Coreless DC Motors CL Series

Smooth-running, optimized-performance, 3 to 25 W coreless DC motors

Allied Motion's CL series of coreless DC motors maximizes performance through the use of high performance permanent magnets, a uniquely wound and formed coreless rotor, and in the CL29 and CL40 a precious-metal commutation system.

CL motors are efficient, and being coreless, have virtually zero iron loss and no preferred rotor position (cogfree). They offer minimized torque ripple, and low rotor inertia.

Available in three diameters (29, 40, and 66 mm), CL series motors are ideal for medical devices, small pumps, mirror/ prism drives, ticket and cash dispensers, and similar applications.

Options & Accessories

- Spur or planetary gearhead with ratios up to 900:1
- Incremental or absolute encoder
- Integrated tachometer
- Ball bearings for CL29 and CL40 models
- Alternate voltage windings
- Custom lead and connector configurations
- Alternate shaft configurations



Features & Benefits

- High performance DC coreless motors in 29, 40, and 66 mm diameters
- Power ratings from 3 to 25 W and voltage ratings from 6 to 36 VDC
- Coreless technology means no cogging and no iron loss for smooth speed and high efficiency operation Coreless rotor design for smooth, cog-free operation
- High-strength magnets for maximized performance
- Coreless design means no iron loss and higher efficiency compared to iron-core motors
- Precious metal commutation system in CL29 and CL40 models
 for low starting voltage
- Low inertia rotor for rapid response

QuickShip Products



Some of the part number configurations for this product are in stock and available for *immediate delivery*!

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CL Series – General Specifications

Series		CL29	CL	CL66				
Rated Power W(H	IP)	3 (0.004)	7 (0.009)	12 (0.016)	25 (0.034)			
Rated Torque mNm (oz.in.)		10 (1.42)	22 (3.12)	26 (3.68)	100 (14.2)			
Load N (oz) max	Radial	5 (18)	5 (18)	5 (18)	100 (22.5)			
	Axial	0.5 (0.18)	0.5 (0.18)	0.5 (0.18)	15 (3.37)			
Bearing System		Sleeve	Sleeve	Sleeve & Ball	Ball			
Commutation Syst	tem	Precious Metal	Precious Metal Graphite-Copper		Graphite-Copper			
Protection								
Weight kg (lb)		0.125 (0.28)	0.2 (0.44)	0.2 (0.44)	0.9 (1.98)			
Ambient	Operating	-10 to 60 °C (14 to +140 °F)						
Temperature	Storage	-40 to 70 °C (-40 to 158 °F)						

* 10 mm (0.39") from front mount

CL Series Options

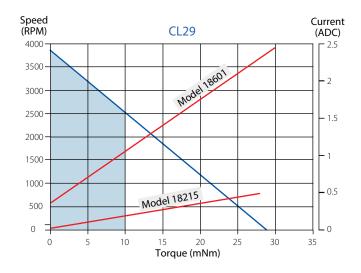
Series	CL29	CL40 (7 W)	CL40 (12W)	CL66
Ball Bearings	 ✓ 	 ✓ 	✓	_
Special Shaft Configuration	 ✓ 	 ✓ 	✓	v
Connection Cable	 ✓ 	 ✓ 	✓	 ✓
Integrated EMI Suppression	 ✓ 	 ✓ 	 ✓ 	 Image: A start of the start of
Alternate Voltage Winding	 ✓ 	 ✓ 	✓	 ✓
Tachometer	 ✓ 	 ✓ 	_	
Encoder	~	 ✓ 	 ✓ 	V

