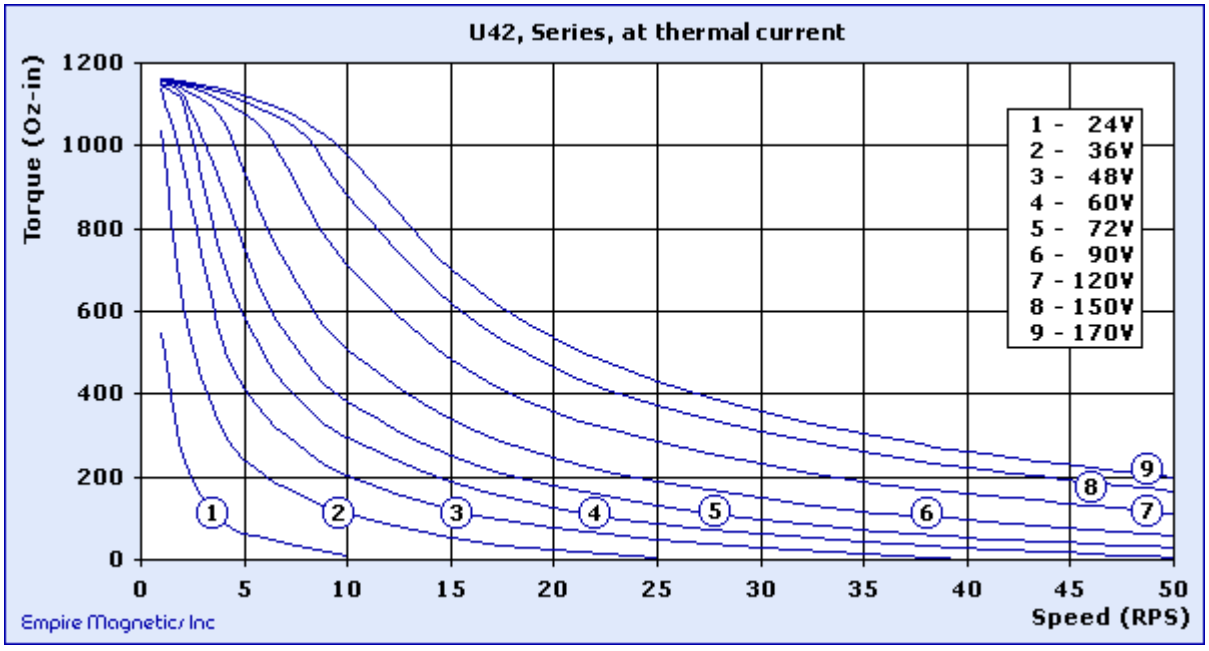
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TORQUE CHARTS U42



Calculated Torque Charts for Stepper Motor U42

The following are calculated torque speed curves based on a series of assumptions,
actual performance may vary depending on the drive electronics.
These calculations are offered only as estimates of performance,
as such Empire Magnetics Inc. does not offer assurances that such performance will be achieved.

