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APEX10/20/40 & APEX6151, 6152, & 6154 USER GUIDE ADDENDUM

This addendum is valid for APEX10 and APEX6151 units with serial numbers greater than: 97052700070.

It is also valid for APEX20/40 and APEX6152/6154 units with serial numbers greater than: 97073000109.

Information contained in this addendum covers recent changes not included in the most current User Guides for

- APEX10 APEX20 APEX40 Analog Servo Drive (user guide: 88-013904-02 A)
- APEX615n Servo Controller/Drive (user guide: 88-016148-01 A)

Topics covered in this addendum are:

APEX10, APEX6151 DIP Switch Changes:

DIP switch functions have been changed for:

Current Loop Compensation

Motor Thermal Time Constant

APEX20/40, APEX6152/6154 DIP Switch Changes:

DIP switch functions have been changed for:

Current Loop Compensation

New Motor Information:

Eight new Compumotor 70mm NeoMetric Series motors have been released with another eight 92mm motors pending release, all of which are for use with the APEX10/20/40 and APEX 6151/6152/6154. This addendum contains the following information for these motors:

DIP Switch Settings

Speed/Torque Curves

Motor Specifications

Motor Dimensions

Compumotor Division

88-016237-01 D 12/98

Parker Automation

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APEX10 Dip Switch Changes

New DIP switch functions are shown below for the APEX10 Drive. DIP switch settings incorporating these changes for Compumotor's APEX Series, SM Series, and NeoMetric Series motors are shown on the following pages.



REGEN FAULT	1							
Enable	OFF							
Disable	ON							
HALL DEGREES		2						
120° Hall motor		OFF						
60° Hall motor		ON						
RESERVED			3					
Off			OFF					
POLE PAIR NUMBER				4	5			
2				OFF	OFF			
3				OFF	ON			
Reserved				ON	OFF			
Reserved				ON	ON			
RESOLVER SPEED						6		
1						OFF		
2						ON		
CURRENT LOOP COMPENSATION (motor inductance)								
with 120VAC Input: / with 240VAC Input:						7	8	
1 – 2 mH / Not Applicable						OFF	OFF	
NEW → 2 – 5 mH / 5 – 10 mH						OFF	ON	
NEW → 5 – 60 mH / 10 – 60 mH						ON	OFF	
Reserved						ON	ON	
CONTINUOUS CURRENT (peak of sine wave)								
1.8 amps								
2.6								
3.5								
4.5								
5.0								
6.5								
7.0								
8.0								

	1	2	3
1.8 amps	OFF	OFF	OFF
2.6	OFF	OFF	ON
3.5	OFF	ON	OFF
4.5	OFF	ON	ON
5.0	ON	OFF	OFF
6.5	ON	OFF	ON
7.0	ON	ON	OFF
8.0	ON	ON	ON

PEAK CURRENT	4	5	6
6.5 amps	OFF	OFF	OFF
7.5	OFF	OFF	ON
9.5	OFF	ON	OFF
11.0	OFF	ON	ON
12.5	ON	OFF	OFF
14.0	ON	OFF	ON
15.0	ON	ON	OFF
16.0	ON	ON	ON

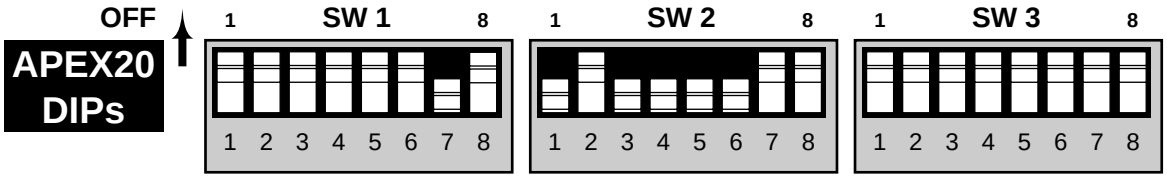
MOTOR THERMAL TIME CONSTANT	7	8
NEW → 2 minutes	OFF	OFF
NEW → 4	OFF	ON
NEW → 8	ON	OFF
NEW → 10	ON	ON

VELOCITY INTEGRATOR	1							
No	OFF							
Yes	ON							
ALIGNMENT MODE		2						
No		OFF						
Yes		ON						
COMMUTATION TEST MODE			3					
No			OFF					
Yes			ON					
HALL SELECT				4				
Resolver Mode				OFF				
Hall Mode				ON				
TACH SCALING					5			
One speed resolver (1V = 1,000 RPM with a one speed resolver)					OFF			
Two speed resolver (1V = 1,000 RPM with a two speed resolver)					ON			
COMMAND INPUT SCALING						6	7	
10V = 16.0 amps						OFF	OFF	
10V = 12.0 amps						OFF	ON	
10V = 8.0 amps						ON	OFF	
10V = 7.0 amps						ON	ON	
COLLECTIVE GAIN								8
Off								OFF
On								ON

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APEX20 Dip Switch Changes

New DIP switch functions are shown below for the APEX6152 Controller/Drive. DIP switch settings incorporating these changes for Compumotor's APEX Series, SM Series, and NeoMetric Series motors are shown on the following pages.



	1	2	3	4	5	6	7	8
REGEN FAULT	1							
Enable	OFF							
Disable	ON							
HALL DEGREES		2						
120° Hall motor		OFF						
60° Hall motor		ON						
RESERVED			3					
Off			OFF					
POLE PAIR NUMBER				4	5			
2				OFF	OFF			
3				OFF	ON			
Reserved				ON	OFF			
Reserved				ON	ON			
RESOLVER SPEED						6		
1						OFF		
2						ON		
CURRENT LOOP COMPENSATION							7	8
NEW → 20 – 50 mH							OFF	OFF
NEW → 4 – 10 mH							OFF	ON
NEW → 10 – 20 mH							ON	OFF
Reserved							ON	ON

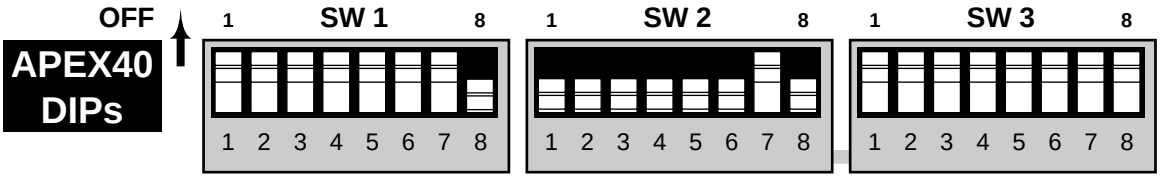
	1	2	3	4	5	6	7	8
CONTINUOUS CURRENT (peak of sine wave)	1	2	3					
3.0 amps	OFF	OFF	OFF					
4.2	OFF	OFF	ON					
5.4	OFF	ON	OFF					
6.6	OFF	ON	ON					
7.8	ON	OFF	OFF					
9.0	ON	OFF	ON					
10.2	ON	ON	OFF					
12.0	ON	ON	ON					
PEAK CURRENT				4	5	6		
9.0 amps				OFF	OFF	OFF		
10.8				OFF	OFF	ON		
13.2				OFF	ON	OFF		
15.0				OFF	ON	ON		
17.4				ON	OFF	OFF		
19.2				ON	OFF	ON		
21.6				ON	ON	OFF		
24.0				ON	ON	ON		
MOTOR THERMAL TIME CONSTANT							7	8
10 minutes							OFF	OFF
20							OFF	ON
30							ON	OFF
40							ON	ON