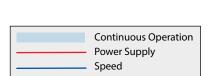


CL29 – Specifications

Ø2 mm Shaft Ø	9904 120+	18611	18612	18613	18614	18615	18616	18617		
Ø3 mm					45			Q 5		
Shaft Ø	9904 120+	18601	18602	18603	<u>18105</u>	18605	18606	<u>18215</u>		
Rated Voltage VDC		6	7.2	9	12	15	18	24		
e mNm (o	oz.in.)			10 (1.42)					
lue age	mNm (oz.in.)	30 (4.25)	30 (4.25)	30 (4.25)	27 (3.82)	27 (3.82)	30 (4.25)	28 (3.97)		
tant mN	m/A (oz.in./A)	13.9 (1.97)	17.3 (2.45)	20.8 (2.95)	28.9 (4.09)	37 (5.24)	41.6 (5.89)	57.7 (8.17)		
	Rated	2680	2550	2680	2440	2380	2680	2470		
	No-load	4010	3850	3990	3840	3750	4010	3840		
	Rated	775	620	515	370	290	260	185		
1	No-load	67	52	45	31	24	22	16		
rent @ Rat	ed Voltage A	2.21	1.73	1.47	0.96	0.75	0.73	0.49		
istance (Əhm	2.7	4.2	6.1	12.5	20.1	24.5	49		
Rotor Inductance mH		0.2	0.32	0.46	0.89	1.46	1.84	3.55		
Rotor Inertia kgm ² (oz.in.s ²)			0.9E-6 (1.27E-4)							
Mechanical Time Constant ms			13							
	Winding-Housing				5.2					
C/W	Housing-Ambient				16.3					
	Shaft Ø Ø3 mm Shaft Ø e VDC e mNm (c age tant mN c rent @ Rat istance (c ance m kgm ² (o	Shaft Ø 9904 120+ Ø3 mm Shaft Ø 9904 120+ e VDC e mNm (oz.in.) ue mNm (oz.in.) ue mNm (oz.in.) tant mNm/A (oz.in./A) Rated No-load Mo-load rent @ Rated Voltage A istance Ohm ance mH kgm² (oz.in.s²) Time Constant ms Winding-Housing	Shaft Ø 9904 120+ 18011 Ø3 mm Shaft Ø 9904 120+ 18601 e VDC 6 age mNm (oz.in.) age mNm (oz.in.) age mNm (oz.in.) Age 2680 No-load 4010 Age 775 No-load 67 rent @ Rated Voltage A 2.21 istance Ohm 2.7 ance mH 0.2 kgm² (oz.in.s²) 0.2 Time Constant ms Uinding-Housing	Shaft Ø 9904 120+ 18011 18012 Ø3 mm Shaft Ø 9904 120+ 18601 18602 e VDC 6 7.2 e MNm (oz.in.) 30 (4.25) 30 (4.25) age mNm (oz.in.) 30 (4.25) 30 (4.25) tant mNm/A (oz.in./A) 13.9 (1.97) 17.3 (2.45) Rated 2680 2550 No-load 4010 3850 A Rated 775 620 No-load 67 52 rent @ Rated Voltage A 2.21 1.73 istance Ohm 2.7 4.2 ance mH 0.2 0.32 kgm² (oz.in.s²) Time Constant ms Uinding-Housing	Shaft Ø 9904 120+ 18011 18012 18013 Ø3 mm Shaft Ø 9904 120+ 18601 18602 18603 e VDC 6 7.2 9 e mNm (ozin.) 6 7.2 9 age mNm (ozin.) 30 (4.25) 30 (4.25) 30 (4.25) tant mNm/A (ozin./A) 13.9 (1.97) 17.3 (2.45) 20.8 (2.95) Rated 2680 2550 2680 No-load 4010 3850 3990 A Rated 775 620 515 No-load 67 52 45 rent @ Rated Voltage A 2.21 1.73 1.47 istance Ohm 2.7 4.2 6.1 ance mH 