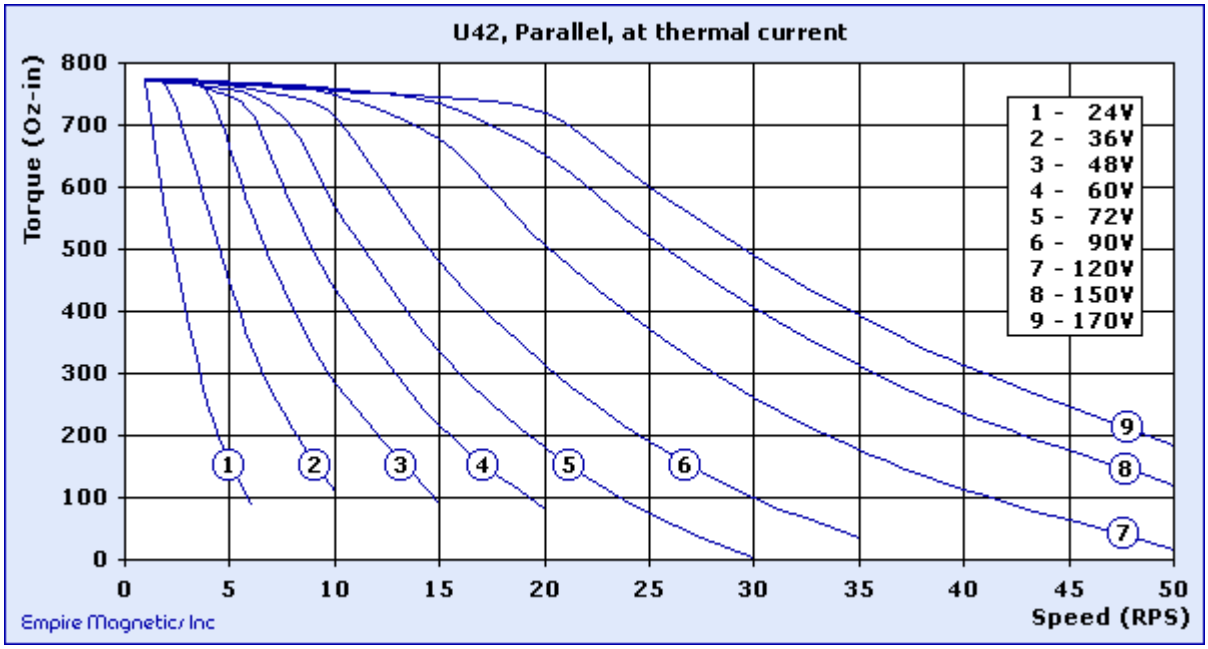


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U42 SERIES AT THERMAL CURRENT

Speed (RPS)	Torque (oz-in)								
	24 V	36 V	48 V	60 V	72 V	90 V	120 V	150 V	170 V
1	547	1037	1139	1149	1153	1157	1159	1160	1161
2	250	612	955	1102	1124	1138	1149	1154	1155
4	94	309	521	719	896	1061	1109	1128	1136
6	55	203	350	491	627	815	1038	1086	1103
8	28	148	259	369	476	629	858	1023	1057
10	9	111	204	294	381	508	709	882	978
15	N/A	54	123	188	250	337	482	618	704
20	N/A	23	77	128	177	248	359	466	536
25	N/A	4	48	89	130	190	284	372	430
30	N/A	N/A	27	63	98	149	231	308	357
35	N/A	N/A	12	43	73	118	190	259	303
40	N/A	N/A	1	28	55	95	159	221	261
50	N/A	N/A	N/A	6	28	60	113	165	198

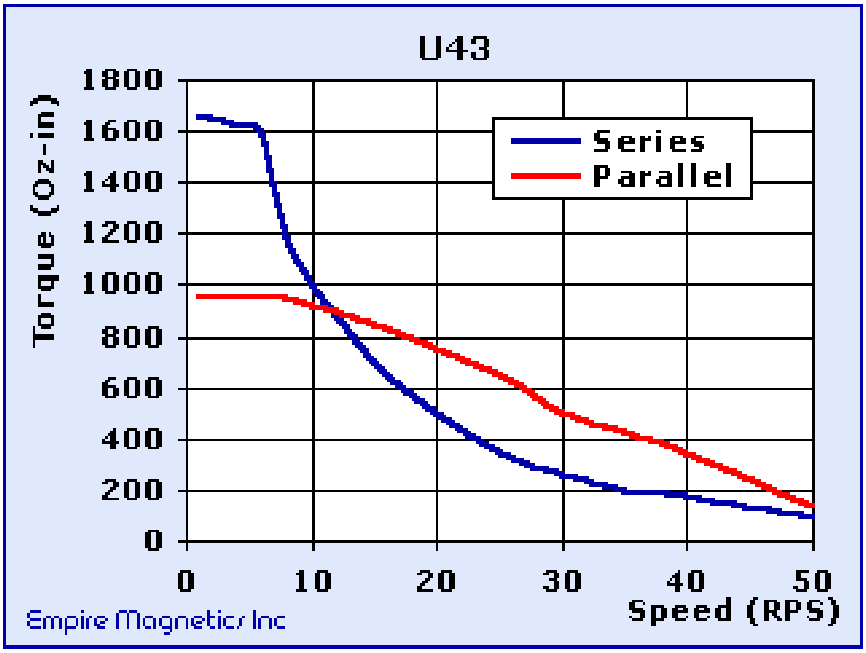
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Speed (RPS)	Torque (oz-in)								
	24 V	36 V	48 V	60 V	72 V	90 V	120 V	150 V	170 V
1	767	772	773	774	774	774	774	774	774
2	546	762	768	770	771	772	773	773	773
4	241	558	747	757	762	766	769	771	771
6	86	346	563	721	748	757	764	767	768
8	N/A	210	402	565	694	744	757	762	764
10	N/A	111	285	436	567	714	748	756	760
15	N/A	N/A	91	216	335	482	677	736	744
20	N/A	N/A	N/A	80	181	313	505	653	719
25	N/A	N/A	N/A	N/A	75	191	370	518	601
30	N/A	N/A	N/A	N/A	2	101	263	406	489
35	N/A	N/A	N/A	N/A	N/A	35	178	312	394
40	N/A	N/A	N/A	N/A	N/A	N/A	112	235	312
50	N/A	N/A	N/A	N/A	N/A	N/A	16	118	185