	1	2	3	4	5	6	7	8
VELOCITY INTEGRATOR	1							
No	OFF							
Yes	ON							
ALIGNMENT MODE		2						
No		OFF						
Yes		ON						
COMMUTATION TEST MODE			3					
No			OFF					
Yes			ON					
HALL SELECT				4				
Resolver Mode				OFF				
Hall Mode				ON				
TACH SCALING					5			
One speed resolver (1V = 1,000 RPM with a one speed resolver)					OFF			
Two speed resolver (1V = 1,000 RPM with a two speed resolver)					ON			
COMMAND INPUT SCALING						6	7	
10V = 24.0 amps						OFF	OFF	
10V = 19.2 amps						OFF	ON	
10V = 14.4 amps						ON	OFF	
10V = 13.2 amps						ON	ON	
COLLECTIVE GAIN								8
Off								OFF
On								ON

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APEX40 Dip Switch Changes

New DIP switch functions are shown below for the APEX6152 Controller/Drive. DIP switch settings incorporating these changes for Compumotor's APEX Series, SM Series, and NeoMetric Series motors are shown on the following pages.



	1	2	3	4	5	6	7	8
REGEN FAULT								
Enable	OFF							
Disable	ON							
HALL DEGREES								
120° Hall motor		OFF						
60° Hall motor		ON						
RESERVED								
Off			OFF					
POLE PAIR NUMBER								
2				OFF	OFF			
3				OFF	ON			
Reserved				ON	OFF			
Reserved				ON	ON			
RESOLVER SPEED								
1						OFF		
2						ON		
CURRENT LOOP COMPENSATION								
NEW → 20 – 50 mH							OFF	OFF
NEW → 4 – 10 mH							OFF	ON
NEW → 10 – 20 mH							ON	OFF
Reserved							ON	ON

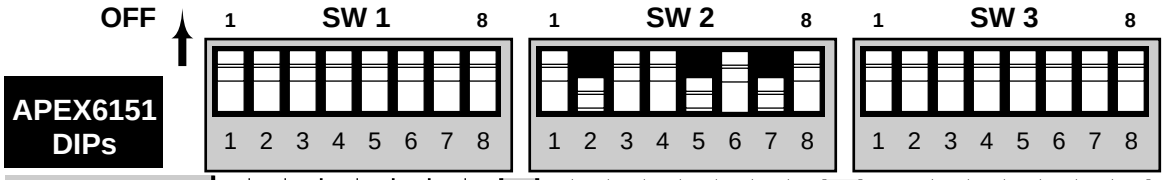
	1	2	3	4	5	6	7	8
CONTINUOUS CURRENT (peak of sine wave)								
5.0 amps	OFF	OFF	OFF					
7.0	OFF	OFF	ON					
9.0	OFF	ON	OFF					
11.0	OFF	ON	ON					
13.0	ON	OFF	OFF					
15.0	ON	OFF	ON					
17.0	ON	ON	OFF					
PEAK CURRENT								
15.0 amps				OFF	OFF	OFF		
18.0				OFF	OFF	ON		
22.0				OFF	ON	OFF		
25.0				OFF	ON	ON		
29.0				ON	OFF	OFF		
32.0				ON	OFF	ON		
36.0				ON	ON	OFF		
40.0				ON	ON	ON		
MOTOR THERMAL TIME CONSTANT								
10 minutes							OFF	OFF
20							OFF	ON
30							ON	OFF
40							ON	ON

	1	2	3	4	5	6	7	8
VELOCITY INTEGRATOR								
No	OFF							
Yes	ON							
ALIGNMENT MODE								
No		OFF						
Yes		ON						
COMMUTATION TEST MODE								
No			OFF					
Yes			ON					
HALL SELECT								
Resolver Mode				OFF				
Hall Mode				ON				
TACH SCALING								
One speed resolver (1V = 1,000 RPM with a one speed resolver)					OFF			
Two speed resolver (1V = 1,000 RPM with a two speed resolver)					ON			
COMMAND INPUT SCALING								
10V = 40.0 amps						OFF	OFF	
10V = 32.0 amps						OFF	ON	
10V = 24.0 amps						ON	OFF	
10V = 22.0 amps						ON	ON	
COLLECTIVE GAIN								
Off								OFF
On								ON

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APEX6151 Dip Switch Changes

New DIP switch functions are shown below for the APEX6154 Controller/Drive. DIP switch settings incorporating these changes for Compumotor's APEX Series, SM Series, and NeoMetric Series motors are shown on the following pages.



	1	2	3	4	5	6	7	8
REGEN FAULT								
Enable	OFF							
Disable	ON							
HALL DEGREES								
120° Hall motor		OFF						
60° Hall motor		ON						
RESERVED								
Off			OFF					
POLE PAIR NUMBER								
2				OFF	OFF			
3				OFF	ON			
Reserved				ON	OFF			
Reserved				ON	ON			
RESOLVER SPEED								
1						OFF		
2						ON		
CURRENT LOOP COMPENSATION (motor inductance)								
with 120VAC Input: / with 240VAC Input:								
1 – 2 mH / Not Applicable							OFF	OFF
NEW → 2 – 5 mH / 5 – 10 mH							OFF	ON
NEW → 5 – 60 mH / 10 – 60 mH							ON	OFF
Reserved							ON	ON

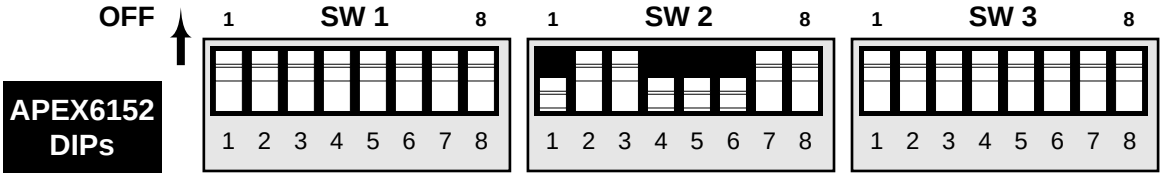
	1	2	3	4	5	6	7	8
CONTINUOUS CURRENT (peak of sine wave)								
1.8 amps	OFF	OFF	OFF					
2.6	OFF	OFF	ON					
3.5	OFF	ON	OFF					
4.5	OFF	ON	ON					
5.0	ON	OFF	OFF					
6.5	ON	OFF	ON					
7.0	ON	ON	OFF					
8.0	ON	ON	ON					
PEAK CURRENT								
6.5 amps				OFF	OFF	OFF		
7.5				OFF	OFF	ON		
9.5				OFF	ON	OFF		
11.0				OFF	ON	ON		
12.5				ON	OFF	OFF		
14.0				ON	OFF	ON		
15.0				ON	ON	OFF		
16.0				ON	ON	ON		
MOTOR THERMAL TIME CONSTANT								
NEW → 2 minutes							OFF	OFF
NEW → 4							OFF	ON
NEW → 8							ON	OFF
NEW → 10							ON	ON

	1	2	3	4	5	6	7	8
RESERVED								
Off	OFF							
ALIGNMENT MODE								
No		OFF						
Yes		ON						
COMMUTATION TEST MODE								
No			OFF					
Yes			ON					
HALL SELECT								
Resolver Mode				OFF				
Hall Mode				ON				
TACH SCALING								
One speed resolver (1V = 1,000 RPM with a one speed resolver)					OFF			
Two speed resolver (1V = 1,000 RPM with a two speed resolver)					ON			
RESERVED								
All Off						OFF	OFF	OFF

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APEX6152 Dip Switch Changes

New DIP switch functions are shown below for the APEX6152 Controller/Drive. DIP switch settings incorporating these changes for Compumotor's APEX Series, SM Series, and NeoMetric Series motors are shown on the following pages.