0.2 0.32 0.46 kgm² (ozin.s²) 0 0 0 Time Constant ms Uinding-Housing 0 0	Shaft Ø 9904 120+ 18011 18012 18013 18014 Ø3 mm Shaft Ø 9904 120+ 18601 18602 18603 18105 e VDC 6 7.2 9 12 e mNm (oz.in.) 6 7.2 9 12 age mNm (oz.in.) 30 (4.25) 30 (4.25) 30 (4.25) 27 (3.82) tant mNm/A (oz.in./A) 13.9 (1.97) 17.3 (2.45) 20.8 (2.95) 28.9 (4.09) Rated 2680 2550 2680 2440 No-load 4010 3850 3990 3840 Mo-load 67 52 45 31 rent @ Rated Voltage A 2.21 1.73 1.47 0.96 istance Ohm 2.7 4.2 6.1 12.5 ance mH 0.2 0.32 0.46 0.89 kgm² (oz.in.s²) 0.9E-6 (1.27E- 13 13 time Constant ms 13 13	Shaft Ø 9904 120+ 18011 18012 18013 18014 18015 Ø3 mm Shaft Ø 9904 120+ 18601 18602 18603 18105 18605 e VDC 6 7.2 9 12 15 e MNm (oz.in.) 30 (4.25) 30 (4.25) 30 (4.25) 27 (3.82) 27 (3.82) ue age mNm (oz.in.) 30 (4.25) 30 (4.25) 20.8 (2.95) 28.9 (4.09) 37 (5.24) tant mNm/A (oz.in./A) 13.9 (1.97) 17.3 (2.45) 20.8 (2.95) 28.9 (4.09) 37 (5.24) Rated 2680 2550 2680 2440 2380 No-load 4010 3850 3990 3840 3750 Mo-load 67 52 45 31 24 ent @ Rated Voltage A 2.21 1.73 1.47 0.96 0.75 istance Ohm 2.7 4.2 6.1 12.5 20.1 ance mH 0.2 0.32 0.46 0.89 1.46 kgm² (oz.in.s²) USE-6 (1.27E-4) 13 1.47 1.46 </td <td>Shaft Ø 9904 120+ 18011 18012 18013 18013 18014 18015 18015 18016 Ø3 mm Shaft Ø 9904 120+ 18601 18602 18603 18105 18605 18606 e VDC 6 7.2 9 12 15 18 a mNm (ozin.) 30 (4.25) 30 (4.25) 30 (4.25) 27 (3.82) 27 (3.82) 30 (4.25) tant mNm/A (ozin./A) 13.9 (1.97) 17.3 (2.45) 20.8 (2.95) 28.9 (4.09) 37 (5.24) 41.6 (5.89) Rated 2680 2550 2680 2440 2380 2680 No-load 4010 3850 3990 3840 3750 4010 Mo-load 67 52 45 31 24 22 rent @ Rated Voltage A 2.21 1.73 1.47 0.96 0.75 0.73 istance Ohm 2.7 4.2 6.1 12.5 20.1 24.5 ance mH 0.2 0.32 0.46 0.89 1.46 1.84 kgm² (ozin.s²) Use to to to to to</td>	Shaft Ø 9904 120+ 18011 18012 18013 18013 18014 18015 18015 18016 Ø3 mm Shaft Ø 9904 120+ 18601 18602 18603 18105 18605 18606 e VDC 6 7.2 9 12 15 18 a mNm (ozin.) 30 (4.25) 30 (4.25) 30 (4.25) 27 (3.82) 27 (3.82) 30 (4.25) tant mNm/A (ozin./A) 13.9 (1.97) 17.3 (2.45) 20.8 (2.95) 28.9 (4.09) 37 (5.24) 41.6 (5.89) Rated 2680 2550 2680 2440 2380 2680 No-load 4010 3850 3990 3840 3750 4010 Mo-load 67 52 45 31 24 22 rent @ Rated Voltage A 2.21 1.73 1.47 0.96 0.75 0.73 istance Ohm 2.7 4.2 6.1 12.5 20.1 24.5 ance mH 0.2 0.32 0.46 0.89 1.46 1.84 kgm² (ozin.s²) Use to to to to to		