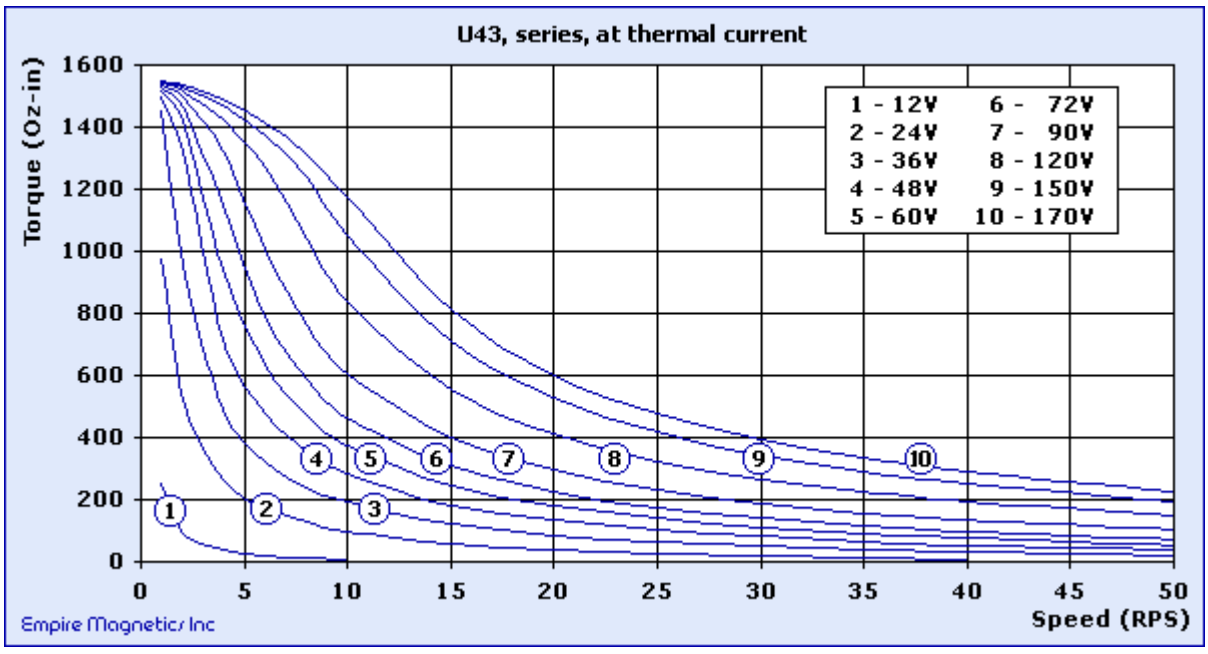
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TORQUE CHARTS U43



Calculated Torque Charts for Stepper Motor U43

The following are calculated torque speed curves based on a series of assumptions,
actual performance may vary depending on the drive electronics.
These calculations are offered only as estimates of performance,
as such Empire Magnetics Inc. does not offer assurances that such performance will be achieved.