	1	2	3	4	5	6	7	8
RESERVED								
All Off	OFF	OFF	OFF					
POLE PAIR NUMBER								
2				OFF	OFF			
3				OFF	ON			
Reserved				ON	OFF			
Reserved				ON	ON			
RESOLVER SPEED								
1						OFF		
2						ON		
CURRENT LOOP COMPENSATION								
NEW → 20 mH – 50 mH							OFF	OFF
NEW → 4 mH – 10 mH							OFF	ON
NEW → 10 mH – 20 mH							ON	OFF
Reserved							ON	ON

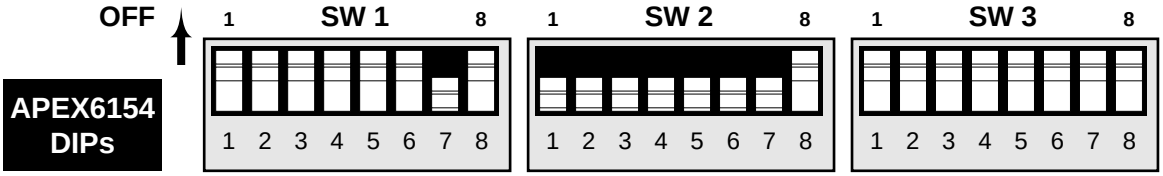
	1	2	3	4	5	6	7	8
CONTINUOUS CURRENT (peak of sine wave)								
3.0 amps	OFF	OFF	OFF					
4.2	OFF	OFF	ON					
5.4	OFF	ON	OFF					
6.6	OFF	ON	ON					
7.8	ON	OFF	OFF					
9.0	ON	OFF	ON					
10.2	ON	ON	OFF					
12.0	ON	ON	ON					
PEAK CURRENT								
9.0 amps				OFF	OFF	OFF		
10.8				OFF	OFF	ON		
13.2				OFF	ON	OFF		
15.0				OFF	ON	ON		
17.4				ON	OFF	OFF		
19.2				ON	OFF	ON		
21.6				ON	ON	OFF		
24.0				ON	ON	ON		
MOTOR THERMAL TIME CONSTANT								
10 minutes							OFF	OFF
20							OFF	ON
30							ON	OFF
40							ON	ON

	1	2	3	4	5	6	7	8
RESERVED								
Off	OFF							
ALIGNMENT MODE								
No		OFF						
Yes		ON						
COMMUTATION TEST MODE								
No			OFF					
Yes			ON					
HALL SELECT								
Resolver Mode				OFF				
Hall Mode				ON				
TACH SCALING								
One speed resolver (1V = 1,000 RPM with a one speed resolver)					OFF			
Two speed resolver (1V = 1,000 RPM with a two speed resolver)					ON			
RESERVED								
All Off						OFF	OFF	OFF

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APEX6154 Dip Switch Changes

New DIP switch functions are shown below for the APEX6154 Controller/Drive. DIP switch settings incorporating these changes for Compumotor's APEX Series, SM Series, and NeoMetric Series motors are shown on the following pages.



	1	2	3	4	5	6	7	8
RESERVED								
All Off	OFF	OFF	OFF					
POLE PAIR NUMBER								
2				OFF	OFF			
3				OFF	ON			
Reserved				ON	OFF			
Reserved				ON	ON			
RESOLVER SPEED								
1						OFF		
2						ON		
CURRENT LOOP COMPENSATION								
NEW → 20 mH – 50 mH							OFF	OFF
NEW → 4 mH – 10 mH							OFF	ON
NEW → 10 mH – 20 mH							ON	OFF
Reserved							ON	ON

	1	2	3	4	5	6	7	8
CONTINUOUS CURRENT (peak of sine wave)								
5 amps	OFF	OFF	OFF					
7	OFF	OFF	ON					
9	OFF	ON	OFF					
11	OFF	ON	ON					
13	ON	OFF	OFF					
15	ON	OFF	ON					
17	ON	ON	OFF					
20	ON	ON	ON					
PEAK CURRENT								
15 amps				OFF	OFF	OFF		
18				OFF	OFF	ON		
22				OFF	ON	OFF		
25				OFF	ON	ON		
29				ON	OFF	OFF		
32				ON	OFF	ON		
36				ON	ON	OFF		
40				ON	ON	ON		
MOTOR THERMAL TIME CONSTANT								
10 minutes							OFF	OFF
20							OFF	ON
30							ON	OFF
40							ON	ON

	1	2	3	4	5	6	7	8
RESERVED								
Off	OFF							
ALIGNMENT MODE								
No		OFF						
Yes		ON						
COMMUTATION TEST MODE								
No			OFF					
Yes			ON					
HALL SELECT								
Resolver Mode				OFF				
Hall Mode				ON				
TACH SCALING								
One speed resolver (1V = 1,000 RPM with a one speed resolver) (All APEX Motors: 610 – 640)					OFF			
Two speed resolver (1V = 1,000 RPM with a two speed resolver)					ON			
RESERVED								
All Off						OFF	OFF	OFF