CL29 – Performance







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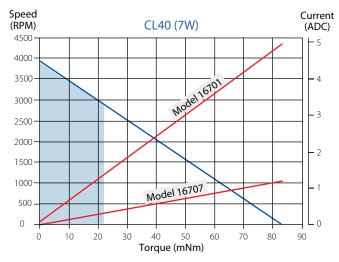


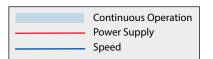


CL40 (7W) – Specifications

				4 5			Q 5			
<u>Model</u>	9904 120+	16701	16702	<u>16703</u>	16704	16705	<u>16706</u>	16707		
Rated Voltage VDC		6	9	12	15	18	24	30		
Rated Torque mNm	(oz.in.)	22 (3.12)								
Starting Torque @ Rated Voltage	mNm (oz.in.)	74 (10.5)	86 (12.2)	77(10.9)	85 (12)	89 (12.6)	87 (12.3)	85 (12)		
Torque Constant mi	Nm/A (oz.in./A)	15 (2.12)	21 (2.97)	30 (4.25)	36 (5.1)	42 (5.95)	57 (8.07)	72 (10.2)		
Speed DDM	Rated	2650	3010	2700	2920	3050	2980	2930		
Speed RPM	No-load	3780	4050	3780	3940	4050	3980	3940		
Current mA	Rated	1520	1090	760	635	540	400	320		
	No-load	60	44	30	25	22	16	13		
Starting Current @ Ra	ated Voltage A	5	4.1	2.6	2.4	2.1	1.5	1.2		
Terminal Resistance	Ohm	1.2	2.2	4.6	6.3	8.4	15.6	25.1		
Rotor Inductance mH		0.15	0.29	0.59	0.85	1.16	2.14	3.41		
Rotor Inertia kgm ² (oz.in.s ²)		4E-6 (5.67E-4)								
Mechanical Time Constant ms		20	20	20	19	19	19	19		
Thermal	Winding-Housing				5.5					
Resistance °C/W	Housing-Ambient	13								

CL40 (7W) – Performance



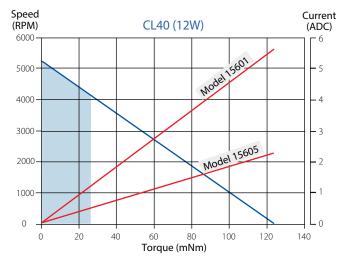


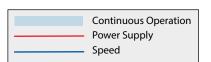


CL40 (12W) – Specifications

		75			75					
<u>Model</u>	9904 120+	<u>15601</u>	15602	15603	<u>15604</u>	15605				
Rated Voltage VDC		12	15	15 18		30				
Rated Torque mN	lm (oz.in.)	26 (3.68)								
Starting Torque @ Rated Voltage	mNm (oz.in.)	121 (17.1)	123 (17.4)	126 (17.8)	123 (17.4)	125 (17.7)				
Torque Constant	mNm/A (oz.in./A)	21.5 (3.05)	27.4 (3.88)	32.6 (4.62)	43 (6.09)	54.9 (7.78)				
Speed RPM	Rated	4140	4090	4150	4170	4100				
	No-load	5280	5180	5220	5280	5180				
	Rated	1250	980	830	630	490				
Current mA	No-load	49	38	32	25	19				
Starting Current @	Rated Voltage A	5.6	4.5	3.9	2.9	2.3				
Terminal Resistance	ce Ohm	2.1	3.3	4.6	8.3	13.1				
Rotor Inductance	mH	0.31	0.5	0.71	1.23	2.01				
Rotor Inertia kgm ² (oz.in.s ²)		4E-6 (5.67E-4)								
Mechanical Time Constant ms		18								
Thermal Resistance °C/W	Winding-Housing			5.5						
	Housing-Ambient			10.5						

CL40 (12W) – Performance







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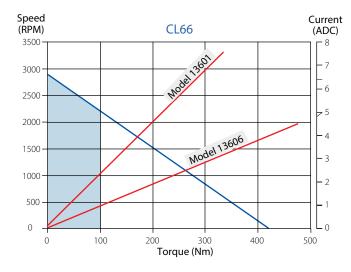