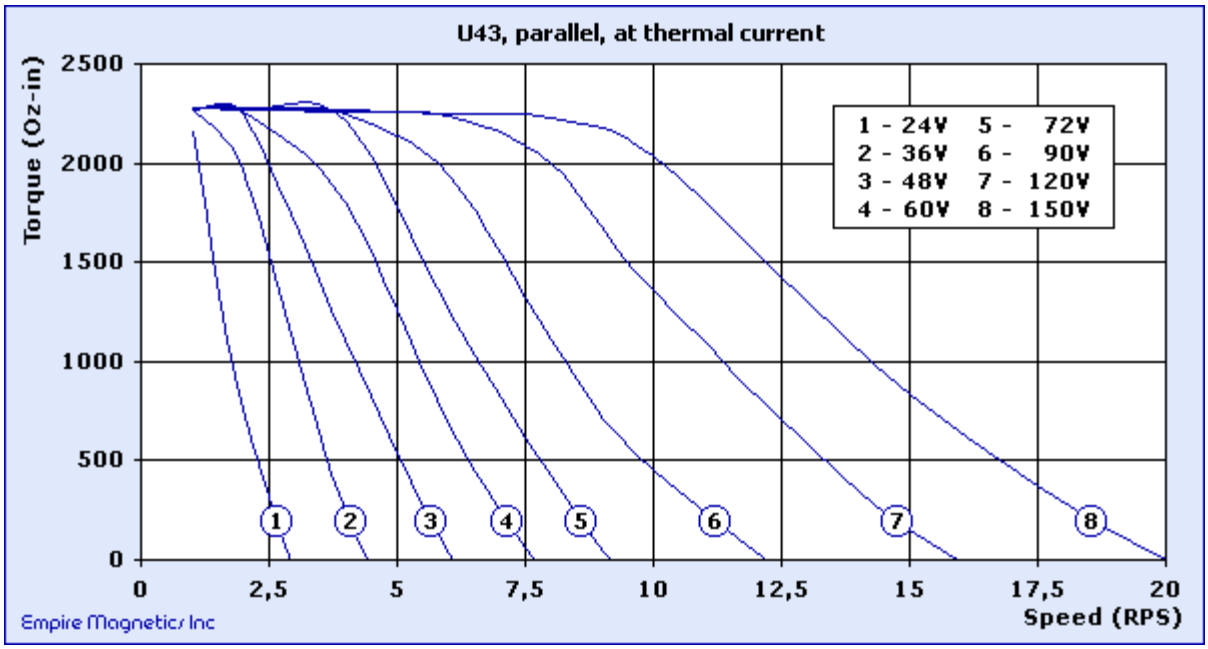


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U43 SERIES AT THERMAL CURRENT

Speed (RPS)	Torque (oz-in)									
	12 V	24 V	36 V	48 V	60 V	72 V	90 V	120 V	150 V	170 V
1	250	974	1449	1499	1518	1528	1536	1542	1544	1545
2	93	523	953	1319	1419	1462	1494	1518	1529	1533
4	37	263	490	717	943	1147	1324	1427	1471	1487
6	20	173	326	478	631	785	1008	1271	1374	1413
8	11	127	242	357	472	587	760	1038	1239	1309
10	6	99	191	283	375	468	606	837	1053	1173
15	N/A	61	122	183	245	307	399	553	707	810
20	N/A	41	87	133	179	226	295	410	526	603
25	N/A	28	65	102	139	176	232	324	417	478
30	N/A	19	50	81	112	143	189	266	343	394
35	N/A	12	39	65	92	118	158	224	290	334
40	N/A	7	30	53	76	100	134	192	250	288
50	N/A	N/A	17	36	54	73	101	147	193	224

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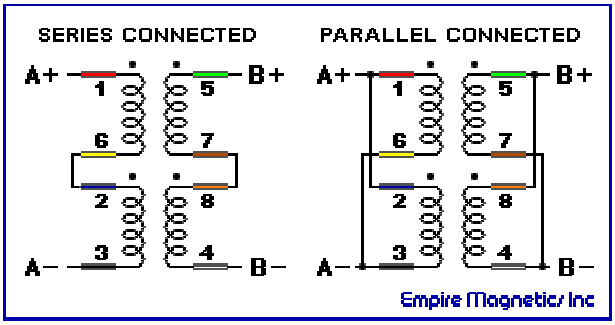


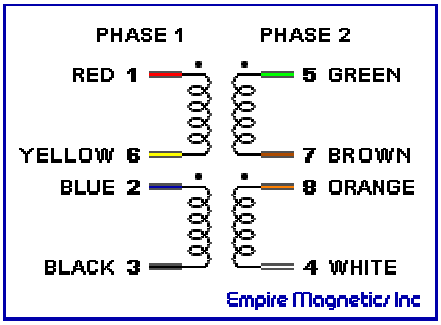
Speed (RPS)	Torque (oz-in)									
	24 V	36 V	48 V	60 V	72 V	90 V	120 V	150 V		
1	2153	2266	2272	2274	2276	2277	2278	2278		
2	758	1970	2249	2260	2265	2270	2273	2275		
4	N/A	256	1112	1801	2215	2245	2258	2264		
6	N/A	N/A	27	673	1250	1934	2235	2249		
8	N/A	N/A	N/A	N/A	423	1111	1998	2229		
10	N/A	N/A	N/A	N/A	N/A	449	1364	2033		
15	N/A	N/A	N/A	N/A	N/A	N/A	153	834		