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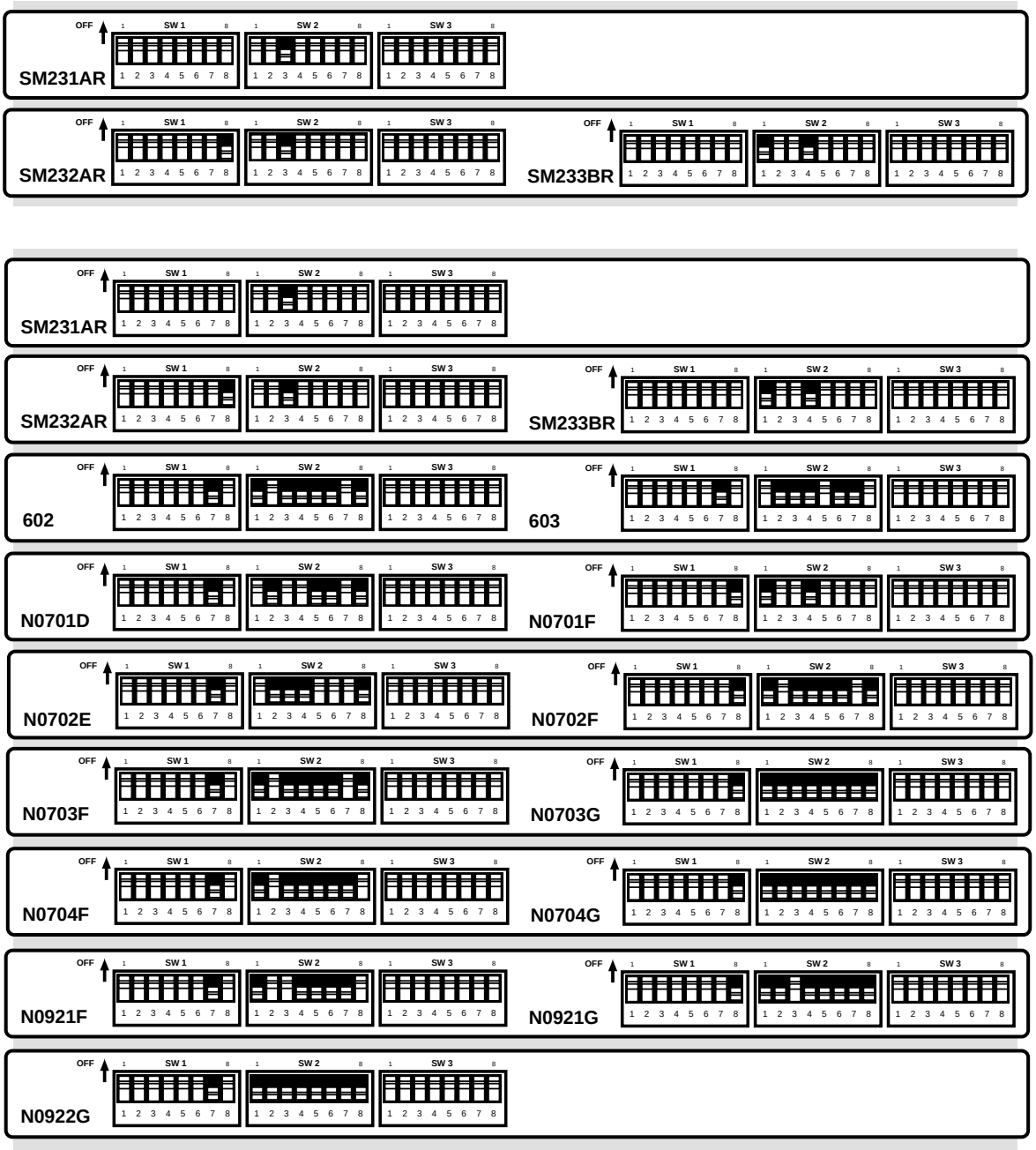
APEX10 and 6151 Dip Switch Settings

New DIP switch functions are shown below for the APEX6151 Controller/Drive. DIP switch settings incorporating these changes for Compumotor's APEX Series, SM Series, and NeoMetric Series motors are shown on the following pages.

APEX10 & APEX6151 DIP SWITCH SETTINGS

OFF

Initial Values for Tuning



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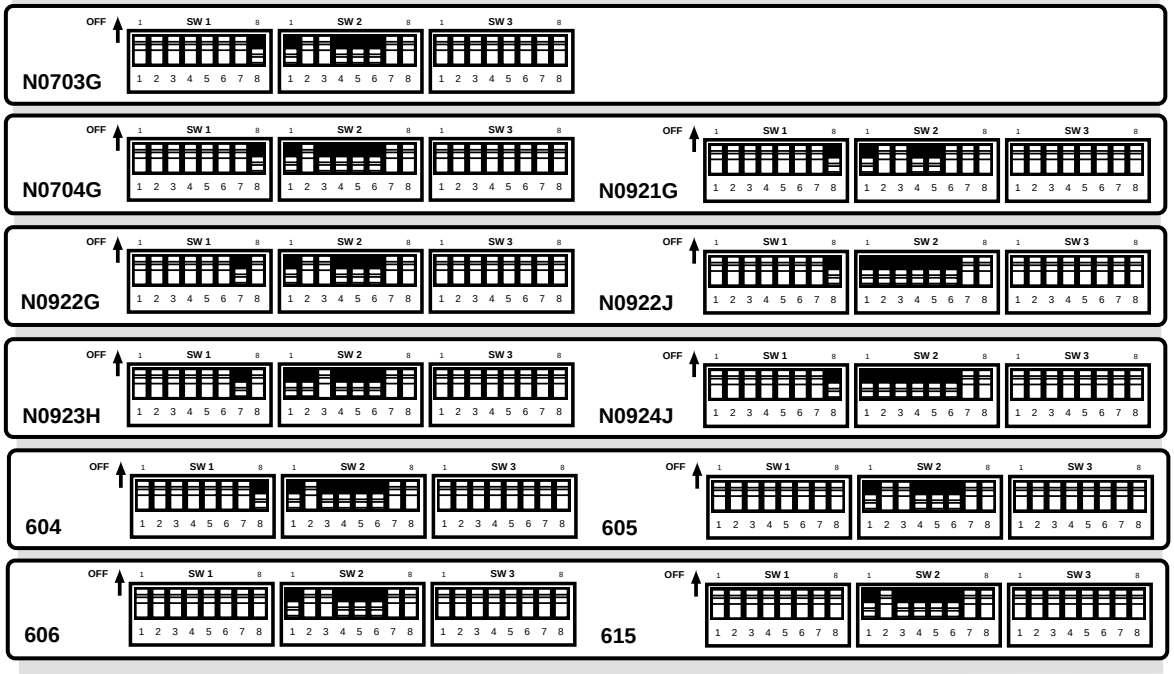
APEX20 and 6152 Dip Switch Settings

New DIP switch functions are shown below for the APEX20 and 6152 Controller/ Drive. DIP switch settings incorporating these changes for Compumotor's APEX Series, SM Series, and NeoMetric Series motors are shown on the following pages.