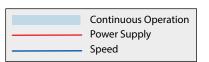


CL66 – Specifications

				Q 5		Q 5				
<u>Model</u>	9904 120+	13601	13602	<u>13603</u>	13604	<u>13605</u>	13606			
Rated Voltage VDC		12	15	18	24	30	36			
Rated Torque mN	lm (oz.in.)	100 (14.2)								
Starting Torque @ Rated Voltage	mNm (oz.in.)	335 (47.5)	384 (54.4)	418 (59.2)	418 (59.2)	436 (61.8)	477 (67.6)			
Torque Constant	mNm/A (oz.in./A)	44.2 (6.26)	50.1 (7.1)	59 (8.36)	79.6 (11.3)	95.8 (13.6)	106 (15)			
	Rated	1800	2090	2200	2170	2280	2540			
Speed RPM	No-load	2560	2830	2890	2850	2960	3210			
Current mA	Rated	2330	2060	1750	1300	1080	980			
Current mA	No-load	81	77	66	49	41	40			
Starting Current @	Rated Voltage A	7.6	7.7	7.1	5.3	4.6	4.5			
Terminal Resistance	ce Ohm	1.6	2	2.5	4.6	6.6	8			
Rotor Inductance	mH	0.59	0.75	1.04	1.9	2.75	3.37			
Rotor Inertia kgm ² (oz.in.s ²)		21E-6 (2.97E-3)								
Mechanical Time Constant ms		17	16	15	15	15	15			
Thermal Resistance °C/W	Winding-Housing			2	.9					
	Housing-Ambient	5								

CL66 – Performance





CL Series Dimensions — mm (in) Tags: 3.5 x 5 x 0.4 (0.14 x 0.20 x 0.016) **CL29** 11.0 (0.43) -39.5 (1.56)-- M2 x 3 (0.19) deep (3x) 3.4 (0.63) Equally Spaced on 17.0 (0.67) B.C. 1.5 (0.06)-7.0 (0.28) Ø2.0 (0.08) 4 <u>*</u>+ ŧ Ø29.0 20.0 (1.41) (0.79) A Ø3.0 (0.19) Ø6.5 4.0 (0.16)-Ø10 (0.39) Ø6.5 (0.26) - Tags: 3.5 x 5 x 0.4 (0.14 x 0.20 x 0.016) CL40 (7W) M3 x 3 (0.19) deep (4x) -39.6 (1.56)-(0.49) Equally Spaced on 28.0 (1.10) B.C. 1.5 (0.06)-¥ 4 Ø40.0Ø32.0 20.0 (1.57) (1.26) (0.79) ŧ ¥. Ø3.0 (0.19) -Ø18 (0.71) - 1.0 (0.04) 3.2 (0.13) -Tags: 3.5 x 5 x 0.4 (0.14 x 0.20 x 0.016) CL40 (12W) M3 x 3 (0.19) deep (4x) 12.5 42 (1.65) (0.49) Equally Spaced on 28.0 (1.10) B.C. 1.5 (0.06)ł 4 Ø40.0 20.0 (1.57) (0.79) ¥ Ø3.0 4 (0.19) Ø10.0 (0.39) Ø18 (0.71) 3.5 (0.14) 6.5 (0.26) - 88.5 (3.48) **CL66** 64.0 (2.52) M4 x 8 (0.31) deep (3x) 57.9 (2.28) 20.8 (0.82) Equally Spaced on 50.0 (1.97) B.C. 50.0 (1.10) B.C. 8.8 (0.35) Ø4 (0.16) x 2.5 (0.1) deep 4.8 (0.19)-66.0 Ø28 (2.60) \square 20 (0.19)Ø5.99 (0.236) Ò 235 (9.24) length 37 6 (0.24) 10 **A**MERICAS +1 (716) 242-7535 **Allied Motion** 7 +46 (8) 546 11 100



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Issue Date: 5.15.17

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