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Wiring Diagram for Frame 4x Waterproof (-WP) Stepper Motors



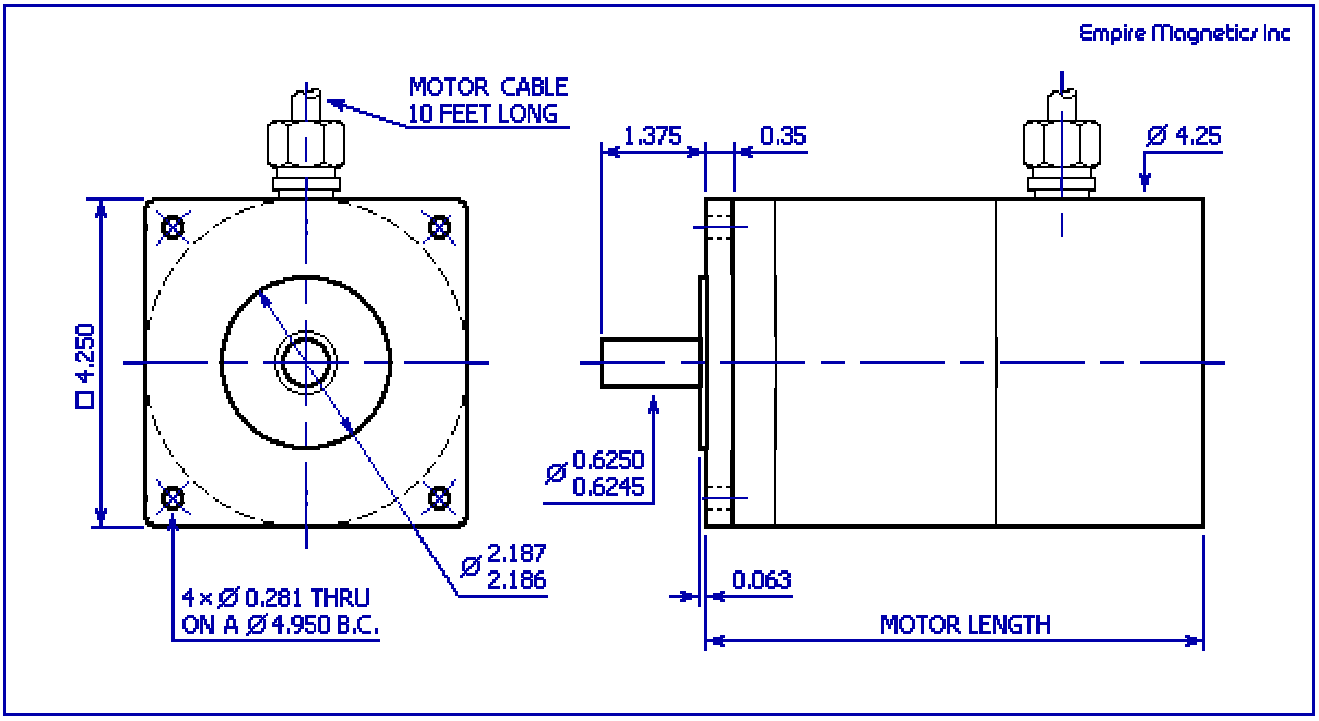


Standard Configuration is 8 Individual Lead Wires Minimum 12 inches in Length		
Motor model	**Wire size**	**Wire diameter (Inches)**
U41	16	0.0545
U42	16	0.0545
U43	16	0.0545

Cable information: Cable is installed inside the motor housing, with strain relief and shield connected to the metal of the motor.

Empire Magnetics Part number 00-0510-0055 four conductors of 16 AWG, with overall shield and jacket, nominal cable OD .416 inches, minimum bend radius 2.7 inches. Tinned copper, paper wrap, rubber insulated conductors, Rayon braid tinned copper braid shield, 85% shield coverage. 600 volt Neoprene jacket.

CAD Drawing for
Frame 4x Stepper Motor
(Model Number WP-U4X)



Motor Model	Motor Length
WP-U41	6.55
WP-U42	8.71
WP-U43	10.88

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