APEX20 & APEX6152 DIP SWITCH SETTINGS

OFF

Use these settings for your final configuration



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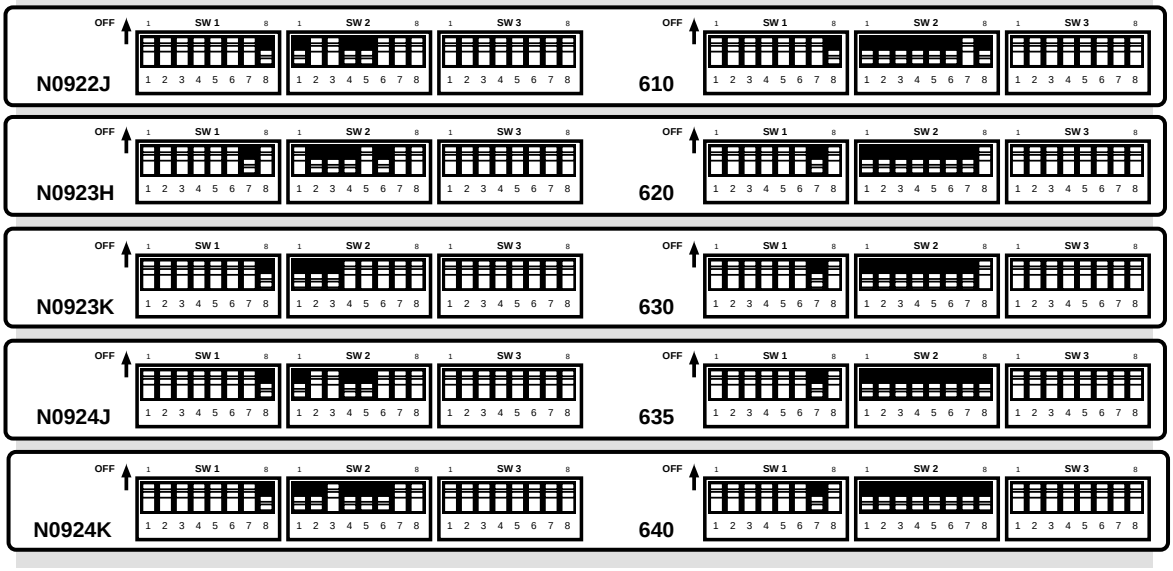
APEX40 and 6154 Dip Switch Settings

New DIP switch functions are shown below for the APEX40 and 6154 Controller/ Drive. DIP switch settings incorporating these changes for Compumotor's APEX Series, SM Series, and NeoMetric Series motors are shown on the following pages.

APEX40 & APEX6154 DIP SWITCH SETTINGS

OFF

Use these settings for your final configuration



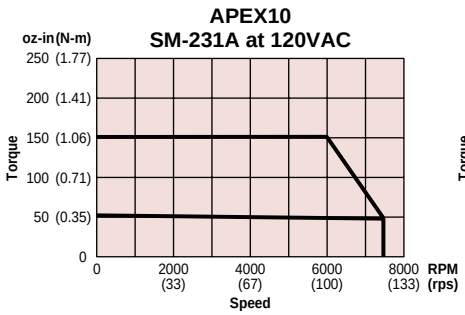
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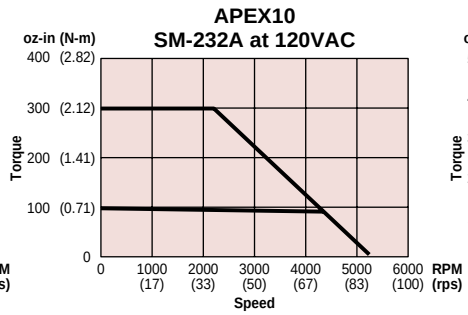
Speed/Torque Curves – Compumotor SM and N Series Motors

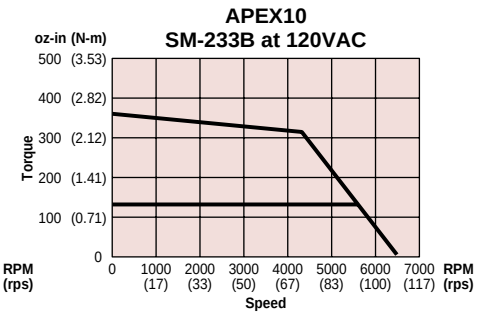
The following speed/torque curves represent the available shaft torque at different operating speeds, under the following conditions. The performance of APEX 10 = APEX6151; APEX20 = APEX6152; and APEX40 = APEX6154.

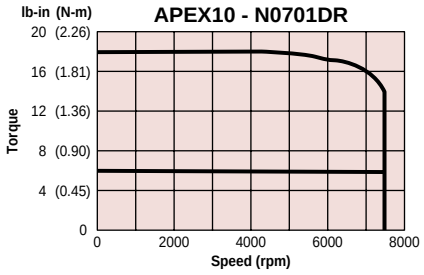
- 25°C (77°F) ambient temperature
- Nominal torque constant K_t
- Motor mounted to heatsink: 10" x 10" x 0.25" aluminum

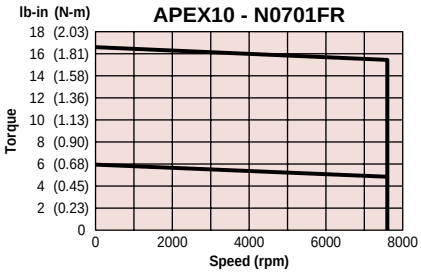
Actual motor torque may vary ±10% due to motor manufacturing variances. All SM motor speed/torque data obtained with APEX10 or APEX6151 at 120VAC. All NeoMetric motor speed/torque data obtained with indicated drive at 240VAC.

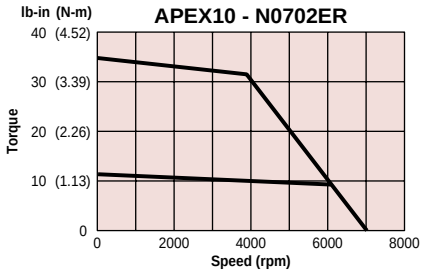


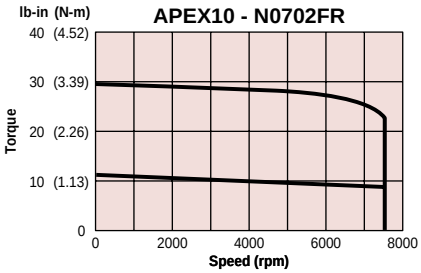


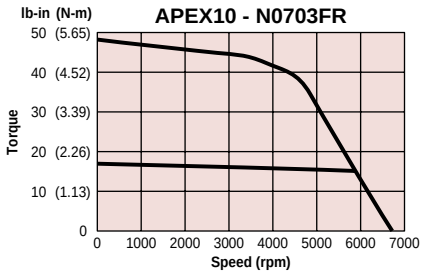


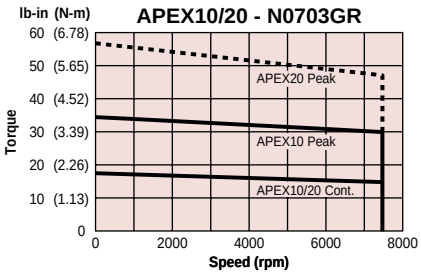


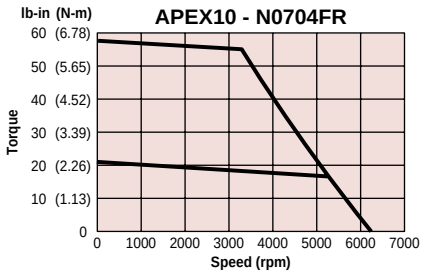


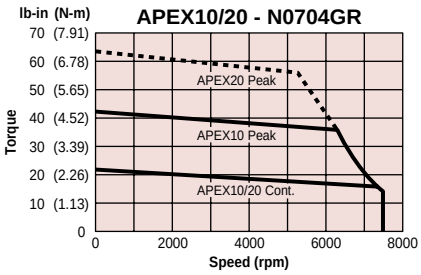








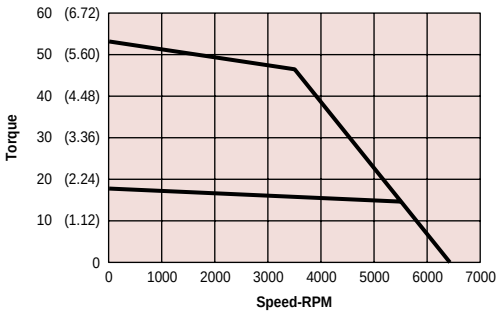




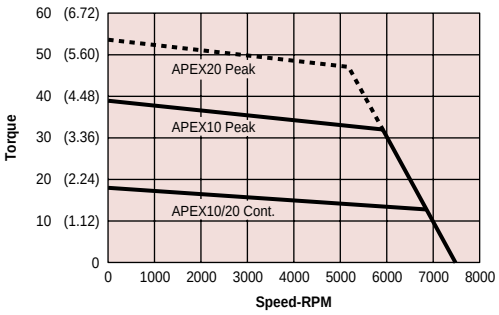
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Speed/Torque Curves – Compumotor NeoMetric Series Motors

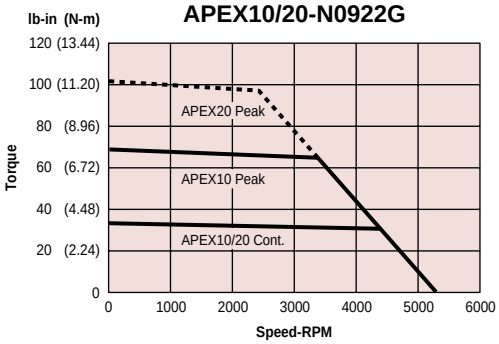
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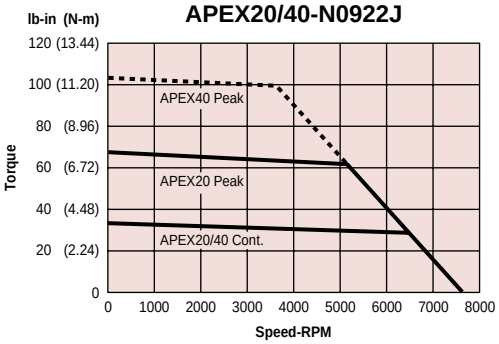
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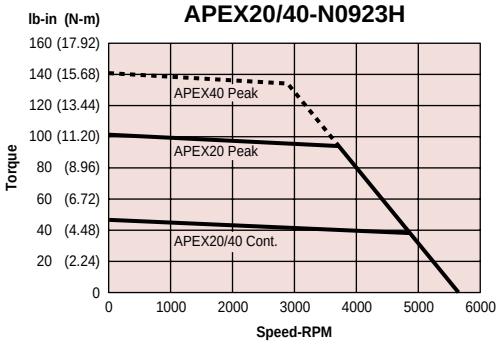
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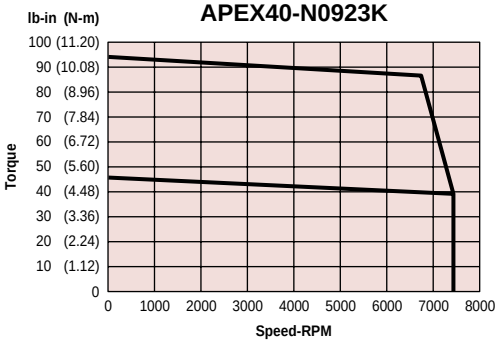
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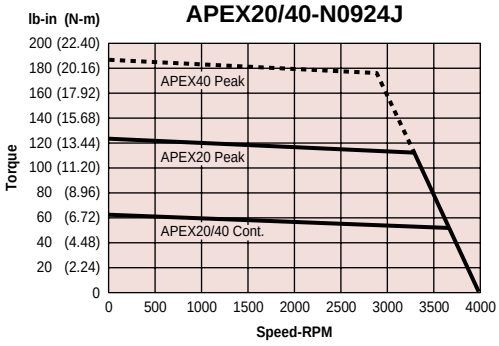
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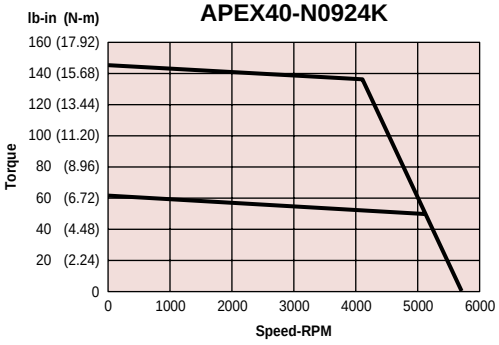
APEX40-N0923K



APEX20/40-N0924J



APEX40-N0924K



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Motor Specifications – Compumotor 70mm NeoMetric Series Motors

The specifications table shows motor charactertistics. Torque specifications are with rated and peak current for the *motors.* Rated and peak current for the *drive* may be lower — thus, torque may be lower. Consult the specifications table for *motor* capabilities. Consult the speed/torque curves for APEX10/20 system capabilities.

Parameter	Symbol	Units	N0701DR	N0701FR	N0702ER	N0702FR	N0703FR	N0703GR	N0704FR	N0704GR
Stall Torque Continuous [1,2]	T_{CS}	lb-in	6.40	6.40	11.90	11.90	18.00	18.00	22.20	22.20
		N-m	0.72	0.72	1.34	1.34	2.03	2.03	2.50	2.50
Continuous Stall Current[1]	I_{CS}	amperes-rms	2.65	4.14	3.05	4.24	4.17	5.79	4.30	5.96
Rated Speed	ω_r	rpm	7,500	7,500	6,480	7,500	5,800	7,500	4,900	7,000
		rps	125	125	108	125	98	125	82	117
Peak Torque[1]	T_{pk}	lb-in	19.20	19.20	35.60	35.60	54.00	54.00	66.60	66.60
		N-m	2.17	2.17	4.02	4.02	6.10	6.10	7.50	7.50
Peak Current, rms[1,6]	I_{pk}	amperes	7.90	12.40	9.10	12.70	12.50	17.40	12.90	17.90
Torque @ Rated Speed[1]	T_C	lb-in	5.80	5.80	9.40	10.40	14.50	15.40	17.50	17.50
		N-m	0.66	0.66	1.06	1.18	1.64	1.74	1.98	1.98
Rated Power-Output Shaft[1]	Po	watts	510	515	718	919	1,004	1,367	1,014	1,450
Voltage Constant [3,4]	K_b	volts/radian/sec	0.221	0.14	0.353	0.253	0.392	0.282	0.468	0.338
Voltage Constant [3,4]	K_e	volts/KRPM	23.11	14.67	36.97	26.52	40.99	29.54	49.02	35.36
Torque Constant [3,4]	K_t	lb-in/amp rms	2.43	1.55	3.89	2.80	4.32	3.11	5.17	3.73
Resistance [3]	R	ohms	5.52	2.27	5.22	2.70	3.36	1.74	3.47	1.80
Inductance [3]	L	millihenries	12.98	5.23	15.86	8.16	12.13	6.30	14.50	7.55
Thermal Resistance[1]	R_{th}	°C/watt	1.44	1.44	1.15	1.15	0.96	0.96	0.87	0.87
Motor Constant	K_m	lb-in/√watt	0.83	1.03	1.70	1.70	2.36	2.36	2.77	2.78
Viscous Damping	B	lb-in/Krpm	0.0438	0.0438	0.050	0.050	0.0563	0.0563	0.0625	0.0625
Torque - Static Friction	T_f	oz.in.	1.40	2.10	2.10	2.80	2.80	2.80	3.50	3.50
Thermal Time Constant [7]	τ_{th}	minutes	45	45	45	45	45	45	45	45
Electrical Time Constant	τ_e	milliseconds	2.35	2.35	3.03	3.03	3.61	3.61	4.19	4.19
Mechanical Time Constant	τ_m	milliseconds	1.60	1.60	0.88	0.88	0.62	0.62	0.56	0.56
Rotor Inertia	J	lb.in.sec^2	0.000128	0.000128	0.000196	0.000196	0.000262	0.000262	0.000329	0.000329
Weight	#	pounds	3.54	3.54	4.53	4.53	6.04	6.04	7.28	7.28
Winding Class			H	H	H	H	H	H	H	H

[1] @25°C ambient with 10 x 10 x 0.25 in. mounting plate, 150°C winding temperature. For 40°C ambient operation, reduce values by 12%

[2] RMS current through a single phase of a sinusoidally driven motor

[3] ±10%, line-to-line, inductance bridge measurement method @ 1 kHz

[4] Peak value

[5] +/-30% line-t0-line, inductance bridge measurement @ 1KHz

[6] Peak current for 2 seconds maximum with initial winding temperature of 40° C.

[7] Per NEMA specifications. For I^2t considerations, use 10 minutes.

All specifications are subject to engineering change

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Motor Specifications – Compumotor 92mm NeoMetric Series Motors

The specifications table shows motor charactertistics. Torque specifications are with rated and peak current for the *motors.* Rated and peak current for the *drive* may be lower — thus, torque may be lower. Consult the specifications table for *motor* capabilities. Consult the speed/torque curves for APEX10/20/40 system capabilities.

Parameter	Symbol	Units	N0921F	N0921G	N0922G	N0922J	N0923H	N0923K	N0924J	N0924K
Stall Torque Continuous [1,4]	T_{CS}	lb-in	17.7	17.7	34.3	34.3	46.6	46.6	62.5	62.5
		N-m	2.0	2.0	3.88	3.88	5.26	5.26	7.06	7.06
Continuous Stall Current[1,2]	I_{CS}	amperes-rms	3.77	5.22	5.6	8.67	7.89	13.85	8.64	12.07
Rated Speed	ω_r	rpm	5,700	7,500	4.375	6,975	4,350	7,500	3,325	4,825
		rps	95	125	72.9	116.2	72.5	125	55.4	80.4
Peak Torque[1]	T_{pk}	lb-in	53	53	103	103	140	140	188	188
		N-m	5.99	5.99	11.6	11.6	15.8	15.8	21.2	21.2
Peak Current, rms[1,6]	I_{pk}	amperes	11.3	15.7	16.8	26	23.7	41.6	25.9	36.2
Torque @ Rated Speed[1]	T_C	lb-in	14.0	14.7	27.0	27.0	36.2	36.3	49	47.7
		N-m	1.58	1.66	3.05	3.05	4.09	4.1	5.5	5.39
Rated Power-Output Shaft[1]	Po	watts	946	1,305	1,397	2,231	1,864	3,222	1,930	2,731
Voltage Constant [3,4]	K_b	volts/radian/sec	0.427	0.309	0.556	0.360	0.540	0.305	0.657	0.470
Voltage Constant [3,4]	K_e	volts/KRPM	44.66	32.27	58.18	37.69	56.54	31.96	68.83	49.17
Torque Constant [3,4]	K_t	lb-in/amp rms	4.71	3.41	6.13	3.97	5.96	3.37	7.25	5.18
Resistance [3]	R	ohms	3.72	1.94	2.32	0.96	1.28	0.42	1.22	0.62
Inductance [3]	L	millihenries	17.11	8.99	14.72	6.18	14.95	4.78	20.60	10.51
Thermal Resistance[1]	R_{th}	°C/watt	1.06	1.06	0.77	0.77	0.70	0.70	0.62	0.62
Motor Constant	K_m	lb-in/√watt	1.96	2.45	4.03	4.04	5.26	5.22	6.58	6.57
Viscous Damping	B	lb-in/Krpm	0.075	0.075	0.087	0.087	0.100	0.100	0.1125	0.1125
Torque - Static Friction	T_f	oz.in.	4	4	6	6	8	8	10	10
Thermal Time Constant [7]	τ_{th}	minutes	60	60	60	60	60	60	60	60
Electrical Time Constant	τ_e	milliseconds	4.6	4.6	6.4	6.4	11.5	11.5	16.9	16.9
Mechanical Time Constant	τ_m	milliseconds	1.13	1.13	0.64	0.64	0.5	0.5	0.41	0.41
Rotor Inertia	J	lb.in.sec^2	0.000532	0.000532	0.000792	0.000792	0.00106	0.00106	0.00132	0.00132
Weight	#	pounds	8.1	8.1	11.7	11.7	15.1	15.1	18.0	18.0
Winding Class			H	H	H	H	H	H	H	H

[1] @25°C ambient with 10 x 10 x 0.25 in. mounting plate, 150°C winding temperature.

[2] RMS current through a single phase of a sinusoidally driven motor

[3] ±10% line-to-line

[4] Peak value

[5] +/-30% line-to-line, inductance bridge measurement @ 1KHz

[6] Peak current for 2 seconds maximum with initial winding temperature of 40° C.

All specifications are subject to engineering change

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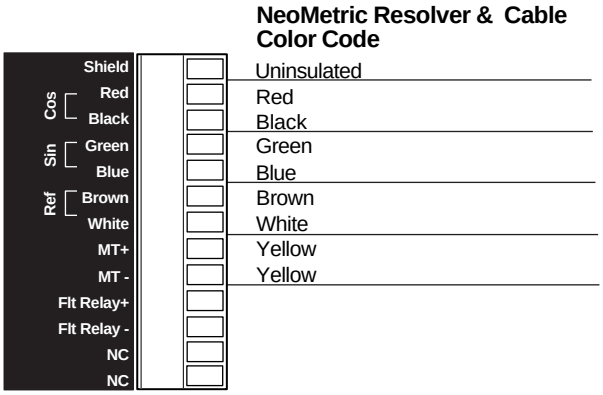
Connecting NeoMetric Motors

Motor Power

Connector Terminal	NeoMetric Motor Cable Color Code
Phase A	Red/Yellow
Phase B	White/Yellow
Phase C	Black/Yellow
Motor Ground *	Green/Yellow
Shield *	Unshielded

* **Motor Ground** and **Shield** are connected internally to the **Earth** terminal on the AC power connector

Motor Feedback



NeoMetric Motors — Electrically Released Brakes

Motor brakes are mounted internal to the motor. When ordering the brake option, specificy the motor type.

Brakes	70mm or 34 frame	92mm
Static rated torque	24 in-lb	72 in-lb
Coil voltage	24 VDC	24 VDC
Coil current	0.8 amps	0.52 amps
Weight	1.0 lbbs	2.51 lbs
Inertia	0.000038 lbs-in-sec2	0.00015 lb-in-sec2

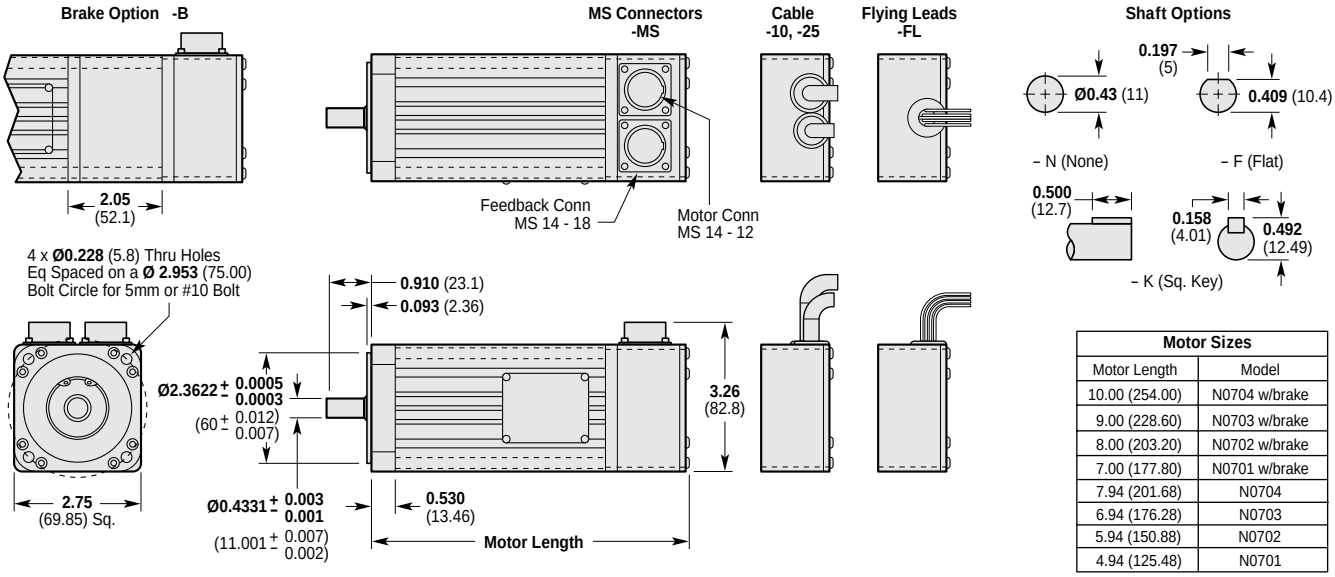
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APEX, SM and NeoMetric Motor Resolver Specifications

Parameter	Value
Input voltage @ 7000 Hz	4.25 volts
Input current, max.	55 ma
Input power, nominal	0.12 watts
Impedance ZSO (@90∞)	58+j145 ohms
Impedance ZRO	53 +j72 ohms
Impedance ZRS	42 +j55 ohms
Transformation ratio	0.470 ±5%
Output voltage	2.0 ±5% volts
D.C. rotor resistance	23 ±10% ohms
D.C. stator resistance	19 ±10% ohms
Sensitivity	35mV/Degree
Max. Error from EZ	±10 minutes
Phase shift, open circuit	5∞ leading ±3"
Null voltage (total)	20 mV rms
Impedance ZSS	50 +j128 ohms
Inertia	included in motor specification

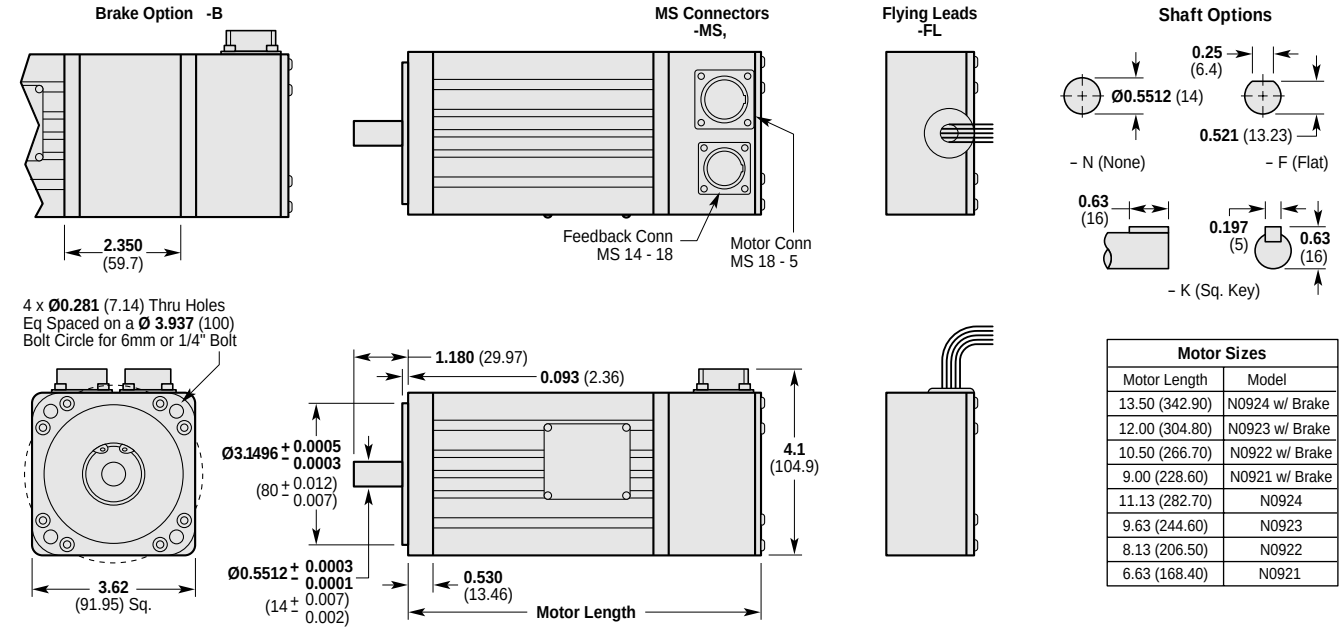
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Dimensions — Compumotor NeoMetric Series Motors, 70mm



Motor Sizes	
Motor Length	Model
10.00 (254.00)	N0704 w/brake
9.00 (228.60)	N0703 w/brake
8.00 (203.20)	N0702 w/brake
7.00 (177.80)	N0701 w/brake
7.94 (201.68)	N0704
6.94 (176.28)	N0703
5.94 (150.88)	N0702
4.94 (125.48)	N0701

Dimensions — Compumotor NeoMetric Series Motors, 92mm



Motor Sizes	
Motor Length	Model
13.50 (342.90)	N0924 w/ Brake
12.00 (304.80)	N0923 w/ Brake
10.50 (266.70)	N0922 w/ Brake
9.00 (228.60)	N0921 w/ Brake
11.13 (282.70)	N0924
9.63 (244.60)	N0923
8.13 (206.50)	N0922
6.63 (168.40)	N0921

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